

City of Ryde Development Control Plan 2014

Part: 1.0 Preliminary

Adopted 28 May 2013

Effective 12 September 2014

Translation

ENGLISH

If you do not understand this document please come to Ryde Civic Centre, 1 Devlin Street, Ryde Monday to Friday 8.30am to 4.30pm or telephone the Telephone and Interpreting Service on 131 450 and ask an interpreter to contact the City of Ryde for you on 9952 8222.

ARABIC

إننا نعتذر عليك فهم محتويات هذه الوثيقة، نرجو للحضور إلى مركز بلدية رايد Ryde Civic Centre على العنوان: 1 Devlin Street, Ryde 1 من الاثنين إلى الجمعة بين الساعة 8.30 صباحاً والساعة 4.30 بعد الظهر أو الاتصال بمكتب خدمات الترجمة على الرقم 131 450 لكي تطلب من أحد المترجمين الاتصال بمجلس مدينة رايد، على الرقم 9952 8222، نيابة عنك.

ARMENIAN

Եթե այս գրությունը չէք հասկնար, խնդրեմ եկե՛ք՝ Բայր Սիվիկ Սենթըր, 1 Տելվին փողոց, Բայր, (Ryde Civic Centre, 1 Devlin Street, Ryde) Երկուշաբթիէն Ուրբաթ կ.ա. ժամը 8.30 – կ.ե. ժամը 4.30, կամ հեռաձայնեցե՛ք Հեռաձայնի եւ Թարգմանություն Սպասարկության՝ 131 450, եւ խնդրեցե՛ք որ թարգմանիչ մը Բայր Քաղաքապետարանին հետ կապ հաստատել ձեզի համար, հեռաձայնելով՝ 9952 8222 թիվին:

CHINESE

如果您看不懂本文，請在周一至周五上午 8 時 30 分至下午 4 時 30 分前往 Ryde 市政中心詢問 (Ryde Civic Centre, 地址: 1 Devlin Street, Ryde)。你也可以打電話至電話傳譯服務中心，電話號碼是: 131 450。接通後你可以要求一位傳譯員為你打如下電話和 Ryde 市政廳聯繫，電話是: 9952 8222。

FARSI

اگر این مدرک را نمی فهمید لطفاً از 8.30 صبح تا 4.30 بعد از ظهر دوشنبه تا جمعه به مرکز شهرداری رايد، Ryde Civic Centre, 1 Devlin Street, Ryde مراجعه کنید یا به سرویس مترجم تلفنی، شماره 131 450 تلفن بزنید و از یک مترجم بخواهید که از طرف شما با شهرداری رايد شماره 9952 8222 تلفن بزند.

ITALIAN

Se non capite il presente documento, siete pregati di rivolgervi al Ryde Civic Centre al n. 1 di Devlin Street, Ryde, dalle 8.30 alle 16.30, dal lunedì al venerdì; oppure potete chiamare il Telephone Translating and Interpreting Service al 131 450 e chiedere all'interprete di contattare a vostro nome il Municipio di Ryde presso il 9952 8222.

KOREAN

이 문서가 무슨 의미인지 모르실 경우에는 1 Devlin Street, Ryde 에 있는 Ryde Civic Centre 로 오시거나 (월 – 금, 오전 8:30 – 오후 4:30), 전화 131 450 번으로 전화 통역 서비스에 연락하셔서 통역사에게 여러분 대신 Ryde 시청에 전화 9952 8222 번으로 연락을 부탁드립니다.

Table of Contents

VOLUME A**1.0 INTRODUCTION**

- 1.1 Name of this Plan
- 1.2 Commencement of this Plan
- 1.3 Land to which this Plan Applies
- 1.4 Purpose of this Plan
- 1.5 Objectives of this Plan
- 1.6 Relationship to Environmental Planning Instruments
- 1.7 Meaning of Words
- 1.8 Structure of this Plan
- 1.9 Lodging a Development Application

2.0 ADMINISTRATION

- 2.1 Notification of Development Applications

3.0 DEVELOPMENT TYPE

- 3.1 Brothels (Sex Service Premises)
- 3.2 Child Care Centres
- 3.3 Dwelling Houses and Dual Occupancy (attached)
- 3.4 Multi Dwelling Housing (for Low Density Residential Zone)
- 3.5 Boarding Houses

4.0 URBAN CENTRES

- 4.1 Eastwood Town Centre
- 4.2 Shepherd's Bay, Meadowbank
- 4.3 West Ryde Town Centre
- 4.4 Ryde Town Centre
- 4.5 Macquarie Park Corridor
- 4.6 Gladesville Town Centre and Victoria Road Corridor

5.0 SPECIAL AREAS

- 5.1 Coronation Avenue and Trelawney Street, Eastwood Character Area
- 5.2 Eastwood House Estate Heritage Conservation Area
- 5.3 Tyrell Street, Gladesville, Character Area
- 5.4 Blenheim Road Small Centre

Table of Contents

VOLUME B**6.0 SPECIFIC SITES**

- 6.1 Blaxland Road (601-607) Eastwood
- 6.2 Pennant Avenue (1-13) Denistone
- 6.3 Second Avenue (9-19) Eastwood
- 6.4 Blaxland Road (283-289) Ryde

7.0 ENVIRONMENT

- 7.1 Energy Smart, Water Wise
- 7.2 Waste Minimisation and Management

8.0 ENGINEERING

- 8.1 Construction Activities
- 8.2 Stormwater Management
- 8.3 Driveways
- 8.4 Title Encumbrances
- 8.5 Public Civil Works
- 8.6 Floodplain Management

9.0 OTHER PROVISIONS

- 9.1 Signage
- 9.2 Access for People with Disabilities
- 9.3 Parking Controls
- 9.4 Installation of Satellite Dishes and MDS-Microwave Antennae
- 9.5 Tree Preservation

10 DICTIONARY

List of Amendments

Amend. No.	Date approved	Effective date	Subject of amendment



City of Ryde
Civic Centre
1 Devlin Street
Ryde NSW 2112

www.ryde.nsw.gov.au

City of Ryde Development Control Plan 2014

Part: 1.0 Introduction

Translation

ENGLISH

If you do not understand this document please come to Ryde Civic Centre, 1 Devlin Street, Ryde Monday to Friday 8.30am to 4.30pm or telephone the Telephone and Interpreting Service on 131 450 and ask an interpreter to contact the City of Ryde for you on 9952 8222.

ARABIC

إننا نعتذر عليك فهم محتويات هذه الوثيقة، نرجو للحضور إلى مركز بلدية رايد Ryde Civic Centre على العنوان: 1 Devlin Street, Ryde 1 من الاثنين إلى الجمعة بين الساعة 8.30 صباحاً والساعة 4.30 بعد الظهر أو الاتصال بمكتب خدمات الترجمة على الرقم 131 450 لكي تطلب من أحد المترجمين الاتصال بمجلس مدينة رايد، على الرقم 9952 8222، نيابة عنك.

ARMENIAN

Եթէ այս գրութիւնը չէք հասկնար, խնդրեմ եկէ՛ք Րայդ Սիվիկ Սենթըր, 1 Տելվին փողոց, Րայդ, (Ryde Civic Centre, 1 Devlin Street, Ryde) Երկուշաբթիէն Ուրբաթ կ.ա. ժամը 8.30 – կ.ե. ժամը 4.30, կամ հեռաձայնեցէ՛ք Հեռաձայնի եւ Թարգմանական Սպասարկութեան՝ 131 450, եւ խնդրեցէ՛ք որ թարգմանիչ մը Րայդ Քաղաքապետարանին հետ կապ հաստատուէ ձեզի համար, հեռաձայնելով՝ 9952 8222 թիվին:

CHINESE

如果您看不懂本文，請在周一至周五上午 8 時 30 分至下午 4 時 30 分前往 Ryde 市政中心詢問 (Ryde Civic Centre, 地址: 1 Devlin Street, Ryde)。你也可以打電話至電話傳譯服務中心，電話號碼是: 131 450。接通後你可以要求一位傳譯員為你打如下電話和 Ryde 市政廳聯繫，電話是: 9952 8222。

FARSI

اگر این مدرک را نمی فهمید لطفاً از 8.30 صبح تا 4.30 بعد از ظهر دوشنبه تا جمعه به مرکز شهرداری رايد، Ryde Civic Centre, 1 Devlin Street, Ryde مراجعه کنید یا به سرویس مترجم تلفنی، شماره 131 450 تلفن بزنید و از یک مترجم بخواهید که از طرف شما با شهرداری رايد شماره 9952 8222 تلفن بزند.

ITALIAN

Se non capite il presente documento, siete pregati di rivolgervi al Ryde Civic Centre al n. 1 di Devlin Street, Ryde, dalle 8.30 alle 16.30, dal lunedì al venerdì; oppure potete chiamare il Telephone Translating and Interpreting Service al 131 450 e chiedere all'interprete di contattare a vostro nome il Municipio di Ryde presso il 9952 8222.

KOREAN

이 문서가 무슨 의미인지 모르실 경우에는 1 Devlin Street, Ryde 에 있는 Ryde Civic Centre 로 오시거나 (월 – 금, 오전 8:30 – 오후 4:30), 전화 131 450 번으로 전화 통역 서비스에 연락하셔서 통역사에게 여러분 대신 Ryde 시청에 전화 9952 8222 번으로 연락을 부탁드립니다.

Amend. No.	Date approved	Effective date	Subject of amendment

Table of Contents

1.0	INTRODUCTION	4
1.1	Name of this Plan	4
1.2	Commencement of this Plan	4
1.3	Land to which this Plan applies	4
1.4	Purpose of this Plan	4
1.5	Objectives of this Plan	4
1.6	Relationship to Environmental Planning Instruments	5
1.7	Meaning of Words	5
1.8	Structure of this Plan	5
1.9	Lodging a Development Application	5

1.0 INTRODUCTION

1.1 Name of this Plan

This Plan is known as City of Ryde Development Control Plan 2014.

1.2 Commencement of this Plan

The DCP was adopted by Council on 28 May 2013 and came into effect on the 12 September 2014.

1.3 Land to which this Plan applies

This Plan applies to all land within the City of Ryde.

1.4 Purpose of this Plan

The purpose of this Plan is to provide, in a consolidated format, guidelines, objectives and controls relating to the future development of the City of Ryde.

The Plan provides detailed provisions relating to urban centres, special areas, specific sites, environment, engineering, administration and a variety of development types. It aims to achieve the best outcomes for all development permitted under Ryde Local Environmental Plan 2014.

The City of Ryde Development Control Plan 2014 makes it easier for business and the community to determine the guidelines, objectives and controls that apply to any one site within the City of Ryde.

1.5 Objectives of this Plan

Objectives

The objectives of this Plan are:

1. To achieve a responsible development control system that has sustainable environmental outcomes;
2. To enhance the existing amenity and character of the City of Ryde;
3. To create vibrant, viable and economically sound employment and living centres;
4. To ensure new development is appropriate for its site and context;
5. To ensure that urban centres and special areas are identified and their special qualities protected and enhanced;
6. To provide guidelines for specific development types and development sites to ensure appropriate high quality development.

1.6 Relationship to Environmental Planning Instruments

This Plan should be read in conjunction with the:

- Ryde Local Environmental Plan 2010;
- Ryde Local Environmental Plan 2014;
- Any relevant State and Regional Environmental Planning Policies.

Where a Local Environmental Plan, Certificate of Title including associated documents or any other legal document, makes reference to a previously revoked DCP, that reference should be read as a reference to the relevant Part of this Plan.

1.7 Meaning of Words

The terms in this DCP are defined in the Dictionary contained in Part 10 of this Plan. Where the term is not defined in this DCP, the term will have the same meaning as those defined in the *Ryde Local Environmental Plan 2014* or the *Environmental Planning and Assessment Act and Regulations* as amended.

1.8 Structure of this Plan

- Part 2 – Administration
- Part 3 – Development Type
- Part 4 – Urban Centres
- Part 5 – Special Areas
- Part 6 – Specific Sites
- Part 7 – Environment
- Part 8 – Engineering
- Part 9 – Other Provisions
- Part 10 – Dictionary

1.9 Lodging a Development Application

Prospective applicants should discuss their development proposals at an early stage with the Customer Service Staff. Council also offers a pre-lodgement advice service to review and discuss development proposals with relevant staff.



City of Ryde
Civic Centre
1 Devlin Street
Ryde NSW 2112

www.ryde.nsw.gov.au

City of Ryde Development Control Plan 2014

Part: 2.1 Notification of Development Applications

Translation

ENGLISH

If you do not understand this document please come to Ryde Civic Centre, 1 Devlin Street, Ryde Monday to Friday 8.30am to 4.30pm or telephone the Telephone and Interpreting Service on 131 450 and ask an interpreter to contact the City of Ryde for you on 9952 8222.

ARABIC

إننا نعتذر عليك فهم محتويات هذه الوثيقة، نرجو للحضور إلى مركز بلدية رايد Ryde Civic Centre على العنوان: 1 Devlin Street, Ryde 1 من الاثنين إلى الجمعة بين الساعة 8.30 صباحاً والساعة 4.30 بعد الظهر أو الاتصال بمكتب خدمات الترجمة على الرقم 131 450 لكي تطلب من أحد المترجمين الاتصال بمجلس مدينة رايد، على الرقم 9952 8222، نيابة عنك.

ARMENIAN

Եթէ այս գրութիւնը չէ՞ք հասկնար, խնդրեմ եկէ՛ք՝ Րայդ Սիվիկ Սենթըր, 1 Տելվին փողոց, Րայդ, (Ryde Civic Centre, 1 Devlin Street, Ryde) Երկուշաբթիէն Ուրբաթ կ.ա. ժամը 8.30 – կ.ե. ժամը 4.30, կամ հեռաձայնեցէ՛ք Հեռաձայնի եւ Թարգմանական Սպասարկութեան՝ 131 450, եւ խնդրեցէ՛ք որ թարգմանիչ մը Րայդ Քաղաքապետարանին հետ կապ հաստատուէ ձեզի համար, հեռաձայնելով՝ 9952 8222 թիվին:

CHINESE

如果您看不懂本文，請在周一至周五上午 8 時 30 分至下午 4 時 30 分前往 Ryde 市政中心詢問 (Ryde Civic Centre, 地址: 1 Devlin Street, Ryde)。你也可以打電話至電話傳譯服務中心，電話號碼是: 131 450。接通後你可以要求一位傳譯員為你打如下電話和 Ryde 市政廳聯繫，電話是: 9952 8222。

FARSI

اگر این مدرک را نمی فهمید لطفاً از 8.30 صبح تا 4.30 بعد از ظهر دوشنبه تا جمعه به مرکز شهرداری رايد، Ryde Civic Centre, 1 Devlin Street, Ryde مراجعه کنید یا به سرویس مترجم تلفنی، شماره 131 450 تلفن بزنید و از یک مترجم بخواهید که از طرف شما با شهرداری رايد، شماره 9952 8222 تلفن بزند.

ITALIAN

Se non capite il presente documento, siete pregati di rivolgervi al Ryde Civic Centre al n. 1 di Devlin Street, Ryde, dalle 8.30 alle 16.30, dal lunedì al venerdì; oppure potete chiamare il Telephone Translating and Interpreting Service al 131 450 e chiedere all'interprete di contattare a vostro nome il Municipio di Ryde presso il 9952 8222.

KOREAN

이 문서가 무슨 의미인지 모르실 경우에는 1 Devlin Street, Ryde 에 있는 Ryde Civic Centre 로 오시거나 (월 – 금, 오전 8:30 – 오후 4:30), 전화 131 450 번으로 전화 통역 서비스에 연락하셔서 통역사에게 여러분 대신 Ryde 시청에 전화 9952 8222 번으로 연락을 부탁드립니다.

Amend. No.	Date approved	Effective date	Subject of amendment

Table of Contents

1.0	INTRODUCTION	5
1.1	Objectives of this Part	5
1.2	What is covered in this Part?	5
2.0	NOTIFICATION REQUIREMENTS FOR DEVELOPMENT APPLICATIONS	6
2.1	The methods used to notify the community of development applications	6
2.2	Notification Table	7
2.3	People to be notified of a development application	8
2.4	The meaning of 'adjoining land'	9
2.5	The meaning of 'extended adjoining land'	9
2.6	Extension of the notification area	11
2.7	Notification across local government boundaries	11
2.8	The information to be provided by the applicant	11
2.9	The amendments to development application where re-notification may not be required	12
2.10	Post determination notification of development applications	12
3.0	NOTIFICATION TABLE	13
4.0	NOTIFICATION REQUIREMENTS FOR OTHER APPLICATION TYPES	17
4.1	Applications for modification of development consent	17
4.2	Section 82A request for review of Council determinations	18

THIS PAGE HAS BEEN
INTENTIONALLY LEFT BLANK

1.0 INTRODUCTION

This part is prepared under Section 74C of the *Environmental Planning and Assessment Act 1979* (Act). This Part only applies to the public notification or advertising of development proposals where the City of Ryde Council is the consent authority.

1.1 Objectives of this Part

Objectives

The objectives of this Part are to:

1. outline the public exhibition and notification procedures for development applications, applications to modify development consents and applications to review Council's determinations;
2. provide opportunity for people who may be affected by a development proposal to have their comments about the proposal considered by the Council, and to; and
3. identify 'advertised development'.

1.2 What is covered in this Part?

This Part applies to the following:

- Development applications
- Complying Development Certificate applications
- Amendment to development applications before being determined by Council
- Amendment/modifications to development consents
- Other applications such as applications under Section 96 for modifications of development consent and Section 82A of the Act to review Council's determination of development applications.

This Part does not apply to the following:

- Exempt development
- State significant development
- Local environmental plans
- Development control plans

2.0 NOTIFICATION REQUIREMENTS FOR DEVELOPMENT APPLICATIONS

2.1 The methods used to notify the community of development applications

Notification takes the form of one or more of the following:

- Letters to people (written notice);
- Notice published in a local newspaper (published notice);
- Signs placed on the land; and
- Information on the City of Ryde website.

The written notice must contain:

- The development application number.
- A description and address of the site.
- A description of the development.
- The name of the applicant.
- Advice that the plans can be inspected free of charge at Council.
- The right of affected persons to lodge a written submission about the application (include place (s), dates and times for inspection)
- The time period within which submissions are to be made.
- A notification plan of the development prepared by the applicant.

The published notice must contain:

- The development application number.
- A description including the address of the site.
- A description of the development.
- Advice that the plans can be inspected free of charge at Council (include place (s), dates and times for inspection).
- The right of affected persons to lodge a written submission about the application.
- The time period within which submissions are to be made.
- The published notice will be advertised on one occasion in a selected newspaper.

The sign on the land must contain:

- A heading – development proposal;
- Address of the site;
- Development application number;
- A brief description of the proposal;
- The name of the applicant;
- A site plan;
- The right of affected persons to lodge a written submission about the application;
- The time period within which submissions are to be made.

Integrated Development:

In the case of development that is integrated development the notice:

- i. must contain a statement that the development is integrated development; and

- ii. must state the approvals that are required and the relevant approval bodies for those approvals, and

In the case of development that is threatened species development, the notice must contain a statement that the development is threatened species development.

Note: The *Environmental Planning and Assessment Act 1979* (Act), sets out the method of notification that must be used for Designated development and Advertised development.

The Act defines Designated development in section 77A and Schedule 3 of the Environmental Planning and Assessment Regulation 2000 (Regulation) identifies the categories of designated development. Designated development refers to certain types of large scale development with potentially high impacts on the environment.

Advertised development is defined in section 4 of the Act which refers to the types of development that are identified as advertised development by the regulation, an environmental planning instrument or a development control plan. The Regulations refer to advertised development identified in a development control plan as other advertised development. The Act enables Council to identify advertised development and set a notification process over and above the minimum notification requirements.

2.2 Notification Table

A Notification Table is included in Section 4 of this part. This table identifies the 'advertised developments', sets out for the development by major land use types, the method or methods of notification and the period for making submissions. The Notification Table also identifies the development types that **do not require notification**.

The submission period commences from the **day of publication** of the first notice in the news paper or if there is no published notice, from the day after the date of the written notice.

If a development proposal is likely to generate significant community interest the Council may also:

- Consult the relevant interest groups such as community organisations;
- Arrange a public meeting, presentation or forum; and/or
- Distribute media release.

During December and January Council will modify the notification periods to take account the public holidays in the following manner:

- Any development application received and notified in the period from first week of December to 24 December and during first and second weeks of January will be subject to a double notification period, e.g., notification requiring 14 days will be extended to 28 days and notifications requiring 21 days will be extended to 42 days;
- Any development application received in December that would be of significant public interest will not be notified until the first week of January in the following year;
- Any development application received in December that would require Newspaper notification will not be notified until the first available publication date in January the following year.

2.3 People to be notified of a development application

Notice of a proposed development application will be sent to:

- people who are owners (and occupier in certain cases) of 'adjoining land' or 'extended adjoining land';
- any person or group of persons whom Council considers may have an interest in the application; and
- public authorities which the Council believes may have an interest in the application. For example Council would notify National Parks and Wildlife Service about a development proposal adjacent to the Lane Cove National Park.

If the land is a lot within the meaning of the Strata Schemes (Freehold Development Act 1973), a written notice to the owners' corporation is considered to be a written notice to the owners and occupiers of each lot within the strata scheme.

If the land is a lot within the meaning of the Strata Schemes (Leasehold Development Act 1986), a written notice to the lessor under the Leasehold Strata Scheme and to the owners' corporation is considered to be a written notice to the owners and occupiers of each lot within the strata scheme.

If the land is owned or occupied by more than one person, a written notice to one owner or occupier is considered to be a written notice to all the owners and occupiers.

Note: Council's records will be used to determine the owners of land. Council does not maintain records of the occupiers of properties and will send letters to the property addressed for the attention of "the occupier".

2.4 The meaning of 'adjoining land'

The diagram below (Figure 2.1.01) shows the land considered to be 'adjoining land'.

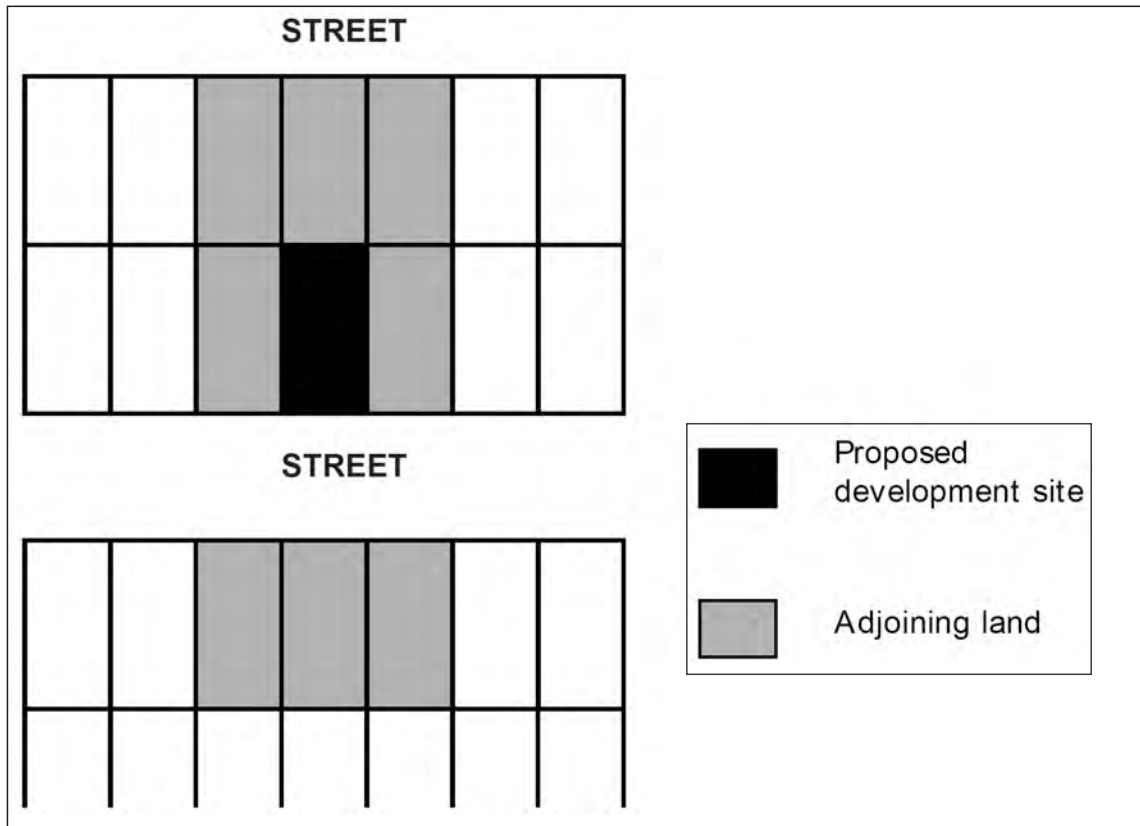


Figure 2.1.01 Adjoining Land

Note: When a site and the adjoining land are not in the configuration shown, Council has delegated to officers the power to form an opinion, which is to be based on the potential impact of the development, on what is considered to be 'adjoining land'.

2.5 The meaning of 'extended adjoining land'

The 'extended adjoining land' is an expansion of the area defined as 'adjoining land' in Section 2.4 of this Part. The diagram below shows the land to be included in the 'extended adjoining land'.

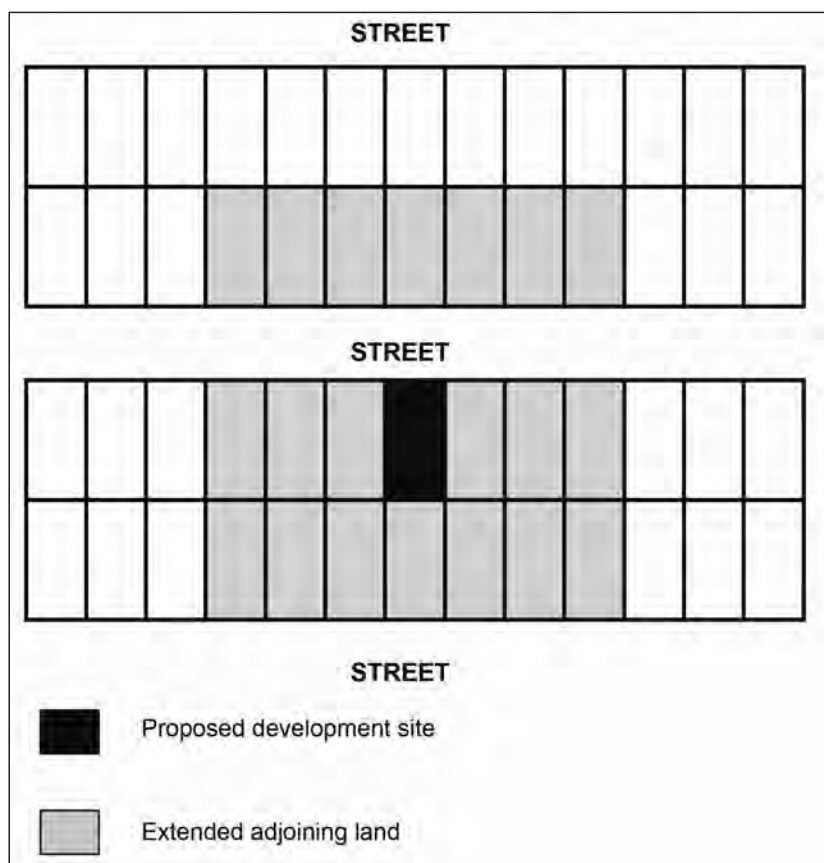


Figure 2.1.02 Extended Adjoining Land

Notification of the 'extended adjoining land' is required for the following development applications:

- New multi dwelling housing with 4 or more dwellings;
- New residential flat buildings;
- New mixed use development;
- Boarding house;
- Child care centres in a residential area or adjoining a residential area;
- Development resulting in changes of use from one non conforming use to another non conforming use;
- Industrial development including a new development, change of use from industry to industry and alterations and additions, where the site adjoins a residential area;
- New café or restaurant, where the site adjoins a residential area;
- Outdoor seating associated with a new café or restaurant, where the site adjoins a residential area; and
- Advertising signs, where the site adjoins a residential area.

Note: When a site and the adjoining land are not in the configuration shown, Council has delegated to officers the power to form an opinion, which is to be based on the potential impact of the development, on what is considered to be the 'extended adjoining land'.

2.6 Extension of the notification area

The notification area may extend beyond the 'adjoining land' when it is considered that the potential impact of a proposed development will affect persons other than the adjoining owners and occupiers. The notification area may be extended where the enjoyment of land may be detrimentally affected in relation to:

- An increase in overshadowing;
- Loss of privacy;
- Increase in noise levels;
- Light spillage or reflection;
- Traffic generation;
- Loss of visual amenity within an area;
- The scale or bulk of the proposed building;
- The siting of the proposed building in relation to the site boundaries;
- Hours of use;
- Means of access to or provision of car parking on the application site; and
- Drainage.

Note: Council has delegated to officers the power to form an opinion on whether the enjoyment of land may be affected by a proposed development, and to notify the owners and/or occupiers of the properties beyond the 'extended adjoining land'.

2.7 Notification across local government boundaries

Where a development application is likely to affect owners of land outside the City of Ryde, Council will contact the neighbouring Council to provide them with information to enable them to adequately inform the community.

The notification of landowners outside the City of Ryde regarding a development is at the discretion of the neighbouring council.

2.8 The information to be provided by the applicant

The information required to be submitted by an applicant in relation to different types of applications are detailed in Council's Development Application Package which can be obtained from the Customer Services Centre or electronically downloaded from Council's web site.

2.9 The amendments to development application where re-notification may not be required

- a. Section 55 of the Environmental Planning and Assessment Regulation 2000 enables an applicant with the agreement of Council to amend or vary a development application at any time before Council has determined the application. No notification or advertisement will occur where the amendments in the Council's opinion:
 - i. do not significantly differ from the original development application; and
 - ii. do not increase the impact on adjoining or neighbouring land or cause no material impact on the environment.
- b. A development application where the amendments to the application is deemed to be substantial or likely to have a greater impact on adjoining or neighbouring land; or where the application has been replaced then Council will renotify:
 - i. those persons who made submissions on the original application; and
 - ii. any other person who owns adjoining or neighbouring land and in the Council's opinion may be adversely affected by the amendments.

Note: In the case of submission being made by petition, only the principal author or first signatory will be notified.

2.10 Post determination notification of development applications

Council notifies all persons who made submissions about a development application regarding the decision made. In the case of submission being made by petition, only the principal author or first signatory will be notified.

Council will publish a public notice of all development applications determined by Council. The public notice, which is placed in a local newspaper, provides details of the land and the development proposal.

3.0 NOTIFICATION TABLE

METHOD OF NOTIFICATION ⁽¹⁾						
Type of Development	Is It Advertised Development	Notice in Newspaper	Sign on Land	Notice to Adjoining Owners	Notice to Adjoining Occupiers	Submission Period
Amusement Centre	No	No	No	Yes	Yes	14 days
Ancillary Uses to Residential - ⁽²⁾ Pergola (unroofed), Detached Garage, Carport, Outbuilding, and Swimming pools 0.5m above the existing ground level	No	No	No	No	No	NA
Boarding House	Yes	Yes	No	Yes	Yes	14 days
Brothels	Yes	Yes	No	Yes	Yes	14 days
Business/Office Building (New)	No	No	No	Yes	No	14 days
Business/ Office- minor building works	No	No	No	No	No	NA
Child Care Centre – on land zoned residential or on land adjoining land zoned residential	Yes	Yes	No	Yes	Yes	14 days
Complying Development	No	Yes (For the purpose of section 101 of the Act)	No	No	No	NA
Change of Use – in Industrial and Business Zones	No	No	No	No	No	NA
Crematoriums/ Cemeteries	No	Yes	No	Yes	Yes	14 days
Demolition – Where no DA for any new building on land has been notified	No	No	No	Yes	No	14 days

METHOD OF NOTIFICATION ⁽¹⁾						
Type of Development	Is It Advertised Development	Notice in Newspaper	Sign on Land	Notice to Adjoining Owners	Notice to Adjoining Occupiers	Submission Period
Demolition – Where a DA for a new building on land has already been notified	No	No	No	No	No	NA
Drug Rehabilitation Facilities	No	Yes	No	Yes	Yes	14 days
Dual Occupancy - including Alterations and additions	No	No	No	Yes	Yes	14 days
Dwelling Houses - New two storey and two storey additions/alterations	No	No	No	Yes	Yes	14 days
Dwelling Houses - New single storey and single storey alterations/ additions	No	No	No	Yes	Yes	14 days
Educational Establishment – on residential land or on land adjoining residential land	Yes	Yes	No	Yes	Yes	14 days
Footpath/Outdoor Dining - adjoining land zoned residential	No	No	No	Yes	Yes	14 days
Footpath/Outdoor Dining - in established business zones	No	No	No	No	No	NA
Funeral Home and associated Chapel	No	Yes	No	Yes	Yes	14 days
Group Homes	No	No	No	Yes	Yes	14 days
Hospital – on land zoned residential or land adjoining land zoned residential	Yes	Yes	Yes	Yes	Yes	21 days
Hospital – on land other than residential zones	Yes	Yes	No	Yes	Yes	21 days

METHOD OF NOTIFICATION ⁽¹⁾						
Type of Development	Is It Advertised Development	Notice in Newspaper	Sign on Land	Notice to Adjoining Owners	Notice to Adjoining Occupiers	Submission Period
Industrial Building Work – on land adjoining residential land	No	No	No	Yes	No	14 days
Industrial Building Work – on land not adjoining any residential land	No	No	No	No	No	NA
Integrated Development – Approval under Heritage Act, Water Act, POE Act	Yes	Yes	No	Yes	Yes	30 days
Internal fit outs - (shops/Business/ industrial)	No	No	No	No	No	NA
Land Subdivision	No	No	No	Yes	Yes	14 days
Liquor Licence	Yes	Yes	No	Yes	Yes (within 200m)	14 days
Massage Services	No	No	No	Yes	Yes	14 days
Mixed Use Developments -New	Yes	Yes	Yes	Yes	Yes	21 days
Mixed Use Developments – Alterations and additions	No	No	No	Yes	Yes	14 days
Multi dwelling Housing -New	Yes	Yes	Yes	Yes	Yes	21 days
Multi dwelling Housing - alterations and additions	No	No	No	Yes	Yes	14 days
Place of Public Worship – on land zoned residential or land adjoining land zoned residential	Yes	Yes	Yes	Yes	Yes	14 days
Place of Public Worship – on land zoned other than residential	No	No	No	Yes	Yes	14 days

METHOD OF NOTIFICATION ⁽¹⁾						
Type of Development	Is It Advertised Development	Notice in Newspaper	Sign on Land	Notice to Adjoining Owners	Notice to Adjoining Occupiers	Submission Period
Residential Flat Building - New	Yes	Yes	Yes	Yes	Yes	14 days
Residential Flat Building – alterations and additions	No	No	No	Yes	Yes	14 days
Restricted Premises	No	Yes	No	Yes	Yes	14 Days
Secondary Dwelling (Granny Flat)	No	No	No	Yes	Yes	14 days
Seniors Housing	Yes	Yes	No	Yes	Yes	21 Days
Signage – on land zoned residential or on land adjoining land zoned residential	No	No	No	Yes	No	14 days
Signage – on other land	No	No	No	No	No	NA
Strata Subdivision	No	No	No	No	No	NA
Telecommunication Facilities	No	Yes	No	Yes (within 300m)	Yes (within 300m)	14 days
All other developments not included above	No	No	No	Yes	No	14 days

1. Notices of all development applications that are being notified will be placed on Council Website.
2. Council has delegated to officers the power to form an opinion, which is to be based on the potential impact of the development, to notify the proposed development.

Note: Refer to section 4.0 for notification requirements involving applications under section 96 and section 82A of the Act.

4.0 NOTIFICATION REQUIREMENTS FOR OTHER APPLICATION TYPES

4.1 Applications for modification of development consent

- Section 96 of the EP&A Act allows an applicant to modify a development consent that has been granted without the need for a new consent to be issued.
- There are 4 types of modification applications that can be made:
 - a minor modification under section 96(1) for minor errors, misdescription or miscalculation;
 - an application under section 96(1A) where the proposed modification is of minimal environmental impact;
 - an application under section 96(2) for other modifications that involve more than a minimal environmental impact; and
 - an application under section 96AA. These are applications for modification of a consent that has been granted by the Land and Environment Court.
- Applications to modify development consent under section 96(1) to correct minor error, misdescription or miscalculation will not be advertised or notified.
- Applications to modify development consent under section 96(1A) or section 96(2) will be notified or notified and advertised for a minimum period of 14 days in the same manner as the original development application was notified or advertised unless:
 - the original development application was not required to be notified or advertised; and/or
 - the modification does not change the external appearance or the building height or the shape of the proposal as shown on the original development application; and/or
 - the responsible Council Officer is satisfied that the proposed modification or amendment has none or minimal impact on the environment; and/or
 - the responsible Council Officer is satisfied that the proposed modification or amendment is unlikely to cause any disadvantage to any person who owns land in the adjoining land area, the extended adjoining land area or who has made a submission relating to the development application.

Note: If Council is satisfied that the proposed modification is of a minor nature, or of minimal environmental impact, the requirements of newspaper advertisement or sign on land may be waived.

In the case of submission being made by a petition, only the principal author or first signatory will be notified.

- An application for modification of development consent granted by the Land and Environment Court will be notified or advertised for a minimum period of 14 days in the same manner as the original development application was notified or advertised.

4.2 Section 82A request for review of Council determinations

Section 82A of the Act enables an applicant lodging a request to Council for a review of its determination of a development application within 12 months of such determination. An applicant is entitled to lodge amended plans with the review request.

A request for a section 82A review:

- will be notified or advertised for a minimum period of 14 days in the same manner as the original development application. Written letters will be sent to all persons who made submissions to the original development application; and
- when accompanied by amended plans, the land owners within the adjoining land area or extended adjoining land area will be notified.

Note: If Council is satisfied that the modifications as proposed are of minor nature, or of minimal environmental impacts, the requirement of notice in newspaper or sign on land may be waived.

THIS PAGE HAS BEEN
INTENTIONALLY LEFT BLANK



City of Ryde
Civic Centre
1 Devlin Street
Ryde NSW 2112

www.ryde.nsw.gov.au

City of Ryde Development Control Plan 2014

Part: 3.1 Brothels (Sex Service Premises)

Translation

ENGLISH

If you do not understand this document please come to Ryde Civic Centre, 1 Devlin Street, Ryde Monday to Friday 8.30am to 4.30pm or telephone the Telephone and Interpreting Service on 131 450 and ask an interpreter to contact the City of Ryde for you on 9952 8222.

ARABIC

إننا نعتذر عليك فهم محتويات هذه الوثيقة، نرجو للحضور إلى مركز بلدية رايد Ryde Civic Centre على العنوان: 1 Devlin Street, Ryde من الاثنين إلى الجمعة بين الساعة 8.30 صباحاً والساعة 4.30 بعد الظهر أو الاتصال بمكتب خدمات الترجمة على الرقم 131 450 لكي تطلب من أحد المترجمين الاتصال بمجلس مدينة رايد، على الرقم 9952 8222، نيابةً عنك.

ARMENIAN

Եթէ այս գրութիւնը չէ՞ք հասկնար, խնդրեմ եկէ՛ք՝ Րայդ Բիւրօ Սիւիլիք Սենթըր, 1 Տելվին փողոց, Րայդ, (Ryde Civic Centre, 1 Devlin Street, Ryde) Երկուշաբթիէն Ուրբաթ կ.ա. ժամը 8.30 – կ.ե. ժամը 4.30, կամ հեռաձայնեցէ՛ք Հեռաձայնի եւ Թարգմանական Սպասարկութեան՝ 131 450, եւ խնդրեցէ՛ք որ թարգմանիչ մը Րայդ Քաղաքապետարանին հետ կապ հաստատուէ ձեզի համար, հեռաձայնելով՝ 9952 8222 թիվին:

CHINESE

如果您看不懂本文，請在周一至周五上午 8 時 30 分至下午 4 時 30 分前往 Ryde 市政中心詢問 (Ryde Civic Centre, 地址: 1 Devlin Street, Ryde)。你也可以打電話至電話傳譯服務中心，電話號碼是: 131 450。接通後你可以要求一位傳譯員為你打如下電話和 Ryde 市政廳聯繫，電話是: 9952 8222。

FARSI

اگر این مدرک را نمی فهمید لطفاً از 8.30 صبح تا 4.30 بعد از ظهر دوشنبه تا جمعه به مرکز شهرداری رايد، Ryde Civic Centre, 1 Devlin Street, Ryde مراجعه کنید یا به سرویس مترجم تلفنی، شماره 131 450 تلفن بزنید و از یک مترجم بخواهید که از طرف شما با شهرداری رايد شماره 9952 8222 تلفن بزند.

ITALIAN

Se non capite il presente documento, siete pregati di rivolgervi al Ryde Civic Centre al n. 1 di Devlin Street, Ryde, dalle 8.30 alle 16.30, dal lunedì al venerdì; oppure potete chiamare il Telephone Translating and Interpreting Service al 131 450 e chiedere all'interprete di contattare a vostro nome il Municipio di Ryde presso il 9952 8222.

KOREAN

이 문서가 무슨 의미인지 모르실 경우에는 1 Devlin Street, Ryde 에 있는 Ryde Civic Centre 로 오시거나 (월 – 금, 오전 8:30 – 오후 4:30), 전화 131 450 번으로 전화 통역 서비스에 연락하셔서 통역사에게 여러분 대신 Ryde 시청에 전화 9952 8222 번으로 연락을 부탁드립니다.

Amend. No.	Date approved	Effective date	Subject of amendment

Table of Contents

1.0 OVERVIEW	5
1.1 Background	5
1.2 Objectives of this Part	5
1.3 Land to which this Part applies	5
2.0 PLANNING REQUIREMENTS FOR BROTHELS	6
2.1 Location	6
2.2 Amenity of the neighbourhood	6
2.3 Parking and Access	7
2.4 Signage and Presentation of the Building	7
3.0 APPLICATION DETAILS	8
3.1 Information to be submitted with a Development Application for a Brothel	8
4.0 INFORMATION RELATING TO DEVELOPMENT CONTROLS ISSUED	9
4.1 Development Consent for Brothels	9
4.2 Closure of Brothels	9
4.3 Health Requirements	9
SCHEDULES	
Schedule 1 - Health Requirements	10

THIS PAGE HAS BEEN
INTENTIONALLY LEFT BLANK

1.0 OVERVIEW

1.1 Background

This Part provides planning controls for brothels (sex services premises) in the City of Ryde.

In the *Ryde Local Environmental Plan 2014*, sex service premises is defined as a brothel, but does not include home occupation (sex services).

Under the *Environmental Planning and Assessment Act 1979*, brothel is defined as a brothel within the meaning of the *Restricted Premises Act 1943*, other than premises used or likely to be used for the purposes of prostitution by no more than one prostitute.

1.2 Objectives of this Part

Objectives

The objectives of this Part are to:

1. Provide appropriate planning controls for the establishment of brothels within the City of Ryde; and
2. Ensure that brothels will not have a detrimental impact on the amenity of the surrounding neighbourhood.

1.3 Land to which this Part applies

This Part applies to all land within the City of Ryde where brothels are a permissible use with the consent of Council.

A development application for a brothel may be considered by Council only within the IN2 Light Industrial Zone and subject to the more detailed planning controls which are specified in this DCP.

Brothels are not permitted in any Residential or Business zones within the City of Ryde.

2.0 PLANNING REQUIREMENTS FOR BROTHELS

Planning matters taken into consideration by Council when assessing a development application for a brothel include the following:

2.1 Location

Controls

- a. The location of the brothel and its proximity to any child care centre, community facility, educational establishment, hospital, place of public worship, recreation area, residential development or any place regularly frequented by children.
- b. The location of the brothel and its proximity to any access point to public transport including bus stops, railway stations, ferry wharves and the like.
- c. The number of brothels operating in the near vicinity of the premises the subject of the application. Council will not permit the “congregation” of brothels so as to form, or potentially form, “red light districts”.

2.2 Amenity of the neighbourhood

Controls

- a. Whether the operation of the brothel would cause a disturbance in the neighbourhood because of its size or operating hours, or the number of people working in it.
- b. Whether a suitable waiting area is provided in the brothel so as to prevent clients loitering outside the premises.
- c. Whether suitable access is available, or is proposed to be provided, to the brothel.
- d. Whether the operation of the brothel would interfere with the amenity of the neighbourhood.
- e. Whether the operation of the brothel would cause a disturbance in the neighbourhood when taking into account other brothels operating in the neighbourhood.

2.3 Parking and Access

Controls

- a. Whether sufficient off-street parking is available or proposed to be provided.

In this regard, carparking must be provided at the rate of 1 space for each 2 employees working at any time in the premises. Council may vary this requirement provided it is satisfied that there is adequate on-street carparking or public transport services close to the premises.

- b. Parking areas must also be well lit and sign posted.

A development application for a brothel may be considered by Council only within the IN2 Light Industrial Zone and subject to the more detailed planning controls which are specified in this DCP.

Brothels are not permitted in any Residential or Business zones within the City of Ryde.

2.4 Signage and Presentation of the Building

Controls

- a. The content, illumination, size and shape of any advertisement and distinctive external lighting shall be included in any application submitted to Council.
- b. Only one discreetly located external sign shall be permitted on the premises having a maximum area of 0.5 m². Wording is to be limited to the name of the business operated from the premises and the sign is not to incorporate any provocative images or wording.
- c. The sign may be externally lit by spotlights only. An internally illuminated sign or "flashing sign" is not permitted.
- d. The design and external appearance of the building and any associated structure and their impact on the character of the surrounding built environment.

3.0 APPLICATION DETAILS

3.1 Information to be submitted with a Development Application for a Brothel

a. Plans to be submitted:

- i. Location plan (showing proximity of the subject site to churches, residential properties, schools, child care centres, community facilities, hospitals and public transport access points).
- ii. Site plan and floor plan including the use of each room in the subject property.
- iii. Entrances to and exits from the subject site. Location, number and layout of carparking spaces.
- iv. Business sign including details of size and colour, illumination and content.
- v. Details of existing and proposed external lighting.
- vi. Details of all external finishes, including colours, textures and window treatments.

b. Information to be provided with the Development Application is to include:

- i. Number of employees.
- ii. Hours of operation of the premises.
- iii. Number of rooms in the premises to be used for the service.

4.0 INFORMATION RELATING TO DEVELOPMENT CONTROLS ISSUED

4.1 Development Consent for Brothels

A consent may include conditions which limit the approval to a period of 12 months so that Council may assess the impact of the development on the local community and monitor compliance with conditions of consent.

At the conclusion of the 12 months, Council will reassess the proposal in terms of any complaints received regarding the approved operations and compliance with any conditions of development consent.

If consent is granted, a specified operator will be nominated on that consent. Should the operator change, Council must be notified in writing.

If changes to the number of sex workers, hours of operation, signage or any other alterations to the building are proposed, contact should be made to Council's Customer Service Centre to ascertain whether an amendment to the consent or a new application is required.

4.2 Closure of Brothels

Council may apply to the Land and Environment Court of NSW under Section 17 of the *Restricted Premises Act 1943* as amended, for the premises not to be used as a brothel. Council can also initiate proceedings under the *Environmental Planning and Assessment Act 1979*, to ensure that brothels comply with its planning requirements.

4.3 Health Requirements

Details of Council's Health Requirements for brothels are specified in Schedule 1 to this Part. These requirements must be fully complied with and will be included as conditions of development consent.

Schedule 1 - Health Requirements

Controls

Compliance with guidelines

- a. The activity and any building or work associated with or carried out in connection with the activity must comply with the *Health and Safety Guidelines for Brothels* published by the WorkCover Authority of NSW and NSW Health.

Sanitary facilities

- b. Each room used for the provision of sexual services must be provided with separate sanitary facilities, comprising a toilet, shower and hand basin, directly accessible from that room for use of both sex workers and their clients.
- c. Sanitary facilities must be provided in accordance with the *Building Code of Australia*.

Lighting and ventilation

- d. Lighting and ventilation must be provided in accordance with the *Building Code of Australia*.

Waste disposal

- e. Adequate arrangements must be made for the storage and disposal of waste generated on the premises.
- f. Contaminated waste must be disposed of by a licensed waste transporter at a licensed waste facility.

Noise

- g. The use of the premises must not give rise to an "offensive noise" as defined in the *Protection of the Environment Operations Act 1997 and Regulations*.
- h. The operating noise level of any plant or equipment must not exceed the background noise level by more than 5 dB(A) when measured at the boundaries of the premises.

Bars and food preparation areas

- i. It is an additional requirement is that the construction and fitout of all bars and food preparation areas must comply with AS 4674-2004 *Design Construction and Fitout of Food Premises* published by Standards Australia .

THIS PAGE HAS BEEN
INTENTIONALLY LEFT BLANK



City of Ryde
Civic Centre
1 Devlin Street
Ryde NSW 2112

www.ryde.nsw.gov.au

City of Ryde Development Control Plan 2014

Part: 3.2 Child Care Centres

Translation

ENGLISH

If you do not understand this document please come to Ryde Civic Centre, 1 Devlin Street, Ryde Monday to Friday 8.30am to 4.30pm or telephone the Telephone and Interpreting Service on 131 450 and ask an interpreter to contact the City of Ryde for you on 9952 8222.

ARABIC

إننا نعتذر عليك فهم محتويات هذه الوثيقة، نرجو للحضور إلى مركز بلدية رايد Ryde Civic Centre على العنوان: 1 Devlin Street, Ryde من الاثنين إلى الجمعة بين الساعة 8.30 صباحاً والساعة 4.30 بعد الظهر أو الاتصال بمكتب خدمات الترجمة على الرقم 131 450 لكي تطلب من أحد المترجمين الاتصال بمجلس مدينة رايد، على الرقم 9952 8222، نيابة عنك.

ARMENIAN

Եթէ այս գրութիւնը չէք հասկնար, խնդրեմ եկէ՛ք Րայդ Բիւրոյ Սիւվիլ Սենթըր, 1 Տելվին փողոց, Րայդ, (Ryde Civic Centre, 1 Devlin Street, Ryde) Երկուշաբթիէն Ուրբաթ կ.ա. ժամը 8.30 – կ.ե. ժամը 4.30, կամ հեռաձայնեցէ՛ք Հեռաձայնի եւ Թարգմանական Սպասարկութեան՝ 131 450, եւ խնդրեցէ՛ք որ թարգմանիչ մը Րայդ Քաղաքապետարանին հետ կապ հաստատուի ձեզի համար, հեռաձայնելով՝ 9952 8222 թիւին:

CHINESE

如果您看不懂本文，請在周一至周五上午 8 時 30 分至下午 4 時 30 分前往 Ryde 市政中心詢問 (Ryde Civic Centre, 地址: 1 Devlin Street, Ryde)。你也可以打電話至電話傳譯服務中心，電話號碼是: 131 450。接通後你可以要求一位傳譯員為你打如下電話和 Ryde 市政廳聯繫，電話是: 9952 8222。

FARSI

اگر این مدرک را نمی فهمید لطفاً از 8.30 صبح تا 4.30 بعد از ظهر دوشنبه تا جمعه به مرکز شهرداری رايد، Ryde Civic Centre, 1 Devlin Street, Ryde مراجعه کنید یا به سرویس مترجم تلفنی، شماره 131 450 تلفن بزنید و از یک مترجم بخواهید که از طرف شما با شهرداری رايد شماره 9952 8222 تلفن بزند.

ITALIAN

Se non capite il presente documento, siete pregati di rivolgervi al Ryde Civic Centre al n. 1 di Devlin Street, Ryde, dalle 8.30 alle 16.30, dal lunedì al venerdì; oppure potete chiamare il Telephone Translating and Interpreting Service al 131 450 e chiedere all'interprete di contattare a vostro nome il Municipio di Ryde presso il 9952 8222.

KOREAN

이 문서가 무슨 의미인지 모르실 경우에는 1 Devlin Street, Ryde 에 있는 Ryde Civic Centre 로 오시거나 (월 – 금, 오전 8:30 – 오후 4:30), 전화 131 450 번으로 전화 통역 서비스에 연락하셔서 통역사에게 여러분 대신 Ryde 시청에 전화 9952 8222 번으로 연락을 부탁드립니다.

Amend. No.	Date approved	Effective date	Subject of amendment

Table of Contents

1.0 INTRODUCTION	5
1.1 Roles of State Government and of Council	5
1.2 Development covered by this Part	5
1.3 Children's services not covered by this DCP	6
1.4 Purpose of this Part	7
1.5 Objectives of this Part	7
1.6 How to use this Part	8
1.7 Child Care Centre Design	8
1.8 Technical Assessment Requirements	9
2.0 SIZE, LOCATION AND SITE SELECTION	10
2.1 Suitability of Location and Site for Child Care	10
2.1.1 Preferred Locations	10
2.1.2 Environmental Risks/Hazards	14
2.2 Assessing Child Care Needs and Size of Facility	15
2.3 Site Analysis	17
3.0 DESIGN AND CHARACTER	20
3.1 All Child Care Centres	21
3.2 Detached Centres and Centres in Residential Areas	23
3.3 Combined Dwelling /Child Care Centre	25
3.4 Centres in Mixed Use Developments and in Non-residential areas	27
3.5 Fencing, Gates and Security	30
4.0 PRIVACY	31
4.1 Acoustic Privacy – for children in the centre	31
4.2 Acoustic Privacy – for adjoining residents	31
4.3 Visual Privacy – for children in the centre	33
4.4 Visual Privacy – for adjoining residents	33
5.0 CAR PARKING, TRAFFIC AND ACCESS	35
5.1 Car Parking	35
5.2 On Site Maneuverability	36
5.3 Impact on Traffic Flow	37
5.4 Pedestrian Safety	38
5.5 Accessibility	38

Table of Contents

6.0	LANDSCAPE DESIGN AND PLAY SPACES	40
6.1	General Landscape Design Requirement	40
6.2	Play Spaces	41
6.2.1	Size and Functionality of Play Spaces	42
6.2.2	Outdoor Play Spaces	42
6.2.3	Indoor Play Spaces	46
6.2.4	Transition Areas	47
6.3	Swimming Pools and Water Hazards	47
7.0	MISCELLANEOUS CONTROLS	48
7.1	Centre Facilities	48
7.2	Signage	48
7.3	Exterior Lighting	49
7.4	Waste Storage and Management	49
7.5	Emergency Evacuation	52
8.0	OUT OF SCHOOL HOURS CARE	53
	SCHEDULES	54
	Schedule 1 - Child Care Centre Development Application Checklist	54
	Schedule 2 - City of Ryde Road Hierarchy Information	57

1.0 INTRODUCTION

The non-parental care and education of young children requires significant regulation due to the inherent vulnerability of young children and also their inherent characteristic of seeking to learn. Young children and babies are adventurous active learners and also have an inability to judge and report on the quality of care being received.

Child care services also have the potential to adversely impact on the amenity and character of surrounding areas if not appropriately and sensitively designed to suit the site and its context, or if not effectively managed.

The controls in this Part have been developed to make more detailed provision with respect to planning and design of child care centre developments and to deal with issues relating to child care facilities. This Part is intended to ensure quality child care facilities and the protection of local amenity.

1.1 Roles of State Government and of Council

As at April 2011, the construction of new child care facilities, or expansion of existing ones, requires approval from the NSW Department of Education and Communities (DEC) as well as from Local Government. At the time of preparing this Part, licensing and regulation of child care services is managed by State Government under the *Children's and Young Persons (Care and Protection) Act 1998*, and the *Children's Services Regulation 2004*.

This Part addresses issues pertaining to the City of Ryde's planning responsibilities, as well as complementing and expanding upon the minimum DEC's licensing standards where these standards relate to planning and design considerations. This DCP does not reiterate licensing requirements in any detail as they may be subject to change from time to time. Reference to the *Children's Services Regulation 2004* will form part of this DCP with respect to issues pertinent to the development approval process.

Applicants are advised to consult the current regulations and licensing requirements of the NSW Department of Education and Communities (DEC).

1.2 Development covered by this Part

This Part applies to all development associated with the establishment, operation and expansion of child care centres, which includes:

- the construction of new purpose built child care centres;
- the conversion or adaptation of existing buildings to child care centres; and
- the expansion or alteration of existing approved child care centres.

The controls are designed to address the planning for location and physical design of child care centres which provide centre based children's services including long day care, pre-school care, occasional care services or out of school hours care.

The controls are designed to address all types of child care centres including single uses, or co-located with other uses, such as combined dwelling/child care centre, or within mixed use developments. The controls also provide guidance with respect to child care centres which provide work-based child care, being child care provided on employment sites.

Consideration is also given to where out-of-school hours (including vacation care) services are proposed within child care centres.

Unless otherwise stated, controls apply to all child care centres developments.



Figure 3.2.01 Miscellaneous Images from Various Child Care Centres.

1.3 Children's services not covered by this DCP

This DCP does not apply to the following types of children's services:

- Home based children's services (see Note below);
- Family day care children's services; and
- Mobile children's services.

Reference should be made to *Ryde Local Environmental Plan 2014* and to Part 10 Dictionary of this DCP for definitions relating to child care centre developments and children's services.

Note: Home based child care:

This DCP does not apply to home based child care services, although many of the development standards, objectives and controls for centre based services covered may be useful for those wishing to establish such a service.

Home based children's services are permitted without consent within all residential zones and the B4 Mixed Use zone. For assistance in this matter, applicants should contact Council's Customer Service Centre. Applicants should also refer to Department of Education and Communities(DEC) for licensing considerations.

1.4 Purpose of this Part

The purpose of this Part is to guide site selection and development associated with child care centres in the City of Ryde in all residential and non-residential areas where child care centres are permissible with Council's consent.

The principles of this Part may also be relevant to other proposed development near existing child care centres, for example with respect to controls regarding the amenity considerations of the users of child care centres including:

- Access to sunlight and natural ventilation for the child care centre;
- Impact on car-parking and traffic movements required for efficient operation of drop-off and pick-up associated with the child care centre;
- Appropriate levels of visual and acoustic privacy for the child care centre; and
- The context and type of proposed development including environmental amenity and safety impacts.

1.5 Objectives of this Part

Objectives

The objectives of this Part are:

1. To provide guidelines particular to child care centre developments in non-residential areas, in multi-use developments and where work-based child care is proposed, and to provide varying controls for child care centres of different scales;
2. To provide clarity in the expectations of Council regarding appropriate location and siting of child care centres including preferred locations;
3. To encourage provision of child care facilities which meet the needs of the community in terms of number and age of children proposed relative to the needs of the locality;
4. To ensure development of child care centres of high quality that are compatible in scale and nature with neighbouring land uses, streetscape, built character;
5. To ensure that child care centres are located and designed so that there is no health or safety risk to children, staff, visitors using the centre;
6. To provide controls for the design and siting of child care centres which encourage environmental sustainability and energy efficiency;
7. To ensure the amenity and privacy of adjoining neighbours is maintained and not adversely affected by noise and activities from the site;
8. To ensure adequate, convenient and safe parking for residents, staff and visitors which does not dominate the streetscape;
9. To provide controls to address amenity considerations with respect to impacts of increased traffic in low density residential areas;
10. To provide a safe environment in and around the child care centre, especially for children;
11. To provide quality play spaces for children both indoor and outdoor;
12. To retain and enhance significant existing vegetation, both indigenous and exotic, where new development is proposed; and
13. To ensure consistency with aims and requirements of the NSW Department of Education and Communities.

1.6 How to use this Part

This Part has 9 sections:

- Section 1 - Introduction;
- Section 2 - Size, Location and Site Selection;
- Section 3 - Site Layout, Building Design, Character and Amenity;
- Section 4 - Privacy;
- Section 5 - Car Parking, Traffic and Access;
- Section 6 - Landscape Design and Play Spaces;
- Section 7 - Miscellaneous Controls; and
- Section 8 - Out of School Hours Care.

Section 1 Provides general information relating to this Part.

Section 2 Provides location and site considerations which address all types of childcare centres, where proposed as self contained uses, or where proposed on-site with other uses. Where requirements are for particular cases, these are expressly stated in the text.

Sections 3-7 Deal with development standards and requirements specific to child care centre developments.

Section 8 Provides information and controls for situations where out-of-school hours care is proposed in a child care centre.

1.7 Child Care Centre Design

All development applications for child care centres are to be prepared in accordance with Council's requirements and must be accompanied by documentation and/or plans as relevant to demonstrate compliance with the relevant objectives and controls of this Part. Applicants should refer to City of Ryde's Development Application package (refer City of Ryde Development Application package at www.ryde.nsw.gov.au), and seek advice from Council's Customer Service Centre.

Under the Children's Services Regulation 2004 DEC does not accept applications for approval of child care centres unless development consent has been granted where required. To assist all applicants in preparing designs which seek to address environmental considerations together with licensing considerations, the design of child care centres, and any additions/alterations to child care centres should take all requirements into consideration. In this regard the following requirements for the submission of development applications in response to this DCP apply:

- A child care centre development is to be designed and drawn by a person who is an architect within the meaning of the Architects Act 2003 or who is accredited by the Building Designers Association of NSW Inc. in relation to the design of the class of buildings concerned (refer also Clause 16 of the Children's and Young Persons (Care and Protection) Act 1998);
- The landscape plan must be designed and specified by a landscape architect with demonstrated experience in designing external spaces for child care centres due to the particular nature of the requirements (refer in particular the requirements in Section 6 Landscape Design and Play Spaces under this Part); and

Note: A landscape plan will be required for:

- all new child care centre developments;
- expansion of existing centres;
- alterations to existing centres involving external areas (in particular outdoor play areas and car parking/front setback areas).

- Child care centre development applications are required to be accompanied by a signed undertaking by the applicant, licensee or proposed licensee that demonstrates that the proposal has been designed to comply with respect to the Children's Services Regulation 2004 or DEC's requirements as relevant at the time of application.

1.8 Technical Assessment Requirements

In addition to the requirements for submission of development applications (refer City of Ryde Development Application package at www.ryde.nsw.gov.au) there are particular requirements stated in this Part of relevance to child care centre developments. In this regard additional supporting technical assessments may also be required to be prepared and submitted with the development application, or while the development application is under assessment, to demonstrate support for the proposal and compliance with this DCP. In many cases this will involve the use of qualified professionals (for example traffic engineer, recognized acoustic consultant).

Depending on the location of the proposal (site and its context), and the design with respect to the requirements under this Part, technical documentation may include one or more, but may not be limited to, the following:

- Traffic Impact Assessment;
- Road Safety Audit;
- Acoustic Report/Noise Impact Assessment;
- Microclimate Assessment;
- Preliminary Geotechnical Contamination Report;
- Air Quality Assessment;
- Environmental Health Assessment;
- Social Impact Assessment;
- Heritage Impact Assessment;
- Fire Safety and Evacuation Plan;
- Market Analysis – Supply and Demand;
- Overland Flow Study; and
- Bush Fire Risk Management Plan.

Further details on the requirements for technical assessment are included in the following sections of this Part, and are included in the Checklist attached to this Part as **Schedule 1**.

2.0 SIZE, LOCATION AND SITE SELECTION

This section provides controls and guidance to assist:

- Choice of potentially suitable sites for child care centres to meet Council's expectations for child care centres;
- Assessment of child care needs (age groups to be catered for) relative to the area in which the children's service is proposed, and of potential size of the centre in terms of number of places;
- Identification and understanding of site characteristics and context characteristics (site analysis); and
- Understanding of the relationship between site and context characteristics and potential constraints on the size and scale of the development proposed.

2.1 Suitability of Location and Site for Child Care

Whilst child care centres are permissible with Council's consent in a number of zones, some sites are more appropriate for child care centre developments. Particular consideration in the choice of site is to be paid to the vulnerability and sensitivity of the potential users of the site being babies and young children. In residential zones, consideration must be given to ensuring the commercial nature of child care centres does not result in adverse impacts on the residential environment.

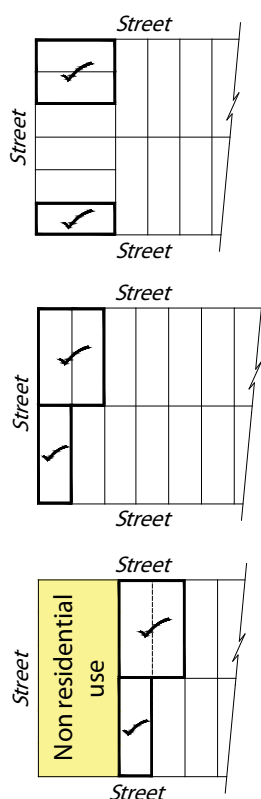
The suitability of locations and sites will depend on supply and demand considerations, and in environmental planning terms will vary due to a number of factors including the size, shape and location of the site, the type and scale of child care centre development, compatibility with neighbouring land uses, potential for exposure to risks to safety and potential for exposure to environmental hazards such as air pollution, contamination, noise and odour generating uses.

2.1.1 Preferred Locations

The following sites best satisfy the objectives of this DCP:

- Sites adjacent to compatible uses including parks, churches, libraries, community facilities related to early childhood, neighbourhood centres;
- Sites which enable co-location of the child care centre with other compatible uses on the same site such as community facilities, educational facilities, churches;
- Sites near primary schools provided it can be demonstrated that traffic and parking requirements are being met;
- Locations which are close to or within employment areas, town centres, business centres;
- Locations away from roads with high traffic volumes, to minimize potential for adverse impacts including unacceptable air quality, traffic, noise and vibration issues;
- Sites located on street corners to maximize street frontage, but which are not on busy intersections to minimise impacts such as traffic conflicts and noise, air quality issues;
- Sites with the least number of adjoining residential properties to minimise the potential for negative amenity impact on neighbours;
- Sites in locations where the development will not unreasonably impact on residential amenity. Sites adjoining town houses, villas and flats are not considered suitable due to increased potential for amenity impacts; and
- Where sites are located within low density residential areas, preference is given to smaller scale development (under 50 child care places).

Preferred Sites:



Corner sites:

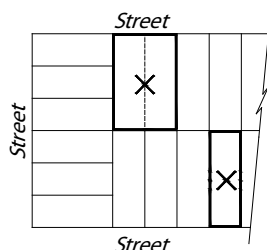
- Fewer common boundaries with residential properties
- Good amount of street frontage for overflow parking
- Preferred sites for larger scale centres (50-90 places)

Adjoining Non-residential:

Note: Yellow represents non-residential uses compatible with child care centres (eg school, park, church, shops etc).

- Minimal common boundaries with residential
- Opportunities to orientate centre spaces for least impact with residential
- Preferred sites for larger scale centres (50 - 90 places)

Poor Sites:



Examples of Poor Sites:

- Too many common boundaries with residential properties
- Narrow frontage, mid block

Figure 3.2.02 Examples of preferred and poor sites for average and larger scale child care centre developments in low density residential areas.

The following controls are based on encouraging child care developments in the preferred locations.

Objectives

1. To ensure that sites selected for child care centres minimise opportunities for adverse impact on the locality and maximise opportunities for a suitable environment for the users.
2. To ensure sites have the least potential adverse impact on neighbouring properties in terms of noise, loss of privacy and traffic.
3. To ensure sites have the least amount of impact on neighbouring properties in terms of scale of development.

4. To ensure sites are of a shape and size which can support vehicular access enabling vehicles to enter and leave with minimal disruption to traffic flow, and without endangering pedestrians.
5. To encourage child care centre development in areas which are not adversely affected by noise, vibration, traffic safety issues or pollution associated with heavy traffic.
6. To ensure sites are of suitable topography for child care centre development.
7. To identify preferred sites for child care centre developments in order to assist in selection of sites suitable for maximising compliance with these controls.

Controls

- a. Where single use developments are proposed, the site is to have a street frontage and width of not less than 20 m, except in the case of corner allotments in which case the site can have a frontage/width of not less than 17 m.
- b. Where single use developments are proposed, the site is to have a minimum site area of 800 m² and be regular in shape.
- c. Sites for single purpose child care centres are not to be located on arterial and sub-arterial roads, or at busy intersections.
Note: Schedule 2 identifies arterial, sub-arterial and collector roads in City of Ryde.
- d. Child care centres proposed within mixed use developments on large sites with common boundaries to arterial or sub-arterial roads are required to be located distant and facing away from arterial and sub-arterial roads and from busy intersections.
- e. The site is not to be a battle-axe allotment.
- f. Sites in culs-de-sac are not preferred. If the site is proposed in a cul-de-sac, the applicant must demonstrate traffic management is adequately provided for including drop off and pickup, queuing of vehicles, manoeuvring and parking and also that potential for impacts on neighbours' amenity is considered.
- g. Child care centres are not to be located within proximity of a brothel.
- h. The site should be flat, or gently sloping, and well-drained to:
 - i. Assist design of useable indoor and outdoor areas at the same grade;
 - ii. Provide for accessibility to all areas for all members of the community; and
 - iii. Assist drainage to ensure optimum useability of outdoor spaces after rain.
- i. The site should have an aspect which permits maximum solar access and natural ventilation, and minimum exposure to unfavourable weather conditions.
- j. The site should not be on land affected by adverse overshadowing by existing or likely future development, nor by undue heat load or UV radiation from reflective surfaces of existing and approved proposed buildings on neighbouring sites.
- k. The site is not to be subject to undue overlooking from surrounding existing and approved proposed uses to ensure privacy and security for users of the centre.
- l. Preferred locations for larger scale centres in residential areas (particularly low density residential areas), i.e. for centres accommodating 50-90 places, are sites located on street corners, where sites share common boundaries with compatible non-residential uses, or where child care centres can be co-located with compatible uses subject to acceptable traffic and parking requirements being met.

- m. In low density residential zones, it is preferred that sites for larger scale development, (i.e. development proposals which include sites comprising 2 or more average size properties for the purposes of accommodating centres catering for up to 90 child care places), share common boundaries with no more than 3 residential properties.
- n. Preferred locations for work-based child care centres and centres in mixed use developments are to be adjacent to non-commercial/non-residential components of uses to protect privacy/amenity of the centre and of neighbouring workers/residents.

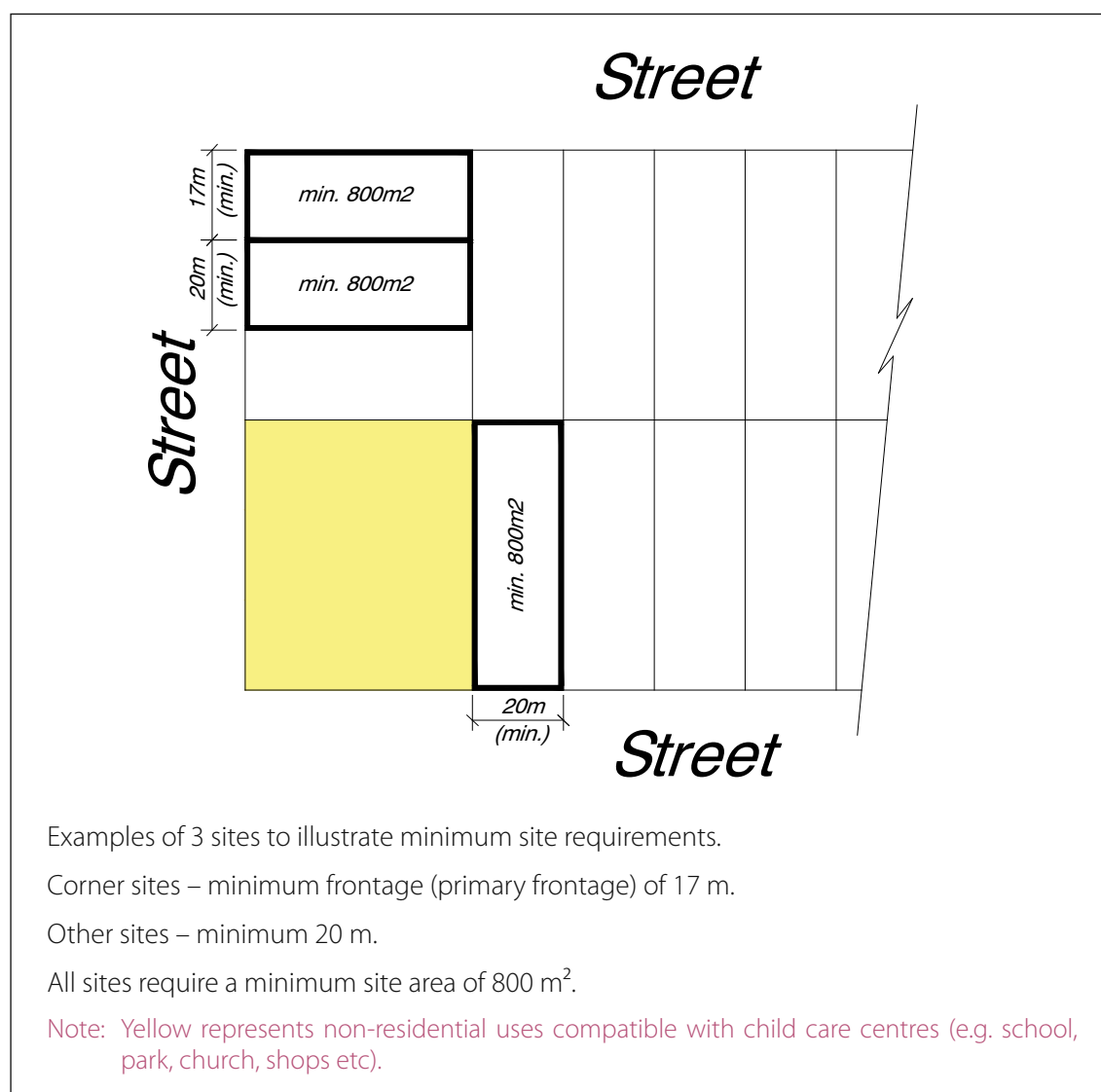


Figure 3.2.03 Minimum site requirements for child care centres

2.1.2 Environmental Risks/Hazards

The potential for environmental risks/hazards is of particular concern with respect to the vulnerability and sensitivity of the potential users of the site being babies and young children. In some circumstances technical assessments, including risk assessment, may be required to be prepared.

Objectives

1. To ensure that sites for child care centres do not pose an environmental hazard or risk for the users and staff of the service.
2. To ensure child care centres are located in areas of high environmental quality (in terms of both existing and potential future quality), free from environmental hazards or risks which may affect children's health and safety.
3. To address criteria for site selection regarding proximity to environmental hazards including traffic, noise, odours, air quality, electromagnetic radiation, chemical contaminants etc.

Controls

- a. Child care centre developments are not to be located on land which is affected by overland flow as identified by Council for reasons of safety considerations of the children using the centre in event of emergencies involving storm events (refer Part 8.2 Stormwater Management under this DCP). This control also applies because the matters for consideration in areas affected by overland flow also work against the objectives and controls for outdoor play spaces and fencing required under this Part.
- b. Where existing child care centres are located on land affected by overland flow, any proposals to alter or add to the centre are not to pose a safety or health risk to children due to poor drainage or flooding, nor increase the risk of flooding occurring on adjacent properties. All such applications are to be supported by an Overland Flow Study/Stormwater Drainage Plan prepared by a suitably qualified hydraulic engineer.
- c. Consideration may be given to development proposed on sites affected by overland flow in the front setback area only if it can be demonstrated that the extent of overland flow does not constitute a flood hazard as described under Part 8.2 of this DCP. The development application will be required to be supported by an Overland Flow Study prepared by a suitably qualified hydraulic engineer.
- d. It is preferable that child care centre developments are not located on land identified as bush fire prone under the Environmental Planning and Assessment Act 1979 for reasons of safety considerations of the children using the centre in event of emergencies involving bushfire.

Note: Where child care centres are located on land identified as bush fire prone, development proposals may require additional matters to be addressed in terms of Integrated Development under the Environmental Planning and Assessment Act 1979 and Rural Fires Act 1997. Applicants should seek advice from Council's Customer Service Centre.

- e. The location is to take into consideration any other environmental health hazard or risk relevant to the site and/or existing buildings within the site or the surrounding area having regard to the following:
 - i. Pollution created by car and other vehicle fumes (from high traffic volumes such as on arterial, sub arterial and collector roads);
 - ii. Existing and potential on and off-site electromagnetic fields;
 - iii. Contaminated land;
 - iv. Lead in painted surfaces, carpets, furnishings and roof void in existing buildings;

- v. Asbestos or other contamination or poisoning in existing buildings;
- vi. Proximity to service stations;
- vii. Proximity to LPG tanks;
- viii. Proximity to significant noise, odour and other pollutant generating sources, or sites which (due to prevailing land use zoning) may in future accommodate noise or odour generating uses;
- ix. Proximity to transmission lines, railway lines, mobile phone towers or other sources of electromagnetic energy;
- x. Mould and mildew in existing buildings;
- xi. Proximity to water cooling and water warming systems; and
- xii. Any other identified environmental hazard or risk relevant to the site and/ or existing buildings within the site.

Note: Consideration may be given to sites affected by one or more of the health risks/potential health risks identified above if amelioration to the satisfaction of Council is possible. Otherwise the site is considered unsuitable for child care centre development.

- f. Where sites are proposed within 125 m of arterial roads, air quality monitoring, and soil quality testing will be required to determine toxicity levels. Noise level testing will also be required. (The 125 metre distance is to be measured from the edge of the road reserve to the nearest point of the site.) Reports by suitably qualified professionals will be required to be submitted for assessment with the Development Application. Consultation should be made with Council prior to testing regarding criteria for testing.
- g. The site must not have been previously used as a petrol station, automotive repair workshops, or other activity associated with hazardous substances, unless a soil analysis has been conducted to demonstrate that the site is safe for use as a child care centre.
- h. The site is not to be in a location likely to be affected by emissions of dust, fumes, noise, nor by frequent truck movements. This especially applies in proximity to industrial and business uses.
- i. Consideration is to be given to the requirements of SEPP 55 and any land contamination policy adopted by Council. In this regard a preliminary site assessment, detailed site assessment, and/ or site audit may be required to be submitted with the development application and/or as a requirement of development consent.

2.2 Assessing Child Care Needs and Size of Facility

The size and suitability of a site has a bearing on the size of the facility which can be expected to be proposed, particularly in terms of the number of places which a child care service might accommodate. The controls in this Part seek to assist applicants to choose locations and sites which will best meet environmental criteria. The opportunity to achieve maximum child care places sought for a site will depend on a range of factors including suitability of sites (shape, context, environmental quality) and appropriateness of the design of the development in its context to meet expectations of minimising impacts on surrounding land users and to meet the various development standards identified in this Part.

The controls in this Part also require consideration of indoor and outdoor play areas and other space requirements with a view to encouraging best practice in the provision of child care centres. Attention to better practice is possible due to the size of lots available in the City of Ryde, and also due to opportunities afforded by the redevelopment of some areas to accommodate quality developments.

Important considerations in the choice of site and location, and potential size of the facility include the relationship with the assessment of child care needs in the area within which the child care centre is proposed, and how these needs translate into the proposed age groups and proportion of numbers in each group to be accommodated.

These considerations relate to evaluation of the proposed development in terms of social impacts on the locality, and of sustainability of the development, particularly in terms of growth expected and being planned for in the City of Ryde with respect to resident and worker populations.

City of Ryde aims to meet child care needs of its community in child care proposals, and also has obligations with respect to being the owner of a number of facilities in use by child care providers. Needs change over time, and with the development of other centres, therefore applicants are encouraged to consult with Council's Community Services staff at the planning stage with regard to current needs and expected needs in child care places for the area in which the child care centre is proposed.

At the time of preparing this Part, City of Ryde is experiencing a shortage in child care places, particularly in the 0-2 year old group, and is also planning in response to the NSW Planning Reforms for a period of substantial growth. Accompanying this growth will be further expected increase in need for child care centre places to assist in meeting growth in the community of people who live, work and visit the City of Ryde.

Satisfying minimum standards for the number of places under DEC's licensing provision does not mean that the proposed number of places and/or configuration of age groups will be supported by Council. A restriction on the number of places approved for a centre may be included in development consent.

Objectives

1. To assist provision, planning and co-ordination of care facilities for the children of the City of Ryde community, particularly the children of those who live and/or work within the City of Ryde.
2. To ensure anticipated needs as identified at the time of proposed development are being met.

Controls

- a. All development applications for child care centres are required to identify:
 - i. Proposed total number of child care places;
 - ii. Proposed number of children by age group; and
 - iii. Proposed number of staff including all full time and part time staff, and role of each staff member.
- b. All development applications for child care centres are required to be supported by justification that the proposed number of children within each age group is consistent with current and projected future needs in the area within which the child care centre is to be located.

Note: Council requires information regarding the proposed number and age groups of children and proposed number and role of full time and part time staff to be submitted with the development application. Although these standards may relate to DEC's requirements, Council also needs this information to assess aspects of the proposal such as number of car parking spaces and amount of outdoor space required. Consideration of maximum number of places approved by Council for a child care centre will be based on assessment against this DCP and will include consideration of comments on DCP by Council's Community Services staff.

2.3 Site Analysis

A site analysis is necessary to ensure that the development is of high quality, sensitive to its environment and positively contributes to its context. A thorough site analysis will ensure that site layout and building design (refer to Section 3 for requirements) address existing and possible future opportunities and constraints of both the site and its surrounds. The site layout and building design must consider the existing characteristics, opportunities and constraints of both the application site and its surrounds.

Objectives

1. To encourage a comprehensive approach to site planning and the design of the child care centre development.
2. To identify if the development is compatible with the natural and built environments within the context of the site.
3. To encourage minimum environmental impacts and site disturbance, and minimum adverse impacts.

Controls

- a. A site analysis is to be submitted with development applications for new child care centres including developments that involve the conversions of existing dwellings/other buildings or a purpose-built centre. The applicant is to demonstrate that the site analysis has been used in preparing the design for the child care centre (refer "Preparing a Site Analysis" guide below).
- b. A site analysis drawing must be based on a survey drawing produced by a qualified surveyor and contain a reference number and date. All levels are to be provided to AHD.

Note: A site analysis may not be required for an expansion of an existing centre, or for minor alterations and additions to existing approved child care centre developments. The applicant should check with Council's Customer Service Centre whether a site analysis will be required.

Preparing a Site Analysis

An analysis of the site and context is a fundamental stage of the design process, and should support many key design decisions relating to the proposal. The site analysis is to assist in minimising issues related to noise, privacy, access, safety, overshadowing, amenity and views.

A site analysis has two steps. Look at and map the qualities and characteristics of the site and its local context. Then, develop a design that addresses and applies the objectives and the controls of this Part.

The applicant must demonstrate to Council that the site analysis has been used in preparing the design for the site and for the child care centre. The analysis may then be used to critically assess the success of the proposal in its response to the features of the site and its context.

Information required in a site analysis may include, but is not limited to, the following:

The site and the building(s):

- **Site dimensions**
 - length
 - width (frontage)
- **Topography**
 - spot levels and/or contours
 - north point
 - natural drainage
 - any contaminated soils or filled areas
 - general slope of the site
 - natural/unique features of sites (e.g. rock outcrops, level changes, mounds)
- **Services**
 - easements and connections for drainage and utility services
- **Existing vegetation**
 - location
 - height
 - spread of established trees and shrubs
 - species – suitability for young children
- **Micro climates**
 - orientation
 - prevailing winds
 - quantity, quality and useability of existing shade
 - quantity, quality and useability of non-reflective surfaces
- **Location of:**
 - buildings and other structures
 - heritage and archaeological features
 - property boundaries
 - pedestrian and vehicle access
- **Views to and from the site**
- **Visual Links**
- **Overshadowing** by neighbouring structures
- **Reflectivity** by structures/surfaces on neighbouring sites
- **Access**

The site's context:

Neighbouring properties:

- **Building (s):**
 - location
 - height
 - use
- **Privacy:**
 - adjoining private open space

- living room windows overlooking the site, particularly those within 9m of the site
- location of any facing doors and windows, particularly those likely to be near children's play areas
- structures located on or near boundaries of the site
- **Walls built to the site's boundary:**
 - location
 - height
 - materials
- **Difference in levels between the site and adjacent properties**
- **Views and solar access enjoyed by neighbouring properties**
- **Reflective/smooth surfaces likely to radiate heat and/or glare onto subject site**
- **Major trees on adjacent properties, particularly those within 9 m of subject site**
- **Street frontage features**
 - poles
 - trees
 - kerb crossovers
 - bus stops
 - other services
- **Traffic and parking**
 - traffic volumes in peak hours
 - access points on adjoining sites
 - nearby side streets and public parking areas
 - availability of on-street parking
 - nearby traffic control devices (median strips, round-about)
- **The built form and character of adjacent development including:**
 - architectural character
 - front fencing
 - garden styles
 - set-backs and building zones
- **Heritage features of the surrounding locality and landscape.**
- **Direction and distance to local facilities:**
 - local shops
 - schools
 - public transport
 - recreation and community
- **Public open space**
 - Location
 - use
- **Adjoining bushland or environmentally sensitive land**
- **Any nearby sites which may be hazardous to young children**
- **Sources of nuisance**
 - flight paths
 - noisy roads or other significant noise sources
 - polluting operations.

3.0 DESIGN AND CHARACTER

Expectations of the design, built character and appearance of a child care centre differ depending on the location and the zone within which the centre is proposed. Requirements for site layout, and building design, including built character and streetscape appearance, will vary with respect to the scale and nature of child care centres developments, and whether they are proposed as detached buildings, or integrated within mixed use developments.

The design requirements for built scale and character can best be clarified in 4 main areas as provided in sections 3.1, 3.2, 3.3 and 3.4:

- All child care centres (Section 3.1);
- Detached child care centres, and centres located in residential areas (Section 3.2);
- Combined dwelling/child care centres (Section 3.3); and
- Child care centres in mixed use developments, and in non-residential areas Section 3.4). This section includes requirements for work-based child care centres.

Environmental sustainability considerations are important, including the opportunity for the design to minimize energy requirements and greenhouse gas emissions. The layout of the site and building (s) should be carefully considered to achieve maximum environmental performance.

By carefully examining the existing site conditions at the beginning of the design stage, new developments and improvements to existing buildings can benefit from more comfortable and economic living and working environments. Environmental benefits, such as the reduction in the emission of greenhouse gases can also be achieved. For controls and design objectives relating to sustainable development, reference should be made to Part 7.1 Energy Smart, Water Wise under this DCP. Included in this section is reference to sustainability in design, specific to child care centre development.

Safety is also a critical design element, particularly due to the vulnerability and sensitivity of the babies and young children using the centre. Attention in the design to crime prevention and secure fencing are important safety elements. The design and appearance of fencing contributes to the overall character of the development and therefore controls are included in this design section.

General safety, amenity and sustainability in design considerations are addressed under Section 3.1 for all child care centres, and specific fencing controls are addressed separately under Section 3.5.



Figure 3.2.04 Examples of child care centres of differing character

1. Conversion of existing dwelling; 2. Large scale purpose built in residential area;
3. Purpose built in mixed use development; 4. Co-located in school grounds

3.1 All Child Care Centres

Objectives

1. To ensure child care centres are appropriately designed to a high level of safety, security, environmental health and amenity for the users of these facilities.
2. To provide guidance for child care centres to assist compliance with Council's DCP 2014 Part 7.1 Energy Smart, Water Wise Controls and Principles.
3. To assist all new development to achieve minimum energy performance:
 - a. To reduce the necessity for mechanical heating and cooling;
 - b. To reduce reliance on fossil fuels;
 - c. To minimise greenhouse emissions; and
 - d. To reduce environmental impact over the life of the building.
4. To ensure planning and building design optimise solar access to land and buildings.
5. To ensure site layout and building design complements existing features of the site such as views and vegetation.
6. To ensure that new development is sensitive to the landscape setting and the environmental conditions of the locality.
7. To ensure that child care centres are compatible with the streetscape and desired future character of neighbourhoods and character areas.
8. To ensure that new development complements heritage items and their setting in a contemporary context.

Controls

- a. Child care centre developments are to be designed in accordance with the principles of the NSW Police Force's *Safer by Design (Crime Prevention Through Environmental Design Guidelines)*. For more information, refer:
 - a. NSW Police website:
http://www.police.nsw.gov.au/community_issues/crime_prevention/safer_by_design
 - b. *Crime Prevention and the Assessment of Development Applications* publication available through the NSW Planning & Infrastructure.
- b. All new buildings are to be orientated for year round natural light and ventilation and comfort in indoor and outdoor spaces for year round useability (refer also Section 6.2 Play Spaces).
- c. Building design is to take advantage of natural lighting and opportunities to maximize solar access and natural ventilation.
- d. The design and siting is to avoid the proximity to and use of large expanses of UV reflective surfaces (smooth surfaces), including metal sheeting, concrete, asphalt, glass and sand from reflecting into the outdoor play spaces.
- e. Attention is to be paid in the design to maximize energy efficiency and sustainability and compliance with Part 7.1 Energy Smart, Water Wise under this DCP.

Note: Child care centre developments are to be considered as "All other development" for the purposes of applying development policies under Sections 2 (2.6) and the Assessment Summary Table under Section 3.1 of Part 7.1 Energy Smart, Water Wise.

- f. The choice of building materials, appliances, utilities and fuel sources should be made with consideration for minimising energy requirements and greenhouse gas emissions;
- g. Energy efficient appliances to be used/installed in the centre should have a minimum 3.5 star rating;
- h. Child care centres are to be designed to reflect desired/expected character of buildings in the area. In this regard, consideration is to be given to: Part 4 Urban Areas, Part 5 Special Areas, Part 6 Specific Sites.
- i. Building frontages and entries are to be designed to be readily apparent from the street frontage which they face (corner sites included).
- j. The Statement of Environmental Effects is to demonstrate how the proposed design responds to the site analysis (refer Section 2.3 of this Part) and is compatible with existing neighbourhood character, and how the development has been designed to benefit from natural light and ventilation.
- k. To avoid mosquito bite infections all doors and windows should be screened.

Note: Mosquito breeding must be minimised by ensuring that drains and gutters are kept clear and/or covered, to ensure on-site water pooling is eliminated. Also dark, damp areas (e.g. between fences and garden sheds) are to be kept clear of vegetation and clutter.

- l. In all cases where fill is proposed to be used, clean fill must be used.



Figure 3.2.05 Example of purpose built larger scale centre located on site with street corner frontages. (Photos show same site, different frontages).

Note: The single storey character and the domestic appearance.

3.2 Detached Centres and Centres in Residential Areas

Child care centre developments in residential areas are proposed in various forms. Some examples include conversion of existing residential buildings or purpose-built centres; conversion of existing churches, school buildings and other non-residential buildings in close proximity to residentially zoned properties. Combined dwelling and child care centres are a form of mixed use and have particular requirements with respect to design and character, and are dealt with separately in the next section.

Child care centres which are located in residential areas tend to predominate in the lower density residential zones where the number of neighbours is minimised.

Sites located in residential areas require additional consideration with respect to the amenity and privacy of neighbouring residents. Attention to design is required to ensure suitable character of development and compatibility with neighbouring development. Design, safety and amenity considerations apply to child care centres.

Objectives

1. To continue to promote opportunities for child care centre development in residential areas.
2. To ensure the site layout and building design enables the maintenance of the residential character of the locality.
3. To encourage design which will assist child care centres to integrate into the existing environment and be unobtrusive in terms of bulk, scale, height, and appearance.
4. To ensure that new development is sensitive to the landscape setting and the environmental conditions of the locality.
5. To ensure that the appearance of the development is of a high visual quality, enhances the streetscape and complements good quality surrounding development, and enhances desired future character.
6. To ensure that new development complements heritage items and their setting in a contemporary context.

Controls

In Residential zones, child care centre developments are to be designed to comply with the following criteria:

- a. Child care centres are to be designed to appear domestic in scale and character and shall have a bulk, height, scale and appearance which is compatible with the existing surrounding development;
- b. The existing streetscape and character of the locality should be maintained as much as possible through the use of appropriate building materials, finishes, landscape design and fencing;
- c. In low density residential areas, child care centres are encouraged to be single storey in height for reasons of safety and access. In the case of 2 storey buildings, the second storey should only be used for the purposes of storage and staff facilities;
- d. In low density residential areas, except as otherwise required under this Part, child care centre developments are to be designed to comply with the built form controls under Part 3.3 Dwelling Houses and Dual Occupancy of this DCP, for example, FSR, height, setbacks; and
- e. The bulk and scale of building form is to be compatible with existing and expected future desirable character of the context of the site. Where the development involves the consolidation of 2 or more properties, the child care centre development is to be designed in a manner which reflects the existing subdivision pattern and pattern of building bulk in the streetscape in terms of expected pattern of building/ space/ building/ space/ building / space. Explanation of this control is provided in Figure 3.2.06.

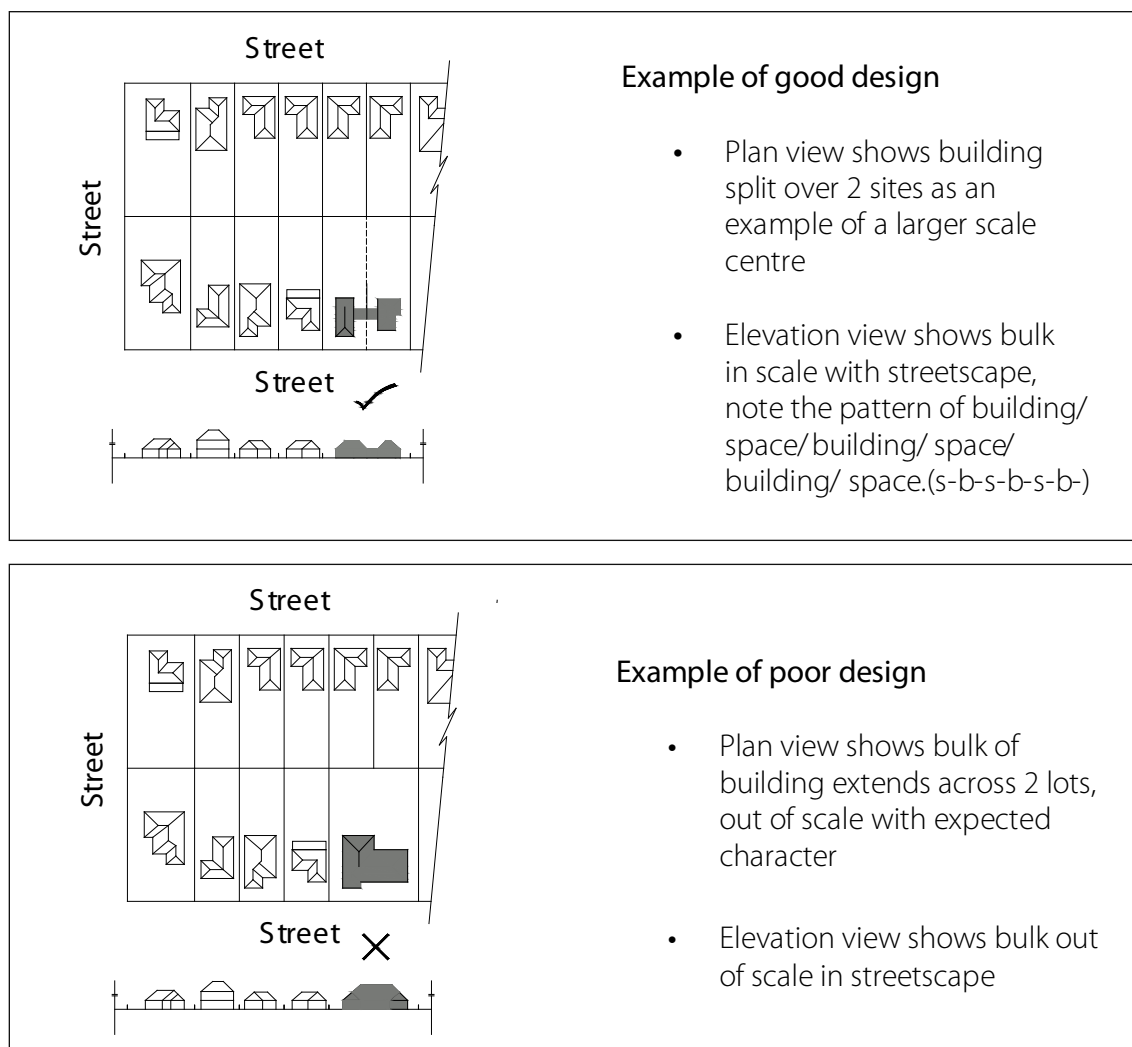


Figure 3.2.06 Streetscape Character of Larger Scale Centres

3.3 Combined Dwelling /Child Care Centre

The development of a child care service in conjunction with a dwelling should not result in a reduction in the standards and safety of the service, nor an over development of the site, detrimental to the amenity of the occupants of the dwelling and their neighbours. Controls are provided to address size of the facility, adequacy of separation of uses, and to ensure privacy for adjoining properties is maintained.

Note: Combined dwelling/child care centre developments are only achievable in extraordinary circumstances. For example, due to existing average site areas, and requirements for minimum separate facilities and amenities to be provided for each use, the majority of residential allotments in the City of Ryde are considered too small for a combined dwelling-house and a child care centre. Consideration could also be given to providing a service for less than 8 children as a Home based child care (refer Section 1.3 of this Part).

Objectives

1. To ensure a residential allotment is sufficiently large for a dwelling and a child care centre.
2. To ensure provision of facilities for each use.
3. To ensure that dual use facilities provide distinct outdoor areas associated with the provision of child care and the domestic needs of the dwelling (i.e. clothes lines, waste bin storage, and recreation).
4. To ensure that the private residential outdoor and indoor areas are located and designed not to interfere with the operation of the child care centre.
5. To ensure that the location and design of the dwelling ensures the privacy of adjoining residents.

Controls

- a. The dwelling must comply with the relevant dwelling requirements (e.g. with Part 3.3 for Dwelling Houses and Dual Occupancy, Part 3.4 Multi Dwelling Housing) in terms of private open space, car parking and access and amenity considerations.
- b. Child care centres that include a dwelling in a residential zone are not to result in an over development of the site.
- c. Separate toilet, laundry and kitchen facilities must be provided for each use.
- d. The child care centre component is to be designed to comply with requirements of this Part.
- e. Children in care must not be able to access any part of the dwelling and its private open space area.
- f. The provision of parking spaces for the residents shall be in addition to the parking requirements of the child care service.
- g. Where the dwelling is a dwelling-house, separate outdoor areas are to be provided at ground level for both uses. The outdoor area provided for the child care centre is to satisfy the outdoor play area requirements under this Part.
- h. The private outdoor area associated with the dwelling-house must be fenced to the general standard contained within this DCP and have a minimum area of 25 m², of which a minimum area of 8 m² is for deep planting.
- i. Separate and exclusive access to the outdoor and indoor areas of the dwelling and child care centre must be ensured.

3.4 Centres in Mixed Use Developments and in Non-residential areas

A mixed use development refers to a building or place that comprises 2 or more different land uses. For the purposes of providing development guidelines for centre based children's services, consideration is given in this Part to child care centres which are:

- Co-located within sites of other compatible uses (e.g. church, school);
- Located at the workplace (work based child care) in non-residential zones or within large scale mixed use developments (e.g. retail/commercial/ residential developments) in non-residential zones.

Note: Combined dwelling and child care centres are a form of mixed use and have particular requirements with respect to design and character, and are dealt with separately (refer to Section 3.3 of this Part).

A number of work based centres exist in the City of Ryde. Council encourages such centres and this DCP provides clarity in Council's expectations for them. In some cases work based child care centres are able to offer places to the general community. Work based child care centres are encouraged to be designed to meet minimum standards in this DCP to ensure that in the event of being only partly required or no longer required by the business, the centre may also be run as a separate business or community run centre. These controls are provided based on consideration given to the longer term opportunities for use of the child care centre for the benefit of the company providing it and for the wider community.

Increasingly, child care centres are being proposed in mixed use developments in business and other non-residential zones to assist provision of places for working parents/carers in proximity to the workplace. The design of child care centres on sites located within non-residential areas and part of mixed use developments requires additional attention with respect to the safety and amenity of children using the centre. The focus of controls in this section reflects these particular considerations.

Child care centres in mixed use developments and in non-residential areas are encouraged at ground level. Design requirements are to accommodate quality outdoor areas which:

- Contain natural landscaping;
- Have good access to natural light and ventilation;
- Are located with compatible land uses; and
- Ensure a safe environment for all children using, accessing and leaving the centre, including in the event of an emergency.



Figure 3.2.07 Work based child care centres (Macquarie Park Corridor)

Note: The ground floor location and self-contained appearance. These sites are located with a northerly aspect, with maximized solar access (note the shadows).

Objectives

1. To continue to promote opportunities for work based child care and child care centres in mixed use developments.
2. To plan and co-ordinate child care services and facilities for the City of Ryde so they are economically viable.
3. To encourage design which provides for maximised safety and amenity for users and for staff.

4. To ensure the site layout and building design maximises opportunity for outdoor play spaces to minimise extremes in heat and cold, and maximises opportunity for environmental sustainability (refer Section 3.1 of this Part).
5. To ensure optimum microclimate conditions for the centre.
6. To ensure that new development is sensitive to the landscape setting and the environmental conditions of the locality.
7. Where development is proposed on sites containing existing development, to encourage design which will assist child care centres to integrate into the existing environment and be compatible in terms of character, bulk, scale, height, and appearance.
8. To ensure that the appearance of the development is of a high visual quality, enhances streetscape and complements good quality surrounding development, and enhances the desired future character.
9. To ensure where relevant that new development complements heritage items and their setting in a contemporary context.

Controls

In non-residential zones, child care centre developments are to be designed to comply with the following criteria:

- a. Work based child care centres are to be designed as self-contained premises to ensure access for child care places is available to community members external from the company, should places permit. The centre is to have a separate main entrance, separate pedestrian and vehicular access including drop off/pickup area in proximity to the entrance, and be readily accessible to the general public.
- b. Child care centres are to be located to benefit from a north/northeast aspect and to provide for year round comfort and useability of outdoor play spaces.
- c. The siting and design is to maximize opportunity for indoor and outdoor play areas to be oriented to receive maximum benefits of natural light and ventilation.
- d. Siting and design of outdoor areas is to avoid being subject to undue reflectivity, glare, heat load and UV radiation from surrounding environments (e.g. from smooth reflective surfaces on tall buildings, expanses of asphalt and concrete). Design and siting should avoid the use of large expanses of UV reflective surfaces (smooth surfaces), including metal sheeting, concrete, asphalt, glass and sand being exposed to the sun from 11 am to 3 pm daylight saving time from reflecting into the outdoor play spaces. Shade audits may be required to be prepared in accordance with the NSW Cancer Council guidelines *Shade for Child Care Services* to identify initial shade opportunities and protection from indirect and direct UVR, and shade opportunities projected to 5 years from establishment of the centre (once planting is established).
- e. Outdoor play areas are to be located away from driveways/ sources of noise or fumes.
- f. Any air conditioning system applied to the work-based child care centre must be separate for the centre from other uses sharing the same premises;
- g. All child care centres are preferred to be located at ground floor level where achievable and in areas where the opportunity for natural landscaping comprising deep soil planting is possible (i.e. not to be entirely located over basement areas).
- h. Child care centres in mixed use developments may provide spaces for 0-2 year olds above ground floor level (no higher than second storey) subject to meeting minimum safety considerations and natural planting requirements (refer Section 6 of this Part).
- i. Where centre facilities are provided for use by children above ground floor level, a safe refuge area shall be provided which opens directly to a dedicated fire-isolated stair. The minimum total area of the refuge shall be calculated at the rate of 0.25 m² per person (staff and children)

for the capacity of the centre occupying the area at that first floor level at any one time. The doors, walls, floors and ceiling of the refuge shall have a minimum Fire Resistance Level (FRL) equal to that required for the fire stairs. The refuge area is not to be used for storage at any time.

- j. Where child care centres are not located at ground level within a mixed-use building, the application is required to address child safety, privacy, and amenity impacts for the surrounding users as well as for occupants of the child care centre (refer Section 6.2 of this Part).

3.5 Fencing, Gates and Security

Fencing is of importance for all child care centres especially due to the vulnerability of babies and young children. Centres need to be securely fenced in order to prevent children escaping, and to prevent entry by unauthorised visitors. A number of factors need to be taken into consideration in the design and siting of fencing, and the various types of fencing and gates to be used on the site. Factors include considerations such as suitability for purpose, appearance and character, performance in terms of security, visual and acoustic privacy, performance in terms of sightlines for pedestrian and vehicle access.

Objectives

1. To require fencing to be compatible with the character of the area in which the child care centre is proposed/located.
2. To ensure the design of fencing provides for safety and amenity considerations and suits the purpose for which it is required.

Controls

- a. For child care centres in low density residential areas, consideration is to be given to requirements under Part 3.2 Dwellings and Duplexes.
- b. Consideration is to be given to the use of appropriate building materials and finishes to complement the streetscape and desired character of the locality.
- c. Designated outdoor play areas must be fenced on all sides. The design and height of fencing are to prevent children scaling fencing and / or crawling under, and must impede intruders from entering premises through it or from scaling it and to prevent unlawful access to children.
- d. Gates are to be designed to prevent children leaving/entering unsupervised by use of childproof locking systems.
- e. All raised areas, including any stairs, are to be enclosed to prevent a child from falling or crawling through gaps.
- f. Adequate safety provision is to be made to prevent children gaining access to other parts of the building/site unsupervised.
- g. Fencing and gates are to be designed to ensure adequate sightlines for vehicles and pedestrian safety in accordance with Australian Standards and RMS Traffic Management Guidelines.

4.0 PRIVACY

It is important that the siting and design of child care centre developments provide visual and acoustic privacy and high amenity for the children and staff of the centre and, where located in residential areas, visual and acoustic privacy for neighbours in their dwellings and in private open space areas.

Similarly it is important that in non residential areas and in mixed use developments containing child care centres, that the child care centres are designed appropriately in the context to ensure visual and acoustic privacy and high amenity for the children and staff of the centres. Centres should also be designed to ensure visual and acoustic privacy and high amenity for sensitive neighbouring land uses (such as residential and office uses) in mixed use developments and in non-residential areas.

This section addresses privacy, including both visual and acoustic privacy for both the users of the facility, and for neighbouring residents and users of neighbouring land uses.

Applicants may be required to submit an acoustic report prepared by a recognised acoustical consultant.

4.1 Acoustic Privacy – for children in the centre

Objectives

1. To ensure children's play and sleep areas are not subjected to excessive traffic noise, or other external noises.

Controls

- a. Sites affected by heavy traffic or other external noises are to be designed so as to locate sleep rooms and play areas away from the noise source. The impact of noise should also be reduced by design measures including barriers such as solid fencing and laminated or double glazing where relevant.
- b. Design measures to minimize internal noise levels should be designed to meet recommended design sound levels equivalent to Australian Standards AS/NZS 2107 (e.g. sleep areas 30dBa, internal activity areas 40dBa).

4.2 Acoustic Privacy – for adjoining residents

Objectives

1. To ensure that the site layout and building design, including internal layout, minimises the noise emitted from the centre and does not have an adverse impact on the amenity of surrounding residences.

Controls

- a. Noise impacts on neighbouring properties are to be minimised by design measures including:
 - i. Orientating the facility having regard to neighbouring property layout, including locating playroom windows and doorways away from neighbouring bedrooms and living areas;
 - ii. Orientating playgrounds/outdoor play areas away from private open space areas, bedrooms and living areas on neighbouring residential properties (refer diagram below);
 - iii. Using laminated or double glazing where necessary; and
 - iv. Designing fencing which minimises noise transmission and loss of privacy (e.g. lapped and capped timber fencing, brick).
- b. For freestanding child care centres in residential areas with a side boundary set back of less than 3 m, noise buffering measures should be considered such as allocating the internal rooms closest to the boundaries to be used for low noise generating uses, for example administration, storage, staff rooms, kitchen, to reduce potential noise impacts on adjoining property owners.
- c. Applicants may be required to submit an acoustic report prepared by a suitably qualified practitioner which includes recommendations for noise attenuation measures. The report must specify pre and post development noise levels and abatement measures.
- d. Roof and walls of the child care centre should be sound insulated.
- e. Elevated play and transition areas are to be avoided.
- f. Information about practical design measures incorporated in the design to minimise potential noise impact, including insulation and other acoustic elements, are to be identified in the Development Application.
- g. Location details of noise sources (such as air conditioning condenser units) are to be included in the Development Application.
- h. Information regarding how groups are proposed to be managed in the outdoor play spaces and where time will be spent, group sizes and how rotated may be required to be submitted with the Development Application.

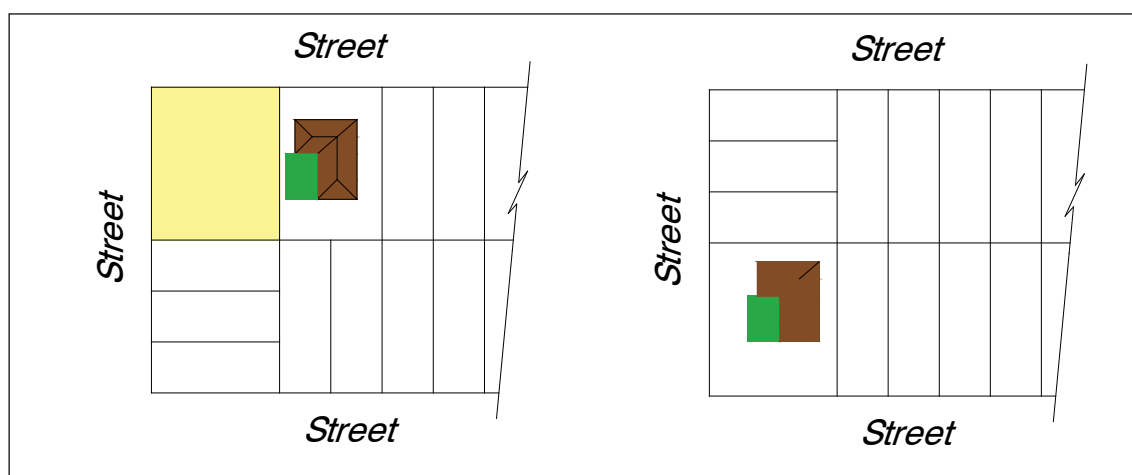


Figure 3.2.08 Site Layout

Examples of sites showing site layout designed to orientate external areas (shown in green) away from surrounding residential properties.

Note: Yellow represents non-residential uses compatible with childcare centres (school, park, church, shops etc).

4.3 Visual Privacy – for children in the centre

Objectives

1. To protect privacy and security of children attending the centre.
2. Provide opportunity for children to view safely out from the centre's indoor and outdoor play areas to assist their visual development.

Controls

- a. Indoor areas adjacent to public areas shall be screened to prevent direct sight lines into child care centres where appropriate whilst maintaining an opportunity for children to view community life.
- b. Direct overlooking of indoor amenities and outdoor play spaces from public areas should be minimised through design features including:
 - i. Appropriate site and building layout;
 - ii. Suitable location of pathways, windows and doors; and
 - iii. Permanent screening and landscape design.
- c. Where relevant, consideration should be given to incorporating design features in walls, screens, fencing (such as peeping holes of varying heights) to suit viewing out to public areas by children.
- d. Windows and doors in the proposed centre are to be sited in locations which maximise security for children attending the centre, whilst maintaining an opportunity for children to view community life.

4.4 Visual Privacy – for adjoining residents

Objectives

1. To minimise the adverse impact on privacy of adjoining properties.

Controls

- a. Direct overlooking of adjoining main internal living areas and private open spaces should be minimised through:
 - i. Appropriate site and building layout;
 - ii. Suitable location of pathways, windows and doors; and
 - iii. Landscape design and screening.
- b. Windows and doors in the proposed centre are to be sited in locations which minimise loss of privacy to adjoining residences.

The choice of site in accordance with Section 2 of this Part will assist towards providing a safe environment for traffic movements (e.g. away from busy roads). The design of car parking spaces and vehicular access is to be integrated in the overall site design to maximise safe vehicular and pedestrian movements in and around the centre, especially for children. Where located in areas visible from the street or public area, attention is needed to minimise potential visual impacts of car parking areas.

The design criteria contained in this section are to be read in conjunction with controls for site selection, landscape design, accessibility and waste collection. These areas need to be appropriately integrated into the design of all new child care centres.

Traffic movements associated with child care centres generally involve vehicles associated with:

- Drop off and pickup of children (predominantly by car due to the young age of children involved);
- Staff;
- Deliveries of equipment and food; and
- Waste collection (the scale of which depends on the size of the centre).

In low residential areas traffic movements generated can exceed that of dwellings. Depending on the site location and its context, traffic can/should be managed so as not to cause undue impacts. Impacts will also depend on traffic activity created by other nearby uses.

Proposals for all new child care centres, and for expansion of existing centres in low density residential areas, will require appropriate technical assessments.

5.0 CAR PARKING, TRAFFIC AND ACCESS

5.1 Car Parking

The provision of off-street parking is expected for all child care centres. In most cases, off-street parking areas will be required to accommodate drop off/pickup of children, access for people with disabilities, emergency access, small deliveries, parking opportunities for staff, and parents/carers/visitors. Parking spaces are expected to be located in proximity to the main entrance of the centres to assist the safe movement of children in and around the centres.

Objectives

1. To ensure adequate car parking spaces are provided on site to meet the needs of visitors and staff, including people with disabilities.
2. To ensure that safe and convenient car parking arrangements are provided to satisfy the demand generated by the centre, and are relevant to the context of the site.
3. To provide adequate and safe on-site parking of staff vehicles, as well as suitable space for deliveries, service access, emergency access.
4. To reduce the incidence of on-street parking which may be detrimental to road safety and the amenity of residents.
5. To ensure the size, location and design of car parking spaces encourages their use.
6. To require parking to be provided in a safe and convenient location allowing for safe movement of children to and from the centre entrance.
7. To allow for minimal on-site parking where the traffic environment will allow and amenity of the street is not compromised.
8. Where child care centres are proposed to be co-located with other uses, to provide convenient parking and set-down areas for the exclusive use of the child care centre.

Controls

All child care centres

- a. All on-site parking areas are to be designed in accordance with Australian Standard AS 2890.1 and AS 2890.2.
- b. Off-street parking is to be provided at the rate of 1 space per 8 children, and 1 space per 2 staff. Stack or tandem parking may only be used for staff parking and with no more than 2 spaces in each tandem space.
- c. Where calculations for car parking result in a fraction, the number is to be rounded up to the nearest whole number.
- d. One off-street accessible parking space (3.6 metre width) is to be provided for use by persons using mobility aids (refer Section 5.5 Accessibility). It is to be located close to the continuous path of travel and have a minimum height clearance of 2.5 m.
- e. Developments for new centres shall comply with the access requirements contained within Section 5.5 of this Part, and Part 9.2 of this DCP.

Low Density residential areas

- f. Underground parking is not permitted in low density residential areas.
- g. The parking and driveway area is not to dominate the streetscape (refer Section 6.1 Landscape Design for treatment of these areas).
- h. Consideration may be given to reducing the on-site parking requirements, in terms of drop off/ pick up component, where convenient and safe on-street parking is available (e.g. indented parking bays) in streets which experience low traffic volumes. This is subject to not adversely affecting the safety and amenity of the adjacent area or causing traffic problems.

Work based child care centres, and centres in mixed use facilities

- i. For child care centres in mixed use developments car parking spaces for drop off/ pick up areas are to be provided in close proximity (a maximum of 30 m distance) to the centre's main entrance and preferably at the same floor levels. to assist accessibility (refer 5.5 Accessibility) and safety considerations. If not at the same floor level, direct access is to be provided which does not require crossing of driveways or manoeuvring areas shared by vehicles accessing other parts of the centre.
- j. In mixed use developments, the drop off/pickup zones are to be exclusively available for use in conjunction with the child care centre throughout the period of the centre's operating hours. Spaces are to be clearly marked to reflect this requirement.
- k. Driveway access, manoeuvring areas and parking areas are not to be shared with access, parking, manoeuvring areas used by other uses or truck movements.

5.2 On Site Manoeuvrability

Controls in this section apply to all centres but are of particular relevance on smaller sites where space is limited.

Objectives

- 1. To ensure sufficient area on-site to enable vehicles to enter and leave in a forward direction.
- 2. To ensure safe and efficient movement of traffic entering and leaving the site to minimize potential conflict in vehicle movements.
- 3. To ensure the safe set down and pick up of children, and the safe movement of children to and from the centre.
- 4. To ensure the driveway area does not visually dominate the front setback area.

Controls

- a. The site must be able to accommodate a "U" shaped one-way driveway system with sufficient driveway turning area in addition to the parking spaces to enable vehicles to enter and leave in a forward direction.
- b. Variation on the requirement for a "U" shaped driveway may be considered, for example on corner lots, where it can be demonstrated that a one-way driveway system can be provided in another way which still meets the following criteria:
 - i. To provide a separate entrance and exit driveway access at a minimum safe distance from each other;
 - ii. To enable vehicles to leave the site in a forward direction;
 - iii. To enable vehicles using the entrances and exits to not endanger persons and vehicles using those accesses; and

- iv. To ensure the front setback is not given over to traffic circulation and parking requirements which may negatively impact on the streetscape and the opportunity for landscape design to meet the requirements of Section 6 of this Part.
- c. Where separation of the entrance and exit driveway is proposed, the separation must be not less than 9 m on a turning circle of 15 m. A minimum width of 12 m between driveway laybacks is to be provided to assist retention of on-street parking spaces between the driveways.
- d. The driveways and parking area are to be designed so that no vehicle will encroach on pedestrian accessways. Use of barriers such as bollards, raised footways, platforms, wheels tops etc, are permissible subject to full details being provided with the development application and barriers not compromising the continuous path of access (refer Accessibility).
- e. The driveway area is to be treated with a variation in pavement treatment to distinguish it from the car parking spaces and to reduce the visual impact of the hard surfaces.

5.3 Impact on Traffic Flow

Objectives

- a. To maximize traffic safety.
- b. To ensure the amount, type and timing of traffic generated does not adversely affect the general flow of traffic in the surrounding area or the amenity of the street.

Controls

- a. All vehicles must be able to enter and leave the site in a forward direction. The area required for drop off/pick up is to be designed as a separate area to that required for manoeuvring in and out of parking spaces.
- b. The applicant is required to address in the Statement of Environmental Effects whether or not traffic associated with the proposed child care development is likely to have impacts on the amenity of the existing street(s) where it is proposed to be located.
- c. A Traffic Impact Assessment prepared by a suitably qualified practitioner shall be prepared and submitted with the development application for all new child care centre developments, and may be required for applications involving the expansion of an existing child care centre in the vicinity of other traffic generating developments.
- d. Child care centres are not encouraged on roads carrying high volumes of traffic (refer Section 2 of this Part). Where developments involve sites located on a road which carries significant volumes of traffic, including arterial and sub-arterial roads, measures must be applied to alleviate the associated traffic problems (refer Schedule 2 regarding road hierarchy information).
- e. A Road Safety Audit is required to be submitted with all applications for child care centre developments on collector roads where traffic volumes exceed 5000 Annual Average Daily Traffic (AADT) (refer Schedule 2 of this Part and Council's Traffic Engineer).

5.4 Pedestrian Safety

Objectives

1. To ensure vehicles entering, traversing and leaving the site are not a danger to pedestrians or cyclists on or in the vicinity of the site.

Controls

- a. Pedestrian access must be segregated from vehicular access with clearly defined paths to and from the facility.
- b. On site parking and drop off/pick up points must be provided in a convenient location (at no more than 30 m distance from the main entrance), clearly lit, and allow safe movement of children to and from the centre.
- c. On-site vehicular movements must be separated from pedestrian access by safety fencing, gates and other means.

5.5 Accessibility

It is important in the design of a child care centre development that consideration is given to providing an environment that is physically accessible to all members of the community. This section should also be read in conjunction with Part 9.2 Access for People with Disabilities. Accessibility is also addressed in other sections in this Part relating to site selection and car parking.

Objectives

1. To ensure that all new child care centres, and alterations and additions to existing child care centres (where relevant), are designed to make adequate provision for access by people with disabilities over and above the requirements of the Building Code of Australia to assist compliance with Disability Discrimination Act (DDA) 1992 and Disability (Access to Premises-Buildings) Standards 2010.
2. To ensure safe and convenient access, including access via the main entry to all internal areas and external play areas.
3. To provide design criteria particular to child care centres to assist developments achieve access for people with disabilities.
4. To encourage all child care centre developments to provide equitable access for the whole community.

Controls

- a. Access should be provided and designed in accordance with *AS 1428.1 Design for Access and Mobility*, and in all respects comply with Part D of the Building Code of Australia for the relevant class of building. Refer also Part 9.2 Access for People with Disabilities of this DCP. Reference to these requirements should be made in the early stages of the design to ensure the development complies with the relevant standards.
- b. In the case of minor alterations to child care centres, not involving structural alterations, or major refurbishment, accessibility is not to be made worse by the proposed work. Applicants are encouraged to improve accessibility where possible.

- c. In addition to the provisions of the Building Code of Australia for disabled access and toilet facilities, other matters to be considered in the design of child care centre developments include :
- i. Provision of access for people with mobility disabilities by a continuous path of travel from the street and/or parking area into and within every room and outdoor area used by children and staff.
 - ii. Hard paved surfaces leading into the entry of a play environment and continuing inside that will allow children and adults with mobility aids as well as toddlers in strollers to enter with ease.
 - iii. Design of the car parking area should incorporate kerb cuts which eliminate a barrier for prams or individuals using mobility aids (such as wheel chairs or crutches).
 - iv. Pathways with extra width (1200 mm - 1500 mm) and grades no steeper than 1:14 to allow easy circulation throughout the site.
 - v. One on-site parking space 3.6 m wide with a height clearance of minimum 2.5 m to permit ease of use for arrivals and departures of individuals using mobility aids.



Figure 3.2.09 Accessibility

Example of larger scale child care centre in residential area. Note the dedicated disabled car parking space in proximity to main entrance.

6.0 LANDSCAPE DESIGN AND PLAY SPACES

This section provides controls and guidelines for landscape design of the site and for play spaces, both outdoor play spaces and indoor spaces.

Landscape design controls encompass the planning, design, construction and maintenance of all landscaped spaces on the site. Landscaped spaces include all soft and hard areas, and all deep soil areas.

Of particular relevance to child care centres is ensuring safety and amenity for children in the choice of plant species, play surfaces, and structures, providing opportunities for early learning about the natural environment, and providing for maximised year round use of the outdoor play spaces.

6.1 General Landscape Design Requirement

Objectives

1. To maintain and enhance existing landscape character and visual amenity.
2. To ensure that adequate area is provided to protect, where practical, existing significant vegetation, and to permit high quality landscape design.
3. To ensure the spacing between trees and buildings is sufficient to ensure their protection.
4. To provide an attractive and safe natural environment for the users of the site and require areas in appropriate locations for deep soil planting.
5. To provide a functional, sustainable and educational outdoor area.
6. To provide light, shading and wind control on the site.
7. To improve microclimatic conditions on the site.
8. To visually soften the hard materials associated with the development, particularly on-site parking areas.
9. To provide screening and privacy to dwellings and private open space areas where located on adjoining sites.

Controls

- a. Development Applications must include a detailed landscape plan showing existing and proposed planting, including a schedule of species. The plan is to be prepared by a suitably qualified landscape architect with experience/skills in designing early childhood environments.
- b. The landscape plan must:
 - i. Identify significant trees/vegetation to be retained (with respect to Council's Tree Preservation Order) and outline a program for their management during the construction period;
 - ii. Avoid plant species likely to present a hazard to children, such as poisonous plants, and any vegetation that can lead to injury or harm or severe discomfort (e.g. plants which are allergy producing, which contain sharp prickles or thorns, or which produce small nuts or fruits);
 - iii. Avoid plant species and landscape materials which may constitute a choking hazard in areas designed for use by babies and toddlers;

- iv. Incorporate landscape design of the outdoor play spaces in accordance with the requirements of Section 6.2.2 of this Part;
 - v. Consider the effects of outdoor play on the compaction and erosion of soil and vegetation in choice of treatments;
 - vi. Specify plants and surface treatments that consider the potential for tree roots to up-lift outdoor surfaces (footpaths, cycle tracks) and create hazards;
 - vii. Identify opportunities for deep soil planting and choice of appropriate species to suit the conditions; and
 - viii. Include shrubs and trees which offer a range of textures, colours and scents for the children's learning experience, such as the opportunity to observe a variety of native birds and insects attracted by plants.
- c. The landscape design is to consider the site analysis and pay attention to use of treatments which manage the effect of sunlight, shading, wind protection and temperature moderation in relation to the care of young children.
 - d. Irrigation should be designed to use rainwater or recycled water.
 - e. A landscape setback of minimum width 2 m is to be provided along the front boundary of all new child care centres in residential zones to assist in preserving streetscape amenity and provide screening. Care is to be taken in design of the setback to avoid vegetation impeding sightlines from vehicles entering/exiting the site, and to consider the use of materials and finishes to complement the neighbouring streetscape.
 - f. A landscape buffer is to be provided along the side and rear boundaries of the site for child care centres in residential zones of a minimum width of 1 metre.
 - g. Landscape setbacks/buffers may need to be provided for centres in commercial and industrial zones depending on the context of the development.

6.2 Play Spaces

This section identifies expectations of best practice in the design of indoor and outdoor play spaces.

Council encourages applicants to exceed the minimum play space requirements provided under DEC's licensing requirements in order to achieve better practice in design, given the opportunities that can occur in the City of Ryde due to the availability of locations and lot sizes where child care centres are permitted.

Positive outcomes of exceeding the DEC's minimum play space requirements include a higher amenity and quality environment for the users, lower incidence of accidental injury, reduced ambient noise levels, improved staff teamwork, and a more appealing child care environment resulting in a higher quality service. At the time of preparing this DCP a number of existing centres in the City of Ryde exceed the minimum licensing requirements to varying degrees.

6.2.1 Size and Functionality of Play Spaces

Objectives

1. To maximize the area available for, and the functionality of, indoor and outdoor play areas associated with child care centres.
2. To encourage applicants to exceed the minimum NSW licensing standards for unencumbered children's play areas.
3. To facilitate quality, safety and attention to best practice in design of play spaces.
4. To require provision of outdoor play spaces in all developments to enable the opportunity for all children in care to experience the outdoor environment.

Controls

- a. All new child care centres are to provide indoor play spaces, outdoor play spaces and transition areas.
- b. All play spaces are to be designed of regular shapes and with convenient access between them to maximize opportunities for supervision of children by staff.
- c. The location of outdoor play spaces in the front setback should be avoided.
- d. All new child care centres are to provide at least 10 m² of unencumbered outdoor play space for each licensed child care place, inclusive of transition areas provided in accordance with Section 6.2.4 of this Part.

Note: Calculation of unencumbered (total 'useable') outdoor play space, is not to include areas where children are prevented from using the space, and where they cannot be readily supervised such as areas used for car parking, storage sheds, garden beds, hedges, or side boundary setbacks.

A reduction in this minimum area requirement (to no less than the DEC's minimum requirement) may be considered subject to satisfactory compliance with the general landscape design requirements under Section 6.1, and design of the outdoor play spaces in accordance with Section 6.2.2 Outdoor Play Spaces and 6.2.4 Transition Areas.

- e. All new child care centres are to provide at least 4.5 m² of unencumbered indoor play space for each licensed child care place, exclusive of transition areas provided in accordance with Section 6.2.4 of this Part.

Note: Calculation of unencumbered indoor play space is not to include passageways or thoroughfares, door swing areas (approx. 0.5 m² per door), kitchen, cot rooms, storage rooms, bed storage areas, children's lockers, toilet or shower areas, nappy change areas, wall cavities, cupboards and craft preparation sinks located in the playroom, or other rooms/ areas not available for the purposes of indoor play.

6.2.2 Outdoor Play Spaces

Outdoor play spaces are areas designed for play to provide children with opportunities for development of a variety of skills including gross motor skills. They should be located and designed to be comfortable environments for year round use.

Council encourages well designed outdoor play spaces to allow children the opportunity to move freely and engage in vigorous play, and to offer children sensory stimulation, exposure to fresh air, sunlight and varying weather conditions.

Some variations in requirements apply depending on location. In residential areas, care is needed in the siting of outdoor play spaces in order to minimise any potential noise or privacy impacts on adjoining properties. In non-residential areas, and where centres are designed in conjunction with mixed uses, care is needed to provide amenity and privacy for children using the outdoor areas, for maximising opportunity for the provision of natural planting (including canopy cover) and natural landscape features and for minimising any potential impacts on neighbouring land uses.

Objectives

1. To provide attractive, safe and functional outdoor spaces which provide positive experiences and developmental growth for children, and achieve best practice in design.
2. To require that outdoor play spaces offer natural settings and provide for variety and diversity in play experiences in accordance with best practice principles.
3. To provide outdoor play environments which are comfortable for year-round use and to protect users of outdoor play spaces, especially children, from harsh weather conditions.
4. To ensure sufficient shade is provided to outdoor play spaces to protect children from the harmful UV radiation effects of the sun.
5. To provide outdoor spaces that enable adequate staff supervision, and for effective access between indoor and outdoor play spaces.
6. To ensure that play areas are clearly defined and safe, and that the design of the development caters for the needs of all users.
7. To ensure that the design and use of the outdoor play areas minimizes impacts on the visual and acoustic privacy and amenity of adjoining users.
8. To ensure that outdoor play spaces are located and designed to minimize potential noise and privacy impacts on any adjoining properties.

Controls

All child care centres

- a. The design of the outdoor area is to be of a shape which maximizes supervision and useable space, and also stimulates early learning. Freeform approaches in design are encouraged.
- b. Outdoor play spaces are to be designed to:
 - i. Be well-drained to permit clearing of water quickly after rain; and
 - ii. Incorporate existing natural features and vegetation.
- c. Designs are to aim for:
 - i. 30% natural planting area (excluding turf);
 - ii. 30% turfed area; and
 - iii. 40% hard surfaces (sand, paving, timber platforms).
- d. Distinct areas within the outdoor play space design must include:
 - i. An open grassed area for gross motor skills (e.g. running, ball games);
 - ii. Formal quiet areas, for focused play (must include a sandpit - see point below and a minimum of 2 formal quiet areas for activities such as storytelling and finger painting);
 - iii. An active area (e.g. climbing structure, digging patch);
 - iv. A transition area (refer Section 6.2.4 of this Part); and
 - v. Storage area(s).

- e. With respect to the distinct areas required, all designs for outdoor play spaces should take into consideration elements of best practice in design (refer photos on following pages) including:
- i. **Sandpits** are considered 'quiet areas' and should be an irregular shape, preferably with several sub-spaces for different age groups. There should be 500 - 600mm depth of sand on a rubble base with good drainage. A wide paved sweeping edge (approx 750 mm wide) and an adjacent tap are essential. All child care centres must incorporate at least one sandpit. The sandpit is to be a minimum size related to the number of children likely to use it at any one time (based on a rate of 15 m² per 20 users).
 - ii. **Formal quiet areas** are designed for activities such as finger painting and story-telling. They are generally 12-25 m² each, and two is the minimum required. They should be sited close to the 'transition area' and be protected from sun and wind. Examples include gazebos, sunken areas, or paved areas surrounded by raised planter beds. These areas should have limited entry points to reduce disruption, be robust (e.g. for painting), contain a tap, and have sensory richness.
 - iii. **Secret places** are small, unexpected spaces, generally on the fringes of play. They are semi-enclosed, quiet retreats for imaginary play. They should be included where possible.
 - iv. **Active areas** should be sited away from the building and usually contain climbing equipment and swings if there is sufficient space. Mobile equipment can be preferable to avoid permanently taking up valuable space. If there is space, elements such as flying foxes, slides down hills or mounding can be installed. Digging patches with shade, adjacent tap and sandy loam surface should be considered. These are usually 20-50 m².
 - v. **Surfaces** are very important in playspaces. Natural surfaces are always preferable to artificial – for example grass, sand, mulch and pebbles are always better than artificial grass. Groundcovers can make interesting surfaces in appropriate locations. Hard surfaces must be non-slip and well drained (e.g. pavers laid on sand), while climbing structures must always have the appropriate soft fall installed underneath, according to the appropriate Australian Standards. All outdoor play equipment must comply with the relevant Australian Standards.
 - vi. **Access corridors:** An access corridor from the major entry to all areas should be considered.
 - vii. **Slowdown features:** The use of slowdown features between certain activities can be useful to prevent children running straight through. Examples include mounding and raised beds.
 - viii. **Elevated areas** can make a playspace more interesting, for example decks, mounds and embankments.
 - ix. **Linkages:** The linkage and flow between activities is important to consider, e.g. pathways, bridges, flying fox.
 - x. **Planting** should be the dominant element in a playspace providing shade, wind protection, and sensory richness. Plants also screen unpleasant views and help divide activities. A combination of evergreen and deciduous, autumn colour, bright flowers and interesting leaves, stimulate children to investigate the natural world. A wide variety of shrubs should be chosen for colour and interest, and to encourage native birds. These should not require pruning. A variety of groundcovers, bulbs and vines could also be planted, to help educate children about the many plant forms.
 - xi. **Storage:** Storage structures are to be located in areas which do not hinder supervision. Storage is to be lockable and childsafe.
- f. Designs are to incorporate suitable species which will achieve a canopy cover of 50-60% of the outdoor play area within 5 years of planting.
- g. Outdoor play spaces are to be adequately shaded from establishment of the centre in accordance with *Shade for Child Care Services* published by the NSW Cancer Council and NSW Health Department. Design of shading is to be in accordance with the key shade planning and design principles, and to consider the nature of shading needed prior to canopy cover being established.

- h. The outdoor play space should relate directly to the indoor play space for the relevant age group of children. The shape of the play space must allow for uninhibited supervision of children at all times. The siting of the outdoor play area shall allow the provision of adequate supervision from internal and external areas. Separate play areas are encouraged to be provided for 0-2 year olds. The landscape plan is to identify how play spaces are designed for each age group.
- i. Designs should consider access opportunities for maintenance of outdoor play areas. Outdoor play space should not be occupied by any service vehicles during the centre's operating hours.

Work based child care centres, and centres in mixed use facilities

- j. Where outdoor spaces are provided externally above ground level (refer Section 3.4 of this Part):
 - i. Effort is to be made to make outdoor space of a similar quality to that achievable at ground floor level. In this regard the outdoor play area is expected to be designed to comply with requirements of Section 6.2.2;
 - ii. Appropriate measures shall be implemented for the protection of outdoor play spaces from excessive wind and other adverse climatic conditions in order to permit year-round use as far as possible; and
 - iii. Adequate fencing is to be provided for the safety of the children and to prevent objects from being thrown over the perimeter of the area.
- k. Outdoor storage space is to be provided in a location which does not impede supervision of the play areas. It is to be a size equivalent to 0.5 m² of space per child who will be using the area.



Figure 3.2.10 Outdoor Play Spaces

An example of extensive use of natural landscape design and good sized organically shaped sandpit (covered in photo).



Figure 3.2.11 Outdoor Play Spaces

1. Shows open area for running (foreground) and active area for climbing structures (under sail); 2. Shows quiet area around tree for storytelling etc (timber platform); 3. Shows well-designed transition area between inside and outside; 4. Shows secret place for imaginative play.

Note: The predominance of natural planting, variety of plants including mix of exotic, native and deciduous, access corridors, elevated areas, linkages between spaces, and variety of surfaces.

6.2.3 Indoor Play Spaces

Objectives

1. To provide attractive, safe and functional indoor spaces which encourage positive experiences and developmental growth for children.
2. To provide a variety of play areas and design in accordance with best practice principles.
3. To provide indoor spaces that enable adequate staff supervision and effective access between indoor and outdoor play spaces.
4. To ensure that play areas are clearly defined and safe, and that the design of the development caters for the needs of all users.

Controls

a. Indoor play spaces shall be designed to:

- i. Achieve passive surveillance from all rooms;
- ii. Provide direct access to play areas;
- iii. Allow maximum supervision of the indoor and outdoor play spaces;
- iv. Allow subspaces to be set up with discernable divisions to offer a variety of play areas.

6.2.4 Transition Areas

Transition areas are areas between the building (indoor play spaces) and outdoor play areas that provide supporting space for indoor and outdoor play activities. It is space in addition to that required for indoor and outdoor unencumbered areas, and may comprise a verandah, terrace area or undercroft. It is space that can be included in the calculation for outdoor play area under this DCP (refer 6.2.1 Size and Functionality of Play Spaces).

Best practice suggests that design of all new child care centres should include transition areas.

Objectives

1. To maximize the use of outdoor areas in a range of weather conditions.
2. To assist integration between indoor and outdoor play spaces.
3. To provide opportunity for a range of activities including craft activities.

Controls

- a. Transition areas shall:
 - i. Be located between the indoor and outdoor areas;
 - ii. Be designed to allow for indoor and outdoor activities to be conducted under cover;
 - iii. Be designed to offer protection from unfavourable weather conditions, and not heat up excessively in summer; and
 - iv. Incorporate facilities for educational experiences and appropriate storage areas.

6.3 Swimming Pools and Water Hazards

To avoid any risk to children, Council prefers that swimming pools are not provided on the premises where child care centres or children's services are located. Care should be taken to avoid exposing children to water hazards.

Objectives

1. To provide a safe environment for children.
2. To clarify requirements for swimming pools on the site of child care centres to avoid any risk to children.
3. To control temporary water hazards on the site of child care centres to avoid any risk to children.

Controls

- a. New swimming pools (within the meaning of the Swimming Pools Act 1992) are not permitted on the premises of any child care centre.
- b. Any swimming pool that existed on the premises of a child care centre or children's service listed under this Part on or before the commencement of this Part must be fenced. The fencing must be in accordance with the Swimming Pools Act 1992 whether or not the Swimming Pools Act 1992 applies to the pool concerned.
- c. Pool filters must be suitably housed to ensure they are inaccessible to children at all times.
- d. Any water containers (including buckets, paddling pools etc) which could constitute a drowning hazard are to be emptied immediately after use, or safely covered and/ or stored in a manner which prevents the collection of water which is accessible to children.

7.0 MISCELLANEOUS CONTROLS

7.1 Centre Facilities

Child care centres must comply with the Building Code of Australia (BCA). BCA matters for consideration in the design of child care centres include requirements for toilet, bathroom, kitchen and laundry facilities; access and egress; structural compliance, and disability access.

DEC also has specific design criteria for various centre facilities. In addition to DEC and BCA matters, Council requires all child care centres to be planned and designed to comply with the objectives of this DCP.

Objectives

1. To ensure best practice in the provision of centre facilities.
2. To provide amenity for staff and users of the centre.

Controls

- a. Each new child care centre must provide rooms, not areas, for the following specific uses:
 - i. Office areas for administration of the service; and
 - ii. Staff respite.
- b. The offices are to be located adjacent to the entry area for security purposes and include a minimum floorspace calculated at the rate of 10 m² per person occupying the offices (e.g. director/administrative staff).
- c. The staff room is to include a minimum floorspace of 20 m².
- d. In centres where children under the age of 2 years are proposed to be cared for the following are to be provided:
 - i. A sleeping room with 2.5 m² of floorspace per cot and a maximum of 10 cots per room; and
 - ii. A nappy change area adjacent to the cot room with good vision to the play room to enable good supervision of children, and including suitable storage (within the staff's reach) for nappy changing needs.
- e. All child care centres are to provide laundry facilities. Consideration should be given to the installation of washing lines in the outdoor areas to reduce the need for clothes dryers.
- f. Consideration should be given to the provision of a pram storage area. Informal pram storage can be an occupational health and safety risk.

7.2 Signage

Council controls regarding information and advertising signage vary according to the zones and character of areas within which developments are located.

Objectives

1. To require information/advertising signs and structures to be compatible with the architectural style and size of child care centre buildings, and with built development on adjoining land.
2. To ensure information/advertising signs and structures do not intrude adversely on the character of the streetscape/area within which they are visible.

3. To ensure information/advertising signs and structures do not intrude on vehicular flow in and around the site.

Controls

- a. All advertising and signage must be designed to comply with Part 9.1 Advertising Signs.

7.3 Exterior Lighting

Objectives

1. To ensure the safety and amenity of all persons entering and leaving the child care centre.
2. To control adverse impacts on neighbouring land uses.

Controls

- a. Lighting is to be provided to assist access via the main entrance.
- b. The street number of the building must be provided for identification. It is to be visible from the street day and night, by lighting and/or reflective material, to ensure easy identification for visitors including emergency services.
- c. The locations and design of all proposed external lighting must not have an adverse impact on adjoining properties. Where possible, sensor lighting and energy efficient lighting should be used. The use of spotlights is discouraged.

7.4 Waste Storage and Management

Consideration of waste produced during demolition and construction, and also management of waste through the ongoing use of the facility once developed, is required for all child care centre developments.

For waste as a result of demolition and construction works proposed, see Part 7.2 Waste Minimisation and Management under this DCP.

For ongoing waste management, this section provides information relevant to child care centre developments. Operators of child care centres might choose a number of differing options for waste collection. In residential areas child care centres might choose smaller receptacles taken to the street for collection. Depending on the size of the centre, more bins may be required than for standard residential use. In mixed use developments, there might be communal waste facilities to consider, and opportunities for the use of larger bins.

In all cases consideration of ongoing waste management is critical in the design stage of the project as there is a need upfront to plan for waste storage size and location, access for waste collection, frequency of collection, and for management of delivery to and from collection points. This is to ensure that appropriate size and location of permanent waste storage facilities are accommodated for the scale of development proposed and that they are appropriately integrated in the design. In all cases where food is prepared on site, which is often the case in child care centres, there are particular requirements for waste storage facilities.

Relevant details are to be shown on the plans and addressed in the documentation provided with the development application.

Objectives

1. To provide guidance for child care centres to assist compliance with Council's waste minimisation and management controls (Part 7.2 of this Plan).
2. To assist all developments to contribute to ecological sustainability by encouraging long term avoidance, reuse and recycling of waste.
3. To ensure waste storage areas are provided on-site and where relevant integrated into the design of child care centre developments.
4. To ensure that the waste storage area and facilities have minimal visual impact.
5. To ensure that waste and recycling storage areas are of a size and scale appropriate for the scale and nature of the development, and realistic for the ongoing management of waste at the centre.
6. To ensure the location and design of waste storage facilities, and the on-going management of waste associated with the centre, minimises undue impacts on amenity (e.g. by emission of odour, or causing noise nuisance).

Controls

- a. A waste management plan is to be submitted for all proposed demolition and construction waste in accordance with Part 7.2 Waste Minimisation and Management under this DCP.
- b. Adequate provision must be made for the storage and collection of waste and recycling receptacles in accordance with Part 7.2 of this DCP.

Note: Child care centre developments are to be considered as "commercial and retail premises" for the purposes of location and design of waste management and minimisation of waste relating to the ongoing operation of the centre.
- c. In addition to the requirements of Part 7.2 of this Plan, applications for child care centre development are to address the following considerations:
 - i. whether a special removal service will be required for the removal/disposal of soiled nappies;
 - ii. the frequency of removal of waste to ensure regular removal and avoid undue build up of garbage;
 - iii. opportunities for avoidance, reuse and recycling of waste;
 - iv. convenience for staff of the location of bins, and where relevant, the size and path of travel required transporting bins to access collection points (unobstructed access to usual collection points);
 - v. security of waste from access by children;
 - vi. likely requirements for waste from kitchen facilities; and
 - vii. impact of waste storage and collection on adjoining residential developments in terms of unsightliness, odour and noise.
- d. Where a new child care centre is proposed, the waste and recycling storage area must be designed to be visually and physically integrated into the design of the development, and not stored within the front setback to avoid visual clutter. Waste facilities are not to be sited within the areas required for car parking, vehicular and pedestrian access, landscaping and outdoor play areas.

- e. Where expansion of an existing child care centre is proposed, the waste and recycling storage area is to be designed as far as possible to be visually and physically integrated into the design of the development. Waste facilities are not to be sited within the areas required for car parking, vehicular or pedestrian access or outdoor play areas. In cases where the waste storage area is likely to be visible from the street, design elements such as fencing, landscaping and roof treatments may be used to screen the waste and recycling storage area so as not to detract from the aesthetics of the streetscape.
- f. Where food preparation is carried out on the premises, the waste storage area is to be designed with a cover to exclude rainwater and a floor to be graded and drained to the sewerage system. The area is to be located readily accessible for servicing and suitably screened from public view.
- g. In residential areas, developments are not to be designed to store waste facilities of a size and scale which can only be managed by side arm waste collection vehicles. There is to be no on-site access by waste collection vehicles.
- h. Any proposed composting area is to be in a location that will not impact on the amenity of adjoining premises nor on the amenity of users of the centre.
- i. Where separate collection services are proposed which differ from the regular Council service to surrounding properties, consideration is to be given to frequency and times of collection to minimise impacts of waste vehicle noise on neighbouring properties.



Figure 3.2.12 Examples of waste storage

7.5 Emergency Evacuation

At the time of preparing this DCP, DEC's licensing requirements included a requirement that a written Fire Safety and Evacuation Plan for fire and other emergencies be prepared and kept up-to-date. Given the vulnerability of the users of child care centres, City of Ryde requires that such a plan is developed and a copy submitted prior to the issue of the Occupation Certificate.

Objectives

1. To ensure child care centres have emergency evacuation procedures and plans in place to assist the safe evacuation of occupants in preparation for times of emergency.

Controls

- a. Prior to the issue of an Occupation Certificate for all new child care centres, and for developments resulting in an increase in number of places in existing child care centre, a *Fire Safety and Evacuation Plan* complying with Australian Standard AS3745 is to be prepared by a suitably qualified person and submitted to the Principal Certifying Authority.
- b. The Fire Safety and Evacuation Plan is to address:
 - i. The mobility of children and how this is to be accommodated during an evacuation;
 - ii. The location of a safe congregation area, away from the evacuated building, busy roads and other hazards, and away from evacuation points for use by other occupants/tenants of the same building or of surrounding buildings; and
 - iii. The supervision of children during the evacuation and at the congregation area with regard to the capacity of the child care centre (including child to staff ratios).

8.0 OUT OF SCHOOL HOURS CARE

Out of school hours (OOSH) care (including vacation care) is a service provided for school age children. The service can, under DEC's licensing requirements, be considered in conjunction with centre-based children's services. The service is usually incorporated within existing schools and within long day care centres in a limited form, in purpose built buildings or adaptations of existing buildings.

This Part includes controls for out of school hours care/vacation care where proposed within child care centre developments only. The inclusion of out of school hours care should not result in a reduction in standards and safety of the service, nor an over development of the site.

Objectives

1. To ensure a child care centre development is of a size which is sufficient to accommodate additional services.
2. To require provision of facilities for each use where separate facilities are relevant.
3. To maintain functionality of spaces fit for purpose.

Controls

- a. Where an OOSH service is proposed in a childcare centre, the centre shall provide permanent separation of OOSH facilities from the remaining centre facilities. Operational elements which are to be provided separately for each service include:
 - i. amenities (toilet facilities);
 - ii. indoor play spaces; and
 - iii. outdoor play areas (especially where vacation care is proposed).
- b. Staff facilities should also be provided for staff of the OOSH facility
- c. The operational elements are to be designed in accordance with any relevant controls under this Part (for example minimum area requirements for outdoor and indoor play areas).
- d. Proposed number of staff and child care places are to be provided in accordance with Section 2.2 of this Part.
- e. Parking requirements will be assessed in accordance with Section 5 of this Part.
- f. Child care centres that include out of school hours care are not to result in an overdevelopment of the site.
- g. The total number of places approved for the centre will include places approved for out of school hours care where this is proposed.

SCHEDULES

Schedule 1 - Child Care Centre Development Application Checklist

		Applicant Use Only	Office Use Only
		Submitted	Confirmed
1.	Does the site chosen address the location and site criteria relevant to child care centre developments in City of Ryde? (Refer Section 2)	<input type="checkbox"/>	<input type="checkbox"/>
2.	Have you confirmed that the proposed use is zoned permissible with Council consent for the chosen site?	<input type="checkbox"/>	<input type="checkbox"/>
3.	Have any required environmental hazard risk assessments been conducted? (Refer Section 2.1)	<input type="checkbox"/>	<input type="checkbox"/>
4.	Has a supply and demand market analysis been undertaken?	<input type="checkbox"/>	<input type="checkbox"/>
5.	Has Council's Community Services staff been consulted regarding child care needs in City of Ryde and specific to the locality of the site? Has relevant justification been included with the application? (Refer Section 2.2)	<input type="checkbox"/>	<input type="checkbox"/>
6.	Has the child care centre proposal been designed and drawn by a suitably and qualified experienced designer/architect? (Refer Section 1.9)	<input type="checkbox"/>	<input type="checkbox"/>
7.	Have the relevant requirements of the Department of Education and Communities been considered in the design of this facility? Have you included with the application submission a signed undertaking regarding the design? (Refer Section 1.9)	<input type="checkbox"/>	<input type="checkbox"/>
8.	Have the "Instructions For Completing Development Application" been complied with? (Refer Council's Development Application package)	<input type="checkbox"/>	<input type="checkbox"/>
9.	Has a site analysis been prepared and consulted in the design of the facility? Have you demonstrated in the submission with the application how the site analysis has been used in the design? (Refer Section 2.3)	<input type="checkbox"/>	<input type="checkbox"/>
10.	Have you clearly defined the type of service being proposed, including the ages and total number of children, group sizes, hours of operation, total number of staff etc.? (Refer Section 2.2)	<input type="checkbox"/>	<input type="checkbox"/>
11.	If out of school hours (OOSH) care (and vacation care) are proposed, have you included details of the separate facilities/ services proposed on the plans and in the application? Have you included information about the number of staff and number of children and hours of operation? (Refer Section 8)	<input type="checkbox"/>	<input type="checkbox"/>

12.	Does the design reflect the relevant requirements of the street/locality within which the development is proposed? (Refer Section 3, and other relevant Parts of this DCP)	<input type="checkbox"/>	<input type="checkbox"/>
13.	Has the child care centre development been designed in accordance with crime prevention through environmental design principles? (Section 3.1)	<input type="checkbox"/>	<input type="checkbox"/>
14.	Have the choice of site, development design and layout taken into consideration energy efficiency and environmental sustainability principles? Refer to Section 3 of this Part and Part 7.1 this DCP)	<input type="checkbox"/>	<input type="checkbox"/>
15.	Have all details regarding proposed fencing been included on the plans? Has fencing been designed to satisfy the requirements of Section 3.5 of this Part?	<input type="checkbox"/>	<input type="checkbox"/>
16.	Have steps been taken in the design to minimise noise generation and impacts on the privacy and security of children and staff using the centre? (Refer Section 4)	<input type="checkbox"/>	<input type="checkbox"/>
17.	Has the site layout and design of the building and spaces been designed to minimise noise and privacy impacts on neighbouring properties? (Refer Section 4)	<input type="checkbox"/>	<input type="checkbox"/>
18.	Have you checked the status of the road/s fronting the site with respect to road hierarchy and requirements under this Part? (Refer Sections 2, 5 and Schedule 2, and Council's Traffic unit)	<input type="checkbox"/>	<input type="checkbox"/>
19.	Has the proposal been designed in accordance with the requirements for car parking, traffic and access? (Refer Part 9.3 of this DCP)	<input type="checkbox"/>	<input type="checkbox"/>
20.	Has disabled access into and throughout the centre been provided? (Refer Section 5.5 of this part and Part 9.2 of this DCP)	<input type="checkbox"/>	<input type="checkbox"/>
21.	Have the required traffic and road safety assessments been conducted and report/s included with the application? (Section 5.3)	<input type="checkbox"/>	<input type="checkbox"/>
22.	Has a landscape plan been prepared to reflect requirements of Section 6? Has the landscape been designed and specified by a landscape architect with demonstrated experience in designing external space for child care centres?	<input type="checkbox"/>	<input type="checkbox"/>
23.	Have you demonstrated compliance with shade planning and design principles in accordance with <i>Shade for Child Care Services</i> published by the NSW Cancer Council and NSW Department of Health? (Refer Section 6.2)	<input type="checkbox"/>	<input type="checkbox"/>
24.	Do indoor and outdoor play areas comply with the minimum numeric standards, and exclude encumbrances? (Refer Section 6.2)	<input type="checkbox"/>	<input type="checkbox"/>
25.	Does the design of indoor and outdoor play spaces meet the criteria under Section 6 of this Part?	<input type="checkbox"/>	<input type="checkbox"/>

26.	Have you provided facilities and amenities in accordance with the requirements of Section 7.1 Centre Facilities? Have these been clearly shown on the plans?	<input type="checkbox"/>	<input type="checkbox"/>
27.	Have you considered signage for the premises? If signage is included in the development proposed have you provided all the dimensions and other details necessary for assessment on the plans and in the application? (Refer to Section 7.2 of this part and Part 9.1 of this DCP)	<input type="checkbox"/>	<input type="checkbox"/>
28.	Have you considered lighting of the exterior of the premises? (Refer Section 7.3)	<input type="checkbox"/>	<input type="checkbox"/>
29.	Have you completed a Waste Management Plan for all proposed demolition and construction work? Have you provided details of proposed waste storage and management on the plans and in the application? (Section 7.4 of this Part 7.2 of this DCP)	<input type="checkbox"/>	<input type="checkbox"/>
30.	Have you included refuge area(s) where required in the design of the proposal? (Refer Section 3). Have you thought about emergency evacuation procedures and planning, including location of possible refuge and congregation areas in the design? (Refer Section 7)	<input type="checkbox"/>	<input type="checkbox"/>
31.	If the proposal is for a combined dwelling-house/child care centre, have you included details of the facilities and services required to be separately provided and clearly indicated which use the facilities are provided for? (Refer Section 3)	<input type="checkbox"/>	<input type="checkbox"/>

Schedule 2 - City of Ryde Road Hierarchy Information

Note: From time to time categories of roads may change. Information provided here should be confirmed with Council's Customer Service Centre.

ARTERIAL ROADS (STATE)	COLLECTOR ROADS
<ul style="list-style-type: none"> ▪ Blaxland Road ▪ Church Street ▪ Devlin Street ▪ Epping Road ▪ Lane Cove Road ▪ Marsden Road ▪ Victoria Road 	<ul style="list-style-type: none"> ▪ Abuklea Road ▪ Adelaide Street ▪ Andrew Street ▪ Badajoz Road ▪ Bank Street ▪ Belmore Street ▪ Blenheim Road ▪ Bridge Road ▪ Bowden Street ▪ Buffalo Road ▪ Charles Street ▪ Chatham Road ▪ Constitution Road ▪ Constitution Road West ▪ Coxs Road ▪ Cressy Road ▪ Culloden Road ▪ Herring Road ▪ Hermitage Road ▪ Higginbotham Road ▪ Kent Road ▪ Lovell Road ▪ Marlow Road ▪ Melville Street ▪ Meriton Street ▪ Morrison Road ▪ North Road ▪ Quarry Road ▪ Parkes Street ▪ Pidding RoadS ▪ Pope Street ▪ Railway Road ▪ Ryedale Road ▪ Shaftesbury Road ▪ Smith Street ▪ Station Street ▪ Talavera Road ▪ Tennyson Road ▪ Terry Road ▪ Thompson Street ▪ Tucker Street ▪ Twin Road ▪ Waterloo Road ▪ Watts Road ▪ West Parade ▪ Well Street ▪ Wharf Road ▪ Vimiera Road
SUB ARTERIAL ROADS (REGIONAL)	
<ul style="list-style-type: none"> ▪ Balaclava Road ▪ Brush Road ▪ First Avenue ▪ Goulding Road ▪ Lawson Street ▪ Monash 6677Road ▪ Pittwater Road ▪ Rutledge Street ▪ Ryde Road ▪ Twin Road (between Goulding and Wicks Roads) ▪ Wicks Road 	



City of Ryde
Civic Centre
1 Devlin Street
Ryde NSW 2112

www.ryde.nsw.gov.au

City of Ryde Development Control Plan 2014

Part: 3.3 Dwelling Houses and Dual Occupancy (attached)

Translation

ENGLISH

If you do not understand this document please come to Ryde Civic Centre, 1 Devlin Street, Ryde Monday to Friday 8.30am to 4.30pm or telephone the Telephone and Interpreting Service on 131 450 and ask an interpreter to contact the City of Ryde for you on 9952 8222.

ARABIC

إننا نعتذر عليك فهم محتويات هذه الوثيقة، نرجو للحضور إلى مركز بلدية رايد Ryde Civic Centre على العنوان: 1 Devlin Street, Ryde من الاثنين إلى الجمعة بين الساعة 8.30 صباحاً والساعة 4.30 بعد الظهر أو الاتصال بمكتب خدمات الترجمة على الرقم 131 450 لكي تطلب من أحد المترجمين الاتصال بمجلس مدينة رايد، على الرقم 9952 8222، نيابة عنك.

ARMENIAN

Եթէ այս գրութիւնը չէք հասկնար, խնդրեմ եկէք՝ Բայր Սիվիլ Սենթըր, 1 Տելվին փողոց, Բայր, (Ryde Civic Centre, 1 Devlin Street, Ryde) Երկուշաբթիէն Ուրբաթ կ.ա. ժամը 8.30 – կ.ե. ժամը 4.30, կամ հեռաձայնեցէք Հեռաձայնի եւ Թարգմանութեան Սպասարկութեան՝ 131 450, եւ խնդրեցէք որ թարգմանիչ մը Բայր Քաղաքապետարանին հետ կապ հաստատուէ ձեզի համար, հեռաձայնելով՝ 9952 8222 թիվին:

CHINESE

如果您看不懂本文，請在周一至周五上午 8 時 30 分至下午 4 時 30 分前往 Ryde 市政中心詢問 (Ryde Civic Centre, 地址: 1 Devlin Street, Ryde)。你也可以打電話至電話傳譯服務中心，電話號碼是: 131 450。接通後你可以要求一位傳譯員為你打如下電話和 Ryde 市政廳聯繫，電話是: 9952 8222。

FARSI

اگر این مدرک را نمی فهمید لطفاً از 8.30 صبح تا 4.30 بعد از ظهر دوشنبه تا جمعه به مرکز شهرداری رايد، Ryde Civic Centre, 1 Devlin Street, Ryde مراجعه کنید یا به سرویس مترجم تلفنی، شماره 131 450 تلفن بزنید و از یک مترجم بخواهید که از طرف شما با شهرداری رايد، شماره 9952 8222 تلفن بزند.

ITALIAN

Se non capite il presente documento, siete pregati di rivolgervi al Ryde Civic Centre al n. 1 di Devlin Street, Ryde, dalle 8.30 alle 16.30, dal lunedì al venerdì; oppure potete chiamare il Telephone Translating and Interpreting Service al 131 450 e chiedere all'interprete di contattare a vostro nome il Municipio di Ryde presso il 9952 8222.

KOREAN

이 문서가 무슨 의미인지 모르실 경우에는 1 Devlin Street, Ryde 에 있는 Ryde Civic Centre 로 오시거나 (월 – 금, 오전 8:30 – 오후 4:30), 전화 131 450 번으로 전화 통역 서비스에 연락하셔서 통역사에게 여러분 대신 Ryde 시청에 전화 9952 8222 번으로 연락을 부탁드립니다.

Amend. No.	Date approved	Effective date	Subject of amendment

Table of Contents

1.0	INTRODUCTION	5
1.1	Land to which this Part applies	5
1.2	Development covered by this Part	5
1.3	Purpose of this Part	5
1.4	Objectives of this Part	5
1.5	How to use this Part	5
1.6	Site Analysis	6
2.0	GENERALS CONTROLS	8
2.1	Desired Future Character	8
2.2	Dwelling Houses	9
2.2.1	New Dwelling Houses	9
2.2.2	Alterations and additions to Dwelling Houses	10
2.3	Dual Occupancy (attached)	11
2.4	Subdivision	13
2.5	Public Domain Amenity	14
2.5.1	Streetscape	14
2.5.2	Public Views and Vistas	16
2.5.3	Pedestrian and Vehicle Safety	17
2.6	Site Configuration	18
2.6.1	Deep Soil Areas	18
2.6.2	Topography and Excavation	20
2.7	Floor Space Ratio (FSR)	21
2.8	Height	22
2.8.1	Building Height	22
2.8.2	Ceiling Height	24
2.9	Setbacks	24
2.9.1	Front Setbacks	25
2.9.2	Side Setbacks	26
2.9.3	Rear Setbacks	27
2.10	Outbuildings	30
2.11	Car Parking and Access	30
2.11.1	Car Parking	31
2.11.2	Semi-basement Car Parking	32
2.12	Swimming Pools and Spas	33

Table of Contents

2.13	Landscaping	34
2.14	Dwelling Amenity	36
2.14.1	Daylight and Sunlight Access	36
2.14.2	Visual Privacy	38
2.14.3	Acoustic Privacy	40
2.14.4	View Sharing	40
2.14.5	Cross Ventilation	40
2.15	External Building Elements	41
2.15.1	Roofs	41
2.15.2	Attic Dormer Windows	42
2.16	Fences	43
2.16.1	Front and return Fences and Walls	44
2.16.2	Side and rear Fences and Walls	45
3.0	CHARACTER AREAS	46
3.1	West Ryde Special Development Area	46
3.2	Denistone Character Area	47
3.2.1	Character Statement	48
3.2.2	Retention of Key Characteristics	49

1.0 INTRODUCTION

1.1 Land to which this Part applies

This Part applies to all land within the City of Ryde where dwelling houses and dual occupancies (attached) are permitted. It has specific relevance to low density residential areas.

1.2 Development covered by this Part

This Part applies to all development associated with a dwelling house or a dual occupancy (attached) and includes garages, carports, garden structures, fences, landscaping, swimming pools and outbuildings.

1.3 Purpose of this Part

The purpose of this Part is to guide development associated with detached housing and dual occupancy (attached) development within the City of Ryde.

1.4 Objectives of this Part

The objectives of this Part are:

1. To ensure that the dwellings are well designed and attractive, and provide a high level of amenity;
2. To encourage environmental sustainability in the low density residential areas; and
3. To ensure that dwellings are compatible with, and enhance the streetscape and desired future character of neighbourhoods and character areas.

1.5 How to use this Part

This Part is to be read in conjunction with the general introduction to the DCP and with Part 10 - Dictionary.

This Part has 3 sections:

1. Section 1 Introduction

2. Section 2 General Controls

- Describes the desired character for the low density residential areas in the City of Ryde.
- Explains and states the objectives for key aspects of a development and sets out the controls.

3. Section 3 Character Areas

- Describes the character of special areas and outlines specific controls for these areas. The controls in this section, to the extent of any inconsistencies, take precedence over the controls in Section 2.

The controls apply to new buildings as well as to alterations and additions to existing buildings. The key consideration is the compliance of the resultant building, either a completely new building or a building which has been altered or added to, with the controls.

1.6 Site Analysis

A site analysis is to be submitted with a development application for a new house, dual occupancy (attached) and dwelling additions. Minor work will generally not require a site analysis. The applicant should check with Customer Service who will advise whether or not a site analysis is required. A landscape plan and site survey may also be required to be submitted.

Preparing a site analysis

A site analysis is necessary to ensure that the development is of high quality, sensitive to its environment and positively contributes to its context. A thorough site analysis will ensure that site layout and building design addresses existing and possible future opportunities and constraints of both the site and its surrounds.

An analysis of the site and context is a fundamental stage of the design process, and should support many key design decisions relating to the proposal. The site analysis is to assist in minimising issues relating to noise, overshadowing, safety, access, views and privacy.

A site analysis has two steps. Look at and map the qualities and characteristic of the site and its local context. Then, develop a design that addresses and applies the objectives and controls.

The applicant must demonstrate to Council that the site analysis has been used in preparing the design for the site and for the dwelling. The analysis may then be used to critically assess the success of the proposal in its response to the features of the site and its context.

A site analysis drawing must be based on a survey drawing produced by a qualified surveyor and contain a reference number and date.

Information required in a site analysis may include, but is not limited to, the following:

The site's context:

- Form and character of adjacent and opposite buildings in the streetscape and adjacent sites; architectural character, front fencing, garden styles;
- Neighbouring properties (those both at the sides of the allotment and to the rear); location, height, use;
- Privacy; adjoining private open space, living room windows overlooking the site, location of any facing doors, windows and external living areas;
- Walls built to the site's boundary; location, height, materials;
- Difference in ground levels between the site and adjacent properties;
- Views enjoyed by neighbouring properties;
- Views enjoyed from public areas;
- Solar access enjoyed by neighbouring properties;
- Major trees on adjacent properties, within 9 m of the subject site;
- Street frontage features; poles, trees, kerb crossovers, bus stops, other services;
- Heritage features of the surrounding locality and landscape, (if relevant);
- Public open space, (if relevant);
- Adjoining bushland or environmentally sensitive land;
- Sources of nuisance; flight paths, noisy roads or other significant noise sources, polluting operations (if relevant).

The site and the building(s):

- Site dimensions, site area and north point;
- Location, use, overall height (in storeys and metres) and important parapet/datum lines of adjacent buildings;
- Street trees, identified by size, botanical and common names (if relevant);
- Topography, showing spot levels and contours 0.5 m intervals for the site, adjoining streets and land adjoining the site;
- Views to and from the site;
- Prevailing winds;
- Geotechnical characteristics of the site and suitability of development;
- Pedestrian and vehicular access points; existing and proposed;
- Location of utility services, including electricity poles, stormwater drainage lines, natural drainage, kerb crossings and easements;
- Overland stormwater flow;
- Site drainage.

2.0 GENERALS CONTROLS

2.1 Desired Future Character

The desired future character of dwelling houses refers to the complete building, whether this is the result of the construction of a completely new house, or of an addition or alteration to an existing house.

The desired future character of the low density residential areas of the City of Ryde is one that:

- Has a low scale determined by a maximum 2 storey height limit;
- Has a low density with free-standing dwellings;
- Has a limited number of dual occupancy (attached) buildings, and these buildings look similar to detached dwellings;
- Has dwellings located in a landscape setting which includes a clearly defined front garden and back yard;
- Has buildings which are well designed and have a high degree of amenity;
- Has streetscapes made up of compatible buildings with regard to form, scale, proportions (including wall plate heights) and materials;
- Has streetscapes with dwellings that have a generally consistent front setback and consistent street orientation;
- Has garages and other structures which are not prominent elements in the streetscape and which are compatible with the character of the dwelling;
- Requires minimal disturbance to the natural topography, which means that excavation is to be minimised;
- Has backyards, which are maximised in size;
- Has backyards which form a connected strip of vegetation in neighbourhoods and which include large trees;
- Has allotments with large deep soil areas which allow rainwater to be absorbed and trees to be planted;
- Has mature trees in streets, front gardens and backyards (existing mature trees are retained and new tree plantings encouraged); and
- Has character areas where special features are retained and enhanced.

Objectives

1. To ensure that development is consistent with the desired future character of the low density residential areas.

Controls

- a. Development is to be consistent with the desired future character of the low density residential areas.



Figure 3.3.01 This aerial photograph shows general consistency within this residential area (apart from one development). Allotments have similar characteristics including; front and rear gardens, building alignment and frontage along the street, building size and location on the allotment, mature trees to the rear of the allotment, front fences and the predominance of the buildings front façade to the street. These features are generally consistent within the low density residential areas even where the subdivision pattern varies.

2.2 Dwelling Houses

A dwelling house is a single detached residence on an allotment. Single dwellings can range in height from one storey to two storeys. Dwelling houses should provide accommodation with a high level of amenity as well as enhancing the existing character of the street.

2.2.1 New Dwelling Houses

Objectives

1. To be free-standing in landscaped lots.
2. To be well designed and compatible with the site's context.
3. To be of a low scale.

Controls

- a. Dwelling houses are to have a landscaped setting which includes significant deep soil areas at the front and rear.
- b. Residential dwellings are to be a maximum of two storeys high.

- c. Dwellings are to address the street.
- d. The boundary between public and private space is to be clearly articulated.
- e. Garages and carports are not to be visually prominent features.
- f. Dwellings are to respond appropriately to the site's constraints and opportunities as identified in the site analysis.

2.2.2 Alterations and additions to Dwelling Houses

Alterations and additions to existing houses can increase the building footprint on the site, can increase the dwelling size within the allowable floor space, can change the internal and/or external configuration of the building and the site to improve the layout, and can improve the liveability and practicality of internal spaces and external areas.

Alterations and additions should be integrated with the existing building so that the finished building appears as a consistent whole when viewed from the public domain. 'Pop-top' roof style additions are discouraged.

Objectives

1. To improve the amenity and liveability of dwellings and sites.
2. To ensure that buildings are well designed.

Controls

- a. Alterations and additions visible from the public domain are to be designed so that the finished building appears as an integrated whole. This may require the addition to have a façade and materials consistent with the existing house.
- b. Alterations and additions are to improve the amenity and liveability of dwellings and sites, including practical and useable external spaces.
- c. Alterations and additions are to meet the controls for dwelling houses set out in section 2.2.1.



Figure 3.3.02 An example of a sensitive addition to an existing house.

Note: The compatible building form and materials and the consistent window head heights.



Figure 3.3.03 Examples of unsympathetic additions which would not be acceptable.

2.3 Dual Occupancy (attached)

Dual occupancy (attached) buildings are two attached dwellings in a single building set on a single allotment. Dual occupancy (attached) buildings provide an alternative, more affordable, type of housing within a building form which is similar to the character of low density residential houses, particularly with regard to bulk, scale and built form. It is important that such buildings do not have an adverse impact on the existing streetscape.

Objectives

1. To provide an alternative form of housing that has a low density residential character and is consistent with the appearance of dwelling houses.
2. To protect the existing streetscape by limiting the number of dual occupancy (attached) buildings in a street.
3. To limit an increase in residential densities within low density areas.
4. To ensure that dual occupancy (attached) buildings are similar in appearance to dwelling houses.

Controls

- a. New Dual occupancy (attached) buildings are to meet the controls for new dwelling houses set out in 2.2.1.
- b. Alterations and additions to dual occupancy (attached) buildings are to meet the requirements set out in 2.2.2.

Note: Ryde Local Environmental Plan 2014 Clause 4.1B Minimum lot sizes for dual occupancies and multi dwelling housing requires a minimum road frontage of 20 m and lot size of 580 m² for dual occupancies (attached)

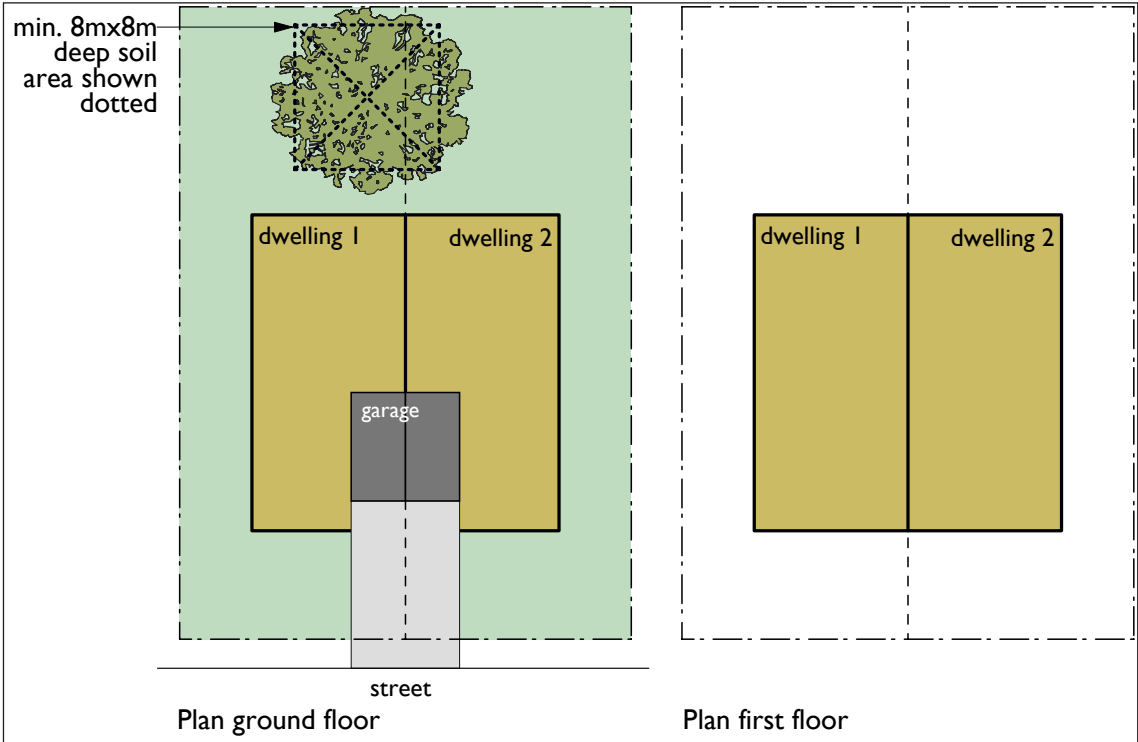


Figure 3.3.04 Illustrative plan of a dual occupancy (attached) with car parking at the front.

Note: The required 8 m x 8 m deep soil area may be located solely in the backyard of one of the dual occupancy (attached) dwellings or may be shared between the backyards. Refer to section 2.6.1 for the 8 m x 8 m deep soil area controls.

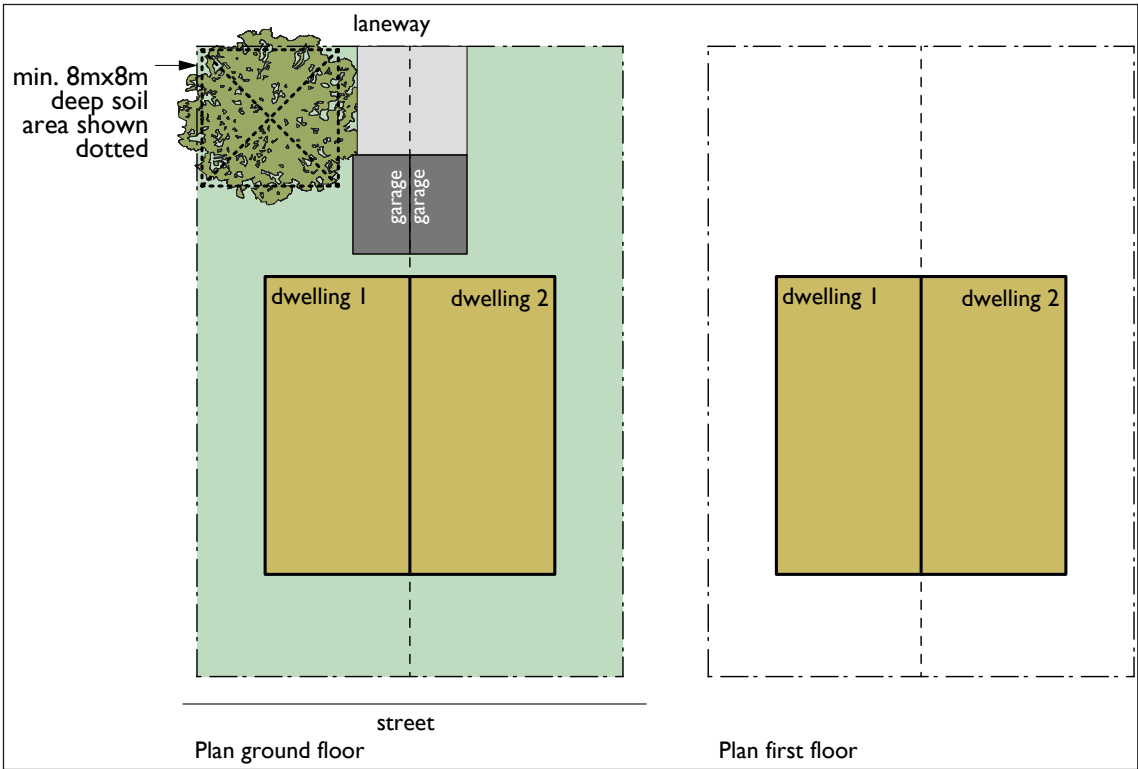


Figure 3.3.05 Illustrative plan of a dual occupancy (attached) with car parking from a rear laneway.

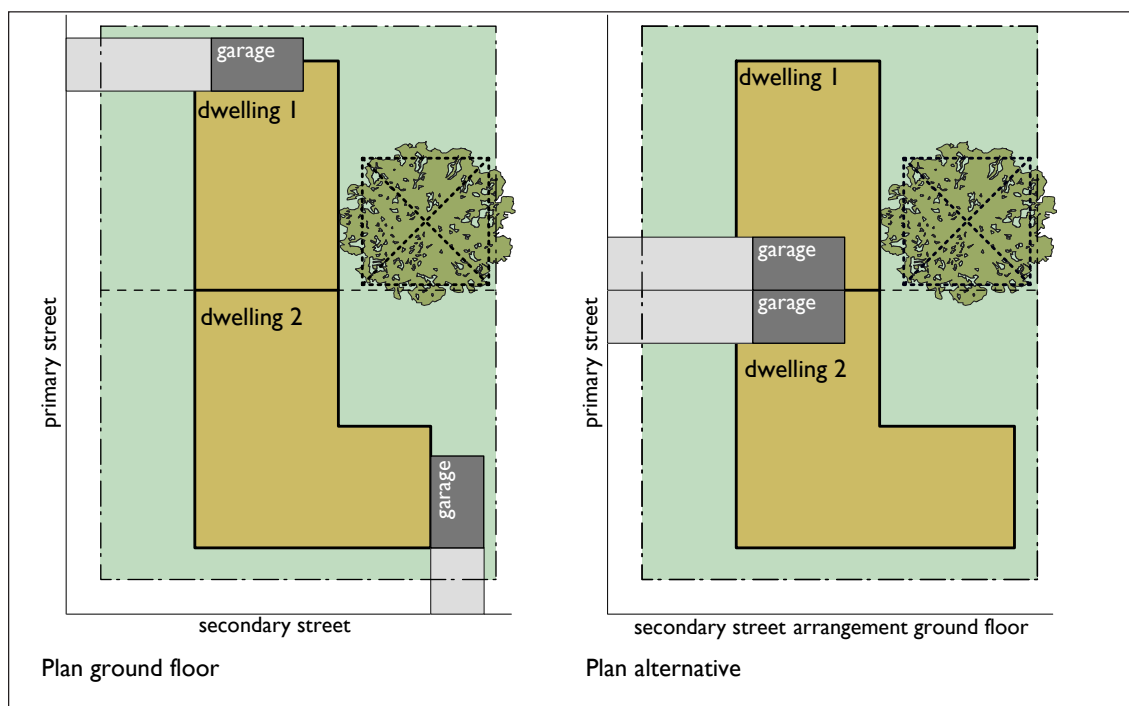


Figure 3.3.06 Alternative arrangements for a dual occupancy (attached) building on a corner allotment. The primary street frontage has the larger setback. Where dual occupancy (attached) dwellings have adjacent garages, the driveway does not need to narrow to a single driveway width.

2.4 Subdivision

Minimum lot sizes apply to subdivision of land under *Ryde Local Environmental Plan 2014* (refer to Clauses 4.1 Minimum subdivision lot size and 4.1C Minimum lot size for battle-axe lots).

Note: For controls relating to the subdivision of **dual-occupancies (attached)** see Clause 4.1A Dual occupancy (attached) strata subdivision of the *Ryde Local Environmental Plan 2014*. For the purposes of Clause 4.1A, the term **dual occupancy (attached)** is considered to include **duplex buildings**.

Duplex building means a single building not more than 2 storeys high that contains 2 dwellings that are attached to one another.

Objectives

1. To retain streetscape, amenity, landscaped areas and private open space in residential zones.
2. To maintain a consistent density of development in low density residential areas.
3. To ensure that lot sizes enable sufficient areas of open space to be provided within each lot so as to enabling the retention and embellishment of green linkage corridors within residential zones.

Controls

- a. Where subdivision of land is proposed, each lot (other than a hatchet shaped lot) must have:
 - i. an area of not less than 580 m²;
 - ii. frontage to a road of not less than 10 m; and
 - iii. a width of not less than 15 m at a distance of 7.5 m from the frontage of the lot.

These requirements are illustrated in Figure 3.3.07.

- b. Each hatchet shaped lot must have:
- an area of not less than 740 m² (not including the access corridor and any part of the lot that is intended for access to other lots);
 - a frontage to a road of not less than 3 m; and
 - an access corridor not less than 3 m wide.

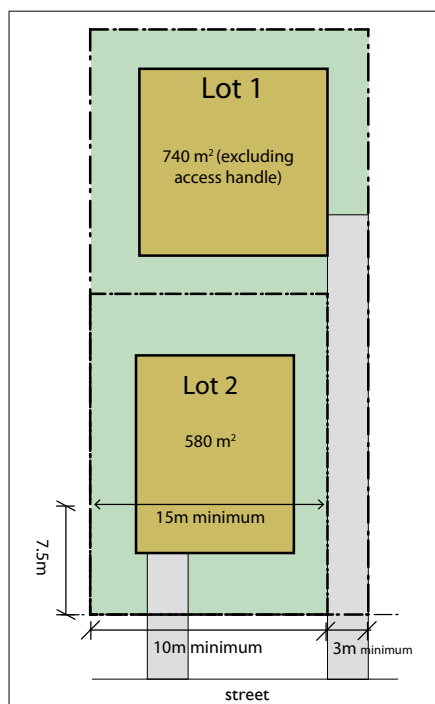


Figure 3.3.07 Minimum standards for land subdivision

2.5 Public Domain Amenity

Public domain relates to those aspects of the urban environment which are either owned publicly or accessible to and enjoyed by the public.

In residential areas this includes:

- streetscapes (which encompass elements such as roadways, verges, footpaths, nature strips, street tree plantings and laneways); and
- public views and vistas.

New developments can help to enhance amenity within the public domain by recognising and respecting the existing qualities and unique characteristics of the place. In locations where the character is either not well established or needs improvement, new development can contribute to strengthening and creating character through appropriate landscaping, setbacks, selection of materials and building design.

2.5.1 Streetscape

Streetscape controls seek to ensure that dwellings and gardens relate well to each other, and to the landscape setting along the street. The primary elements that create streetscape character are:

- the relationship of street levels to the topography of the land on either side of the street;
- the width, layout, landscaping and materials of the street including street trees and footpaths;

- buildings and front gardens;
- building setbacks, building height; and
- relationship of buildings to the topography and to other buildings in the streetscape.

Aspects of development that help to create quality streetscapes, if well considered and designed, include:

- the design of the building, especially facades visible from the street;
- front and side boundary landscaping including boundary fences and walls;
- access and driveway design; widths, materials and location; and
- the building's size and shape, front elevation and roof form as seen from the street.

Objectives

1. To ensure the existing landform and landscape setting of the street is retained and reinforced by new dwellings.
2. To ensure new development is compatible with the positive characteristics of the existing streetscape and the desired future character of the low density residential areas.
3. To encourage the design of well proportioned elevations.
4. To ensure streets provide a high level of pedestrian amenity, access and safety.
5. To ensure garages are not dominant elements in the streetscape.
6. To ensure that the orientation of dwellings, garages and carports is consistent with the existing streetscape.

Controls

- a. Site design, building setbacks and the location and height of level changes are to respect the existing topographic setting of the street and the relationship of existing buildings in the street to the topography.
- b. The design of front gardens is to complement and enhance streetscape character by:
 - i. providing soft landscaping; lawn, trees and shrubs, between the street boundary and the dwelling;
 - ii. reflecting the character and height of fences and walls along the street, or the absence of front fences;
 - iii. reflecting the character and layout of established front gardens of other allotments in the street, particularly the older or original front garden landscapes;
 - iv. retaining, protecting or replacing existing vegetation and mature trees; and
 - v. ensuring no damage occurs to trees on neighbouring properties or on the street.
- c. Dwelling design is to enhance the safety and amenity of the streetscape by:
 - i. having front doors and windows facing the street, or if the front entry door is located at the side of the dwelling, its location is to be clearly apparent from the street; and
 - ii. having roof form and detailing that complements the proportions, massing and elevation composition of other buildings in the street.
- d. Carports and garages visible from the public street are to:
 - i. be compatible with the building design; and
 - ii. be set back behind the dwelling's front elevation.
- e. Driveways and hardstand areas are to be minimised so as to maximise deep soil areas and the opportunity for soft landscaping in the front garden, and to reduce the visual impact of driveways and hard surfaces from the street.

- f. Dwellings, garages and carports are to be orientated to match the prevailing orientation of such buildings in the streetscape.
- g. Facades visible from the public domain are to be well designed by:
 - i. having important elements such as front doors and building entry areas prominent in the building facade and clearly identifiable from the street;
 - ii. co-ordinating and integrating building services, such as drainage pipes, with overall facade design;
 - iii. integrating the design of architectural features, including stairs and ramps, and garage/carport entries with the overall facade design, and by locating car parking structures on secondary streets where possible;
 - iv. ensuring corner buildings have attractive facades which address both street frontages, and include the careful placement and sizing of windows;
 - v. ensuring entrance porticos are single storey;
 - vi. the head height of doors and windows being preferably at a consistent level; and
 - vii. ensuring street facades are articulated to provide visual interest.

2.5.2 Public Views and Vistas

Public views and vistas are enjoyed from public places such as foreshores, parks and along streets. Views are generally contained by buildings in the streetscape, such as view corridors down a residential street or across properties.

Where there is a view to the Parramatta or Lane Cove Rivers from the street down the sides of a lot, this view is to be retained through the use of appropriate side setbacks, open front fences and the careful placement of garages, outbuildings and landscape elements such as plantings.

Objectives

1. To ensure public view corridors between buildings are retained and created where the view is from a public place to the water.

Controls

- a. Where there is an existing or potential view to the water from the street, a view corridor is to be provided along at least one of the side boundaries. Fences in the view corridor, including the front boundary fence, are to be 70% open at least where the fences are higher than 900 mm. View corridors in battleaxe allotments are to have the view corridor co-ordinated with that of the front allotment or a view corridor along the driveway access handle. Landscape elements such as ancillary structures, plantings, are not to restrict views.
- b. Garages, carports and outbuildings are not to be located within the view corridor if they will obstruct views.

Note: Figure 3.3.08 illustrates the above controls.

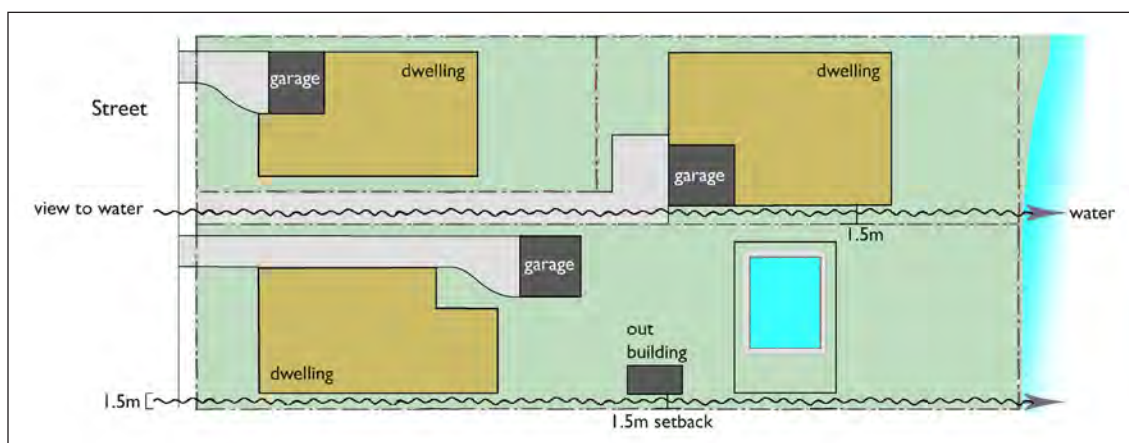


Figure 3.3.08 Views from public places to the water are to be provided between buildings along side boundaries. Fencing, landscaping elements, garages and outbuildings are not to obstruct the view.

2.5.3 Pedestrian and Vehicle Safety

Vehicles entering the street from private driveways need adequate visibility of the adjacent footpath in order to ensure pedestrian safety.

Objectives

1. To provide for pedestrian safety through adequate sight lines.

Controls

- a. Car parking structures are to be located to accommodate sightlines to the footpath and road.
- b. Fences which have the potential to block sight lines from the driveway to the footpath and road are to be splayed as shown in Figure 3.3.09.
- c. Refer to the relevant Australian Standards when designing driveways.

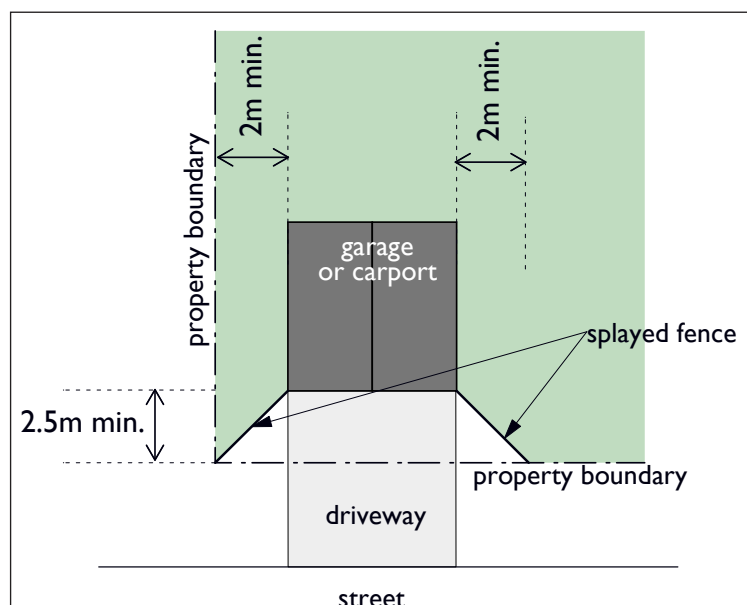


Figure 3.3.09

Illustrative plan showing the location of car parking structures and how fences are to be splayed to provide adequate sight lines in situations where fences would otherwise obstruct views.

2.6 Site Configuration

Site configuration is concerned with the location and layout of both structures and open spaces on a site. Good design relates to the siting and design of buildings and open spaces, and to the existing characteristics of the site particularly in terms of existing mature vegetation and topography. This is to ensure that mature trees are retained, that structures work with the existing site levels and that excessive excavation is avoided.

2.6.1 Deep Soil Areas

Deep soil areas are areas of natural ground which have a relatively natural soil profile. They are areas free of structures (including underground structures) and hard surfaces. They are suitable for the growth of vegetation, particularly mature trees, and importantly, they allow water to be absorbed by the soil.

The deep soil areas include 2 special areas, the front garden, and an area with the minimum dimensions of 8 m x 8 m in the back yard which is sufficiently large to support at least one mature tree.

Deep soil areas have significant environmental benefits including:

- the promotion of the healthy growth of large trees;
- the protection of existing mature trees and vegetation;
- the retention of the natural hydrology of the site;
- the improvement of the amenity of developments by providing areas for landscaping which can enhance microclimatic conditions; and
- contributing to the retention and extension of vegetation corridors in the locality to enhance flora and fauna corridors.

Neighbourhood Plan



Block Plan

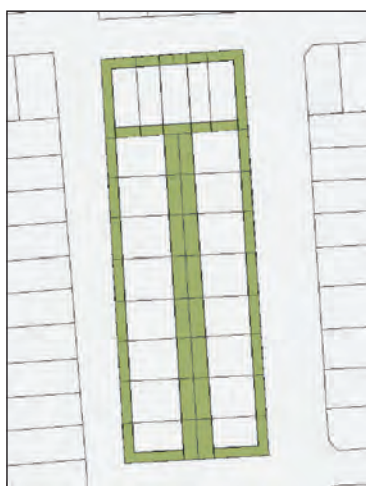


Figure 3.3.10 At a suburban scale, deep soil areas provide connected flora and fauna corridors. At the block scale, adjoining green space is consolidated to the rear and front of allotments.

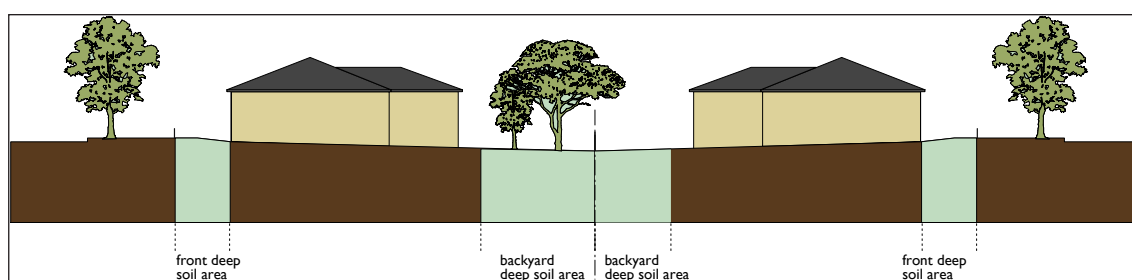


Figure 3.3.11 Deep soil areas are free of structures. They fit neatly around the building without obstruction of either above or below ground built elements such as outbuildings, driveways, impervious surfaces, basement garages, detention tanks or paved terraces.



Figure 3.3.12 Existing mature trees are generally located to the rear of allotments. The backyard deep soil area makes it possible to retain mature trees and to reflect the existing pattern of planting within the area.

Objectives

1. To ensure that land retains its ability to absorb rain water so as to reduce stormwater runoff and to increase the moisture level of the soil for the use of trees and other vegetation.
2. To ensure that each building allotment has a minimum deep soil area.
3. To retain and enhance vegetation corridors.
4. To provide space for mature tree growth and other vegetation.
5. To generally retain existing mature trees and vegetation.
6. To enable movement of fauna along vegetation corridors.

Controls

- a. Sites are to have a deep soil area that is at least 35% of the area of the allotment.
- b. The deep soil area must include:
 - i. an area with minimum dimensions of 8 m x 8 m in the back yard; and
 - ii. a front garden area which is to be completely permeable with the exception of the driveway, pedestrian path and garden walls.
- c. Allotments with dual occupancies need only have one 8 m x 8 m deep soil area for the allotment. The area does not need to be shared equally with each allotment.
- d. Deep soil areas are to have soft landscaping.
- e. Deep soil areas are to be 100% permeable to water and cannot be covered by structures, paving or the like, or have below surface structures such as stormwater detention elements.

2.6.2 Topography and Excavation

The City of Ryde has a distinctive topography which provides the underlying framework for the character of its suburbs. The retention of this natural topography means that buildings can retain a consistent relationship to the topography within a streetscape. This relationship provides an important visual link between buildings. Deep excavations could not only disrupt the visual consistency of the streetscape but could disrupt the pattern of subsoil water flow and soil stability which may adversely affect neighbouring properties and the natural environment. The area of the site with natural ground levels should be maximised. The areas of excavation and fill are generally to be for the purpose of creating useable and practical outdoor recreation spaces where the existing ground level is not suitable and should not result in an unreasonable loss of the privacy or security of neighbours.

The overland flow of stormwater should not be affected by excavation and fill. In the case where an allotment experiences overland flow, Council's development engineers are to be consulted prior to the preparation of plans.

Objectives

1. To retain natural ground levels and existing landform.
2. To create consistency along streetscapes.
3. To minimise the extent of excavation and fill.
4. To ensure that excavation and fill does not result in an unreasonable loss of privacy or security for neighbours.

Controls

- a. Building form and siting are to relate to the original topography of the land and of the streetscape.
- b. The area under the dwelling footprint may be excavated or filled so long as:
 - i. the topography of the site requires cut and/or fill in order to reasonably accommodate a dwelling;
 - ii. the depth of excavation is limited to 1.2 m maximum; and
 - iii. the maximum height of fill is 900 mm.

- c. Areas outside the dwelling footprint may be excavated and/or filled so long as:
 - i. the maximum height of retaining walls is no greater than 900 mm;
 - ii. the depth of excavation is not more than 900 mm;
 - iii. the height of fill is not more than 500 mm;
 - iv. the excavated and filled areas do not have an adverse impact on the streetscape;
 - v. the filled areas do not have an adverse impact on the privacy of neighbours;
 - vi. the area between the adjacent side wall of the house and the side boundary is not filled; and
 - vii. the filled areas are not adjacent to side or rear boundaries.
- d. Fill is not allowed in areas of overland flow. Refer to Part 8.2 Stormwater Management under this DCP.
- e. Generally the existing topography is to be retained. The areas of excavation and fill are to be minimised.

Design Guidelines

- On longitudinally sloping sites buildings will generally need to step down the site in order to remain under the height and storey limit and to avoid excessive cut and fill.
- There are a number of design solutions which can be used for sloping sites including:
 - a series of small terraces or stepped retaining walls;
 - incorporating a retaining wall into the building elevation; and
 - incorporating a retaining wall into the boundary fence along the street front.

2.7 Floor Space Ratio (FSR)

Floor space ratio (FSR) controls help determine the bulk and scale of new development. FSR is not to be the sole determinant of future built form; it needs to be linked with all other building envelope controls as well as streetscape and desired future character controls to achieve the desired building form.

The FSR is an absolute maximum. This maximum may not be wholly achievable on all sites due to other design considerations, including streetscape, building bulk and scale and neighbours' amenity. The maximum FSR will generally only be achieved in a 2 storey dwelling.

Objectives

1. To ensure bulk and scale are compatible with the desired future character of the low density residential areas and of dwelling houses.
2. To define the allowable development density for sites.

Controls

- a. The floor space ratio must not be greater than 0.5:1 as per *Ryde Local Environmental Plan 2014* Floor Space Ratio Map.
- b. A floor area of 36 m² may be excluded from the gross floor area when this area accommodates 2 car parking spaces. An area of 18 m² may be excluded when the area accommodates 1 car parking space.

Calculation Rules

- FSR is the ratio of the area of the site to the gross floor area.
- FSR is defined in Clause 4.5 Calculation of floor space ratio and site area of *Ryde Local Environmental Plan 2014*.
- Outbuildings are to be included in the gross floor area (refer definition under *Ryde LEP 2014*).

2.8 Height

2.8.1 Building Height

Height is an important control to ensure that future development responds to the desired 2 storey maximum scale, and to character of the street and to the local area, and to ensure that good daylight access is provided to existing and proposed dwellings. The allowable heights ensure new development is consistent with existing buildings in the street and locality. Height controls on individual sites may be further refined by consideration of the streetscape, solar access, roof design, residential amenity, setting and topography of the particular allotment.

Objectives

- To ensure that the height of development is consistent with the desired future character of the low density residential areas and is compatible with the streetscape.
- To ensure that the height of dwellings does not exceed 2 storeys.

Controls

- Building heights are to be in accordance with the Building Height Table below.

Building Height Table

	DWELLING HOUSE AND DUAL OCCUPANCY (ATTACHED) BUILDING	OUTBUILDINGS, INCLUDING GARAGES AND CARPORTS
Maximum building height	9.5 m	4.5 m
Maximum wall plate height	7.5 m or 8 m for a roof which has a continuous parapet	2.8 m
Maximum number of storeys	2, but a maximum of 1 floor level of the building including car parking level can be located above a garage which is attached to a dwelling, whether a semi-basement garage or a garage at grade.	1

Calculation Rules

Building height is defined under *Ryde LEP 2014*. It is the vertical distance between existing ground level and the top most part of the building. The measurement of building height includes all roofs, but excludes communications devices, antennae, satellite dishes, masts, flagpoles, chimneys, flues or the like. The height as specified is the maximum allowable.

Wall plate height is the vertical distance between the finished ground level at any point and the point where the adjacent wall joins the roof, or to the underside of the eaves, or to the top of a

parapet. The exception is where the existing ground level has been lowered through excavation. In this case, walls visible from the public domain are to have their wall plate height measured from the finished ground level. A storey is defined in *Ryde Local Environmental Plan 2014*.

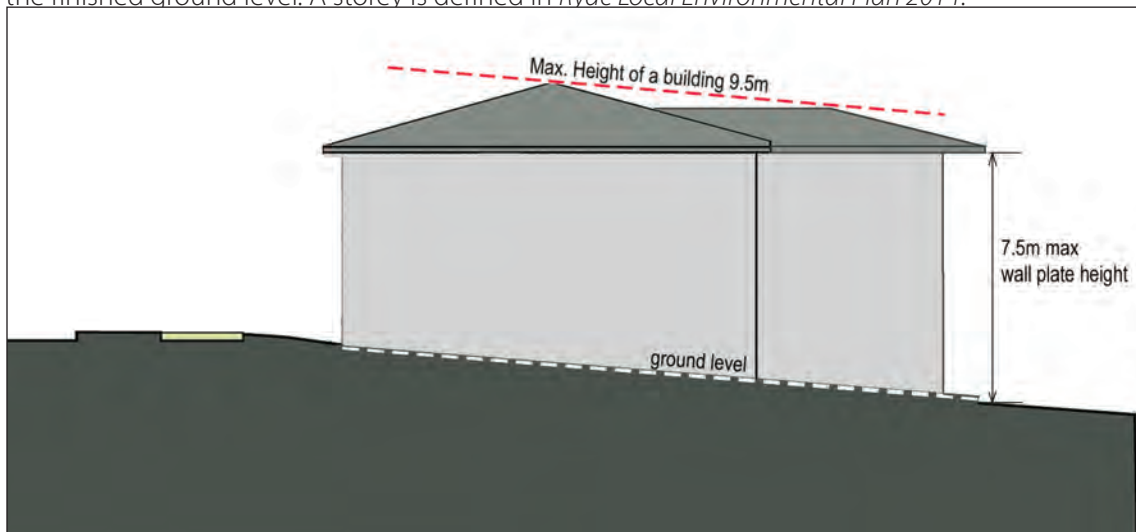


Figure 3.3.13 The building height is measured from the existing ground level to the topmost part of the building. The wall plate height is measured to the underside of the eaves. In this diagram the existing ground level and the finished ground level are the same.

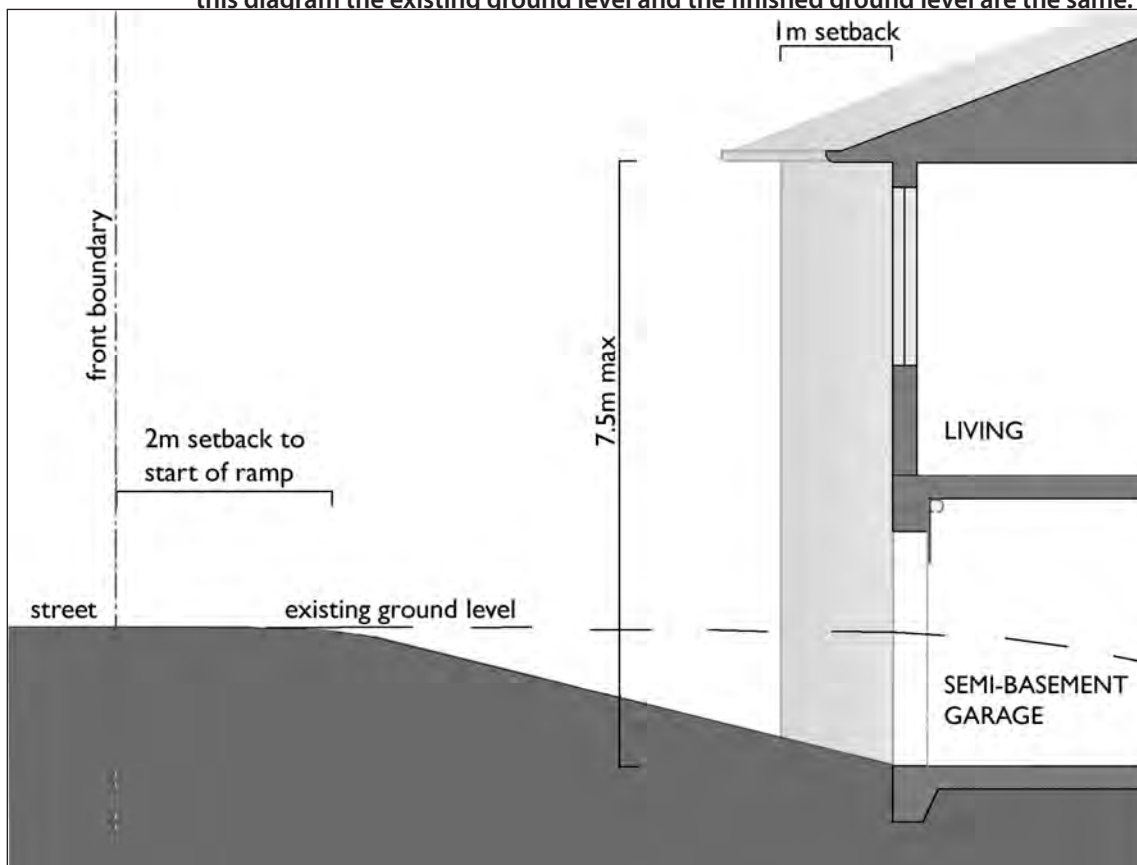


Figure 3.3.14 Only a single storey may be built above a garage. Basement car parking is included as a storey if it extends more than 1.2 m above ground level.

2.8.2 Ceiling Height

Minimum ceiling heights provide for residential amenity.

Objectives

- 1. To provide amenity for dwellings.

Controls

- a. The minimum ceiling height for habitable rooms is to be 2.4 m.

Calculation Rules

Ceiling heights are measured from finished floor level to the finished ceiling level.

2.9 Setbacks

A setback is the distance between the outside face of a building wall and the adjacent allotment boundary. Setbacks are important as they determine the building's location in relation to the allotment boundaries, the street, and the neighbouring buildings. Setbacks allow space for landscaping, light and air, access to rear gardens, and provide for privacy between dwellings.

The setbacks aim to maximise the area of the backyard, while providing for a front garden which can have trees and other plantings. The front setback has also been sized to accommodate the off-street parking of a car in the driveway.

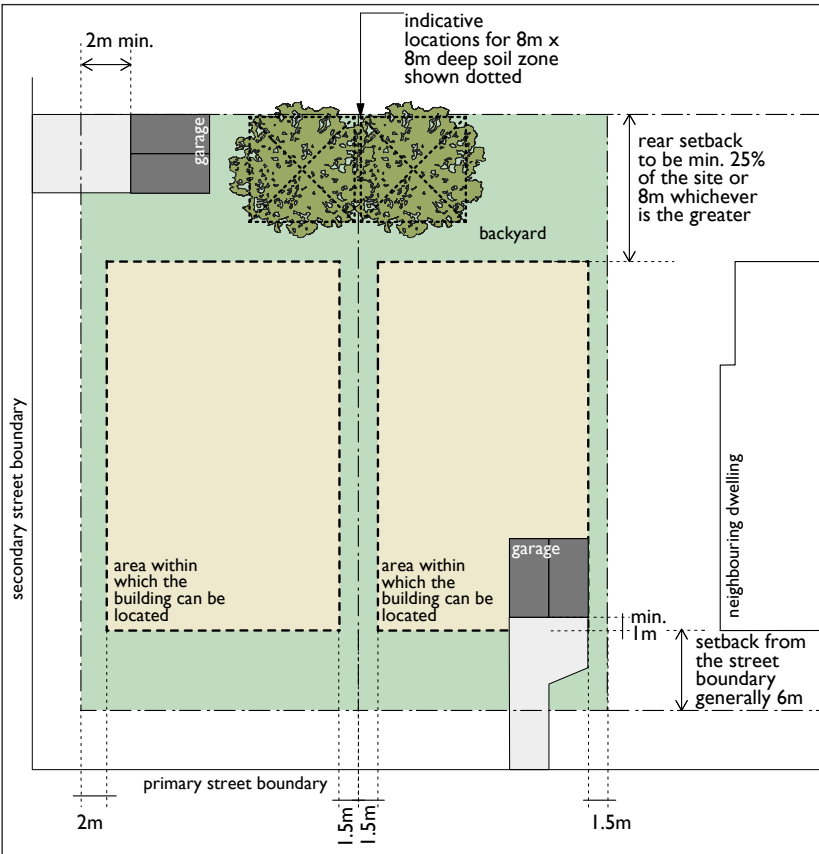


Figure 3.3.15
Diagram showing general setback requirements.

The buildable area is partly determined by the building setbacks. The side setbacks shown are those for a two storey building. The setback for garages and carports also needs to have regard to pedestrian and vehicle safety. Refer to Section 2.5.3.

2.9.1 Front Setbacks

Building orientation describes the direction the building faces relative to the front and side boundaries. Dwellings, garages and carports should be orientated to match the prevailing orientation of buildings in the street. The setback from the front boundary establishes the location of the building's front façade. Front setbacks help unify streetscapes by providing a consistent streetfront alignment for buildings, and by creating a transition between the public space of the street and the private space of the dwelling. Front setbacks can also be used to enhance the setting for the building as they provide deep soil areas for a front garden. The general 6 m front setback provides sufficient space at the front to park a car in the driveway.

Objectives

1. To create a transition between public and private space.
2. To provide consistent building setbacks along streets.
3. To provide for a front garden.
4. To ensure garages and carports are not prominent elements in the streetscape.

Controls

- a. Dwellings are generally to be set back 6 m from the street front boundary.
- b. On corner sites, the setback along the secondary street (the street to which the house has its secondary frontage) is to be a minimum of 2 m.
- c. Garages and carports, including semi-basement garages and attached garages, are to be set back a minimum of 1 m from the dwelling's front façade.
- d. The front setback is to be free of structures, and ancillary elements such as rainwater tanks and air conditioning units. The exception is car parking structures which comply with section 2.11.
- e. Attached garages, including semi-basement garages, on secondary street frontages do not need to be set back 1 m from the adjacent façade but are not to protrude forward of the adjacent facade. The exception is garages located on battleaxe (hatchet shaped) allotments. These garages do not need to be setback.
- f. The outside face of a wall built above a garage which faces the street is to align with the outside face of the garage wall below.

Calculation Rules

- Setbacks are measured from the allotment boundary to the outside wall, or the outside face of any deck balcony or the like, or to the supporting posts of a carport or verandah.



Figure 3.3.16 Front setbacks are to be compatible with the existing streetscape.

2.9.2 Side Setbacks

Side setbacks provide separation between dwellings for fire safety, privacy, light and air. They also provide access to the back garden for pedestrians or for a side driveway to a rear garage. Minimising side boundary setbacks allows the building to have a wider street and rear building frontage. However, consideration should be given to increasing side setbacks where the side boundary is to the north of the dwelling, so that greater sunlight access can be provided to north facing living rooms.

Objectives

1. To enable building siting to be compatible with the streetscape.
2. To provide car access.
3. To provide access to the rear of the allotment.

Controls

- a. The outside walls of a one storey dwelling are to be set back from the side boundaries not less than 900 mm.
- b. The outside walls of a two storey dwelling are to be set back from side boundaries not less than 1.5 m.
- c. The outside walls of a second storey addition to a single storey dwelling are to be set back not less than 1.5 m from the side boundaries.
- d. Allotments which are wider than they are long, are to have one side setback a minimum of 20% of the width of the allotment or 8 m, whichever is the greater.

Calculation Rules

- Side setbacks are measured from the allotment's side boundary to the outside edge of the building elevation. Setbacks are measured at 90 degrees to the allotment boundary and are measured to the outer most edge of the building elevation including balconies, terraces and porches.
- On allotments which are wider than they are long, and are of an irregular shape, the large side setback can be measured at the centre line of the allotment. In these cases, the side setback must be able to accommodate a deep soil area with the minimum dimensions of 8 m x 8 m.

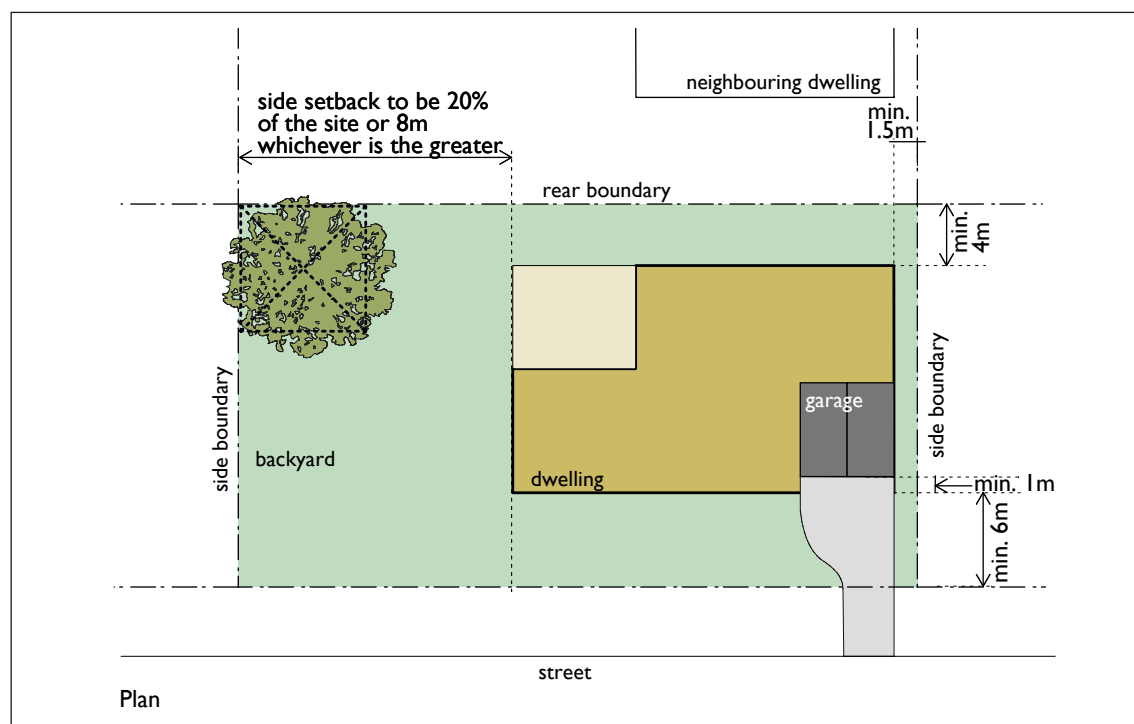


Figure 3.3.17 On allotments which are wider than they are long so that the minimum rear setback cannot be achieved, a large side setback is to be provided on one side of the allotment.

2.9.3 Rear Setbacks

Rear setbacks provide open space to the rear of the allotment for mature tree growth and water percolation areas, as well as private areas for recreation and relaxation. Rear setbacks allow separation distances between neighbouring dwellings so as to provide for the visual and acoustic privacy of dwellings.

Objectives

1. To provide an area for private outdoor recreation and relaxation.
2. To allow space for vegetation, mature trees and deep soil zones.
3. To separate dwellings to achieve privacy.
4. To enable contiguous vegetation corridors across blocks.

Controls

- The rear of the dwelling is to be set back from the rear boundary a minimum distance of 25% of the length of the site or 8 m, whichever is the greater.
- Allotments which are wider than they are long, and so cannot achieve the minimum rear setback requirement, are to have a minimum rear setback of 4 m.
- Dwellings on battle-axe (hatchet shaped) allotments are to be setback from the rear boundary of the front allotment, a minimum of 8 m. A single storey garage or outbuilding may be located within this setback.

Calculation Rules

- Rear setbacks are measured from the rear boundary to the outside edge of the rear wall including any articulation to the building, such as balconies, terraces and decks.
- Setbacks are measured at 90 degrees to the allotment boundary.
- The rear setback must be able to accommodate a deep soil area with the minimum dimensions of 8 m x 8 m.

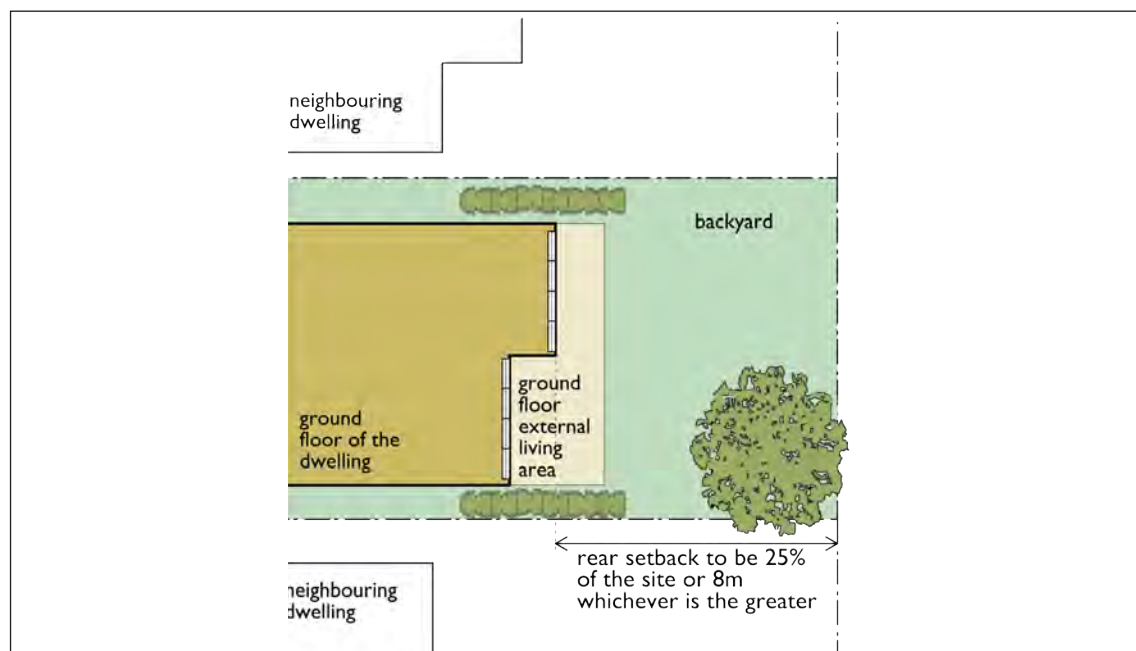


Figure 3.3.18 Rear setbacks are measured to the building's rear wall. deep soil areas, including an area with minimum dimensions of 8 m x 8 m are included in the rear setback. Unroofed ground level paved areas may extend into the rear setback area.

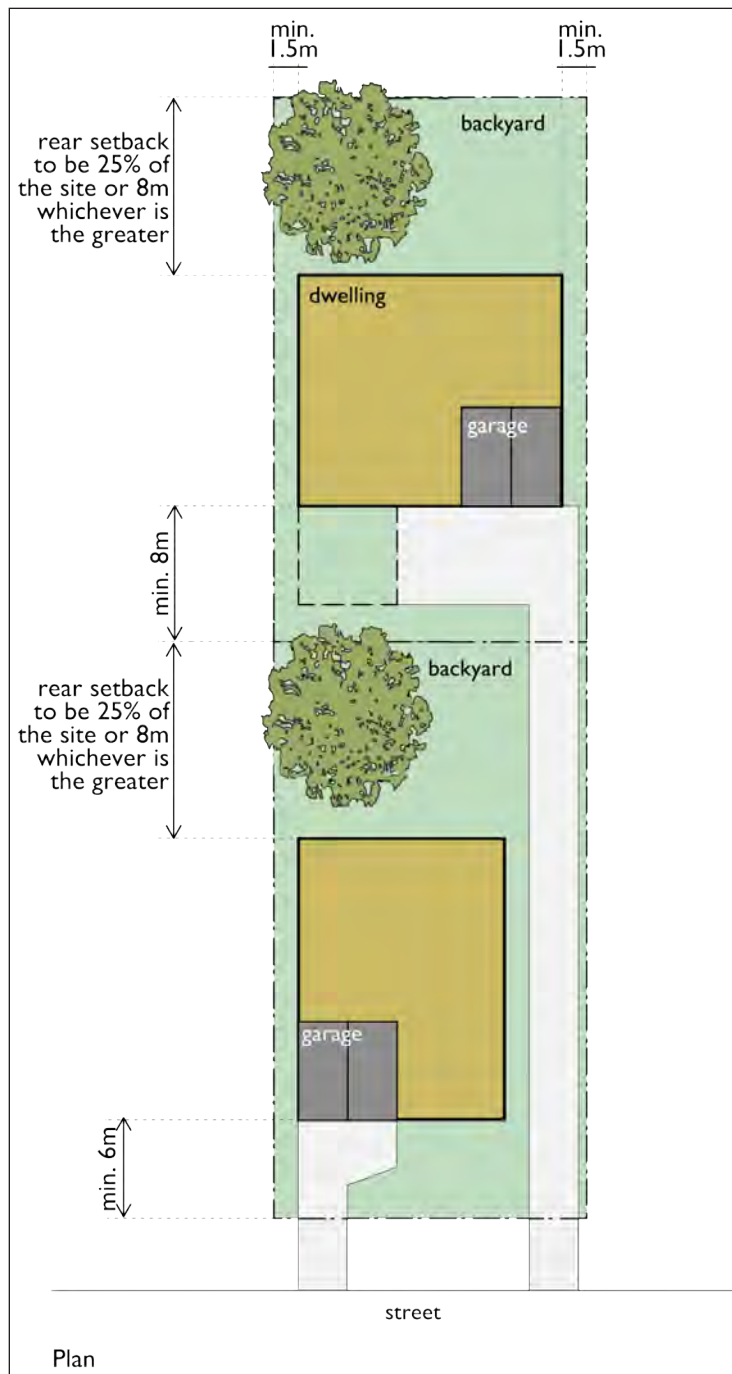


Figure 3.3.19 Setbacks on battle-axe (hatchet shaped) allotments. The 'front' setback of a battleaxe allotment is to include a hardpaved area for car turning.

Note: Side setbacks are those for two storey dwellings.

2.10 Outbuildings

Outbuildings are buildings that are ancillary to, and detached from, the dwelling. They should be small scale buildings which are visually compatible both with the design of the dwelling they are associated with, and with neighbouring buildings. Examples of outbuildings include boatsheds, large cubby houses, workshops, storage sheds and covered pergolas.

Objectives

1. To provide for uses which are complementary and supplementary to the dwelling.
2. To complement the design and materials of the dwelling with which they are associated.
3. To have limited visibility from the street and other public spaces.
4. To ensure that the amenity of the dwelling or neighbouring dwellings is not adversely affected by outbuildings.
5. To ensure that outbuildings are of a small scale.

Controls

- a. The use of outbuildings is to be ancillary to the residential use of the dwelling.
- b. The total area for all outbuildings is not to exceed 20 m².
- c. Outbuildings cannot be erected between the street alignment and the front building alignment of the dwelling.
- d. The design and materials of outbuildings are to complement the existing dwelling.
- e. An outbuilding may contain a toilet, shower and hand basin but cannot contain a bar, sink or any other kitchen facilities.
- f. An outbuilding may be located on the side or rear boundary so long as the external wall is maintenance free and there is no eaves overhang.
- g. If an outbuilding is built closer than 900 mm from the side boundary a concrete dish drain is to be constructed between the external wall and the adjacent boundary.
- h. The windows of outbuildings are to be at least 900 mm away from a boundary.
- i. Outbuildings are not to adversely affect the privacy and/or amenity of neighbours.
- j. Outbuildings are not to be located in view corridors to the water.
- k. An outbuilding is not to be used as a dwelling.

2.11 Car Parking and Access

The design of car parking is to be integrated with the overall site design in order to minimise the visual impacts of car parking structures. Wide expanses of garages and carports do not contribute in a positive way to the streetscape. Garages and carports are not to be prominent features either on the individual lot or within the streetscape. Likewise, driveway widths need to be minimised so that they do not dominate the front garden area. Garages should not be located below a 2 storey section of a building as the building would appear to be 3 storeys high.

Objectives

1. To provide for off-street parking.
2. To ensure car parking structures and garage doors are not prominent features with regard to either the individual lot or the streetscape.
3. To ensure that car parking structures are consistent with the design of the dwelling.

2.11.1 Car Parking

Controls

- a. Provision must be made for off street parking in accordance with Part 9.3 Parking Controls in this DCP.

Note: Part 9.3 requires as follows:

- dwelling house = up to 2 spaces/dwelling
- dual occupancy (attached) = 1 space/dwelling

- b. Parking spaces can be either in an enclosed structure (a surface or semi-basement garage) or a roofed open structure (a carport).
- c. Garages are to be located at least 1 m behind the front building elevation.
- d. A garage or carport may be located in front of an existing dwelling if:
 - i. there is no other suitable position on the allotment;
 - ii. there is no vehicular access to the rear or side of the allotment; and
 - iii. it is preferred that a garage or carport in front of a dwelling be a single car width.
- e. Garage doors are to be solid. Open doors such as expanded mesh doors are not acceptable.
- f. Garage and carport entries are preferably to be located off laneways and secondary street frontages where this is possible.
- g. The width of driveways should be minimised. Driveways should be a single car width except where they need to widen to provide access to a double garage.
- h. Driveways cannot be roofed.
- i. Garages and carports facing the public street are to have a maximum width of 6 m or 50% of the frontage, whichever is less.
- j. The total width of garage doors visible from a public place, such as the street, is not to exceed 5.7 m.
- k. Driveways for battle-axe allotments must be designed so that vehicles can enter and leave the site in a forward direction.
- l. Garage doors are not to be recessed more than 300 mm behind the outside face of the building element immediately above.
- m. Garage windows are to be at least 900 mm away from the boundary.
- n. Free standing garages are to have a maximum gross floor area of 36 m².
- o. The design and materials of garages and carports are to complement the dwelling.
- p. Garages, whether free standing or incorporated into the house, are to be set back at least 1 m from the building's front façade.
- q. Carports must not be enclosed.

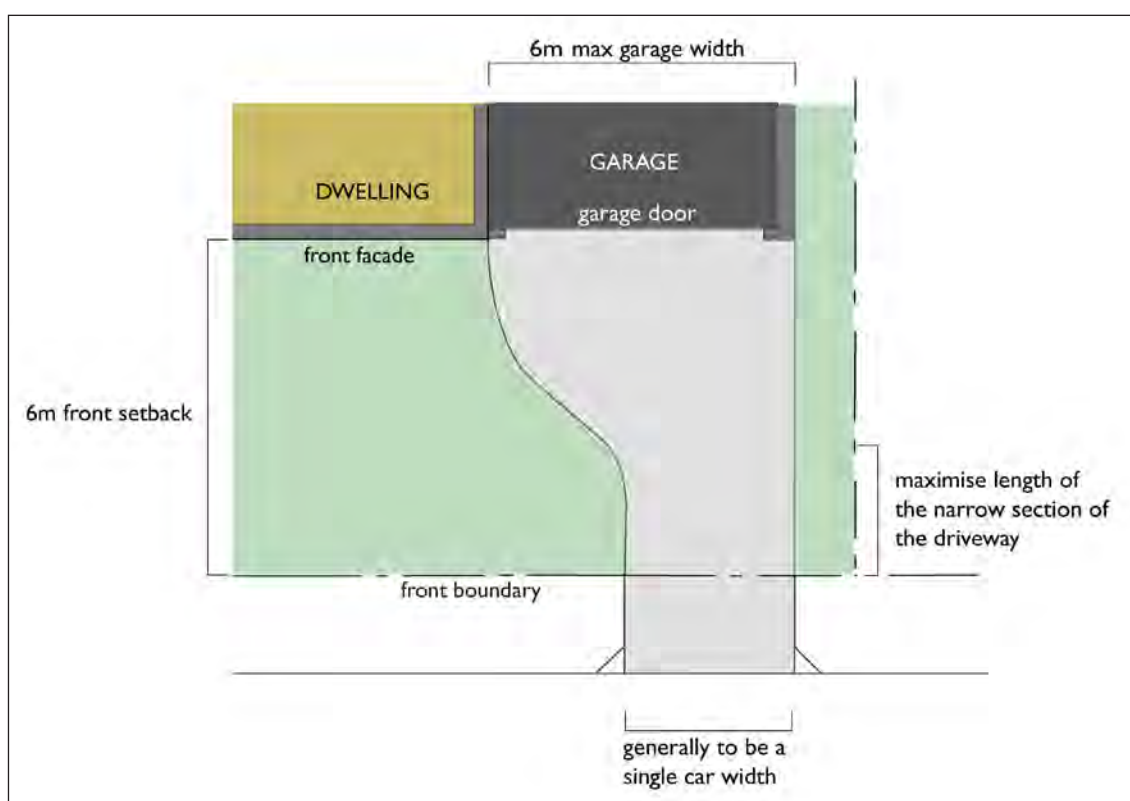


Figure 3.3.20 Driveway. The width of the driveway is to be minimised. The garage door is to be setback no more than 300 mm from the front of the structure above

2.11.2 Semi-basement Car Parking

Semi-basement car parking is a car parking structure set partly below ground level. Semi-basement car parking is generally discouraged but may be appropriate in some instances where the topography is suitable. It is important that semi-basement parking is only used where it will be compatible with the streetscape. Semi-basement parking needs to be carefully designed to ensure the building is not raised unnecessarily high above ground level and the retaining walls and access ramps do not dominate the individual lot or the street. The location and size of ramps requires special consideration to ensure the streetscape is not adversely impacted. Landscaping and the selection of materials can help to soften the impact of ramps and basement walls. Semi-basement car parking is to be located underneath the building footprint. Semi-basement car parking is not suitable for flat sites. Basement parking structures set completely below existing ground level are not acceptable.

Controls

- Ramps must start at least 2 m back from the street boundary. Ramps cannot be located on public land.
- The walls of semi-basement car parks are not to extend beyond the walls of the dwelling above.
- Semi-basement car parking can only be used where it is appropriate with regard to the topography of the site.

2.12 Swimming Pools and Spas

Swimming pools and spas enhance the amenity and liveability of dwellings. However, care must be taken to ensure a high level of safety for children and to ensure they do not detract from the amenity of neighbours.

It is important that swimming pools and pool fencing are not only built in accordance with the City of Ryde's planning controls, but also with the relevant NSW Government Acts and Regulations and with relevant Australian Standards. Swimming pool fences must comply with the relevant requirements for pool fences set out in the Swimming Pool Act 1992 (as updated) and with Australian Standards (such as Australian Standard 1926 (as updated)). Compliance with the Australian Standard will generally mean that a 1200 mm high fence with self-closing, self-latching gates will need to be provided.

The protection of the privacy and amenity of adjoining residents is another important consideration. Some ways to achieve this are to ensure the width of coping is minimal where the edge of the pool is adjacent to neighbouring properties and by locating entertainment areas such as decks away from boundaries. The location and enclosure of the pool filter is also an issue as noise from the filter can disturb neighbours. Filters are preferably to be located away from boundaries.

It is important that pools are located so that they will not damage mature trees, either on the subject site or those within neighbouring properties.

Objectives

1. To provide a place for recreation and enjoyment.
2. To provide a high level of child safety.
3. To minimise the impact of swimming pools and spas on neighbours.
4. To require swimming pools to comply with all relevant legislation and Australian Standards.

Controls

- a. Swimming pools, pool fencing, gates and spas including indoor swimming pools and access to these pools, must comply with all relevant Acts, Regulations and Australian Standards.
- b. Swimming pools must at all times be surrounded by a child-resistant barrier designed and located to separate the pool from any residential building and/or outbuildings (such as garages and sheds), situated on the site, with the exception of pool houses, and from any adjoining land. A child resistant barrier is one described in the Australian Standard for swimming pool fences.
- c. The wall of a residential building may form part of the child resistant barrier so long as the wall contains no openable door, window or other opening through which access may at any time be gained to the swimming pool.
- d. A spa pool is not required to be surrounded by a child resistant barrier provided that the spa pool is covered or secured by a child-safe structure (e.g. door, lid or mesh) that is fastened to the spa pool by a child-resistant device at all times when the spa pool is not in actual use.
- e. Pools are not to be located within the front garden setback.
- f. The finished coping level of the pool must not be higher than 500 mm above the adjacent existing ground level. This maximum height can only be achieved where it will not result in an unreasonably adverse impact on the privacy of neighbours.

- g. Pools are to be setback a minimum of 900 mm from the boundary, measured from the outside edge of the coping, deck or pool surrounds including paving, to allow sufficient space for screen planting. Further setbacks may be required to preserve existing screening vegetation.
- h. Screen planting is to be provided within a landscape bed, which is to have a minimum width of 900 mm and is to extend for the length of the pool. Planting is to take the form of dense hedging with a minimum height of 2 m and minimum spacing of plants of 1 metre.
- i. Pools are to be located at least 3 m minimum from the trunk of a tree over 5 m in height that is to be retained on the site or is located on a neighbouring property.
- j. The pool pump/filter is to be located as far away as practicable from neighbouring dwellings and is to be enclosed in an acoustic enclosure that will ensure the noise emitted from the enclosure is not greater than 5dB(A) above the background noise level, measured at the boundary.

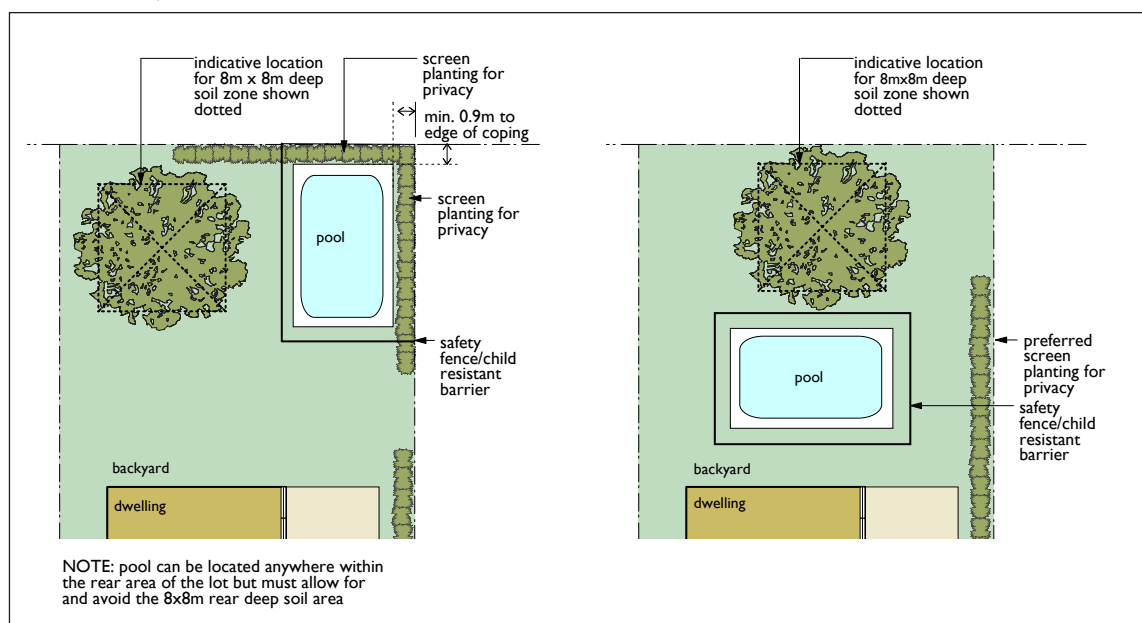


Figure 3.3.21 Site plans showing different pool fencing arrangements. Where a pool fence includes part of a boundary fence, that part of the boundary fence is also required to be a child resistant barrier. Where a pool fence is placed near a boundary fence, the distance between the two fences is to be in accordance with the Australian Standard for pool fencing.

2.13 Landscaping

Landscaping encompasses the planning, design, construction and maintenance of private open space, gardens, driveways, parking areas, and utility areas. This includes both soft and hard landscape areas and all deep soil areas. Landscaping should retain significant natural features, particularly mature trees and other vegetation. The planting of endemic species is encouraged on allotments adjacent to bushland.

The landscape design should ensure that vegetation, outdoor spaces and structures are considered together to achieve unity of design, greater amenity for occupants, and the best use of outdoor space. The design of landscape areas needs to be carefully considered and should be designed at the same time as the building.

Landscape design should consider usability, privacy and opportunities for social and recreation activities. Neighbours' amenity should also be respected. Landscaping also has an important role to play in improving environmental conditions such as storm water and rainwater absorption, habitat for native animals and plants, reducing bushfire risk, and helping to regulate the amenity of a development through such things as pergolas and tree plantings.

Objectives

1. To enhance the appearance and amenity of development.
2. To enhance the character of the locality and the streetscape.
3. To retain existing important landscape features.
4. To provide privacy between adjoining dwellings and their private open space.
5. To assist in the percolation of rainwater and reduction in stormwater runoff.
6. To improve microclimatic conditions on sites and the solar performance of dwellings.
7. To contribute to improving urban air quality.
8. To provide fauna and flora habitat.
9. To assist in the protection of urban bushland.

Controls

- a. Major existing trees are to be retained in a viable condition whenever practicable, through the appropriate siting of buildings, accessways and parking areas and through appropriate landscape treatment. Refer to Part 9.6 Tree Preservation in this DCP.
- b. On allotments adjoining bushland, protect and retain indigenous native vegetation and use native indigenous plant species for a distance of 10 m from any lot boundaries adjoining bushland.
- c. Provide useful outdoor spaces for liveability by coordinating the design of private open space, external living areas, driveways, parking areas, swimming pools, utility areas, deep soil areas and other landscaped areas with the design of the dwelling.
- d. Where the ground floor level of a dwelling is above the finished external ground level reached through a door or doorways, there is to be a physical connection made between these levels. Examples of a physical connection include stairs, terraces, and the like.
- e. Provide a landscaped front garden. Hard paved areas are to be minimised, and at a maximum, are to be no more than 40% of the front garden areas.
- f. A pathway is to be provided along one side of the dwelling so as to provide pedestrian access from the front garden to the rear yard. This access is not to be blocked by such things as landscaping features, rainwater tanks, hot water heaters and retaining walls. The pathway does not need to be provided on allotments which have rear lane access or are a corner allotment.
- g. Landscape elements in front gardens, particularly trees and other plants, are to be compatible with the scale of development.
- h. The front garden is to have at least 1 tree capable of a minimum mature height of 10 m with a spreading canopy.
- i. Where the backyard does not have a mature tree at least 15 m high, plant a minimum of one large canopy tree in the back yard. The tree is to be capable of a mature height of at least 15 m and is to have a spreading canopy. The tree is to be located in the 8 m x 8 m deep soil area.
- j. Locate and design landscaping to increase privacy between neighbouring dwellings.

- k. Hedge planting on boundaries is to consist of plant species which have a mature height no greater than 2.7 m.
- l. Retaining walls and other landscape elements are not to obstruct the stormwater overland flow path.
- m. On site stormwater detention is generally not to be located in the front setback unless it is a underground tank located beneath the driveway.
- n. Landscaping is to include ground level private open space for each dwelling.
- o. Landscaping is to be designed to improve the energy efficiency of buildings and the microclimate of external living areas.

Calculation Rules

Private open space:

- is a private outdoor recreational and relaxation space for a dwelling; and
- is located adjacent to internal living rooms and may take the form of a paved area, deck, terrace, courtyard, lawn area and the like.

2.14 Dwelling Amenity

Dwelling amenity is the way in which the building is suitable for residential use. It includes the ability of spaces to adequately provide for their intended function and to respond to climatic conditions. The key aspects of building amenity include:

- daylight and sunlight access;
- visual privacy;
- acoustic privacy;
- cross ventilation; and
- view sharing.

2.14.1 Daylight and Sunlight Access

Sunlight

Sunlight is direct light from the sun.

The use of passive solar design in dwellings is encouraged. Sydney has a temperate sub-tropical climate and well designed houses in Sydney should only require a limited amount of heating and cooling. The heat load resulting from direct solar penetration into buildings during the hotter months can be a major problem, and so it is important that dwellings are designed to optimise the benefits of sunlight, whilst minimising its negative effects. Key aspects to be considered in the design of dwellings are: orientation, material selection, type and placement of windows, ceiling heights, and sun shading devices. Considered design will result in a comfortable living environment and will assist in reducing energy consumption.

The orientation of the allotment, the immediate subdivision pattern and the local topography, have a significant impact on the ability to provide solar access. Sites on the southern side of a hill, for example, may not receive the same level of sunlight access as other sites. On allotments where the side boundary has a northerly aspect, consideration should be given to increasing the side setback to improve sunlight access and to prevent overshadowing by future development on neighbouring allotments.

It is also important when designing new buildings to consider the impact of the new development on the solar access of the neighbour.

Ideally, solar access should be maximised in winter and minimised in summer. A northerly aspect is most desirable as it provides the most solar access in winter and is relatively easy to shade in summer. A westerly aspect is least desirable, particularly in summer. Protection for a westerly aspect can be achieved by using such elements as vertical sun shading devices, blinds and deciduous trees.

Daylight

Daylight is diffuse light from a sunlit sky. Good levels of daylight in a dwelling improve amenity and reduce the need for artificial lighting. Good levels of daylight can be achieved through the careful consideration of window size, location and proportion.

Objectives

1. To maximise sunlight and daylight access.
2. To ensure that new development maintains appropriate sunlight access to neighbouring dwellings and neighbouring private open space.
3. To encourage the use of passive solar design.

Controls

- a. Living areas are to be located predominantly to the north where the orientation of the allotment makes this possible.
- b. Dwellings on allotments which have a side boundary with a northerly aspect are to be designed to maximise sunlight access to internal living areas by increasing the setback of these areas. In these cases a minimum side setback of 4 m is preferred.
- c. Windows to north-facing living areas of the subject dwelling are to receive at least 3 hours of sunlight between 9 am and 3 pm on 21 June over a portion of their surface.
- d. Private open space of the subject dwelling is to receive at least two hours sunlight between 9 am and 3 pm on June 21.
- e. For neighbouring properties ensure:
 - i. sunlight to at least 50% of the principal area of ground level private open space of adjacent properties is not reduced to less than two hours between 9 am and 3 pm on June 21; and
 - ii. windows to north-facing living areas of neighbouring dwellings receive at least 3 hours of sunlight between 9 am and 3 pm on 21 June over a portion of their surface, where this can be reasonably maintained given the orientation topography of the subject and neighbouring sites.

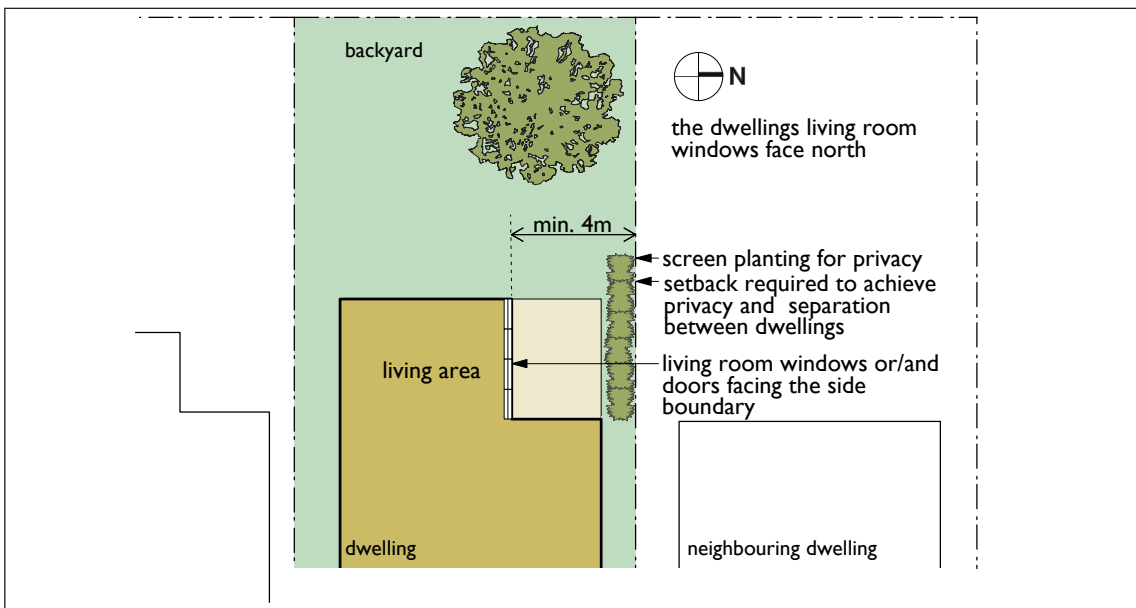


Figure 3.3.22 On allotments with a northerly aspect to the side boundary, sunlight access to living areas will be maximised if windows face the side boundary. A minimum setback of 4 m is encouraged in order to improve amenity by providing direct sunlight access to living rooms.

2.14.2 Visual Privacy

Visual privacy allows residents to carry out private activities within all rooms and private open spaces without compromising the functioning of internal and external spaces. Visual privacy is determined by the nature of adjacent developments, site configuration topography, the scale of the development, and the layout of individual dwellings.

Living areas should be located to the front and rear elevations where privacy and outlook are more easily achieved. Locating the majority of living area windows facing towards the street and the rear boundaries means that the windows of ancillary rooms will face the side boundaries. This allows the building to be located closer to the side boundaries as there a fewer privacy impacts.

It is not necessary to provide the same degree of privacy protection to all parts of a neighbouring site. Higher levels of privacy are to be provided to both internal living areas and to the external living area. Overlooking from bedroom windows is less of a concern than overlooking from the windows of other habitable rooms.

Terraces and balconies from living areas located above ground level can have a significant impact on the amenity of neighbours with regard to loss of visual privacy and increase in noise levels. Such features will not be allowed except where it can be demonstrated that neighbours' privacy is not compromised. Terraces which are recessed into the building so that the balustrade is approximately in line with the abutting walls are likely to have an adverse impact on neighbours' privacy.



Figure 3.3.23 When buildings are oriented to the front and rear of allotments, privacy, security, and outlook are coordinated across the block, the street and between neighbouring buildings.

Objectives

1. To provide appropriate levels of visual privacy to internal living spaces and external private open space.
2. To facilitate outlook and views from principal rooms in dwellings and private open spaces without compromising visual privacy of neighbours.
3. To provide a level of surveillance over the street.
4. To minimise overlooking of neighbouring dwellings.

Controls

- a. Orientate the windows of the main internal living spaces such as living rooms, dining rooms, kitchens, family rooms and the like, generally to the front or to the rear of allotments.
- b. Orientate terraces, balconies and outdoor living areas to either the front or the rear of allotments, and not to the side boundaries.
- c. Terraces and balconies are not to overlook neighbour's living areas and private open space.
- d. Living room and kitchen windows, terraces and balconies are not to allow a direct view into neighbouring dwellings or neighbouring private open space.
- e. Side windows are to be offset by distances sufficient to avoid visual connection between windows of the subject dwelling and those of the neighbouring dwelling.
- f. Splayed walls with windows are not to be located above ground level where the windows will provide views into neighbouring allotments.

2.14.3 Acoustic Privacy

Acoustic privacy is a measure of sound insulation between individual dwellings, and between external and internal spaces. Designing for acoustic privacy relates to the location and separation of buildings and the location of living areas and above ground external areas such as terraces.

The proximity of the building to major external noise sources such as busy roads is also a major consideration.

Setbacks, separation between dwellings, and the appropriate location of external living areas, provide the primary method of ensuring acoustic privacy.

Objectives

1. To provide a high level of acoustic privacy.
2. To minimise the impacts of noise generating uses such as traffic, air conditioners, pumps, and other mechanical equipment.

Controls

- a. The noise of an air conditioner, pump, or other mechanical equipment must not exceed the background noise level by more than 5dB(A) when measured in or on any premises in the vicinity of the item. This may require the item to have a sound proofed enclosure.
- b. Dwellings located on arterial roads are preferably to have double glazed windows where these windows face the road and provide light to living rooms or bedrooms. This is the case whether or not the dwelling has a solid masonry wall to the arterial road.
- c. Dwellings located on arterial roads are preferably to have an acoustic seal on the front door to reduce noise transmission.
- d. Dual occupancies (attached) are to be designed to reduce noise transmission between dwellings. One way to achieve this is to locate noisy areas next to each other and quieter areas next to other quiet areas, for example, living rooms with living rooms, bedrooms with bedrooms, kitchens with kitchens.

2.14.4 View Sharing

View sharing is where development is designed so as to retain the private views enjoyed from existing dwellings on neighbouring sites. However the equitable sharing of views is desired and existing dwellings will not always be able to retain existing views across neighbouring allotments.

Objectives

1. To ensure new dwellings endeavour to respect important views from living areas within neighbouring dwellings.

Controls

- a. The siting of development is to provide for view sharing.

2.14.5 Cross Ventilation

Cross ventilation is the flow of outside air through a dwelling. In Sydney's humid sub-tropical climate the thermal comfort of a dwelling is greatly enhanced through a design which optimises the movement of air. A plan layout, including careful placement of openings which capitalise on

the cooling southerly and north-easterly breezes, enhances amenity and reduces cooling costs. Louvre windows can assist in optimising the movement of air, as can ceiling fans. Higher floor to ceiling heights also help rooms remain cooler in the summer months.

Objectives

1. To optimise the comfort of a dwelling by ensuring good cross-ventilation.
2. To maximise ceiling heights.

Controls

- a. The plan layout, including the placement of openings, is to be designed to optimise access to prevailing breezes and to provide for cross-ventilation.

2.15 External Building Elements

External building design elements include:

- Fences and walls;
- Roofs; and
- Façades visible from streets and other public spaces.

These external building elements are highly visible from the street and contribute to the character of the streetscape. The design of external building elements should:

- make a positive contribution to the attractiveness of the streetscape;
- can assist in creating a high level of thermal comfort and amenity for dwellings; and
- contribute to a consistent built character along the street.

2.15.1 Roofs

The roof is an important architectural element, both for the individual building and for the area. The shape and form of a roof should be compatible with the buildings in the streetscape and neighbourhood. Roofs should be relative in scale to that part of the building below. Generally the roof height should be no more than a storey in height.

Objectives

1. To contribute to the design and performance of buildings.
2. To integrate the design of the roof, including roof elements such as dormer windows, into the overall elevation and building composition.
3. To contribute to a consistent and attractive streetscape.
4. To provide shading and weather protection.

Controls

- a. Relate roof design to the desired built form by:
 - i. Articulating the roof;
 - ii. Ensuring that the roof form is consistent with the architectural character of the dwelling;
 - iii. Providing eaves with a minimum overhang of 450 mm to pitched roofs;
 - iv. Using a compatible roof form, slope, material and colour to adjacent buildings; and
 - v. Ensuring the roof height is in proportion to the wall height of the building.

- b. The main roof is not to be a trafficable terrace.
- c. An attic, where provided, is to be contained within the volume of the roof space.
- d. The number of skylights is to be minimised on roof planes visible from the public domain. Skylights are to be arranged symmetrically.
- e. The front roof plane is not to have both dormer windows and skylights. Dormers are preferred.
- f. Balconies and terraces are not to be set into roofs.
- g. The scale of the roof is to be in proportion with the scale of the walls below.
- h. Attics may be located in the garage roofs if the garage is located next to the dwelling. Garages located within the front or rear setbacks, are not to have attics.

2.15.2 Attic Dormer Windows

Attic dormer windows provide light and air to attic spaces, their purpose is not to increase the volume of the roof space. Dormer windows should be minor elements in the roofscape and should reflect the architectural character of the building. Dormer windows are generally only appropriate for steeply pitched roofs.

Objectives

- 1. To ensure attic dormer windows are minor roof elements and are consistent with the scale and architectural character of the building.
- 2. To ensure attic dormer windows only minimally increase the volume of the roof space.

Controls

- a. Dormer windows are not to increase the volume of the roof space except as provided for by the controls.
- b. A roof may have a maximum of 2 attic dormer windows with a maximum total width of 3 m (i.e. if 2 dormers then they would have a maximum width of 1.5 m).
- c. The highest point of an attic dormer window is to be located a minimum of 500 mm below the ridge of the roof in which they sit and a minimum of 1 m above the top of the gutter.
- d. The total roof area of attic dormer windows is to be a maximum of 8 m² (i.e. if there are 2 attic dormer windows then the area of each roof is to be a maximum of 4 m²). The roof area is measured on the plan view.
- e. The front face of an attic dormer window is to be set back from the external face of the wall immediately below by a minimum of 1 metre.
- f. Attic dormer windows are not to have balconies or terraces set into the roof.
- g. Attic dormer windows occurring in the same roof plane are to be similarly sized and arranged symmetrically.

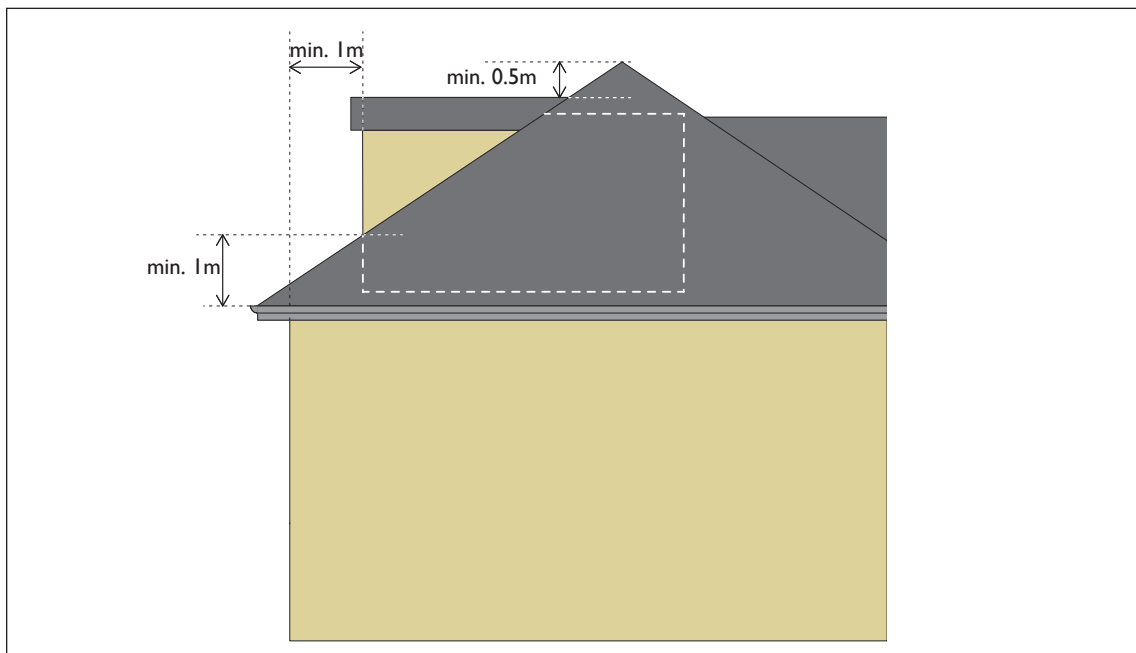


Figure 3.3.24 Attic dormer window

2.16 Fences

Fences and walls can define boundaries between an allotment and a neighbouring allotment. The design of fences and walls has an impact on the amenity of the public domain and the streetscape character. The visual impact, scale and design of fences need to be carefully considered. The fences which bound an allotment are described as:

- The front fence;
- The return fences;
- Side fences; and
- Rear fence.

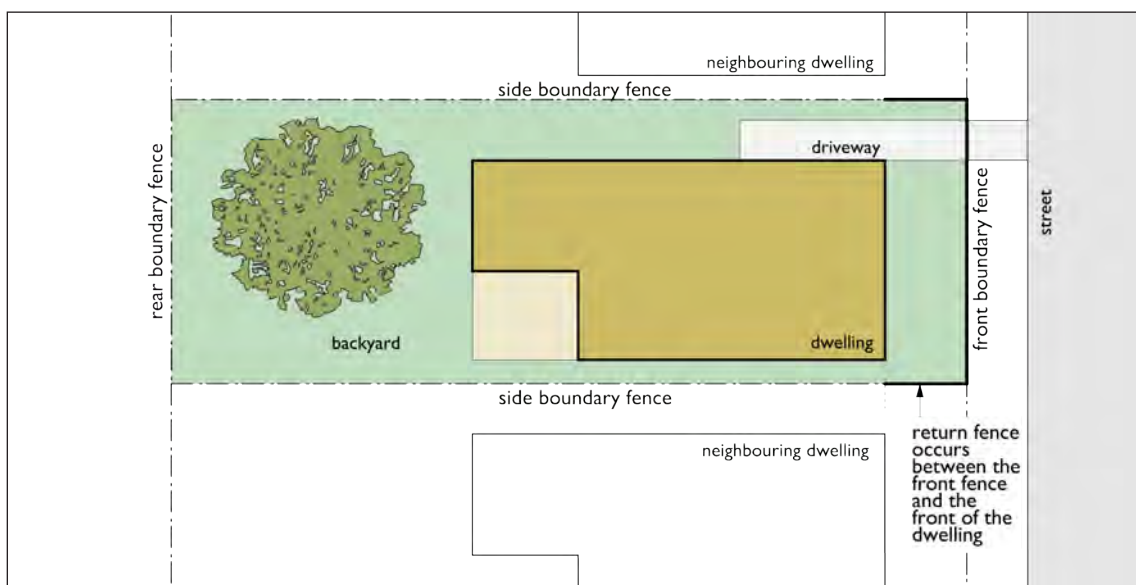


Figure 3.3.25 Diagram showing the fencing bounding an allotment

Objectives

1. To define the boundaries between public and private land.
2. To define the boundaries between neighbouring properties.
3. To contribute to the streetscape appearance.
4. To enhance the usability of private open space.
5. To offer acoustic and visual privacy on noisy roads.

2.16.1 Front and return Fences and Walls

Controls

- a. Front and return fences are to reflect the design of the dwelling.
- b. Front and return fences and walls are to be constructed of materials compatible with the house and with other fences and walls within the streetscape.
- c. A solid front or return fence is to be no higher than 900 mm. An open lightweight fence, such as a timber picket fence may be up to 1 m high.
- d. A return fence is to be no higher than the front fence.
- e. Fences may have a maximum height of 1.8 m so long as the fence is an open fence with an openness ratio of at least 50%. The fence may have a solid base so long as the base is no higher than 900 mm.
- f. Fences along arterial roads may be solid masonry up to a maximum height of 1.8 m.
- g. Front and return fences are not to be Colorbond or timber paling.
- h. Retaining walls which are part of a front or return fence are to have a maximum height of 900 mm.
- i. In areas of overland flow, fencing shall be of open construction so that it does not impede the flow of water.
- j. Fence piers are to have a maximum width of 350 mm.

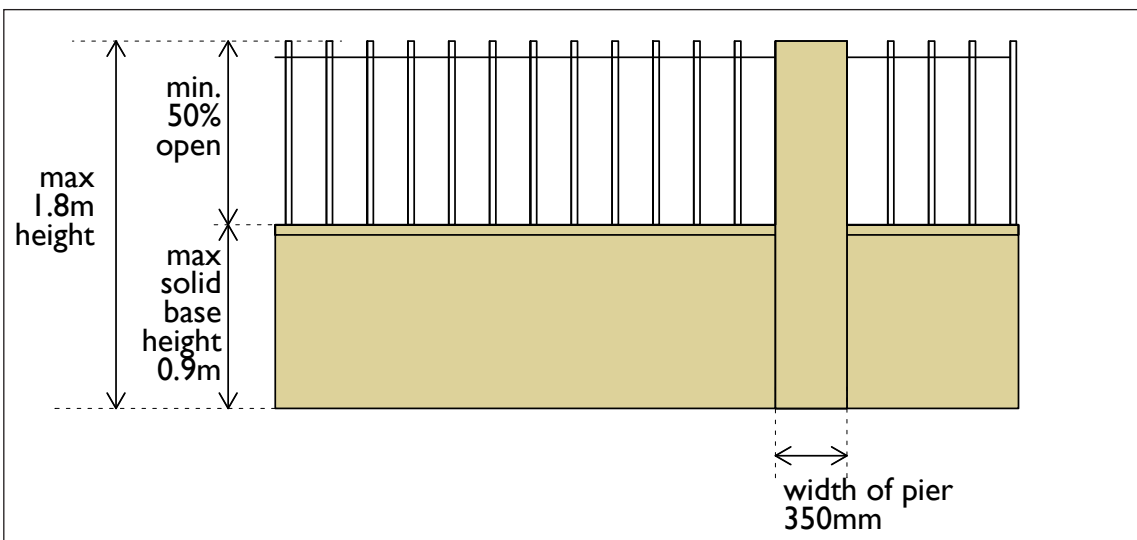


Figure 3.3.26 Front Fence 1.8 m high



Figure 3.3.27 Examples of front fences which are compatible with the houses they front and with the streetscape.

2.16.2 Side and rear Fences and Walls

Controls

- a. The maximum height for side and rear fences is to be 1.8 m.
- b. In areas of overland flow, all fencing shall be of open construction so that it does not impede the flow of water.
- c. Barbed wire, broken glass and other dangerous elements must not be used in the construction of fences.
- d. Any fencing located forward of the foreshore building line shall be of open, permeable construction.

Calculation Rules

The height of a fence on the street alignment is to be measured above the level of the adjacent footpath or verge. The level of the footpath or verge may be obtained from Council's Development Engineers.

3.0 CHARACTER AREAS

3.1 West Ryde Special Development Area

Controls

- a. Front building setbacks in the West Ryde Special Development Area are to be consistent with existing setbacks and may be up to 12m in order to ensure this consistency.



Figure 3.3.28 West Ryde Special Development Area

3.2 Denistone Character Area

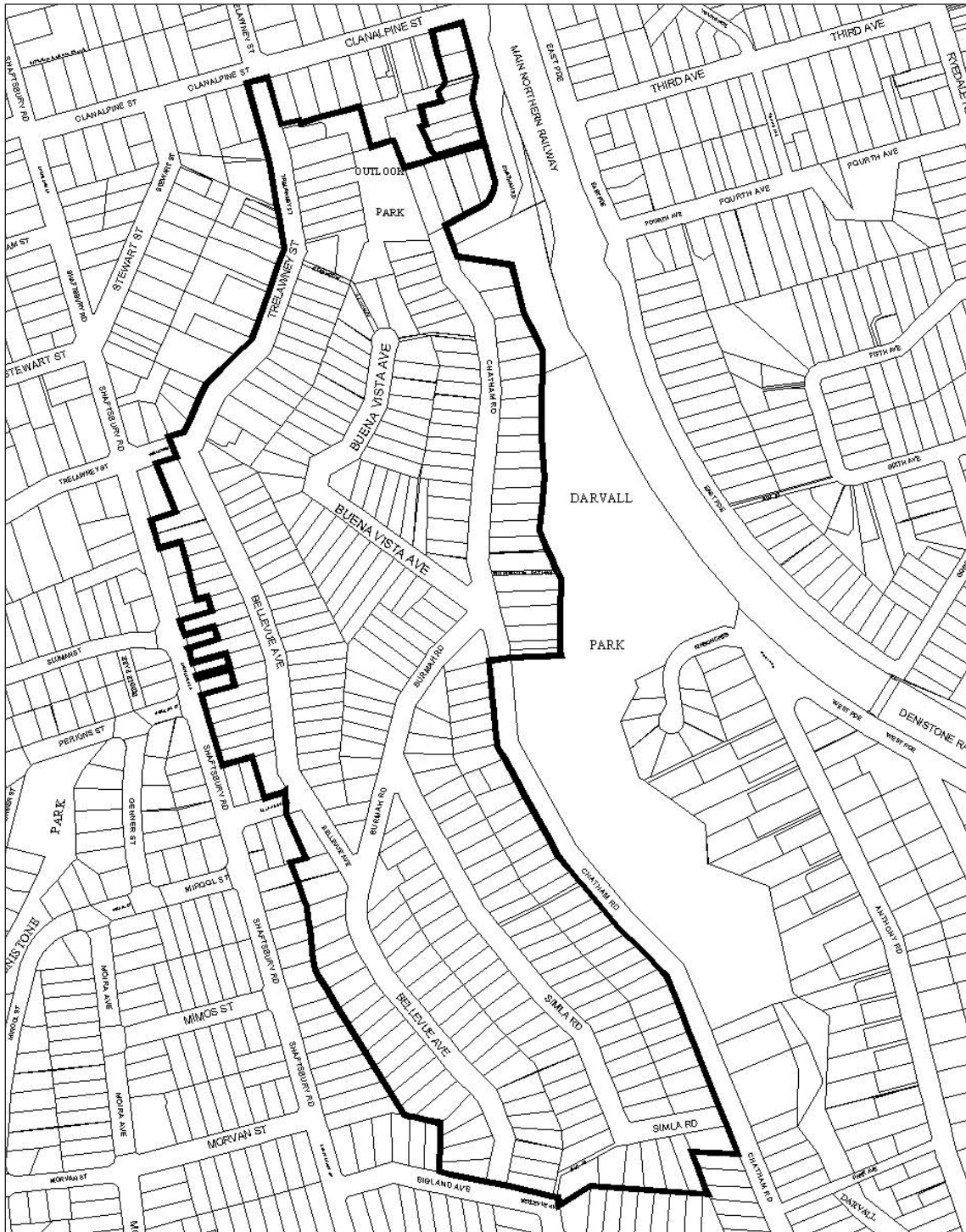


Figure 3.3.29 Denistone Character Area

3.2.1 Character Statement

The Denistone Character Area, an early 20th century hillside subdivision, features a strong pattern of single detached brick and tile dwellings which predominately date from the Inter-War period and display architectural styles consistent with their period. Houses sit within established gardens, which together with the street trees, help establish the green and leafy character of the area.

Dwellings are almost exclusively single storey with two storey dwellings occurring as a lower ground level where the site slopes away from the street. They are relatively closely spaced with mostly minimum side setbacks but have clearly defined front façades through the use of modulation and architectural detail. Front setbacks are generally consistent within streetscapes.

Unspoiled roofscapes make a significant contribution to the character and visual cohesiveness of the area. Roofs are generally geometrically regular simple hipped roofs of a moderate slope and with a modest eaves overhang.

Car parking structures are widespread in the area reflecting the suburban development during the period when cars were becoming more common. Garages have differing forms but are generally unobtrusive. The placement and style of the garage has been influenced in some situations by the topography of the lot.

Low front fences complement the style of the dwelling and respond to the topography of the setting. Fences are predominantly face brick with a brick capping and are usually detailed to match the architectural character of the house they front. The low front fences delineate the private and public domain and allow the house to be readily seen from the street.

Well-established and highly visible front gardens feature lawns, garden beds and mature specimen tree plantings. The garden like character of the area is partly determined by Outlook Park with its large trees providing a visible green canopy, by the garden plantings, grassed verges and by the street tree plantings. Rear gardens together form a band of green treed space between houses.

Considerable additions to and alteration of dwellings has occurred over the past several decades, however the alterations and additions that have been done sit comfortably with existing structures and streetscapes. Those alterations and additions that are identifiable generally display a concern for and sympathy with the immediate area.

The key characteristics are:

- Face brickwork on visible façades, and tiled roofs, with the colours consistent with the existing predominant colours;
- Clearly defined front façades displaying modulation;
- Consistent front setbacks;
- Geometrically regular simple hipped roofs of a moderate slope and with a modest eaves overhang; and
- Low front fences which complement the design and materials of the house they front.

3.2.2. Retention of Key Characteristics

It is important that the character of the Denistone Character Area is maintained.

While it is accepted that some change will occur, this change should be harmonious with the character of the area. This means that new development, such as new houses, alterations and additions and car parking structures, should reflect the character of the area. The scale, form, massing, materials and details of new development requires careful consideration. Large block like forms are not acceptable.

Objectives

1. To ensure that new development is consistent with the character of the area.
2. To ensure that existing structures which are characteristic of the area are not demolished unless the proposed new structure is also characteristic of the area.

Controls

- a. New development is to be consistent with the characteristics described in the key character statement.
- b. New development is to be compatible with the existing streetscape.
- c. Existing houses, garages and front fences are not to be demolished unless a replacement is part of the same application.



City of Ryde
Civic Centre
1 Devlin Street
Ryde NSW 2112

www.ryde.nsw.gov.au

City of Ryde Development Control Plan 2014

Part: 3.4 Multi dwelling housing (for Low Density Residential Zone)

Translation

ENGLISH

If you do not understand this document please come to Ryde Civic Centre, 1 Devlin Street, Ryde Monday to Friday 8.30am to 4.30pm or telephone the Telephone and Interpreting Service on 131 450 and ask an interpreter to contact the City of Ryde for you on 9952 8222.

ARABIC

إننا نعتذر عليك فهم محتويات هذه الوثيقة، نرجو للحضور إلى مركز بلدية رايد Ryde Civic Centre على العنوان: 1 Devlin Street, Ryde 1 من الاثنين إلى الجمعة بين الساعة 8.30 صباحاً والساعة 4.30 بعد الظهر أو الاتصال بمكتب خدمات الترجمة على الرقم 131 450 لكي تطلب من أحد المترجمين الاتصال بمجلس مدينة رايد، على الرقم 9952 8222، نيابة عنك.

ARMENIAN

Եթէ այս գրութիւնը չէ՞ք հասկնար, խնդրեմ եկէ՛ք՝ Րայդ Բիւրօ Սիւիլիք Սենթըր, 1 Տելվին փողոց, Րայդ, (Ryde Civic Centre, 1 Devlin Street, Ryde) Երկուշաբթիէն Ուրբաթ կ.ա. ժամը 8.30 – կ.ե. ժամը 4.30, կամ հեռաձայնեցէ՛ք Հեռաձայնի եւ Թարգմանութեան Սպասարկութեան՝ 131 450, եւ խնդրեցէ՛ք որ թարգմանիչ մը Րայդ Քաղաքապետարանին հետ կապ հաստատուէ ձեզի համար, հեռաձայնելով՝ 9952 8222 թիւին:

CHINESE

如果您看不懂本文，請在周一至周五上午 8 時 30 分至下午 4 時 30 分前往 Ryde 市政中心詢問 (Ryde Civic Centre, 地址: 1 Devlin Street, Ryde)。你也可以打電話至電話傳譯服務中心，電話號碼是: 131 450。接通後你可以要求一位傳譯員為你打如下電話和 Ryde 市政廳聯繫，電話是: 9952 8222。

FARSI

اگر این مدرک را نمی فهمید لطفاً از 8.30 صبح تا 4.30 بعد از ظهر دوشنبه تا جمعه به مرکز شهرداری رايد، Ryde Civic Centre, 1 Devlin Street, Ryde مراجعه کنید یا به سرویس مترجم تلفنی، شماره 131 450 تلفن بزنید و از یک مترجم بخواهید که از طرف شما با شهرداری رايد شماره 9952 8222 تلفن بزند.

ITALIAN

Se non capite il presente documento, siete pregati di rivolgervi al Ryde Civic Centre al n. 1 di Devlin Street, Ryde, dalle 8.30 alle 16.30, dal lunedì al venerdì; oppure potete chiamare il Telephone Translating and Interpreting Service al 131 450 e chiedere all'interprete di contattare a vostro nome il Municipio di Ryde presso il 9952 8222.

KOREAN

이 문서가 무슨 의미인지 모르실 경우에는 1 Devlin Street, Ryde 에 있는 Ryde Civic Centre 로 오시거나 (월 – 금, 오전 8:30 – 오후 4:30), 전화 131 450 번으로 전화 통역 서비스에 연락하셔서 통역사에게 여러분 대신 Ryde 시청에 전화 9952 8222 번으로 연락을 부탁드립니다.

Amend. No.	Date approved	Effective date	Subject of amendment

Table of Contents

1.0	INTRODUCTION	5
1.1	Background	5
1.2	Guiding Principles	5
1.3	Objectives	5
1.4	Assessment of Multi dwelling housing Developments	6
2.0	SITE ANALYSIS, LOCATION, NUMBER AND TYPE OF DWELLING	7
2.1	Site Analysis	7
2.2	Minimum Allotment Size	7
2.3	Non preferred Locations	7
2.4	Retention of Existing Dwellings	8
2.4.1	Heritage Significant Buildings	8
2.5	Density	9
2.6	Number of Dwellings	10
2.7	Type of Dwellings	10
3.0	SITE PLANNING	11
3.1	Slope Of Site	11
3.2	Altering the Levels of the Site	12
3.3	Storey and Height	12
3.3.1	Storey Controls	13
3.3.2	Height Controls	13
3.4	Site Coverage	13
3.5	Setbacks	14
3.5.1	Front setbacks	14
3.5.2	Front Setback for Hatchet-Shaped Allotment	15
3.5.3	Setback from second street frontage	15
3.5.4	Side and Rear Setbacks	16
3.5.5	Internal setbacks	16
3.6	Private Outdoor Space (courtyards)	16
3.7	Landscaping	17
3.8	Car Parking, Manoeuvrability and Driveway crossings	20
3.8.1	Car Parking	20
3.8.2	Manoeuvrability	21
3.8.3	Driveways	22

Table of Contents

3.8.4	Driveway Crossings	22
3.9	Overshadowing and Access to Sunlight	22
3.10	Visual and Acoustic Privacy	23
3.11	Accessibility	24
3.11.1	Pedestrian Access	24
3.11.2	Access for People with Disabilities - Developments of 6 or more dwellings	24
3.11.3	Access Audits	24
4.0	BUILDING FORM	25
4.1	Appearance	25
4.2	Ceiling Height	25
4.3	Roofscape and Roof Materials	25
4.4	Building Materials for Walls	26
4.5	Fences	26
4.5.1	Front Fences	26
4.5.2	Other Boundary Fences which Face a Street	26
4.5.3	Other Boundary Fences	27
4.6	Clotheslines and Drying Area	27
4.7	Lighting	27
4.8	Location of Bin Enclosures	28
5.0	ENGINEERING	29
5.1	Drainage	29
6.0	PUBLIC FACILITIES	31
6.1	Local Open Space Facilities	31
6.2	Local Road Facilities	31
SCHEDULES		
Schedule 1 – Site Analysis		32
Schedule 2 – Non Preferred Locations		34
Schedule 3 – Waste Bin Storage Area Enclosures		42
Schedule 4 – Designing for a Slope		43

1.0 INTRODUCTION

1.1 Background

The City of Ryde's residential development strategy is Improving Housing Choice and Housing Opportunities. It is a strategy for the people of Ryde, which recognises that housing needs and demands are changing ("Choice") and renewal of some areas of our City is important ("Opportunities").

The population of Ryde is changing with an increasing number of 1 and 2 person households. Such households have different housing needs from families with children. In particular, they need smaller dwellings.

Particular households within the existing community that may require smaller housing includes:

- Single person household
- Couples with no children
- Couples whose children have left home
- Older people

Multi dwelling housing developments provide a form of housing within residential areas that meet the needs of smaller and different households.

1.2 Guiding Principles

The guiding principles of this Part are:

- Providing a medium density housing form within the City of Ryde which is compatible and sympathetic with conventional detached dwelling-houses while maintaining the existing character of residential neighbourhoods;
- Spreading the increase in population densities over all residential areas within the City rather than concentrating such increases in any one area;
- Providing for the changing housing needs of a growing proportion of existing residents;
- Providing the best possible environment for a variety of household groups with particular emphasis on couples, older persons and persons with disabilities;
- Preserving and enhancing the existing residential amenity of the City;
- Ensuring no adverse environmental impacts such as loss of remnant vegetation and other significant vegetation or adverse impacts on heritage items or conservation areas occurs;
- Ensuring change in any area is gradual and that change is distributed across the City.

1.3 Objectives

The objectives of the Part are:

1. to ensure Multi dwelling housing developments complement existing development and streetscape;
2. to encourage dispersal of Multi dwelling housing developments within neighbourhoods throughout the City of Ryde;
3. to require Multi dwelling housing developments be designed to the highest possible aesthetic standard;

4. to ensure Multi dwelling housing developments meet the needs of all households including older persons;
5. to provide for a mix of housing types throughout the City of Ryde;
6. to ensure that Multi dwelling housing designs promote security and safety of residents;
7. to ensure that land used for Multi dwelling housing development has adequate provision or daylight, privacy, landscaping and car parking;
8. to ensure the amenity of occupants of adjoining land is not adversely affected by any Multi dwelling housing development;
9. to require the scale of any Multi dwelling housing development be related to the character of the area;
10. to provide for the retention of heritage significant buildings and those identified as contributing to the character of Ryde; and
11. to ensure that Multi dwelling housing developments occur in suitable areas only, that is areas where the development meets the needs of all residents, does not have adverse environmental impact or an adverse impact on the character of an area.

1.4 Assessment of Multi dwelling housing Developments

All development applications received by Council for Multi dwelling housing development will be assessed in terms of the standards and requirements that comprise this Part. Satisfactory compliance with such requirements does not mean however that Council will necessarily approve an application.

In the assessment process the way in which the application satisfies the Guiding Principles and Objectives of this Part will be reviewed. For the Guiding Principles and Objectives of this Part to be achievable with respect to individual Multi dwelling housing development it is necessary for strict compliance with the following core standards:

- Minimum allotment size (Section 2.2)
- Non preferred locations (Section 2.3)
- Retention of Existing Dwellings (Section 2.4)
- Density (Section 2.5)
- Number of Dwellings (Section 2.6)
- Storeys (Section 3.3) and
- Site coverage (Section 3.4)

The impact of the development on the surrounding locality will also be considered. In particular the Site Analysis (Section 2.1 Site Analysis) will be reviewed with regard to:

- a. How the Multi dwelling housing development will relate to its surroundings within its own and opposite street block;
- b. Whether a design has been submitted that results in any negative impacts on the amenity of adjoining developments.

2.0 SITE ANALYSIS, LOCATION, NUMBER AND TYPE OF DWELLING

2.1 Site Analysis

Objectives

1. To ensure that Multi dwelling housing design is of high quality and sensitive to its environment and to ensure that the site layout and building design considers the existing characteristics, opportunities and constraints of both the site and its surrounds.

Controls

- a. Each development application for a Multi dwelling housing development must be accompanied by a site analysis.

Note: Site analysis identifies and explains the key features of the site and its surroundings.

- b. In particular the site analysis should be used to:
 - i. Assess how future dwellings will relate to their immediate surroundings and to each other;
 - ii. Produce a design that minimizes the negative impact on the amenity of adjoining developments and development within the street/neighbourhood.

Schedule 1 – Site Analysis lists the elements the site analysis must address.

2.2 Minimum Allotment Size

Objectives

1. To ensure that Multi dwelling housing development is capable of meeting all the requirements of this Plan and provide adequate visual and acoustic privacy for the occupants of the Multi dwelling housing development and nearby residents.

Controls

- a. Allotments must have a frontage to a road of not less than 20 m and area of not less than 900 m² (refer to clause 4.1B Minimum lot sizes for dual occupancies and multi dwelling housing of *City of Ryde Local Environmental Plan 2014*);
- b. Hatchet shaped allotments are not considered suitable for Multi dwelling housing developments and development on such allotments will only be approved under the circumstance described in Section 2.4 Retention of Existing Dwellings.

2.3 Non preferred Locations

Objectives

1. To allow Multi dwelling housing developments only in suitable locations, that is:
 - a. Locations where development meets the needs of all residents, and
 - b. Locations where development does not adversely impact on traffic, stormwater, the environment or the character of an area.

Controls

- a. That Council is satisfied that the site is suited for a form of more intense residential development, that being Multi dwelling housing development.

Note: Specific locations have been identified by the Council as unsuitable for Multi dwelling housing development. These are called non-preferred locations.

Schedule 2 - Non-Preferred Locations lists those areas unsuitable for Multi dwelling housing developments, reasons for their listing and possible exemptions.

2.4 Retention of Existing Dwellings

Objectives

- 1. To encourage urban renewal that enhances the quality of life for the future residents of the development.

Controls

- a. Retention of an existing dwelling as part of a new Multi dwelling housing development will not be approved. (Experience has shown that existing dwellings do not comply with open space and setback requirements of Multi dwelling housing, which compromises the quality of life for future residents).

Exception to this may occur if the site contains a heritage significant building or a building identified as a contributing item.

2.4.1 Heritage Significant Buildings

Council may approve Multi dwelling housing developments on the site of a heritage significant building or building identified as a contributing item where:

Controls

- a. The site can be subdivided so that the heritage building or contributing item and the Multi dwelling housing development are on separate lots that generally comply with subdivision lot sizes of Council's codes and policies.

In these circumstances the Multi dwelling housing allotment must have:

- i. A width of not less than 20 metres beyond the access handle;
- ii. A minimum area of 900 m² excluding the access handle; and
- iii. The width of the access handle must be not less 4 metres for 3 or more dwellings.



Figure 3.4.01 Heritage Site Requirements

- b. The new development must complement the heritage significant building or contributing item;
- c. A schedule of conservation and restoration works for the heritage building or contributing item is required to be lodged with the development application for subdivision. As part of the approval Council will require that the heritage building or contributing item is restored and conserved; and
- d. The heritage significant building or contributing item is not to be demolished.

Note: A heritage significant building is a building listed in an LEP or DLEP as a heritage building or where in Council's opinion it is of heritage significance. A contributing item is a building which contributes to the significance of an area as identified in a DCP or Adopted DCP.

2.5 Density

Objectives

1. To create a balanced relationship between the site area, dwelling size and residential population living on the site.
2. To ensure the highest aesthetic Multi dwelling housing developments possible.

Controls

- a. Refer to Clause 4.5A Density controls for Zone R2 Low Density Residential in *Ryde Local Environmental Plan 2014*.
- b. In calculating site area, the area of any access handle or the area between the foreshore building line and the mean high water mark is not included.

Note: Areas abutting the foreshore are a "non-preferred location" (Section 2.3 Non Preferred Locations).

2.6 Number of Dwellings

Objectives

- 1. To ensure that Multi dwelling housing developments are not the dominant form of development in an area and do not dramatically change the character of a location.

Controls

- a. No development shall contain more than 12 dwellings.

2.7 Type of Dwellings

Objectives

- 1. To ensure Multi dwelling housing developments contain a mix of dwelling sizes to meet the needs of different household groups.

Controls

- a. In developments containing 4 or more dwellings not more than 75% of dwellings should have the same number of bedrooms. Where 75% is not a whole number, the number should be rounded down.

Note: For example in a 6 dwelling development 4 dwellings can have 3 bedrooms and two dwellings can have 2 bedrooms.

- b. In any proposed Multi dwelling housing development the slope of the site, proposed levels, height of dwellings, site coverage, landscaping, setbacks, accessibility and overshadowing must be considered when assessing:
 - i. Whether the development will complement and enhance the existing neighbourhood; and
 - ii. Whether the development meets the needs of all householders including older persons and persons with disabilities.

3.0 SITE PLANNING

3.1 Slope Of Site

Objectives

1. To ensure that a Multi dwelling housing development is compatible and sympathetic with surrounding development in its presentation to the street.
2. To prevent adverse impacts on the privacy of other properties.
3. To ensure that the following requirements are achieved:
 - i. Improved streetscape
 - ii. Better accessibility
 - iii. Steps minimised
 - iv. Reduce impact on adjoining properties from stormwater and overlooking.



Figure 3.4.02

Example of Multi dwelling housing

Controls

- a. Dwellings must have presentation to the street. The front entrance of at least one dwelling must be clearly seen from the street.
- b. Sites with a down slope of more than 1:6 will not be acceptable (refer Figure 3.4.03).
- c. Sites that slope up from the street with a slope of more than 1:6 will not be acceptable.



Figure 3.4.03

Sites which slope

Sites which slope from the street to rear of the lot where only the roof of the dwelling is visible to the street are not suitable for Multi dwelling housing development. Sites for Multi dwelling housing development should be selected so that the finished ground level and finished floor level of the dwellings are similar to adjoining properties.

- d. Sites with a cross fall of more than 1:14 will not be acceptable.

Sites which have a cross slope may not be suitable for Multi dwelling housing as dwellings will be higher than adjoining properties and lead to adverse impacts on the privacy of other properties (See Schedule 4 – Designing For A Slope).

3.2 Altering the Levels of the Site

Objectives

1. To ensure development is sympathetic with the natural topography of the site resulting in improved accessibility, better street impacts, improved solar access for private open space and living areas, protection of privacy of adjoining properties and less impact on ground water.



Figure 3.4.04

Controls

- a. Fill should not be brought onto the site;
- b. The levels of the site should not be altered by more than 300 mm. This relates to all areas of the site not covered by the building floor envelope e.g. driveways, courtyards, setback areas, landscaped areas;
- c. No basement garages are permitted, steps are to be minimised and there should be minimal retaining walls; and
- d. Private open space is required to be provided generally at natural ground level.

3.3 Storey and Height

Objectives

1. To ensure the scale of a Multi dwelling housing development is related to the character and streetscape of the surrounding area; and
2. To ensure privacy to adjoining development.

3.3.1 Storey Controls

Controls

- a. A Multi dwelling housing development must be contained within a single storey building. However, a dwelling with frontage to the street can be two storeys provided:
 - i. The two storey dwelling is not attached to any other two storey dwelling; and
 - ii. Council is satisfied that a two storey dwelling is suitable in terms of the surrounding streetscape.
- b. For corner allotments only one dwelling within the development can be two storeys that being the dwelling fronting the shortest street frontage. This is usually the street to which the property is rated.
- c. Corner allotments that contain a two storey dwelling must be sensitively designed with consideration being given to topography, dwelling size and height.

3.3.2 Height Controls

Controls

- a. Refer to Clause 4.3 Height of buildings and Clause 4.3A (2) Exceptions to height of buildings in *Ryde Local Environmental Plan 2014*.

3.4 Site Coverage

Objectives

1. To ensure a balance between built and unbuilt areas, and to allow for sufficient landscaping and pervious areas within the site.

Controls

- a. Site coverage must not exceed 40%.

Note: In calculating site area the area of any access handle or the area between the foreshore building line and the mean high water mark is not included.

- b. Pervious area of the site must not be less than 35%.

Note: Part of this area may be pervious pavers if approved by Council.



Figure 3.4.05

3.5 Setbacks

Objectives

- 1. To allow sufficient separation within the development and from adjoining properties to ensure privacy between dwellings;
- 2. To allow for substantial landscaping and pervious areas;
- 3. To allow sufficient manoeuvring area for vehicles;
- 4. To ensure the development is in keeping with the existing streetscape; and
- 5. To allow the retention of existing substantial trees.



Figure 3.4.06

3.5.1 Front setbacks

Controls

- a. Buildings must be setback:
 - i. The same distance as one of the buildings on an adjoining allotment, if the difference between the setbacks of the building on the two adjoining allotments is not more than 2 m; or
 - ii. If the difference between the setbacks of the adjoining buildings is more than 2 m the development must be setback the average of the front setback of the two adjoining developments.

This is explained in Figure 3.4.07a and 3.4.07b.

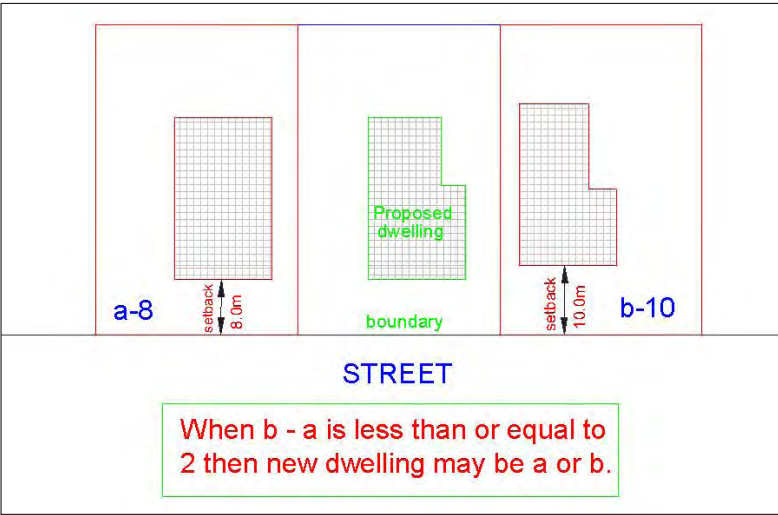


Figure 3.4.07a
Front Setbacks

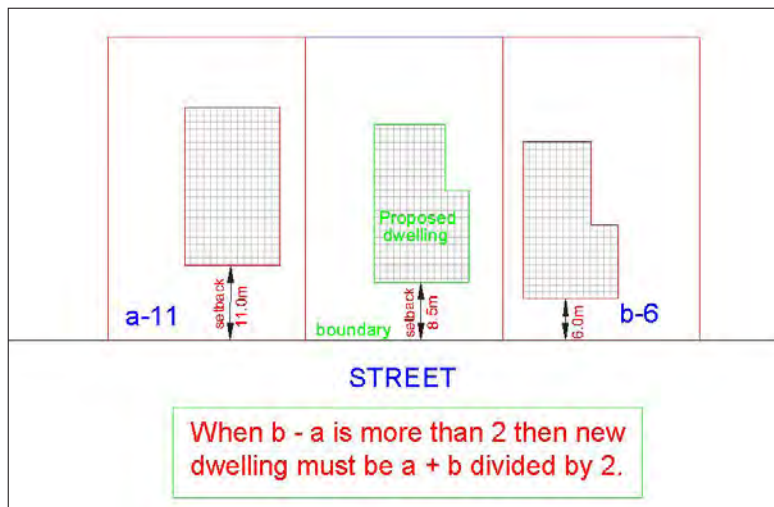


Figure 3.4.07b
Front Setbacks

- b. Council may approve a setback of 1 m less than the above standard for not more than 50% of the front elevation of the building in order to provide an irregular front elevation and to add interest to the streetscape provided that this variation does not adversely affect any adjoining property.
- c. Council may vary this standard if it is satisfied that the existing streetscape is likely to change. In this situation the setback must be not less than 7.5 m for 50% of the frontage and not less than 6.5 m for 50% of the frontage.

3.5.2 Front Setback for Hatchet-Shaped Allotment

Controls

- a. Buildings must be sited so that vehicles can enter and leave the site in a forward movement.

Note: Multi dwelling housing will only be approved on a hatchet-shaped allotment where the allotment has been created as part of a subdivision to create a separate allotment for a heritage significant building or a building which is a contributing item.

3.5.3 Setback from second street frontage

Controls

- a. Where the site has a second street frontage the walls of all buildings must be setback not less than 4.5 m from that boundary.



Figure 3.4.08

3.5.4 Side and Rear Setbacks

Controls

- The walls of all buildings must be not less than 4.5 m from side and rear boundaries. Where vehicular access is provided within this area, the minimum setback shall be 6 metres.
- The rear and side setbacks must be adequate to achieve an appropriate level of solar access within all proposed courtyards (see Section 3.9 Overshadowing and Access to sunlight).
- The development must be designed in such a way as to ensure existing substantial trees are not located within proposed courtyard areas (Section 3.6 Private Outdoor Space).
- To promote variation and interest in design Council may allow up to 50% of the wall of any Multi dwelling housing dwelling to be not less than 3 metres from the side and rear boundary.

Note: Private outdoor open space for each dwelling must have a minimum dimension of 4 m - Section 3.6 Private Outdoor Space.

3.5.5 Internal setbacks

Controls

- The development should be designed so that the windows of habitable rooms of one dwelling does not overlook habitable room windows of another dwelling.
- A minimum of 9m separation should be provided between the windows of habitable rooms of facing dwellings within an Multi dwelling housing development. (Section 3.10 Visual and Acoustic Privacy).



Figure 3.4.09

3.6 Private Outdoor Space (courtyards)

Private outdoor space is an important component of any residential development. Sydney's climate allows for outdoor living areas to be utilised for much of the year, making it essential that private outdoor spaces are functional and relate to the activity areas of the dwelling.

Objectives

- That private outdoor spaces are functional and relate to the activity areas of the dwelling.
- That all courtyards gain satisfactory access to sunlight.

Controls

- a. Minimum private open space requirements:
 - i. 30 m² for 2 bedroom dwelling; and
 - ii. 35 m² for 3 or more bedroom dwelling.
- b. All private outdoor space must have a minimum dimension of 4 metres and generally be at natural ground level.
- c. Private outdoor space should be orientated or be sufficiently large enough so that sunlight to at least 50% of the courtyard is achieved for two hours between 9 am and 3 pm on June 21 (see Section 3.9 Overshadowing and Access to Sunlight).
- d. The development should be designed in such a way that courtyards do not contain any existing substantial trees (see Section 3.7 Landscaping –Protection and Retention of Trees).
- e. Access other than through the dwelling, must be provided to each private outdoor space for maintenance purposes. This access must be not less than 1 m wide and may be provided through the garage.
- f. Private outdoor space should be securely enclosed (fences and gates), and clearly visible from the living areas of the dwelling to enable young children to play in a safe environment.
- g. Private outdoor space must be one area not many small areas, may be partially paved, and must not be covered by a roof.
- h. Courtyards are not permitted within front setback areas.
- i. A minimum 1.2 m wide landscaped privacy strip is required to be provided between the courtyard and the adjoining property (see Section 3.7 Landscaping – Privacy Planting).

3.7 Landscaping

Objectives

1. To ensure the landscaping of the site within the Multi dwelling housing development complements or enhances the desired future neighbourhood character by:
 - i. Providing sufficient open space for planting trees and shrubs;
 - ii. Retaining, protecting, or replacing, existing vegetation where possible; and
 - iii. Protecting neighbouring trees from damage to their root systems.
2. Landscaping designs must seek to:
 - i. Ensure that trees and shrubs will have a softening effect on buildings and the overall environment and trees should be planted in sufficient numbers and scale to achieve this aim;
 - ii. Screen poor views;
 - iii. Give privacy to occupants and neighbouring properties;
 - iv. Be easily maintained;
 - v. Use native plant material, particularly material indigenous to the area; and
 - vi. Provide for sufficient depth of soil to support the long term viability of the landscaping.

Controls

Landscape plans

- a. The development site must be landscaped to Council's satisfaction. A Landscape Concept Plan must be submitted with the Development Application. A final Landscape plan is to be submitted and approved prior to the issue of the Construction Certificate.
- b. Landscaping must be completed prior to the dwellings being occupied. Landscaping should include a watering system, that meets current Sydney Water usage requirements, to assist in the establishment and maintenance of the landscaping.

Protection and Retention of Trees

- c. Existing trees should be retained. Buildings and other structures must be designed and located a sufficient distance from proposed and existing trees to ensure the longevity of the tree. Setback from trees should be determined by an accepted industry standard based on trunk diameter measured at a height of 1.5 m.
- d. The development must be designed in such a way as to ensure existing substantial trees are not located within proposed courtyard areas. Where substantial trees exist every effort should be made to incorporate the trees into a common landscaped area. The design of the development should provide adequate separation between such trees and the building.
- e. Siting and tree selection should consider the potential for the tree to cause damage to the building and potential for the building to cause damage to the tree. In some situations root barriers will be required. The minimum distance from a building for a proposed tree or existing tree is determined based on the size or potential size of the tree itself. This information, i.e. the potential size of the tree and the proposed distance from it to the building, is to be provided to Council as a separate schedule within the landscape plan.
- f. An arboriculture assessment will be required with any application where significant trees are affected.

Note: The Tree Preservation requirements should be read to determine controls and to see if any trees are designated as significant trees - refer Ryde Local Environmental Plan 2014 and Part 9.6 Tree Preservation in this DCP.



Figure 3.4.10

Privacy Planting

- g. Landscaping may also be used to assist in preserving the privacy of the occupants of dwellings within the development and adjoining properties. Landscape strips included for privacy purposes must be not less than 1.2 metres wide. Shrubs planted in this strip must achieve a mature height of 3 to 4 metres. Where possible small trees with a mature height of 5 to 6 metres should be planted in combination with the shrubs.

Planting Along the Driveway and Around Pathways

- h. A planting strip not less than 1.2 metres wide should be provided between the driveway and the adjoining property boundary. Shrubs planted in this strip must achieve a mature height of 2 to 2.5 metres. Where possible small trees with a mature height of 5 to 6 metres should be planted in combination with the screen planting.
- i. A landscaping strip of not less than 1 metre must be provided between the driveway and the wall of the dwellings.
- j. The edge between the driveway and paths and gardens and lawn areas should be edged or kerbed with concrete or similar materials. Timber edging is not acceptable.
- k. A rolled edge should be used between the driveway and garden/ lawn areas.

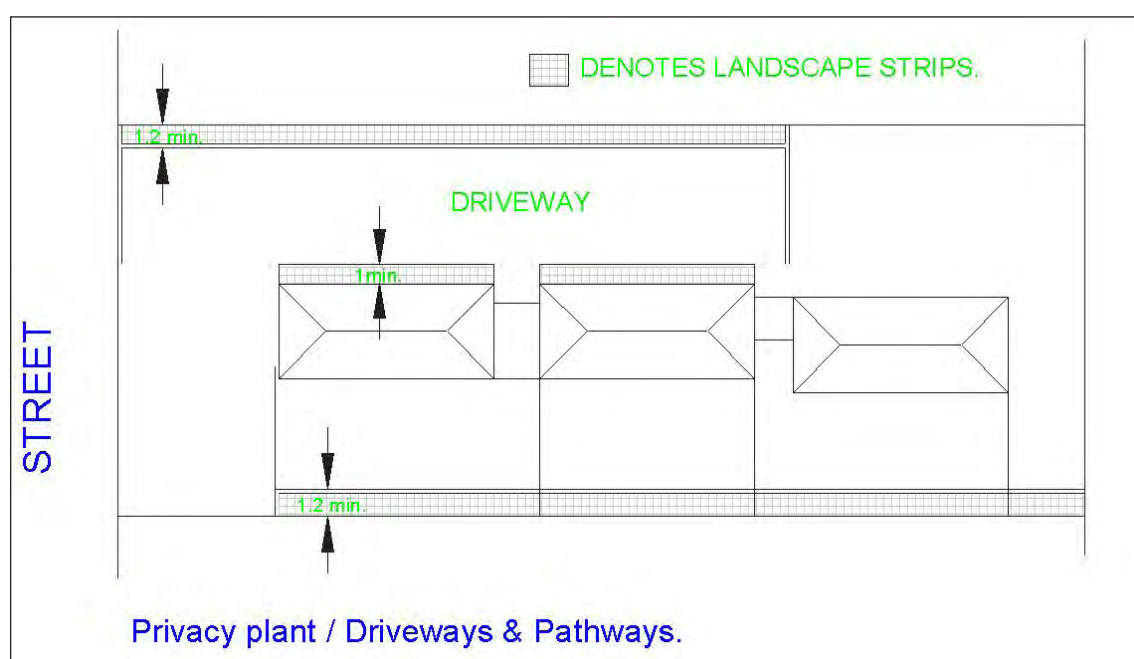


Figure 3.4.11 Privacy Planting

Nature Strips

- l. Trees located within the adjoining footpath area must be protected. Footpaths may need to be constructed and the nature strip landscaped as part of the development if considered necessary by Council (refer to Section 6).

On-site Detention

- m. On-site detention tanks and above ground on-site detention should not be located in the front setback as this limits the opportunity for landscaping. The preferred location is within or under the driveway. If an on-site detention tank must be located under landscaped areas it must have a minimum of 300 mm soil cover to facilitate vegetation growth. If a surface storage basin must be located in the front setback the depth of the basin must be less than 300 mm so that a pool type barrier fence will not be required.

3.8 Car Parking, Manoeuvrability and Driveway crossings

3.8.1 Car Parking

Objectives

1. To provide sufficient car parking on site to satisfy the needs of the residents and visitors to the site.

Controls

Number of car spaces

- a. On site car parking must be provided in accordance with the requirements identified under Part 9.3 Parking Controls in this DCP.
- b. At least one parking space for each dwelling must be provided in a lockable garage.

Note: In calculating the number of car parking spaces the number is rounded up to the next whole number. For example if the calculated number is 4.2 then 5 spaces must be provided.

Hatchet shaped allotments

- c. As a result of the reduced opportunity for on-street car parking with hatchet shaped allotments, additional on – site car parking must be provided.
- d. For hatchet-shaped allotments 1 additional car parking space for every 4 dwellings is required. These spaces must be located in an area accessible to all residents of the development.

Location

- e. Garages and parking spaces must not be located between the dwellings and the street frontage.
- f. Garages and parking spaces should not dominate the development when viewed from the street or any other public area.
- g. Garages (in particular doors) and carports should be detailed to reduce their visual impact and add interest.
- h. Tandem parking must not be provided in front of a garage.
- i. Garages and car parking areas should be located so that they can be used conveniently by the occupiers of the development.
- j. Garages should be located so that they separate dwellings.

3.8.2 Manoeuvrability

Objectives

1. To provide convenient and safe turning areas that will permit all vehicles to enter and leave the site in a forward direction. This requires adequate width of driveways, garages and turning areas.

Controls

- a. Vehicles must be able to enter and leave the garages and parking areas using a single 3 point turn.
- b. For corner allotments council may allow vehicles to leave the site by reversing where the traffic conditions allow this to occur safely and where there is not more than 3 dwellings and not more than 2 crossovers.
- c. For corner allotments vehicle access points must be no closer than 6 metres from the property boundary at the intersection of the 2 roads.
- d. Tandem parking arrangements will only be allowed where there is no impact on the ability of vehicles to manoeuvre on the site and access parking areas.
- e. The size and layout of garages and car parking must enable vehicles to enter and leave the garage and car parking space in a single 3 point turn.

The following table of garage opening widths (Figure 3.4.12) is a general guide only, as individual circumstances will vary. The table can also be used to check the opening for recessed garages and carports.

OFFSET FROM EDGE OF DRIVEWAY	SINGLE OPENING		DOUBLE OPENING	
	FORWARD ENTRY	REVERSE ENTRY	FORWARD ENTRY	REVERSE ENTRY
4.5	4.1	4.6	7.2	7.0
5.0	4.1	3.7	7.2	6.1
5.5	4.2	3.1	7.2	5.5
6.0	4.1	2.8	7.1	5.2
6.5	4.0	2.6	6.8	5.0
7.0	3.8	2.5	6.5	4.9
7.5	3.5	2.4	6.1	4.8
8.0	3.2	2.4	5.7	4.8
8.5	2.9	2.4	5.5	4.8
9.0	2.6	2.4	4.8	4.8
Straight Approach	2.4	2.4	4.8	4.8

Figure 3.4.12 Opening Width Guidelines

- f. All parking areas are to be designed in accordance with the *Australian Standards AS 2890.1*.

3.8.3 Driveways

Objectives

1. To ensure the design and function of driveways complement a development.

Controls

- a. Driveways must be suitably paved. The extent of driveways should be minimised to avoid excessive amounts of hard paved surfaces and grass cell or the like should be considered for turning bays.

3.8.4 Driveway Crossings

Objectives

1. To minimise the impact of driveway crossings on the flow of pedestrian movements and landscaping of the development.

Controls

- a. Where traffic conditions are suitable, the width of a driveway crossing is to meet the following minimum standards:

SIZE OF DEVELOPMENT	WIDTH OF CROSSING
Up to 10 car parking spaces	4 metres
More than 10 car parking spaces	Not more than 6 metres

Two vehicular crossings will not be permitted where the width of the driveway openings is more than 30% of the frontage.

3.9 Overshadowing and Access to Sunlight

Objectives

1. To ensure buildings are sited and designed to maximise access to daylight to habitable rooms.
2. To ensure daylight to habitable rooms in adjacent dwellings is not significantly reduced.
3. To maximise winter sunlight to courtyards within the development and the open space areas of neighbouring dwellings.

Controls

- a. Habitable room windows should face a courtyard or other outdoor space open to the sky. Habitable room windows should be no closer than 1.5 m (horizontal distance) from the wall of a building.
- b. Sunlight to at least 50% of each courtyard within the development and the principal area of ground level private open space of adjacent properties must not be reduced to less than two hours between 9 am and 3 pm on June 21.

Where existing overshadowing by buildings and fences is greater than this on adjoining properties, sunlight must not be further reduced by more than 20%.

- c. Shadowing diagrams are to be submitted to Council indicating solar access within the development and to adjoining properties. Fences and existing vegetation may be required to be provided on the shadow diagram where Council considers it necessary.

3.10 Visual and Acoustic Privacy

Objectives

1. To ensure that direct overlooking of main internal living areas and private open spaces of other dwellings both within the development and adjoining is minimised by building layout, location, design of windows and screening devices and landscaping.

Controls

- a. A minimum of 9m separation should be provided between the windows of habitable rooms of facing dwellings within a Multi dwelling housing development.
- b. Direct views between living area windows of adjacent dwellings should be screened or obscured where ground and first floor windows are within an area described by taking a 9m radius from any part of the window of the adjacent dwelling. This is the "privacy sensitive zone" (refer to Figure 3.4.13).
- c. Direct views from living rooms of dwellings into the principal area of private open space of other dwellings should be screened or obscured within a privacy sensitive zone of a 12 m radius (refer to Figure 3.4.13).

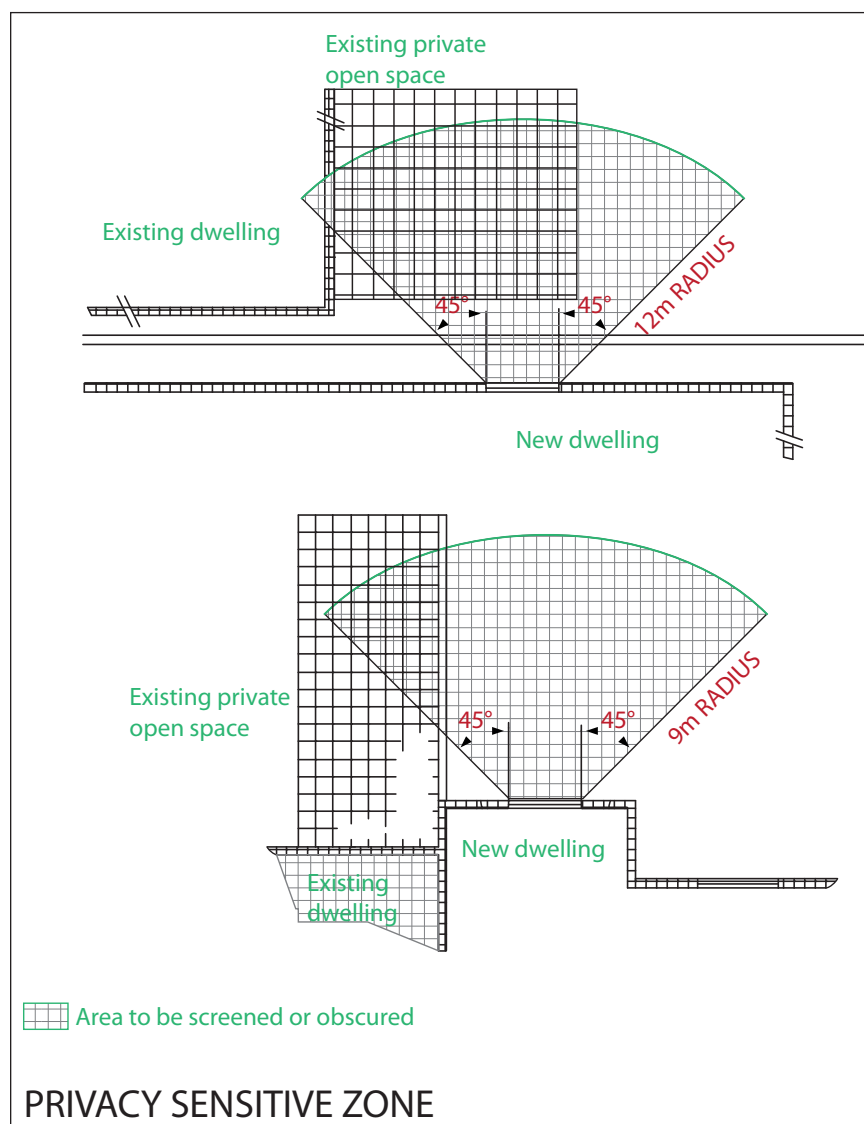


Figure 3.4.13
Privacy Sensitive Zone

- d. Balconies are prohibited on all dwellings and any elevated landing or similar structure associated with stairs to courtyard areas are to be no more than 1 m wide.
- e. Site layout and building design should protect the internal living and sleeping areas from high levels of external noise. Building design and layout should minimise transmission of structural-borne sound.
- f. The operating noise level of air conditioners, swimming pool pumps and other mechanical services must not exceed the background noise level by more than 5dB(A).

3.11 Accessibility

Objectives

- 1. To ensure that Multi dwelling housing developments meet the needs of all households including older persons and people with disabilities.

3.11.1 Pedestrian Access

Controls

- a. All Multi dwelling housing developments should be designed and constructed so that they are safe and accessible for pedestrians including children, people with disabilities and older people.
- b. Pedestrian access should be provided throughout the development using a continuous accessible path of travel to all dwellings where the level of the land permits. Such access where practicable should be separate from vehicle access.

3.11.2 Access for People with Disabilities - Developments of 6 or more dwellings

Controls

- a. Developments of 6 or more dwellings must be designed so that not less than 35% of the dwellings provide access to all indoor areas and outdoor living areas for people with disabilities in accordance with the *Australian Standards for Adaptable Housing AS4299*.
- b. Dwellings which have been designed in accordance with AS 4299 must be able to access the street, car parking and common areas using a continuous path of travel.

3.11.3 Access Audits

Controls

- a. Developments of 6 or more dwellings will be required to provide an access audit that has been conducted by a qualified and accredited access auditor.

4.0 BUILDING FORM

4.1 Appearance

Controls

- a. Multi dwelling housing developments should be designed and constructed so that they complement and enhance the existing streetscape of the locality.
- b. Multi dwelling housing must include elements such as pitched roofs, eaves, vertically orientated windows, verandahs, rendered and face brick.
- c. At least one dwelling must face the street where its residential entry is clearly seen. The design of the dwellings should enable casual surveillance from living rooms and verandahs to the street, internal driveways, public spaces and public parks.

4.2 Ceiling Height

Objectives

1. To ensure dwellings have sufficient light, space and ventilation to all rooms.

Controls

- a. The floor to ceiling height must not be less than 2.7 m.

4.3 Roofscape and Roof Materials

Objectives

1. To provide interest and variation to the appearance of the development and enhance and complement the existing streetscape.

Controls

- a. Roofs should generally be pitched between 22-30 degrees where visible from public areas or streets.
- b. The pitch of the roof may be increased to 35% where the second storey is contained within the roof.
- c. All roofs and where appropriate verandahs should incorporate, overhang eaves of at least 300 mm.
- d. The use of gables fronting the street is required to add further interest to the streetscape. Hip roofs will generally not be permitted.
- e. There should be variation in the roof line, by breaking the roof into smaller elements so that it does not appear as a continuous roof.
- f. Roofs should use materials consistent with the traditional materials of the street.

4.4 Building Materials for Walls

Objectives

1. To be in keeping with the locality and streetscape.

Controls

- a. The exterior walls should use materials consistent, in both form and colour, with the traditional materials of the locality. Detailing should be used to break up large wall areas adding interest and individuality.
- b. The proportion of windows and other openings should be consistent with the character of the locality. Windows should generally have a vertical proportion of between 2:1 and 3:1.

4.5 Fences

Objectives

1. To maintain the traditional low open front fences that are used throughout Ryde and creating a visual relationship to the adjoining public areas.

4.5.1 Front Fences

Controls

- a. Front fences must not be higher than 1 metre and must be at least 70% visually permeable.
- b. Front fences should be constructed of materials that complement the materials used in the dwellings. Materials which could be used include:
 - i. Wooden pickets (open);
 - ii. Masonry, sandstone or face brick with infill panel of decorative metal (some high quality pool fencing may be acceptable); and
 - iii. Wrought iron or materials of similar appearance.

4.5.2 Other Boundary Fences which Face a Street

Controls

- a. Boundary fences which face another street or abut a public space (including laneways) must be constructed of materials similar to the front fence.
- b. For boundary fences which face another street lapped and capped timber fences and "colorbond" fences will not be permitted.
- c. If a boundary fence which faces another street is of solid construction then indents not less than 600 mm by 300 mm must be provided in the fence to allow landscaping to soften the impact of the fence (refer to Figure 3.4.14) and reduce the potential damage by graffiti. Landscaping must be located where the depth of soil is capable of supporting the landscaping.

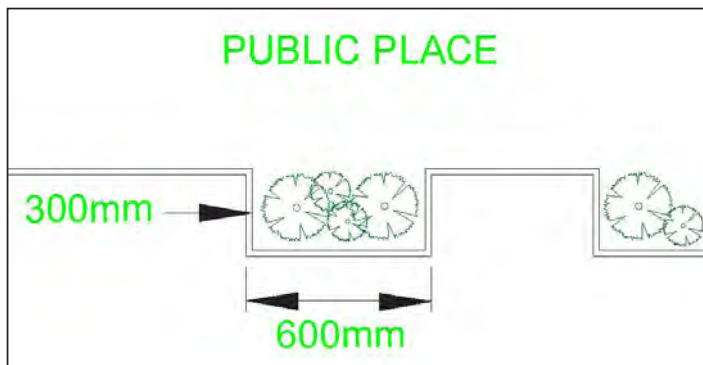


Figure 3.4.14 Solid Fence Construction Requirements

4.5.3 Other Boundary Fences

Controls

- Fences other than boundary fences which face a street must be a minimum of 1.8 m in height.
- Side, return and rear boundary fences should be constructed of timber to lapped and capped standard.

4.6 Clotheslines and Drying Area

Objectives

- To ensure that residents must have access to energy efficient and convenient, clothes washing and drying facilities.

Controls

- Each dwelling must be provided with clothes drying facilities in the form of an external clothesline. These should be located to maximise winter sunshine without being able to be seen from adjoining properties or public areas.
- Each dwelling must have its own laundry.

4.7 Lighting

Objectives

- To ensure safety and security of residents entering and leaving the site.

Controls

- Front yard lighting and lighting on the front of dwellings is to be provided.
- The location and design of all external lighting must not have an adverse effect on adjoining properties. Where possible sensor lights should be used.
- The use of spot lights is discouraged.

4.8 Location of Bin Enclosures

Objectives

1. To provide a storage area for rubbish and recycle bins which has minimal visual impact on adjoining dwellings, the streetscape and within the Multi dwelling housing development.

Controls

- a. Waste and recycling storage areas and facilities are to be provided and designed for all developments in accordance with the requirements of Part 7.2 Waste Minimisation and Management in this DCP.
- b. For developments of up to 5 dwellings on sites which are not steeply sloping and which have a wide road frontage:
 - i. Each dwelling must be provided with a storage area for Council's standard rubbish and recycling bins.
 - ii. The storage area should be behind the dwelling and not visible from public spaces, common areas within the development and habitable room windows (from dwellings within the development and on other properties).
- c. For developments of 6 or more dwellings or where sites are steeply sloping or have a narrow road frontage:
 - i. A central garbage bin enclosure shall be provided.
 - ii. The garbage bin enclosure is to be located behind the building line and suitably screened by landscaping. A plan indicating the design and location of the garbage bin enclosure must be submitted with the development application. (See Schedule 3 for details on the construction of Garbage Enclosures)

5.0 ENGINEERING

5.1 Drainage

Note: Detailed design standards are contained in other Parts of this DCP, such as Stormwater Management. The following provisions are a guide only.

Objectives

1. To provide an acceptable means of controlling stormwater runoff from properties that will not cause nuisance or damage to other private or council properties.

Controls

Stormwater Runoff

- a. Detailed design standards for the management of stormwater from, and through development projects are in Part 8.2 Stormwater Management of this DCP. That Part should be consulted to determine development standards. The following is a general overview on the management of stormwater.

Property Drainage

- b. Rainwater runoff from roofs and hard surfaces must not cause nuisance or damage to other private properties or to Council property.
- c. Surface runoff from roofs, driveways and hard surfaces is to be collected and directed by gravity to an on-site stormwater detention system before being discharged to either a street gutter, an appropriate Council pipeline or watercourse
- d. Properties which cannot pipe runoff to the street or do not have access to a suitable drainage pipeline will need to secure an interallotment drainage easement through neighbouring downstream properties to allow collected rainwater runoff to be piped, by gravity, to a Council street or suitable pipeline. The applicant should secure this easement through negotiation with the affected property owner(s) before submitting their development application to Council.
- e. Pump-out systems or systems that will redirect stormwater from one catchment to another will not be approved.
- f. Surface on-site stormwater detention basins will not be permitted within the front setback or private open spaces.

Minimising Flowrates

- g. The extent of hard surfaces within the site should be minimised. Pervious area of the site must not be less than 35% (refer Section 3.4).
- h. An on-site detention system must be provided to ensure the hard surfaces on the property do not aggravate flooding problems in lower reaches of the catchment.
- i. The use of porous paving for patios and pathways is encouraged to assist in minimizing flowrates.
- j. Where correctly constructed porous paving is used the area can be considered to be 25% impervious with regard to site cover calculations. The use of pervious paving for driveways is not considered to be suitable and will not be permitted.

Stormwater Conservation

- k. The use of rainwater and stormwater tanks to store stormwater for reuse is encouraged and is now a requirement for all new residential developments under State Government requirements. This is in addition to the requirement for on-site stormwater detention. All rainwater tanks must be fitted with a first flush filtering device to remove contaminants washed off roofs at the beginning of any storm event.
- l. Details of the types of tanks and guidelines for installation can be found in other publications and Part 8.2 Stormwater Management of this DCP.

Overland Flow

- m. Properties that are located downstream of other lots, or are located within topographical low points, will have rainwater flowing over them during storm events. The failure to adequately consider this overland flow can result in dwellings being flooded, problems of scour and erosion and even hazardous flows which could endanger lives. Adequate consideration must be given to the effects of overland flow on persons and property.
- n. If the amount of water entering the property is sizeable, a consulting hydraulic engineer must demonstrate the proposed development complies with the Council's minimum design standards. The proposed buildings location and shape will often have a large influence on overland flow characteristics. For this reason, the early involvement of a competent hydraulic engineer is recommended.
- o. If overland flow entering the property is small (from a catchment of less than five average sized allotments), a hydraulic study will generally be unnecessary, however developments must comply with the following principles.
- p. Overland flow must not:
 - i. Be obstructed from entering the site;
 - ii. Be redirected in a manner which increases the quantity or concentration of flows through adjoining properties;
 - iii. Enter buildings, lockup garages or sheds;
 - iv. Enter the piped drainage system unless that system has been designed to accept those flows;
 - v. Enter the on-site detention system.
- q. Overland flow must:
 - i. Be conveyed through the site in a safe manner,
 - ii. Be conveyed in a manner which will not result in scour.

Note: Piped drainage systems cannot be relied up to protect buildings against flooding by overland flow. Overland flow generally carries debris which can block a piped drainage system.

- r. Details of the method of dealing with stormwater are to be submitted with the Development Application to Council's satisfaction.

6.0 PUBLIC FACILITIES

6.1 Local Open Space Facilities

Objectives

1. To ensure that the increased demand for local open space facilities by the future residents of a Multi dwelling housing development is satisfied.

Controls

- a. Increased demand for local open space facilities is to be satisfied through the acquisition and embellishment of certain land for open space purposes identified in Council's Open Space and Recreation Facilities Plan. Multi dwelling housing developments which create an increased demand for local open space are required to make an appropriate cash contribution toward the local open space acquisition and embellishment program.

Note: Council has adopted City of Ryde Section 94 Contributions Plan 2007 which indicates the manner by which open space contributions are levied.

6.2 Local Road Facilities

Objectives

1. To protect the road pavement from damage by the discharge of surface water, or, alternatively, to protect any property from the flow of stormwater from a public road and provide pedestrian access.

Controls

- a. The construction of kerb and gutter, paved road shoulder, foot paving and landscaping where such facilities do not exist across the entire frontage of the land adjacent to the proposed development will be requested to be undertaken as part of the development. This work is to be carried out in accordance with the requirements of Council.

Schedule 1 – Site Analysis

Investigation of the site should identify:

- a. Site dimensions:**
 - Length
 - Width
- b. Topography:**
 - Spot levels and/or contours
 - North point
 - Natural drainage
 - Any contaminated soils or filled areas
- c. Services:**
 - Easements/connections for drainage and utility services
- d. Existing Vegetation:**
 - Location
 - Height
 - Spread of established trees and shrubs
 - Species
- e. Micro climates:**
 - Orientation
 - Prevailing winds
- f. Location of:**
 - Buildings and other structures
 - Heritage and archaeological features
 - Property boundaries
 - Pedestrian and vehicle access
- g. Views to and from the site**
- h. Overshadowing by neighbouring structures**
- i. Neighbouring properties:**
 - Location
 - Height
 - Use
- j. Privacy:**
 - Adjoining private open space
 - Living room windows overlooking the site (particularly those within 9m of the site)
 - Location of any facing doors or windows

k. Walls built to the site's boundary:

- Location
- Height
- Materials

l. Difference in levels between the site and adjacent properties**m. Views and solar access enjoyed by neighbouring properties****n. Major trees on adjacent properties, particularly those within 9m of the subject site****o. Street frontage features:**

- Poles
- Trees
- Kerb crossovers
- Bus stops
- Other services

p. The built form and character of adjacent development including:

- Architectural character
- Front fencing
- Garden styles

q. Heritage features of the surrounding locality and landscape**r. Direction and distance to local facilities:**

- Local shops
- Schools
- Public transport
- Recreation and community facilities

s. Public Open Space:

- Location
- Use.

t. Adjoining bushland or environmentally sensitive land**u. Sources of nuisance:**

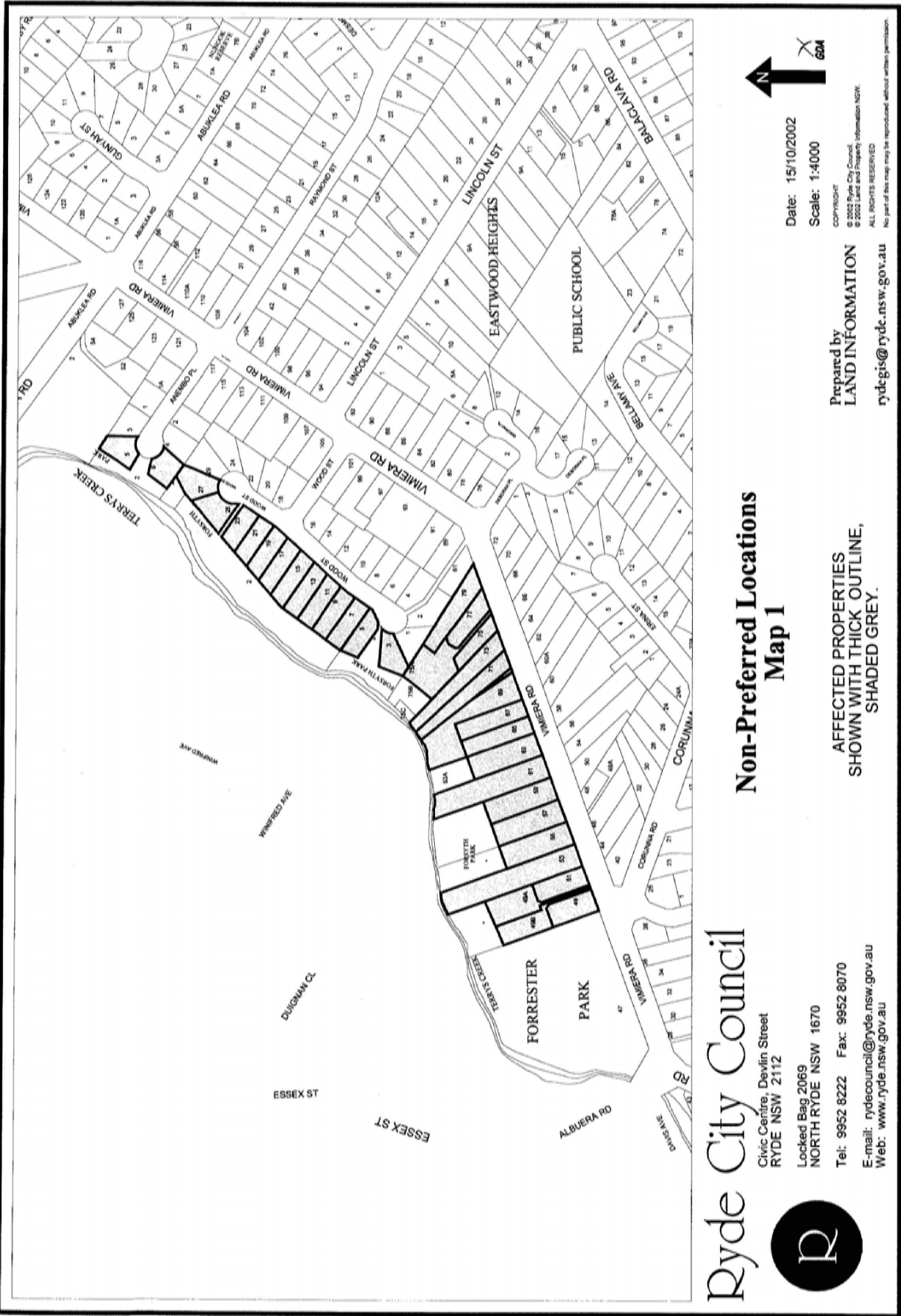
- Flight paths
- Noisy road or significant noise sources
- Polluting operations.

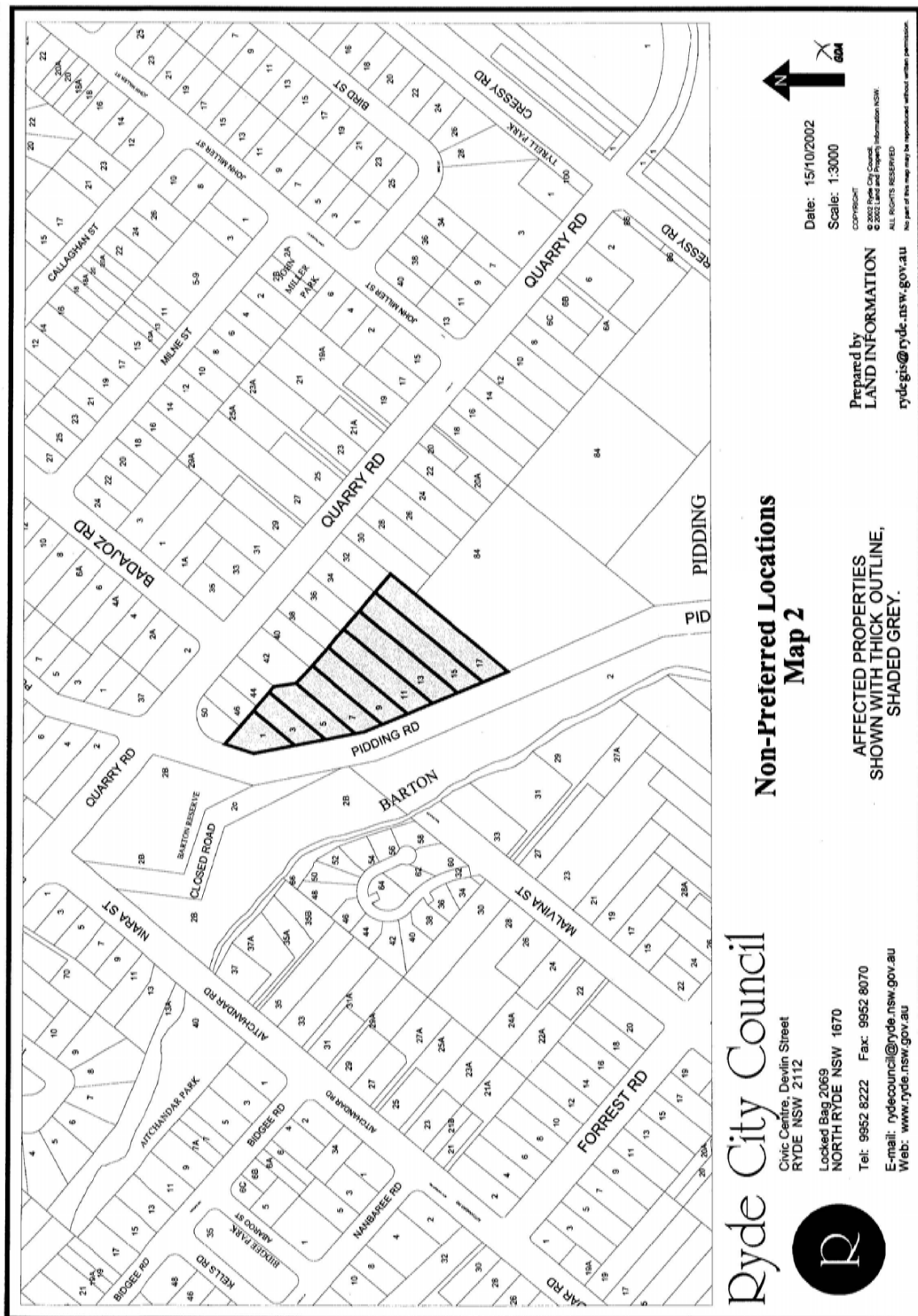
Schedule 2 – Non Preferred Locations

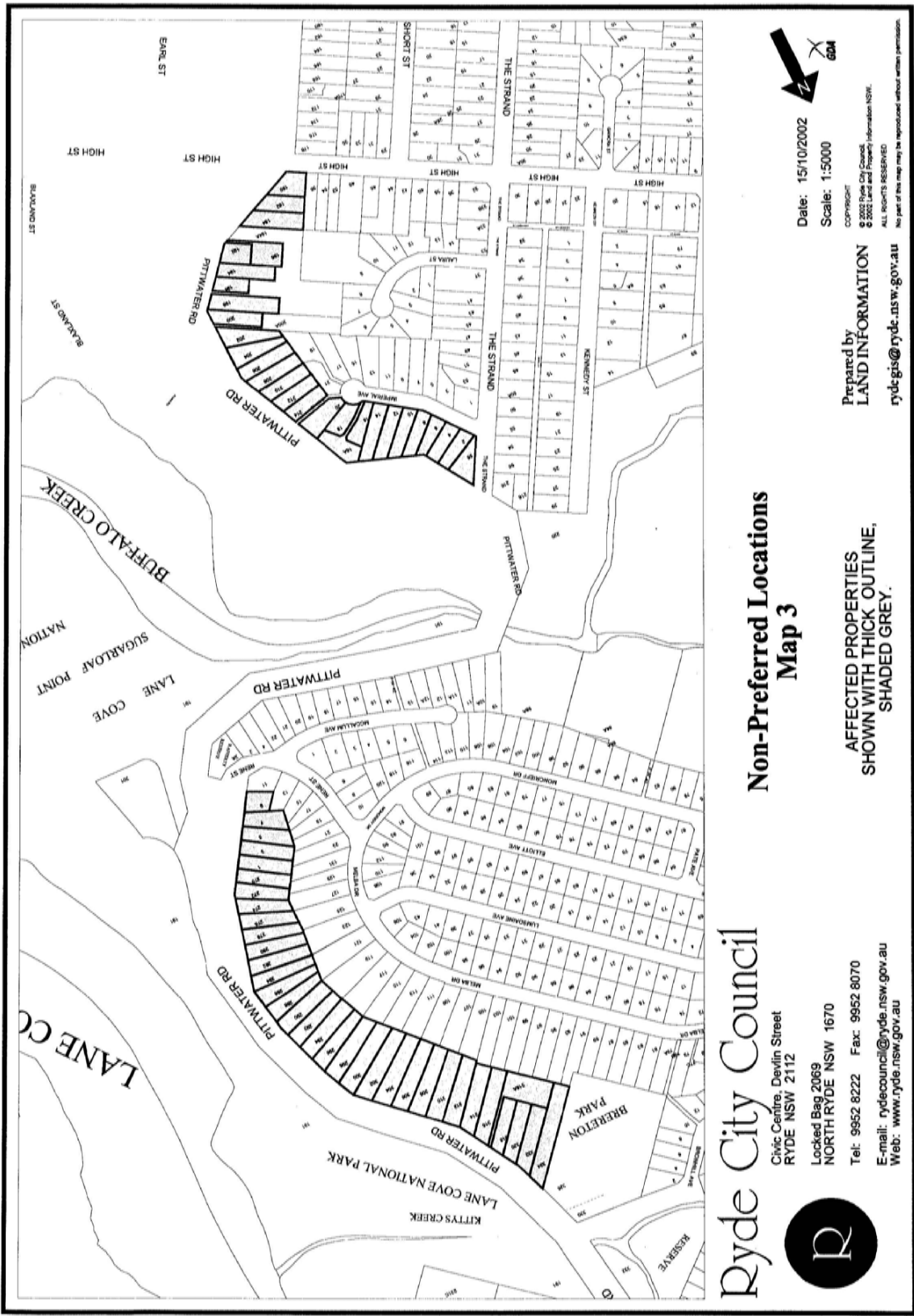
Table 3.4.S1. The following are non-preferred locations:

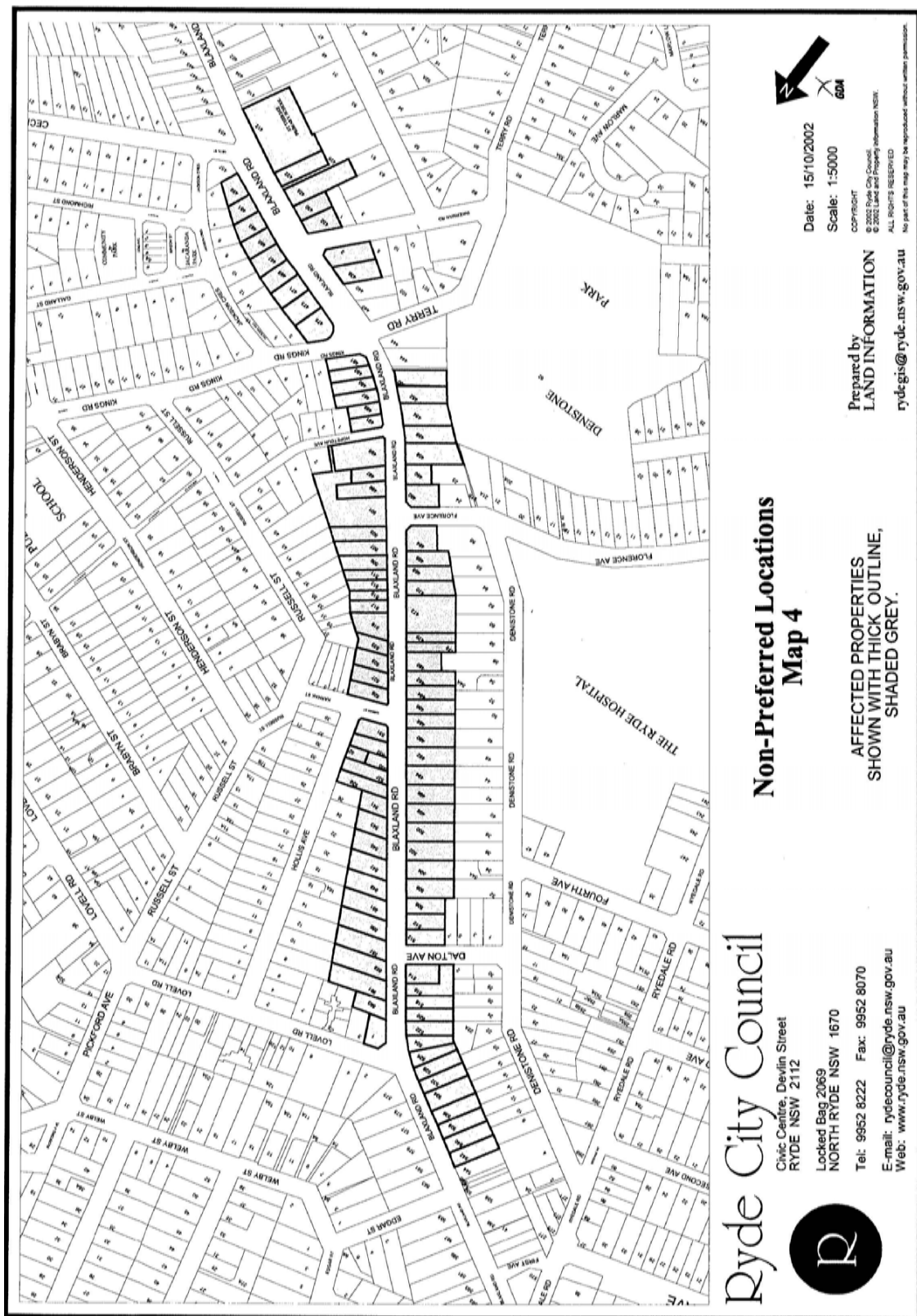
LOCATION		REASON	POSSIBLE EXEMPTIONS
Heritage Conservation Areas, Adopted Heritage Conservation Areas and Neighbourhoods.		Incompatible with the character of the location.	DCP for area indicates that Multi dwelling housing may be approved.
Land on the west side of Vimiera Road.	Refer to Map No 1.	Adverse impact on the environmental quality of the area.	Existing allotment does not abut existing or proposed open space and stormwater disposal does not adversely affect the open space.
Pidding Road	Refer to Map No 2.	Development will lead to adverse impact on vegetation and change the character of the local area.	None
Pittwater Road (part)	Refer to Map No 3	Development will lead to adverse impact on vegetation and change the character of the local area.	None
Blaxland Road (part)	Refer to Map No 4.	Adverse traffic impacts and adverse impact/ change to the character of the local area.	Existing house is retained and development is constructed on a hatchet shaped allotment. Not all allotments will be suitable for this form of subdivision.
Lane Cove Road and Church Street	Refer to Map No 5.	Adverse traffic impacts and poor residential amenity.	None
Victoria Road		Adverse traffic impacts and poor residential amenity.	Where existing house has a front setback of less than 6 m. This exemption is intended to allow redevelopment of land where the amenity of the existing dwelling has been badly affected by road widening.
Land abutting the Parramatta Fore-shore	Refer to Map No 6	Development would be incompatible with the intent of SEPP 56 and relevant DCPs.	None
Land affected by overland flow	Refer to Environmentally Sensitive Maps.	Development may be adversely affected by overland stormwater flow or affect other properties.	Able to demonstrate no adverse impact. Refer to Part 8.2 Stormwater of this DCP.

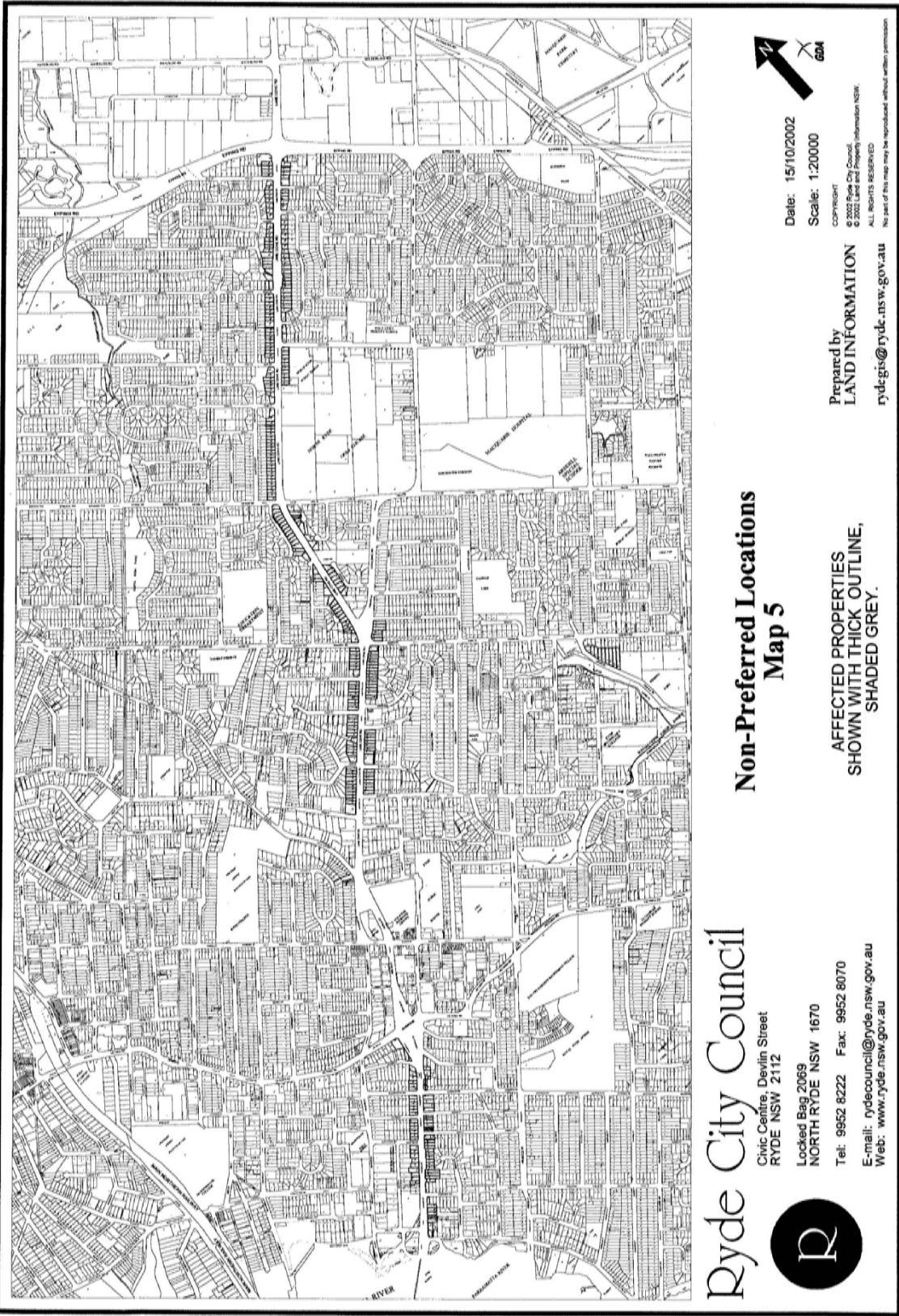
LOCATION		REASON	POSSIBLE EXEMPTIONS
Land abutting reserves where the land slopes towards the reserve		Adverse environmental impacts on reserve.	
Land where the slope is greater than that described in section 3.1 of this Plan.		Adverse impacts on privacy, access, over-land, stormwater flow.	
Land where there is significant vegetation as identified in "Urban Bushland in the Ryde LGA", April 2001		Development will have an adverse impact on the vegetation.	

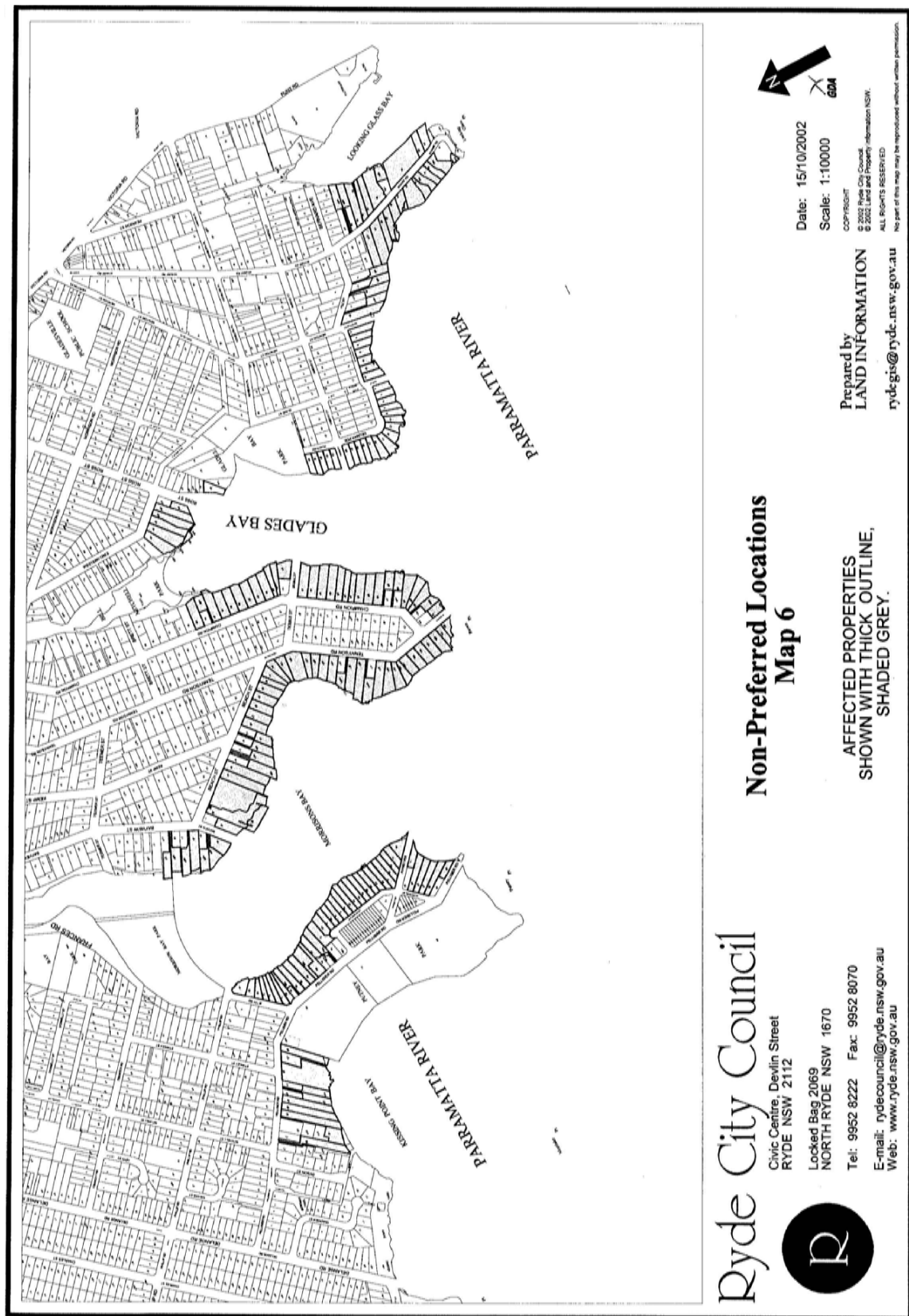












Schedule 3 – Waste Bin Storage Area Enclosures

The bin storage area should have walls constructed of brick or other approved masonry and be designed to screen the garbage bins from view. The storage area should not be higher than 1.3 m.

The floor of the bin storage area should be constructed of concrete, graded and drained so that surface water from the bin storage area is discharged onto a landscaped area on the site. The discharge of surface water from this area to the Council's stormwater drainage system.

Where building occupants can look down on the bin storage area, a roof should be provided over the bins unless adequately screened by other means.

Entry to the bin storage areas should be from the rear or the side. Bins must be screened from the street.

The minimum space required for each bin is 700 mm wide, 750 mm deep and at least 1.2 m high where a roof is provided over the bins.

The floor layout of the bin storage area should be designed so that each bin can be accessed and serviced without the need to move another bin. Typically bins should be arranged in rows with clear access at least 1 m wide along one side to permit easy servicing.

A paved pathway at least 1 m wide must be provided between the entry to the bin storage area and the front boundary. The path must be moderately graded to permit easy access for servicing and must not incorporate any steps.

Gates are not permitted between the storage area and the street as these may impede access for servicing purposes.

Suitable landscaping should be provided around the bin storage area to minimize the impact on the streetscape and nearby residents.

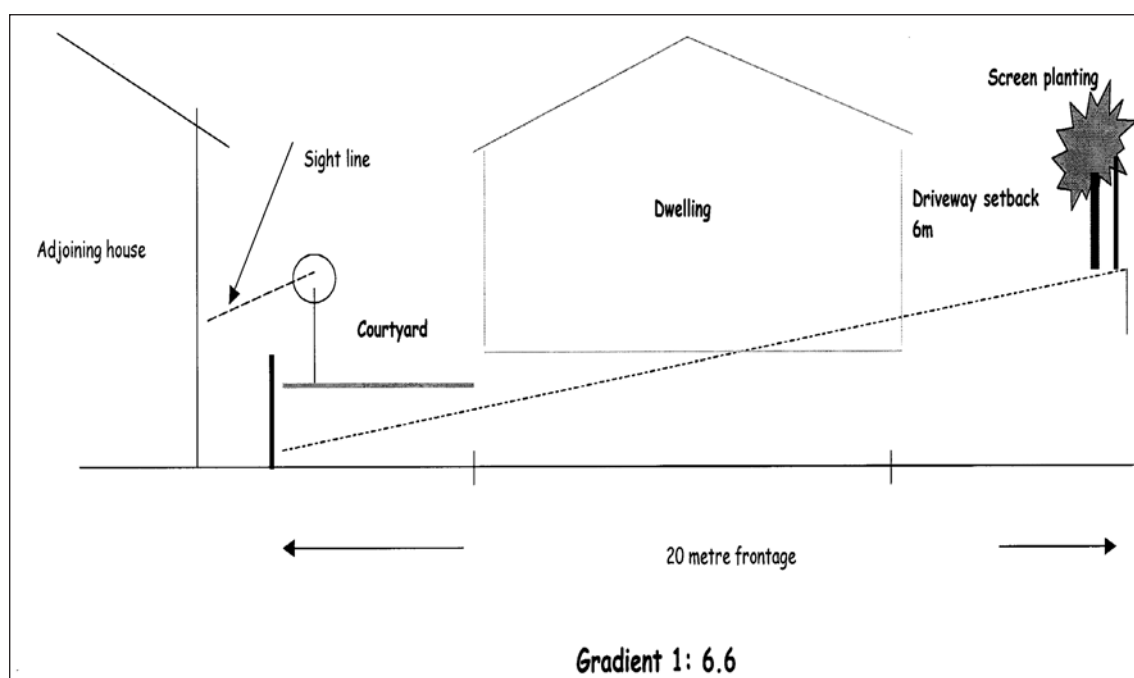
Note: As information on waste storage requirements may change, contact should also be made with Council's Waste Department (via Customer Service Centre).

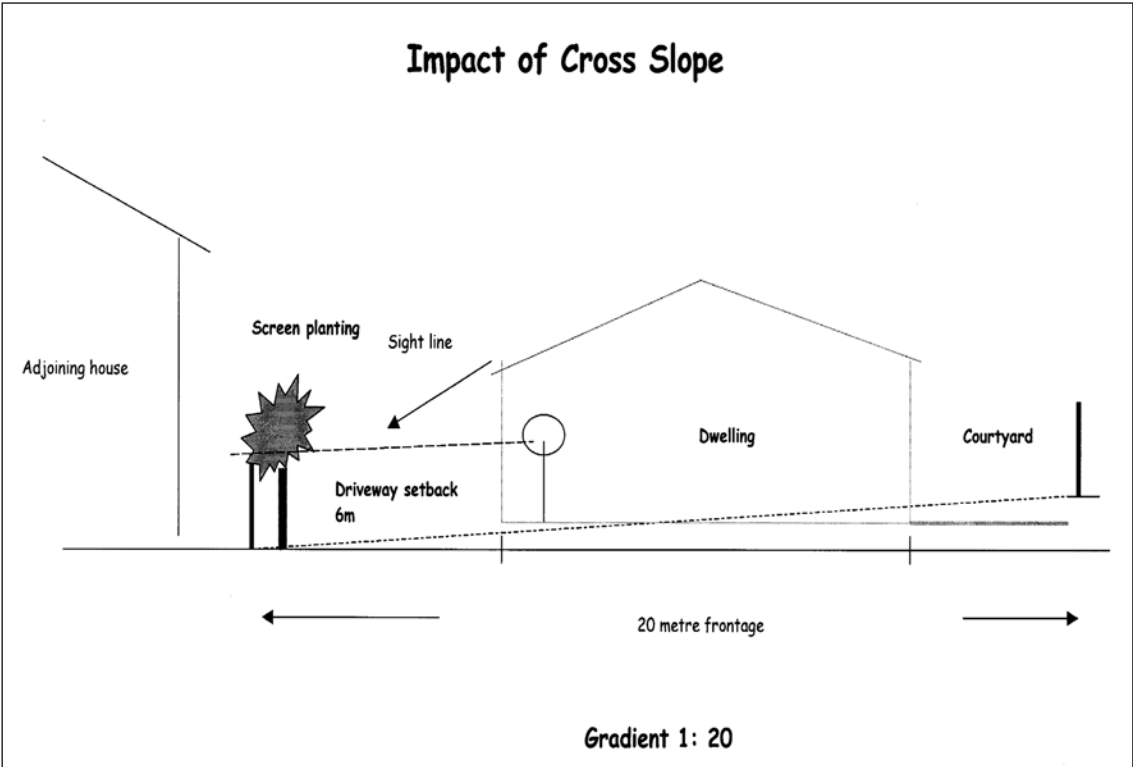
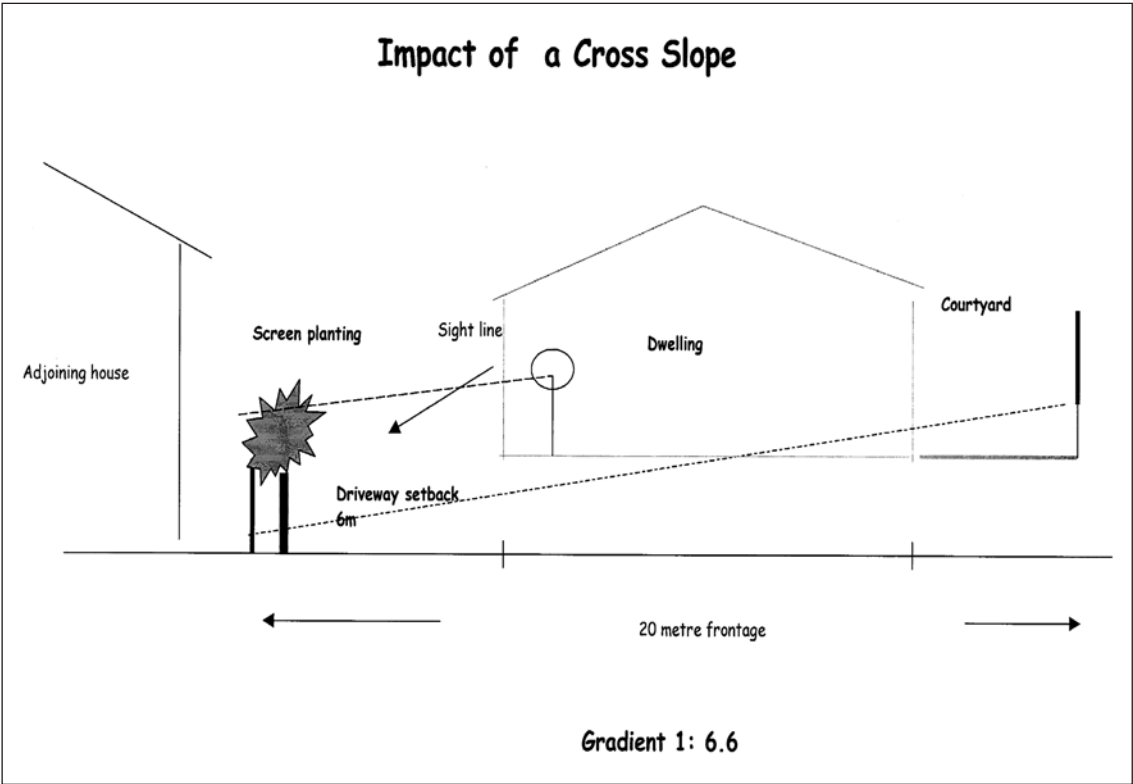
Schedule 4 – Designing for a Slope

This Plan aims to improve the quality of design for sloping sites. The following diagrams illustrate the challenges that must be overcome when designing for sloping sites. These challenges include:

- Privacy for adjoining properties
- Extent to cut and fill
- Location of courtyards
- Construction of retaining walls

Development applications should be accompanied by cross sectional drawings.





THIS PAGE HAS BEEN
INTENTIONALLY LEFT BLANK



City of Ryde
Civic Centre
1 Devlin Street
Ryde NSW 2112

www.ryde.nsw.gov.au

City of Ryde Development Control Plan 2014

Part: 3.5 Boarding Houses

Translation

ENGLISH

If you do not understand this document please come to Ryde Civic Centre, 1 Devlin Street, Ryde Monday to Friday 8.30am to 4.30pm or telephone the Telephone and Interpreting Service on 131 450 and ask an interpreter to contact the City of Ryde for you on 9952 8222.

ARABIC

إننا نعتذر عليك فهم محتويات هذه الوثيقة، نرجو للحضور إلى مركز بلدية رايد Ryde Civic Centre على العنوان: 1 Devlin Street, Ryde من الاثنين إلى الجمعة بين الساعة 8.30 صباحاً والساعة 4.30 بعد الظهر أو الاتصال بمكتب خدمات الترجمة على الرقم 131 450 لكي تطلب من أحد المترجمين الاتصال بمجلس مدينة رايد، على الرقم 9952 8222، نيابة عنك.

ARMENIAN

Եթէ այս գրութիւնը չէք հասկնար, խնդրեմ եկէ՛ք Րայդ Սիվիկ Սենթըր, 1 Տելվին փողոց, Րայդ, (Ryde Civic Centre, 1 Devlin Street, Ryde) Երկուշաբթիէն Ուրբաթ կ.ա. ժամը 8.30 – կ.ե. ժամը 4.30, կամ հեռաձայնեցէ՛ք Հեռաձայնի եւ Թարգմանութեան Սպասարկութեան՝ 131 450, եւ խնդրեցէ՛ք որ թարգմանիչ մը Րայդ Քաղաքապետարանին հետ կապ հաստատուէ ձեզի համար, հեռաձայնելով՝ 9952 8222 թիվի:

CHINESE

如果您看不懂本文，請在周一至周五上午 8 時 30 分至下午 4 時 30 分前往 Ryde 市政中心詢問 (Ryde Civic Centre, 地址: 1 Devlin Street, Ryde)。你也可以打電話至電話傳譯服務中心，電話號碼是: 131 450。接通後你可以要求一位傳譯員為你打如下電話和 Ryde 市政廳聯繫，電話是: 9952 8222。

FARSI

اگر این مدرک را نمی فهمید لطفاً از 8.30 صبح تا 4.30 بعد از ظهر دوشنبه تا جمعه به مرکز شهرداری رايد، Ryde Civic Centre, 1 Devlin Street, Ryde مراجعه کنید یا به سرویس مترجم تلفنی، شماره 131 450 تلفن بزنید و از یک مترجم بخواهید که از طرف شما با شهرداری رايد شماره 9952 8222 تلفن بزند.

ITALIAN

Se non capite il presente documento, siete pregati di rivolgervi al Ryde Civic Centre al n. 1 di Devlin Street, Ryde, dalle 8.30 alle 16.30, dal lunedì al venerdì; oppure potete chiamare il Telephone Translating and Interpreting Service al 131 450 e chiedere all'interprete di contattare a vostro nome il Municipio di Ryde presso il 9952 8222.

KOREAN

이 문서가 무슨 의미인지 모르실 경우에는 1 Devlin Street, Ryde 에 있는 Ryde Civic Centre 로 오시거나 (월 – 금, 오전 8:30 – 오후 4:30), 전화 131 450 번으로 전화 통역 서비스에 연락하셔서 통역사에게 여러분 대신 Ryde 시청에 전화 9952 8222 번으로 연락을 부탁드립니다.

Amend. No.	Date approved	Effective date	Subject of amendment

Table of Contents

CONTENTS

1.0 INTRODUCTION	4
1.1 Boarding Houses	4
1.2 Purpose	4
1.3 Objectives	4
1.4 Land Affected by this Part	5
1.5 Development covered by this Part	5
1.6 Relationship of this Part to other Plans and Policies	5
1.7 Application of this Part	5
1.8 Interpretation	6
1.9 Retention of Low Rental Affordable Accommodation	9
1.10 Building Classifications under the Building Code of Australia	9
2.0 LOCATION AND CHARACTER	11
2.1 Design and Local Area Character	11
2.2 Objectives	11
2.3 Development subject to provisions of Part 2 of the ARHSEPP	12
2.4 Development on land NOT subject to the provisions of Part 2 of the ARHSEPP	14
3.0 OTHER DESIGN REQUIREMENTS	16
3.1 Objectives	16
3.2 Privacy (Acoustic and Visual) and Amenity	16
3.3 Accessibility	17
3.4 Waste Minimisation and Management	17
3.5 Sustainability and Energy Efficiency	17
3.6 Internal Building Design	17
4.0 MANAGEMENT	21
4.1 Objectives	21
4.2 Management Controls	21
SCHEDULES	22
Schedule 1 – Guidelines for Local Area Character Assessment	22
Schedule 2 – Template for Plan of Management	27

1.0 INTRODUCTION

1.1 Boarding Houses

Boarding houses play a key role in providing affordable housing for many people on lower incomes needing accommodation close to work, study, transport, and services.

The *State Environmental Planning Policy (Affordable Rental Housing) 2009* (ARHSEPP) was introduced on 31 July 2009 to increase the supply and diversity of affordable rental and social housing in NSW. In particular, the City of Ryde has seen a significant increase in demand for low rental housing for student accommodation in proximity to Macquarie University. This Part includes controls for a new generation of boarding houses providing affordable housing options including for students and key workers in areas close to tertiary education facilities, hospitals, and centres.

In the development of this Part, Council is striving for a balance between a number of factors, including:

- Promoting residential amenity, safety and wellbeing for boarding house occupants as well as for neighbouring residents;
- Encouraging the development of a mix of housing types and affordable housing options, and
- Meeting State government policy requirements whilst seeking development outcomes which are compatible within the local context.

1.2 Purpose

This purpose of this Part is to provide development controls applicable to boarding houses in the City of Ryde.

1.3 Objectives

The objectives of this Part are:

1. To recognise boarding house accommodation as a component of the City of Ryde's residential housing mix.
2. To facilitate the provision of high quality affordable rental housing in the form of boarding houses where permissible in residential and business zones in the City of Ryde.
3. To support government policy which facilitates the retention and mitigates the loss of existing affordable rental housing.
4. To encourage appropriate design of boarding house development to ensure the impact and operation does not interfere with surrounding land uses and amenity.
5. To provide controls for boarding houses that are not within "accessible area" as defined under the ARHSEPP.
6. To ensure that boarding houses are designed to be compatible with and enhance the local area character and the desired future character.
7. To ensure that any building that has been developed or adopted into a boarding house maintains a satisfactory standard of amenity for both the needs of occupants and neighbours alike.

1.4 Land Affected by this Part

This Part applies to land within the City of Ryde where boarding houses are permitted.

1.5 Development covered by this Part

This Part applies to development for the purposes of boarding houses including:

- Establishment of a new boarding house by the conversion of an existing building
- Construction of a new boarding house
- Alterations and additions to an existing boarding house
- Demolition of an existing boarding house.

Note: Boarding Houses referred to in this DCP include both Class 1b and Class 3 Boarding Houses (Refer to Section 1.9 Building Classifications under the Building Code of Australia).

1.6 Relationship of this Part to other Plans and Policies

This Part supplements and gives guidance to the objectives and controls of *Ryde Local Environmental Plan 2014* (RLEP 2014) and *State Environmental Planning Policy (Affordable Rental Housing) 2009* (ARHSEPP).

This Part is also to be read in conjunction with:

- Other Parts of the City of Ryde Development Control Plan 2014, including but not limited to:
 - Part 3.3 Dwelling Houses and Dual Occupancy (Attached), 3.4 Multi Dwelling Housing [for Low Density Residential zone] in 3.0 Development Types,
 - all parts in 4.0 Urban Centres, and
 - all parts in 5.0 Special Areas with respect to local area character; and
 - Part 7.1 Energy Smart, Water Wise; Part 7.2 Waste Minimisation and Management; and Part 9.3 Parking Controls.
- City of Ryde Enforcement Policy – Boarding Houses.

Where boarding house development is associated with residential flat building design, the provisions of *State Environmental Planning Policy No. 65 Residential Flat Development (SEPP 65)* are also relevant.

1.7 Application of this Part

This Part has been designed to apply controls to boarding house development located in all land use zones where boarding houses are permissible with consent in the City of Ryde. This Part is to be applied in conjunction with the provisions of the ARHSEPP.

Division 3 Boarding Houses under Part 2 of the ARHSEPP applies controls to boarding houses on land within any of the following zones:

- R1 General Residential;
- R2 Low Density Residential (if within an “accessible area”);
- R3 Medium Density Residential;
- R4 High Density Residential;

B1 Neighbourhood Centre

B2 Local Centre

B4 Mixed Use

B6 Enterprise Corridor

Note: “accessible area” is defined under the Affordable Rental Housing SEPP (refer also next section 1.8 Interpretation).

In the City of Ryde boarding houses are permissible with consent in all of the above zones.

Controls

- a. All boarding house developments in the R2 Low Density Residential land use zone are required to comply with this DCP.

Note: This DCP does not provide for any variation on the minimum and maximum size of boarding rooms identified under the ARHSEPP and applies the requirement to the whole of the R2 Low Density Residential Land Use zone.

1.8 Interpretation

Terms used in this Part are the same as defined in the *Environmental Planning and Assessment Act 1979*, *State Environmental Planning Policy (Affordable Rental Housing) 2009* (ARHSEPP), the RLEP 2014 (and Standard Instrument LEP template), and the Dictionary under Part 10 of this DCP.

Three terms in particular have relevance to this Part, these being “boarding house”, “accessible area” and “walking distance”.

Boarding House

A boarding house is a type of land use under the group term “residential accommodation” and is distinct from other types under this group such as dwelling house, dual occupancy, hostel, group home, semi-detached dwelling, secondary dwelling, etc (refer RLEP 2014).

“Boarding house” is defined under environmental planning instruments, and is defined under the ARHSEPP and RLEP 2014 as follows:

boarding house means a building:

(a) that is wholly or partly let in lodgings, and

(b) that provides lodgers with a principal place of residence for 3 months or more, and

(c) that may have shared facilities, such as a communal living room, bathroom, kitchen or laundry, and

(d) that has rooms, some or all of which may have private kitchen and bathroom facilities, that accommodate one or more lodgers,

but does not include backpackers’ accommodation, a group home, a serviced apartment, seniors housing or hotel or motel accommodation.

Where the living emphasis shifts away from communal living to self contained units, a development may no longer be considered a boarding house, but rather a serviced apartment or similar (refer

definitions under RLEP 2014).

A boarding house is generally a building containing a number of rooms available for rent on a relatively short term basis (minimum 3 months). Generally boarding houses provide lodgings (distinct from shared accommodation), which is not subject to a long term residential lease.

A distinction exists between residents of boarding houses (known technically as “lodgers” or “boarders”) and “tenants” of residential accommodation under a longer term rental contract such as a residential tenancy agreement (refer *Residential Tenancies Act 2010*).

Accessible Area and Walking Distance

The applicability of the ARHSEPP (refer Part 2 Division 3 Boarding houses) in the R2 Low Density Residential land use zone is dependent on an accessible area test.

The following definitions apply: “accessible area” and “walking distance” have the same meanings as under the ARHSEPP, which are defined as:

accessible area means land that is within:

(a) 800 metres walking distance of a public entrance to a railway station or a wharf from which a Sydney Ferries ferry service operates, or

(b) 400 metres walking distance of a public entrance to a light rail station or, in the case of a light rail station with no entrance, 400 metres walking distance of a platform of the light rail station, or

(c) 400 metres walking distance of a bus stop used by a regular bus service (within the meaning of the Passenger Transport Act 1990) that has at least one bus per hour servicing the bus stop between 06.00 and 21.00 each day from Monday to Friday (both days inclusive) and between 08.00 and 18.00 on each Saturday and Sunday.

walking distance means the shortest distance between 2 points measured along a route that may be safely walked by a pedestrian using, as far as reasonably practicable, public footpaths and pedestrian crossings.

The diagram below indicates approximate locations of areas in the City of Ryde which could satisfy the accessible area test under Part 2 Division 3 of the ARHSEPP.

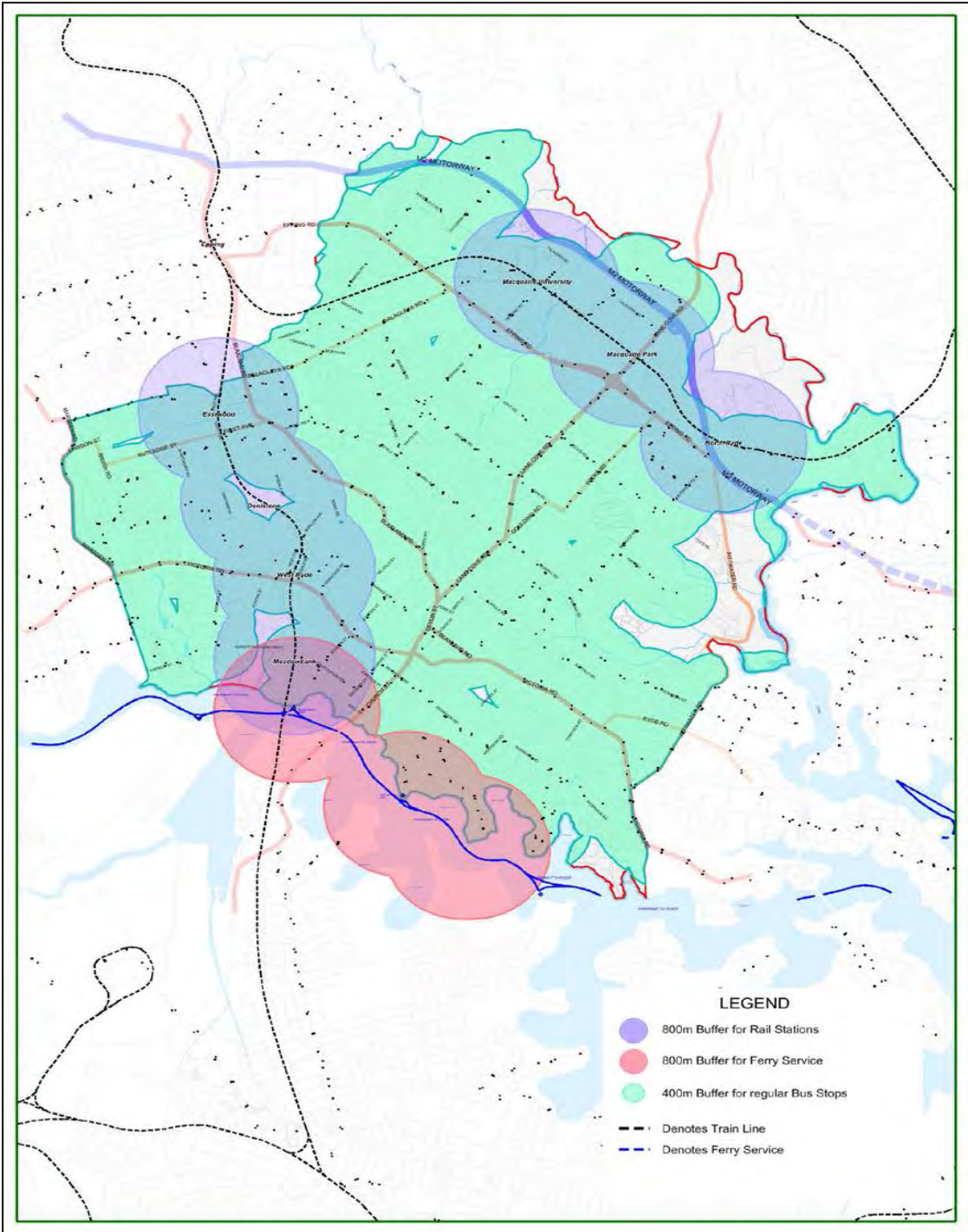


Figure 3.5.01 Potential accessible areas in the City of Ryde according to the “accessible area” test under the ARHSEPP (Part 2 Division 3)

Note: This map is indicative only and not to scale.

1.9 Retention of Low Rental Affordable Accommodation

A boarding house plays a key role in providing affordable housing for people on lower incomes in our community. To support ongoing retention of low rental affordable housing, the ARHSEPP does not permit the strata or community title subdivision of boarding houses (refer Clause 52 *No subdivision of boarding houses* under the ARHSEPP).

The ARHSEPP also applies to buildings which were low-rental residential as at 28 January 2000 (refer Part 3 *Retention of existing affordable rental housing* under the ARHSEPP).

Where a development application proposes the demolition or change of use of an existing boarding house, Council may require the submission of a Social Impact Assessment to accompany the development application which addresses, the social and economic impacts of the potential loss of low-rental accommodation, and the demand for and availability of comparable low-rental accommodation in the City of Ryde.

1.10 Building Classifications under the Building Code of Australia

The Building Code of Australia (BCA) is a national construction code comprising requirements for fire safety, access, amenity, health and safety, and structural standards. The BCA classifies buildings according to the purpose for which they have been designed, constructed or intended to be used. Boarding houses are included in Class 1b and Class 3, as follows:

Class 1b – a boarding house, guest house, hostel or the like with a total floor area not exceeding 300m² and in which not more than 12 persons would ordinarily be resident, which is not located above or below another dwelling or another Class of building other than a private garage.

Class 3 – a residential building, other than a building of Class 1 or 2, which is a common place of long term or transient living for a number of unrelated persons. Examples include a boarding house, hostel, backpackers accommodation, guest house or residential part of a hotel, motel, school or detention centre.

The distinction in classification is important in understanding design and safety requirements for boarding houses as they vary for each class. This DCP Part addresses the different design and planning requirements for Class 1b and Class 3 Boarding Houses but does not repeat BCA provisions.

Disability (Access to Premises – Buildings) Standards 2010 (Disability Discrimination Act 1992) apply to both classifications of boarding houses under the BCA.

Existing buildings may require upgrade to meet current BCA requirements. For example, where a dwelling house is proposed to be converted into a boarding house (change of classification to Class 1b) smoke detection systems and emergency lighting will need to be upgraded to meet the Class 1b requirements. In the case of conversion of buildings to Class 3 boarding houses, more stringent fire safety requirements apply.

Reference to the *Environmental Planning and Assessment Regulations 2000* also applies (in particular Clauses 93 - *Fire safety and other considerations* and 94 - *Consent authority may require buildings to be upgraded*).

A BCA Consultant's report will be required to be prepared and submitted with the Development Application for all applications relating to Class 3 boarding houses.

The following table identifies some of the scope of works and requirements under the two classes of boarding houses.

DEVELOPMENT PROPOSAL		CLASS 1B	CLASS 3
Existing Building	Establishment of a new boarding house by converting an existing building (change of classification)	Requirements for upgrading existing building to meet BCA include: <ul style="list-style-type: none"> • smoke detection systems • emergency lighting • sound insulation. <p>Note: It is advisable that the applicant seek the advice of a suitably qualified BCA consultant.</p>	Requirements for upgrading existing building to meet BCA include: <ul style="list-style-type: none"> • smoke detection systems • emergency lighting, and • building elements (dividing walls, doors, stairways, hall widths etc) to meet fire safety and resistance requirements. <p>Note: A report prepared by a suitably qualified BCA consultant is required to be submitted with DA.</p>
	Alterations and additions to an existing boarding house	AS ABOVE <p>Note: It is advisable that the applicant seek the advice of a suitably qualified BCA consultant.</p>	AS ABOVE <p>Note: A report prepared by a suitably qualified BCA consultant is required to be submitted with DA.</p>
New Building	Construction of a new boarding house	Building to be designed to comply with BCA (Class 1b).	Building to be designed to comply with BCA (Class 3).

Note: This DCP part does not repeat BCA requirements

2.0 LOCATION AND CHARACTER

2.1 Design and Local Area Character

This section will assist applicants in designing boarding houses that are compatible with the character of the local area as required under the ARHSEPP (refer Clause 30A *Character of local area* under the ARHSEPP).

In the City of Ryde, many boarding house developments occur as infill development in an existing suburban area or centre. Consideration of the local character comprises a number of factors including the site characteristics, the streetscape, the expected and/or desired future character of the area identified through the land use zone objectives and applicable development standards.

Local area character is not a function of the land use. Rather, character is a consideration of the external appearance of the building and how it relates to the context within which it is proposed. For example, where a boarding house is proposed through the conversion of a dwelling house, it is the design of any proposed works that will be assessed in terms of compatibility with the local area and streetscape character, not the change in function of the building from a dwelling-house to a boarding house.

Local area character is shaped by many contributing factors such as:

- The underlying natural landform
- Distinctive landscape elements
- The age and style of the existing buildings
- The scale and form of the buildings
- Street and subdivision patterns
- Setbacks of the buildings
- Materials, building techniques and details
- Views, vistas and skylines.

Local area character is also shaped by the planning controls that apply to the land use zone in which the proposal is located. In the City of Ryde, boarding house development is permissible in a number of different residential and business land use zones which in turn may include different character areas. There are also areas in the City which are changing in character. Where areas are in transition, the local area character is also informed by the planning controls and any desired future character statements under the LEP and the DCP.

2.2 Objectives

Objectives

1. To provide controls which support the “deemed to satisfy” and minimum requirements under the ARHSEPP.
2. To provide controls for boarding house development on land where the ARHSEPP does not apply.
3. To ensure boarding houses complement the local area character and streetscape and meet the objectives of the land use zone.
4. To ensure development is of a scale and form that is compatible with the character and quality of streetscapes.

2.3 Development subject to provisions of Part 2 of the ARHSEPP

These controls apply to all boarding houses developments which are subject to the requirements under the ARHSEPP Part 2 Division 3 Boarding Houses, including in particular that require design to be compatible with the local area character (refer Clause 30A *Character of local area* under the ARHSEPP).

This section therefore applies to land within any of the following land use zones under RLEP 2014 (refer clauses 26 *Land to which Division applies* and 27 *Development to which Division applies* of Part 2: Division 3 under the ARHSEPP):

- a. Zone R1 General Residential
- b. Zone R2 Low Density Residential and within an accessible area as defined under the ARHSEPP
- c. Zone R3 Medium Density Residential
- d. Zone R4 High Density Residential
- e. Zone B1 Neighbourhood Centre
- f. Zone B2 Local Centre
- g. Zone B4 Mixed Use

Refer Section 2.4 of this Part for controls applicable to boarding house development on land not included in the above list, for example on R2 Low Density Residential zoned land which is not in an accessible area as defined under the ARHSEPP, and land within the B6 Enterprise Corridor zone.

Controls

- a. All boarding house developments are to be designed to be compatible with the character of the local area.
- b. Where external changes, including building and/or construction work, are proposed, a Local Area Character Statement is to be prepared and submitted with the development application. This must demonstrate compatibility of the design of the development with the character of the local area. The statement is to include descriptions of:
 - the existing character of the local area (comprising streetscape and visual catchment area) in terms of character elements, and
 - the design responses for the following character elements, as a minimum:
 - i. predominant building type,
 - ii. predominant height of buildings,
 - iii. predominant front setback and landscape treatment,
 - iv. permissible floor space ratio (FSR) and site coverage,
 - v. predominant pattern of subdivision and spacing of buildings,
 - vi. predominant parking arrangements on sites within the area (location, structures),
 - vii. predominant side setbacks, and
 - viii. predominant rear alignment of buildings and rear landscaping.
- c. Boarding house development located in the vicinity of a Heritage Item or within a Heritage Conservation Area must be designed sympathetically to the significance of the Heritage Conservation Area/Item. Character elements identified in (b) above and the following are to be addressed:
 - i. the significance of the Heritage Item or Heritage Conservation Area

- ii. the architectural form (built form and roof form), materials and finishes of existing buildings
- iii. the age and style of existing buildings
- iv. views, vistas and skylines
- v. the curtilage of the Heritage Item.

Note: Heritage Items and Heritage Conservation Areas are listed/ mapped under Ryde's LEP, and additional information about the significance is included in inventory sheets for each, available via Council's website.

- d. The design of boarding house development is to take into consideration any desired future character objectives of urban centres identified under the RLEP 2014 and Part 4 Urban Centres of this DCP.

Note: To assist preparation of a Local Area Character Statement, a guidance table is attached to this Part (refer Schedule 1 Guidelines for Local Area Character Assessment).

Size and Scale

- e. In the R1 General Residential and R2 Low Density Residential zones, a maximum number of 12 bedrooms per boarding house will be permitted.
- f. Notwithstanding compliance with numerical standards under the ARHSEPP and LEP, applicants must demonstrate that the bulk and relative mass of development is acceptable for the street and adjoining dwellings in terms of:
 - i. Overshadowing and privacy
 - ii. Streetscape (bulk and scale)
 - iii. Building setbacks
 - iv. Parking and traffic generation
 - v. Landscape requirements
 - vi. Visual impact and impact on existing views (this must address view sharing)
 - vii. Any significant trees on site, and
 - viii. Lot size, shape and topography.

Parking and Traffic

- g. Parking spaces and access are not to be located within communal open space areas or landscaped areas.
- h. Notwithstanding the requirements of Part 9.3 Parking Controls under this DCP, a boarding house development for 30 or more bedrooms is to be supported by a Traffic and Parking Impact Assessment Report, prepared by a suitably qualified person, addressing as a minimum the following factors:
 - i. the prevailing traffic conditions
 - ii. the likely impact of the proposed development on existing traffic flows and the surrounding street system
 - iii. pedestrian and traffic safety, and
 - iv. justification of any variation to the parking requirements (if proposed).

2.4 Development on land NOT subject to the provisions of Part 2 of the ARHSEPP

The following section applies to boarding house development where it is permissible with consent from Council and is NOT subject to Part 2 Division 3 Boarding Houses of the ARHSEPP by virtue of clauses 26 *Land to which Division applies* and 27 *Development to which Division applies* under that division where the land is:

- a. Zoned R2 Low Density Residential NOT within an accessible area as defined under the ARHSEPP, and
- b. Zoned B6 Enterprise Corridor.

Controls

The following controls apply to proposals for boarding house development on land not identified under Clauses 26 *Land to which Division applies* and 27 *Development to which Division applies* of Part 2 Division 3 Boarding Houses under the ARHSEPP.

Development Standards

- a. Development is to be designed to comply with development standards applicable to dwelling houses under Ryde Local Environmental Plan 2014, and with development controls under this DCP applicable to dwelling houses (refer Part 3.3 Dwelling Houses and Dual Occupancy (attached)).

Note: A control applies under the ARHSEPP for number of car parking spaces per boarding houses in locations which are not in an accessible area as defined under the ARHSEPP.

Accommodation size

- b. Each boarding room is to have a gross floor area (excluding any area used for the purposes of private kitchen or bathroom facilities) of at least:
 - i. 12 square metres in the case of a boarding room intended to be used by a single lodger, or
 - ii. 16 square metres in any other case.

Note: Council will not consider room sizes that are less than the above minimum room sizes. Boarding rooms may include private kitchen or bathroom facilities.

- c. All boarding rooms are to have a gross floor area (excluding any area used for the purposes of private kitchen or bathroom facilities) not exceeding 25 square metres.
- d. All boarding rooms must not be occupied by more than 2 adult lodgers.

Local Area Character

- e. Development is to be designed to be compatible with the character of the local area comprising the streetscape and visual catchment area of the proposed development.
- f. The front setback and its landscape treatment is to be designed to be compatible with the streetscape in which the building is located.
- g. The applicant is to demonstrate compliance with controls 2.4 (e) and 2.4 (f) through the submission of a Local Area Character Statement with the development application identifying compatibility of the development with the character of the local area. The statement is to refer to character elements and design compatibility responses in **Schedule 1 Guidelines for Local Area Character Assessment**.

Note: A Local Area Character Statement will only be required where external changes, including construction/building work, are proposed as part of the development.

- h. Development is to be designed to be consistent with the desired future character of low density residential areas in the City of Ryde (refer section 2.1 Desired Future Character under Part 3.3 Dwelling Houses and Dual Occupancy (attached)).

Communal Living Room and Solar Access

- i. Communal living room/s, where proposed, are to receive a minimum of 3 hours direct sunlight between 9am and 3pm in mid-winter.
- j. Where development has 5 or more boarding rooms, at least one communal living room is to be provided.

Note: Communal living room means a room within a boarding house or on site that is available to all lodgers for recreational purposes, such as a lounge room, dining room, recreation room or games room.

Private open space

- k. The following private open space areas are to be provided (other than within the front setback area) as a minimum:
 - i. one area of at least 20 square metres with a minimum dimension of 3 metres is provided for the use of the lodgers,
 - ii. if accommodation is provided on site for a boarding house manager—one area of at least 8 square metres with a minimum dimension of 2.5 metres is provided adjacent to that accommodation,
- l. Where provided, private open space is to be clearly identified and designated for private use.

Communal Open Space

- m. All communal open space is to be:
 - i. north-facing to receive a minimum 2 hours solar access to at least 50% of the open space area between 9am and 3pm on 21 June;
 - ii. provided at ground level in a courtyard or terrace area, and wherever possible adjacent to the main circulation areas;
 - iii. provided with partial cover from weather;
 - iv. connected to communal indoor spaces, such as kitchens or living areas;
 - v. provided with communal facilities such as barbecues, seating and shade structures where appropriate; and
 - vi. screened from adjoining properties and the public domain.

Access, Parking and Traffic

- n. Parking is to be provided on the site in accordance with the rates and requirements identified under this DCP (refer Part 9.3 Parking Controls). For every 5 boarding rooms or part thereof, area equivalent to one parking space must be provided for a bicycle parking and area equivalent to one parking space one must be provided for motorcycle parking.

3.0 OTHER DESIGN REQUIREMENTS

Boarding houses, are generally for occupants who are unrelated. It is therefore important to maintain a level of safety, amenity and security for all occupants in the design while providing for opportunities for social interaction.

Proposals should also consider the impact of Boarding Houses on adjoining properties, where both noise disturbance and visual intrusion should be minimised.

The ARHSEPP includes provisions regarding the following matters:

- minimum and maximum sizes of boarding rooms and maximum occupancy per boarding room;
- manager's accommodation (when to be provided and minimum size);
- kitchen and bathroom facilities required; and
- communal living rooms (when required) and minimum requirements for solar access.

Additional matters also apply as required under the BCA.

This section identifies design requirements which are not covered in the ARHSEPP, addressing matters such as privacy, waste management, internal building design, sustainability and energy efficiency.

This section applies to all boarding house development in the City of Ryde, unless otherwise stated.

3.1 Objectives

Objectives

1. To ensure all new boarding houses and building conversions are designed to provide an acceptable level of safety, amenity and privacy for occupants of boarding houses, and also for occupants of neighbouring developments.
2. To promote opportunities for energy and water use efficiency in boarding house development to assist the affordability of low rental accommodation.
3. To require facilities that are designed to meet the long term needs of residents and to promote student/lodger interaction and a sense of community.
4. To identify adequacy with respect to kitchen, bathroom and laundry facilities to meet resident's needs.
5. To provide for adequate space and appropriate location of management functions.

3.2 Privacy (Acoustic and Visual) and Amenity

Controls

- a. The main entrance of the boarding house is to be located and designed to address the front (street) elevation.
- b. Accessways to the front entrance of the boarding house are to be located away from windows to boarding rooms to maximise privacy and amenity for lodgers.
- c. Boarding houses are to be designed to minimise and mitigate any impacts on the visual and acoustic privacy of neighbouring buildings and on the amenity of future residents.

- d. An acoustic report prepared by a suitably qualified acoustic consultant may be required where there is the potential for noise impacts on occupants and neighbours.

3.3 Accessibility

The design of boarding houses needs to provide an environment that is physically accessible to all members of the community, including those with disabilities.

The ARHSEPP contains parking rates for boarding houses. The design of boarding houses, including parking spaces and access thereto, will also need to take into consideration the following controls.

Controls

- a. All boarding house developments are to be accompanied by an Accessibility Report which addresses the accessibility requirements for people with disabilities, where required, under the BCA and Disability (Access to Premises – Buildings) Standards 2010.

3.4 Waste Minimisation and Management

Controls

- a. Waste storage and recycling facilities shall be provided on the premises in accordance with the requirements for boarding houses contained in Part 7.2 Waste Minimisation and Management of this DCP.

3.5 Sustainability and Energy Efficiency

Attention to energy efficiency and sustainability in the development and establishment of boarding houses is important for ongoing affordability and amenity for occupants as well as environmental sustainability more broadly.

Controls

- a. A BASIX Certificate is to be submitted with the Development Application.

Note: From July 2007, all residential development (including boarding house development) of a total estimated cost of works of \$50,000 or more requires which must be submitted with the development application. A Certificate is issued once a BASIX assessment has been satisfactorily completed, using the on-line tool. Refer NSW Planning & Infrastructure website at: www.planning.nsw.gov.au

3.6 Internal Building Design

Controls

General

- a. As a minimum, in the R2 Low Density Residential zone (and where Class 1b under the BCA) boarding houses shall make provision for the following facilities within each building;
 - i. storage for occupants;
 - ii. laundry facilities;
 - iii. sanitary facilities.

- b. As a minimum, in all other cases boarding houses shall make provision for the following facilities within each building;
 - i. manager/operator accommodation where there are 20 or more lodgers;
 - ii. laundry facilities;
 - iii. communal food preparation facilities (in addition to private provision where required);
 - iv. sanitary facilities;
 - v. storage area for each occupant.
- c. Boarding houses in larger scale developments (more than 20 boarding rooms) are to be designed so that:
 - i. no more than 8 boarding rooms share a stairway and / or corridor
 - ii. 1 communal living area is provided per every 8 boarding rooms or part thereof.

Consideration may be given to varying this number where it can be demonstrated that the design incorporates opportunities for social interaction within reasonable distance of boarding rooms, whilst maximising privacy and minimising thoroughfares through corridors containing boarding rooms.

- d. All boarding house developments are to be designed to optimise safety and security, both internal to the development and for the public domain by employing design criteria including:
 - i. maximising overlooking of public and communal spaces while maintaining internal privacy;
 - ii. avoiding dark and non-visible areas;
 - iii. locating communal and common areas in safe and accessible locations;
 - iv. providing lighting appropriate to the location and desired activities; and
 - v. providing clear definition between public and private spaces.

Specific Rooms, Areas and Facilities

- e. The development is to be designed to meet the requirements identified in the following table. Details relating to compliance with this section are to be included on plans and in the statement of environmental effects submitted with the development application:

ELEMENTS	CONTROLS
(i) Bedrooms/ Boarding Rooms <i>Note: Bedrooms also refer to boarding rooms, especially where additional facilities are provided other than bedroom facilities.</i>	<ol style="list-style-type: none"> Boarding rooms are to be designed as the principal place of residence for occupants. No boarding rooms shall open directly onto communal living, dining and kitchen areas. Each boarding room (excluding any private kitchen or bathroom facilities) must comply with the minimum areas identified in the ARHSEPP. Plans shall clearly show the size and maximum occupation of each room. Boarding rooms less than the minimum size will not be supported. Where additional facilities are proposed in boarding rooms, the following additional gross floor areas apply: <ol style="list-style-type: none"> Minimum 2.1m² for any ensuite, which must comprise a hand basin and toilet; plus 0.8m² for any shower in the ensuite (in addition to above); plus 1.1m² for any laundry, which must comprise a wash tub and washing machine; plus 2m² for any kitchenette, which must comprise a small fridge, cupboards and shelves (in addition to required wardrobe space), a microwave, and a minimum of 0.5m² bench area. <p><i>Note: For fire safety reasons no other cooking appliances are permitted.</i></p>
(ii) Communal Living Rooms	<ol style="list-style-type: none"> Indoor communal living rooms/areas are to be located: <ol style="list-style-type: none"> near commonly used spaces, such as kitchen, laundry, lobby entry area, or manager's office; adjacent to the communal open space; and where they will have a minimal impact on bedrooms and adjoining properties in terms of noise generation. Class 1b boarding houses must have indoor communal living areas of a minimum 12.5m² or 1.25m²/resident, whichever is greater. Class 3 Boarding Houses must provide a common living area a minimum 15m² in area, with a further 15m² provided for each additional 12 persons thereafter. <p><i>Note: The communal living area calculation can include any dining area, recreation room or games room, but cannot include bedrooms, bathrooms, laundries, reception area, storage, kitchens, car parking, loading docks, driveways, clothes drying areas, corridors and the like.</i></p> Openings are to be oriented away from adjoining residential properties to minimise overlooking and maximise privacy and amenity.

(iii) Communal Kitchen and Dining Areas	<ul style="list-style-type: none"> a. Where communal kitchens are provided, they are to be in a location accessible to all residents. b. A communal kitchen area is to be provided with a minimum area of 6.5m² in total or 1.2m² for each resident occupying a boarding room that does not contain a kitchenette, whichever is greater, and is to contain: <ul style="list-style-type: none"> i. One sink for every 6 people, or part thereof, with running hot and cold water; and ii. One stove top cooker for every 6 people, or part thereof, with adequate exhaust ventilation. c. A combined kitchen and dining area must have a minimum area of 15m² with an additional 1m² per room in a development that contains 12 or more bedrooms. d. No bathrooms, toilets or boarding rooms shall open directly on to communal kitchen facilities. e. Where food is proposed to be provided as part of Boarding House operations, or is for sale, kitchen and food areas shall comply with the National Code for the Construction and Fitout of Food Premises and be provided with sufficient ventilation in accordance with the BCA. f. Kitchen facilities shall be available for all lodgers 24 hours per day/ 7 days per week.
(iv) Bathroom Facilities	<p>In all boarding houses communal bathroom facilities must be in an accessible location for all occupants 24 hours per day.</p> <p>Bathrooms should be a minimum of 5m².</p> <p>Where ensuite bathroom facilities are provided in boarding rooms, the overall facilities must comply with the minimum facility requirements for the total occupancy of the overall premises.</p>
(v) Laundries and Drying Facilities	<ul style="list-style-type: none"> a. Laundry and drying facilities are to be provided for all lodgers. Where lodgers do not have their own laundry facilities, the following is to be provided: <ul style="list-style-type: none"> i. A minimum space of 4m² for every 12 lodgers; an additional 3m² for every additional 12 lodgers or part thereof; ii. 15m² external clothes drying area for every 12 residents in an outdoor area (can be retractable). b. Outside drying areas shall be located in a communal open space in a location which maximises solar access and ensures that the usability of the space is not compromised. c. Internal drying and laundry facilities shall be located in a safe and accessible location for all residents, and separate from communal kitchen facilities.
(vi) Management office design	<ul style="list-style-type: none"> a. Where management offices are to be provided, they are to be located at a central, visible point which is convenient to occupants of and visitors to the boarding house.

4.0 MANAGEMENT

Council encourages boarding houses which are well maintained and operated in a manner that ensures a high level of amenity for the occupants as well as for the residents of neighbouring properties.

4.1 Objectives

Objectives

1. To require management and operational practices that ensure the safety and wellbeing of occupants within boarding house accommodation.
2. To require boarding houses to be operated and maintained in a manner that minimises impacts on adjoining owners and residents.
3. To assist Council in monitoring the operations of boarding houses and affordable rental housing generally in the City of Ryde.

4.2 Management Controls

Controls

- a. All boarding houses are required to be managed by a manager who has overall responsibility including the operation, administration, cleanliness, maintenance and fire safety of the premises. Management arrangements are to be set out in a Plan of Management.
- b. A Plan of Management is to be submitted with each Development Application for a boarding house. The Plan of Management, as a minimum, must address the ongoing management and operational aspects of the boarding house identified in the template attached to this Part (refer **Schedule 2 Template for Plan of Management**).

Note: The approved Plan of Management will form part of any development consent. The Plan of Management can only be amended with the agreement of Council in writing. Copies of the approved Plan of Management must be provided to the relevant managing agent, and are required to be on display and available at all times to lodgers.

- c. The name and contact details of the manager or managing agent is to be displayed at all times externally at the front entrance on the boarding house.
- d. Occupiers of adjacent properties are to be provided with a 24 hour telephone number for a principal contact (for example owner or manager) for use in the event of an emergency.

SCHEDULES

Schedule 1 – Guidelines for Local Area Character Assessment

The table below is a guide to be used in the preparation of a Local Area Character Statement required under this Part (refer Section 2.0 Location and Character).

At the minimum, all questions provided in this table which are relevant to the development should be answered for preparation of a satisfactory Local Area Character Statement.

TABLE: GUIDELINES FOR LOCAL AREA CHARACTER ASSESSMENT		
Design Elements	Local Area Character Analysis (How to analyse and identify the Local Area Character)	Design Responses and Compatibility Tests (How to identify the design characteristics and respond to the local area character)
Building Type	<p><i>What is the predominant building type?</i> E.g. dwelling house, residential flat building (refer definitions under Ryde LEP 2014), multi-unit dwellings (villas, townhouses)</p>	<p><i>How does the design respond to the predominant building type in the area?</i> E.g. the proposal converts an existing dwelling house building. Properties adjoining, opposite and in the streetscape contain dwelling houses.</p> <p>Note: "boarding house" is a development type, NOT a building type.</p>
Height	<p><i>Is there a predominant height of buildings in the streetscape/ visual catchment area?</i></p> <p><i>What is the predominant height? For example, are buildings single storey, 2 storey, 4 storeys etc?</i></p> <p><i>Is there a mix of heights? e.g 1-4 storeys?</i></p> <p><i>What is the permissible height of buildings under Ryde LEP 2014?</i></p>	<p><i>Does the proposed height comply with Ryde LEP controls and Ryde DCP controls?</i> <i>How does the design respond to the predominant building height? Is it similar?</i></p> <p>Note: Where there is a mix of heights/ significant differences in height, design compatibility is expected to be achieved via a gradual transition in height. The extent to which height differences are acceptable depends also on the consistency of height in the existing streetscape.</p>
Site Coverage and Floor Space Ratio (FSR)	<p>Site coverage: <i>Is there a predominant site coverage for existing buildings in the street/ visual catchment area?</i></p> <p>Floor space ratio: <i>What is the floor space ratio (FSR) of existing buildings?</i></p> <p><i>What is the permissible FSR under RLEP 2014?</i></p>	<p><i>What is the proposed site coverage and FSR? How does the design respond to the predominant site coverage and floor space ratio? Does the proposed FSR comply with LEP and DCP controls?</i></p> <p>Note: The FSR of existing buildings may be difficult to determine if site area and floor space calculations are unknown or unavailable. Estimates can be made by approximating site coverage (e.g. building covers 40% of the site, and is 2 storeys in height therefore FSR is approximately 0.8:1).</p>

TABLE: GUIDELINES FOR LOCAL AREA CHARACTER ASSESSMENT		
Design Elements	Local Area Character Analysis (How to analyse and identify the Local Area Character)	Design Responses and Compatibility Tests (How to identify the design characteristics and respond to the local area character)
*The scale and form of buildings	<p><i>Is there a dominant form/ scale of existing buildings in the streetscape/ visual catchment area?</i></p> <p><i>What is the dominant form/ scale?</i></p> <p><i>What is the dominant scale and form of buildings within the streetscape/ visual catchment?</i></p> <p>E.g. are buildings single or two storey detached dwellings with hipped roof forms?</p>	<p><i>What scale and form is the design and how does the design respond to the scale and form of buildings in the streetscape/ visual catchment area?</i></p> <p>Note: Where the scale proposed is larger than within the context of the site (e.g. medium density scale within low density context), the scale of the larger scale proposal should be visually broken up.</p>

TABLE: GUIDELINES FOR LOCAL AREA CHARACTER ASSESSMENT		
Design Elements	Local Area Character Analysis (How to analyse and identify the Local Area Character)	Design Responses and Compatibility Tests (How to identify the design characteristics and respond to the local area character)
Frontage Treatment including: <ul style="list-style-type: none"> • Streetscape setting • Landscape Character/ Open Space • Front setbacks (building line/s) 	Streetscape Setting (outside the site): <i>What is the treatment of the streetscape in front of the subject site and properties in the local area?</i> E.g. Are there grassed nature strips, paved path, street trees, one drive-way crossing per site?	Design Compatibility: <i>How does the design of the proposal respond to the existing streetscape setting? Are any changes proposed, e.g. new driveway, removal of street trees etc.? Will proposed changes be compatible?</i> <i>Note: The road reserve located outside the front of the property between the road surface and the front boundary forms part of the visual catchment and relates directly with the frontage treatment.</i>
	Landscape Character/ Open Space (within the site): <i>What is the treatment of the front yard – are there fences on the boundaries, no fences, landscaping?</i> <i>What is the dominant character of landscape treatment within the front yard of properties in the streetscape/ visual catchment area? (i.e. the area inside the front boundaries of the properties in front of the building). Is there an established pattern of landscaping? E.g. Lawn areas behind low fences with shrub borders, and narrow paved driveways.</i>	Design response – landscaping of front area: <i>How does the proposed development respond to the established landscaped treatment of front setbacks in the streetscape?</i> <i>Does the proposal increase the amount of paved area/alter fencing, propose removal of existing established trees?</i> <i>What landscaped treatment is proposed and how is this compatible with that in the local area character?</i>
	Front Setbacks (building line/s): <i>What are the front building setbacks in the streetscape/visual catchment area? i.e. how far back are the buildings located from the front boundary? Is there a predominant setback, or a range of setbacks?</i> <i>If located on a corner, what is the dominant setback in the secondary street?</i> <i>Does another Part of this DCP prescribe a front setback for the building type or area?</i>	<i>What are the proposed front setbacks in the street?</i> <i>How does the proposed front boundary setback/s respond to the existing front setbacks of:</i> <ul style="list-style-type: none"> • buildings in the local area? • of properties either side of the development? • DCP setback requirements <i>Note: Front setbacks and the way they are treated are an important element of urban character. Where there is a uniform building line, even small differences can destroy the unity.</i>

TABLE: GUIDELINES FOR LOCAL AREA CHARACTER ASSESSMENT		
Design Elements	Local Area Character Analysis (How to analyse and identify the Local Area Character)	Design Responses and Compatibility Tests (How to identify the design characteristics and respond to the local area character)
Main Entrance	Location of main entries: <i>Where is the main entry of the buildings in the local area located? E.g. main entry at ground level facing the street.</i>	<i>Proposed siting of main entry: How does the design of the proposal respond to the siting of main entries? (At ground level facing the street?)</i> <i>Note: The main entry is the main point where residents and visitors enter and leave the premises. Side entries are discouraged, unless facing side street frontage (corner lots). If proposed at the side (corner lot) is it clearly visible?</i>
Treatment of side and rear areas • Setbacks of buildings (side and rear), pattern and spacing of buildings • Landscape Character/ Open Space (side/ rear)	Side setbacks: <i>What are the side boundary setbacks of buildings in the streetscape/visual catchment area? Is there a consistent pattern of side boundary setbacks? What are the requirements for side setbacks for the relevant building type under other parts of this DCP?</i> Pattern of subdivision and spacing of buildings <i>Is there an established subdivision pattern and spacing of buildings including, consistency in size of lots, frontage width, and regular spacing between buildings?</i>	<i>What are the proposed side boundary setbacks? Do they meet DCP requirements?</i> <i>Are the proposed side boundary setbacks consistent with the existing side setbacks of:</i> <ul style="list-style-type: none"> • buildings either side of the development? • buildings in the local area? <i>Note: Setbacks from side boundaries determine the rhythm of building and void. While it may not be possible to reproduce the rhythm exactly, new development should strive to reflect it in some way.</i>
	Rear setbacks: <i>Is there consistency in the rear alignment of buildings on properties either side and within the streetscape/visual catchment?</i> Landscaping in side and rear areas <i>What is the dominant character of landscaping treatment in the side setbacks and rear yards of properties in the streetscape/visual catchment area?</i> <i>Is there opportunity for deep soil planting? Is there a minimum site coverage required? (Refer section 2.5.1 under Part 3.3 of this DCP)</i>	<i>What is the proposed rear setback?</i> <i>Has consistency in the rear alignment been retained in the proposed development when compared with buildings on properties either side and beyond?</i> <i>How does the proposed development respond to the established landscaped treatment of rear area?</i> <i>What landscaped treatment is proposed and how is this compatible with that in the local area character? Does the proposal increase the amount of paved area, fencing, or propose removal of existing established trees and deep soil zone?</i>

TABLE: GUIDELINES FOR LOCAL AREA CHARACTER ASSESSMENT		
Design Elements	Local Area Character Analysis (How to analyse and identify the Local Area Character)	Design Responses and Compatibility Tests (How to identify the design characteristics and respond to the local area character)
* The style of existing buildings	<i>Is there a predominant style of buildings within the streetscape/visual catchment area?</i> <i>What is the dominant age/style?</i> E.g. "interwar" style, post World War 2.	<i>How does the design respond to the age and style of buildings?</i> Note: Where new materials and forms are introduced, this should be done with sensitivity to the existing forms and materials.
* Materials and Finishes	<i>What are the predominant building finishes and materials in the locality (streetscape/visual catchment area)?</i> E.g. brick and tile roof?	<i>What materials and finishes are proposed and how do these respond to the pre-dominant building finishes and materials in the locality?</i> Note: Where new materials and finishes are introduced, this should be done with sensitivity to the existing forms and materials. Colours should be complementary to existing.
* Views vistas and skylines	<i>Are there significant views, vistas or skylines in the streetscape/visual catchment area of the proposed development?</i> <i>Are there water views, are there views of significant buildings (e.g. heritage building/s)?</i>	<i>How does the design respond to the significant views, vistas and skylines?</i> <i>Does the proposal open up or close views?</i> Note: Building height/s and side setbacks most often affect views. (Reference should be made to section 2.13.4 View Sharing under Part 3.3 of this DCP).
* Optional except where the proposal is located on land which is within the vicinity of heritage item, within a conservation area, within a character area identified under Ryde DCP 2014.		

Schedule 2 – Template for Plan of Management

This schedule contains a template for use in the preparation of a Plan of Management for a Boarding House required under this Part (refer Section 5.0 Management). The Plan of Management sets out the various requirements and responsibilities of management and lodgers and includes:

- a. Management arrangements and Manager's contact details
- b. Council consent compliance details
- c. Inspection and recording records
- d. Maintenance of an Incidents Register
- e. Requirements for keeping Council informed of any change in management

Note: Requirements may change from time to time, and consultation should be made with Council to ensure currency of requirements.

PLAN OF MANAGEMENT

Boarding House

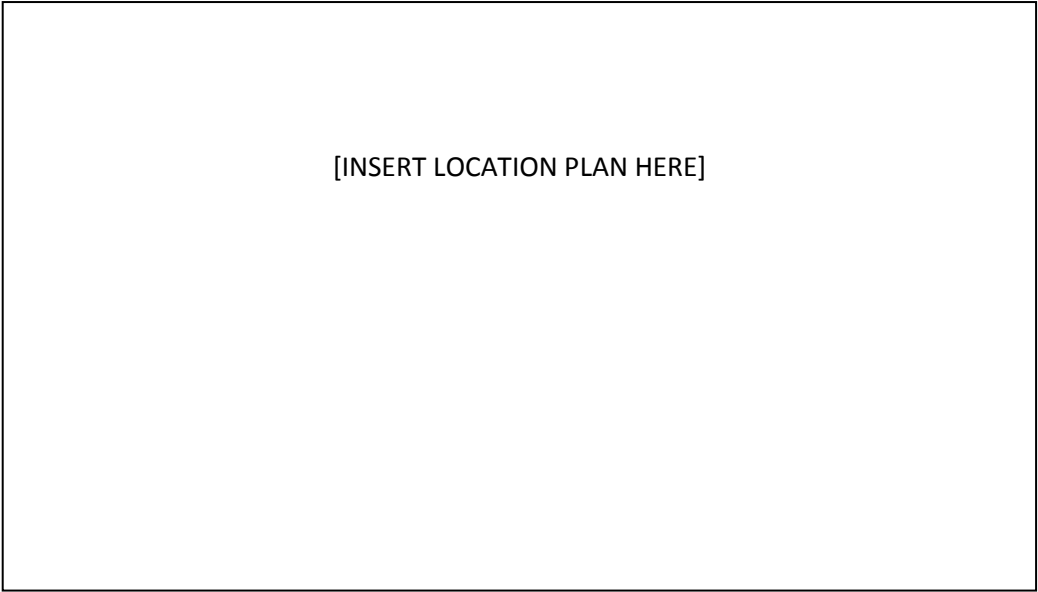
[INSERT ADDRESS]

1. INTRODUCTION

- 1.1 This Plan of Management provides directions and controls on the use and management of the premise as a Boarding House. The directions and controls are to be strictly adhered to in the operation of the Boarding House, to ensure compliance with the conditions of Development Consent and health and amenity requirements for both the occupants and surrounding residents.
- 1.2 The Plan of Management refers to the plans prepared by **[INSERT NAME]** dated **[INSERT DATE OF PLANS]** and Development Application No. **[INSERT NUMBER]**.
- 1.3 The Plan of Management has been prepared for a Boarding Housing at premises: **[INSERT ADDRESS, SUBURB]**. The Boarding House was approved on **[INSERT DATE OF DA CONSENT]** and is subject to compliance with the Conditions of Consent **[INSERT DA CONSENT NUMBER]**. The Conditions of Consent and a copy of the approved plans are provided as **Annexure A** **[PROVIDE COPY OF RELEVANT CONSENT AS ANNEXURE A]**.
- 1.4 The Boarding House is to be managed by **[INSERT WHETHER AN Off-site Manager, or On-site Manager]** who will be familiar with the content of the Plan of Management.

[INSERT MANAGER CONTACT DETAILS]

1.5 The location of the premises is shown on Figure 1 – Location Plan.



2. DEFINITIONS

2.1 In this Plan of Management:

- a. **Building:** means the the building known as **[INSERT ADDRESS]**.
- b. **Business:** means the operation of the building as a Boarding House.
- c. **Common Room:** means the room identified as the dining room on the approved plans.
- d. **Common Areas:** means the common room, kitchen, laundry/bathroom, downstairs WC, first floor bathroom opposite the stairs, hallways and the stairs as identified on the approved plans.
- e. **Common Open Space Area:** means the external communal area including the front yard, side yard, rear yard, ground floor patios and porches as identified on the approved plans.
- f. **Council:** means City of Ryde Council.
- g. **Boarder, Lodger:** means a person having the benefit of the use a nominated bedroom and the common rooms /areas within the building.
- h. **Manager:** means the Manager engaged by the business proprietor.
- i. **Owner:** means the registered proprietor/s of the building.
- j. **Room:** means that part of the building occupied and used by a lodger.

3. DUTIES OF THE MANAGER

- 3.1 The proprietor shall engage a Manager whose responsibilities are, but not limited to, the following:

The Manager shall:

- a. Be contactable between the hours of 8.00 am to 6pm Monday to Saturday inclusive.
- b. Oversee all residential concerns.
- c. Enforce the minimum occupancy period.
- d. Organise the cleaning and maintenance of the common areas and common open space areas.
- e. Enforce the maximum occupancy levels.
- f. Provide lodgers with appropriate information prior to the commencement of occupation.
- g. Carry out inspections on a regular basis at a minimum of once every 3 months to ensure that the building is maintained in a clean and tidy condition and that all facilities and fittings are appropriately maintained.
- h. Record all inspections in a log book which must be made available to Council upon request.
- i. Organise the waste collection and facility needs for the site, and the ongoing storage and collection of waste on-site including transfer of waste to and from collection points for the waste collection service as required, and regular cleaning of bins/waste storage areas/rooms.
- j. Maintain an incident register.
- k. Maintain the electrical circuits to a safe standard.
- l. Notify the Council in writing within 1 month of any change in the management and provide contact details for the new management.

4. MAXIMUM NUMBER OF LODGERS

- 4.1 The maximum number of lodgers in the building is **[INSERT NUMBER IN TEXT AND IN NUMERALS]**. The maximum number of persons per bedroom is as follows:

- Bedroom one (1): **[INSERT number in text and in numeral]**
- Bedroom two (2): **[INSERT number in text and in numeral]**
- Bedroom three (3): **[INSERT number in text and in numeral]**
- Bedroom four (4): **[etc]**
- Bedroom five (5): **[etc]**
- Bedroom (etc): **[etc]**
- Bedroom (etc): **[etc]**

It is the Manager's responsibility to ensure that these numbers are not exceeded.

5. MINIMISING IMPACTS ON RESIDENTS

So as to minimise impacts upon the residents of adjoining premises as well as residents of the building the following rules are to apply:

- a. No loud music or television noise is permitted after 10.00pm.
- b. No parties or gatherings are permitted upon the premises after 10.00pm.
- c. No visitors other than residents of the property are permitted after 10.00pm.
- d. No use of the outdoor areas is permitted after 10.00pm.
- e. No smoking in areas which may affect the amenity of other residents of the boarding house or of residents of neighbouring properties.

Note: More specific references may be required to define the terms such as “loud” and “noise”, maximum number of persons after 10pm, etc depending on the scale of development proposed.

6. DISPLAY OF HOUSE RULES

The house rules are to be clearly displayed throughout the premises and are to detail the following:

Boarder behaviour, including that no smoking or cooking to be permitted in bedrooms.

- a. Visitor policy
- b. Activities and noise
- c. Operating hours of outdoor common areas
- d. Emergency contact details
- e. Advice concerning the responsible consumption of alcohol, and
- f. A zero tolerance policy on illegal drugs.

Note: The above list is provided as a minimum. Other house rules may also relate to:

- use of communal space and facilities, quiet enjoyment etc
- keeping shared facilities clean and tidy
- keeping of pets
- use of parking spaces (bicycle parking and motorcycle parking spaces available on first come first use);
- incidents register will be referred to prior to renewing any lease;
- balconies or porches not to be used for the purpose of drying clothing.

7. FIRE SAFETY

Emergency Management & Evacuation Plans and Fire Mitigation Plans (no smoking or cooking in bedrooms) are to form part of this Plan of Management.

All fire safety features within the building are to be regularly maintained in accordance with any statutory requirements.

A copy of the annual fire safety statement and current fire safety schedule for the premises must be prominently displayed in the reception area.

A floor plan must be permanently fixed to the inside of the door of each sleeping room to indicate the available emergency egress routes from the respective sleeping room.

All residents are to be made aware of the fire safety features of the building and what to do in the event of an emergency.

All staff shall be trained in relation to the operation of the approved Emergency Management & Evacuation Plan.

8. CLEANING & MAINTENANCE

The subject premises are at all times to be maintained in a safe and healthy condition. In this regard all common areas are to be cleaned to a professional standard at least once a week. The cleaning and maintenance is to occur to both the area and fixtures and fittings in the area.

In addition all boarders are to be made aware, upon their entering into an agreement to occupy, of their responsibilities in relation to the maintenance and cleaning of the facility.

Further, the common open space areas are to be maintained in a neat and orderly manner. This will require twice/month mowing and garden maintenance during spring and summer and once/month mowing and garden maintenance during autumn and winter.

9. BOARDER/ LODGER INFORMATION

All boarders are to be made aware of the contents and their obligations under approved Plan of Management.

In this regard:

- A full copy of the approved Plan of Management is to be permanently displayed in each boarding room and each common area.
- A copy of the approved Plan of Management is to be made available upon request.

10. BOARDING HOUSE FURNITURE & FACILITIES

[THIS SECTION IS TO BE USED TO LIST THE FURNITURE AND FACILITIES PROVIDED WITHIN EACH ROOM OF THE BOARDING HOUSE AN EXAMPLE LIST IS PROVIDED]

[Example List]

1. *Each boarding room shall be provided with:*
 - a. *One (1) single bed, mattress and bedding*
 - b. *One student desk & chair*
 - c. *One desk lamp*
 - d. *Clothes storage facility of 1.0m³*
 - e. *Window furnishing/blind*
2. *The communal kitchen is to be provided with a sink, one stove (or an oven and cook top) and two large refrigerators/freezer.*
3. *The laundry is to be provided with at least one washing machine.*

Note: The ratio will vary according to number of boarders and must be in accordance with section 3.6 of this Part]

4. *The common room is to be provided with a dining table and [insert number] chairs*

Note: Ratio of 1 chair minimum per approved boarder

5. *A broom, bucket and mop are to be kept in the laundry for use by lodgers as necessary.*

6. *The entrance door, doors from boarding rooms to patios or porches and each boarding room shall be fitted with a classroom latch (dead bolt) which is able to be opened from the inside by a single handle motion.*

Note: Additional inclusions should also be listed here, such as television, sofas, etc, and identification of access and facilities for people with disabilities.]

[End of example list]

11. WASTE MANAGEMENT & RECYCLING

Residents of the facility are to be encouraged where possible to take advantage of Council's waste and recycling facilities. It is the responsibility of the boarder to sort garbage and place it in the appropriate receptacles.

The manager is to be responsible for the collection arrangements, including making sure that the waste containers are placed adjacent to the kerb on the day of collection and removed back onto the property promptly after collection, and including the servicing of special waste such as "sharps" and/or sanitary napkin receptacles. Where receptacles are provided for the disposal of sanitary napkins, these are to be serviced and readily cleaned on a regular basis.

Collection responsibilities of the manager include all regular garbage, recycling and green waste collection services, as well as household cleanup collection, ensuring goods for collection are managed in accordance with Council's collection requirements (information available on Council's website at: www.ryde.nsw.gov.au or via Council's Customer Service Centre ph: 9952 8222).

12. SAFETY & SECURITY

The following matters are to be provided within the property:

- Internal signage indicating the property caretaker or manager and contact numbers;
- Emergency contact numbers for essential services including fire, ambulance, police and utilities such as gas, electricity, plumbing and the like;
- Perimeter lighting;
- Individual room keys (a master key is to be maintained by the manager and made available to the fire brigade);
- Landline telephone within a common area available for use by residents in the event of an emergency.

Note: Other safety and security measures for reference in the POM might also include:

- surveillance or security camera systems;
- fencing and secure gates;
- Identification of access and facilities for people with disabilities;
- Information about maximum loading of electrical circuits.

[END OF PLAN OF MANAGEMENT]

THIS PAGE HAS BEEN
INTENTIONALLY LEFT BLANK



City of Ryde
Civic Centre
1 Devlin Street
Ryde NSW 2112

www.ryde.nsw.gov.au

City of Ryde Development Control Plan 2014

Part: 4.1 Eastwood Town Centre

Translation

ENGLISH

If you do not understand this document please come to Ryde Civic Centre, 1 Devlin Street, Ryde Monday to Friday 8.30am to 4.30pm or telephone the Telephone and Interpreting Service on 131 450 and ask an interpreter to contact the City of Ryde for you on 9952 8222.

ARABIC

إننا نعتذر عليك فهم محتويات هذه الوثيقة، نرجو للحضور إلى مركز بلدية رايد Ryde Civic Centre على العنوان: 1 Devlin Street, Ryde من الاثنين إلى الجمعة بين الساعة 8.30 صباحاً والساعة 4.30 بعد الظهر أو الاتصال بمكتب خدمات الترجمة على الرقم 131 450 لكي تطلب من أحد المترجمين الاتصال بمجلس مدينة رايد، على الرقم 9952 8222، نيابة عنك.

ARMENIAN

Եթէ այս գրութիւնը չէք հասկնար, խնդրեմ եկէք՝ Րայդ Սիվիկ Սենթըր, 1 Տելվին փողոց, Րայդ, (Ryde Civic Centre, 1 Devlin Street, Ryde) Երկուշաբթիէն Ուրբաթ կ.ա. ժամը 8.30 – կ.ե. ժամը 4.30, կամ հեռաձայնեցէք Հեռաձայնի եւ Թարգմանական Սպասարկութեան՝ 131 450, եւ խնդրեցէք որ թարգմանիչ մը Րայդ Քաղաքապետարանին հետ կապ հաստատուի ձեզի համար, հեռաձայնելով՝ 9952 8222 թիվի:

CHINESE

如果您看不懂本文，請在周一至周五上午 8 時 30 分至下午 4 時 30 分前往 Ryde 市政中心詢問 (Ryde Civic Centre, 地址: 1 Devlin Street, Ryde)。你也可以打電話至電話傳譯服務中心，電話號碼是: 131 450。接通後你可以要求一位傳譯員為你打如下電話和 Ryde 市政廳聯繫，電話是: 9952 8222。

FARSI

اگر این مدرک را نمی فهمید لطفاً از 8.30 صبح تا 4.30 بعد از ظهر دوشنبه تا جمعه به مرکز شهرداری رايد، Ryde Civic Centre, 1 Devlin Street, Ryde مراجعه کنید یا به سرویس مترجم تلفنی، شماره 131 450 تلفن بزنید و از یک مترجم بخواهید که از طرف شما با شهرداری رايد شماره 9952 8222 تلفن بزند.

ITALIAN

Se non capite il presente documento, siete pregati di rivolgervi al Ryde Civic Centre al n. 1 di Devlin Street, Ryde, dalle 8.30 alle 16.30, dal lunedì al venerdì; oppure potete chiamare il Telephone Translating and Interpreting Service al 131 450 e chiedere all'interprete di contattare a vostro nome il Municipio di Ryde presso il 9952 8222.

KOREAN

이 문서가 무슨 의미인지 모르실 경우에는 1 Devlin Street, Ryde 에 있는 Ryde Civic Centre 로 오시거나 (월 – 금, 오전 8:30 – 오후 4:30), 전화 131 450 번으로 전화 통역 서비스에 연락하셔서 통역사에게 여러분 대신 Ryde 시청에 전화 9952 8222 번으로 연락을 부탁드립니다.

Amend. No.	Date approved	Effective date	Subject of amendment

Table of Contents

CONTENTS

1.0 INTRODUCTION	5
1.1 Purpose of this Part	5
1.2 Objectives of this Part	5
1.3 Land affected by this Part	6
1.4 Structure of this Part	6
2.0 PLANNING PRINCIPLES	8
2.1 Ryde Local Planning Study	8
2.1.1 Planning Principles for Eastwood Town Centre	8
2.2 Eastwood Town Centre – Character Statement	9
2.2.1 Existing Character Statement	9
2.2.2 Future Character Statement	10
3.0 DEVELOPMENT CONTROLS - EASTWOOD URBAN VILLAGE PRECINCT	11
3.1 Mixed use development	11
3.2 Flooding and Stormwater Management	12
3.3 Architectural Characteristics	13
3.3.1 Setbacks	13
3.3.2 Urban Design/Exterior Finishes	14
3.3.3 Corner Allotments	14
3.4 Access & Parking	15
3.4.1 Parking Design and Location	15
3.4.2 Location of Vehicle Access and Footpath crossings	16
3.4.3 Design of Vehicle Access	16
3.5 Pedestrian Access & Amenity	16
3.5.1 Street Frontage Activities	17
3.5.2 Circulation	18
3.5.3 Public Domain Finishes	18
3.5.4 Landscaping & trees	19
3.5.5 Awnings and Weather Protection	19
3.6 Signage	20
3.7 Environmental Management	21
3.7.1 Sunlight	21

Table of Contents

3.7.2	Wind Standards	22
3.7.3	Energy Efficiency of Buildings	22
3.7.4	Vibration and Noise Mitigation	22
3.7.5	Reflectivity	23
3.7.6	External Lighting of Buildings	23
4.0	DEVELOPMENT CONTROLS - GLEN STREET AND LAKESIDE ROAD PRECINCT	25
4.1	Site Amalgamation	25
4.2	Built Form	26
4.2.1	Urban and Environmental Design	26
4.2.2	Residential Private Open Space	26
4.2.3	Solar Access and Sun Shading	27
4.2.4	Visual Privacy	27
4.2.5	Acoustic Privacy	27
4.2.6	Built Form Heights	28
4.2.7	Setbacks	31
4.2.8	Building Depth	35
4.2.9	Active Street Frontages	36
4.2.10	Awnings + Entry Canopies	38
4.2.11	Services Access and Parking	38
4.3	Public Domain	39
4.3.1	Access and the Public Domain	39
4.3.2	Landscape Character	40
4.3.3	Urban Elements and Finishes	40
4.3.4	Signage	40

1.0 INTRODUCTION

1.1 Purpose of this Part

The purpose of this Part is to provide development controls relating to the future development of Eastwood Town Centre. This DCP is one of a series of planning initiatives targeting the renewal and revitalisation of the City's traditional business centres of Eastwood, West Ryde, Ryde, Gladesville and Meadowbank.

This Part should be read in conjunction with the following documents:

- *Ryde Local Environmental Plan 2014*
- *Eastwood Centre Planning Study and Master Plan*
- *Glen Street/Lake Side Road Precinct Master Plan 2010*
- *Section 94 Development Contributions Plan 2007*
- *State Environmental Planning Policies (SEPP) including SEPP 65, Design Quality for Residential Flat Buildings.*

1.2 Objectives of this Part

Objectives

This Part aims to revitalise Eastwood Town Centre through controls and provisions which:

1. Facilitate the creation of town centres that contain a mix of land uses that service the needs of visitors and communities within the centre catchment;
2. Encourage new development and enhance existing buildings;
3. Describe the desired form scale and bulk of new buildings;
4. Improve pedestrian amenity and develop a sense of community place;
5. Create a people-friendly place with active street life;
6. Increase the number of people living within walking distance of public transport services;
7. Provide for safe and convenient motor vehicle access and parking;
8. Protect and enhance items of environmental heritage within each centre; and
9. Provide for safe, well used and attractive public spaces.

1.3 Land affected by this Part

This Part applies to land within the Eastwood Village Precinct, Lakeside Road and Glen Street Precinct as identified in Figure 4.1.01.

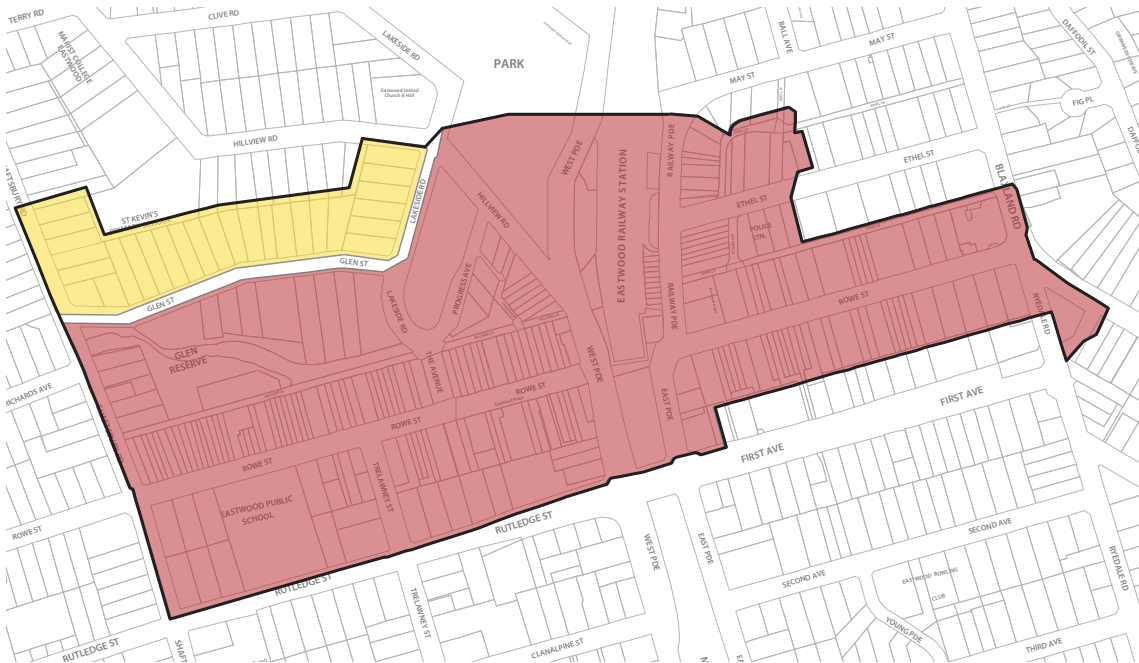


Figure 4.1.01 Eastwood Town Centre

This Controls in Section 3.0 refer to the Eastwood Village Precinct and the controls in Section 4.0 refer to the Glen Street and Lakeside Road Precinct (highlighted in yellow in Figure 4.1.01)

1.4 Structure of this Part

This Part provides guidance for future development Town Centre. It includes a statement indicating the desired future character for Eastwood, to which Council and the community have committed.

Section 3 of this Part refers to Eastwood Village Precinct and contains development controls which address the following:

- Mixed use development;
- Stormwater management;
- Architectural characteristics;
- Access & parking;
- Pedestrian access & amenity;
- Advertising & signage; and
- Environmental management.

It is critical that the development controls for Eastwood Town Centre be considered together to achieve the planning objectives for the Centre. For instance height planes and urban design components will collectively guide the bulk, form and scale of development. No single component is necessarily more important or significant than another, they inter-relate to achieve desired planning.

Section 4 of this Part refers to the Glen Street/Lakeside Road Precinct shaded in yellow in Figure 4.1.01. Section 4 identifies objectives and controls that will shape the future development of Glen Street and Lakeside Road Precinct to create attractive, accessible and unique urban environments in which to live, work, shop, and visit.

The Glen Street and Lakeside Road Precinct sites have been tested with regards to built form, public domain, design and traffic. The detailed development controls for these sites are provided in Section 4.0.

Specific built form development controls for the sites include building heights, building setbacks, active street frontages, awnings and built form sections.

2.0 PLANNING PRINCIPLES

2.1 Ryde Local Planning Study

Council, as part of its commitment to Town Centre Revitalisation, has developed an Urban Villages strategy for the City's traditional centres. An Urban Village is a place in a City which has the characteristics of a village and may be defined as an urban precinct located around a public transport interchange, incorporating:

- A mix of land uses;
- Attractive and well used public spaces;
- A safe and convenient pedestrian environment; and
- Urban design elements which promote community pride and identity.

In assessing any development application relating to land within Eastwood Town Centre, the council must take into consideration the aim of this Part that development should be consistent with the planning principles set out below.

2.1.1 Planning Principles for Eastwood Town Centre

The planning principles for Eastwood Town Centre are:

1. Regional Role

- a. Development should contribute to the status of Eastwood as an important business, employment and residential location.
- b. Development is to promote a compact working and living environment to maximise the efficient use of resources and infrastructure provision.

2. Integrated Planning and Development

- a. Planning and development is to ensure that social, economic, environmental and urban design issues are considered together and with proper regard for their mutual and cumulative impacts.
- b. All planning, design and development activities must take account of and effectively respond to the linkages and interfaces between public space and private land.

3. Public domain

- a. Development is to create the setting and contribute to the public domain so as to ensure high quality, safe and accessible public space that can be enjoyed by shoppers, residents and workers.
- b. Development of the public domain is to enhance the integration between individual precincts and their surrounding areas.
- c. Public space areas will be set aside for public use and enjoyment. Development that enhances the enjoyment of public spaces, such as outdoor dining will be encouraged.
- d. Car parking facilities should not prejudice pedestrian and cycle use of the public space.
- e. Public spaces will be enhanced and created wherever practicable.

4. Urban Form

- a. Building form is to reflect its location in relation to transport nodes, existing residential and commercial precincts, be architecturally rich, define and enhance the public domain and allow for mixed uses.
- b. Building form is to be articulated both in height and mass to provide interest resolve urban design and environmental issue.

- c. Buildings are to be of high quality and adaptable to a variety of uses over time.
- d. Buildings are to support and be integrated into the public domain network to achieve coherence and purpose.
- e. Heritage items and significant landscape elements are to be protected and enhanced.

5. Land use Mix

- a. Development is to provide a variety of housing types and employment-based activities and contribute to the character of the Village.
- b. Development is to contribute to an integrated mixed use development pattern containing a wide range of housing, employment and recreation opportunities.
- c. Development is to facilitate the increase and diversity of employment opportunities, which are to be compatible with achieving a high quality, mixed shopping, living and working environment.

6. Transport and Access

- a. Development is to promote the reduction of motor vehicle dependency and actively encourage the use of public transport, walking and cycling.
- b. An accessible environment for people with disabilities and mobility difficulties is to be created to ensure access equity.
- c. The intensity of development is to be in accordance with the capacity of existing and proposed public transport and road systems.
- d. Parking provision is to acknowledge accessibility by foot, bicycle and public transport.

7. Environmental Performance

- a. Development is to create a safe and comfortable environment for shoppers, residents and workers in both the private and public space.
- b. Development is to be designed having regard to:
 - i. Wind effect; reflectivity; noise attenuation; solar access and energy
 - ii. conservation; water conservation and re-use; stormwater management; use of recycled materials; and waste reduction.
 - iii. The development of public spaces must contribute to greater bio-diversity, habitat protection and improved air and water quality.

2.2 Eastwood Town Centre – Character Statement

2.2.1 Existing Character Statement

The Eastwood Commercial Centre is an important retail and commercial centre and transport in the City of Ryde that is well served by public transport. There has been shopping at Eastwood since the 1880's when the railway was constructed. Growth in trade built up as Eastwood and surrounding suburbs grew in the twentieth century. Retail and commercial development extends to the east and west bisected by the railway line. Eastwood has a 'village character' with a traditional development generally 2-3 storeys in height.

Eastwood has a concentration of professional services, retail and food outlets. It has seen a gradual increase in the quantity of floor space used for professional services and business purposes that is in turn boosting employment generation and retail trade in the centre.

Within the centre there are also parks, child care centres, schools, fire station, police station, community facilities and churches.

2.2.2 Future Character Statement

In the future, Eastwood will be a place designed for the enjoyment and utility of pedestrians and a place which allows convenient access for people between home, work, shopping and leisure.

It will also be a place that has:

- a high level of aesthetic amenity at street level;*
- safe attractive and convenient public spaces;*
- a vibrant, viable and profitable commercial centre;*
- well-used robust and attractive active and passive recreation and public space;*
- an appropriate mix and arrangement of land uses, which satisfactorily serve and integrate with the surrounding residential activities.*

There are some opportunities for mixed use growth in the centre, which includes residential, retail and commercial uses. Eastwood must avoid competing with the larger regional centres and establish itself as a niche market, concentrating on convenient retailing.

It is likely that the centre will attract office services, with demand likely to come from small to medium sized office firms. To ensure that the village character of the centre is retained, new developments that accomate office and commercial activities, medical and professional suites with activity at street level should be encouraged.

Residential development will also be encouraged. Shop-top and medium density housing should be located within the centre.

3.0 DEVELOPMENT CONTROLS - EASTWOOD URBAN VILLAGE PRECINCT

3.1 Mixed use development

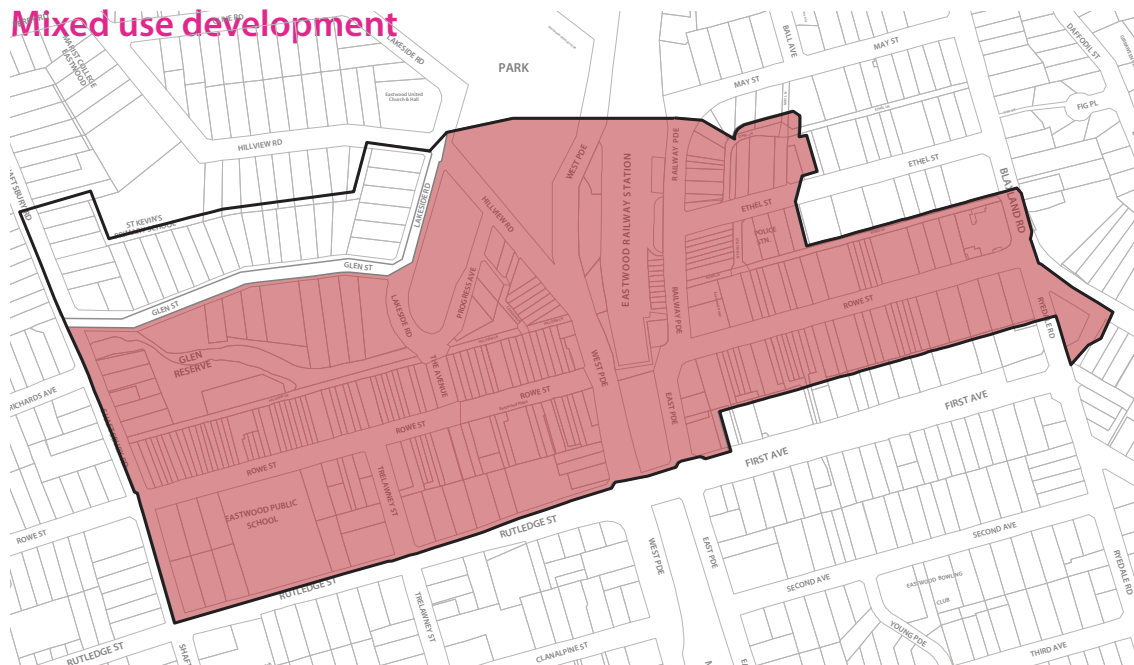


Figure 4.1.01b Eastwood Village Precinct

Council seeks to encourage development forms and arrangements that contribute to the overall goal of developing its centres as urban villages.

Objectives

1. To establish diverse land uses, services and facilities within the Centre;
2. To encourage the development of well used safe and attractive public places; and
3. To increase the number of persons living close to public transport.

Controls

- a. Active public uses, such as restaurants, cafes, community facilities, entries to business premises and retail should be located at street level. Refer also section 3.5.1 of this DCP Part

Note: These uses would tend to attract higher volumes of pedestrian traffic, resulting in a safer environment particularly after dark and would also result in adjacent public areas being better utilised (for example, side street cafes).

- b. Public and commercial uses should be accommodated in the level/s immediately above street level. Such uses may include professional offices, medical suites, leisure uses such as gymnasias, cinemas, theatres, places of worship and meeting rooms. Residential dwellings that include home offices may also be accommodated on this level.
- c. Residential land uses are discouraged at the street level within the Eastwood Urban Village Precinct. Residential development may be provided at upper levels of development.

- d. Buildings are to designed to overlook public and communal streets and other public areas to provide casual surveillance.
- e. Private living spaces and communal or public spaces should be clearly identified and defined.
- f. Sufficient lighting is to be provided to all pedestrian ways, building entries, driveways and car parks to ensure a high level of safety and security for residents
- g. Pedestrian and communal areas to be well lit and designed to minimise opportunities for concealment.
- h. Pedestrian entry to the residential component of mixed use developments should be separated from entry to other land uses in the building/s.
- i. The use of outdoor restaurant seating whether on private or public land is a favoured land use in the urban village. Applicants should refer to Council's Footpath Activity Policy and Outdoor Dining Policy.

3.2 Flooding and Stormwater Management

The quality and quantity of stormwater runoff directly affects the functionality of Eastwood and the Lane Cove River. The extent of stormwater inundation in Eastwood has widespread potential to impact on the majority of the commercial district.

Building and public domain design should have regard to potential inundation and public safety.

Objectives

- 1. Minimise and control nuisance stormwater inundation;
- 2. Provide the safe passage of less frequent stormwater inundation events;
- 3. Protect downstream properties from stormwater inundation due to upstream development;
- 4. Maintain acceptable water quality; and
- 5. Maximise land available for urbanisation.
- 6. Protect public safety

Controls

- a. A stormwater inundation impact assessment and stormwater management strategy is to be submitted for all developments to the satisfaction of Council.
- b. Floor levels within any new development should be a minimum of 300mm above the calculated flood level for the 100 year ARI event.
- c. Developments should comply with Part 8.2 Stormwater Management and Part 8.6 Floodplain Management of this DCP for flood controls for Eastwood/Terry's Creek Flood Plain.
- d. Where development is considered to constitute minor modifications or does not intensify the use of the property. A stormwater impact assessment or stormwater management plan may not be required.

Note: Further information on risk of flooding and any proposed stormwater infrastructure in the catchment can be obtained from Council's Development Engineers, during normal business hours.

3.3 Architectural Characteristics

Architectural characteristics refer to the individual elements of building design that collectively contribute to the character and appearance of the built environment. The provisions in this section of this development control plan are intended to encourage high quality design for new buildings, and an attractive public domain.

3.3.1 Setbacks

Eastwood comprises a “village” character that is, in part, provided by the scale and massing of buildings to the streetscape.

Objectives

1. To ensure that the existing traditional scale element of the streetscape is retained
2. To reinforce the established and accepted streetscape characteristics of Eastwood when considered from the pedestrian perspective.
3. To clearly define the adjoining streets, street corners and public spaces and avoid ambiguous external spaces with poor pedestrian amenity and security;

Controls

- a. Buildings must comply with the maximum height limit shown on the Height of Buildings Map under Ryde Local Environmental Plan 2014.
- b. Setbacks at the upper levels shall be provided. Parapets, fronting retail/pedestrian priority streets (see Section 3.5) should reflect existing predominant parapet lines.

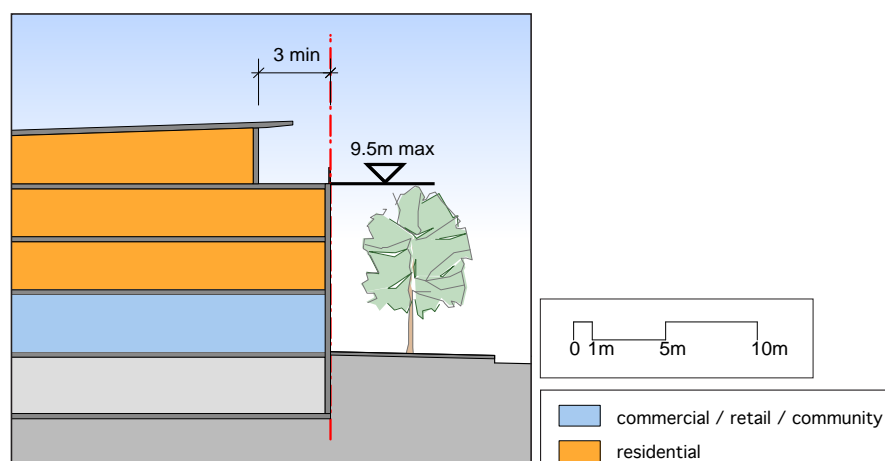


Figure 4.1.02 Building Height Setback

- c. New buildings are to have street frontages built predominantly to the street alignment (front boundary) for up to 9.5 m measured from the street level.
- d. Buildings may be constructed to the side and rear boundaries for up to 9.5 m from street level.
- e. Buildings (including balconies) must be setback a minimum of 3 m from all boundaries above 9.5 m from street level.
- f. Buildings may be setback from the street alignment where:
 - i. The site is adjacent to a freestanding heritage building. In this case the setback of the new building from the street alignment should match the setback of the heritage building; or
 - ii. The new development contributes an appropriate public space at the street frontage.

3.3.2 Urban Design/Exterior Finishes

The maintenance and improvement of the public domain is dependent on a consistent approach to the design of new development including the articulation and finish of building exteriors.

Objectives

1. To contribute positively to the streetscape by means of high quality architecture;
2. To provide architectural interest especially at visually prominent parts of buildings such as lower storeys and roof tops;
3. To present appropriate design responses that complement the streetscape;
4. To maintain a pedestrian scale in the articulation and detailing of the storeys levels of the building; and
5. To contribute to a visually interesting skyline.

Controls

- a. Building exteriors are to be designed to avoid extensive expanses of blank glass or solid wall.
- b. Balconies and terraces should be provided, particularly where buildings overlook public spaces.
- c. The siting and configuration of buildings should take into account the impact on surrounding development and public spaces in terms of amenity, shadowing and visual privacy. In this regard at least 2 hours of sunlight access must be maintained in public spaces in Rowe Street.
- d. The tops of buildings are to be designed so that they:
 - i. Integrate with the design of the building and conceal plant and equipment; and
 - ii. Promote a visually distinctive and interesting skyline.

3.3.3 Corner Allotments

Developments on corner sites should address the intersection that they front.

Objectives

1. To ensure buildings situated on corner allotments provide for visual interest and address the intersections that they front.

Controls

- a. The design of buildings on corner allotments must address the following:
 - i. The height of adjacent buildings;
 - ii. Ensure that the building turns the corner;
 - iii. The incorporation of distinctive architectural features to enhance the streetscape, for example clocks, flag poles, public spaces, etc;
 - iv. Giving the corner a splayed, concave, convex or square recess treatment such that it signifies the intersection; and
 - v. Design incorporating the removal of clutter such as power poles and advertising signage from around intersections.



Figure 4.1.03 Examples of Corner Treatments

3.4 Access & Parking

The access and parking provisions in this section are intended to control the design of parking.

3.4.1 Parking Design and Location

To provide for a reasonable amount of safe and convenient car parking within the centre.

Objectives

1. To encourage additional on-street parking in appropriate locations.
2. To ensure that off-street parking does not interfere with the safety of pedestrians.
3. To encourage high quality design.

Controls

- a. The creation of additional on-street car parking is encouraged. Opportunities to amplify on-street car parking through reconfiguration of car spaces (i.e. angled parking) should be explored with Council.
- b. Car parking should be located below ground level. Where this is not practicable (e.g. due to flood impacts) parking must not be visible from the street.
- c. In order to minimise vehicular conflict between residents' delivery and customer vehicles, car parking associated with residential uses should be separated from parking for other land uses.

3.4.2 Location of Vehicle Access and Footpath crossings

This section seeks to minimise the effects of vehicle crossings over footpaths that disrupt pedestrian movement, threaten safety and influence the quality of the public domain.

Objectives

1. Reduce the number of vehicle access points and associated footpath crossing.
2. The design and location of vehicle access to development is to minimise:
 - i. Conflicts between pedestrian and vehicles on footpaths, particularly along pedestrian priority streets; and
 - ii. Visual intrusion and disruption of streetscape continuity.

Controls

- a. New vehicle access points are restricted in retail/pedestrian priority streets. Where practicable, vehicle access is to be from lanes and minor streets rather than major pedestrian streets or major arterial roads such as Rutledge Street, First Avenue, or Blaxland Road.
- b. Service vehicle access is to be combined with parking access and limited to a maximum of one access point per building.

3.4.3 Design of Vehicle Access

Vehicular crossings need to be managed to ensure that they do not detract from the visual harmony of the streetscape.

Objectives

1. Minimise the number of vehicular crossing for any development.
2. Reinforce the rhythm of the streetscape through the provision of visual interest.

Controls

- a. Vehicle access is to be a single crossing, perpendicular to the kerb alignment.
- b. Vehicle access ramps parallel to the street frontage will not be permitted.
- c. Active uses or items of visual interest above vehicle access points are required in the horizontal line of sight of pedestrians.
- d. Vehicle entries to buildings are to be well designed and include high quality finishes to walls and soffit. No service ducts or pipes are to be visible from the street.

3.5 Pedestrian Access & Amenity

Pedestrian amenity incorporates all those aspects of developments that affect the quality and character of the public domain. The pedestrian amenity provisions are intended to achieve a high quality of urban design and pedestrian comfort in the public spaces of Eastwood. The pedestrian environment should be well used, safe, functional and accessible to all. It should provide a wide variety of opportunities for social and cultural activities. The centre's design and layout should form an integrated pedestrian network providing a choice of routes for pedestrians.

3.5.1 Street Frontage Activities

It is important that diverse activities at street level provided liveliness of the public domain of Eastwood is increased.

Objectives

1. To provide for active street frontages along all retail/pedestrian priority streets.
1. To ensure uses such as retailing, cafes and restaurants, and other uses that interact with the public are located along all retail/pedestrian priority streets.
2. To promote of streetscape variety and diversity at the pedestrian level.

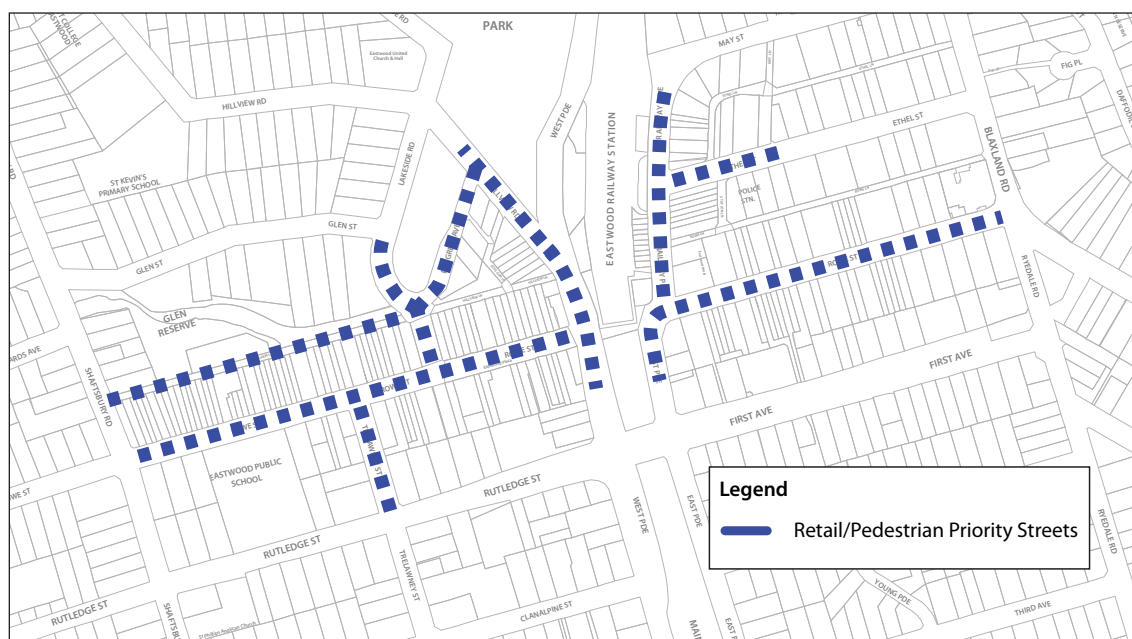


Figure 4.1.04 Retail/Pedestrian Priority Streets

Controls

- a. Provide ground level active uses on the Retail/Pedestrian Priority Streets (refer to Figure 4.1.04)
- b. Active uses contribute to personal safety in the public domain and comprise:
 - i. Community and civic facilities.
 - ii. Recreation and leisure facilities.
 - iii. Shops.
 - iv. Commercial premises
 - v. Residential uses, particularly entries and foyers. However, these should not occupy more than 20% of the total length of each street frontage.
- c. Where required, active uses must comprise the street frontage for a depth of at least 10 m.
- d. Vehicle access points may be permitted where active frontage is required if there are no practicable alternatives.
- e. Blank roller- shutter type doors are not permitted on ground level shop fronts.
- f. Serviced apartments hotels and motels shall not have apartments at the ground level. Locate retail, restaurants and / or other active uses at the ground level.

3.5.2 Circulation

The manner in which vehicles and pedestrians circulate within and around the Centre are important for its future success.

Objectives

- 1. To provide pedestrian links in accordance with the Circulation Strategy (Figure 4.1.05).
- 2. To ensure developments are designed in a manner which reinforces the Circulation Strategy (refer Figure 4.1.05).

Controls

- a. Where circulation is provided through a site or within a building serving to connect 2 points, the thoroughfare should function as a shortcut, be continuous and level with pedestrian streets / areas and incorporate adjoining active retail and / or commercial edges.

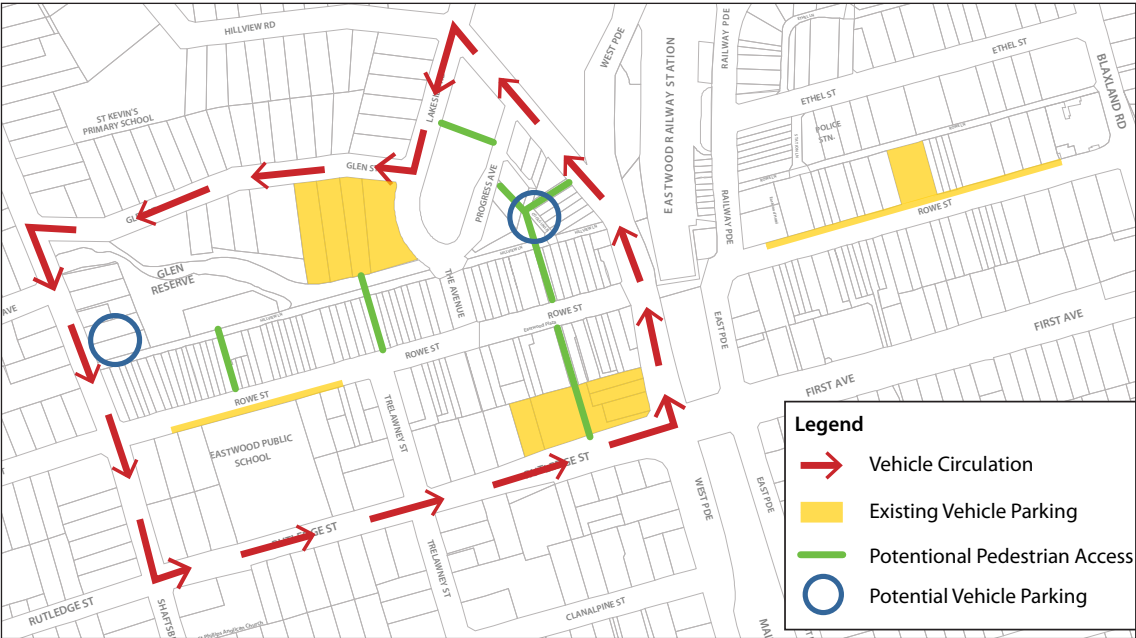


Figure 4.1.05 Circulation Strategy

- b. Entry and exit points for vehicles are to be designed in a manner that reinforces the Circulation Strategy.

3.5.3 Public Domain Finishes

The purpose is to create well used public spaces that provide comfort and convenience for users and incorporate high quality design, attractive appearance, robust materials and street furniture.

Objective

- 1. To ensure street furniture including lighting, seats, bins, drinking fountains, street signs, etc, is used to establish an identity for the Centre and helps define streets, paths and public space.

Controls

- a. Developments which entail the provision of new public spaces (e.g. streets, footpaths, walkways and the like) will need to incorporate new paving and street furniture that is at the developers cost and in accordance with the *Ryde Public Domain Technical Manual*.

3.5.4 Landscaping & trees

To soften the appearance of buildings and improve the visual quality of the centre and to modify the microclimate.

Objectives

1. To create attractive public spaces and walkways.
2. To enhance built form.

Controls

- a. Development proposals, incorporating landscaped elements, are to be accompanied by a landscape plan. Where the development comprises mixed uses or is 2 or more storeys the landscape plan should be prepared by a qualified landscape architect.
- b. Where appropriate, developments should incorporate landscaping into the upper levels to soften the building form and to contribute to privacy and amenity.
- c. Ground level entries should be well lit and not obstructed by planting in a way that reduces the actual or perceived personal safety and security of centre residents or pedestrians.
- d. Street trees shall be provided in accordance with the *Ryde Public Domain Technical Manual* and shall be provided at the developers' cost in conjunction with any new building work involving additional floor space.
- e. Street trees at the time of planting shall have a minimum container size of 200 litres, and a minimum height of 3.5m, subject to species availability.
- f. Where a proposal involves redevelopment of a site with a frontage of at least 40m to a public road, the developer shall arrange for electricity and telecommunications utilities to be undergrounded along the entire length of all street frontages. Such utility modifications will be carried out to the satisfaction of the responsible authority (e.g. Energy Australia).

3.5.5 Awnings and Weather Protection

It is important to provide continuous weather protection (from rain and sun) on street footpaths, particularly on pedestrian routes and retail frontages.

Objectives

1. To provide shelter from the natural elements along pedestrian routes.
2. To ensure the usability of public spaces.
3. To encourage walking within the centre.

Controls

- a. Buildings with frontage to any street must incorporate an awning or other form of weather protection along that boundary.
- b. The pavement level of a covered walkway shall be at the same level as the footpath to which it is adjacent.
- c. The height of a colonnade, awning or covered way shall not be less than 3 metres or greater than 4.5 metres measured to the soffit.
- d. The width of a colonnade, awning or covered way shall not be less than 3 metres.

- e. Any new awnings should:
 - i. Be continuous for the entire length of the site frontage;
 - ii. Be set back from the face of the kerb by 0.6m;
 - iii. Have cut-outs of 1m wide by 1m deep to accommodate street trees, where the frontage is proposed to accommodate a street tree in accordance with the master plan or any public domain improvement plan;
 - iv. Be weather sealed to the face of the building to which they are attached and to the adjoining awnings;
 - v. Have a height clearance above the footpath level of at least 3m or a height consistent with adjacent awnings; and
 - vi. Maintain sufficient clearances from any overhead electricity or telecommunications installations.

3.6 Signage

To allow advertising and signage in a manner that enhances the image and visual quality of the centre and which does not contribute to visual clutter or detract from architectural features.

Objectives

- a. Reduce visual clutter through the control and co-ordination of signage.
- b. Reinforce the streetscape and enhance the individual architectural features of buildings.

Controls

- a. Signage shall relate to the use of the building on which it appears.
- b. Architectural features of the building shall be considered in the design of the advertising sign or structure. Signs shall not obscure decorative forms or mouldings and should observe reasonable separation distance from the lines of windows, doors, parapets, etc.
- c. Signs should be of a size and proportion which complement the scale of the existing façade, as well as surrounding buildings and signs. Care should be taken in the design, size and positioning of signs above awning level.

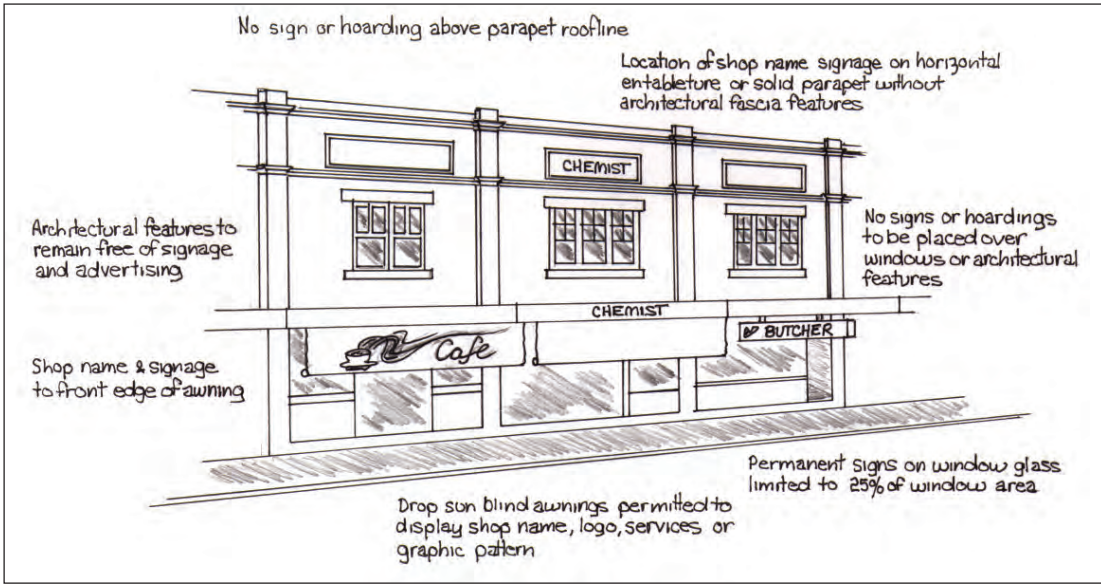


Figure 4.1.06 Location for Signage and Advertising

d. Signage must comply with the following restrictions and dimensional requirements:

i. Under-Awning Signs

- Should not exceed
- a. One per five (5) metres of street frontage; and
 - b. 2.4 metres in length and 0.3 metres in height.

ii. Flush Wall Signs

Should not exceed a maximum of five (5) square metres.

iii. Clearance

All signs should maintain a minimum clearance of 2.6 metres above footpaths or above any pedestrian areas.

iv. Multiple use of Properties

A co-ordinated approach to the sign development on the site should be used by utilising composite signs.

v. Prohibited Signs

1. Flashing and moving signs;
2. Signs other than identification, business and directional signs;
3. Signs that would adversely affect traffic movement or safety or would interfere with the amenity of the neighbourhood;
4. Signs attached to and above awnings;
5. Illuminated signs on fascia of awnings;
6. Signs not permanently fixed to the site or which obstruct the footpaths or pedestrian area;
7. Pylon signs;
8. Roof signs; and
9. Blimps or airborne signs.

3.7 Environmental Management

Environmental management includes those aspects of development that have a measurable effect on the physical quality of Eastwood's environment. The environmental management provisions are intended to ensure that principles of ecologically sustainable development are integrated into design and construction of development, particularly in relation to reduced energy usage. They are also intended to lead to improved sun access to publicly accessible spaces and to lower overall levels of wind, noise and reflectivity that will contribute to people's enjoyment of the public domain.

3.7.1 Sunlight

This section is primarily concerned with sun access to public spaces in Eastwood, including those that are privately owned and sun access to residential developments.

Objectives

1. To provide access to sunlight in public spaces. Sun access during lunchtime hours is highly desirable in all public spaces. Some public spaces, particularly those with sun access, are heavily used throughout the day.
2. To maximise use of public spaces. Use of some public spaces is substantially increased by sun access, so overshadowing effects of development outside the lunchtime period should also be considered.

Controls

- a. Major public spaces should receive a minimum of 50% sunlight on the ground plane for at least 2 hours between 10am and 2pm on June 21.

Note: Depending on the nature and use of a particular space, periods outside those specified above may also be required.

- b. In new residential developments, windows to north-facing living areas should receive at least 3 hours of sunlight between 9am and 5pm on June 21 over a portion of their surface. North-facing windows to living areas of neighbouring dwellings should not have sunlight reduced to less than the above 3 hours.
- c. All development proposals of 2 storeys or more are to be accompanied by shadow diagrams that are to be submitted with the local development application.

3.7.2 Wind Standards

Windy conditions can cause discomfort and danger to pedestrians, and down drafts from buildings can inhibit the growth of street trees. Conversely, moderate breezes that penetrate the streets can enhance pedestrian comfort and disperse vehicle emissions.

Objectives

1. To maximise public safety and comfort. The shapes, location and height of buildings are to be designed to promote public safety and comfort at ground level. The usability of open terraces on buildings also depends on comfortable conditions being achieved.

Controls

- a. Building design is to minimise adverse wind effects on recreation facilities, on open terraces within developments and on the public domain.

3.7.3 Energy Efficiency of Buildings

The Master Plan calls for ecologically sustainable development (ESD) principles to be taken into account in development within the Eastwood Centre.

Objectives

1. To maximise energy efficiency and sustainable design. Buildings should optimise 1. their passive and operational energy efficiencies, reduce pollution, include waste minimisation systems and use construction materials from renewable resources.

Controls

- a. New buildings should be designed to ensure that energy usage is minimised.

3.7.4 Vibration and Noise Mitigation

Loud noise and vibration affects the amenity of places. Developments within close proximity to the railway line may be subject to actual or potential impact from vibration.

Objectives

1. To minimise noise nuisance. New buildings shall mitigate the effects of noise by using insulation. In particular, residential buildings, serviced apartments and the like should be insulated for noise reduction.
2. To encourage the use of the NSW Government's "Environmental Criteria for Road Traffic Noise" a guide to address the potential road traffic noise on the amenity of the area.

3. To encourage design to take into account that loud noise emanating from shops can also detract from otherwise pleasant street environments.
4. To encourage new developments within 100m of the railway line to consider urban design as a means of mitigating noise and vibration impacts.

Controls

- a. In respect of proposals for new residential buildings:
 - i. the building plan, walls, windows, doors and roof are to be designed and detailed to reduce intrusive noise levels.
 - ii. balconies and other external building elements are located, designed and treated to minimise infiltration and reflection of noise onto the façade.
 - iii. dwellings are to be constructed in accordance with:
 - Australian Standard 367 1-1989: Acoustics – *Road Traffic Noise Intrusion, Building Siting and Construction*; and
 - Australian Standard 367 1-1987: Acoustics – *Recommended Design Sound Levels and Reverberation Times for Building Interiors*.
 - *Environmental Criteria for Road Traffic Noise* (EPA, 1999).
- b. In respect of developments proposed within 100m of the railway line, the following document should be used as a guideline for incorporating measures to mitigate noise and vibration:
 - i. *Rail Related Noise and Vibration: Issues to Consider in Local Environmental Planning – Development Applications and Building Applications* (State Rail Publication, 1995).

3.7.5 Reflectivity

Reflective materials used on the exterior of buildings can result in undesirable glare for pedestrians and potential hazardous glare for motorists. Reflective materials can also impose additional heat load on other buildings.

Controls

- a. The use of highly reflective glass is discouraged.
- b. New buildings and façades should not result in uncomfortable glare that causes discomfort or threatens safety of pedestrians or drivers.
- c. Visible light reflectivity from building materials used on the façades of new buildings should not exceed 18%.

3.7.6 External Lighting of Buildings

The external lighting of buildings can add to the architectural character of buildings at night and enliven the centre. However, external lighting has an impact on total energy efficiency and can affect residential amenity.

Objectives

1. To encourage use of lighting to highlight certain architectural features of a building rather than floodlighting whole façades.
2. To encourage designs that provide lighting with minimal energy consumption.
3. To control the effects of adverse impacts on neighbouring land uses.

Controls

- a. Any external lighting of buildings is to be considered with regard to:
 - i. The integration of external light fixtures with the architecture of the building (for i. example, highlighting external features of the building);
 - ii. The contribution of the visual effects of external lighting to the character of the building, surrounds and skyline;
 - iii. The energy efficiency of the external lighting system; and
 - iv. The amenity of residents in the locality.

4.0 DEVELOPMENT CONTROLS - GLEN STREET AND LAKESIDE ROAD PRECINCT

4.1 Site Amalgamation

Objectives

1. To ensure as few driveways as possible in order to promote pedestrian amenity and road safety.
2. To encourage access from the local roads network and the provision of new laneways.
3. To encourage development quality & amenity and meet other parts of the controls set out.

Controls

- a. Minimum lot sizes shall comply with Ryde LEP 2014 Clauses 4.3A and 4.4A.

Note : 1. To achieve the optimum development outcome a minimum lot size is required for particular development to occur. Clauses 4.3A Exceptions to height of buildings and 4.4A Exceptions to floor space ratio make provision for additional height and floor space to be available when lots over a particular size are being developed. A preferred amalgamation is shown in Figure 4.1.09.

2. To achieve the required lot size may require the amalgamation of lots. If amalgamation is required an application for consolidation should be included as part of the development application.

3. Building Envelopes are based on the preferred amalgamation pattern (Figure 4.1.08 - Figure 4.1.15). They are indicative only.



Figure 4.1.07 Map showing Glen Street and Lakeside Road Precinct Preferred Amalgamation Site Pattern

4.2 Built Form

4.2.1 Urban and Environmental Design

The quality of streets and public spaces may be enhanced by the way buildings address these spaces. Good environmental design includes the control of solar access and overshadowing.

Objectives

- 1. To ensure new buildings contribute positively to the urban built form and environment.
- 2. To ensure appropriate scale and good environmental amenity, such as sun access.
- 3. To ensure a built form of a high quality that successfully integrates environmental sustainability with architectural design.

Controls

- a. Development on corners must address all street frontages. Entries, windows and other architectural elements should be placed to reinforce the corner.
- b. Provide building articulation elements including awnings, verandahs, decks, loggias, pergolas, bay windows and recessed doors.
- c. Windows and entries shall be placed to overlook public spaces and streets to provide surveillance opportunities.
- d. Balconies may not be continuous along the whole length of building facades.
- e. Provide solar protection, including awnings, recessed windows, roof overhangs, external shutters and screens to the western and northern elevations of buildings.
- f. Where sites are amalgamated express the prevalent historic Eastwood Town Centre lot structure in the design of new buildings particularly at street level.

4.2.2 Residential Private Open Space

Private open space such as front gardens, private gardens, above ground open space and the like where located adjacent to the public domain contributes to the character of the public domain and provides amenity to residents.

Objectives

- 1. To contribute to the character and environmental quality of the landscape of the Small Centres.
- 2. To enhance the micro-climate created by development, in development and the Small Centres.
- 3. To ensure that every dwelling in the Ryde Small Centres has access to usable private open space.

Controls

Private open space

Refer to the *SEPP 65 Residential Flat Design Code (Planning NSW) - Open Space*.

- a. Single aspect apartments set below the natural ground level are not permitted.
- b. Comply with *SEPP 65* Rule of Thumb.

4.2.3 Solar Access and Sun Shading

Sunlight is a major determinant of environmental comfort. Good passive solar design offers financial benefits, by reducing the need for artificial heating and cooling.

Objectives

1. To provide solar access to habitable rooms and external areas of dwellings in mid winter.
2. To achieve the development of living and working environments not reliant on artificial heating, cooling, and lighting with passive heating/cooling, solar orientation, appropriate shading treatments.

Controls

Refer to the *SEPP 65 Residential Flat Design Code (Planning NSW) - Daylight Access*.

- a. Comply with *SEPP 65* Rule of Thumb.
- b. The *SEPP 65* controls for lightwells apply to apartments below ground level for the purpose of satisfying *SEPP 65* requirements.

Note: Single aspect apartments set below the natural ground level are not permitted.

4.2.4 Visual Privacy

Objectives

1. To maximise the visual privacy of on-site and neighbouring residents.
2. To maximise outlook and views from habitable rooms and private open space without compromising visual privacy

Controls

Refer to the *SEPP 65 Residential Flat Design Code (Planning NSW) - Visual Privacy*.

- a. Comply with *SEPP 65* Rule of Thumb.

4.2.5 Acoustic Privacy

Potential unwanted noise sources increase in more densely developed areas. In mixed-use areas developments need to consider the amenity of a range of occupants. The impact of commercial and retail noise on residential development and pedestrian amenity needs to be considered. Residential, commercial and retail developments can be designed and managed to minimise noise generation and intrusion.

Objectives

- a. To achieve an appropriate acoustic environment, by giving design consideration to the following:
 - i. Siting of buildings.
 - ii. Building planning.
 - iii. Internal room layout.
 - iv. Location of private open space.

- v. Location and treatment of windows.
- vi. Building materials.
- vii. Location and design of waste storage and collection for commercial component.

Controls

Refer to the *SEPP 65 Residential Flat Design Code (Planning NSW)- Acoustic Privacy*.

- a. Acoustic separation between commercial and residential uses shall be attained.

4.2.6 Built Form Heights

Development within the small centre is of a scale and character that promotes an attractive and sustainable urban environment.

Objectives

- 1. To attract investment, new employment opportunities and enhance economic sustainability.
- 2. To promote an urban scale to the retail and commercial development.
- 3. To enhance the existing streetscape and ensure appropriate development scale in predominantly residential and retail precincts.
- 4. To ensure adequate sunlight is available for all buildings, streets and public domain.

Controls

- a. Buildings must comply with the maximum heights described in Ryde LEP 2014 Height of Buildings Map.
- b. Building height must comply with the Building Height Control Figure 4.1.08 and Figure 4.1.09.

Note: The height limits in the LEP and the DCP should be read in conjunction and they correlate to each other. The LEP provides building heights in metres and the DCP provides building heights in storeys.

- c. Floor to ceiling height must be a minimum of 2.7m for residential uses.
- d. To ensure that ground floor levels are adaptable over time for a wide range of uses, the floor to ceiling height on the ground floor shall be a minimum of 3.5m to allow adaptable use over time.



Z

Glen Street and Lakeside Road Precinct Building Height Control

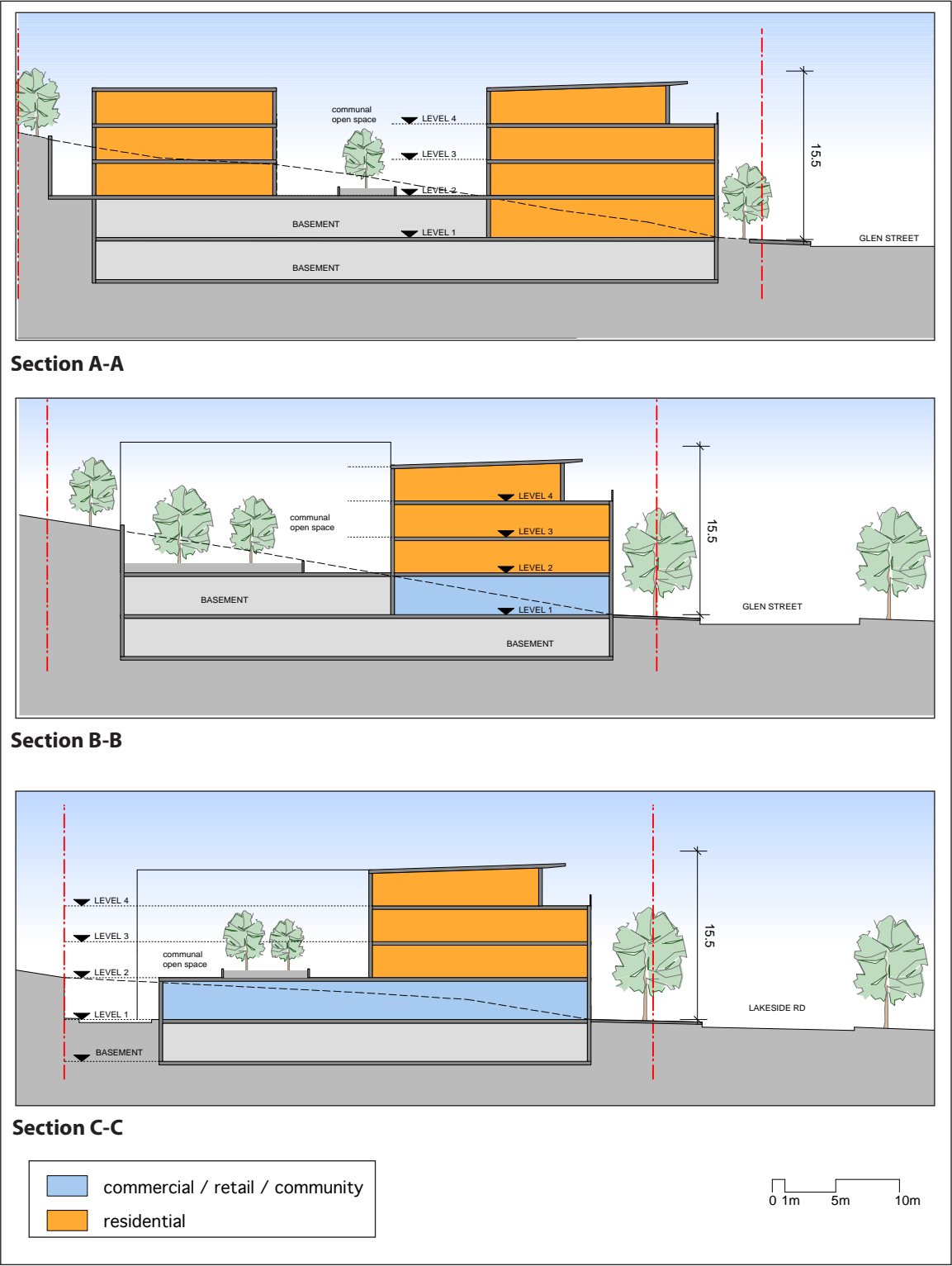


Figure 4.1.09 Glen Street and Lakeside Road Precinct Building Height Control Sections -- to be read in conjunction with Ryde LEP 2014

4.2.7 Setbacks

Front setbacks give streets and public domain physical definition and control the relationships of buildings to each other. The front setbacks defined in this Part will reflect and reinforce the character of the Glen Street and Lakeside Road Precinct. The front setbacks will provide opportunities for improved pedestrian and transport access. Business and retail areas are to be built to the east of the precinct to reinforce and promote a positive urban character and personal safety and security. Rear and side setbacks control the relationships of buildings to each other and provide visual and acoustic privacy. Upper level setbacks reduce the visual bulk and scale of buildings; promote an interesting skyline and access to sunlight and fresh air.

Objectives

1. To establish an individual identity for the centre and influence street character.
2. To integrate Safer-by-Design principles into the design of the public domain and built form.
3. To effect positive relationships between buildings.
4. To create an interesting skyline.
5. To promote sunlight access to the public domain and buildings.
6. To provide for the future access and transport needs of residents and businesses.
7. To encourage integration between the private and public domain.

Controls

- a. Building setbacks at the ground level and upper levels must comply with the Setbacks Control Drawing Figure 4.1.10 - Figure 4.1.13. Unless noted otherwise the minimum rear and side setbacks shall be 6m.
- b. The top floor must be setback 4m from the boundary as indicated in the Setbacks Controls Drawing Figure 4.1.10 - Figure 4.1.13.
- c. Provide a continuous unimpeded paved surface as shown in Figure 4.1.10 - Figure 4.1.13.
- d. There shall be no barriers (such as fences and landscaping) provided on the pavement which will limit integration between the private and public domain.

Note: The set backs in Figure 4.1.10 - Figure 4.1.13 shall apply even if the building envelope differs from the envelopes shown.

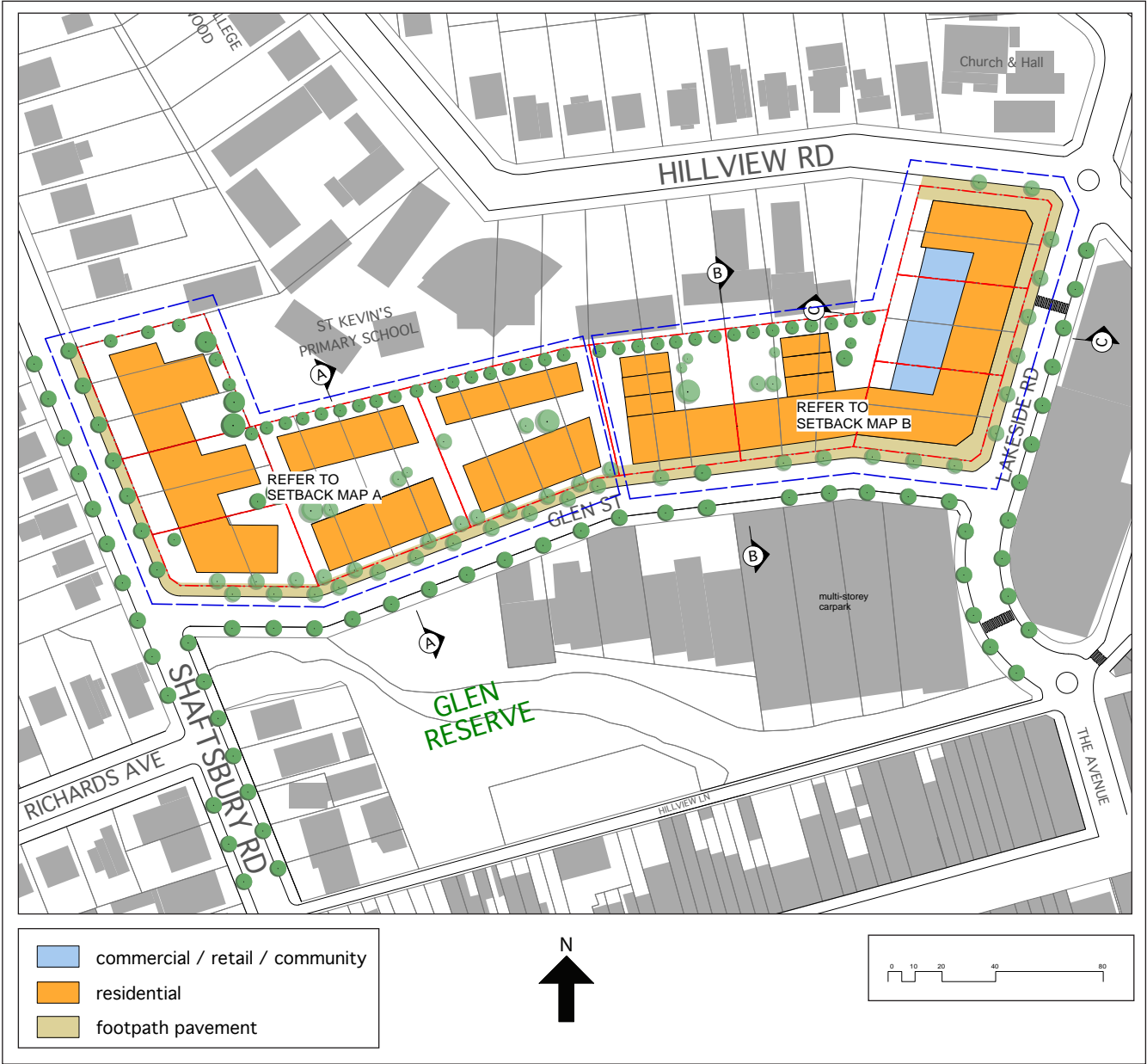


Figure 4.1.10 Glen Street and Lakeside Road Precinct Setback Control Plan.

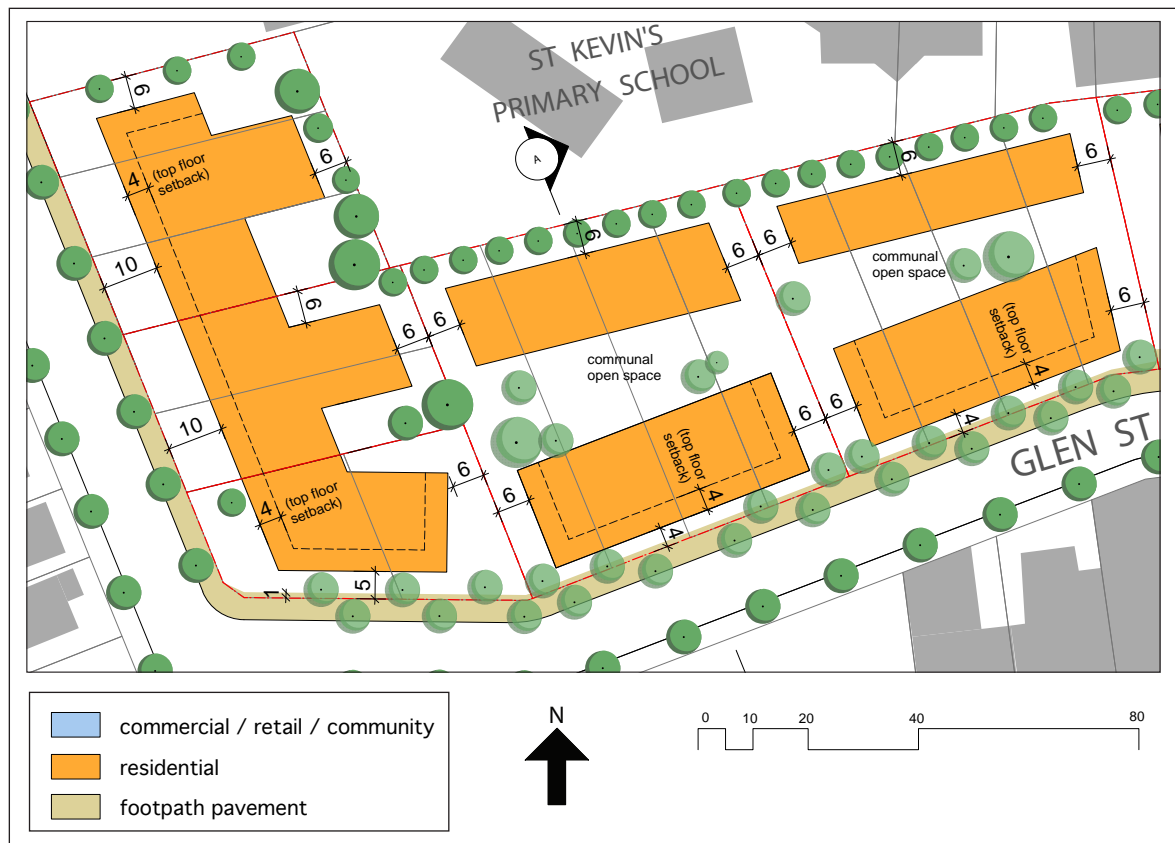


Figure 4.1.11 Map A. Glen Street & Shaftsbury Road Setback Control Drawing.

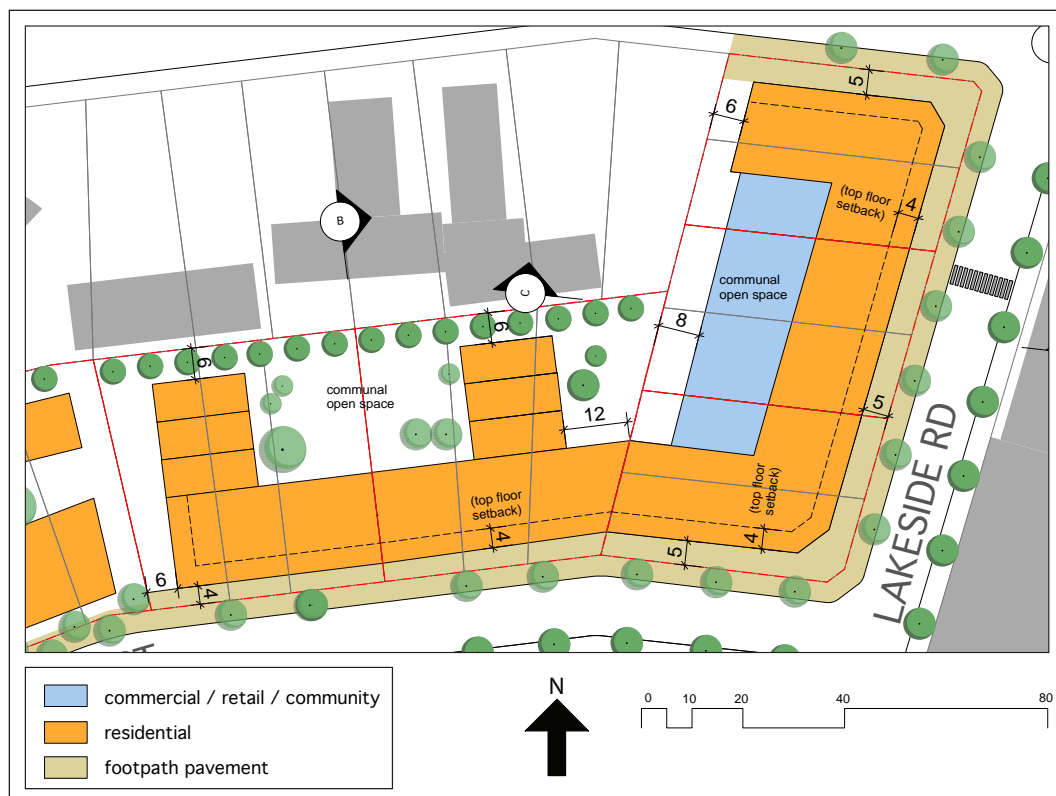


Figure 4.1.12 - Map B. Glen Street and Lakeside Road Setback Control Drawing.

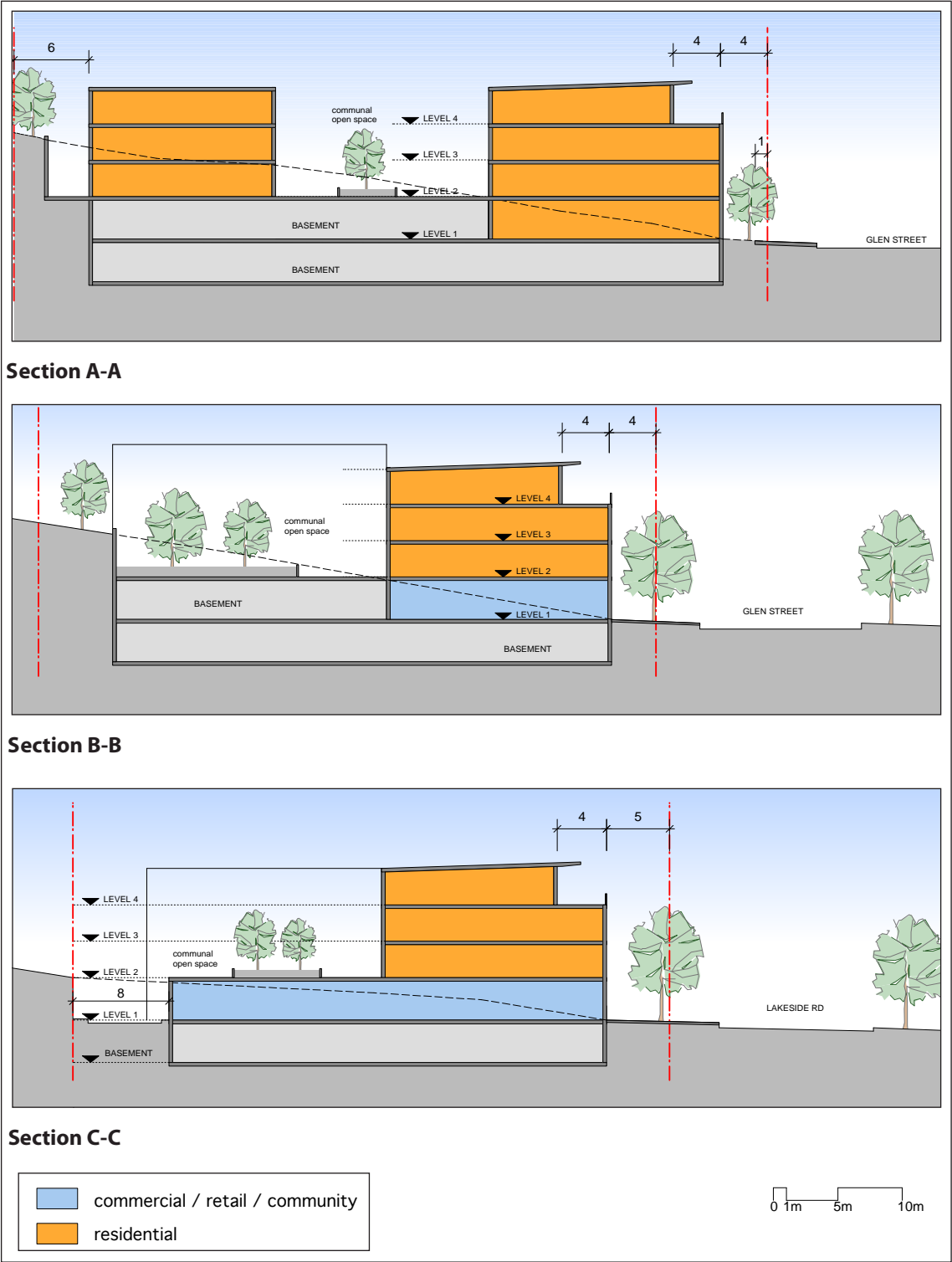


Figure 4.1.13 Glen Street and Lakeside Road Precinct Building Setback Controls Sections

4.2.8 Building Depth

Objectives

1. To promote sustainable built form.
2. To improve the amenity of buildings for users.
3. To improve cross ventilation.

Controls

- a. Building depth must comply with the Building Depth Control Drawing Figure 4.1.14.
- b. Achieve natural ventilation in residential buildings by having window openings in opposite directions and walls where possible. Comply with *SEPP 65* Rule of Thumb.
- c. Where alternative building envelopes and amalgamation patterns are proposed the maximum overall depth of buildings is 18m unless design excellence can be demonstrated and natural ventilation is achieved.



Figure 4.1.14 Glen Street and Lakeside Road Precinct Building Depth Control Drawing

4.2.9 Active Street Frontages

Objectives

To enhance personal safety and security within the small centre.

Controls

- a. Provide ground level active uses where indicated on the Active Street Frontages Control Drawing Figure 4.1.15.

Active uses contribute to personal safety in the public domain and comprise:

- i. Community and civic facilities;
 - ii. Recreation and leisure facilities;
 - iii. Shops;
 - iv. Commercial premises;
 - v. Residential uses, particularly entries and foyers, however, these must not occupy more than 20% of the total length of each street frontage.
- b. Residential uses, particularly entries and foyers, these must not occupy more than 20% of the total length of each street frontage.
 - c. Vehicle access points may be permitted where active street frontage is required if there are no practicable alternatives.
 - d. Ground floor shop fronts may incorporate security grills provided these ensure light falls onto the footpath and that the interior of the shop is visible. Blank roller- shutter doors are not permitted.
 - e. Locate retail, restaurants and / or other active uses at the ground level.

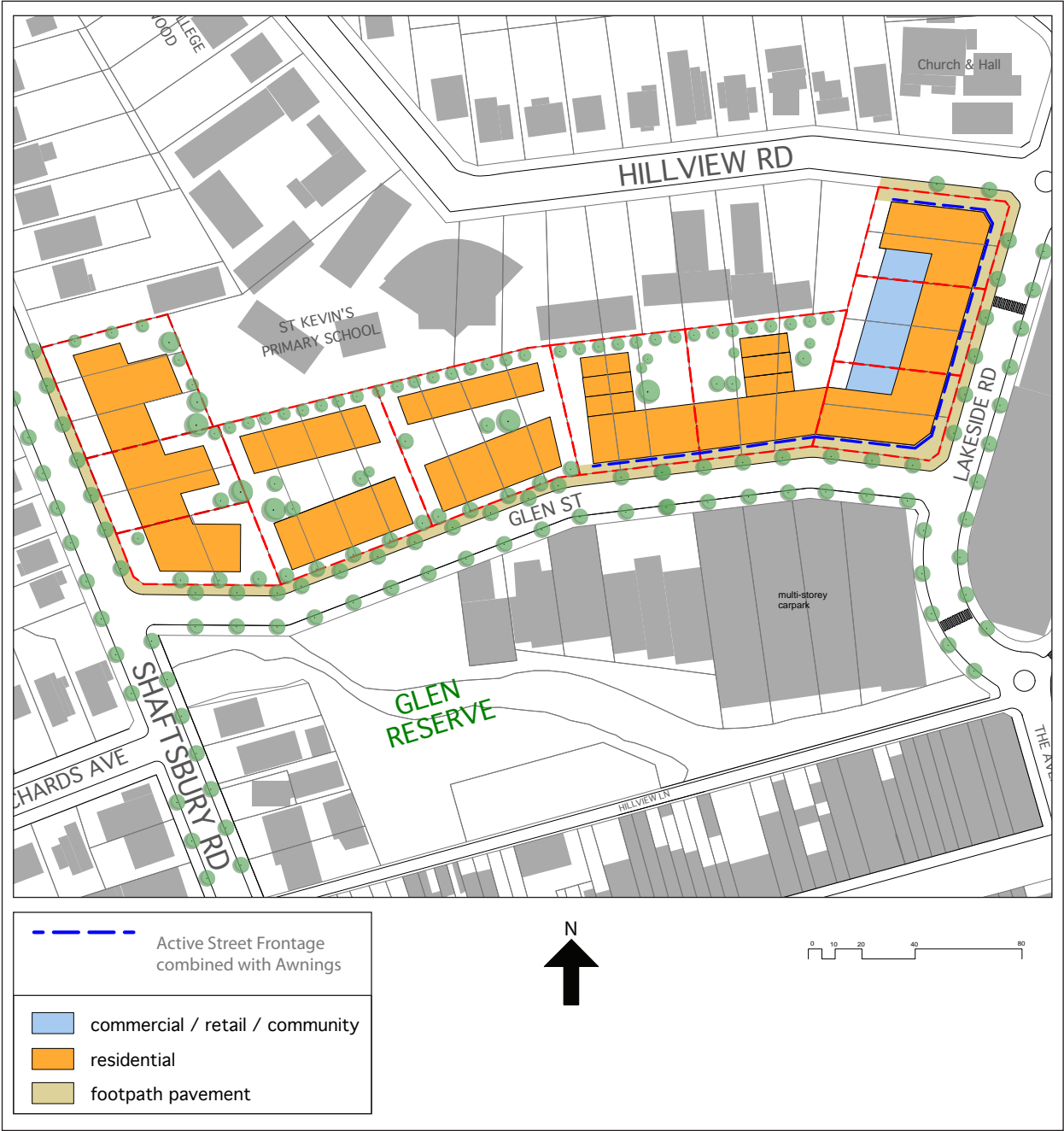


Figure 4.1.15 Glen Street and Lakeside Road Precinct Active Street Frontages Control Drawing.

4.2.10 Awnings + Entry Canopies

Objectives

1. To create a consistent streetscape.
2. To contribute to pedestrian amenity (all-weather protection), safety and security (lighting).

Controls

- a. Provide continuous awnings as indicated in Awnings Control Drawing Figure 4.1.15.
- b. Awning height is to be generally a minimum of 3m from the pavement and setback minimum 1m from the kerb edge. The heights of adjoining awnings should be considered.
- c. Design awnings to protect pedestrians from sun and rain. Glazed awnings will not be permitted where awnings are required unless it can be demonstrated that:
 - i. A cleaning and maintenance regime will be established; and
 - ii. Solar protection (shade) can be achieved; and
 - iii. Lighting will be installed to the underside of the awning that will light the footpath.
- d. Provide lighting, preferably recessed, to the underside of awnings, sufficient to ensure a high level of safety and security for pedestrians at night.
- e. Where the street or ground level is sloped, awnings should step down the hill.

4.2.11 Services Access and Parking

Objectives

1. To provide adequate and accessible parking and on-site service areas.
2. To provide size and number of service areas in proportion to the scale and intensity of the proposed use.
3. To ensure that service facilities do not detract from the amenity of nearby public spaces and residential areas.

Controls

Service Access

- a. On-site car and service vehicle access must be provided and designed in accordance with the following:
 - i. a driveway must be established that is of adequate strength, width and design for the intended car and service vehicle characteristics.
 - ii. the driveway is to be designed such that service vehicle movement is in a forward direction, both when entering and exiting the site;
 - iii. on-site manoeuvrability must be unimpeded for all site users.
- b. Generally service vehicle access is to be combined with parking access.
- c. Waste and recycling are to be provided in accordance with DCP Part 7.2 Waste Minimisation and Management Facilities for Waste.

Parking

- d. All carparking is to be provided underground.

Note: Refer to the CoR DCP 2014 Part 9.3 Parking Controls.

Services

- e. All services infrastructure including fire hydrants, gas meters and the like shall be located within the building envelope and are not to be visible from the public domain.

4.3 Public Domain

The public domain is made up of streets, pedestrian connections, small civic parks and squares.

Streets form the framework of the public domain connecting people to shopping, services, recreation and residential. Public spaces are the outdoor rooms of the small centres, providing focal points for community life.

Refer to the *City of Ryde Public Domain Technical Manual* in relation to the following sections.

4.3.1 Access and the Public Domain

Public domain spaces within the Ryde Small Centres need to be designed and sited so that the areas are safe at all times for all pedestrians and cyclists and that they are accessible to all.

Objectives

1. To reduce vehicular conflicts through good design of building entrances and reducing footpath cross-overs.
2. To clearly differentiate uses and separate conflicting uses.
3. To use appropriate lighting levels.
4. To encourage 'safe' pedestrian access and mobility.

Controls

- a. To be in accordance with the *City of Ryde Public Domain Technical Manual* and are to be implemented by the developer.
- b. Adequate parking and safe convenient access to buildings for people with disabilities must be provided.
- c. To provide active frontage and quality building design, where applicable vehicular access ramps must enter and exit from the rear lane.
- d. Vehicular traffic must be separated from pedestrians and vehicular access points clearly identified with paving, signage and the like.
- e. Loading docks must be located to the rear of the retail / commercial premises so that vehicles do not stand on any public road, footway and vehicles entering and leaving the site move in a forward direction.

4.3.2 Landscape Character

Objectives

- 1. To create a memorable landscape image for the small centre, which builds on the positive characteristics of topography, landscape character and views.
- 2. To protect, through planning controls, those spaces in private lands that contribute to the character and quality of the small centre.
- 3. To create tree planting, to reinforce spatial quality & build on the palette of existing species in the street, provide shade for pedestrians, and improve the image of the small centre.

Controls

- a. Select street trees based on the scale of buildings, width of the street, aspect, and on environmental parameters such as soil type shall be provided in accordance with the *City of Ryde Public Domain Technical Manual*.

4.3.3 Urban Elements and Finishes

Objectives

- 1. To coordinate paving and urban elements within the small centres.
- 2. To improve the image, quality and amenity of streets and public spaces through quality paving, lighting and street furniture.
- 3. To ensure that the selection of urban elements and level of provision is based on the hierarchy of streets and intensity of use.

Controls

- a. Provide paving, seats, benches and bins as selected by Council in accordance with Eastwood Village in the *City of Ryde Public Domain Technical Manual*.
- b. Provide seating and shelter (awnings or bus shelter) at all bus stops, and provide seating at community facilities and drop off points. Seating shall be in accordance with Eastwood Village in the *City of Ryde Public Domain Technical Manual*.
- c. Provide new street lighting to council satisfaction.

4.3.4 Signage

The aim is to provide consistent, attractive signage that enhances the built form within the Centre.

Objectives

- 1. To reduce visual clutter through the control and coordination of signage.
- 2. To reinforce the streetscape and enhance the character of the area.

Controls

- a. Signage shall comply with DCP Part 9.1 Signage.

THIS PAGE HAS BEEN
INTENTIONALLY LEFT BLANK



City of Ryde
Civic Centre
1 Devlin Street
Ryde NSW 2112

www.ryde.nsw.gov.au

City of Ryde Development Control Plan 2014

Part: 4.2 Shepherd's Bay, Meadowbank

Translation

ENGLISH

If you do not understand this document please come to Ryde Civic Centre, 1 Devlin Street, Ryde Monday to Friday 8.30am to 4.30pm or telephone the Telephone and Interpreting Service on 131 450 and ask an interpreter to contact the City of Ryde for you on 9952 8222.

ARABIC

إننا نعتذر عليك فهم محتويات هذه الوثيقة، نرجو للحضور إلى مركز بلدية رايد Ryde Civic Centre على العنوان: 1 Devlin Street, Ryde من الاثنين إلى الجمعة بين الساعة 8.30 صباحاً والساعة 4.30 بعد الظهر أو الاتصال بمكتب خدمات الترجمة على الرقم 131 450 لكي تطلب من أحد المترجمين الاتصال بمجلس مدينة رايد، على الرقم 9952 8222، نيابة عنك.

ARMENIAN

Եթէ այս գրութիւնը չէք հասկնար, խնդրեմ եկէ՛ք Րայդ Բիւրոյ Սիւվիլ Ենթըր, 1 Տելվին փողոց, Րայդ, (Ryde Civic Centre, 1 Devlin Street, Ryde) Երկուշաբթիէն Ուրբաթ կ.ա. ժամը 8.30 – կ.ե. ժամը 4.30, կամ հեռաձայնեցէ՛ք Հեռաձայնի եւ Թարգմանական Սպասարկութեան՝ 131 450, եւ խնդրեցէ՛ք որ թարգմանիչ մը Րայդ Քաղաքապետարանին հետ կապ հաստատուէ ձեզի համար, հեռաձայնելով՝ 9952 8222 թիվի:

CHINESE

如果您看不懂本文，請在周一至周五上午 8 時 30 分至下午 4 時 30 分前往 Ryde 市政中心詢問 (Ryde Civic Centre, 地址: 1 Devlin Street, Ryde)。你也可以打電話至電話傳譯服務中心，電話號碼是: 131 450。接通後你可以要求一位傳譯員為你打如下電話和 Ryde 市政廳聯繫，電話是: 9952 8222。

FARSI

اگر این مدرک را نمی فهمید لطفاً از 8.30 صبح تا 4.30 بعد از ظهر دوشنبه تا جمعه به مرکز شهرداری رايد، Ryde Civic Centre, 1 Devlin Street, Ryde مراجعه کنید یا به سرویس مترجم تلفنی، شماره 131 450 تلفن بزنید و از یک مترجم بخواهید که از طرف شما با شهرداری رايد شماره 9952 8222 تلفن بزند.

ITALIAN

Se non capite il presente documento, siete pregati di rivolgervi al Ryde Civic Centre al n. 1 di Devlin Street, Ryde, dalle 8.30 alle 16.30, dal lunedì al venerdì; oppure potete chiamare il Telephone Translating and Interpreting Service al 131 450 e chiedere all'interprete di contattare a vostro nome il Municipio di Ryde presso il 9952 8222.

KOREAN

이 문서가 무슨 의미인지 모르실 경우에는 1 Devlin Street, Ryde 에 있는 Ryde Civic Centre 로 오시거나 (월 – 금, 오전 8:30 – 오후 4:30), 전화 131 450 번으로 전화 통역 서비스에 연락하셔서 통역사에게 여러분 대신 Ryde 시청에 전화 9952 8222 번으로 연락을 부탁드립니다.

Amend. No.	Date approved	Effective date	Subject of amendment

Table of Contents

CONTENTS

1.0 INTRODUCTION	5
1.1 The Objectives of this Part	5
1.2 Land Affected by this Part	5
1.3 Relationship to Other Plans and Policies	6
2.0 DESIRED CHARACTER	7
2.1 Introduction	7
2.2 Desired Future Character	7
2.2.1 Integrated Public Domain and Development	7
2.2.2 Sustainability and Environmental Performance	7
2.3 Land-use	8
2.4 Precincts	9
3.0 DESIGN EXCELLENCE PROVISIONS	11
3.1 Site Analysis	11
3.2 Staged Development Applications	12
4.0 GENERAL DEVELOPMENT CONTROLS	13
4.1 Development and the Public Domain	13
4.1.1 Mixed-Use Development	13
4.1.2 Public Domain, Access and Pedestrian/Cyclist Amenity	14
4.1.3 Implementation - Infrastructure, Facilities and Public Domain Improvements	16
4.1.4 Views and Vistas	23
4.1.5 Landscaping and Open Space	25
4.1.6 Street Furniture and Public Art	27
4.1.7 Safety	27
4.2 Architectural Characteristics	28
4.2.1 Height	28
4.2.2 Setbacks	31
4.2.3 Roof Form	34
4.2.4 Building Facades and Articulation	35
4.2.5 Private and Communal Open Space	35

Table of Contents

4.2.6	Residential Amenity	36
4.3	Ecological Sustainability	36
4.3.1	General Requirements for Development Applications	36
4.3.2	Energy Efficient Design	36
4.3.3	Waste Management	37
4.4.2	Noise and Vibration Attenuation	37
4.4	Parking Access and Loading	38
4.5	Flooding and Stormwater Drainage	39
5.0	PRECINCT SPECIFIC DEVELOPMENT CONTROLS	42
5.1	Precinct 1 - Station	43
5.2	Precinct 2 - Constitution Road	43
5.3	Precinct 3 - Waterfront	44
5.4	Precinct 4 - Church Street	45

1.0 INTRODUCTION

The purpose of this Part is to guide the future development of the Shepherd's Bay, Meadowbank. This Part consists of a series of planning provisions targeting the renewal and revitalisation of Shepherd's Bay, Meadowbank. These provisions will see the employment area progressively transformed into a transit-orientated, mixed use environment.

1.1 The Objectives of this Part

This Part aims to revitalise Shepherd's Bay, Meadowbank through development provisions that:

1. encourage new development or the adaptive re-use of existing buildings containing a mix of residential, commercial and local retail;
2. describe the maximum scale, bulk and height of new buildings;
3. facilitate convenient access between work, home and leisure;
4. create a place specifically designed for the enjoyment and use of pedestrians and cyclists;
5. provide for a high level of aesthetic amenity, particularly at street level;
6. recognise and reinforce the area's topography, landscape setting and unique location on the Parramatta River foreshore;
7. facilitate uses and development that are compatible with, and complement, public use of the Parramatta River and its foreshores;
8. provide for safe, attractive and convenient public spaces that are well used;
9. preserve, protect and enhance elements of cultural and environmental significance.

1.2 Land Affected by this Part

This Part applies to land within Shepherd's Bay, Meadowbank as identified in Figure 4.2.01.



Figure 4.2.01 Meadowbank Employment Area

1.3 Relationship to Other Plans and Policies

The following documents should be referenced in relation to any proposed development within Meadowbank:

- Local Planning Study 2010
- Ryde Local Environmental Plan 2014
- State and Regional Plans relating to Sydney Harbour Catchment

2.0 DESIRED CHARACTER

2.1 Introduction

City of Ryde, as part of its commitment to Centre Revitalisation, has endorsed an Urban Villages concept for the City's traditional centres. An Urban Village is a place in a city which has the characteristics of a village and may be defined as an urban precinct located around a public transport interchange, incorporating:

1. A mix of land uses;
2. Attractive and well used public spaces;
3. A safe and convenient pedestrian environment;
4. Urban design elements which promote community pride and identity; and
5. Appropriate scale of built form that optimises the areas location between a major railway line and arterial road.

2.2 Desired Future Character

1. The vision for Shepherd's Bay, Meadowbank is to create a higher density transit-orientated neighbourhood, providing for a mix of residential and commercial/retail uses.
2. Excellent transport infrastructure will provide a high level of access and mobility, ensuring efficient connections from the east to west and north to south.
3. Shared zones and dedicated pedestrian and cycle ways will encourage walking and cycling whilst connecting green open spaces and transport nodes to create a high quality public domain for residents and visitors
4. New mixed use development will integrate with surrounding neighbourhoods and buildings, ensuring that the bulk and scale of new buildings is sensitive to the foreshore location and maximises the view potential towards the Parramatta River and surrounding regions.
5. Commercial and retail development will be concentrated around Meadowbank Station and along Church Street, whilst residential development will dominate between these employment nodes.
6. An improved public domain that provides an improved level of amenity that allows for higher densities across the area.

2.2.1 Integrated Public Domain and Development

Developments are to ensure that social, economic, environmental and urban design issues are considered together and with proper regard for their mutual and cumulative impacts. All planning, design and development activities must take account of, and effectively respond to, the linkages and interfaces between public space and private land.

2.2.2 Sustainability and Environmental Performance

Shepherd's Bay, Meadowbank will develop into a transit-oriented community that maximises the potential of urban consolidation and the integration of economic, infrastructure and physical resources. Development is to create a safe and comfortable environment for residents and workers in both private and public open spaces, through best practice design that ensures buildings and spaces achieve maximum environmental performance and minimum resource use.

Development is to be designed having regard to:

1. wind effect;
2. reflectivity;
3. noise attenuation;
4. solar access and energy conservation;
5. water conservation and re-use;
6. stormwater management;
7. adaptive re-use of buildings, where practicable;
8. landscape setbacks;
9. use of native plant species;
10. use of recycled materials;
11. waste reduction; and
12. cyclist facilities.

The development of public spaces must contribute to greater biodiversity, habitat protection and enhancement, and air and water quality. Development of contaminated land shall not proceed until the site has been remediated to a standard commensurate with the use of the land for any purpose permitted with consent in any environmental planning instrument.

2.3 Land-use

Under the LEP 2014 Shepherd's Bay, Meadowbank is zoned B4 Mixed Uses. The aim of this zone is to allow a mix of compatible uses and to integrate suitable business, office, residential, retail and other development in accessible locations so as to maximise public transport patronage and encourage walking and cycling. Shepherd's Bay due to its unique setting in relation to transport, water and major roads provides the opportunity to meet these goals. The zone permits a range of uses. This development control plan provides additional detail to land use planning in Meadowbank. Specific aims in relation to land use include:

- Provide a mix of uses in areas where more intense development is to occur such as in the Station Precinct and the Church Street Precinct;
- Protect residential areas from the impacts of noise and pollution along busy roads by providing a non residential buffer;
- Provide a predominantly residential land use in the centre of Shepherd's Bay, Meadowbank; and
- Ensure that land uses and public domain upgrades compliment each other and are coordinated.

Part 5, Precinct Controls provide additional detail in relation to land use across the area.

2.4 Precincts

Shepherd's Bay, Meadowbank consists of four precincts (see Figure 4.2.02) differentiated by land-use, urban form and character. For detailed descriptions, objectives and controls for the precincts refer to Precinct Specific Development Controls (Section 5). The four precincts are:

Station Precinct

The station precinct is located in the north-western corner of the site and includes the area surrounding the existing Meadowbank Station.

Constitution Road Precinct

This precinct is centred on Constitution Road an important access to Shepherd's Bay, Meadowbank. It is bounded by Nancarrow Avenue to the south, Porter Street to the east, and Bowden Street to the west.

Waterfront Precinct

The waterfront precinct comprises the area south of Nancarrow Avenue. It includes the area along the foreshore, as well as Faraday Park.

Church Street Precinct

The Church Street precinct is situated between Porter Street and Church Street on the eastern edge of the site.

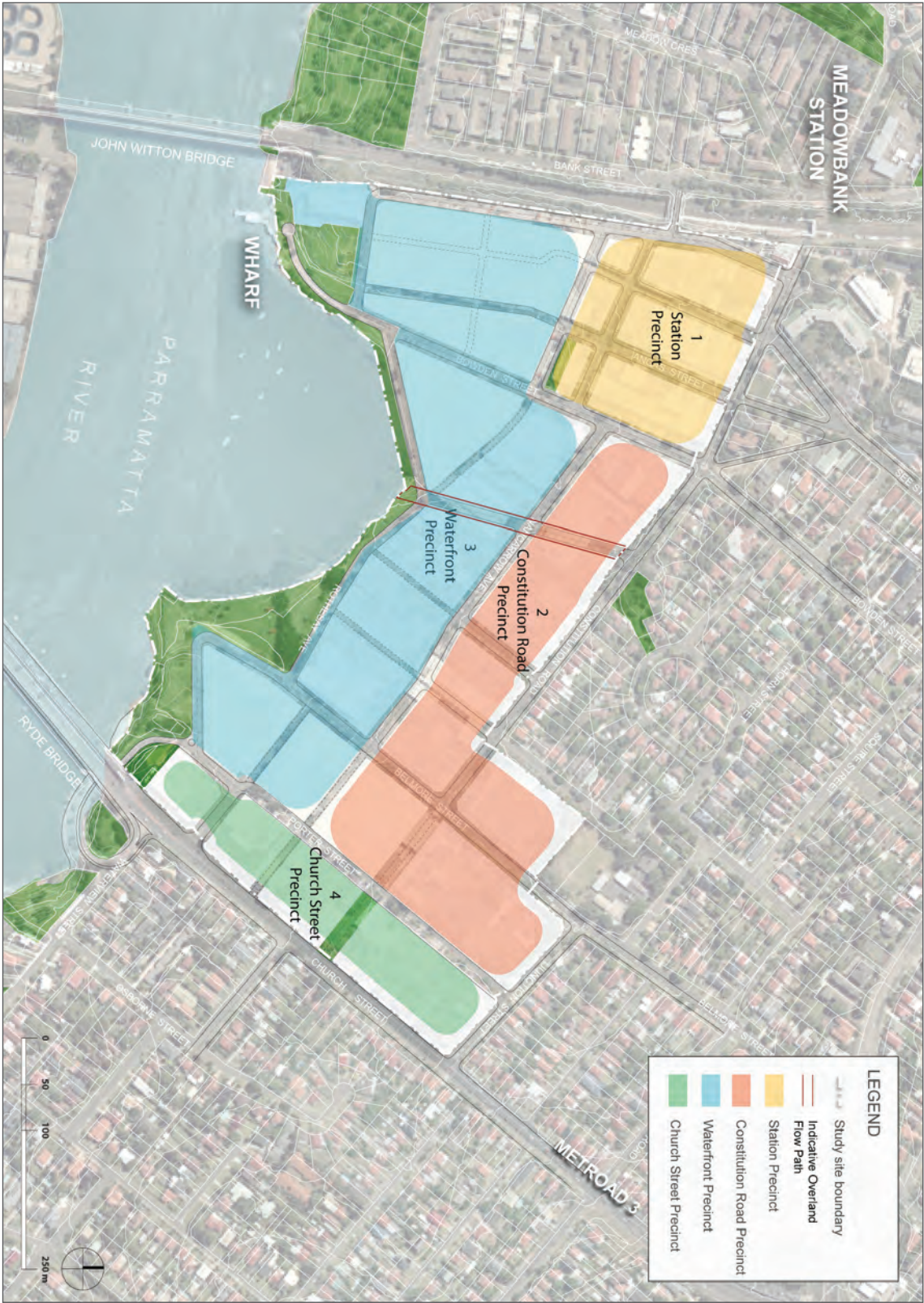


Figure 4.2.02 Precinct Plan

3.0 DESIGN EXCELLENCE PROVISIONS

Good building design should positively contribute to the overall architectural quality of the area and provide buildings appropriate to their context. In some circumstances, this contribution may be as an iconic or landmark building, but more typically it is as a well-mannered building that fits sensitively into the streetscape and surrounding built form.

This DCP sets out a number of controls that aim to achieve design excellence. This will ensure an appropriate transition between the development and public domain as well established areas.

3.1 Site Analysis

Site analysis is the first step in preparing a development proposal and must be undertaken prior to the consideration of any development options. A site analysis assesses and documents the key opportunities and constraints of a site and shows how these, in conjunction with Council's requirements, have determined the final proposal for the site.

Objectives

1. To appropriately assess the site and its constraints in order to develop a proposal that is appropriate to the sites setting and surrounding built form.
2. To ensure that the built form and architectural features of the development are appropriate for the locality.

Controls

The site analysis:

- a. Must be submitted with any development application for building works;
- b. Should address the performance criteria, design solutions and controls set out in this Part.

Note: The level of detail will depend on the size of the proposed development, with minor work requiring less information.

The level of detail should be clarified with Council's Environment and Planning Group;

- c. Should indicate the relationship of the site/development to the following:
 - i. the public open spaces (or public domain) like parks, streets and verges;
 - ii. its context including other buildings;
 - iii. pedestrian and cycle connectivity, both along the edges and where appropriate through the site;
 - iv. heritage items where applicable; and
 - v. the future built form of the area and the precinct.
- d. Should include plans, sketches, photographs and supporting written information; and
- e. Must indicate how the analysis has influenced the proposed design.

3.2 Staged Development Applications

A staged development application provides for a more consistent urban design outcome. A staged development application sets out the concept proposal for the development of the site.

The staged application sets the site layout and broad building envelopes that will guide the more detailed development applications later on.

Objectives

1. To develop an appropriate building envelope that is in keeping with the site characteristics, public domain and surrounding built form.
2. To ensure consistent design outcome over large sites and areas
3. To ensure that all residential amenity controls (e.g. solar access, natural ventilation etc) can be achieved over the site prior to commencing the detailed design of a development.

Controls

- a. On sites over 5000 m² a stage development application is required that addresses:
 - i. Existing and future character;
 - ii. Design principles drawn from an analysis of the site and its context;
 - iii. Proposed staging of development;
 - iv. Distribution of land uses, including open space and landscaping;
 - v. Ways in which the development will interface with, and contribute to, the public domain and the context;
 - vi. Pedestrian, cycle and other transport access and circulation systems;
 - vii. Parking provision;
 - viii. Impact on traffic movements;
 - ix. Built form, including the height and bulk of buildings;
 - x. Infrastructure provision;
 - xi. Site densities and coverage;
 - xii. Design elements;
 - xiii. Heritage conservation/interpretation;
 - xiv. Remediation of the site;
 - xv. Provision of public facilities and/or public art;
 - xvi. Social, cultural and economic impact assessment; and
 - xvii. Analysis of the potential impact of the proposed development.
- b. A photo montage from the Parramatta River of the proposed scheme and/or a 3-dimensional model at a scale of no less than 1:200.
- c. Staged development applications must be considered by Council's urban design review panel.

4.0 GENERAL DEVELOPMENT CONTROLS

4.1 Development and the Public Domain

This section details controls that seek to manage the interface between the public and private domain and enhance accessibility and environmental amenity throughout the area. It covers:

1. Mixed-use development;
2. Pedestrian and cyclist amenity, access and linkages;
3. Views and vistas;
4. Landscaping and open space;
5. Street furniture and public art;
6. Safety; and
7. Advertising and signage.

4.1.1 Mixed-Use Development

Council seeks to encourage development that fosters Shepherd's Bay, Meadowbank as a vibrant, attractive, safe and economically viable urban village, characterised by a mix of residential, commercial and retail uses. Mixed use involves different uses being designed to compatibly coexist either horizontally on adjacent parcels of land or vertically with in the same building.

Objectives

1. To accommodate a mix of activities – residential and commercial – in a manner that protects residential amenity while promoting economic viability.
2. To encourage a range of local uses in the vicinity of the rail station.
3. To allow for a mix of uses comprising predominantly commercial and retail uses in the Station Street and Church Street precincts.
4. To encourage lively and safe streets by requiring active street frontages and uses (retail and commercial) at ground level in designated precincts.
5. To accommodate small-scale supporting retail activity designed specifically to service, the needs of residents, workers and visitors to the area.
6. To encourage flexible building design that is adaptable to a variety of uses and future changes of use.

Controls

Mixed-use development will comprise either:

- a. a combination of medium and high density residential development with compatible employment related activity; or
- b. compatible employment related activities including:
 - i. restaurants and cafés;
 - ii. small scale retail establishments such as convenience stores and news agencies up to 2000 m²;
 - iii. small commercial offices and studios such as real estate agencies offices;
 - iv. professional suites such as doctors suits; and
 - v. home offices.

- c. Home office accommodation is allowed throughout the area.
- d. Retail developments, restaurants and cafés are to be generally located at street level.
- e. Commercial uses are encouraged at the level immediately above street level, including but not confined to, professional and commercial offices, services such as dry cleaners, newsagency, and leisure uses such as a gym, places of worship or meeting rooms.
- f. Ground floor apartments are to be of flexible design to facilitate change of use and ensure privacy for occupants.
- g. Where upper levels of development are used for either commercial or residential activity, the amenity of both uses must not conflict or be compromised by other uses in the development.
- h. Private living spaces and communal or public spaces should be clearly identified and defined.
- i. Pedestrian entry to the residential control of mixed-use developments should be
 - i. separated from entry to other land uses in the building(s); and
 - ii. have a clear address and presentation to the street.
- j. Active streetscapes will be encouraged by the use of outdoor restaurant seating, whether on private or public land. Refer to Council's Outdoor Dining Policy.
- k. New large scale warehousing is not appropriate in the area.
- l. The Church Street frontage should be used for commercial uses with residential uses setback at 12m and fronting Porter Street.

4.1.2 Public Domain, Access and Pedestrian/Cyclist Amenity

The public domain provisions are intended to achieve a high quality of urban design and pedestrian comfort in the public spaces of Shepherd's Bay, Meadowbank and to encourage people to walk and cycle. This environment should be legible, safe, clear and distinct, functional and accessible to all, provide opportunities for social and cultural activities, and be characterised by excellence of design appropriate to a mixed-use area.

Shepherd's Bay, Meadowbank is noted for its relatively steep topography with pedestrian and cycle access needing to take into account gradients that are in some cases 1:7. The aim is to ensure the area is as accessible as possible for all people including those with mobility disabilities, aged people, people with prams.

Vehicle crossings over footpaths need to be managed and minimised to ensure that they do not detract from the quality of the public domain, disrupt pedestrian movement or threaten safety.

Objectives

1. To enhance pedestrian and cyclist accessibility and the connectivity and permeability of the street network.
2. To limit the number of vehicle crossings and high vehicle access points for any development.
3. To provide appropriate linkages to public transport.
4. To provide an upgraded public domain throughout the area.

Controls

- a. The achievement of maximum heights and density is contingent on meeting the public domain provisions of this plan and all public domain items being provided by the proponent.
- b. New developments must be provided with a minimum of one barrier free access point to the main entry.
- c. Publicly accessible pedestrian and cycle ways must be provided through large sites. (even if not envisioned by this plan) (refer to Figure 4.2.03)
- d. New pedestrian and cycleway access points, gradients and linkages are to be designed to be fully accessible by all.
- e. New commercial development should provide facilities, including showers, bike lockers etc, to encourage walking and cycling to work – refer to Part 9.3 - Parking.
- f. New roads, shared ways, pedestrian and cycle paths shall be provided in accordance with Figure 4.2.03.
- g. Constitution Road, Faraday Lane and Porter Street (see Figure 4.2.03, Figure 4.2.04, Figure 4.2.04a, Figure 4.2.04b, Figure 4.2.05, Figure 4.2.06 and Figure 4.2.07) are to be widened.
- h. The design of new roads, shared ways footpaths and cycle paths shall be in accordance with Figure 4.2.03, Figure 4.2.04, Figure 4.2.04a, Figure 4.2.04b, Figure 4.2.05, Figure 4.2.06 and Figure 4.2.07.
- i. Shared pedestrian links, cycle ways, public roads and lanes are to be of a high standard and treated in a way which indicates their shared status. The selection of paving, street furniture, lighting, bollards, signage and paving should compliment the existing upgrade works to Shepherds Bay (refer to the Ryde Public Domain Technical Manual).
- j. The design and location of vehicle access to developments should minimise conflicts between pedestrian and vehicles on footpaths, particularly along high volume pedestrian streets.
- k. Service vehicle access is to be combined with parking access and limited to a maximum of one access point per building.
- l. Wherever practicable, vehicle access is to be a single crossing, perpendicular to the kerb alignment.
- m. Vehicle access ramps parallel to the street frontage will not be permitted.
- n. Vehicle entries are to have high quality finishes to walls and ceiling as well as high standard detailing. No service ducts or pipes are to be visible from the street.
- o. The ground floor of all development is to be flush with the street footpath for the predominant level of the street frontage and at the main entry to the building.
- p. Recesses for roller doors and fire escapes are to be wide and shallow to provide for personal security. Narrow, deep recesses are to be avoided.
- q. Pedestrian links must be a minimum width of 3.5 m, clear of buildings and open 24 hours a day. Pedestrian links identified in Figure 4.2.03 must be dedicated to Council.
- r. Developments must be setback from the corner on blocks with poor site lines. The setback distance will be at the discretion of Council.
- s. The Rothsay Avenue to Bowden Street pedestrian link must be a minimum width of 6 m.

4.1.3 Implementation - Infrastructure, Facilities and Public Domain Improvements

New and improved infrastructure (road network and drainage), and public domain improvements (planting, public art) within the area is necessary to support its growth and development to create a vibrant and commercially viable area. Such elements are also vital for strengthening and sustaining the existing and future community.

The basis for the infrastructure, facilities and public domain improvements within the Corridor is documented within this DCP.

The provisions of these elements will be achieved through:

1. Development contributions under s94 of the Environment Planning and Assessment Act 1979;
2. Development process achieved through design and implemented as a condition of the development; and
3. Development process achieved through a negotiated outcome undertaken through the planning agreement process.

This control relates to achieving infrastructure, facilities and public domain improvements through the development processes.

Objectives

1. To ensure the provision of infrastructure, facilities and public domain improvements within Shepherd's Bay.

Controls

- a. The public land such as the road verge adjoining a development site is to be embellished and if required dedicated to Council as part of any new development. The design and construction of the works are to be undertaken in accordance with section Figure 4.2.03, Figure 4.2.04, Figure 4.2.04a, Figure 4.2.04b, Figure 4.2.05, Figure 4.2.06 and Figure 4.2.07.
- b. The Access Network being the roads, pedestrian connections and open space network as shown Figure 4.2.03 is to be embellished if required and dedicated to Council as part of the new development. The design and construction of the works are to be undertaken in accordance with Ryde Public Domain Technical Manual and section 4.1.2 of this DCP
- c. S94 contributions still apply throughout area, notwithstanding any land dedications, public domain improvements, infrastructure provision etc as required by this DCP.

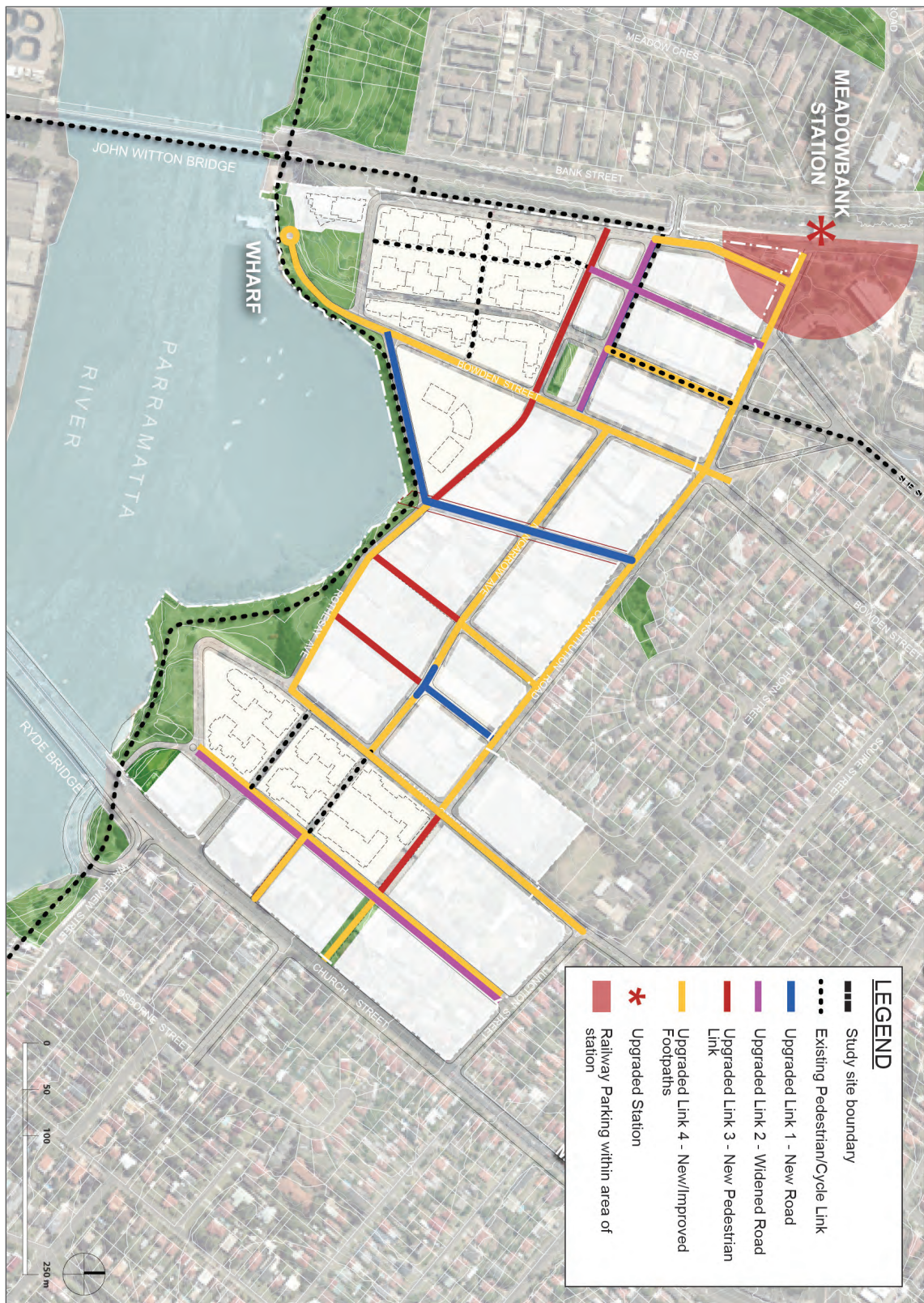


Figure 4.2.03 Public Domain Upgrades

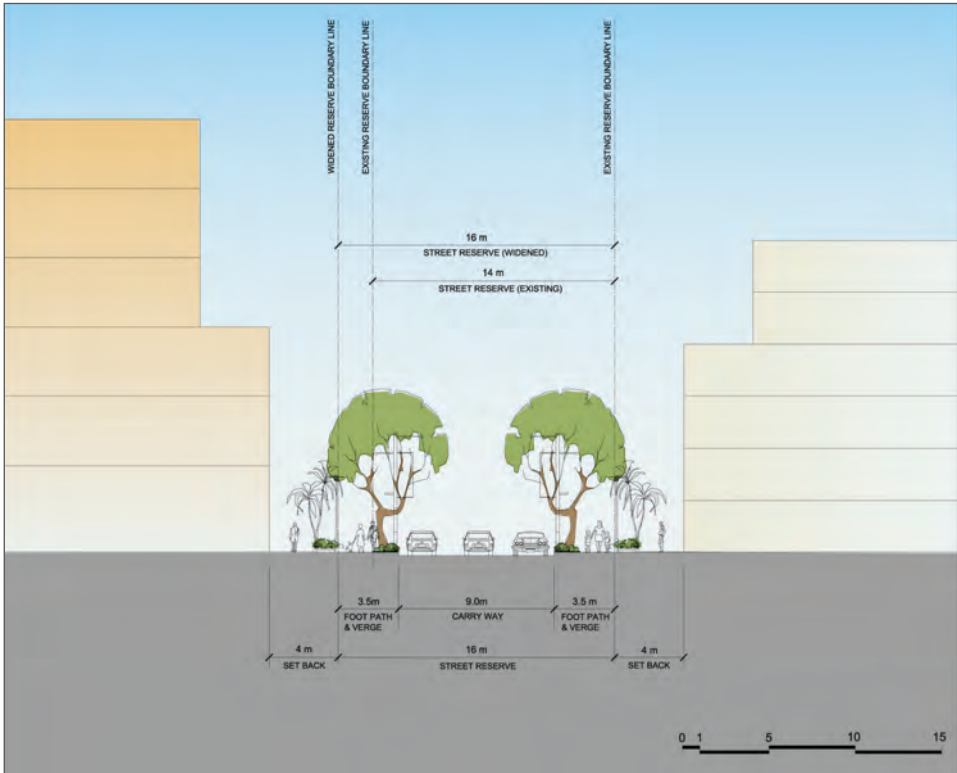
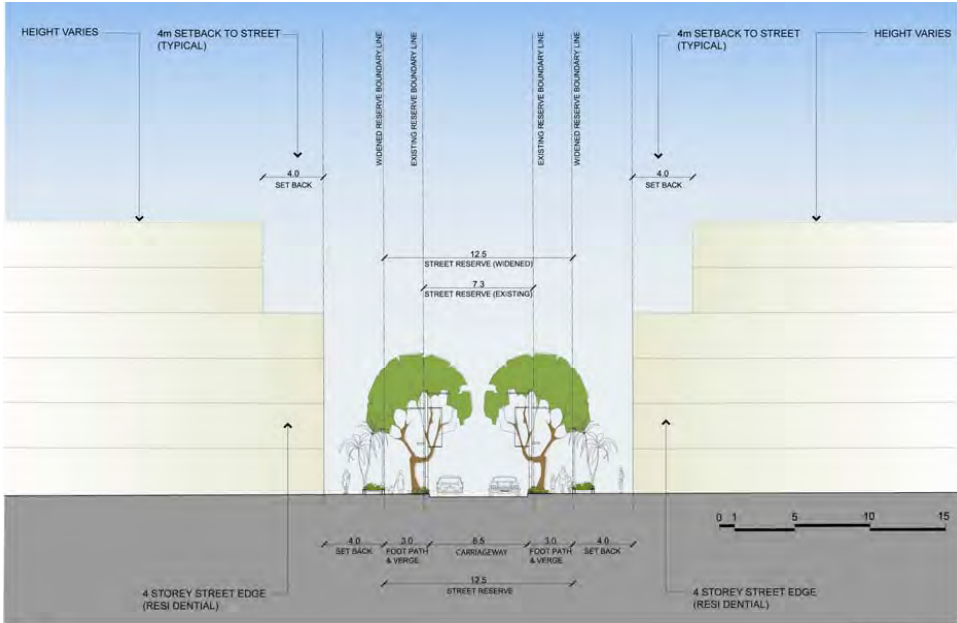


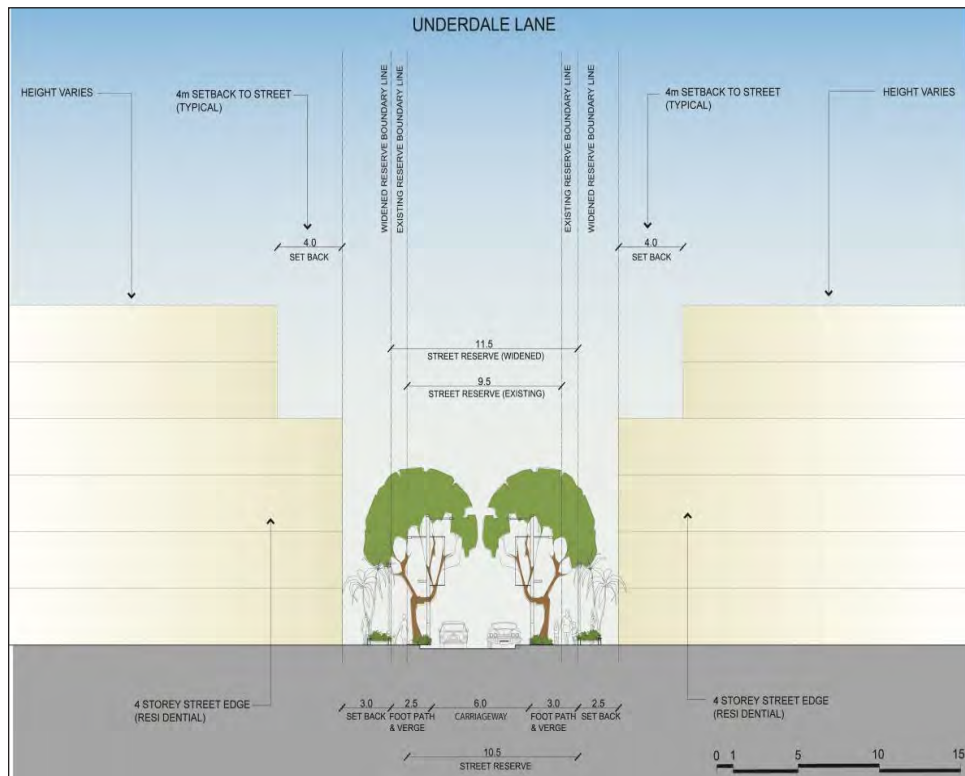
Figure 4.2.04 Porter Street widening



FARADAY LANE



Figure 4.2.04a Faraday Lane Widening



UNDERDALE LANE



Figure 4.2.04b Underdale Lane Widening

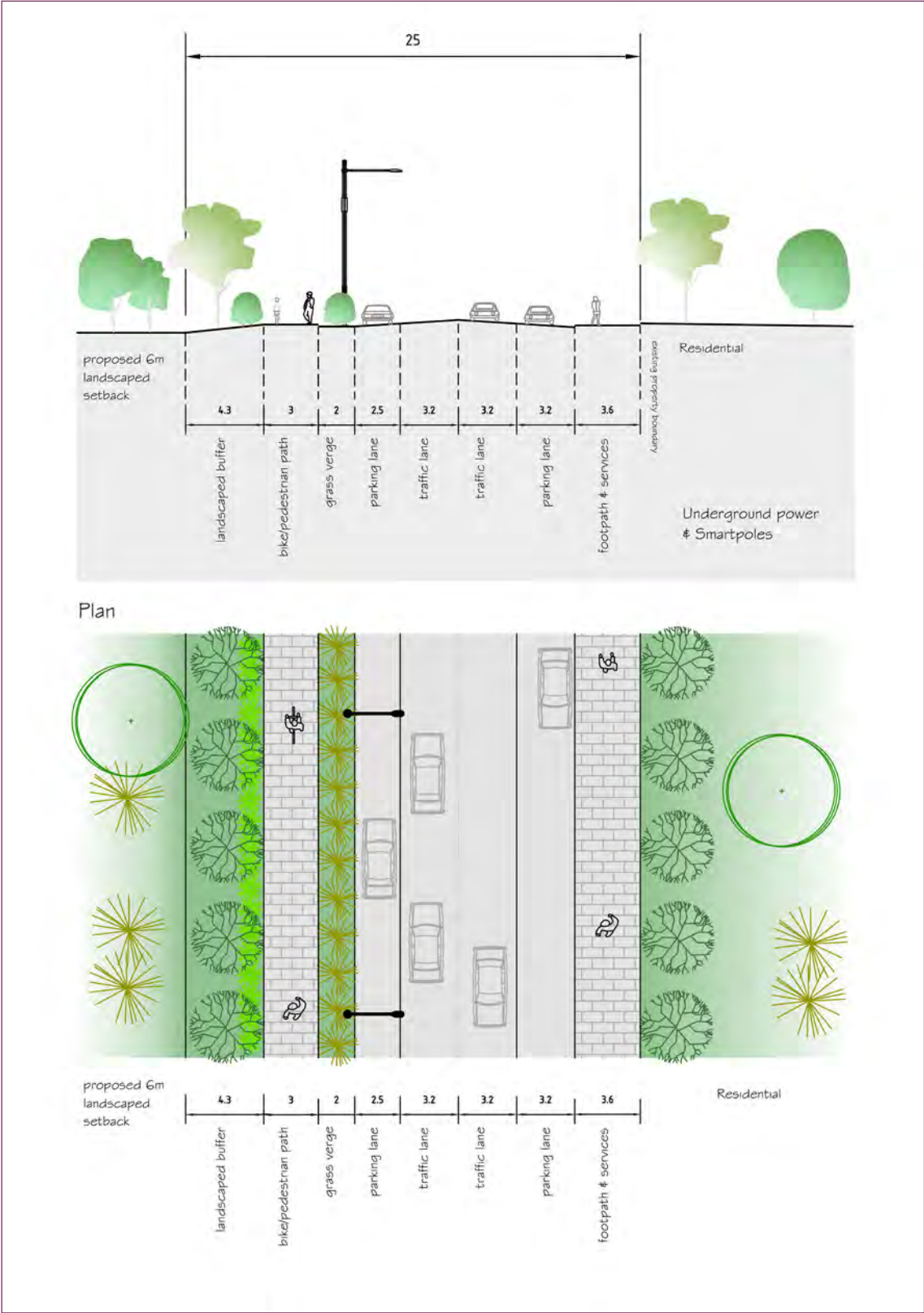


Figure 4.2.05 Constitution Road Widening (Section A)

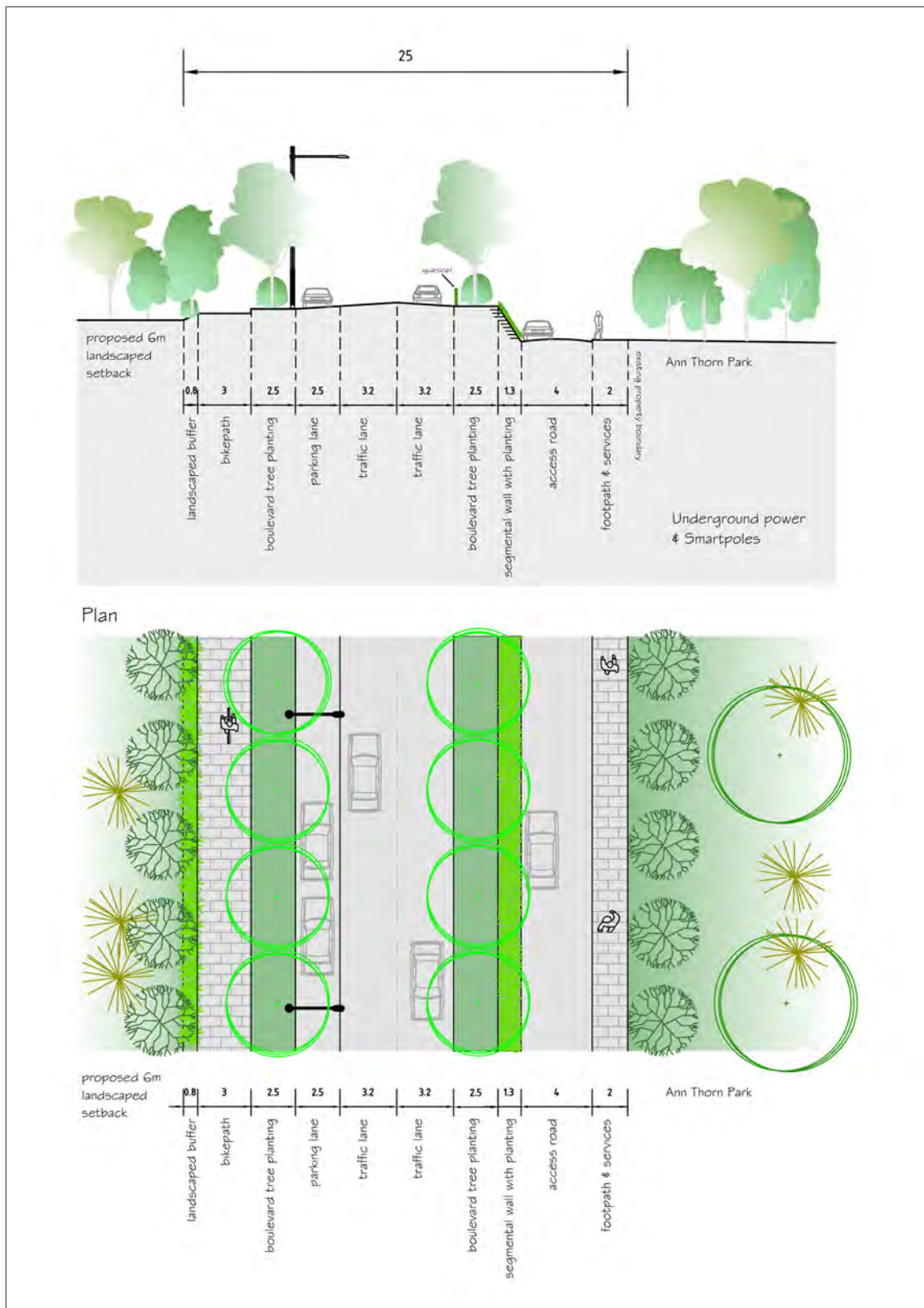


Figure 4.2.06 Constitution Road Widening (Section B)

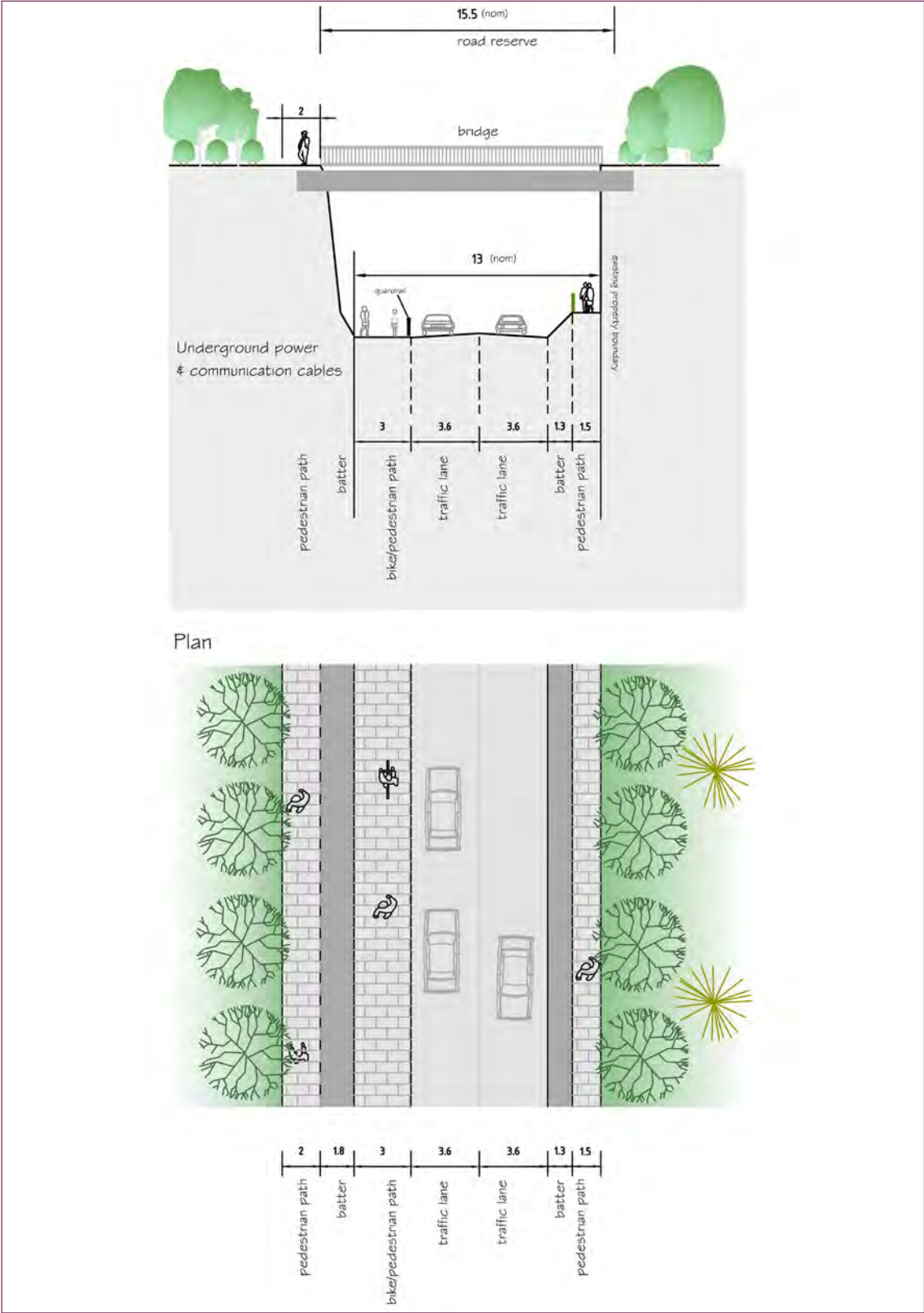


Figure 4.2.07 Constitution Road Widening (Section C)

4.1.4 Views and Vistas

The topography of Shepherd's Meadowbank Basin, with falls of some 20 metres towards the south to the Parramatta River, provides a number of vantage points for views. Much of the north-south orientated existing road structure enables views from elevation points, in particular Bowden and Belmore Streets. The foreshore public open space, contiguous with the Parramatta River, enables views through trees and vegetation. Limited vistas towards Sydney Olympic Park and the City of Sydney are possible from some vantage points.

Objectives

1. To reinforce and protect views to the Parramatta River and beyond and enhance permeability through the area - north-south and east-west.
2. To maintain and enhance view corridors, view sheds and panoramas both into and out of the area.
3. To protect views from the water of the northern treed ridgeline of Meadowbank.
4. To facilitate views by reflecting topographical changes in building heights.

Controls

- a. Panoramic views of Parramatta River are to be maintained from Faraday Park, Settlers Park, Anderson Park, and Helene Park (refer to Figure 4.2.08)
- b. Development is to ensure that vistas towards Parramatta River are maintained (refer to Figure 4.2.08)
- c. Development must reflect the topography of the area taking into consideration views from the Rhodes Peninsula, Railway Bridge and Ryde Bridge.
- d. Maintain views for pedestrians and cyclists along the public open space to the Parramatta River.
- e. Provide a four (4 m) metre setback along both sides of Bowden Street and Belmore Street from the north at Constitution Road towards the south at the junction of the Parramatta River. (Refer to section 4.2.2)
- f. Maintain secondary views through the site from pedestrian and cycle links from Nancarrow Avenue to the Parramatta River.
- g. New buildings are to take into account the existing views on the subject site and adjoining sites.
- h. Orientate new development to take advantage of water views and vistas.
- i. New developments are not to materially compromise views of the northern ridgeline of Meadowbank.
- j. Development applications will be required to include an assessment of views in accordance with the above controls.

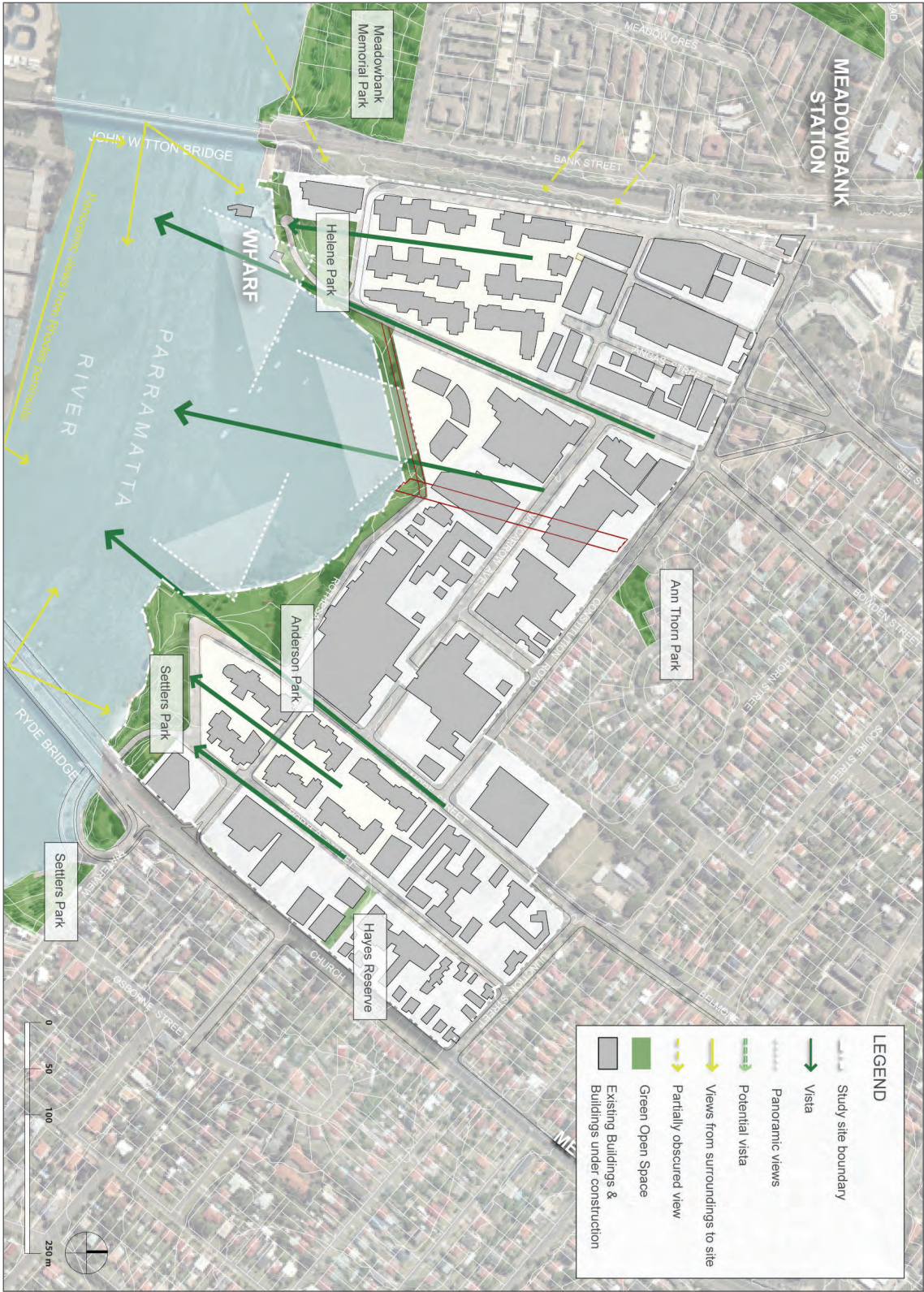


Figure 4.2.08 View and Vistas

4.1.5 Landscaping and Open Space

The unique features of topography, mature trees and vegetation - in particular mangroves at the foreshore and mature fig trees along Rothesay Avenue and at Helene Park - distinguish Meadowbank from other waterfront areas in Sydney. Their preservation is essential. The tree canopy along the northern ridgeline further defines the character and scale of Shepherd's Meadowbank Basin. The existing foreshore and park edge to the Parramatta River are the area's major open space assets.

Controls in relation to landscaping and trees seek to protect this feature of Meadowbank, enhance amenity and environmental qualities at street level, soften the appearance of buildings and improve the visual quality of the area. The public domain will create more linkages and connections from all parts of the site to the foreshore. These are primarily north / south links.

In addition wider street verges and street trees will form 'green' links from the water north to Constitution Avenue. This will be particularly important when the site is viewed from public areas of the foreshore, the Parramatta River, and the Rhodes Peninsula.

Objectives

1. To facilitate development of open space that contributes to greater biodiversity, habitat protection and enhancement.
2. To provide a network of linked, quality landscaped areas of public and private open spaces, pedestrian connections and streets.
3. To retain and preserve all existing mature trees that add to the quality of the area.

Controls

- a. All development proposals are to be accompanied by a Landscape Plan prepared by a qualified and suitably experienced landscape architect. This is to include an arborist's report on existing trees, and demonstrate how proposed landscaping will contribute to ecological sustainability. Management of construction impacts must also be addressed.
- b. Roof gardens are encouraged and must be considered in any landscaping plan.
- c. Any development located adjacent to, or immediately across the road from open space is required to address the open space by way of design and orientation.
- d. All existing mature trees that enhance the quality of the area are to be retained.
- e. Provide adequate deep planting zones above car parking and other concrete or similar structures to allow sustainable planting.
- f. Provide at ground floor level, where possible, open space for dwelling units and contiguous open garden areas to create common large landscaped space.
- g. Construction of roof areas of multi unit developments is to make provision for useable roof gardens.
- h. Where appropriate, developments should incorporate landscaping (such as planter boxes) integrated into the upper levels of building to soften building form.
- i. Building setbacks are to allow for landscaping/planting as in section 4.2.2 Setbacks.
- j. For corner buildings a reduction of the landscape setback on one side will be considered on its merit. This reduction does not apply to foreshore setbacks.

- k. Where a proposal involves redevelopment of a site the developer are to arrange for electricity and telecommunications utilities to be under grounded along the entire length of all street frontages. Such utility modifications will be carried out to the satisfaction of the responsible authority (e.g. Energy Australia). This is to improve the visual amenity of the area and allow street trees to grow unimpeded.
- l. Permeable landscape surface materials is to be maximised, to allow maximum penetration of stormwater and urban runoff. Recommended permeable landscape materials include gravel, loosely fitting pavers, stepping stones, vegetative groundcover such as grass, creepers, and shrubs.

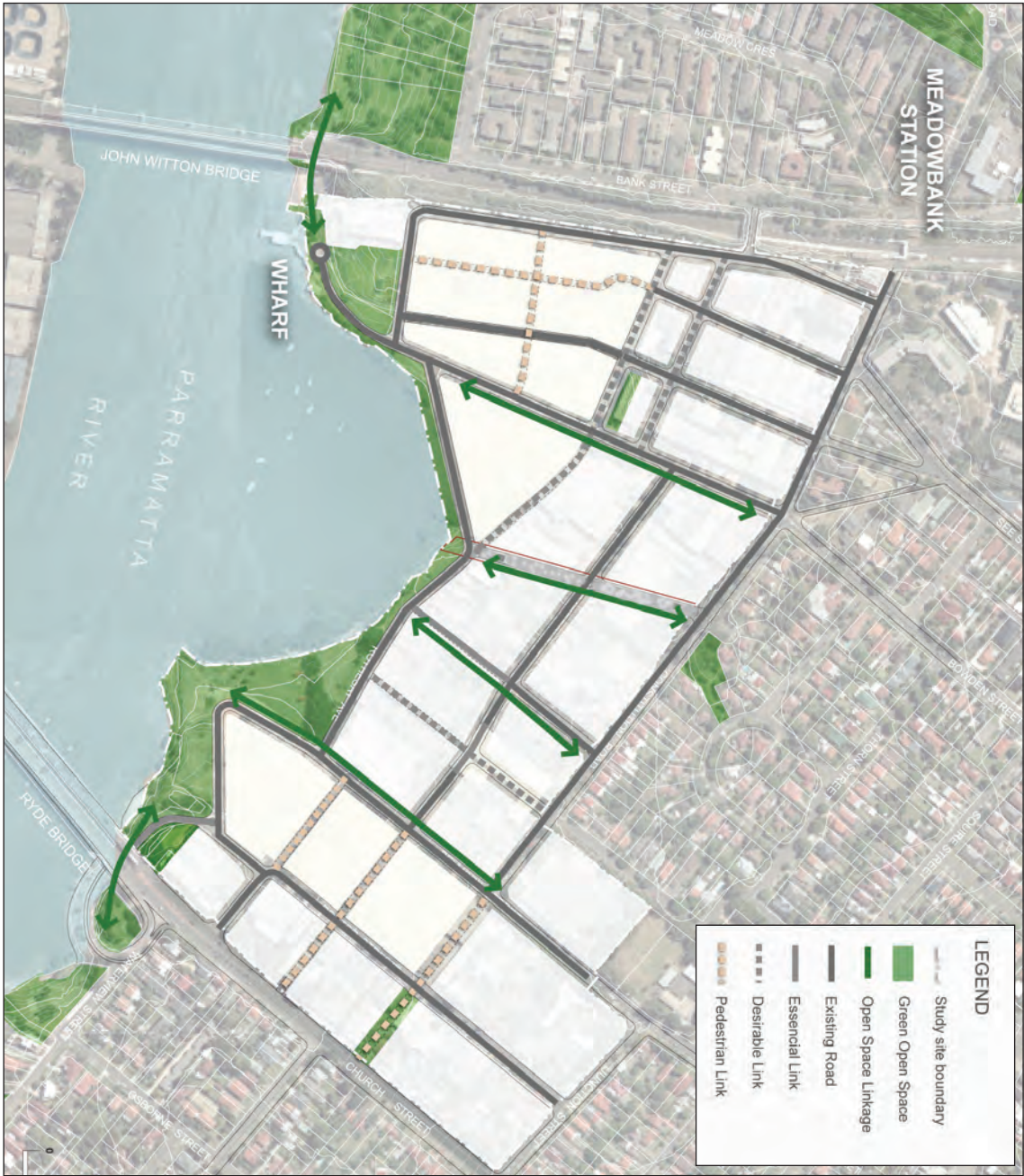


Figure 4.2.09 Open space diagram

4.1.6 Street Furniture and Public Art

Street furniture, such as seats, litter bins, drinking fountains, street and information signs, etc, provides comfort and convenience for pedestrians and creates visual unity and identity through the design and appearance of public spaces. It can be used to define spaces as well as roads, paths and gateways.

Quality artwork enhances the enjoyment and visual appearance of an area and contributes to its unique identity. It aids legibility, enlivens the public domain and can contribute to the identity of Shepherd's Bay, Meadowbank.

Public art can be freestanding art objects or works integrated into building facades, other built edges and landscaping adjoining public spaces and forecourts.

Objectives

1. To enhance new and existing public spaces (i.e. open space, streets, footpaths, walkways and the like) through the incorporation of new street furniture and public artworks.

Controls

- a. All development proposals are to be accompanied by a landscape plan, prepared by a qualified and suitably experienced landscape architect, indicating how public domain improvements including paving, street furniture and lighting will be incorporated into the development.
- b. Public domain finishes including the style, colour and installation methods of street furniture, paving and street lighting shall be in accordance with Ryde Public Domain Technical Manual.
- c. Public art is to be provided in accordance with Council's Public Art Policy. Developers must examine opportunities to incorporate public art in both internal and external public spaces and indicate how public art will be incorporated into major developments. Relevant themes include:
 - i. the harbour location;
 - ii. industrial history and heritage;
 - iii. Aboriginal heritage; and
 - iv. urban revitalisation.
- d. Embellishment of public places/spaces will be at developers' cost and the type and amount of embellishment will be negotiated with Council.

4.1.7 Safety

Public safety can be reinforced and addressed through urban design which increases the perception of safety in streets and other public spaces, and encourage the use of public spaces, by employing a variety of security measures to decrease the potential for crime.

In particular, street level activity is encouraged to attract higher volumes of pedestrian traffic, resulting in a safer environment particularly after dark. Safety and crime prevention are to be considered in the initial design and ongoing maintenance of buildings in Shepherd's Bay, Meadowbank.

Objectives

1. To ensure that the design and location of development contributes to a safe, active and liveable urban environment.

Controls

- a. Public spaces need to be designed to meet *Crime Prevention Through Environmental Design (CPTED) principles (DUAP 2001)*.
- b. Open sightlines and landscaping needs to be provided that allows for high levels of public surveillance by residents and visitors.
- c. Lighting is to be provided to all pedestrian ways, building entries, corridors, laundries, lifts, stairwells, driveways and car parks to ensure a high level of safety and security for residents and visitors at night. Further, external lighting including street lighting if necessary (in accordance with pedestrian lighting AS1158 is to be provided which makes visible potential hiding spots at night.
- d. Entrances to public open spaces will need to encourage pedestrian use and establish clear sightlines to improve visual security.
- e. The design of public domains must not result in dead ends or similar design outcomes.

4.2 Architectural Characteristics

This section seeks to establish controls for a diverse, cohesive and high quality built environment that complies with the desired future character, local conditions and environmental characteristics and is appropriate for mixed-use development. It covers:

1. Height;
2. Setbacks;
3. Roof form;
4. Building facades and articulation;
5. Private and communal open space;
6. Residential amenity; and
7. Energy Efficient Design.

4.2.1 Height

The undulating topography of Meadowbank both constrains and provides opportunities for interest and variations in building height.

To preserve the views, character and scale of the Shepherd's Bay Basin, control of building height is critical. Building heights have been determined by the relationship of the built form to Parramatta River, existing ridgelines and the current built form.

Ceiling heights in commercial and residential developments will differ, with total floor to ceiling height and associated bulkhead spaces affecting the overall height of buildings.

Objectives

1. To protect views to and from the Parramatta River and foreshore, and of Shepherd's Meadowbank ridgeline to the north.
2. To optimise views from and through the site to vistas of the Parramatta River and beyond.

Controls

- The maximum building height is to comply with the heights shown in Ryde Local Environmental Plan 2014 Height of Buildings Map. Buildings must comply with the maximum number of stories shown in Figure 4.2.10.
- Notwithstanding Figure 4.2.10, Council may permit new development within the building envelope of the existing industrial buildings on the subject site.
- The ground floor height shall be 4 m floor to floor regardless of use.
- Any car parking above ground will have a minimum 3 metres (floor to underside ceiling) to allow for potential future conversion.
- Retail and commercial uses at ground floor are to have floor levels contiguous with finished footpath levels. On sloping sites the levels must be contiguous at entries.

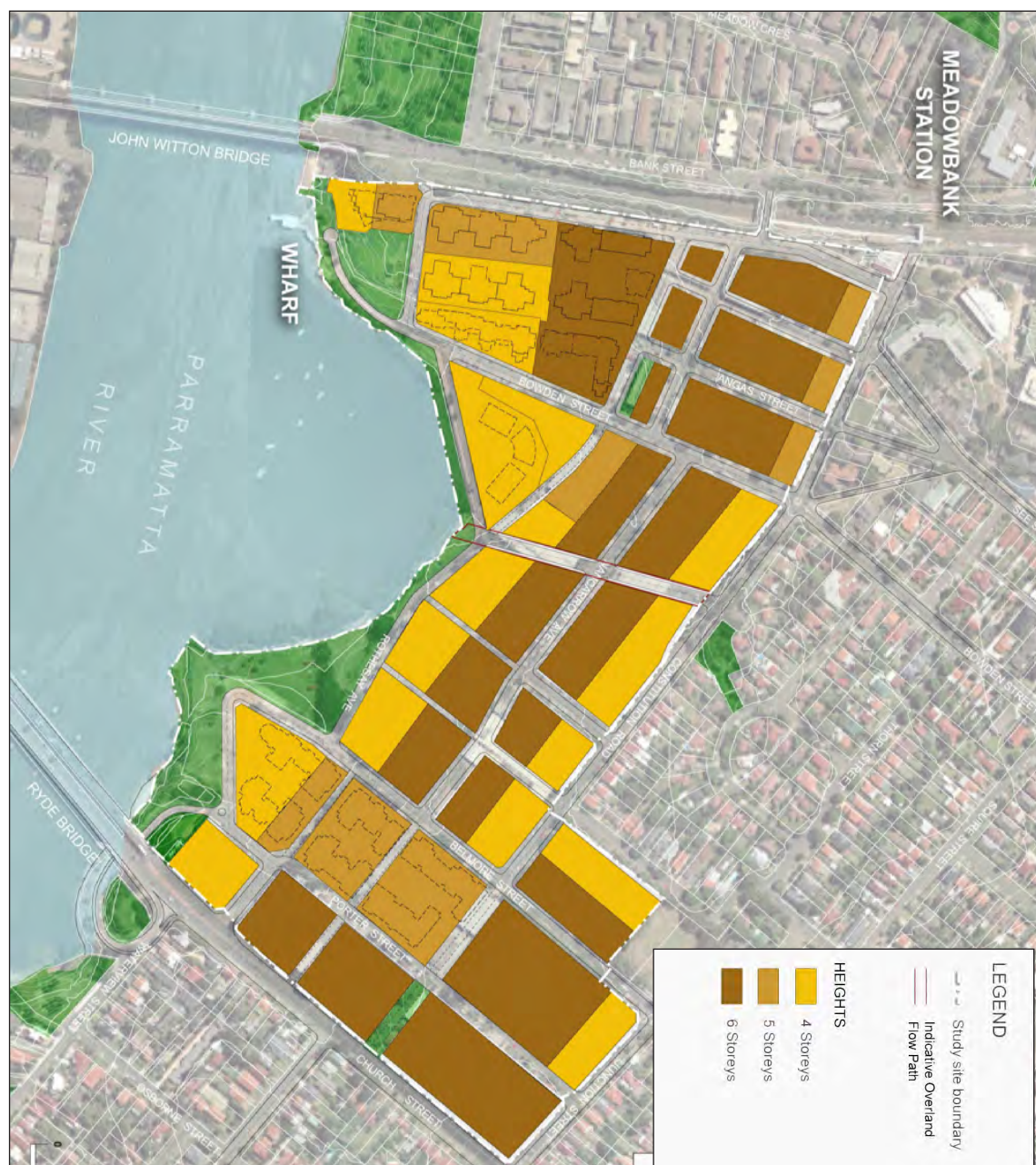


Figure 4.2.10 Height diagram

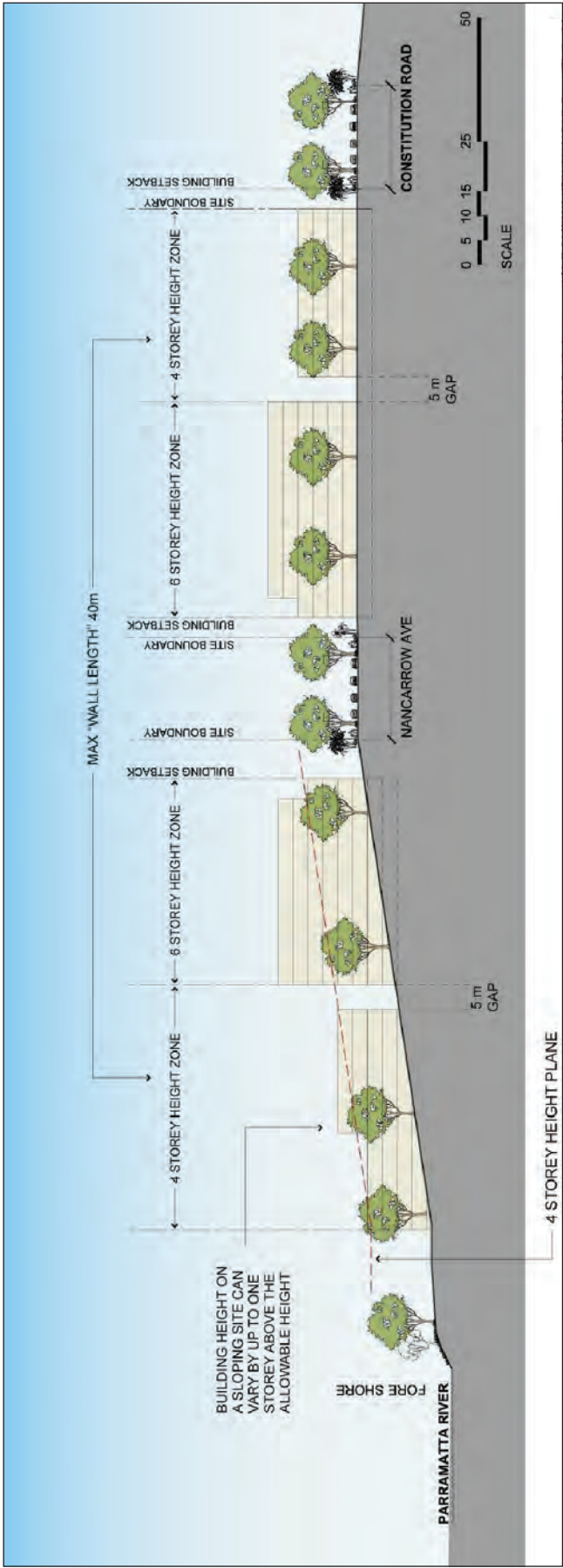


Figure 4.2.11 Height variations

4.2.2 Setbacks

Setbacks determine the building's location in relation to the allotment boundaries, the street, and the neighbouring buildings. Setbacks allow space for landscaping, light and air, and provide for privacy between buildings.

Objectives

1. Setbacks will be required to ensure a comfortable pedestrian and built form scale to the street.

Controls

- a. Setbacks must be consistent with the setback map (see Figure 4.2.12):
 - i. New development to have 4 m setbacks
 - ii. Development along the northern boundary of the Meadowbank area adjacent to R2 low density residential zones is to have 6 m landscape buffer setback
 - iii. Development fronting Church Street to have 6 m landscaped buffer setbacks

Note: Setbacks are defined as the distance between the lot boundary and the build to line for new developments.
- b. A 6 m setback is to be provided along Church Street. The setback:
 - i. Can only be used for driveways with the concurrence of the RMS (access is preferred from Porter Street)
 - ii. Must be planted with large native trees. Species must be chosen in consultation with Council.
 - iii. Native street trees to be planted at 8 m spacing in the landscaped setback along Church St
- c. Residential development must be setback at least 12m from Church Street.
- d. Development in the vicinity of the station to have no setback at ground level (ie built to the lot boundary).
- e. Setbacks for buildings of four storeys and above to be consistent with Figure 4.2.13.
- f. Low native shrubs should be provided within all setbacks with the selection of species discussed with Council.
- g. Low signage relating to the use of the building is permitted within the Church Street setback.
- h. All setbacks are exclusive of the road reservation.

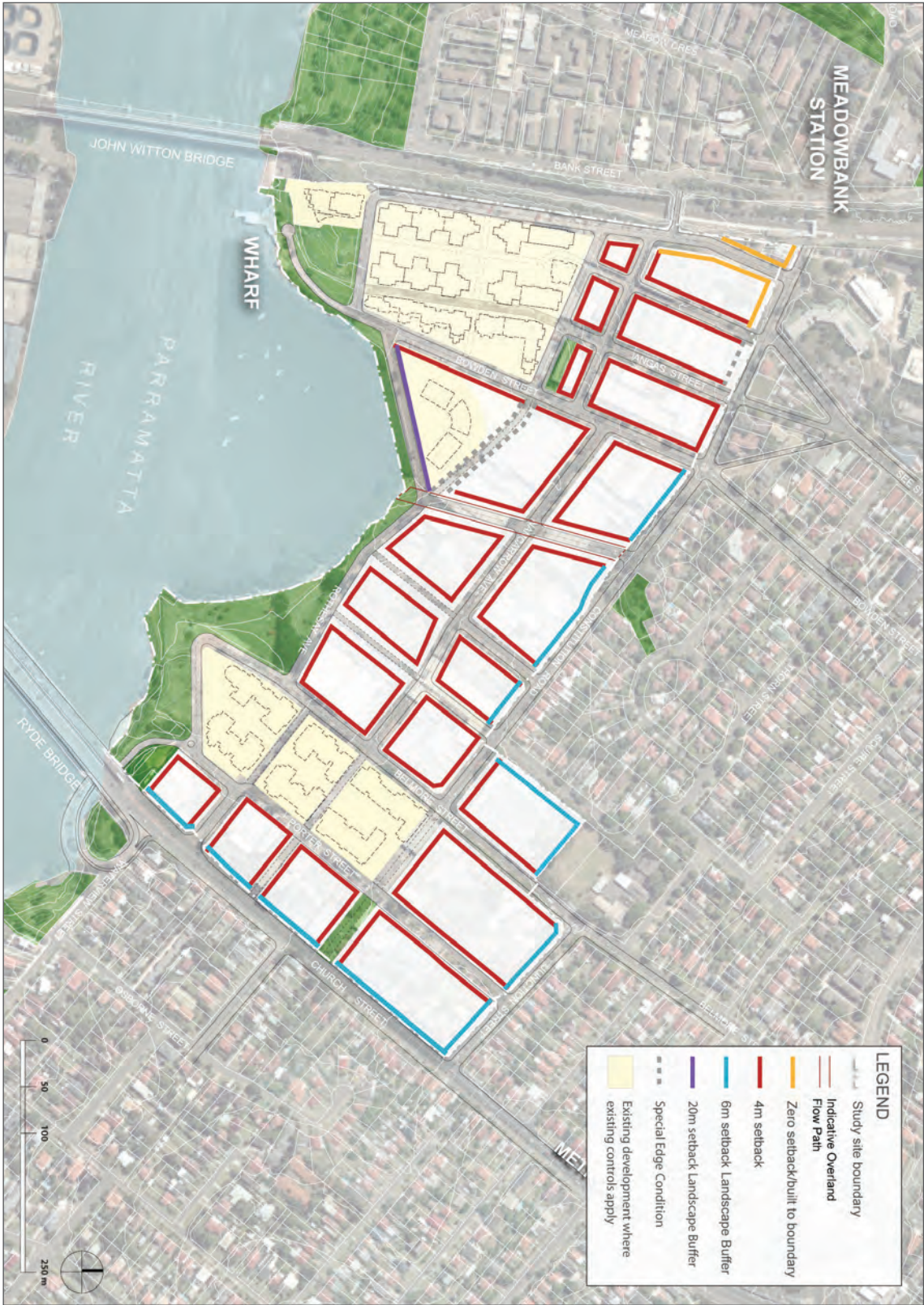


Figure 4.2.12 Setbacks diagram

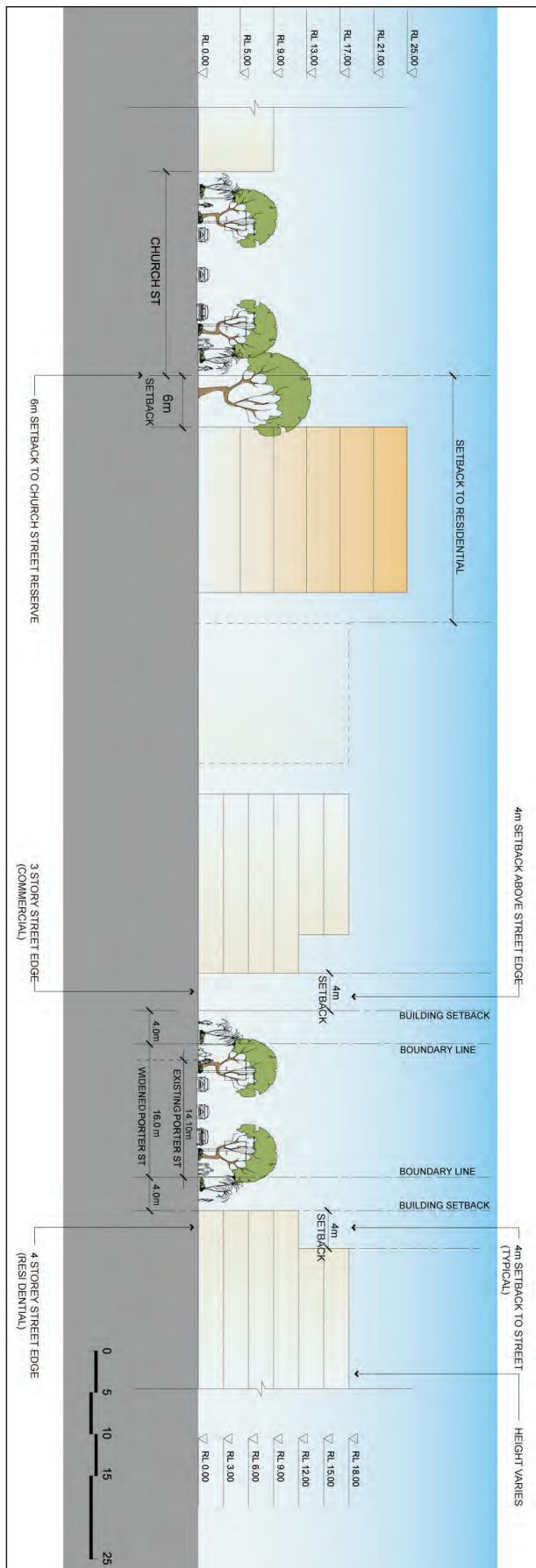


Figure 4.2.13 Setbacks for heights greater than 4 storeys

4.2.3 Roof Form

The topography of Meadowbank makes the articulation of roof forms important. New buildings will have views down toward the Parramatta River which overlooks roofs below. As views of the entire Meadowbank basin to the south are available from Victoria Road, roof forms are important from this aspect as well.

Roof articulation involves provision of landscaped roof areas; roofs utilised for recreation purposes (especially on large building footprints); minimally pitched roofs (skillion etc) carefully designed to minimise bulk.

Objectives

1. To encourage roof forms that provide continuity and consistency with the streetscape character
2. To encourage roof designs that blend with the building composition
3. To ensure the design of roofs protect views from Shepherd's Bay, Meadowbank.

Controls

- a. Buildings below RL 15 must have articulated roofs, as they will be viewed from buildings above. Articulated roofs refer to well-designed roof zones with landscaping, useable areas and/or richly detailed roofs made of high quality materials.
- b. The use of solar panels on roofs is encouraged where possible.
- c. Pitched roofs of up to 30% are permitted for buildings that are 3 storeys or less.
- d. Attics are to be avoided – as they are not in character with the locale.

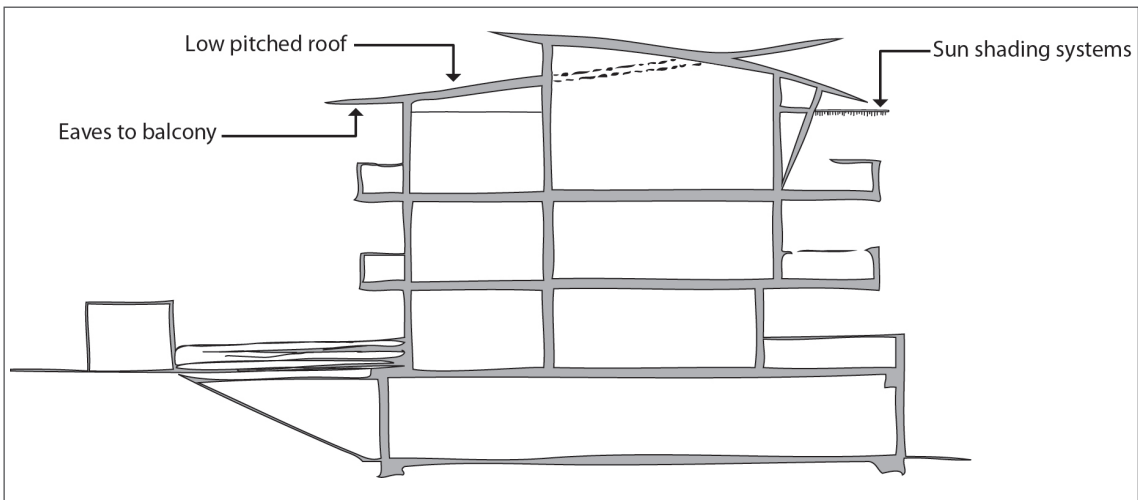


Figure 4.2.14 Height variations

4.2.4 Building Facades and Articulation

Façade treatment and the external design detail of the built form establish the building's context and relationship to the street and public domain. It also impacts on the perceived bulk and scale of a building.

Objectives

1. To articulate the facades of buildings to provide urban design and architectural interest, address environmental condition, and link the building to its location.
2. To ensure the appearance of buildings is complimentary to the locality and streetscape character.

Controls

- a. Building facades should be articulated within a 3-metre zone to provide entries, external balconies, porches, glazed balcony enclosures, terraces, verandas, sun shading elements etc.
- b. Penthouses should be set a minimum of 4 metres from any building façade.
- c. Articulate buildings to respond to orientation, views, breezes, privacy, views, acoustic requirements, street widths and the relationship of the building to external garden spaces.
- d. Articulate buildings vertically and horizontally: materials and building setbacks on the upper storeys are to be used to reduce the perceived bulk of buildings.
- e. Provide and denote entries along street frontages and public domain spaces where appropriate.
- f. Buildings are to address streets, open spaces and the river foreshore. Street frontages are to be parallel with or aligned to the street alignment.
- g. Provide balconies and terraces, particularly where buildings overlook public spaces.
- h. All facades visible from the public domain are to be durable, low maintenance and of high quality.
- i. External glass to be non-reflective and have a maximum of 20% tint.

4.2.5 Private and Communal Open Space

Private and communal open space provides immediate open space needs for residents of medium and high density residential unit developments. Communal open space can also help to develop a sense of community within the development.

Objectives

1. To ensure that private open space is designed to provide residents with quality usable private outdoor living areas for recreational and outdoor activities
2. To provide low maintenance communal open space areas for residents that encourage opportunities for recreational and social activities, passive amenity, and landscaping.

Controls

- a. Private open space with sunlight access, ventilation and privacy shall be provided for apartments in accordance with SEPP65.
- b. No more than 50% of communal open space provided at ground level shall be paved or of other non-permeable materials;
- c. Landscaping to be in accordance with approved landscape plan.

4.2.6 Residential Amenity

Appropriate building design contributes to the residential amenity and energy efficiency of a development by making the best use of the available solar energy and ventilation.

Objectives

1. To encourage buildings to collect and disperse solar energy by virtue of their design, with the least possible mechanical support to minimise the use of non-renewable energy sources.
2. To respect the need for solar access to adjoining buildings, and both public and private open spaces.
3. To preserve the privacy of residential units and private open spaces.

Controls

- a. In considering compliance with SEPP65, regard will be given to:
 - i. limitations imposed by heritage items to be retained on the site;
 - ii. sunlight access to adjoining balconies of living rooms; and
 - iii. appropriate urban form, site orientation and other constraints.
- b. Apartments below a sloping ground level shall apply the SEPP65 guideline for lightwells.

4.3 Ecological Sustainability

These environmental management provisions are intended to ensure that principles of ecologically sustainable development are integrated into the design, construction and management of development and to ensure that new development does not reduce access to sunlight or energy efficiency. The provisions are also intended to promote design that will contribute to people's enjoyment of the public domain.

4.3.1 General Requirements for Development Applications

All applications for development of a new building, or renovation of an existing building, with a gross floor area over 1,500 m², shall be accompanied by an Energy Performance Report which sets out in detail the ways in which the proposal complies with the energy efficiency standards in this DCP. The Energy Performance Report is to be prepared by a person qualified in energy efficient building design.

This section covers:

1. Energy Efficient Design;
2. Waste Management; and
3. Noise and Vibration Attenuation.

4.3.2 Energy Efficient Design

Objectives

1. To optimise a buildings their passive and operational energy efficiencies, reduce pollution, include waste minimisation systems and use construction materials from renewable resources.

Controls

- a. Residential development must be designed in accordance with principle outlined in the Building Sustainability Index (BASIX)
- b. The principles and properties of thermal mass, insulation and glazing are to be considered in the design of buildings to achieve a high level of energy efficiency
- c. All commercial buildings over 1500 m² are to be designed to a minimum of 4 stars under the Green Star rating system.

BASIX design guidelines can be found at www.basix.nsw.gov.au.

Information about Green Star guidelines can be found at www.gbcaus.org.

4.3.3 Waste Management

Refer to Part 7.2 of the Ryde DCP 2014 for waste minimisation and management objectives and controls.

4.4.2 Noise and Vibration Attenuation

Loud noise affects the amenity of places, particularly in mixed-use areas where developments need to consider the amenity of a range of occupants. The impact of rail, road, commercial and industrial noise and vibration on residential development and pedestrian amenity needs to be considered. Residential, commercial and industrial developments can be designed and managed to minimise noise and vibration generation and intrusion.

Objectives

1. To mitigate the impacts of noise and vibration on residential development through appropriate design and the use of insulation.

Controls

Residential

- a. New residential developments, including those within a mixed-use building, are required to consider noise attenuation and acoustic treatment in their design. Particularly, the building layout, walls, windows, doors and roofs are to be designed and detailed to reduce intrusive noise levels.
- b. Development must have regard to "Interim Guidelines for Development Near Busy Road and Rail Corridors" NSW Planning & Infrastructure.
- c. Balconies and other external building elements are to be located, designed and treated to minimise infiltration of noise into the building and reflection of noise from the façade.
- d. New units are to be constructed in accordance with:
 - i. *Australian Standard 3671-1989: Acoustics – Road Traffic Noise Intrusion, Building Siting and Construction*; and
 - ii. *Australian Standard 3671-1987: Acoustics – Recommended Design Sound Levels and Reverberation Times for Building Interiors*.

Commercial and Industrial

- a. Church Street has been identified as a commercial strip to provide a buffer between Church Street and residential uses along Porter Street.

- b. The use of a premises, and any plant, equipment and building services associated with a premises must not:
 - i. create an offensive noise as defined by the Protection of the Environment Operations Act 1997; and
 - ii. add significantly to the background noise experienced in a locality.
- c. At Council's discretion, if there is any doubt over whether these requirements can be achieved, a statement of compliance from a qualified acoustic consultant may be required.
- d. Machinery and activities, including construction work, that are likely to generate offensive noise must be adequately sound-proofed in accordance with the Protection of the Environment Operations Act 1997 prior to occupation of the premises.
- e. Development must have regard to "Interim Guidelines for Development Near Busy Road and Rail Corridors" NSW Planning & Infrastructure.
- f. Where development adjoins residential development, the use of mechanical plant equipment and building services will be restricted and must have acoustic insulation.
- g. Loading and unloading facilities must not be located immediately adjacent to residential development.
- h. Retail premises must limit any spruiking and the playing of amplified music or messages so as not to disturb the amenity of other public and private places.
- i. Air conditioning ducts shall not be situated adjacent to residential development.
- j. Where development is situated adjacent to residential development, working hours shall generally be restricted to 7 am to 6 pm Monday to Friday and 8 am to 1 pm on Saturday, and nil on Sundays or public holidays. Activities in operation outside these hours must demonstrate that there will be no detrimental impact to residential amenity.
- k. Driveways, access ramps, landscaping and public infrastructure are permissible within overland flow paths.

4.4 Parking Access and Loading

Access to parking and loading points can have a significant impact on the operation of vehicular movements, active streets and pedestrian amenity. This impact of access points on streets and pedestrian amenity must be considered when planning a development parking access points. Parking access and loading points should be located in areas that do not impact on traffic movements or pedestrian amenity.

Controls – On-Site Loading and Unloading Facilities

- a. All new buildings are required to provide on-site loading and unloading facilities. Buildings on Church Street will be accessed from Porter Street. This is to be addressed in Staged development applications for these sites.
- b. Loading docks shall be located in such a position that vehicles do not stand on any public road, footway, laneway or service road and vehicles entering and leaving the site move in a forward direction.
- c. Loading docks that extend more than 7.5 metres into a building, mechanical ventilation might be required.

For detailed car parking controls refer to Part 9.3 of the Ryde DCP.

4.5 Flooding and Stormwater Drainage

The quality and quantity of stormwater runoff and inundation directly affects the functionality of Shepherd's Bay, Meadowbank and the Parramatta River.

The City of Ryde has adopted the major stormwater design standard as the 100-year Average Recurrence Interval (ARI) event. The inundation is to be accommodated by the use of pipe drainage, natural and modified channels, including roads, overland flow paths and floodways.

Controls for flooding and stormwater drainage aim to:

- a. Protect built structures and public safety from stormwater inundation up to the 'major design flood'.
- b. Avoid nuisance flooding in more frequent stormwater inundation events.
- c. Establish water quality requirements for stormwater drainage, including sediment and silt control.

Developers must Consult Council regarding the extent of flooding of the 100-year ARI event. Properties within these boundaries may have flooding problems, and are considered 'flood affected' for the purposes of this Part. The information shown has been derived from the best available data, however flood conditions on individual sites may vary from those shown.

Applicants are required to discuss the flood risk of affected properties with Council's drainage engineer prior to lodging a development application. Development may be restricted until drainage issues are resolved.

Objectives

1. To minimise the harmful effects of flooding on human life and property.
2. To minimise and control nuisance stormwater inundation.
3. To promote development compatible with the flood risk in flood affected areas.
4. To protect downstream properties from stormwater inundation due to upstream development.
5. To provide the safe passage of less frequent stormwater inundation events.
6. To maintain acceptable water quality.
7. To promote best practice for water sensitive design.

Controls

- a. Development must comply with Part 8.6 Floodplain Management of this DCP.
- b. With any application for development on flood affected land, the applicant is required to submit a survey plan, prepared by a registered surveyor, which shows:
 - i. the position of any proposed and existing buildings on the site;
 - ii. the existing ground levels to Australian Height Datum (AHD) around
 - iii. the perimeter of such buildings and at key intervals throughout the site;
 - iv. the floor level, to AHD, of all existing and proposed buildings;
 - v. the extent, depth and location of any proposed filling and excavation on the site; and
 - vi. details and location of proposed and existing power supply and effluent disposal system, fuel installations etc.

- c. With any application for development on flood affected land, the applicant is required to submit a report, prepared by a suitably qualified and experienced consulting engineer, which demonstrates that:
 - i. the proposed structure(s) can withstand the forces of floodwater, debris and buoyancy, up to and including the maximum flood event;
 - ii. the proposed development will not significantly affect flood levels downstream;
 - iii. the proposed development will not increase the flood hazard or flood damage to other properties, either upstream or downstream, or adversely affect flood behaviour.
- d. Where any application for development is on or is accessed by way of flood affected land developers must design/provide appropriate driveways, pedestrian ways, ramps, public domain and infrastructure to the satisfaction of Council.
- e. Buildings must, as far as possible, be constructed of flood compatible building materials.
- f. To facilitate the flow of floodwater, parking areas situated below ground or at the base of buildings must not be fully enclosed.
- g. Council and relevant state consents must be obtained for the filling and/or excavation of flood affected land.
- h. A 16 m wide overland flow path from Constitution Road to the Parramatta River with subsurface drainage upgrade to accommodate a 1:100 year storm event is to be provided. An easement over the path is to be granted to Council. This will be subject to detailed engineering, architectural and landscape design solutions to the satisfaction of Council. Refer to Figure 4.2.15 - Overland Flow Path/ Stormwater Engineering Diagram on the following page.

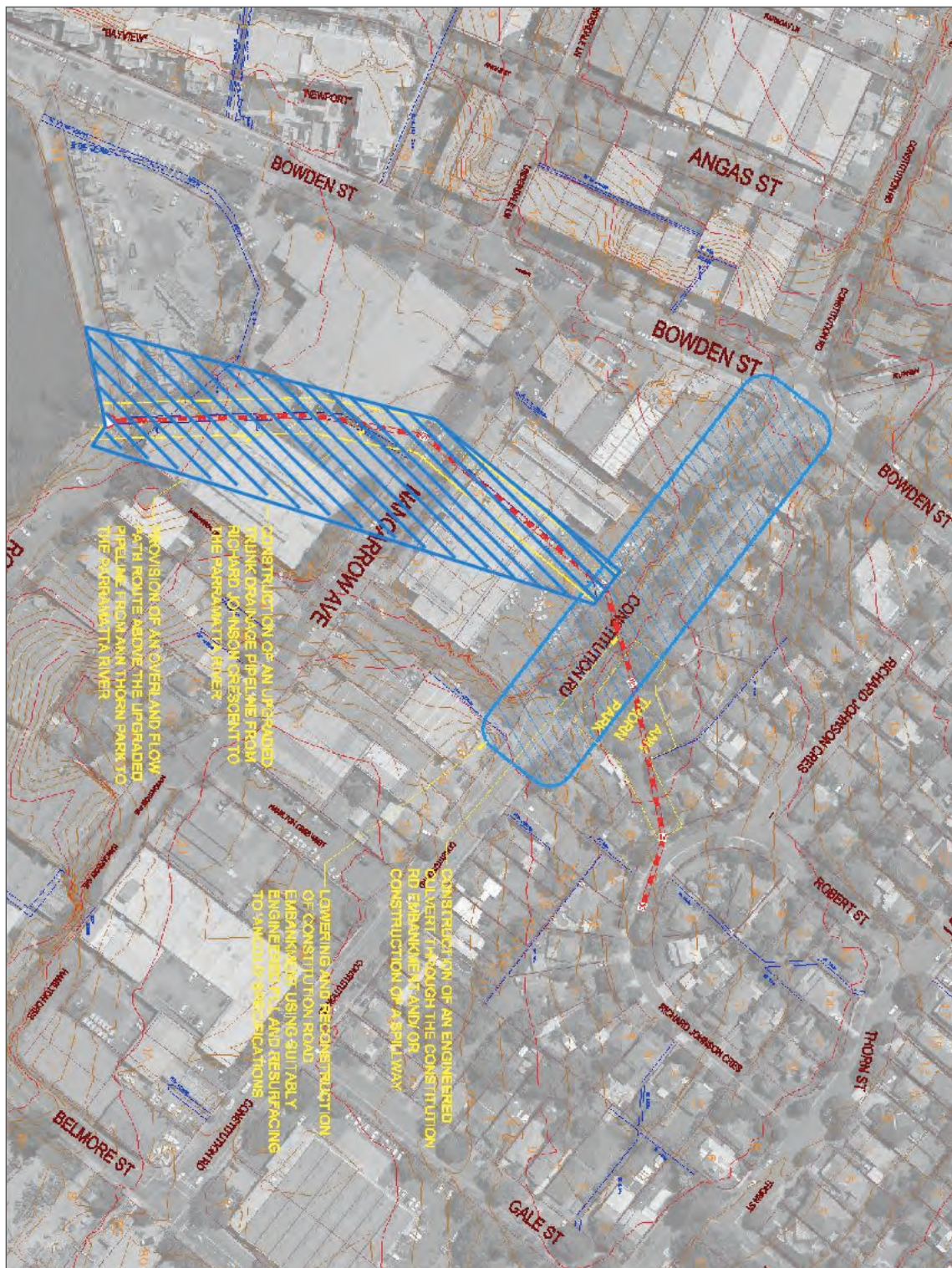


Figure 4.2.15 Overland Flow Path/Stormwater Engineering Diagram

Note: The overland flow path shown generally on the figures in this DCP is diagrammatic. The blue hatched area on the drawing above indicates the zone within which the overland flow path and drainage solution may be implemented subject to detailed engineering solutions and architecture design.

5.0 PRECINCT SPECIFIC DEVELOPMENT CONTROLS

Shepherd's Bay, Meadowbank consists of four precincts differentiated by land-use, urban form and distinct character. This section sets out additional and specific planning principles and planning and urban design controls (such as land use, built form, public domain) that are to be applied in these precincts. The general development controls applying to the public and private domain also apply in the precincts.

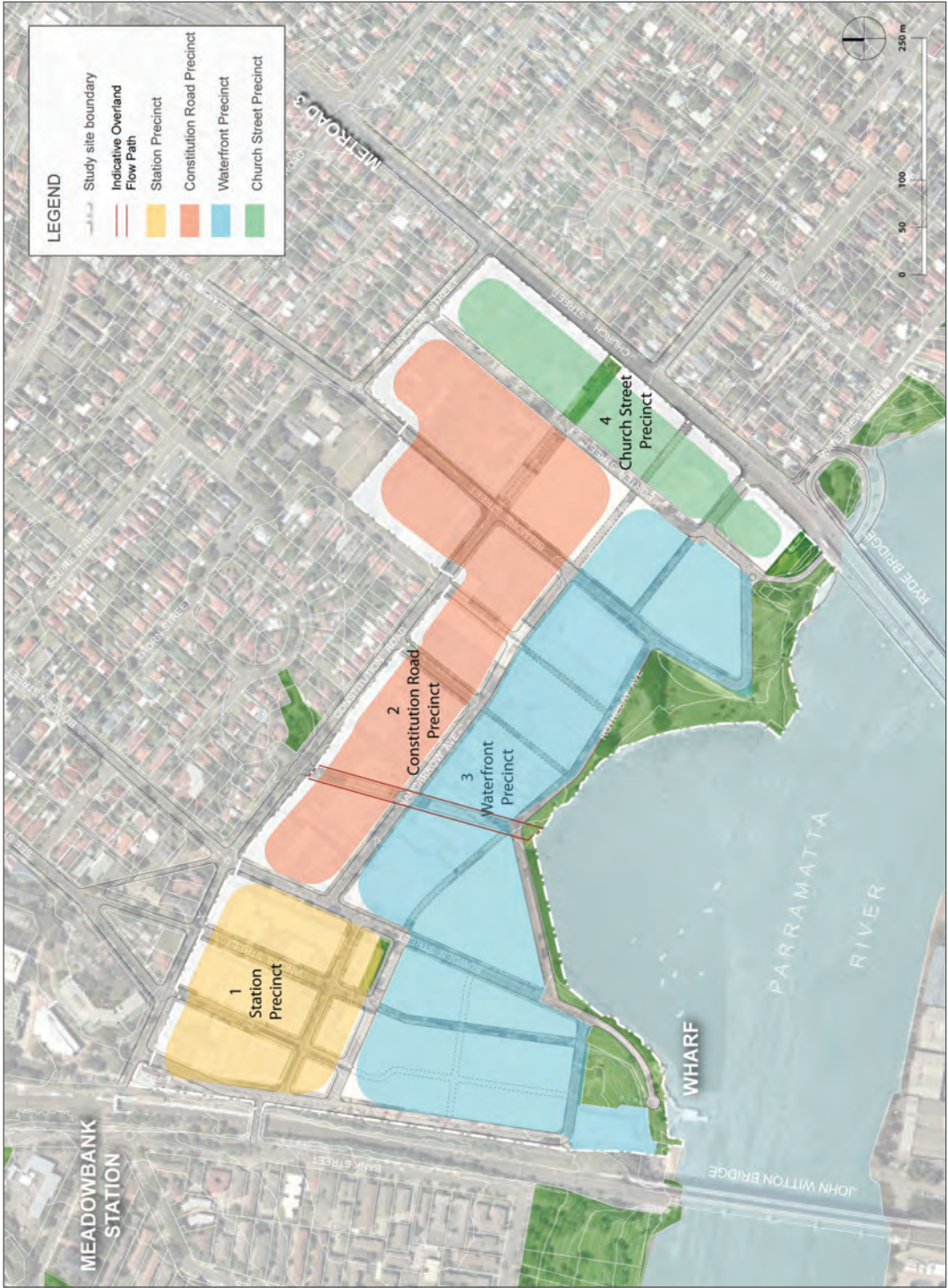


Figure 4.2.16 Precinct plan

5.1 Precinct 1 - Station

The station precinct is located in the north-western corner of the site and includes the area surrounding the existing Meadowbank Station.

Objectives

1. To ensure compatible uses such as commercial near the station and residential in the areas in areas further away from the station.
2. To ensure a more intense built form around transport nodes with a gradation from these areas.
3. To provide public domain improvements that mitigate the impacts of increased density in the area.

Controls

- a. Views from the Parramatta River must be protected and not be interrupted by a continuous line of buildings.
- b. Apartments fronting the main railway line at the western side of the precinct must be treated with suitable acoustic glazing and appropriate solar control. The use of recessed balconies and winter gardens (glazed balconies) is encouraged to counter the western orientation.
- c. Acoustic treatment such as high performance glazing/double glazing is to be considered for development fronting the railway cutting.
- d. Awnings are required on Railway Road with a minimum height to the underside of 3.2 metres. Awnings are to allow for street tree planting.
- e. Properties between Angas Street and Faraday Lane, between Constitution Road and Underdale Lane, must be accessed from Angas Street.
- f. Properties between Faraday Lane and Railway Road, between Constitution Road and Underdale Lane, must, wherever possible, be accessed from Railway Road.

5.2 Precinct 2 - Constitution Road

The Constitution Road precinct is dominated by busy Constitution Road. It is bounded by Nancarrow Avenue to the south, Porter Street to the east, and Bowden Street to the west.

Objectives

1. To ensure uses along the Constitution Road precinct are compatible with surrounding residential land uses.
2. To provide less dense a built form as the distance from the station and Church Street increases.
3. To provide public domain improvements that mitigate the impacts of increased density in the area.

Controls

- a. Views from the highest point in this precinct to the south-west and Sydney Olympic Park should be maximised.
- b. Minimum permeable landscaped area is to be 35% of site area.
- c. Facades should be articulated within a zone of 3 metres and be built to street edge behind the required landscape setback.

5.3 Precinct 3 - Waterfront

The waterfront precinct comprises the area south of Nancarrow Avenue. It includes the area along the foreshore, as well as Faraday Park.

Objectives

1. To provide predominantly residential uses, although a mix of uses is encouraged on the ground floor.
2. To ensure the built form does not create a "walled" effect along the waterfront.
3. To provide public domain improvements that mitigate the impacts of increased density in the area.

Controls

- a. The impact of new buildings on views from the Parramatta River to the site and the treed ridgeline to the north are to be considered. Similarly, views from this precinct to the Parramatta River are to be optimised.
- b. Development near the waterfront is to respond to and consider views from the Parramatta River.
- c. Distances between buildings should take into account acoustic and privacy issues to protect the amenity for all residential units. Minimum distances should be in accordance with SEPP 65 principles.
- d. Facades should be articulated within a zone of 3 metres and be built to street edge behind the required landscape setback.
- e. Maintain all existing mature trees that add to the high landscape quality of the area.
- f. Enhance street planting along Bowden Street to facilitate the perception of a boulevard providing direct access to the Parramatta River.
- g. Ensure that new developments are responsive to and add to the landscape quality by providing adequate deep planting zones above car parking to allow sustainable planting which takes into account solar access and views.
- h. Retain and enhance landscaped embankments parallel to Bowden Street and at the southern part of the site adjacent to the ferry terminal.
- i. Provide a new pocket park to the southern part of the precinct to ensure tree retention and enable passive activity with views to Parramatta River.
- j. Provide a landscaped connection between Railway Road and the cycleway to Shepherd's Meadowbank-Rhodes Railway Bridge.
- k. Provide a 20-metre foreshore landscape setback with a high quality solution knitting with the Shepherds Bay foreshore upgrade.

5.4 Precinct 4 - Church Street

The Church Street precinct is situated between Porter Street and Church Street on the eastern edge of the site.

Objectives

1. To provide a non residential buffer along Church Street to protect the amenity of residential buildings behind this area.
2. To provide a built form that does not lead to a cavernous impact on buildings along Church or Porter Streets.
3. To create a landscaped boulevard.
4. To provide public domain improvements that mitigate the impacts of increased density in the area.

Controls

- a. New development in this precinct is to respond to, and consider views from, the Parramatta River.
- b. Retain all existing mature trees that add to the high quality of the area.
- c. New commercial buildings in this precinct are to have a maximum depth from window to core of 12 metres to ensure adequate natural light and ventilation.
- d. For retail ground floor areas larger footprints are allowable. Retail development is to be limited to showrooms. Supermarkets are not permitted.
- e. Development must take into account the hostile environment and accordingly provide acoustic treatment, such as high performance glazing / double-glazing, for buildings fronting Church Street.
- f. The building adjoining the southern boundary of Hayes Reserve should take advantage of the northerly aspect and provide visual surveillance of pedestrians utilising Hayes Reserve.
- g. Due to the traffic volume on Church Street, vehicular access will be from Porter Street for buildings fronting Church Street
- h. Low native shrubs should be provided within all setbacks with the selection of species discusses with Council.
- i. Low signage relating to the use of the building is permitted within the Church Street setback.
- j. Council seeks contributions from developers along Church Street for the upgrade of the public domain on the opposite side of the street.
- k. Residential development must be setback at least 12m from Church Street.



City of Ryde
Civic Centre
1 Devlin Street
Ryde NSW 2112

www.ryde.nsw.gov.au

City of Ryde Development Control Plan 2014

Part: 4.3 West Ryde Town Centre

Translation

ENGLISH

If you do not understand this document please come to Ryde Civic Centre, 1 Devlin Street, Ryde Monday to Friday 8.30am to 4.30pm or telephone the Telephone and Interpreting Service on 131 450 and ask an interpreter to contact the City of Ryde for you on 9952 8222.

ARABIC

إننا نعتذر عليك فهم محتويات هذه الوثيقة، نرجو للحضور إلى مركز بلدية ريد Ryde Civic Centre على العنوان: 1 Devlin Street, Ryde 1 من الاثنين إلى الجمعة بين الساعة 8.30 صباحاً والساعة 4.30 بعد الظهر أو الاتصال بمكتب خدمات الترجمة على الرقم 131 450 لكي تطلب من أحد المترجمين الاتصال بمجلس مدينة ريد، على الرقم 9952 8222، نيابة عنك.

ARMENIAN

Եթէ այս գրութիւնը չէք հասկնար, խնդրեմ եկէք՝ Րայդ Սիվիկ Սենթըր, 1 Տելվին փողոց, Րայդ, (Ryde Civic Centre, 1 Devlin Street, Ryde) Երկուշաբթիէն Ուրբաթ կ.ա. ժամը 8.30 – կ.ե. ժամը 4.30, կամ հեռաձայնեցէք Հեռաձայնի եւ Թարգմանական Սպասարկութեան՝ 131 450, եւ խնդրեցէք որ թարգմանիչ մը Րայդ Քաղաքապետարանին հետ կապ հաստատուի ձեզի համար, հեռաձայնելով՝ 9952 8222 թիվին:

CHINESE

如果您看不懂本文，請在周一至周五上午 8 時 30 分至下午 4 時 30 分前往 Ryde 市政中心詢問 (Ryde Civic Centre, 地址: 1 Devlin Street, Ryde)。你也可以打電話至電話傳譯服務中心，電話號碼是: 131 450。接通後你可以要求一位傳譯員為你打如下電話和 Ryde 市政廳聯繫，電話是: 9952 8222。

FARSI

اگر این مدرک را نمی فهمید لطفاً از 8.30 صبح تا 4.30 بعد از ظهر دوشنبه تا جمعه به مرکز شهرداری راید، Ryde Civic Centre, 1 Devlin Street, Ryde مراجعه کنید یا به سرویس مترجم تلفنی، شماره 131 450 تلفن بزنید و از یک مترجم بخواهید که از طرف شما با شهرداری راید شماره 9952 8222 تلفن بزند.

ITALIAN

Se non capite il presente documento, siete pregati di rivolgervi al Ryde Civic Centre al n. 1 di Devlin Street, Ryde, dalle 8.30 alle 16.30, dal lunedì al venerdì; oppure potete chiamare il Telephone Translating and Interpreting Service al 131 450 e chiedere all'interprete di contattare a vostro nome il Municipio di Ryde presso il 9952 8222.

KOREAN

이 문서가 무슨 의미인지 모르실 경우에는 1 Devlin Street, Ryde 에 있는 Ryde Civic Centre 로 오시거나 (월 – 금, 오전 8:30 – 오후 4:30), 전화 131 450 번으로 전화 통역 서비스에 연락하셔서 통역사에게 여러분 대신 Ryde 시청에 전화 9952 8222 번으로 연락을 부탁드립니다.

Amend. No.	Date approved	Effective date	Subject of amendment

Table of Contents

CONTENTS

1.0 INTRODUCTION	5
1.1 The Purpose of this Part	5
1.2 Land to which this Plan Applies	5
2.0 VISION	7
2.1 Objectives	7
2.2 West Ryde Town Centre Master Plan	7
2.3 West Ryde Town Centre Vision	8
2.4 Town Centre Precincts	8
2.5 Key Town Centre Principles	9
2.5.1 Green Strategy & Water Management	9
2.5.2 Pedestrian Circulation	10
2.5.3 Safety & Accessibility	10
2.5.4 Retail and Employment Areas	11
2.5.5 Residential Precincts	11
3.0 GENERAL DEVELOPMENT CONTROLS	12
3.1 Built Form	12
3.1.1 Building Height and Bulk	12
3.1.2 Mixed-Use Development	13
3.1.3 Street Setbacks and Alignment	14
3.1.4 Urban Design	15
3.1.5 Building Entrances and Lobbies	16
3.1.6 Active Street Frontages and Street Address	17
3.1.7 Awnings	18
3.1.8 Balconies	19
3.1.9 Visual Privacy and Acoustic Amenity	20
3.1.10 Housing Choice and Mix	21
3.2 Traffic, Access and Pedestrian Amenity	22
3.2.1 Vehicular Access	22
3.2.2 Pedestrian Access	23
3.2.3 Bicycle Facilities	24
3.3 Environmental Controls	25

Table of Contents

3.3.1	Solar Access	25
3.3.2	Natural Ventilation	26
3.3.3	Stormwater Management	27
3.4	Public Domain	28
3.4.1	Street Furniture, Paving & Street Lighting	28
3.4.2	Street Tree Planting and Landscaping	29
3.4.3	Public Art	29
4.0	PRECINCT DEVELOPMENT CONTROLS	31
4.1	Victoria Road West	32
4.1.1	Character Statement	32
4.2	Retail Core	33
4.2.1	Character Statement	33
4.2.2	Urban Design	34
4.2.3	Public Domain	35
4.2.4	Public Car Parking	35
4.3	Ryedale Road	36
4.3.1	Character Statement	36
4.4	Anzac Park	38
4.4.1	Character Statement	38
4.5	Victoria Road Mixed Use	40
4.5.1	Character Statement	40
4.6	Victoria Road Enterprise Corridor	41
4.6.1	Character Statement	41

1.0 INTRODUCTION

This Part will facilitate in the revitalisation of West Ryde Town Centre and adjoining areas as a vibrant, attractive and safe urban environment with a diverse mix of retail, commercial, and residential opportunities.

1.1 The Purpose of this Part

The purpose of this Part is to provide policies relating to the future development of the West Ryde Town Centre and adjoining areas.

This Part of the DCP provides objectives, principles and development controls to guide future development within the West Ryde Town Centre and adjoining areas and achieve the intended future vision for the West Ryde Town Centre.

This Part should be read in conjunction with the following documents:

- *Ryde Local Environmental Plan 2014*
- The relevant State Environmental Planning Policies (SEPPs) including SEPP 65, Design Quality for Residential Flat Buildings.

West Ryde Centre Study and Master Plan 2010 should be the source of reference for developers and other individuals interested in the development of the Town Centre.

Ryde City Council commissioned a study into the West Ryde Town Centre to update the vision for the centre. The West Ryde Town Centre Master Plan was developed in consultation with owners, traders, residents and servicing authorities in West Ryde and was adopted on 7 December 2010. The adopted Master Plan forms an important strategic planning document describing the development vision which is to be pursued in the centre.

1.2 Land to which this Plan Applies

This Part supplements and gives guidance to the controls and objectives of *Ryde Local Environmental Plan 2014*. Specifically, this Part identifies objectives and controls that will shape the future development of the West Ryde Town Centre. The controls contained indicate how the objectives are to be implemented.

This Part applies to all land within the West Ryde Town Centre and adjoining areas as shown in the following map.

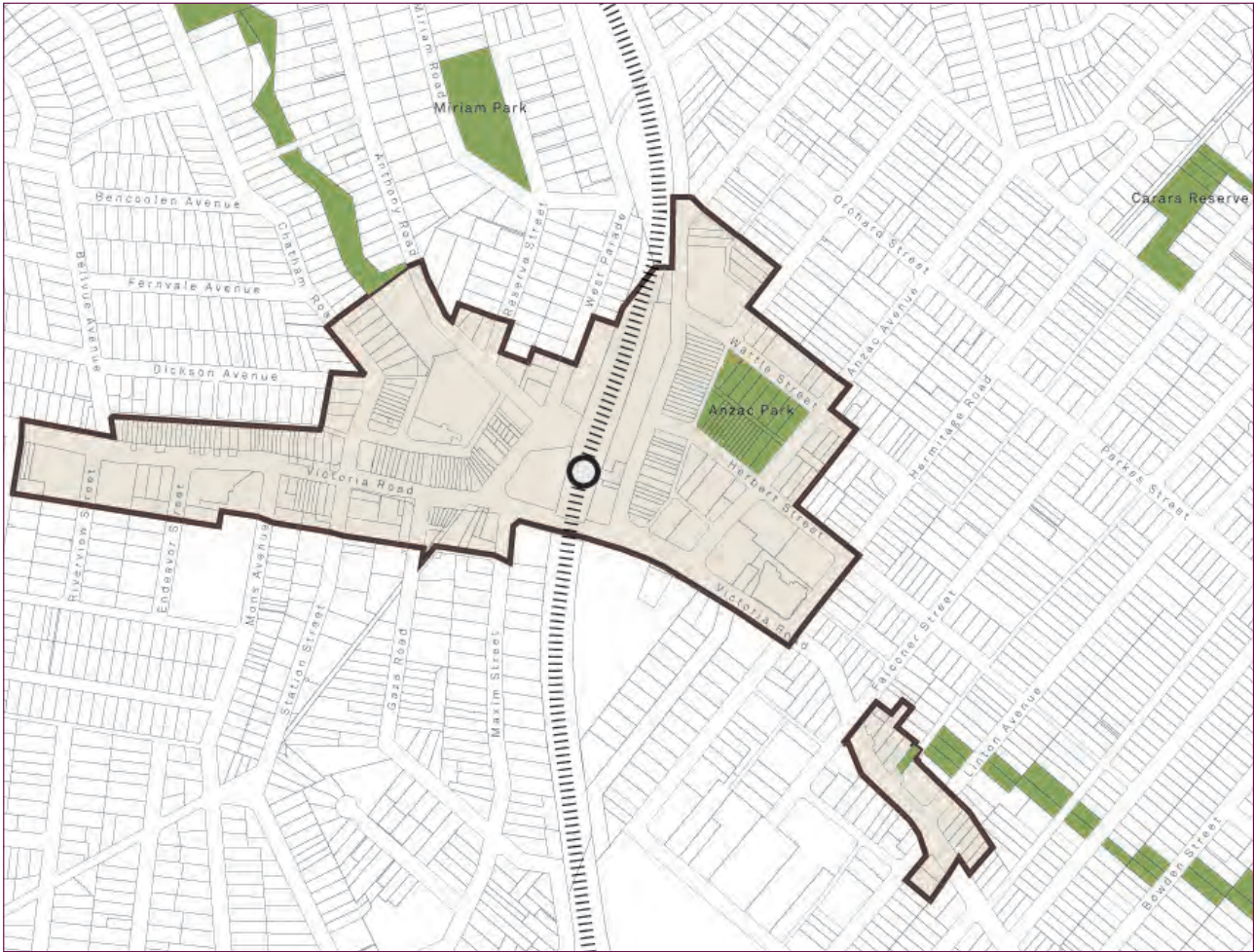


Figure 4.3.01 West Ryde Town Centre and adjoining areas

2.0 VISION

This Part is one of a number of planning initiatives undertaken to revitalise established urban centres within the City of Ryde. The vision for each centre is to create a unique character arising from its natural and built features, history and community expectations.

The objectives of this Part are to promote Council's vision for the West Ryde Town Centre.

2.1 Objectives

This Part aims to revitalise the West Ryde Town Centre through development provisions which:

1. facilitate the creation of a convenient community and retail centre within the core town centre;
2. encourage higher density development surrounding the town centre and provide transition to surrounding suburban areas;
3. encourage new development and re-use of existing buildings to contain a mix of land uses;
4. describe the desired maximum scale and bulk of new buildings;
5. improve pedestrian amenity and develop a sense of community place;
6. create a pedestrian oriented town centre including active street frontages;
7. increase the number of people living within walking distance of high frequency public transport services;
8. provide for safe and convenient vehicle access and parking;
9. minimise risk of flooding to the town centre;
10. facilitate development that is environmentally sustainable;
11. encourage the protection and enhancement of items and areas of environmental heritage;
12. enhance existing open space to offer increased amenity to surrounding residential development and provide for safe, inviting, well used and attractive public spaces; and
13. encourage a built form that integrates with the existing public domain and pedestrian network.

2.2 West Ryde Town Centre Master Plan

The Council adopted the West Ryde Master Plan on 7 December 2010. The Master Plan is supported by a number of planning studies, refining its underpinning objectives and desired outcomes, and informs the suite of controls contained in this section.

The Master Plan proposes a vision for the Town Centre and adjoining areas. It also provides an urban design framework to guide an increase in residential and employment opportunities, and promote the sustainable use of existing infrastructure and services.

2.3 West Ryde Town Centre Vision

The West Ryde Master Plan identifies a vision for West Ryde Town Centre that anticipates:

- the creation of a new identity for the Town Centre as an important place along Victoria Road. Improvements will see Victoria Road become a landscaped route, with the West Ryde Town Centre being defined by both new activity and built form;
- improvements to key public domain areas will see the creation of a series of 'green links', which extend both towards and through the Town Centre core. Improvements at the core will also be implemented highlighting this area as a pedestrian priority environment as well as increasing permeability and pedestrian accessibility;
- existing open spaces will be enhanced, offering increased amenity to surrounding residential development. New development and increased densities will be focused at the centre core in areas of pedestrian activity such as public transport nodes and close to open space areas; and
- achievement of a mix of development type introduces a transition between the core Town Centre and the surrounding residential areas of West Ryde. The retail core of the Town Centre will remain the primary retail and commercial centre for the surrounding locality.

2.4 Town Centre Precincts

The West Ryde Town Centre Master Plan provides a vision for the future urban form and function of the West Ryde Town Centre. Key precincts which are of importance to the future of the Town Centre have been identified for the purposes of this Part of the DCP. These key precincts are:

1. Victoria Road West;
2. Retail Core;
3. Ryedale Road;
4. Anzac Park;
5. Victoria Road Mixed Use; and
6. Victoria Road Enterprise Zone.

Character objectives and the desired future character for these Town Centre Precincts are outlined in Section 4.0. The built form controls outlined in this Part support these objectives, guiding the design of new development that will reinforce the characteristics of each area. Future development within or adjacent to these identified Town Centre Precincts is to be consistent with relevant built form controls, and is to demonstrate that the intended future character is protected and enhanced.

The six Town Centre Precincts are identified in the following map (Figure 4.3.02).

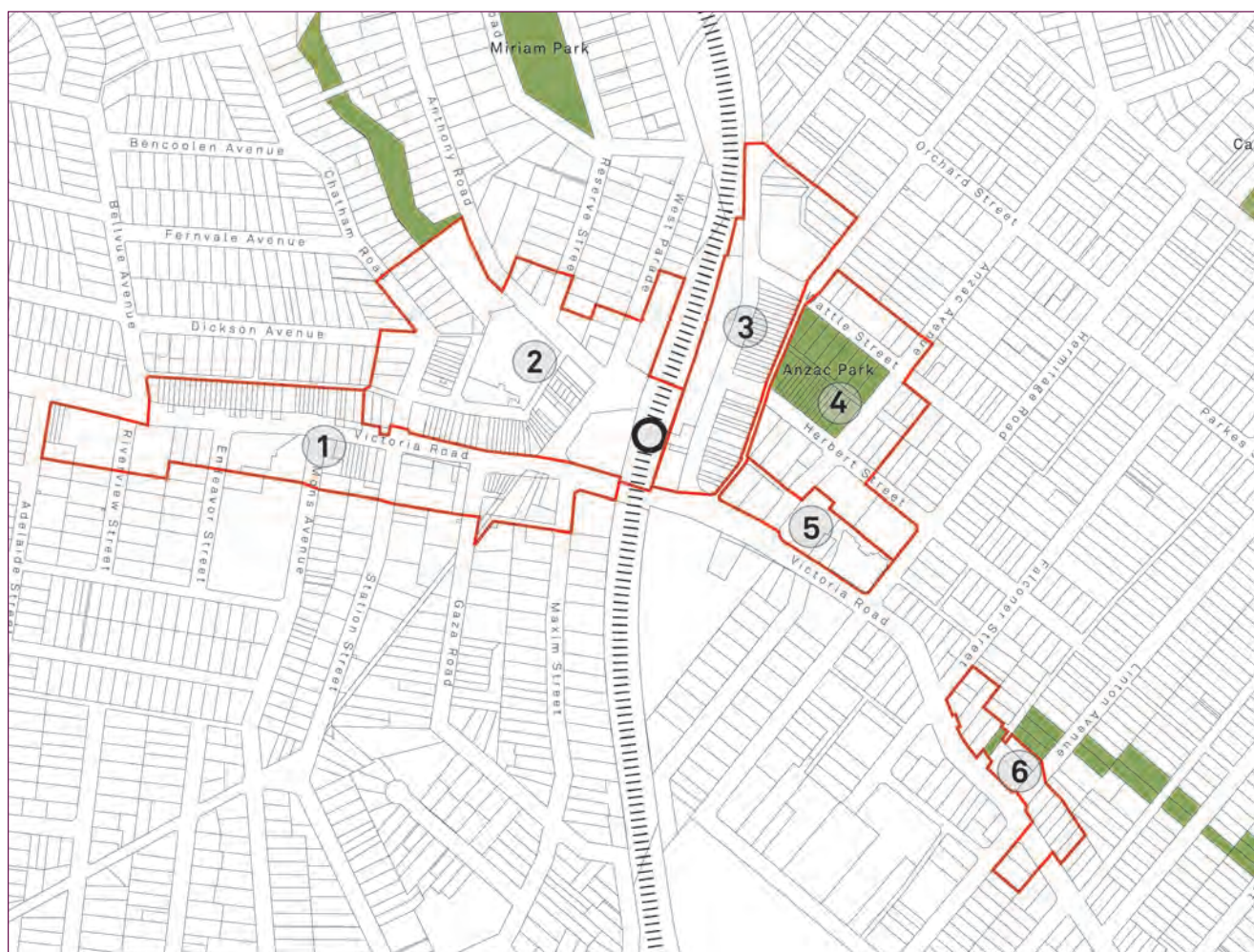


Figure 4.3.02 West Ryde Town Centre DCP Precincts

2.5 Key Town Centre Principles

The West Ryde Master Plan provides principles to influence the future built form and public domain of the West Ryde Town Centre and adjoining areas. There are five key factors which are important to the future development of the town centre and will influence future development. Each of these is supported by principles that achieve to the intended future vision of the West Ryde Town Centre and adjoining areas.

2.5.1 Green Strategy & Water Management

A series of 'Green Links' can be developed to connect the edges of the centre and existing green space areas to the central retail core precincts, and beyond. Through improving existing open spaces and integrating these with existing and new street tree planting and public/domain and streetscape improvements, these corridors will offer amenity to surrounding residential development and critical pedestrian linkages to, and throughout, the town centre. These links will also provide critical public transport.

Principles

1. To improve existing public amenity and build on existing natural assets to ensure the future sustainability and amenity of West Ryde.
2. To improve public domain through a series of connecting 'green links' extending towards and through the Town Centre Core.
3. To create a 'green strategy' that integrates residential amenity with water management.

2.5.2 Pedestrian Circulation

An integrated approach to pedestrian and vehicular circulation is needed to allow safe and efficient access to and within the town centre, with priority given to pedestrian movement, amenity and safety in the core.

The network of streets, lanes and pedestrian/shared spaces are a vital component of a town centre that need to be reinforced and maintained. The role and function of each of these spaces is determined by the scale, character, and purpose of the surrounding built form, as well as the activities that take place within the public domain.

Principles

1. To maximise pedestrian safety (primarily through traffic calming measures) within active precincts, integrated public transport corridors and bus interchange.
2. To provide a legible access and parking arrangement within the Town Centre through a clear hierarchy of pedestrian prioritisation with parking opportunities adjacent.
3. To define and activate edges to streets and parks to create a sense of character, legibility, convenience and safety for users of the public domain.
4. To improve the pedestrian environment and amenity including quality pavement design, street trees and furniture.
5. To ensure new buildings address streets and parks, in order to provide definition and casual surveillance of these spaces.
6. To ensure safe and convenient movement of cyclists within the town centre, including greater connectivity to surrounding cycle networks.

2.5.3 Safety & Accessibility

Future development within the town centre should encourage pedestrian movement, providing safe access for the whole community to and from the main transport hubs. Future consideration should be given to ensuring clear movement lines through the Town Centre and between primary transport nodes. Public domain upgrades will also assist in providing a safe and secure Town Centre.

Principles

1. To ensure development provides legible pathways for pedestrians and contributes to the provision of safe access.
2. To provide active frontages at street level to contribute to the safety and surveillance of the street.
3. To encourage public domain upgrades including street tree planting and street lighting.
4. To introduce safe road crossings to enhance north-south and east-west connectivity.

2.5.4 Retail and Employment Areas

The important economic and employment role of West Ryde is recognised and should be enhanced by future development of the Town Centre and adjoining areas. The Town Centre comprises several distinct retail and commercial areas. These areas should be further developed as an integrated series of retail and commercial precincts in order to enhance the economic viability of West Ryde.

Principles

1. To encourage future development of distinct, but connected, retailing precincts.
2. To activate and reinvigorate the Victoria Road corridor to improve amenity and viability of future uses.

2.5.5 Residential Precincts

Residential uses are considered an important land use in the Town Centre. Over time, the development of the centre will encourage a mixture of housing densities throughout, with higher density residential developments concentrated around the central core and within close proximity to the transport interchange. Low density residential developments will be encouraged on the outer edge of the Town Centre to create a clear transition between the town centre and the surrounding zoned residential land.

Principles

1. To focus residential density around the Town Centre core and improve the public domain to increase 'livability'.
2. To focus density around open space areas to encourage casual surveillance and provide additional amenity to dwelling occupants.
3. To maintain a transition in the scale of residential development at the edge of the centre.

3.0 GENERAL DEVELOPMENT CONTROLS

This section of the Plan sets out the objectives and development requirements that address

- Site Planning;
- Building Form Character Principles;
- Built Form Controls;
- Public Domain/Public Amenity;
- Accessibility;
- Environmental Management;
- Social Considerations; and
- Housing Choice.

The following controls apply to all types of development found within the Town Centre and adjoining areas. Precinct base controls are specified in Section 4.0 Precinct Development Controls.

3.1 Built Form

This section outlines specific built form controls for new development in the West Ryde Town Centre. New development is to address each of the built form controls, ensuring that the overall scale and form responds appropriately to its context.

3.1.1 Building Height and Bulk

The building height controls aim to deliver a range of building heights across the Town Centre, responding to sunlight access requirements, achieving an acceptable pedestrian scale and function of the public domain and promoting flexibility and adaptability into the future.

Objectives

1. To ensure an appropriate bulk and scale of development which is consistent with the character of the West Ryde Town Centre.

Controls

- a. The maximum height of any building in the town centre will be in accordance with the height shown on *Ryde Local Environmental Plan 2014* Height of Building Map.
- b. Scale and bulk of development will primarily be determined by the maximum Floor Space Ratio applying to the land. Floor Space Ratio of buildings is to be in accordance with the *Ryde Local Environmental Plan 2014* Floor Space Ratio Map.

Floor to Ceiling Heights

- c. The following controls provide the minimum floor to ceiling heights, as illustrated in Figure 4.3.03:
 - i. Non residential uses:
 - Ground floor retail/commercial uses require 3.6 metres floor to ceiling height; and
 - Any non residential level above require a minimum 3.3 metres floor to ceiling height; and
 - ii. All residential uses:
 - Minimum 2.7 metres floor to ceiling height.

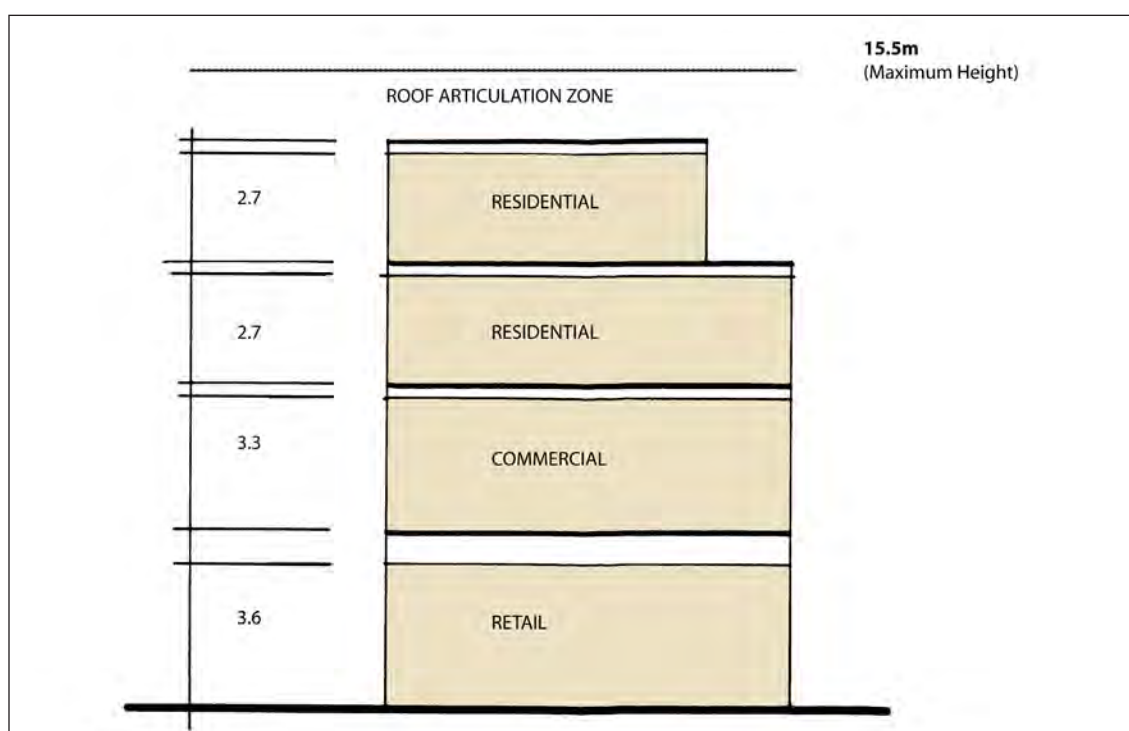


Figure 4.3.03 Minimum Floor to Ceiling Heights (Indicative)

Building Articulation and Features

- d. In multi-storey and mixed use buildings, roof articulation should be provided to add visual interest to buildings. Any elements within the roof articulation zone are not to extend above the maximum height in metres specified by the *Ryde LEP 2010*.
- e. Building articulation is to respond to the local context and environmental conditions by considering roof shape, pitch and overhangs, entries and verandahs, balconies, terraces, materials, finishes, fixtures, patterns, colours and detailing.
- f. Lift overruns, plant equipment and communication devices are to be integrated into the design of the building.

3.1.2 Mixed-Use Development

Objectives

1. To encourage a vibrant and active Town Centre and improve the visual image of West Ryde.
2. To encourage a mix of residential, commercial and retail land uses within the Town Centre.
3. To ensure buildings situated on corner allotments provide for visual interest and address the intersections which they front.
4. To ensure car parking provisions and servicing do not compromise active street frontage and desirable urban form outcomes.
5. To encourage safety through built form design and mixed-use developments.

Controls

- a. Uses which promote pedestrian activity (i.e retail shops, cafes etc) are to be provided at ground floor level to promote vibrancy and allow passive and active surveillance opportunities.
- b. New development is to encourage a mix of retail and commercial activities to be located on a single level or at ground level. Residential uses should be provided within upper levels of the building.
- c. Where new residential development is proposed as part of a mixed use development the following issues are to be considered:
 - i. the proposal should be consistent with the requirements of *State Environmental Planning Policy No. 65 - Design Quality of Residential Flat Buildings* and the *Residential Flat Design Code*, where appropriate; and
 - ii. Development must comply with noise and sound insulation requirements under BCA and *AS3671-1987: Acoustics - Recommended Design Sound Levels and Reverberation Times for Building Interiors*. Design features may be used to achieve primary acoustic privacy. In addition, developments are to comply with State Environmental Planning Policy (Infrastructure) and RailCorp where appropriate.

3.1.3 Street Setbacks and Alignment

The way a building addresses the street is critical in delivering a high quality and vibrant public domain. Setback requirements have been determined having regard to the function of the street, laneway or public domain, which the development addresses.

Objectives

1. To establish build to street lines which respond to the function and character of the street.
2. To promote the definition and activation of the streetscape through built form.
3. To allow for access and circulation throughout the town centre.
4. To ensure a transition to the neighbouring low density residential areas.
5. To allow an outlook to and passive surveillance of the street.
6. To maintain reasonable sunlight access to the public domain, open space and to adjoining sites.
7. To clearly identify corner sites through prominent built form.

Controls

- a. New buildings are to have street frontages built predominantly to the street alignment for the first 2 storeys, except for land to which this Part of the DCP applies and are zoned residential, industrial or enterprise corridor.
- b. The first two storeys of all buildings along a build to street (hard) setback line as indicated in Figure 4.3.04, are generally to maintain a hard alignment with the street. Setbacks are to be minimised.
- c. New buildings which are built along a street frontage with no build to street setback line indicated in Figure 4.3.04 are to provide setbacks as required for their development type.
- d. Building design is to minimise any adverse wind effects on public spaces. The orientation, height and form of development are to be designed to promote public safety and comfort at ground level. Awnings are to be provided, if necessary, for pedestrian comfort.
- e. All applications for buildings over 5 storeys shall be accompanied with a Wind Impact Statement from a qualified person. For buildings over 9 storeys a detailed wind impact study must be submitted.



Figure 4.3.04 Build to Street Setback

3.1.4 Urban Design

In addition to built form controls, appropriate urban design is important to encourage the creation of a high quality urban environment and to enhance the sense of place. Within the West Ryde Town Centre, it is also important to maintain an appropriate transition to surrounding low density residential areas.

Objectives

1. To encourage commercial/retail facilities along Victoria Road reinforcing and supporting activities within the West Ryde Town Centre.
2. To encourage mixed use development activities.
3. To provide opportunities for a range of commercial/retail uses at ground level.
4. To ensure future scale and mix of development recognises the residential/ commercial interface and encourages a transition between high density development and lower density residential land.
5. To activate laneways and 'back-of-house' areas to create improved pedestrian environments and linkages and build upon the sustainability and accessibility corridors between the adjoining residential areas and West Ryde Town Centre.
6. To encourage clearer connections between the western and eastern sides of West Ryde Train Station.
7. To encourage a variety of built form in new development and to assist in defining street blocks.
8. To encourage high quality urban design of new development.
9. To ensure new and refurbished development responds to the urban context.

Controls

- a. Built form is to follow and reinforce the established street alignment, providing a continuous building line to define the public domain.
- b. Pedestrian corridors and linkages such as arcades, lanes and streets, should be provided, maintained and enhanced.
- c. Built form design should respect the existing character or contribute to a preferred character of the town centre.
- d. Open Space and public domain is to be provided, maintained and enhanced in accordance with the City of Ryde Public Domain Technical Manual.
- e. Off-street parking should be provided behind the front building line to limit impact to the streetscape and must be consistent with 3.1.6 Active Street Frontages and Street Address. Basement parking should be provided where possible.
- f. Where residential development is proposed, pedestrian entry should be separated from the entry to other land uses in buildings.
- g. Car parking and servicing must not impact adversely upon desirable built form outcomes and must be consistent with active street frontages objectives. Car parking should be located behind the building or at basement level.

3.1.5 Building Entrances and Lobbies

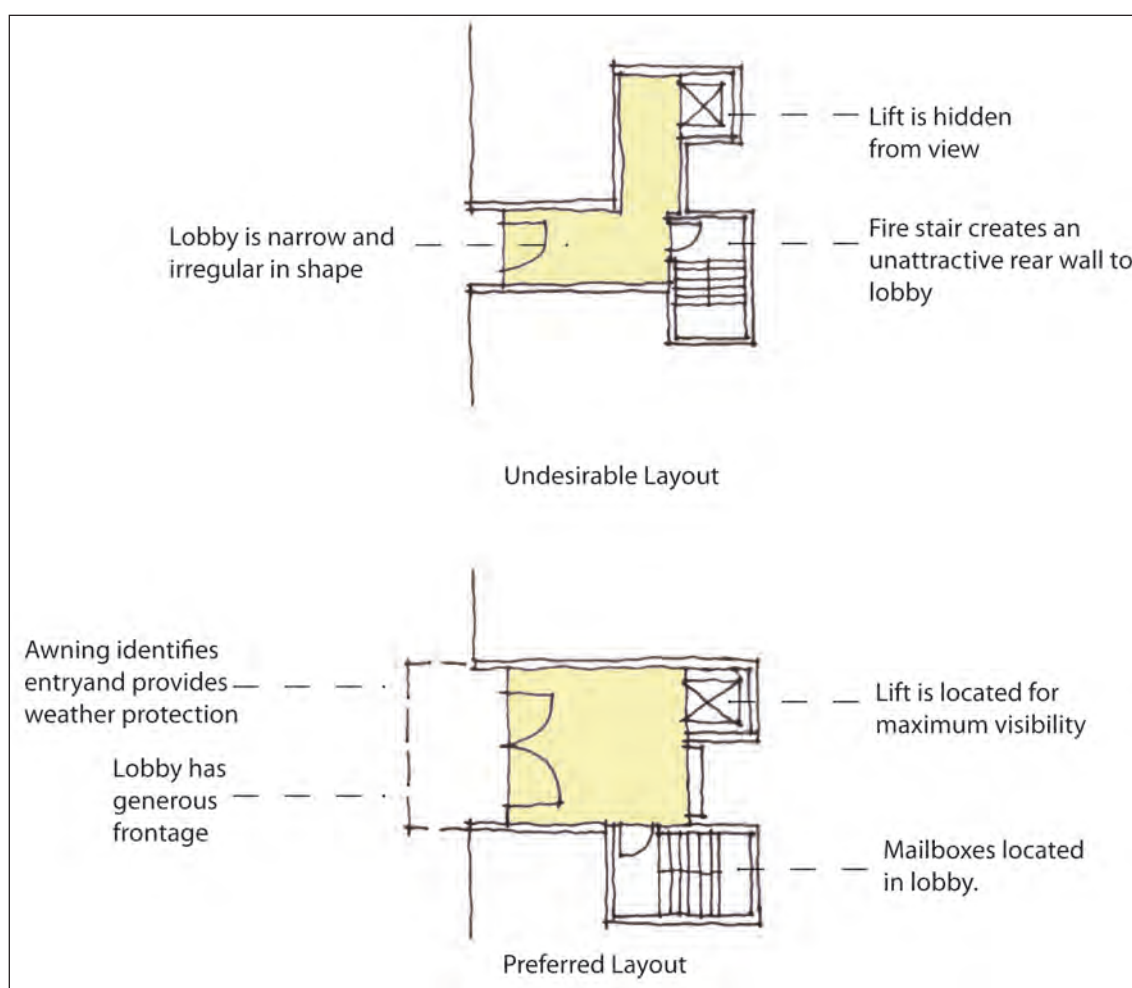
New development involving multi-storey and mixed use development, should provide safe and accessible building entry from the street. The controls for building entrances and lobbies are provided to ensure appropriate design of building entry.

Objectives

1. To ensure entrances establish a distinguishable address and outlook to the public domain.
2. To provide safe, high quality building entry points and lobby areas that contribute to the street frontage.
3. To provide all weather protection to all building entry and lobby areas.
4. To ensure compliance with Crime Prevention Through Environmental Design principles.

Controls

- a. All entrances are to be clearly visible and identifiable from the street and public areas. Use of colour, contrasting materials and articulation in the building design can assist in entrance visibility. Figure 3.4 provides preferred lobby layout principles.
- b. Building lobbies must be accessible from a continuous path of travel.
- c. The lobby area is to have a separate and identifiable street entry, at ground floor level from the footpath.
- d. All areas within the lobby are to be visible from the entry point to enhance the sense of security.
- e. All entrances and lobbies are to provide suitable and appropriate lighting.



3.1.6 Active Street Frontages and Street Address

Active street frontages provide for interesting and safe pedestrian environments. Busy pedestrian areas and non-residential uses such as shops, studios, offices, cafes recreation and promenade opportunities promote the most active street frontages.

Active street frontages and street addresses are critical to the viability and vitality of the West Ryde Town Centre as direct, easy access from the footpath draws people from the street into premises. Active street frontages also add to the safety and security of a street by enabling casual surveillance.

Objectives

1. To maximise active street frontages and street address.
2. To retain and reinforce the continuity of activities along the street.
3. To clearly define corner sites and contribute to the street address through design and facade features.
4. To ensure buildings positively relate to surrounding development and enhance the quality and character of streetscape.
5. To ensure buildings situated on corner allotments address the intersections which they front.
6. To provide building facades that are of high architectural value and of visual interest to contribute to the character of the street and public domain.

Controls

- a. Active street frontages are required along those property frontages identified in Figure 4.3.06. Active frontages should be achieved using one or a combination of the following uses at street level:
 - retail shop front;
 - entrance to a retail arcade;
 - frontage to open space;
 - glazed entry to a commercial or residential lobby;
 - cafe or restaurant;
 - outdoor dining areas; and
 - active office uses (including community uses).
- b. Active ground floor uses are to be at the same general level as the footpath and be accessible directly from the street.
- c. Building facades are to be designed to maximise activation, movement and lighting within the public domain.
- d. Developments on corner allotments should incorporate a significant architectural feature to address the corner such as a wrap around verandah, upper storey balcony, bay window, corner entry or roof feature.



Figure 4.3.06 Active Street Frontages

3.1.7 Awnings

Awnings encourage pedestrian activity along streets as they provide shelter and shade, enhance amenity, protection, comfort and usability of footpaths. In addition, awnings provide streetscape continuity and reduce the perceived bulk of development.

Objectives

1. To provide awnings that shelter pedestrians along all public streets and retail areas.
2. To provide continuous awnings that define the street frontage and encourage pedestrian activity.
3. To enhance the quality of the streetscape through a consistent approach to awning design.

Controls

- a. Awnings should be provided along street frontages as shown in Figure 4.3.06 to contribute to active street frontages.
- b. New awnings are to be designed to:
 - i. be continuous for the entire length of the site frontage;
 - ii. be set back from the face of the kerb by 0.6 m;
 - iii. be weather sealed to the face of the building to which they are attached and to the adjoining awning
 - iv. have a height clearance above the footpath level of at least 3 m or a height consistent with adjacent awnings; and
 - v. maintain sufficient clearances from any overhead electricity or telecommunications installations.
- c. Awnings are to step in response to changes in street level, and may highlight building entrances. Otherwise awnings should be relatively level and should continue the alignment of other adjacent awnings.
- d. All awnings to provide under awning lighting to enhance public safety and to facilitate night use of the Town Centre.

3.1.8 Balconies

Balconies provide elementary architectural features that contribute to the form, character and style of buildings and streets. They provide articulation, visual interest as well as an important source of private open space.

Objectives

1. To provide private open spaces that also contribute to outlook and enliven the streetscape.
2. To ensure balconies are integrated into the design of buildings, function and respond to the local context and environment.
3. To provide opportunities for overlooking to streets and public open space.

Controls

- a. In mixed use and residential flat buildings involving more than 20 dwellings, at least one balcony or courtyard per apartment is to be provided off the living area.
- b. In larger development, balconies should provide different styles and designs to provide visual interest to the facade.

3.1.9 Visual Privacy and Acoustic Amenity

Design measures are incorporated to protect the privacy and amenity of occupants of residential apartments or serviced apartments. Acoustic privacy is a measure of sound insulation between residential apartments and between external and internal spaces. It is important in a mixed use environment to ensure that the noise levels between neighbouring properties are respected.

Note: Future development is to take into account the provisions outlined in SEPP 65 - Design Quality of Residential Flat and Development Near Rail Corridors and Busy Roads - Interim Guideline.

Objectives

1. To ensure adequate visual and acoustic privacy of residential development in the Town Centre and to associated private open space.
2. To ensure that the siting and design of residential buildings minimises noise transmission from abutting railway lines, major roads or other major noise-generating land uses.
3. To minimise the risk of noise and vibration impacts on noise sensitive developments located near the rail corridor and major arterial roads.
4. To encourage building design to provide for public safety and security, while maintaining the quality of the streetscape.
5. To reduce opportunities for crime through crime prevention and environmental design principles.
6. To reduce the impact of road and rail related noise on surrounding retail and residential developments.
7. To meet RailCorp and State Environmental Planning Policy (Infrastructure) 2007 requirements to maintain safety and operation of the rail network.

Controls

Visual Amenity

- h. Orientate the main living spaces within apartments to the street and/or communal open space (in designing the layouts this will need to be balanced against other criteria such as solar access).
- i. Proposed development should address the design principles outlined in the NSW Police Service's *Crime Prevention through Environmental Design* (CPTED).
- j. Development design should incorporate the following techniques to increase public safety and security:
 - i. Provide active uses wherever possible at ground level;
 - ii. Avoid blank walls onto streets, or large building setbacks with no visual supervision;
 - iii. Maintain strong view corridors along streets, laneways and pedestrian linkages;
 - iv. Provide high levels of lighting in carparks;
 - v. Provide passive surveillance by locating entrances and living areas where surveillance is limited;
 - vi. Locate entrances and living areas to provide surveillance of the public domain;
 - vii. Provide well lit entrances and main walkways, with appropriate landscaping;
 - viii. Use physical barriers or other methods to deter people from entering unsafe spaces; and

ix. Design lighting to ensure it does not produce glare or dark shadows. This can be achieved by the following:

- use diffused lights and/or movement sensitive lights;
- direct these lights towards access/egress routes to illuminate potential offenders, rather than towards buildings or resident observation points;
- lighting should have a wide beam of illumination, which reaches to the beam of the next light, or the perimeter of the site or area being traversed;
- as a guide areas should be lit to enable users to identify a face 15 metres away; and
- illuminate possible places for intruders to hide.

Acoustic Amenity

- k. Where residential development is proposed in proximity to a major road, railway lines or major noise generating activity, appropriate materials with acoustic properties should be incorporated in the design of the dwellings.
- l. Council may require a noise and vibration assessment to be undertaken for development applications for noise generating developments or for residential developments on sites adjacent to noise generating sources such as rail corridors.
- m. Development must comply with noise and sound insulation requirements under BCA & AS3671-1987: Acoustics - Recommended Design Sound Levels and Reverberation Times for Building Interiors. Design features may be used to achieve primary acoustic privacy.

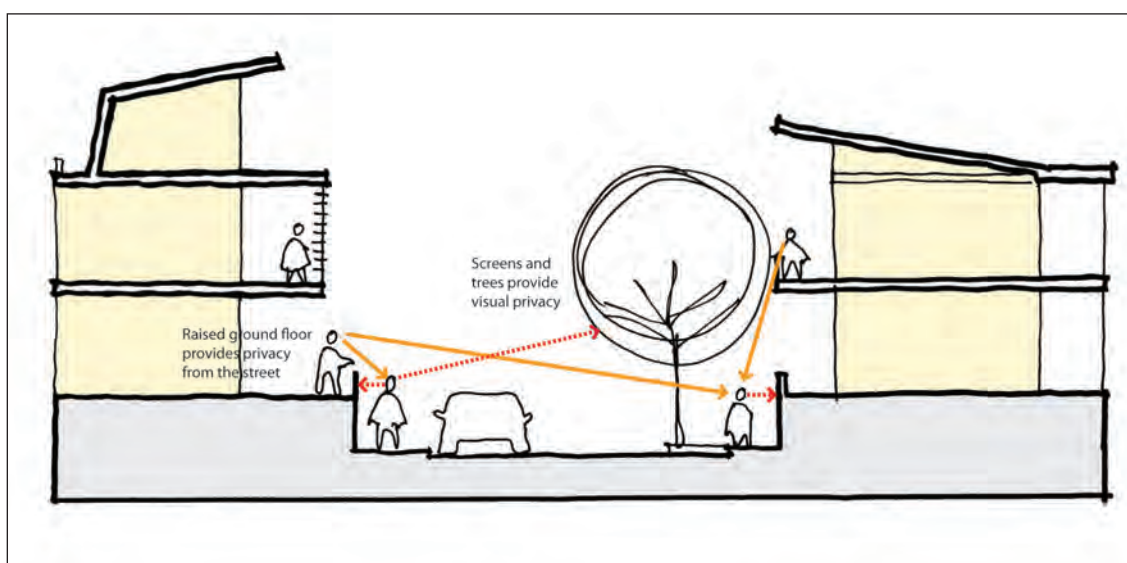


Figure 4.3.07 Casual Surveillance and Privacy Design Principles

3.1.10 Housing Choice and Mix

A choice of apartment types and mix of sizes in the town centre caters for a variety of household types. A range of dwelling sizes and types create a housing mix that will cater for a diverse population, as well as provide for changing use over time.

Objectives

1. To ensure that residential development provides a mix of dwelling types and sizes to cater for a range of household types, including families
2. To ensure that dwelling layout meets the needs of the occupants and is sufficiently flexible to allow for changing needs and activities over time.

3. To ensure the provision of housing that will, in its adaptable features, meet the access and mobility needs of any occupant.
4. To encourage a range of new housing with good access to the city centre..
5. To ensure Residential Flat Buildings respond to the Residential Flat Design Code and SEPP 65.

Controls

- a. Developments comprising residential uses must provide a variety of residential units mix, sizes and layouts within each residential development.
- b. The total number of studio units and one-bedroom apartments/dwellings within any development must not exceed 25% of the total number of apartments/dwellings.

The Residential Flat Design Code provides examples of appropriate unit sizes which will be used to assess the appropriateness of unit size proposed in any development.

3.2 Traffic, Access and Pedestrian Amenity

This section outlines controls for access and pedestrian amenity for new development.

3.2.1 Vehicular Access

The location, type and design of vehicle access points to a development can have significant impacts on streetscape, site layout, building facade design and pedestrian activity.

The design and location of vehicle access to development should minimise conflicts between pedestrians and vehicles on footpaths, and reduce visual intrusion and disruption of streetscape continuity.

Objectives

1. To ensure safe and efficient access to properties and limited impact on existing traffic movement.
2. To minimise the impact of vehicle access points and driveway crossovers on streetscape amenity, pedestrian safety and the quality of the public domain.
3. To reduce impact on traffic flow and movement along the major transport corridor of Victoria Road.
4. To minimise conflict between vehicles and pedestrians within the town centre.

Controls

- a. Vehicle access is to be designed to:
 - i. Minimise the impact on the street, site layout and the building facade; and
 - ii. Be integrated into the building design, if located off a primary street frontage.
- b. Vehicle access to properties should be provided from lower order roads or rear lanes where possible.
- c. New property access to Victoria Road will be permitted only where it is determined that access from a lower order road or laneway is not possible or would result in a detrimental impact to the surrounding traffic network. Access point must be RMS compliant.

- d. Vehicle access points are to be minimised as much as possible, particularly within mixed use developments and residential flat buildings. Where practicable, buildings should share, amalgamate, or provide a rear lane for vehicle access points.
- e. For large scale development, all vehicles must be able to enter and leave the site in a forward direction without the need for complicated turns.
- f. Vehicle access points should inflict the least amount of impact on pedestrian movement, especially movement corridors surrounding the railway station.

3.2.2 Pedestrian Access

Pedestrian links throughout the town centre will enhance the public domain and legibility of the centre. Direct through-site links will improve access between transport nodes, retail areas and civic uses. The improvements in the public domain network and ease of access to key features will improve the town centre's desirability.

Within the West Ryde Town Centre Core and Ryedale Road Precinct, the following hierarchy of pedestrian circulation should be established:

- i. Pedestrian Town Centre;
- ii. Pedestrian Priority Area;
- iii. Key Intersection; and
- iv. Major Vehicular Intersection.

Objectives

- 1. To improve pedestrian comfort in the town centre.
- 2. To create a safe environment for pedestrians in the town centre,
- 3. To create attractive, convenient and safe pedestrian linkages that allow easy movement throughout the West Ryde Town Centre.

Controls

- a. Pedestrian links are to be provided in accordance with the Pedestrian Circulation Framework (refer Figure 4.3.08) and the City of Ryde Public Domain Technical Manual.
- b. Where circulation is provided through a site or within a building serving to connect two points, the thoroughfare should function as a shortcut, be continuous and level with public pedestrian areas and incorporate an active edge of retail or commercial uses.
- c. Through-site links can be provided by plazas, arcades, colonnades or tree lined passages or a combination of these.

Note: Consideration will be given to the provision of pedestrian links additional to those outlined in the Pedestrian Circulation Framework, where development has frontages to two streets or provide an opportunity to extend the existing network.

- d. All pedestrian access areas and footpaths adjacent to new development will be required to be reconstructed using paving treatment in accordance with Council's requirements. The design, finish and element of any new through site links and access ways to be in accordance with Council's Public Domain Technical Manual.
- e. Council encourages the provision of through-site pedestrian links throughout the Town Centre Core.

- f. Buildings should be designed to limit overshadowing of major pedestrian spaces such as the proposed village square/civic space and the southern portion of Graf Avenue, Ryedale Road and areas fronting Anzac Park.
- g. Internal pedestrian links should, where practical and feasible, make provision for natural light.
- h. Distinctive paving treatment, bollards and other street furniture should be created in the retail core where pedestrians and vehicles mix. The following streets should be considered for such treatment:
 - Graf Avenue;
 - Market Street;
 - Anthony Lane;
 - Ryedale Road; and
 - Anzac Lane.

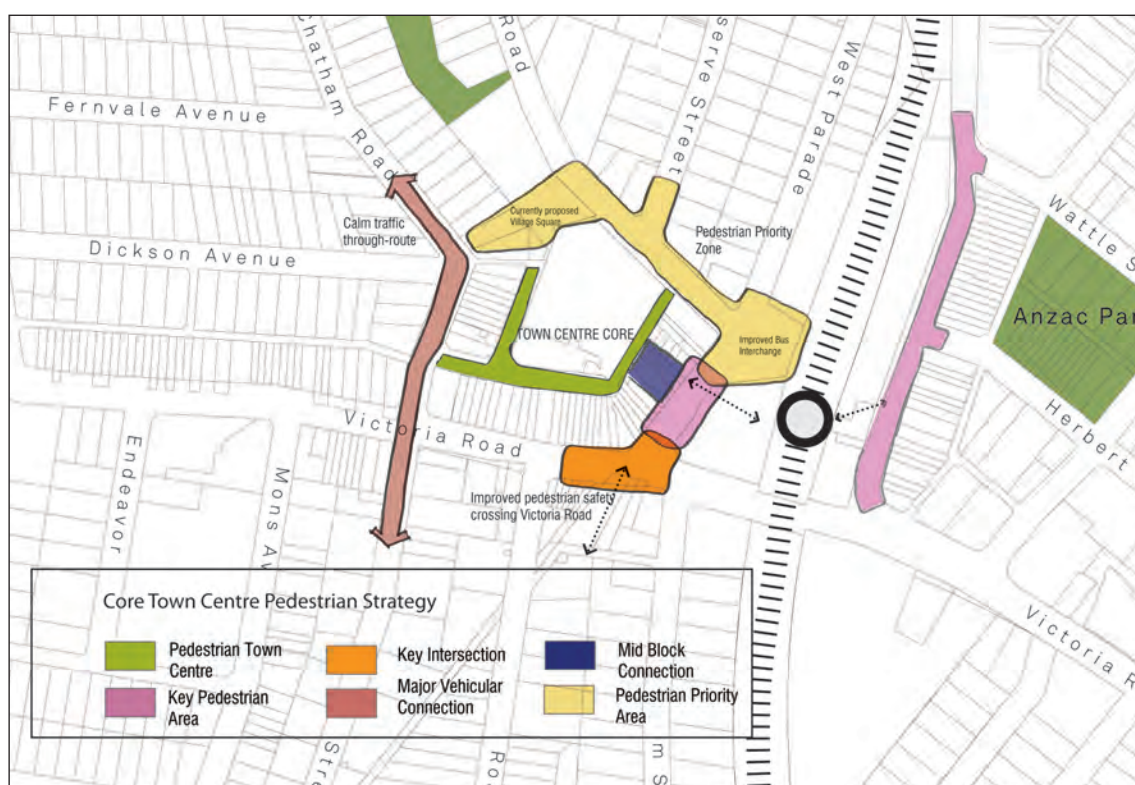


Figure 4.3.08 Core Town Centre Pedestrian Circulation Framework

3.2.3 Bicycle Facilities

In recognition of a more sustainable place and the creation of extended pedestrian and bicycle networks, the following objectives and controls seek to better accommodate bicycle facilities.

Objectives

1. To encourage the use of bicycles for trips that might otherwise involve the private motor vehicle.
2. To ensure the facilities required to support bicycle users are provided.
3. To ensure that appropriate facilities are available to permit safe and convenient storage of bicycles.

Controls

- a. Bicycle storage racks are to be provided to accommodate a minimum of:
 - 1 bicycle space for every 200 square metres of office floor space;
 - 1 bicycle space per 300 square metres of retail; and
 - 1 bicycle space for every 3 residential units.
- b. Bicycle racks must be easily accessible from the public domain, and within areas that are well lit with adequate levels of natural surveillance.
- c. The bicycle parking area must be capable of being made secure to protect the security of cyclists and their belongings. Communal showers, changing facilities and lockers for storing cycle attire and equipment may be required.
- d. Notwithstanding (b) and (c) above, bicycle storage facilities for residential uses can be provided within private garage areas, where it is demonstrated that:
 - there is sufficient storage within the garage for a bicycle and the required number of vehicles; and
 - there is a safe path for cyclists to leave the garage area.
- e. Bicycle facilities are to be in keeping with the City of Ryde Public Domain Technical Manual.

3.3 Environmental Controls

This section outlines the environmental controls that are to be met by all new developments.

3.3.1 Solar Access

Solar access is a major contributor to environmental comfort and amenity in homes, retail and commercial office space and the public domain. Good passive solar design solutions offer a resource and financial benefit by reducing the need for artificial lighting, heating and cooling.

Objectives

1. To encourage the use of renewable energy sources in the centre.
2. To maximise the amount of natural light in pedestrian areas, public open spaces and residential dwellings during the winter months.
3. To maximise the use of natural light to reduce energy consumption.
4. To minimise the need for artificial lighting during daylight hours.

Controls

- a. All developments must provide shadow diagrams that accurately describe the overshadowing impact to adjacent buildings and public domain areas.
- b. Demonstrate access to sunlight is to be substantially maintained so that existing private and public open spaces, footpaths and existing windows to habitable rooms in adjoining buildings receive at least 3 hours of sunlight between 9 am and 3 pm on 21 June (winter solstice).
- c. Major public open spaces are to be designed to receive a minimum of 50% sunlight on the ground plane for at least 2 hours between 10 am and 2 pm on 21 June.

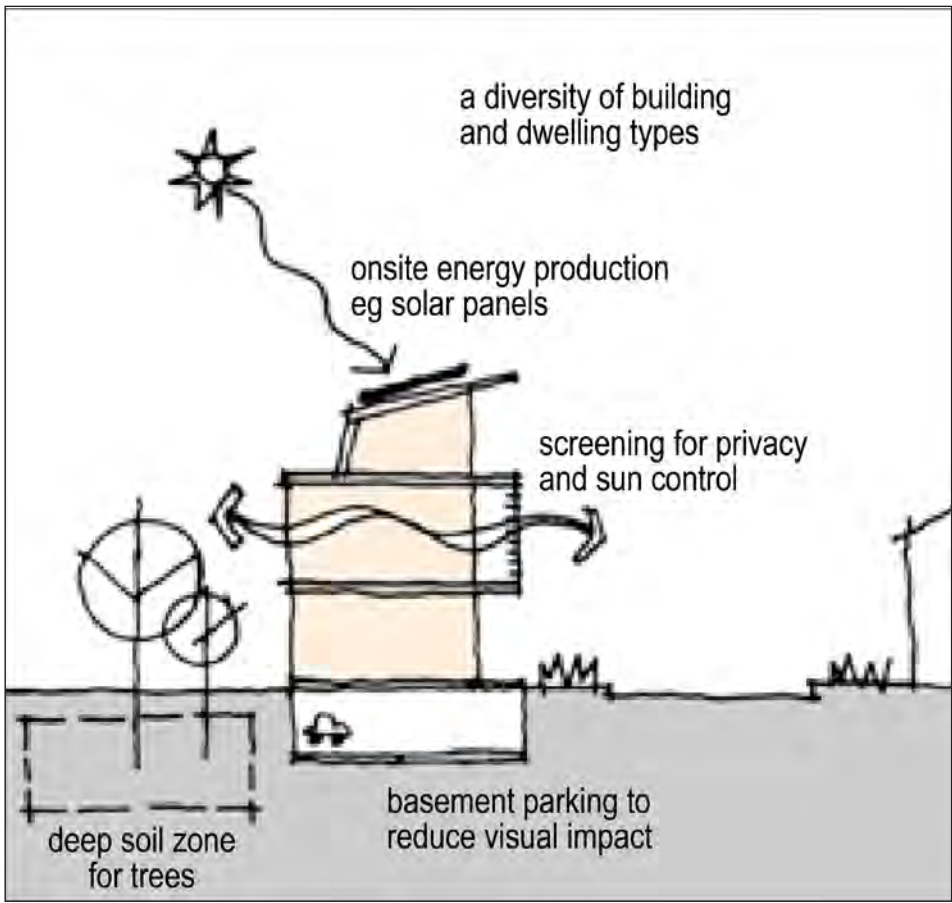


Figure 4.3.09 Site Design Principles for New Development

3.3.2 Natural Ventilation

Natural Ventilation contributes to environmental amenity and comfort, as well as reducing the need for artificial heating and cooling. Incorporating opportunities for natural ventilation in new development is important in ensuring adequate thermal comfort and reducing demand for mechanical heating and cooling.

Objectives

- 1. To reduce the use of mechanical means of heating and cooling to minimise energy consumption.
- 2. To ensure natural ventilation is available to all habitable rooms of a dwelling.
- 3. To allow the opportunity for mixed modes of ventilation in commercial buildings.

Controls

- a. In locations where wide footpaths already exist, or are proposed, ensure ground floor shops can satisfy natural ventilation requirements for operating a restaurant.
- b. Design of commercial developments must incorporate mixed modes of ventilation.

3.3.3 Stormwater Management

Objectives

1. To appropriately manage stormwater and runoff from sites.
2. To minimise the likelihood for flooding and the potential effects of flood events.
3. To ensure any future development does not exacerbate flooding on other properties or increase stormwater run-off.
4. To ensure public open space operates efficiently and without disruption during high levels of rainfall and the potential impacts of flood events.
5. To encourage development with high sensitivity to flood damages or danger to life to be sited and designed so that it is subject to minimal flood hazard, and the unnecessary impediment of stormwater.
6. To ensure that the design and siting controls, and built form outcomes required to address the flood hazard do not result in unreasonable impacts on the:
 - amenity and character of an area;
 - streetscape and the relationship of the building to the street;
 - social and economic outcomes; and the
 - environment and ecology
7. To minimise the amount of run-off generated by new development and inconvenience to other properties.
8. To retain stormwater on site, where possible, and minimise downstream runoff from industrial sites.
9. To ensure future built form is water efficient, reducing water usage and incorporating water recycling in day to day operations.
10. To encourage Water Sensitive Urban Design (WSUD) principles to be incorporated into the design of stormwater drainage and in the orientation of development.

Controls

- a. All stormwater drainage is to be designed in accordance with Part 8.2 Stormwater Management of this DCP.
- b. A Stormwater Management Plan is required to be submitted with all development applications.
- c. Access to underground parking is to be designed with consideration to flood levels and impact on the street frontage.
- d. All new development should meet best practice targets for stormwater management set out in *Managing Urban Stormwater (The Blue Book)* by Landcom.
- e. Runoff which enters a property from upstream properties must not be obstructed or impeded from flowing onto the site and must not be redirected so as to increase the quantity or concentration of surface runoff entering adjoining properties.
- f. Where appropriate enable the installation of grey water collection treatment on site, so that waste water can be re-used for non-potable purposes, such as toilet flushing and irrigation of gardens and landscape.

3.4 Public Domain

The public domain is the public space in West Ryde Town Centre, the public face and setting for buildings and structures. It is the parts of the town centre not privately owned. The goal of public domain design is to create an integrated space that is legible, comfortable, safe and engaging; which encourages pedestrian use and increases the amount and quality of public leisure spaces.

3.4.1 Street Furniture, Paving & Street Lighting

Street furniture includes lighting, seats, bus shelters, benches, litter bins, telephone booths, drinking fountains, street signs, etc. and are to be used to establish an identity for West Ryde and define roads, paths and gateways.

Street lighting is essential in promoting a safe public domain, in order to clearly define entry points to buildings and public spaces, and to promote activity at night.

Objectives

1. To create visual unity in the design and appearance of public spaces in the centre.
2. To provide comfort and convenience for pedestrians in the centre.
3. To ensure clear separation between roadway and parking areas for legibility and safety on streets with a continuous flow of traffic, particularly for vision impaired people.
4. To provide consistent paving in order to unify the town centre.
5. To promote a well-lit, safe and vibrant public domain at all times.

Controls

- a. Developments which entail the provision of new public spaces (i.e. streets, footpaths, walk ways and the like) will need to incorporate new street furniture and paving and in some cases underground power lines and new light poles in the public space.
- b. Street furniture, paving, underground power lines, and lighting should be designed and installed in accordance with the City of Ryde Public Domain Technical Manual.
- c. Provide a pavement surface which is consistently graded both along and across the pedestrian route.
- d. Use tactile indicators in paving with discretion, considering the needs for all pedestrians.
- e. Council encourages lighting, located approximately 2 to 2.5 metres apart, above ground level located on building walls, awnings or other appropriate structures to minimise shadow from built form and structures.
- f. The multifunction pole lighting system is to be used in the West Ryde Town Centre in accordance with council requirements. The multifunction pole will incorporate lighting, street signage and banners into one element.

3.4.2 Street Tree Planting and Landscaping

Street trees can improve legibility in the urban environment by reinforcing the hierarchy of streets and enhancing sense of place. Placement of trees affects light and shadow, colour and views, which contributes to the quality of pedestrian experience. Trees also contribute to environmental quality in many ways.

Objectives

1. To create attractive public spaces and walkways.
2. To soften the appearance of buildings and improve the visual quality of the retail core.

Controls

- a. All development proposals are to be accompanied by a landscape plan prepared by a qualified and suitably experienced landscape architect.
- b. Where appropriate, developments should incorporate landscaping in the form of planter boxes on the upper levels of buildings to soften the building form (i.e. roof gardens, planting on structures).
- c. Ground level entry areas to upper level dwellings shall be well lit and not obstructed by planting in a way that reduces the actual or perceived personal safety and security of building occupants or pedestrians.
- d. Street trees shall be provided in accordance with the City of Ryde Public Domain Technical Manual and shall be provided at the developers' cost in conjunction with any new building work involving additional floor space.
- e. Street tree species must be selected for their hardiness under adverse and polluted conditions, to provide screening to pedestrians and residents from traffic, and to improve the visual quality of the area.
- f. Street trees at the time of planting shall have a minimum container size of 200 litres, and a minimum height of 3.5 m, subject to species availability.

3.4.3 Public Art

Public art in the urban environment can provide an essential reference point to a place's civic image and positioning. It can make urban spaces attractive and welcoming, promote local identity, link private and public domains, increase pedestrian activity and connectivity, evoke business confidence and attract investment. Good public art can be a destination in itself.

The strong heritage associated with West Ryde provides a spectrum of ideas that can be explored and expressed through public art. Artworks can be used to create emblems or symbols that depict and promote the identity of West Ryde, to distinguish particular developments, enable new businesses to develop signatures, identify entry points and generally stimulate the interaction of ideas that are central to the vision of the area.

Public art, while permanent in its appearance and structure, is also an installation which may change over time.

Strategy

The following principles should support the development of public art in West Ryde:

- Public art reflects local character and cultural identity, creating distinctive urban environments and a sense of place;
- Public art can strengthen and connect neighbourhoods by engaging communities in creative processes;
- Public art is original, creative and innovative in its design and use of form, technique and materials, and at the forefront of new ideas and sustainable practice;
- Public art is inclusive, non-partisan and secular in its subject matter;
- Public art shall be funded, commissioned and attended in a way that encourages artistic excellence and upholds the design intent of the artworks;
- Public art shall comply with all measures and standards in regard to health and safety, maintenance, longevity and durability.

Objectives

1. To include site-specific integrated public artworks in new developments in West Ryde
2. To develop iconic points of reference or focal points that promote identity and add to the enjoyment and experience of West Ryde.
3. To contribute positively to site and surrounds, and respond to the natural and built environment.

Controls

- a. Public art is to be in keeping with the City of Ryde Public Domain Technical Manual and the City of Ryde Public Art Policy.
- b. Public art must be included in all new mixed use development with an estimated construction value of more than \$20 Million.
- c. A site specific Arts Plan is to be submitted together with a development application.
- d. Requirements for the provision of public art and the format of an Arts Plan are to be confirmed with Council prior to lodging a Development Application.

4.0 PRECINCT DEVELOPMENT CONTROLS

The area of the West Ryde Town Centre and adjoining areas have been divided into a number of precincts which reflect the differing urban character of West Ryde. These urban precincts include:

1. Victoria Road West
2. Retail Core
3. Ryedale Road
4. Anzac Park
5. Victoria Road Mixed Use
6. Victoria Road Enterprise Corridor

Each of these precincts reflect different urban character and functions, varied natural and physical settings and serve different purposes. As such, it necessary to provide specific details for each precinct to supplement the general controls specified in Section 3.0



Figure 4.3.10 DCP Precinct Boundaries

4.1 Victoria Road West

4.1.1 Character Statement

The Victoria Road West Precinct will be a vibrant, lively area, providing the primary traffic and transit corridor to West Ryde, and serving as a prominent feature of the Town Centre. The precinct will continue to provide a diverse range of retail and business uses for the community. New development will draw on the existing pedestrian environment. Built form is to follow and reinforce the established street alignment of the Victoria Road West Precinct. Opportunities for larger format retail and commercial premises are located on the southern side of Victoria Road due to the availability of larger sites. The existing small retail shops on the northern side of Victoria Road provide opportunities for small start up businesses.

Active street frontages along Victoria Road West must be retained with any new development, promoting a safe and active environment. Retention of the existing character for the retail sector of Victoria Road West should be prioritised by allowing for small to medium retail units with narrow frontages presenting to the street at ground level. Revitalisation of the precinct is encouraged through the enhancement of the public domain.

Future development will assist in establishing Victoria Road West as a 'landscaped route', defined by new activity and built form.



Figure 4.3.11 Victoria Road West Precinct Boundary

Objectives

1. To enhance the role of Victoria Road West as a commercial/retail corridor of West Ryde Town Centre.
2. To create opportunities for new mixed use developments on the northern side of Victoria Road.
3. To support the activities of the primary West Ryde commercial/retail core adjoining.
4. To encourage maximum development potential through the consolidation of allotments.
5. To ensure future development reflects the surrounding residential development.
6. To ensure the built form of Victoria Road West caters for small and medium scale business opportunities, providing opportunities for small and start up businesses.

Controls

- a. All future development should recognise and address the residential/commercial interface, with a clear transition between high density and lower scale residential density development.

4.2 Retail Core

4.2.1 Character Statement

The Retail Core is the primary retail centre for West Ryde. This precinct provides an important retail and commercial centre for the surrounding West Ryde locality and adjoining residential areas.

The Retail core is encouraged as a main shopping centre as up to approximately 14,000 m2 gross leasable floor area focuses on the provision of food items, basic goods and community services in a central location.

Future development in the retail core is encouraged to include a mix of ground level commercial and retail, combined with residential units above. This typology provides an enhanced pedestrian environment and helps to enliven and activate the street environment.

The Retail Core Precinct will provide the focus for high intensity and large footprint mixed use development with a diversity of retail, commercial, residential and civic services with a focus for large scale employment uses.

The edge of the Retail Core Precinct performs a transitional role, with new development to be suitably designed to maintain the amenity of adjoining residential land uses.

New development is to be designed and oriented to maximise and improve visual and physical connections across the Precinct and to ensure community focal points in the private domain interact with the surrounding network of civic spaces and linkages.



Figure 4.3.12 Retail Core Precinct Boundary

4.2.2 Urban Design

Objectives

1. To encourage mixed use development within the Town Centre where appropriate.
2. To encourage a safe and secure pedestrian-oriented environment.
3. To provide opportunities for a range of commercial/retail uses at ground level.
4. To establish a retail core which services, and is compatible with the surrounding residential areas.
5. To provide the primary commercial and retail centre of West Ryde.
6. To increase diversity in housing opportunities within the West Ryde Town Centre through new mixed use developments.
7. To maintain a diversity of access opportunities and formalise the functions and use of thoroughfares.
8. To maintain and enhance the linkages between the retail core and railway station.

Controls

- a. All development should provide flexible building layouts which facilitate variable tenancies or uses on the first floor of a building above the ground floor.
- b. New development should include retail activities at ground level to maximise activity at street level.
- c. Built form of new development must follow and reinforce the established street alignment to provide a continuous building line for the town centre.

- d. Laneways and arcades must be enhanced and maintained in order to provide clear and accessible pedestrian environment.
- e. Development within the retail core is to ensure a transition to surrounding low density residential areas is achieved.

4.2.3 Public Domain

Objectives

- 1. To build on the character of the retail core and the amenity of the public domain.
- 2. To promote pedestrian activity and safety in the public domain.
- 3. To provide visual interest and richness in architectural detail.
- 4. To encourage an address to the street outside of areas where active or street frontages are required.

Controls

- a. Public areas should have direct access from the public domain.
- b. Provide active ground floor uses including well articulated ground floor entrances to buildings.
- c. Building facades are to be of high architectural value and of visual interest to contribute to the character of the street and public domain.
- d. Buildings are to be articulated and are not to present long unrelieved structures that dominate the landscape. All street frontages are to be activated by light, activity, glazing, building articulation or materials to create visual interest.

4.2.4 Public Car Parking

Objectives

- 1. To provide a reasonable amount of convenient car parking for general public use in the retail core.

Controls

- a. New car parking within the Retail Core Precinct Centre should be provided in a basement. Where this cannot be achieved, parking areas should be provided at ground level and be adequately enclosed and screened from street frontages.
- b. Car Parking associated with residential and retail and commercial land uses should be separated.



Images 1 (a), (b) & (c) Precedent Images

4.3 Ryedale Road

4.3.1 Character Statement

The Ryedale Road precinct is envisaged to be a future mixed use precinct benefiting from a variety of residential, commercial and retail development, and its close proximity to the rail corridor, the retail core of West Ryde, and Anzac Park.

Development on the east side of the railway will consist of a mix of ground level commercial and retail combined with residential units above. Increased heights are permitted in this precinct to capitalise on the proximity to rail. The open space of Anzac Park will balance the scale of the development, and makes the location an appropriate precinct for this type of built form.

The West Ryde Railway Station will activate surrounding businesses and create opportunities for new linkages, connecting Ryedale Road Precinct with the Retail Core. Active uses are to be promoted at the ground and lower levels of development to promote vibrancy and passive and active surveillance of the public domain.

New development adjacent to Anzac Park should enhance the interface with this open space location, ensuring opportunity for views to Anzac Park from the surrounding area, whilst minimising any adverse impacts on the open space. The precinct will also need to recognise the interface between the higher density residential development and the adjacent retail development.

Much of the Ryedale Road Precinct is a Heritage Conservation Area. Future development will also ensure an enhanced recognition and interpretation of the Heritage Conservation Area, as any future development should recognise the significance of the area and incorporate it into the design.

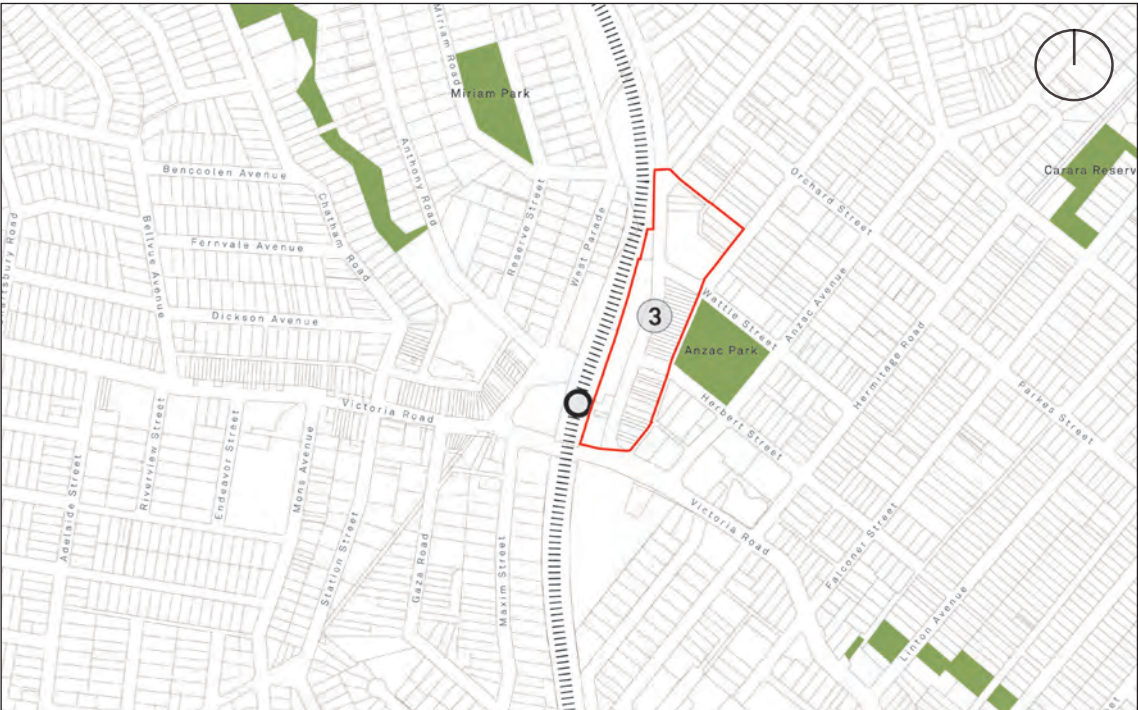


Figure 4.3.13 Ryedale Road Precinct Boundary

Objectives

1. To maintain and preserve the Ryedale Road heritage conservation area.
2. To ensure future development is sympathetic to the existing character of the precinct.
3. To enhance redevelopment opportunities for sites within the Ryedale Road precinct to achieve the maximum building envelope;
4. To recognise the historic fine grain pattern at street level.
5. To establish a neighbourhood level mixed use commercial and retail precinct which capitalises on accessibility to the retail core and West Ryde railway station.
6. To incorporate active uses at ground level, including cafes and restaurants, with residential dwellings positioned above.
7. To improve the accessibility and interface of the West Ryde Railway Station.
8. To help foster a distinctive community identity that reflects the history and enhances the heritage qualities of the local area.
9. To respond to the physical, cultural and urban heritage of the site.
10. To facilitate the provision of a diversity of residential, retail, and commercial uses.

Controls

- a. A Heritage Impact Statement is to be prepared as part of the redevelopment for a heritage item or site in the Ryedale Precinct heritage conservation area.
- b. Development along the residential interface boundary is to be sympathetic in scale and activity to the surrounding residential land uses, protecting the residential amenity.
- c. Future development adjoining the train station should incorporate improved pedestrian access, in order to provide a connection between Ryedale Road and the retail core.
- d. Development is to maintain the character and heritage significance of the heritage conservation area and ensure the infill development responds positively to the heritage character of the area.
- e. Where lot consolidation is proposed, applicants are to provide building envelopes that demonstrate the new development would not significantly impact upon the amenity, streetscape and desired future character, including:
 - adjoining sites are not isolated and retain access;
 - the objectives and principles of this section can be achieved;
 - adequate on site parking can be achieved to meet the parking demands of the development; and
 - the design and function of the development above podium level will achieve a high level of amenity to both its future occupants and to adjoining properties.



Images 2 (a), (b) & (c) Precedent Images

4.4 Anzac Park

4.4.1 Character Statement

The Anzac Park Precinct comprises a residential precinct surrounding the large open space area known as Anzac Park. Anzac Park is an important open space within the West Ryde Town Centre.

The precinct is encouraged for residential development with potential opportunities for ground floor mixed use and live/work adaptability, where the land is zoned for mixed use.

Future development should integrate with the important open space setting created by Anzac Park. New development should provide an attractive streetscape surrounding the park and provide opportunities to overlook the park.



Figure 4.3.14 Anzac Park Precinct Boundary

Objectives

1. To encourage increased residential density around Anzac Park.
2. To reinforce the role and setting of Anzac Park as an important open space and passive recreation space within West Ryde.
3. To recognise the heritage values of the adjacent Ryedale Road Precinct.
4. To provide opportunities to increase pedestrian linkages with the retail core and Ryedale Road Precinct.
5. To provide a consistent built form edge that addresses Anzac Park.

Controls

- a. New buildings are to be designed to activate facades which interface with Anzac Park to promote casual surveillance and interaction (eg. design to include upper level balconies and low front walls).
- b. The bulk and scale of new development is to complement the surrounding residential location.
- c. New buildings within the Anzac Park Precinct which adjoin established residential areas are to provide a transition to these existing areas to maintain the amenity of adjoining residential land uses.



Images 3 (a), (b) & (c) Precedent Images

4.5 Victoria Road Mixed Use

4.5.1 Character Statement

Land to east of the Town Centre comprises a variety of uses along the Victoria Road corridor. The Victoria Road Mixed Use precinct includes several larger allotments on the northern side of Victoria Road providing commercial, retail and residential uses.

Sites within the precinct have been redeveloped recently, adopting a character of mixed use development, comprising of a variety of retail, commercial and residential land uses. This precinct provides a transition to higher density mixed use development to the west and low density residential land to the east, providing an important interface with Victoria Road.

Active ground level uses such as retail activities are encouraged along Victoria Road.

The precinct is slightly elevated above Victoria Road and presents as a prominent location when viewed from the eastern approach to the town centre. New development will assist in establishing a distinctive gateway to the West Ryde Town Centre.



Figure 4.3.15 Victoria Road Mixed Use Precinct Boundary

Objectives

1. To provide a transition from the high density commercial mixed use precinct of the town centre.
2. To assist in establishing a prominent visual gateway to the West Ryde town centre.
3. To provide opportunities for a variety of commercial, retail and residential activities within mixed use developments.
4. To recognise and respond to the elevated location of the precinct along Victoria Road through creation of a visually attractive setting.
5. To respond to the existing built form of adjacent heritage properties.

Controls

- a. New development should provide a primary interface to Victoria Road.
- b. The intention is to develop a mix of uses. This will be achieved by the following measures:
 - i. the precinct will encourage retail uses at ground level fronting onto Victoria Road and existing and proposed land uses;
 - ii. generally commercial uses will be provided on the second levels; and
 - iii. residential uses should be positioned on and above the third level.
- c. Balconies and other facade elements should be provided to the upper levels of buildings which front Victoria Road to increase visual interest to the street.

4.6 Victoria Road Enterprise Corridor

4.6.1 Character Statement

Land along Victoria Road, west of the rail line, provides an important gateway to the West Ryde Town Centre and supports predominantly commercial and residential activities. The precinct is opposite the West Ryde Industrial Area, an important employment and economic precinct for the West Ryde Area.

The land zoned as B6 Enterprise Zone along Victoria Road serves as an important commercial precinct which supports the industrial zone and protects the primacy of core commercial activities within the Town Centre. New development in this precinct will assist in strengthening the visual quality of the Victoria Road Enterprise Corridor.

Development in this precinct will comprise larger footprint commercial activities which are not appropriate for core Town Centre locations and which supplement the activities of the industrial zone. New development should exhibit high quality design which responds to the Victoria Road frontage, provides an important interface with low density residential and improves the visual quality of the corridor.

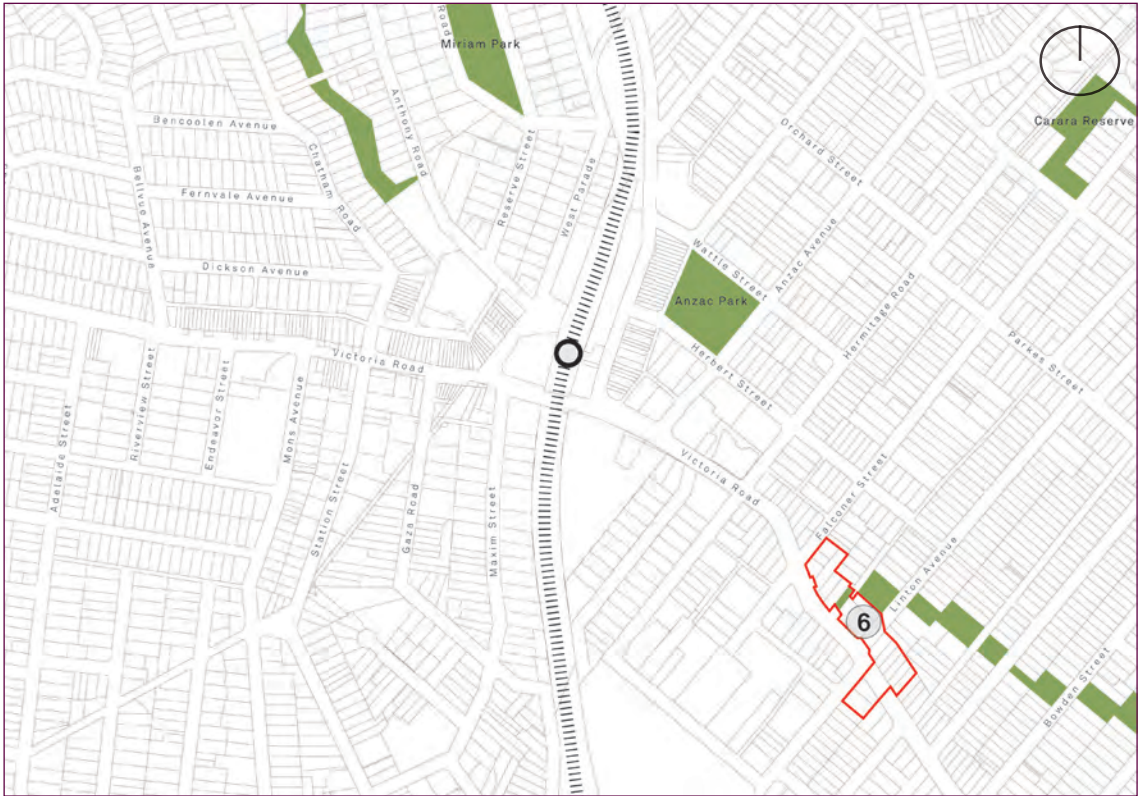


Figure 4.3.16 Victoria Road Enterprise Corridor Precinct Boundary

Objectives

1. To establish a transport corridor related business corridor along Victoria Road adjacent to industrial land uses.
2. To protect the primacy of core commercial and retail activities within the West Ryde Town Centre
3. To encourage establishment of activities which will support the industrial activities to the south west.
4. To encourage a built form and design which is of a high quality and defines the Victoria Road corridor.
5. To assist in defining the eastern gateway to West Ryde.
6. To support and supplement the light industrial activities of West Ryde
7. To ensure that any future extension of the existing use of the land is compatible with adjacent development.

Controls

- a. New development should address Victoria Road and provide use of glazing and contrasting material to provide visual interest to the street. Development should not provide blank walls to the street.
- b. All future development should recognise the presence of the industrial precinct.
- c. Buildings and public domain will delineate entry to the Town Centre though innovative design.
- d. New buildings within the Victoria Road Enterprise Corridor Precinct are to provide a transition to adjoining low density residential areas to maintain the amenity of those adjoining residential land uses.

THIS PAGE HAS BEEN
INTENTIONALLY LEFT BLANK



City of Ryde
Civic Centre
1 Devlin Street
Ryde NSW 2112

www.ryde.nsw.gov.au

City of Ryde Development Control Plan 2014

Part: 4.4 Ryde Town Centre

Translation

ENGLISH

If you do not understand this document please come to Ryde Civic Centre, 1 Devlin Street, Ryde Monday to Friday 8.30am to 4.30pm or telephone the Telephone and Interpreting Service on 131 450 and ask an interpreter to contact the City of Ryde for you on 9952 8222.

ARABIC

إننا نعتذر عليك فهم محتويات هذه الوثيقة، نرجو للحضور إلى مركز بلدية رايد Ryde Civic Centre على العنوان: 1 Devlin Street, Ryde 1 من الاثنين إلى الجمعة بين الساعة 8.30 صباحاً والساعة 4.30 بعد الظهر أو الاتصال بمكتب خدمات الترجمة على الرقم 131 450 لكي تطلب من أحد المترجمين الاتصال بمجلس مدينة رايد، على الرقم 9952 8222، نيابة عنك.

ARMENIAN

Եթէ այս գրութիւնը չէ՞ք հասկնար, խնդրեմ եկէ՛ք՝ Բայր Սիվիլ Ենթըր, 1 Տելվին փողոց, Բայր, (Ryde Civic Centre, 1 Devlin Street, Ryde) Երկուշաբթիէն Ուրբաթ կ.ա. ժամը 8.30 – կ.ե. ժամը 4.30, կամ հեռաձայնեցէ՛ք Հեռաձայնի եւ Թարգմանութեան Սպասարկութեան՝ 131 450, եւ խնդրեցէ՛ք որ թարգմանիչ մը Բայր Քաղաքապետարանին հետ կապ հաստատուէ ձեզի համար, հեռաձայնելով՝ 9952 8222 թիվի:

CHINESE

如果您看不懂本文，請在周一至周五上午 8 時 30 分至下午 4 時 30 分前往 Ryde 市政中心詢問 (Ryde Civic Centre, 地址: 1 Devlin Street, Ryde)。你也可以打電話至電話傳譯服務中心，電話號碼是: 131 450。接通後你可以要求一位傳譯員為你打如下電話和 Ryde 市政廳聯繫，電話是: 9952 8222。

FARSI

اگر این مدرک را نمی فهمید لطفاً از 8.30 صبح تا 4.30 بعد از ظهر دوشنبه تا جمعه به مرکز شهرداری رايد، Ryde Civic Centre, 1 Devlin Street, Ryde مراجعه کنید یا به سرویس مترجم تلفنی، شماره 131 450 تلفن بزنید و از یک مترجم بخواهید که از طرف شما با شهرداری رايد شماره 9952 8222 تلفن بزند.

ITALIAN

Se non capite il presente documento, siete pregati di rivolgervi al Ryde Civic Centre al n. 1 di Devlin Street, Ryde, dalle 8.30 alle 16.30, dal lunedì al venerdì; oppure potete chiamare il Telephone Translating and Interpreting Service al 131 450 e chiedere all'interprete di contattare a vostro nome il Municipio di Ryde presso il 9952 8222.

KOREAN

이 문서가 무슨 의미인지 모르실 경우에는 1 Devlin Street, Ryde 에 있는 Ryde Civic Centre 로 오시거나 (월 – 금, 오전 8:30 – 오후 4:30), 전화 131 450 번으로 전화 통역 서비스에 연락하셔서 통역사에게 여러분 대신 Ryde 시청에 전화 9952 8222 번으로 연락을 부탁드립니다.

Amend. No.	Date approved	Effective date	Subject of amendment

Table of Contents

CONTENTS

1.0 INTRODUCTION	6
1.1 The Purpose of this Part	6
1.2 The Land affected by this Part	6
1.3 Relationship of this Part to other Plans	7
1.4 Interpretation	7
1.5 The Structure of this Part	7
1.6 How to use this Part	7
2.0 OBJECTIVES	8
2.1 Vision	8
2.2 Planning Principles for Ryde Town Centre	8
2.3 The Objectives of this Part	9
3.0 PUBLIC DOMAIN	12
3.1 Pedestrian Access + Through Site Links	12
3.2 Environmental Management and the Public Domain	14
3.3 Active Frontage	14
3.4 Awnings + Entry Canopies	16
3.5 Access and the Public Domain	16
3.6 Signage	17
3.7 Public Domain Finishes and Elements	17
3.8 Landscaping and Street Trees	18
3.9 Public Art	18
3.10 Hoardings	19
4.0 ARCHITECTURE AND URBAN FORM	20
4.1 Building Height	20
4.2 Setbacks and Build-to Lines	23
4.3 Building Depth	25
4.4 Architectural and Design Quality	25
4.5 Streetscape Buildings and Elements	26
5.0 HERITAGE	28
5.1 Understanding Heritage Significance	28
5.2 New Development and Heritage	29

Table of Contents

5.3	The Setting	30
5.4	Interpretation and Records	30
6.0	SUSTAINABLE DEVELOPMENT	31
6.1	Environmental Management	31
6.2	Water Management	32
6.3	Waste Management	32
6.4	Stormwater Management	33
6.5	Alternatives to Private Vehicle Transport	33
7.0	RESIDENTIAL AMENITY	34
7.1	Residential Private Open Space	34
7.2	Solar Access and Sun Shading	36
7.3	Visual Privacy	37
7.4	Acoustic Privacy	37
7.5	Buildings facing Devlin St, Lane Cove Rd, Blaxland Rd and Victoria Rd	38
7.6	Housing Choice	39
8.0	PRECINCTS	40
8.1	Precinct 1- Civic/Mixed Use	42
8.1.2	Future Character	43
8.1.3	General Precinct Provisions	45
8.1.4	Landscape and Public Domain Character	46
8.1.5	Precinct Access and Circulation	47
8.1.6	Site A	49
8.1.7	Site B	58
8.1.8	Development Application Requirements	60
8.2	Precinct 2 - Town Core	61
8.2.1	Future Character	62
8.3	Precinct 3 - Main Street	67
8.3.1	Future Character	68
8.3.2	Retail Development In Precinct 3	71
8.3.3	Argyle Street	71
8.4	Precinct 4 - Residential	72
8.4.1	Future Character	72
8.5	Precinct 5 - Heritage	72
8.5.1	Future Character	73

Table of Contents

8.6	Commercial Edge Precincts	74
8.6.1	Precinct 6 - Commercial Edge North	75
	Future Character	75
8.6.2	Precinct 7- Commercial Edge West	76
	Future Character	76
8.6.3	Precinct 8 - Commercial Edge East	77
	Future Character	77
8.9	Precinct 9 - Ryde Park	79
8.9.1	Future Character	79
8.10	Precinct 10 - Low Density Residential	79
8.10.1	Future Character	79
8.11	Precinct 11 - Ryde School	80
8.11.1	Future Character	80
8.12	Precinct 12	80
8.12.1	Commercial Edge South	80

1.0 INTRODUCTION

This Part will facilitate the revitalisation of Ryde Town Centre as a vibrant, attractive and safe urban environment with a diverse mix of retail, commercial, and leisure opportunities.

This Part should be read in conjunction with other City of Ryde Planning Policies and Development Standards.

1.1 The Purpose of this Part

This Part will facilitate the revitalisation of Ryde Town Centre as a vibrant, attractive and safe urban environment with a diverse mix of retail, commercial, residential and leisure opportunities.

1.2 The Land affected by this Part

This Part applies to land defined in Ryde Local Environment Plan (LEP) 2014 Centres Map as Ryde Town Centre and in the drawing entitled Ryde Town Centre: Extent as shown on the next page (Figure 4.4.01).



Figure 4.4.01 Ryde Town Centre Extent

1.3 Relationship of this Part to other Plans

This Part supplements and gives guidance to the controls and objectives of *Ryde LEP 2014*. It is also part of a series of plans promoting the revitalisation of Ryde's business centres and should be read in conjunction with other relevant Council plans and policies, including but not limited to:

- *Section 94 Development Contributions Plan 2007*
- *Adopted Top Ryde Town Centre LEP Traffic Assessment Report 2005*
- *Ryde Town Centre Public Domain Plan, 2005*

This Part should also be considered in conjunction with the State Environmental Planning Policies (SEPP) including SEPP 65, Design Quality for Residential Flat Buildings.

1.4 Interpretation

In this Part, terms have the same meaning as in the *Environmental Planning and Assessment Act 1979* (as amended) and the *Ryde Local Environmental Plan 2014*. If there is an inconsistency between this plan and other codes or policies this Part shall prevail.

1.5 The Structure of this Part

This Part identifies objectives and controls that will shape the future development of Ryde Town Centre to create an attractive, accessible and unique urban environment in which to live, work, shop, and visit. It will build on the historic role of Ryde Town Centre as the civic heart and retail hub for the City of Ryde.

The controls indicate how the objectives are to be implemented.

1.6 How to use this Part

1. If your land is affected by this Part you will need to also consider the Controls of the *Ryde Local Environmental Plan 2014* (*Ryde LEP 2014*) and other relevant planning documents and policies in any development application submitted to Council. Council's plans and policies may be viewed at the Civic Centre, Devlin Street, Ryde or on Council's website: www.ryde.nsw.gov.au.
2. *Ryde Local Environmental Plan 2014* defines permissible land uses and heights.
3. This Part establishes detailed development principles for land use management, parking, built form, environmentally sensitive design and the public domain in Ryde Town Centre. It is important that these elements are considered as an integrated whole and to understand that no single element is necessarily more significant than another when preparing a design solution for a site.
4. Appropriately qualified professionals should be engaged to prepare a DA submission.
5. Applicants should take advantage of Council's pre-lodgment service prior to submitting a Development Application. Enquiries may be directed to Council's Customer Service Centre.
6. For information to assist in submitting a DA, see Council's website at www.ryde.nsw.gov.au.

2.0 OBJECTIVES

This Part is one of a number of planning initiatives undertaken by Ryde Council to revitalise established urban centres within the City of Ryde. The vision for each centre is to create a unique character arising from its natural and built features, history and community expectations.

The objectives of this Part are to promote Council's vision for Ryde Town Centre.

2.1 Vision

Ryde Town Centre will be an attractive place to live, work and visit. The future character of Ryde Town Centre will build on its historic role as a community and retail hub catering for leisure and learning, shopping and business.

This Part identifies strategies and controls that will shape the future development of Ryde Town Centre to create an attractive, accessible and unique environment in which to live, work, shop, and visit. High quality built form will define and edge public spaces.

2.2 Planning Principles for Ryde Town Centre

The planning principles for Ryde Town centre are:

1. Regional role
 - a. Development within the Ryde Town Centre is to contribute to the status of the land as an important retail, business, employment, recreational, entertainment, civic and residential centre.
2. Sustainable planning and development
 - a. Development is to minimise energy, water and materials use and resultant pollutants (such as greenhouse gases, stormwater liquid and solid waste) during construction and life cycle of the development.
 - b. Planning and development is to ensure that social, economic and environmental issues are considered together and with proper regard for their mutual cumulative impacts.
 - c. Development is to enhance employment, recreation and residential opportunities, and encourage adaptable living environments, in the Ryde Town Centre.
 - d. The comprehensive redevelopment of Precinct 2 (the Town Core Precinct), as identified on the Ryde LEP 2014: Ryde Town Centre Precincts Map is to include a mix of residential, recreation, civic and commercial development and contribute to the revitalisation of the Ryde Town Centre.
 - e. Residential development (with the exception of Precincts 9, 10, and 11 as identified on the Ryde LEP 2014: Ryde Town Centre Precincts Map is to provide a variety of housing (including affordable housing) to accommodate a range of income groups and increase housing choice.

3. Public domain
 - a. All planning, design and development activities must take account of and effectively respond to the linkages and interfaces between public space and private land and create a high quality physical setting for buildings.
 - b. Development is to create a safe and accessible public domain that will be enjoyed by shoppers, residents, workers and visitors. Active uses are to be located along pedestrian thoroughfares and streets.
 - c. Development of the public domain is to facilitate pedestrian movement and cycling between precincts within the Ryde Town Centre and surrounding areas.
 - d. Public streets and public domain spaces are to be created in accordance with relevant Council policies and plans.
4. Urban form
 - a. Development is to demonstrate design quality and respond appropriately to the landmark qualities of the ridgeline, gateway locations and to places of heritage significance within Ryde Town Centre.
 - b. Urban form, including public domain enhancements, land use, height and appropriate built form, are to contribute to an individual identity for each precinct identified on the Ryde LEP 2014: Ryde Town Centre Precincts map.
 - c. Development is to provide a transition between the Town Centre and adjoining residential areas with complementary land-uses and the scale and massing of built form.
5. Transport and access
 - a. Development is to promote a compact working and living environment to maximize the efficient use of resources and infrastructure provisions.
 - b. The safety, amenity and convenience of pedestrians and cyclists is to be considered in all development.
 - c. Public transport use will be promoted by the provision of facilities for users.

2.3 The Objectives of this Part

Objectives

1. **To reinforce Ryde Town Centre as an important cultural, civic, commercial, retail, employment, education, residential and recreation location**
 - a. Revitalise Ryde Town Centre as a retail and government service centre meeting the needs of local communities.
 - b. Develop a mixed-use centre with a wide range of housing, employment and recreation opportunities.
 - c. Create sustainable employment opportunities that are compatible with shopping, living and recreation environments.
 - d. Create residential development that contributes to village life with increased activity at the weekends and in the evenings.
 - e. Enrich the neighbourhood by accommodating a diverse population in a wide range of housing types.

2. To enhance the civic qualities of Ryde Town Centre

- a. Develop new high quality, sustainable public buildings and public domain spaces and improve the existing public domain.
- b. Integrate Ryde Park into the Town Centre as a significant heritage, recreation, leisure and community resource.
- c. Develop community facilities that are readily accessible and encourage participation.
- d. Enhance and increase the physical and visual prominence of the Civic/Mixed Use Precinct.

3. To create an attractive, safe, convenient and well-used pedestrian environment and public domain

- a. Create a high quality public domain that is safe and accessible for all, during and outside business hours.
- b. Improve pedestrian connections within Ryde Town Centre, Ryde Park and surrounding areas.
- c. Ensure positive interfaces between public space and private development.
- d. Enrich the public domain with public art that interprets local history, culture and social identity.
- e. Develop a high quality public domain with durable and attractive finishes, furniture, lighting, public art, information and directional signage.

4. To develop a high quality urban centre

- a. Reinforce the legibility of the town centre street pattern comprising primarily Blaxland Road, Church and Tucker Streets.
- b. Create a compact living and work environment to promote walking and the efficient use of public resources including public transport, schools and parks.
- c. Enhance and extend the public domain as an amenity for all.
- d. Protect sun access to significant public domain spaces.
- e. Ensure that all development addresses the public domain and street frontages.
- f. Protect streetscapes and the pedestrian environment from adverse impacts of site servicing, garage doors, driveways and loading docks.
- g. Protect and conserve heritage resources.
- h. Identify existing assets (including landscapes, trees, exemplary built form and public art) that contribute positively to the urban environment and ensure their retention and enhancement.
- i. Create eleven distinctive precincts, each with an individual identity drawn from its history, natural and built features, community needs and expectations.

5. To develop high quality built form

- a. Give detailed guidance to development standards.
- b. Ensure well-designed buildings constructed of durable and attractive materials.
- c. Protect and enhance the integrity of heritage items and encourage their interpretation, adaptation and sympathetic reuse.
- d. Ensure development is flexible and durable and able to accommodate a range of uses over time.
- e. Create distinctive precincts within the Town Centre each with a unique identity drawn from its history, natural and built features, community needs and expectations.

6. To develop a sustainable town centre that balances social, economic and environmental objectives

- a. Encourage efficient and appropriate land-use.
- b. Revitalise Ryde Town Centre with economically sustainable civic, commercial, retail and residential development.
- c. Intensify land-use to better utilise public transport and other public infrastructure.
- d. Improve facilities for public transport use, walking and cycling.
- e. Improve access and reduce the impacts of traffic congestion in Ryde Town Centre
- f. Develop public domain spaces and community facilities that support social interaction and community life.
- g. Ensure personal safety and security in the public domain.
- h. Develop sustainable buildings that are robust and adaptable to a variety of uses over time
- i. Develop environmentally sustainable shopping, living and working environments that conserve resources and:
 - Minimise long term energy and water consumption;
 - Protect and improve water and air quality;
 - Minimise waste production and encourage materials recycling and reuse; and
 - Integrate environmental management.

3.0 PUBLIC DOMAIN

A quality public domain attracts visitors, residents and investors. It contributes to an area's economic sustainability and livability. It is characterised by a safe, convenient and equitable pedestrian network. It provides opportunities for social and cultural interaction in a range of spaces from intimately scaled courtyards to grand civic plazas.

A quality public domain is flexible, attractive, functional, durable and robust.

3.1 Pedestrian Access + Through Site Links

The need for efficient, safe pedestrian routes throughout the Town Centre is important for its future success.

Objectives

1. To provide accessible, direct and safe pedestrian links on public and private property.
2. To establish a vibrant, safe and attractive public domain activated by diverse land uses, services and facilities.
3. To create a public domain that is well-used by residents, workers and visitors to Ryde Town Centre.

Controls

- a. Provide pedestrian through-site routes and public domain areas in accordance with the Public Domain Control Drawing opposite. (Figure 4.4.02)
- b. Pedestrian through-site routes must be:
 - i. Direct, without concealment opportunities and designed to provide clear sightlines from one end to the other;
 - ii. A minimum of 3 m wide, unless otherwise specified in Ryde LEP 2014 or this Part;
 - iii. Designed to consider pedestrian safety and the security of adjacent businesses;
 - iv. Activated by retail, civic and / or commercial land-uses;
 - v. Naturally lit and ventilated;
 - vi. Well lit at night;
 - vii. Publicly accessible between at least 7 am and 7 pm daily, however 24 hour public access is preferred;
 - viii. Accessible to all and designed to provide barrier free access;
 - ix. Have regard to Safer-by-Design Principles; and
 - x. Courtyards, plazas or squares should be provided to complement pedestrian through-site routes.

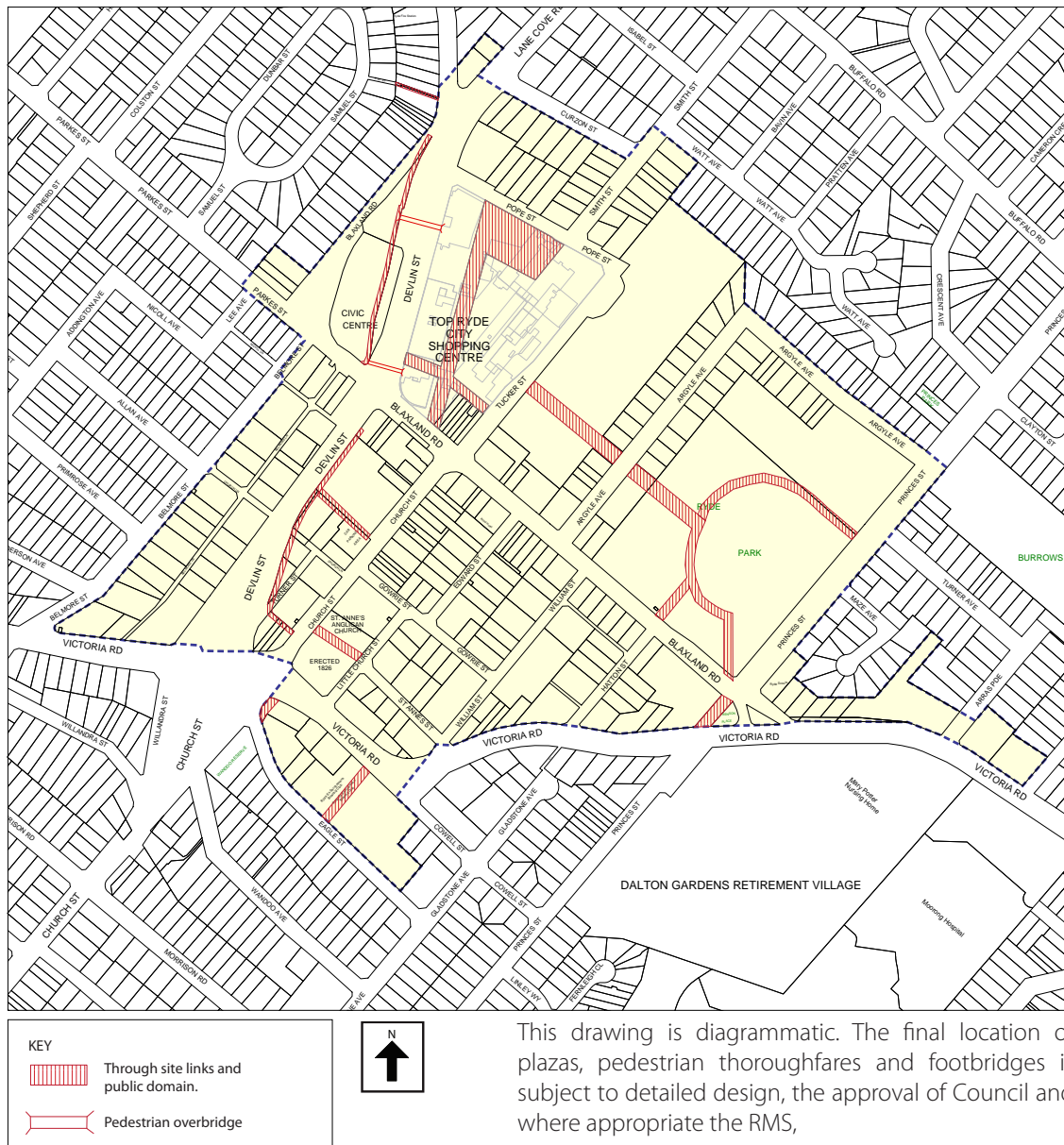


Figure 4.4.02 Public Domain Control Drawing

Note: Public domain areas are publicly accessible plazas, squares, courtyards and the like. They may be in public or private ownership.

3.2 Environmental Management and the Public Domain

Objectives

1. To protect solar access to public domain and open spaces whether publicly or privately owned.
2. To protect and enhance the amenity of public domain spaces whether publicly or privately owned.

Controls

- a. Provide solar access to no less than 80% of the ground plane for at least 2 hours between 10 am and 2 pm on June 21 (exclusive of shadows cast by trees) to the following public domain areas:
 - i. School playgrounds.
 - ii. Landscaped grounds of heritage items.
 - iii. Ryde Park including bowling greens.
 - iv. Public Open Spaces in the area identified in the Public Domain Control Drawing. (Figure 4.4.02)
- b. Building design is to minimise adverse wind effects on public open spaces. The orientation, height and form of development are to be designed to promote public safety and comfort at ground level. Awnings and galleria are to be provided, if necessary, for pedestrian comfort. Council may require an assessment of wind impacts and a statement of commitment regarding proposed wind mitigation measures.
- c. Building design should ensure that summer breezes are not blocked to private open space, such as courtyards and balconies, as well as to the public domain.

3.3 Active Frontage

Objectives

1. To enhance personal safety and security within the Ryde Town Centre.

Controls

- a. Provide ground level active uses where indicated on the Active Frontage and Awnings Control Drawing. (Figure 4.4.03)
- b. Active uses contribute to personal safety in the public domain and comprise:
 - i. Community and civic facilities.
 - ii. Recreation and leisure facilities.
 - iii. Shops.
 - iv. Commercial premises
 - v. Residential uses, particularly entries and foyers. However, these should not occupy more than 20% of the total length of each street frontage.
- c. Where required, active uses must comprise the street frontage for a depth of at least 10 m.
- d. Vehicle access points may be permitted where active frontage is required if there are no practicable alternatives.

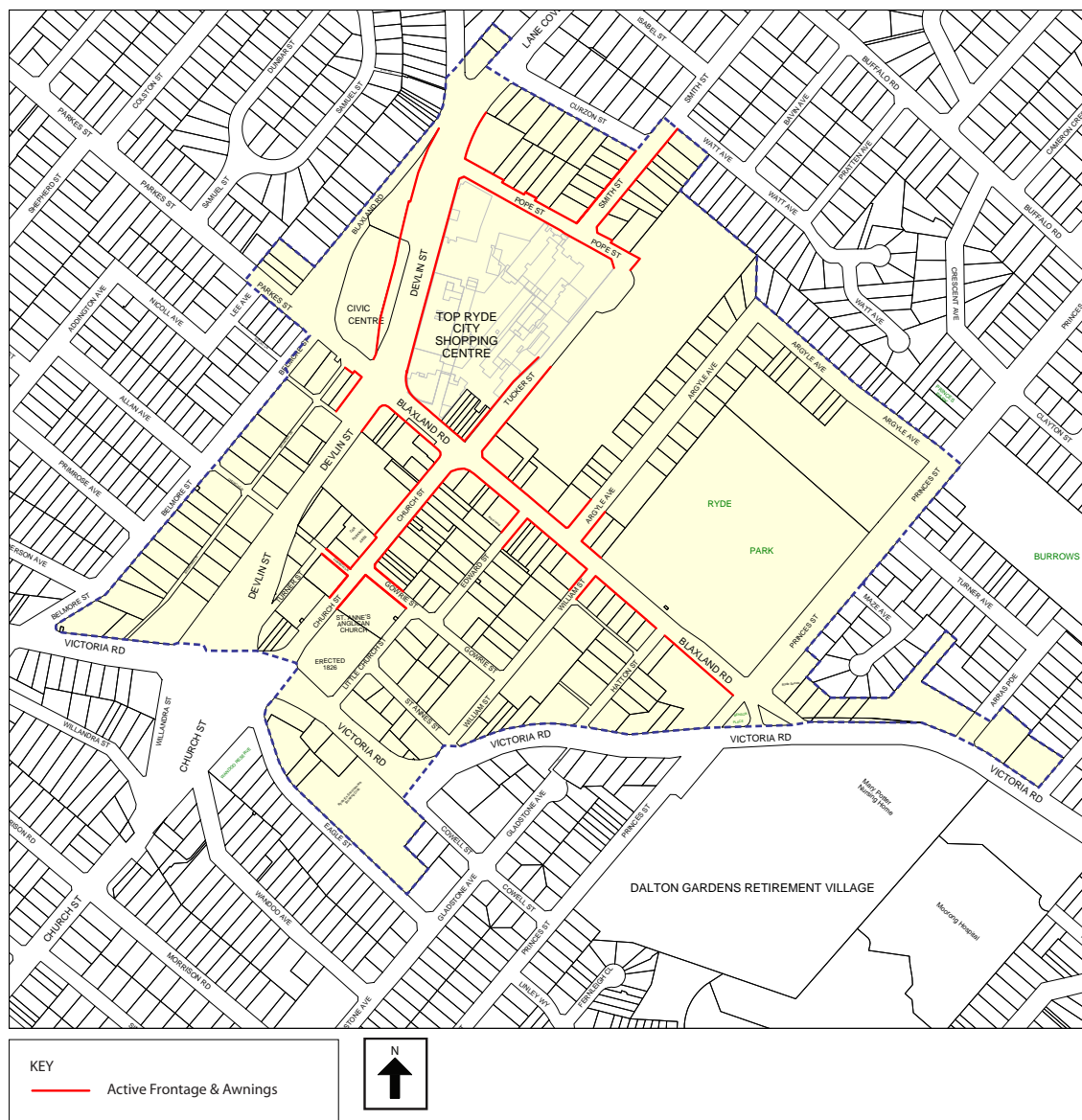


Figure 4.4.03 Active Frontage and Awnings Control Drawing

- e. Blank roller- shutter type doors are not permitted on ground level shop fronts.
- f. Serviced apartments hotels and motels shall not have apartments at the ground level. Locate retail, restaurants and / or other active uses at the ground level.

3.4 Awnings + Entry Canopies

Objectives

1. To unify the streetscape.
2. To contribute to pedestrian amenity (all-weather protection), safety and security (lighting).

Controls

- a. Provide continuous awnings as indicated in Active Frontage and Awnings Control Drawing (Figure 4.4.03).
- b. Awning soffit height is to be a minimum of 3 m awnings are to be set back 600 mm from the kerb edge. The heights of adjoining awnings should be considered.
- c. Design awnings to protect pedestrians from sun and rain. Glazed awnings will not be permitted where awnings are required unless it can be demonstrated that:
 - i. A cleaning and maintenance regime will be established; and
 - ii. Solar protection (shade) can be achieved; and
 - iii. Lighting will be installed to the underside of the awning that will light the footpath.
- d. Provide lighting, preferably recessed, to the underside of awnings, sufficient to ensure a high level of safety and security for pedestrians at night.
- e. Vertical canvas drop blinds may be used along the outer edge of awnings. Drop blinds may not carry advertising signage but may carry business identification signage.
- f. Where the street or ground level is sloped, awnings should step down the hill.

Note: Awnings are required along all Active Frontages

3.5 Access and the Public Domain

Public domain spaces within the Town Centre need to be designed and sited so that the areas are safe at all times for all pedestrians and cyclists and that they are accessible to all.

Objectives

1. To reduce vehicular conflicts through good design of building entrances, reducing footpath cross-overs, introducing rear lanes and the like.
2. To clearly differentiate uses and separate conflicting uses.
3. To use appropriate lighting levels.
4. To encourage 'safe' pedestrian access and mobility.

Controls

- a. If required by Council, footpath improvements in accordance with the Ryde Town Centre Public Domain Plan are to be implemented by the developer.
- b. All development must comply with Australian Standard 1428 and Part 9.2 Access for People with Disability under this DCP.
- c. Barrier free access must be provided to the common areas of all buildings and public domain areas.

- d. Adequate parking and safe convenient access to buildings for people with disabilities must be provided.
- e. To provide active frontage and quality building design, vehicular access ramps must be screened from view, contained wholly within buildings and may not ramp along street boundary alignments except in Devlin Street and by approval of Council and the RMS.
- f. Minimise the size, quantity and visual intrusion of vehicle access points. The preferred width of vehicle access points is 3 m however, up to 6 m may be permitted. Greater widths for car parking access may be approved, if it can be demonstrated that the greater width is necessary and that pedestrian safety is not compromised.
- g. Vehicular traffic must be separated from pedestrians and vehicular access points clearly identified with paving, signage and the like.
- h. Loading docks must be located so that vehicles do not stand on any public road, footway, laneway or service road and vehicles entering and leaving the site move in a forward direction.
- i. Parking should be well lit, easily accessible and screened from view to maintain the attractiveness of the streetscape.

Note: Reference to the provision of laneway access in LEP 2014 height and floor space incentive clauses means:

(1) the provision of a new laneway in a location required by Council to achieve public benefit

(2) the provision of laneway widening of an existing laneway in a location required by Council to achieve public benefit

3.6 Signage

All signage is to be in accordance with Part 9.1 Signage of this DCP.

3.7 Public Domain Finishes and Elements

The aim is to create visual unity in the design and appearance of public spaces in the Centre and to provide comfort and convenience for pedestrians.

Objectives

1. To provide for the amenity of pedestrians.
2. To ensure that street furniture is of a design and style that is consistent throughout the Centre.
3. To establish an identity for Ryde Town Centre.

Controls

- a. Provide paving in accordance with the Ryde Town Centre Public Domain Plan.
- b. The safety of pedestrians is to be given priority over vehicular traffic.
- c. Developers must provide for public domain embellishment, including paving, lighting, signage and street furniture in accordance with Ryde Town Centre Public Domain Plan and relevant Council policies and specifications at their own cost for all new developments and for additions or alterations to an existing development of 500 sqm or greater.

3.8 Landscaping and Street Trees

The aim is to increase amenity and biodiversity levels in the Centre. Street trees improve the liveability of an area is microclimate by providing summer shade and helping to cool summer breezes.

Objectives

1. To improve the microclimate.
2. To create attractive public spaces and walkways.

Controls

- a. Street trees and other planting shall be provided in accordance with the Ryde Town Centre Public Domain Plan and their health guaranteed for a minimum of 2 years.
- b. Ground level entry areas should be well lit and unobstructed by plantings to minimise risk to personal safety.

3.9 Public Art

Public art may be small and intimately scaled or monumental. It may be produced from a variety of media such as metal, concrete and light and an integral part of useful structures such as pedestrian bridges, seating, bollards and lighting. It may also be ephemeral such as banners celebrating cultural events like Chinese New Year. Public art adds interest to the public domain and contributes to the character of an area. Successful public art helps create a sense of place and is an expression of public memory and identity.

Objectives

1. To establish a unique identity for Ryde Town Centre.
2. To create a sense of place that relies on strong relationships with local communities history and expectations.

Controls

- a. Public art must be included in all new developments of \$5 million dollars or greater.
- b. A site specific Arts and Cultural Plan is to be submitted together with the development application. The Arts and Cultural Plan should be prepared by an arts and cultural planner and should address the following:
 - i. Identify opportunities for the integration of public art in the development;
 - ii. Identify themes for public art that are informed by the site history and local community issues including environmental sustainability;
 - iii. Be inclusive of communities catering for the elderly, youth, children, mothers and minority groups;
 - iv. Durability, robustness and longevity; and
 - v. Demonstrate how public art is incorporated in the site and built form design.
- c. Public art shall be located in publicly accessible areas of new development such as foyers, building exteriors, rooftops, adjoining footpaths and the like.
- d. To the greatest extent possible public art should have a dual purpose. For example public art may include lighting that contributes to luminance levels in the public domain and hence public safety. Public art may also include paving and street furniture such as seating, safety barriers and water features.

- e. Public art may be required as part of an Interpretation Plan for heritage and archaeological resources.

Note: The production and installation of a public artwork should not commence prior to approval of the Arts and Cultural Plan.

3.10 Hoardings

Objectives

1. To achieve high standards for the construction and maintenance of hoardings in Ryde Town Centre.
2. To improve standards of design and finish and promote high quality urban environment.

Controls

- a. For any development in Ryde Town Centre hoardings must include the following (unless duration of construction is to be less than 12 weeks):
 - i. Coordinated graphics that may form part of the public art program for the site;
 - ii. Project consultant information in one location;
 - iii. Required safety signage; and
 - iv. Solid panels in preference to open mesh and fencing.
- b. Traffic and Pedestrian Plan of Management is required for the hoarding, construction or demolition phase.

Note: Consultation with government authorities, including the RMS is the responsibility of the applicant.

4.0 ARCHITECTURE AND URBAN FORM

The aim of this Part is to create a town centre with a diverse range of public spaces from significant plazas and streets to intimately scaled lanes and courtyards catering for leisure and learning, shopping and business. High quality built form will define and edge public spaces. The Architecture and Urban Form Controls aim to create an appropriate relationship between landform, built form and public space by defining building heights, setbacks architectural qualities and forms. The Controls integrate environmentally sensitive design and consider public amenity including sun access to public space.

4.1 Building Height

Development within Ryde Town Centre is of a scale and character that promotes an attractive and sustainable urban environment.

Objectives

1. To attract investment, new employment opportunities and enhance economic sustainability.
2. To promote an urban scale in retail, civic and business precincts.
3. To promote opportunities for landmark development in appropriate locations.
4. To enhance the existing streetscape and ensure appropriate development scale in predominantly residential and heritage precincts.
5. To ensure adequate sunlight is available for all buildings, streets and public open space.

Controls

- a. Buildings must comply with the maximum heights described in *Ryde LEP 2014 - Height of Buildings Map*.
- b. Height Planes A, B, C and D apply where indicated on the Building Height Control Drawing in this plan (Figure 4.4.05).
- c. Building Height Plane described in Figure 4.4.22 shall apply to the required through site thoroughfare in Precinct 2 and defines the relationship of built form to the public domain.

Note: For Height planes, generally refer also to Figure 4.4.06.

- d. Floor to ceiling height must be a minimum of 2.7 m for residential uses.
- e. To ensure that ground floor levels are adaptable over time for a wide range of uses, the floor to ceiling height shall be a minimum of 3.5 m clear for the ground floor and street levels in all development, regardless of uses, in the B4 Mixed Use – land-use zone except for Precinct 4.

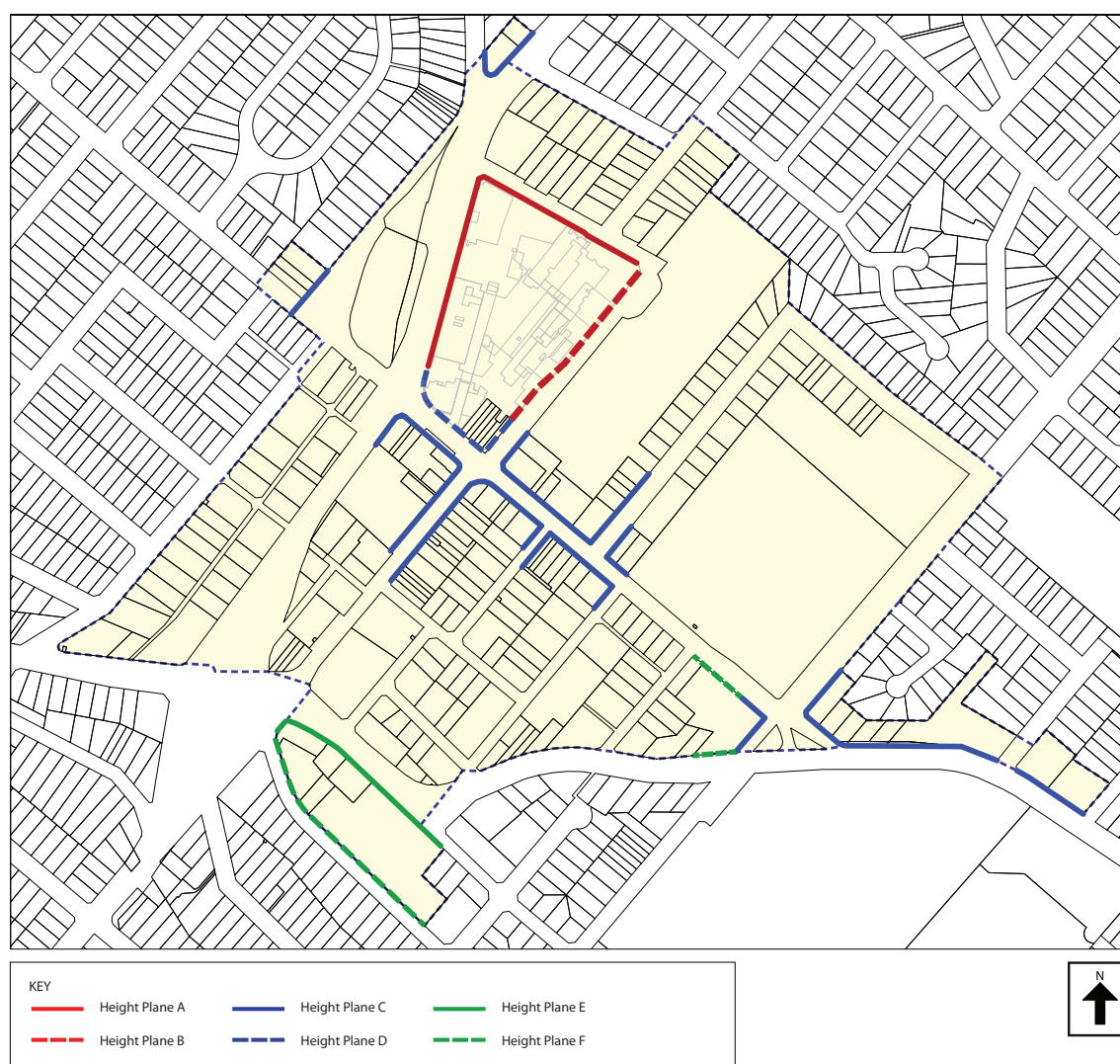


Figure 4.4.05 Street Edge Height Control Drawing for Ryde Town Centre

HEIGHT PLANE EXPLANATORY NOTES FOR FIGURE 4.4.06

The height planes are intended as a guide to built form. They may be varied if it can be demonstrated that solar access to publicly accessible space is enhanced or better “infill” design is achieved. Infill design may be guided by NSW Heritage Office guidelines.

Building Alignment is defined by the setback in the Setbacks and Build-to Lines Control Drawing.

Architectural Design Zone – The zone in which built form articulation and modulation is encouraged to achieve design excellence and passive solar control. Integrated design elements such as sun-shading, balconies, planter boxes and public art may be used to achieve articulation and modulation.

Environmental Design Zone – Setbacks above street level will be determined by Council after taking into consideration the environmental impact including solar access to Tucker Street and to school playgrounds and the design quality. Refer also Controls 4.2, 4.3 and 4.4 of this Part.

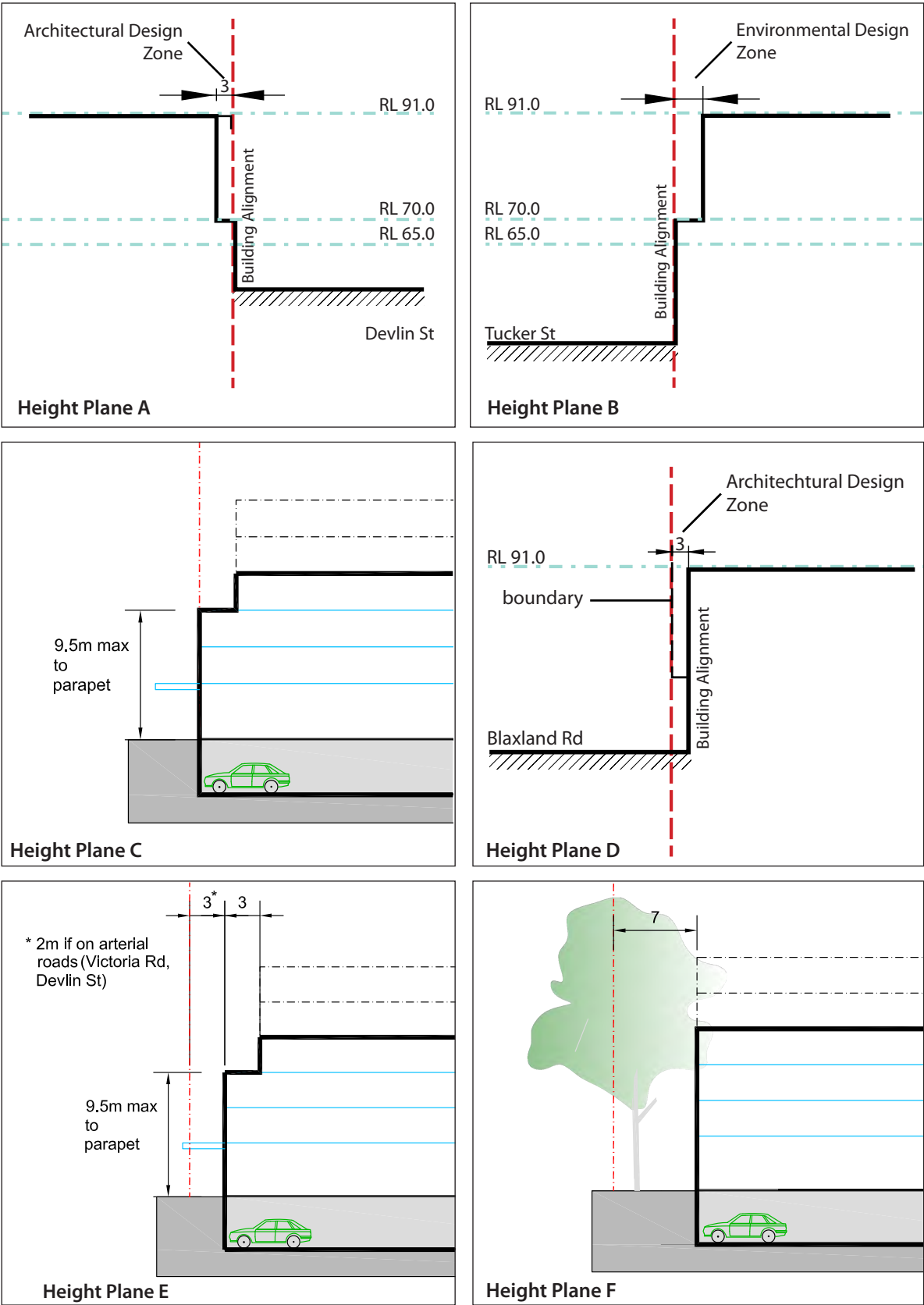


Figure 4.4.06 Height Control Planes

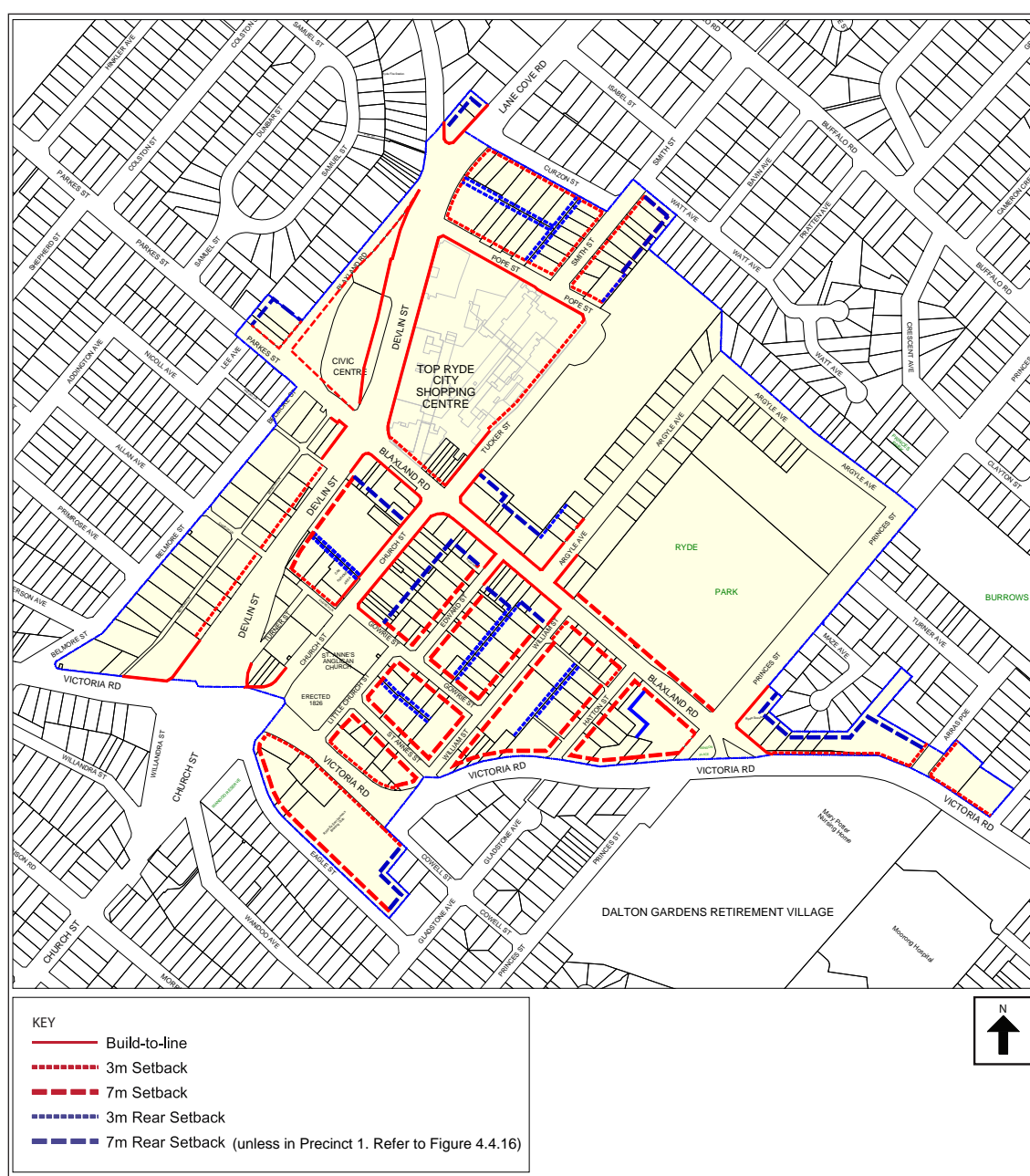


Figure 4.4.07 Setbacks and Build-to Lines Control Drawing

4.2 Setbacks and Build-to Lines

Front setbacks give streets and public squares physical definition and control the relationships of buildings to each other. The front setbacks defined in this Part will reflect and reinforce the character of each precinct within Ryde Town Centre and establish points-of-difference for each area. Business and retail areas are to be built to the street frontage to reinforce and promote a positive urban character and personal safety and security, while development in residential and heritage precincts is to be setback from the street in landscaped grounds. Rear and side setbacks control the relationships of buildings to each other and provide visual and acoustic privacy. Upper level setbacks reduce the visual bulk and scale of buildings; promote an interesting skyline and access to sunlight and fresh air.

Objectives

1. To establish an individual identity for each precinct and influence street character.
2. To integrate Safer-by-Design principles into the design of the public domain and built form.
3. To effect positive relationships between buildings.
4. To create an interesting skyline.
5. To promote sunlight access to the public domain and buildings.

Controls

- a. Building setbacks at the ground level must comply with the Setbacks Control Drawings Figure 4.4.07 and Figure 4.4.17.
- b. Develop built forms that are appropriate to the land use and setback requirements including row or street-wall buildings having continuous active uses at the ground level street frontage where the Zero Build-to-Line is specified.
- c. Ground level architectural features such as recessed doors and windows are permitted to a maximum of 400 mm from the Zero Build-to-Line to design out concealment opportunities and promote personal safety and security.
- d. Setbacks in Tucker Street may be varied provided that the following considerations are addressed to the satisfaction of Council:
 - i. Pedestrian Safety (including potential conflicts between pedestrians and vehicles at driveway crossings).
 - ii. Arrangements for drop-off and collection of children attending Ryde Public School and child care centres and children moving to and from Precinct 2.
 - iii. Traffic Management.
 - iv. Acoustic isolation between the public domain and loading docks, ramps, parking areas and the like.
 - v. Overshadowing and environmental impacts that affect amenity of the public domain.
 - vi. Design Quality including premium quality external façades. The Design Quality Plan shall demonstrate how this is achieved.

4.3 Building Depth

Objectives

1. To promote sustainable built form.
2. To improve the amenity of buildings for users.

Controls

- a. All occupied points on a commercial floor shall be no more than 15 m from a source of daylight. The preferred maximum depth of office buildings with openings on one side is 15 m. The preferred maximum depth of office buildings with openings on two or more sides is 30 m.
- b. Maximise daylight to public spaces in retail uses, including particularly arcades, circulation spaces, food courts and the like. Design devices such as atria and light wells are to be provided.
- c. Maximise natural ventilation in retail and commercial uses by incorporating where possible stack ventilation, openable windows, open air circulation spaces and courtyards.
- d. Achieve natural ventilation in residential buildings by having window openings in opposite directions and walls where possible.
- e. The maximum overall depth of residential buildings is 18 m unless design excellence can be demonstrated and natural ventilation is achieved.

4.4 Architectural and Design Quality

Elements such as windows, balconies and parapets contribute to a building's character, appearance and style, while the height and width are factors of the massing and scale of built form. For larger sites it will be necessary to consider the site in a holistic way. The site layout and the way built form relates to the context are important.

Objectives

1. To emphasise the landmark and civic qualities of Ryde Town Centre.
2. To ensure new buildings contribute positively to the urban character.
3. To ensure appropriate scale and amenity levels, such as sun access.
4. To ensure high quality built forms of a high quality that successfully integrate environmental sustainability with architectural design.
5. To place new development into the urban framework of the centre.
6. To contribute to the interest on the skyline and landmark potential of the ridgeline.
7. To protect the significance of heritage items and contributory buildings.

Controls

- a. Development on corners must address all street frontages. Entries, windows and other architectural elements should be placed to reinforce the corner.
- b. Provide building articulation elements including awnings, verandahs, decks, loggias, pergolas, bay windows and recessed doors.
- c. Windows and entries shall be placed to overlook public spaces and streets to provide surveillance opportunities.
- d. Balconies may not be continuous along the whole length of building façades.

- e. Provide solar protection, including awnings, recessed windows, roof overhangs, external shutters and screens to the western and northern elevations of buildings.
- f. Development should protect the existing level of amenity of adjacent development as well as for all users of the site.
- g. Where sites are amalgamated or existing large sites, express the existing or prevalent Ryde Town Centre lot structure in the design of new buildings. For example the width of shop-fronts and residential units should reflect the historic Ryde lot structure of Blaxland Rd and Church St.
- h. The material quality of all buildings and structures shall be to the satisfaction of the Council. In the opinion of Council building materials, external cladding and glazing shall:
 - i. Incorporate the principles of environmentally sensitive design, including passive solar design and whole of life energy conservation,
 - ii. Be durable, robust and of premium quality,
 - iii. Be integrated with the Arts and Cultural program for the site,
 - iv. Be attractive and contribute to the material quality of the public domain.
- i. Building materials shall not result in glare that causes discomfort or threatens the safety of pedestrians or motorists. A Reflectivity Report may be required to be submitted with the Development Application.
- j. Renewable resources such as plantation timber and waste minimisation should be used.
- k. Applications for proposals that incorporate residential flats are to be accompanied by a Design Statement detailing how the proposal meets the Design Quality Principles and Rule of Thumb of the Residential Flat Design Code.
- l. Applications for new development where the site area exceeds 900 m² must include the following documents that address issues of design quality:
 - i. A site analysis drawing that considers the context of the development including but not limited to pedestrian desire lines, public transport, sunlight access, adjoining and nearby development, topography and the location of significant trees.
 - ii. A proposed site layout plan that shows the relationship of the proposal to its context including adjoining properties and the public domain
 - iii. A model at 1:500 that includes the context
 - iv. 3D computer model of the proposed development and its context
 - v. Elevations and photomontages that show the streetscape for at least the entire block
 - vi. A design statement detailing how the proposal addresses the objectives of this Part and the principles of the Residential Flat Design Code and outlining the input at the earliest stages of a professional multidisciplinary design team that includes, for example, landscape architects, arts and cultural planners, architects, environmental engineers and transport planners.
 - vii. One or more 1:20 sections through the building street façade.

4.5 Streetscape Buildings and Elements

Streetscape buildings and elements add to our understanding of the development of the area and reinforce the character of the streetscape and individual precincts. Streetscape buildings and elements may include elements such as sandstone walls and sandstone kerbs. Streetscape Items may also have architectural qualities that demonstrate the objectives promoted by this Part.

Some streetscape buildings and elements may be potential heritage items. In these cases it is important to identify the heritage significance of the place prior to making decisions about changes to the place.

Objectives

1. To ensure that layers of development history are retained and contribute to the architectural diversity and identity of each precinct.
2. To retain valued components of streetscapes and promote complementary new development.
3. To ensure that an appropriate assessment of the heritage significance of potential heritage items is undertaken at the early stages of the design process.

Controls

- a. Items identified in the table entitled "Streetscape Buildings and Elements" (Table 4.4.01) should be retained.
- b. A heritage assessment of all streetscape buildings is to be included with development application. The heritage assessment is to be made in accordance with the NSW Heritage Division guidelines and is to consider the setting of the item.
- c. A pre-lodgment meeting should be held with Council staff for all streetscape buildings.
- d. If a streetscape item is found to have heritage significance sufficient to list as a local heritage item then the heritage controls of this Part apply to the subject site.
- e. Streetscape buildings may be adapted for compatible new uses. If retention of the whole building is not practicable the street front façade shall be retained and incorporated in new development.
- f. New development adjacent to streetscape buildings should reflect the scale, massing, parapet lines, stringcourses, material qualities and fenestration patterns of the streetscape items.

STREETSCAPE BUILDINGS + ELEMENTS	BETWEEN HABITABLE ROOMS AND BALCONIES
Address	Description
96 Blaxland Road corner Church Street	Edwardian shops constructed of dark brick with contrasting stucco detail particularly at parapet
Blaxland Road	Sandstone retaining wall
Church Street	Sandstone kerb
34, 36, 38, 40 Church Street, corner Gowrie Street	Edwardian shops constructed of dark brick with contrasting brick decoration
25 and 27 Church Street, corner Church Lane	Landscaped square facing Church Lane and edged by Wesleyan Church buildings
33 and 35 Blaxland Road	Argyle Centre – interwar rendered picture theatre
68 Blaxland Road	Royal Hotel Edwardian architecture constructed of dark brick with contrasting stucco detailing
89 Blaxland Road, near corner Tucker Street	Group of native trees
128 Blaxland Road, corner Devlin Street	Former Bank of New South Wales. Constructed in Inter-war Classical style of dark brick with contrasting stucco detailing at parapet

Table 4.4.01 Streetscape Buildings + Elements

5.0 HERITAGE

The purpose of these heritage controls is to provide a general framework for the conservation of heritage significant places and items. The emphasis is on identifying and understanding the heritage significance of a place prior to making development decisions about that place. The controls are based on the *ICOMOS Burra Charter* and *NSW Heritage Division Guidelines*.

5.1 Understanding Heritage Significance

A clear understanding of the significance of a place provides the basis for decisions about changes to the place. The significance of the place may be adequately established by the heritage inventory sheet held by Council, or may require additional research and investigation. Generally, additional research and investigation will be required where the place is on the State Heritage Register, where the work is more than minor, or where Council has requested it. In some cases a Conservation Management Plan may be required.

The grading of different parts of the place according to the contribution they make to the heritage significance of the place is done as part of a Conservation Management Plan. It is important because it allows an informed decision to be made about the most appropriate areas in which to make changes. Generally the more significant the area or feature the less change will be allowed. Areas or features of little or no significance or which are intrusive can be removed.

Objectives

- 1. To ensure that an appropriate assessment of the heritage significance of the place is prepared for the purpose of guiding future changes to the place.

Controls

- a. For all heritage items provide a Statement of Heritage Impact, which includes an assessment of heritage and cultural significance, prepared in accordance with relevant NSW Heritage Division guidelines. The Statement of Heritage Impact is to consider the extent and impact of new development on heritage significance and existing fabric, the curtilage, landscape setting and significant views to and from the item.
- b. A Conservation Management Plan prepared in accordance with relevant NSW Heritage Division guidelines is to be provided if requested by the City of Ryde. The Conservation Management Plan shall include a grading of existing fabric according to its heritage significance as described in relevant Heritage Division guidelines

Note: Refer to NSW Department of Environment and Heritage for NSW Heritage Division publications.

Note: Assessments of significance, information and reports provided will be used to update Council's heritage inventory sheets and will be lodged with the Local Studies Library.

5.2 New Development and Heritage

New development is the proposed change to a place. The decision about the nature and extent of changes must be guided by an understanding of the heritage significance of the place.

Objectives

1. To retain existing heritage items.
2. To ensure that new development enhances the heritage significance and cultural values of a place.

Controls

- a. In addition to the controls of *Ryde Local Environmental Plan 2014* the following shall apply.
- b. New development shall comply with an approved Conservation Management Plan if required by the City of Ryde.
- c. Parts of the place that have been graded as having moderate, high or exceptional significance should be retained and repaired rather than replaced.
- d. New development is to be located so as to minimise adverse impacts on significant fabric.
- e. Original elements, features and structures shall be reinstated if the heritage significance of the place will be enhanced by the action.
- f. Alterations and previous work to a place shall be removed if the heritage significance will be enhanced by the action.
- g. New development is to be compatible with the existing item though readily discernible on inspection. Precise imitation is discouraged.
- h. New development shall be subservient to the existing heritage item, less eye catching and not higher than the existing structure.
- i. New work should reflect the scale, parapet lines, pitching point, stringcourses, material qualities and fenestration patterns of significant fabric.
- j. New development shall have regard to the NSW Heritage Division publication *Design in Context: Guidelines for Infill development in the Historic Environment*.
- k. New uses are to be compatible with the heritage significance of items.

5.3 The Setting

The setting of a heritage item and visual links from the item to other places need to be carefully considered as they often contribute to the significance of the place. Protecting the views and curtilage of a heritage item means that the appropriate historical and visual setting of the heritage item will be conserved.

Objectives

1. To protect the setting of heritage items by ensuring that development in the vicinity does not detract from the heritage values of that item.
2. To retain and enhance important views between heritage items and other places.

Controls

- a. New development in the vicinity of a heritage item is to be compatible with the visual character of the heritage item and its significant context or setting.
- b. If the site of a heritage item is amalgamated, the original lot structure shall be discernible in all new development and the visual curtilage retained.
- c. The natural topography and landscaped setting of the site of a heritage item is to be retained.
- d. Significant views and other visual links to and from a heritage item are to be preserved and enhanced.

5.4 Interpretation and Records

Interpretation of the heritage significance of items assists to tell the story of Ryde Town Centre and promote the area. Interpretation may include signage, a program of events or public art. As a consequence an interpretation strategy may overlap or have strong links to an Arts and Cultural Plan for the site.

Objectives

1. To enhance community understanding of local heritage.
2. To contribute to the diversity of the area.
3. To ensure that appropriate records are kept of the place and are made publicly available.

Controls

- a. Items of State and National Significance shall if required by Council, implement an approved Interpretation Strategy for the place.
- b. If required by Council, an archival record is to be made in accordance with the NSW Heritage Division guidelines. Two copies are to be submitted to Council.

Note: Archival records will be lodged with the Local Studies Library.

6.0 SUSTAINABLE DEVELOPMENT

The City of Ryde supports environmental sustainability.

The following controls should be read in conjunction with Part 7.1 Energy Smart, Water Wise.

6.1 Environmental Management

Environmental management includes those aspects of development that have a measurable effect on the physical quality of the Ryde Town Centre environment. The environmental management controls are intended to ensure that principles of ecologically sustainable development are integrated into design and construction of development, particularly in relation to reduced energy usage. They are also intended to improve sunlight to publicly accessible spaces and to lower overall levels of wind, noise and reflectivity so as to contribute to people's enjoyment of the public domain.

Objectives

1. To ensure sunlight reaches all open spaces and buildings.
2. To ensure that the public domain is comfortable.
3. To ensure new buildings are energy efficient and minimise potable water use.
4. To manage waste in residential, commercial and retail buildings.
5. To encourage use of available public transport.

Controls

- a. Development is to comply with Part 7.1 Energy Smart, Water Wise of Development Control Plan 2010. Development within Precinct 1 is to achieve a minimum 5.0 Greenstar Rating and development in Precinct 2 is to achieve a minimum 4.0 Greenstar Rating.
- b. New development is required to submit an Energy Efficiency Performance Report to indicate overall environmental performance and management in relation to the following matters:
 - i. Solar access that has been achieved for residential living areas, public open space and private open space including clothes drying areas;
 - ii. Solar access for adjoining and nearby development and public domain areas;
 - iii. How energy efficiency is integrated into the orientation and design of buildings and the public domain;
 - iv. Energy efficiency of all appliances including but not limited to hot water systems, clothes dryers, mechanical ventilation, ceiling fans and the like;
 - v. How water usage is minimised and how the quality and quantity of water discharge from the site is managed; and
 - vi. Details of the potential for water recycling.

6.2 Water Management

Controls

- a. New development is to submit a Water Management Statement for proposals less than 15 residential dwellings or an Integrated Water Cycle Management Plan for proposals more than 15 dwellings.

Note: A Water Management Statement is a brief statement of Environmental Effects for the development application that summarises the proposed water management measures and expected performance levels compared to BASIX performance standards.

An Integrated Water Cycle Plan is a design management and implementation plan that integrates all the issues and responses affecting the water cycle.

- b. A Water Management Statement and an Integrated Water Cycle Plan must indicate:
 - i. How the water usage is minimised and how the quantity of water discharge from the site is managed;
 - ii. Details of the potential for water recycling and rainwater harvesting and re-use options;
 - iii. Installation of appliances and plumbing hardware that have a minimum AAA Australian Standards Water Conservation Rating;
 - iv. Investigation of treatment and reuse options of Grey Water for non-potable uses as part of the development; and
 - v. Potential for any surplus harvested rainwater being piped for irrigation or other reuse possibilities to downstream Ryde Park.

6.3 Waste Management

Minimising and managing waste contributes substantially to ecological sustainability. All waste streams contain many resources that are useful products. Recovering, recycling and using these as secondary resources is a key element in working towards ecologically sustainable development.

Much construction and demolition waste can be reduced with good design. A further percentage can be reused and recycled if the time is taken to source-separate, promote local markets and arrange for transportation. On-site re-use of waste is encouraged, for example timber and stone derived from the site can be used as landscaping materials.

Objectives

1. To minimise noxious waste problems through appropriate storage and collection of waste and good design of facilities.
2. To assist in achieving Federal and State Government waste minimisation targets in accordance with regional waste plans by:
 - i. requiring source separation;
 - ii. requiring compliance with Council's Waste Management Code; and
 - iii. requiring recycling of building materials where possible.

Controls

- a. All applications for demolition and development must be accompanied by a Waste Management Plan that specifies the type of waste to be produced and the proposed arrangements for ongoing waste management, collection and disposal.

- b. All Waste Management Plans shall be prepared in accordance with the relevant requirements of the Waste Recycling and Processing Service Act 1970, and the Waste Minimisation and Management Act 1995, and the Protection of the Environment Operations Act 1997 and Part 7.2 Waste Minimisation and Management.

6.4 Stormwater Management

The quality and quantity of stormwater runoff and inundation directly affects the functionality of Ryde Town Centre and indirectly the Parramatta River and Lane Cove River.

City of Ryde has adopted the 100-year Average Recurrence Interval (ARI) event as its design standard. Inundation is to be accommodated by the use of pipe drainage, natural and modified channels, overland flow paths and floodways. Properties within the 100-year ARI event may have flooding problems, and are considered 'flood affected' for the purposes of this Part.

Applicants are encouraged to discuss the flood risk of affected properties with Council's drainage engineer prior to lodging a development application.

Objectives

1. To minimise the harmful effects of flooding on human life and property.
2. To minimise and control nuisance stormwater inundation.
3. To promote development compatible with the flood risk in flood affected areas.
4. To protect downstream properties from stormwater inundation due to upstream development.
5. To provide the safe passage of less frequent stormwater inundation events.
6. To maintain acceptable water quality.

Controls

- a. Development must comply with the Part 8.2 Stormwater Management.

6.5 Alternatives to Private Vehicle Transport

Objectives

1. Encourage alternatives to motor vehicles and promote walking, cycling and public transport usage.

Controls

- a. Refer to 2.7 Bicycle Parking within Part 9.3 Parking Controls of this DCP.
- b. Workplace Travel arrangements are made in every commercial building to encourage greater use of available public transport services by staff. Target 40% of staff to use public transport in each commercial or office premises.
- c. Development is to provide bus facilities if required including but not limited to seats, awnings and provision for signage.

7.0 RESIDENTIAL AMENITY

This section of the Part protects the amenity of existing and future residents of the Ryde Town Centre. It provides for private open space – such as front and roof top gardens – that will contribute to the character of the public domain and provide amenity for residents.

This section details requirements for sunlight access and solar design that will contribute to environmental comfort and reduce the need for artificial heating and cooling.

Visual and acoustic privacy are also considered.

7.1 Residential Private Open Space

Private open space – front gardens, private gardens, above ground open space and the like – contributes to the character of the public domain and provides amenity to residents.

Objectives

1. To encourage development with front gardens that retain existing landscape character and trees, which contribute to the quality of the public domain.
2. To contribute to the character and environmental quality of the landscape of Ryde Town Centre.
3. To enhance the micro-climate created by development, in development and the Ryde Town Centre.
4. To ensure that landscaped areas support recreational activities for the residents.
5. To enhance the social and cultural attributes of development and where appropriate, the Ryde Town Centre (e.g. provision of safe common spaces for residents, child-care facilities etc).
6. To promote development in which all dwellings have access to private landscape spaces that are useable and comfortable. These spaces should have a balance of podium, or terrace space, and deep soil, soft garden spaces.
7. To ensure that every dwelling in the Ryde Town Centre has access to useable private open space.
8. To use the climate to improve the amenity and lifestyle of apartment residents.
9. To create private open space which provide privacy, security and solar access.
10. To create private open space which protects the privacy of neighbours.

Controls

Front gardens

- a. Provide front gardens to residential developments where buildings are required to be setback from the street. Refer Setbacks Control Drawing.
- b. Design front gardens to provide a positive setting for the building.
- c. Tree species shall be selected from a palette in accordance with the relevant recommendations of the *Ryde Town Centre Public Domain Plan 2006*. Native plant species are generally encouraged.

- d. Minimise the impact of driveways in front gardens by design, materials selection and appropriate screen planting.
- e. All driveways are to be separated from pedestrian pathways and entryways.
- f. Driveways, kerb crossings, parking, paved areas and external structures must be sited to safeguard the root zone of existing street trees.
- g. Gardens less than 3 m wide shall have adequate continuous access to allow maintenance.
- h. Design front gardens for security by providing adequate lighting to pedestrian and vehicle entrances. Avoid planting which may obscure buildings entries.
- i. The following are not permitted in front gardens forward of the building alignment:
 - i. Garden structures including gazebos, clotheslines, play equipment;
 - ii. Swimming pools, spa baths and associated plant;
 - iii. Garbage and parking structures; and
 - iv. Air conditioning plant and equipment.

Private Gardens

- j. Landscape spaces shall retain existing significant mature trees and contribute to the character and environmental quality of the landscape of Ryde Town Centre.
- k. Where possible provide 20% minimum deep soil landscape space.
- l. Deep soil landscape areas shall provide some capacity for storage and infiltration of stormwater falling within the total development.
- m. Provide one large tree, with a spreading canopy, and mature height of 12 metres minimum, planted in deep soil, for every 100 m² of landscaped open space. Indigenous species are preferred and should be selected from the palette detailed in the Ryde Town Centre Public Domain Plan 2006.
- n. To the greatest extent possible, locate car parking under the building footprint to maximise deep soil.
- o. Gardens less than 3 m wide shall have adequate continuous access to allow maintenance.
- p. All air conditioning and other plant shall be screened from view and integrated in the architectural design.
- q. The design of podium landscapes above car parking shall create optimum conditions for the establishment and long term viability of soft garden areas, including:
 - i. A minimum of 600 mm of soil to allow sustainable planting.
 - ii. Provide drainage and irrigation to all planters over structure.
 - iii. Ensure that all planters are accessible for maintenance.
- r. All communal garden, swimming pool and outdoor spaces should be designed to enhance the safety and security of residents:
 - i. Consider the impact of noise on the amenity of residents within the development and on the likely future amenity of nearby and adjoining development.
 - ii. Consolidate areas of activity both within the site and with adjoining sites.

Above ground open space

- s. Provide at least one balcony, terrace or deck for each dwelling where direct access to ground level private open space is not available.
- t. Primary above ground open space is to be accessible from a family room, lounge, dining room or kitchen, and be north, east or west facing, in the form of balconies, courtyards, terraces, roof gardens and the like.

- u. The depth of the primary above ground open space is to be in the range of 2 – 4.0 m. The optimal depth is 2.4 – 3.0 m.
- v. Smaller secondary open spaces such as balconies off bedrooms are also encouraged. The depth of the secondary open space should be in the range of 0.9 – 1.5 m.
- w. Lightweight pergolas, sunscreens, privacy screens and planters are permitted on roof terraces, provided they do not increase the bulk of building. These elements should not significantly affect the views and privacy available from properties in the immediate vicinity.

Fences

- x. Front fencing may only occur in the Precincts 4 and 6 where front setbacks are required.
- y. The maximum height of front fences is 1.0 metres above the footpath level.
- z. Fences should:
 - i. Be integrated with the building and landscape design through the use of materials and detailing;
 - ii. Highlight building entrances, and allow for outlook and street surveillance; and
 - iii. Conform with the predominant character of fences in the street.
- aa. The maximum height of fences to lanes and side boundaries is 1.8 metres above the ground or carriageway level.
- ab. Fences should be integrated with the building and landscape design through the use of materials and detailing.
- ac. Fences may be solid or transparent but may not be constructed of sheet metal, Colorbond Trimdeck and the like.

7.2 Solar Access and Sun Shading

Sunlight is a major determinant of environmental comfort. Good passive solar design offers financial benefits, by reducing the need for artificial heating and cooling.

Objectives

1. To ensure that solar access be achieved for internal and external areas of dwellings in mid winter.
2. To achieve the development of living and working environments not reliant on artificial heating, cooling, and lighting with passive heating/cooling, solar orientation, appropriate shading treatments.
3. To ensure that the design of windows and other glazed areas consider the internal environmental impact of heat gain, heat loss, privacy, views and architectural resolution.
4. To reduce the need for artificial heating and cooling.

Controls

- a. Optimise solar access to principal living rooms and private open spaces of all dwellings. Mid winter solar access diagrams may be required as part of the energy efficiency Performance Report required by Part 7.1 Energy Smart, Water Wise.
- b. Provide appropriate sun protection to glazing depending on orientation:
 - i. On north facing facades provide external horizontal shading devices, eaves, awnings, colonnades, balconies, pergolas, planting and the like, to maximise solar access in winter and minimise solar access in summer; and

- ii. On east and west facing facades provide external vertical shading, sliding screens, adjustable louvres and the like. These may be used in conjunction with awnings, colonnades, balconies, pergolas, and planting.
- c. Extensive areas of glazing unprotected from sunlight during summer will NOT be permitted.
- d. Reliance on high performance glazing as the primary element of sun control is NOT permitted.

7.3 Visual Privacy

Objectives

1. To maximise the visual privacy of on-site and neighbouring residents.

Controls

- a. Ground floor residential development may be permitted subject to Land Use Controls (refer Ryde Planning Scheme Ordinance), and provided that:
 - i. No bedrooms are located along the street frontage on the ground level; and
 - ii. The floor level is elevated 600 mm – 1200 mm above the ground or street level.
- b. Ground floor residential development is encouraged to be more than one storey in height with split-levels, mezzanines and the like so that bedrooms and other spaces may be located above the street level.
- c. Direct overlooking of rooms and private outdoor space of on-site or neighbouring housing, including housing within the same development is to be minimised through:
 - i. Building layout.
 - ii. Location and design of windows and balconies.
- d. The use of tinted glazing that does not prevent overlooking is not acceptable as the primary means of achieving privacy.
- e. This provision gives detailed guidance to the principles of SEPP 65 and promotes appropriate building separation. The preferred minimum distances between opposite windows of neighbouring buildings and dwellings where direct view is not restricted by screening or planting are:
 - i. 6 m between windows of service rooms and/or edges of secondary balconies.
 - ii. 9 m between windows of service rooms and/or edges of secondary balconies to edges of primary balconies.
 - iii. 9 m between windows of service rooms and/or edges of secondary balconies to windows of commercial uses.
 - iv. 12 m between windows of “living” rooms and/or edges of primary balconies. 12 m between windows of “living” rooms to windows of commercial uses.

7.4 Acoustic Privacy

Potential unwanted noise sources increase in more densely developed areas where there are more people living, more closely together. Loud noise affects the amenity of places. In mixed-use areas developments need to consider the amenity of a range of occupants. The impact of commercial and retail noise on residential development and pedestrian amenity needs to be considered. Residential, commercial and retail developments can be designed and managed to minimise noise generation and intrusion.

Objectives

1. To achieve an appropriate acoustic environment, by giving design consideration to the following:
 - a. Siting of buildings;
 - b. Building planning;
 - c. Internal room layout;
 - d. Location of private open space;
 - e. Location and treatment of windows; and
 - f. Building materials.

Controls

- a. Development is to meet or exceed the sound insulation requirements between separating walls and floors of adjoining dwellings of the Building Code of Australia.
- b. New development is to meet or exceed the recommendations of Australian Standard 3671-1987: Acoustics – Recommended Design Sound Levels and Reverberation Times for Building Interiors.
- c. Site buildings and design the internal layout of rooms, courtyards, terraces and balconies, the use of openings, screens and blade walls, and choice of materials, to minimise the transmission of noise externally.
- d. Design to achieve primary acoustic privacy between adjacent dwellings with appropriate building materials. This may be enhanced using service areas such as circulation, and storage areas, and back-to-back kitchens, laundries, storage and bathrooms to create a noise buffer.
- e. Balconies and other external building elements are to be located, designed and treated to minimise noise in the building and reflection of noise from the façade.
- f. The use of a premises, and any plant, equipment and building services associated with a premises must not:
 - i. Create an offensive noise as defined by the Protection of the Environment Operations Act 1997; and
 - ii. Add significantly to the background noise experienced in a locality. Council may require a statement of compliance from a qualified acoustical consultant.
- g. Machinery and activities, including construction work, that are likely to generate offensive noise must be adequately sound-proofed in accordance with the Protection of the Environment Operations Act 1997 prior to occupation of the premises.
- h. Where retail and commercial development adjoins residential development, the use of mechanical plant equipment and building services will be restricted and must have acoustic insulation.
- i. Loading and unloading facilities must not be located immediately adjacent to residential development.
- j. Design restaurants and cafes to diminish the impact of noise associated with late night operation on nearby residents.

7.5 Buildings facing Devlin St, Lane Cove Rd, Blaxland Rd and Victoria Rd

Objectives

1. To ensure the impacts of noise on residential development will be mitigated through appropriate design and the use of insulation.
2. To ensure the operation of commercial and retail developments will protect the amenity of residential and public spaces.

Controls

- a. Development is to comply with Australian Standard 3671-1989: Acoustics – Road Traffic Noise Intrusion, Building Siting and Construction.
- b. Maximise the effect of the following noise attenuation strategies by using them in combination:
 - i. Use appropriate building materials;
 - ii. Create a noise buffer between habitable rooms and working environments, facing Devlin Street and Victoria Road;
 - iii. Use service areas such as circulation, kitchens, laundries, storage and bathrooms to create a noise buffer;
 - iv. Use enclosable balconies to moderate the impact of noise;
 - v. Use glazed enclosable balconies where the noise source is northward of development;
 - vi. Protect the amenity of bedrooms by not locating them on the same side as the noise source; and
 - vii. Use double glazing.
- c. Use design to achieve adequate noise attenuation while maintaining architectural address to busy roads.

7.6 Housing Choice

There is a need to provide a broad range of housing choice in the Ryde Civic, including a range of dwelling sizes.

Objectives

1. To provide a broad range of housing choice in Ryde Civic, including a range of dwelling sizes.
2. To enrich the local character and accommodate a diverse population by requiring that development, include a variety of housing types and sizes.
3. To provide and retain housing with good access at reasonable rental cost for tenants with low to moderate incomes.
4. To achieve a varied social and economic mix of residents in the Civic

Controls

- a. This provision gives detailed guidance to the principles of SEPP 65. Development is to provide a diverse mix of dwelling sizes generally within the following ranges.

3 bedroom	5 – 35%
2 bedroom	40 – 80%
1 bedroom + studio	5 – 35%

- b. Developments providing less than 10 units may vary this mix providing a range of dwelling sizes are represented.
- c. Developments providing less than 5 units are exempt.

8.0 PRECINCTS

The Ryde Town Centre is made up of eleven character precincts (refer Figure 4.4.08 Precincts Control Drawing). These are determined based on existing development and future character. The establishment of eleven character precincts is part of an approach that will retain and enhance the fine grain of the area - its lot structure, urban framework and identity - to create a town centre that is diverse, interesting, attractive and caters for residents, workers and visitors.

The objective of this Part is to create distinctive precincts within the Town Centre each with an identity drawn from its history, natural and built features, community needs and expectations.

1. **Civic / Mixed Use Precinct** will comprise a range of government, community, residential and commercial uses and will incorporate buildings and landscapes that demonstrate civic qualities, design excellence, governance and leadership, and triple-bottom-line sustainability.
2. **Town Centre Core Precinct** will service the needs and expectations of local communities and include new public spaces and community and recreational facilities, residential and commercial opportunities. It will demonstrate design excellence and environmental sustainability.
3. **Main Street Precinct** will be attractive, vibrant and safe with a diverse range of neighbourhood shops, living and business accommodation and a high quality public domain that encourages social interaction.
4. **Residential Precinct** will be a compact living environment well serviced by public transport, retail, leisure and work opportunities.
5. **Heritage Precinct** will value enhance and interpret heritage resources and cultural landscapes.
- 6, 7, 8 & 12 **Commercial Edge Precincts** will negotiate a transition between the Town Centre and residential areas nearby. The Commercial Edge Precincts are gateways to the Town Centre.
9. **Ryde Park Precinct** will be valued as a significant heritage, recreation, leisure and community resource and an important green space.
10. **Low Density Residential Precinct** that adjoins Ryde Park and Ryde Public School.
11. **Ryde Public School Precinct** will continue to be a valued asset that enhances the diversity of the Town Centre and strengthens bonds with the community.

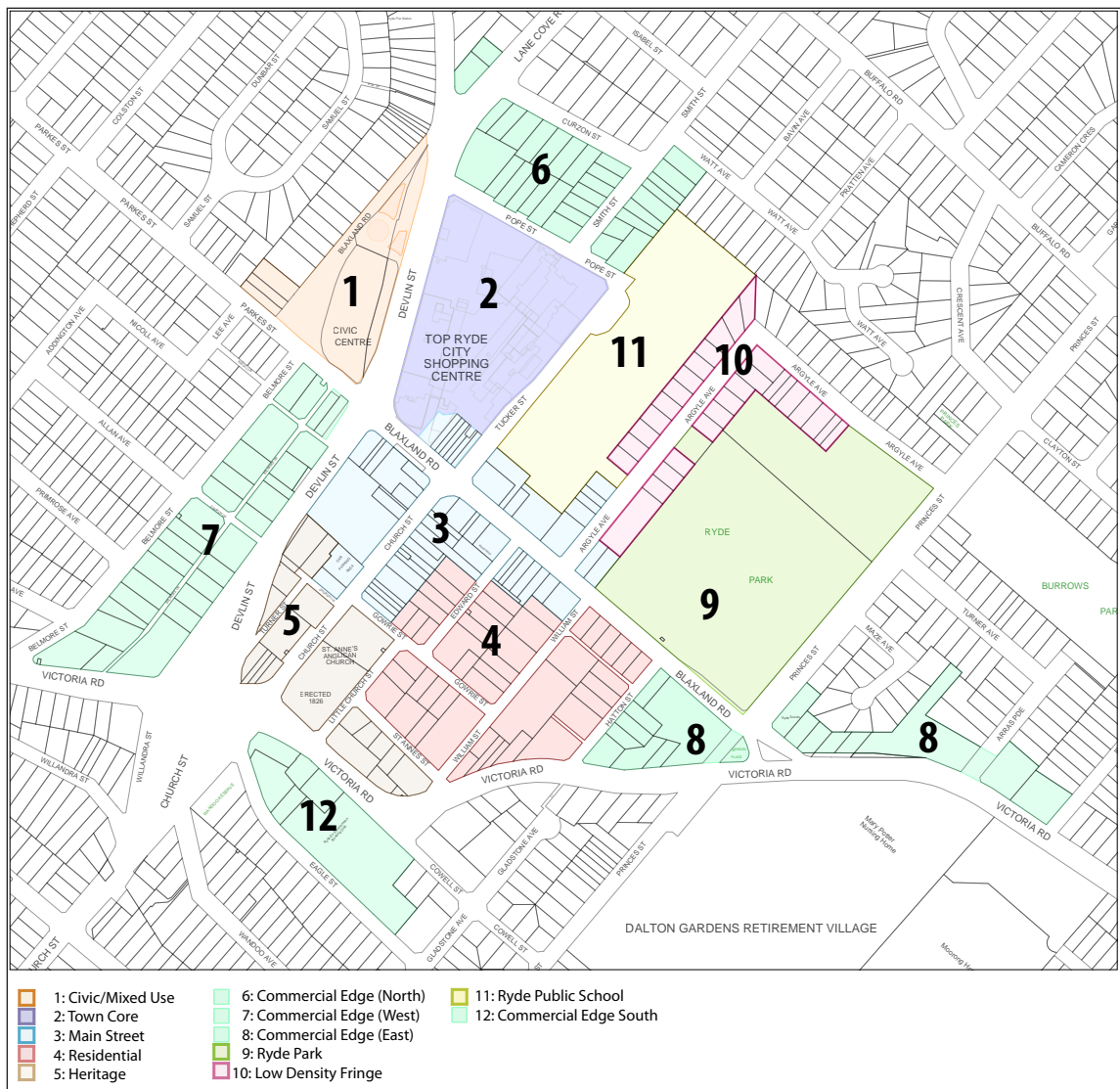


Figure 4.4.08 Precinct Control Drawing

8.1 Precinct 1- Civic/Mixed Use

The Civic/Mixed Use Precinct is the existing civic hub for the City of Ryde. It is an island surrounded by roads and disconnected from the retail core and town centre by Devlin Street.

The Precinct is located on a ridgeline and accommodates a landmark building that is highly visible from within the Ryde Town Centre and regionally. The existing seven-storey City of Ryde Civic Centre was constructed in 1964, and later in the 1970's, the community hall was constructed. The Precinct is linked to two pedestrian overpasses across Devlin Street and the vehicle access portals currently serving Top Ryde City, located within the subsurface of Devlin Street. The Precinct also contains car parks and landscape areas associated with the Civic buildings.

The Civic Centre has contributed to the character of the Precinct for in excess of 40 years. However, the current building no longer provides the scale and amenity required of a modern functional Civic building. It is constrained by a lack of sizeable floor space and is rapidly approaching the end of its useful life. The successful adaptive re-use of the existing building is cost prohibitive.

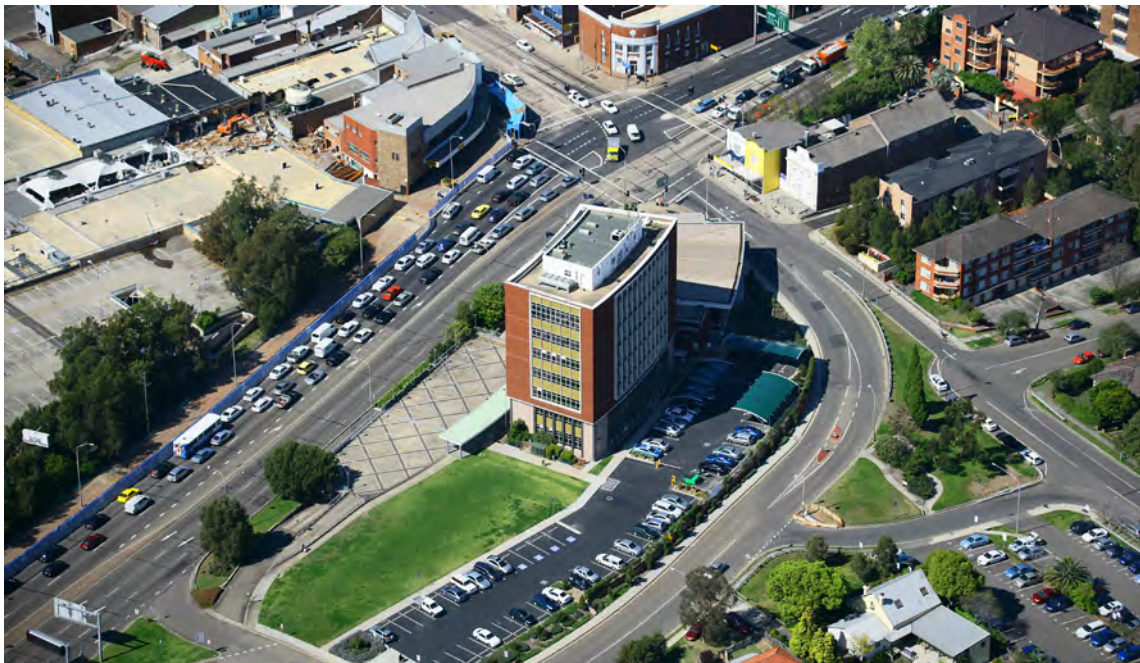


Figure 4.4.09 Ryde Civic Centre Area 2002

8.1.2 Future Character

The Precinct is divided into two key future development sites: Site A and Site B – see Figure 4.4.09.

Site A is the larger and eastern most portion of the Precinct. It currently accommodates the existing Civic buildings, car parking and landscaped areas.

Site B is the smaller western portion of the Precinct. Currently Site B is utilised as an at grade car parking area for Council vehicles.

The two sites will be separated by a realigned Blaxland Road, which is to be provided to better service the Precinct and to continue to provide access to existing residential, commercial and community properties to the west of the Precinct.

It is anticipated that the future redevelopment of the Precinct will involve the demolition of the existing Civic Centre and the establishment of new landmark and sustainable building(s) that may comprise a mix of cultural, civic, community, retail, commercial and residential uses that demonstrate civic quality and design excellence, as well as triple bottom-line sustainability.

Future development will contribute to the revitalisation of the Ryde Town Centre by:

1. Providing significant new mixed used development of up to 60,000 m² of net useable floorspace (66,000 m² gross floor area) that complements and supports the high density urban character and functions of the Ryde Town Centre.
2. Replacing the existing Ryde Civic Centre and Civic Hall with approximately 2,600 m² of net useable floor space (approximately 3,000 m² gross floor area) comprising a Council Chamber and civic uses (including flexible community, function, Final and performance spaces).
3. Realigning Blaxland Road and undertaking road network improvements to support the redevelopment of the site.
4. Establishing significant new development that complements and supports the high density urban character and functions of the wider Ryde Town Centre.
5. Delivering high quality architectural and landscape design both in built form and public domain, that is based on environmental and sustainability principles.

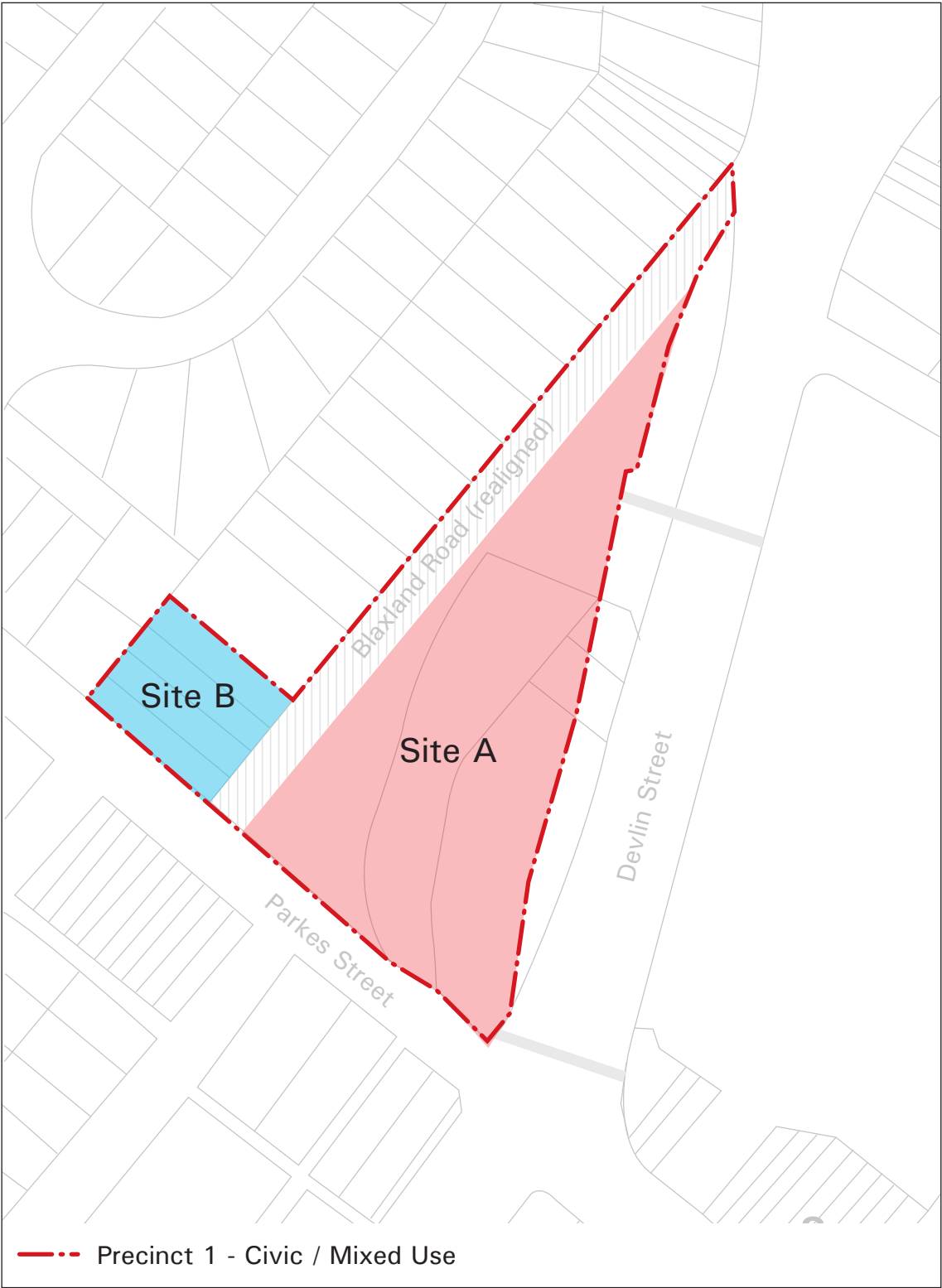


Figure 4.4.10 Precinct Map

8.1.3 General Precinct Provisions

Architectural and Built Form Character

Objectives

1. To enhance the landmark qualities of the Precinct and character of the Ryde Town Centre through the provision of development that is visually prominent in terms of height and scale and architectural design.
2. To encourage built form that reinforces the corners of Devlin Street with Blaxland Road and Parkes Street as key gateways to the Ryde Town Centre.
3. To provide for new civic and community uses within the Precinct with a good level of pedestrian connectivity to the existing civic and community uses in Precinct 2.
4. To ensure the Precinct is well connected to other Precincts in the Ryde Town Centre in terms of pedestrian access.
5. To encourage the provision of active / non-residential uses fronting the public domain.
6. To ensure that future development accommodates a mix of civic, residential and non-residential land uses within the Precinct.
7. To ensure vehicular and pedestrian access to all existing properties to the west of the realigned Blaxland Road is maintained and improved.
8. To ensure that the design of future development considers the interface with adjacent development, and provides for a transition in built form height and scale, particularly to lower density development to the west and south.
9. To deliver development based on ecologically sustainable development (ESD) principles.

The desired town centre built form character is conceptually illustrated by the images at Figure 4.4.10.

Controls

- a. The development of the site is to comply with the controls for the Site A and Site B in the following section of the DCP



Figure 4.4.11 Examples town centre built form

8.1.4 Landscape and Public Domain Character

Objectives

1. To provide a quality public domain within and immediately surrounding the Precinct that:
 - a. establishes landscaped frontages on Devlin Street, Parkes Street and the re-aligned Blaxland Road;
 - b. provides a landscaped plaza on the site;
 - c. improves the pedestrian amenity and connectivity between the existing pedestrian bridges across Devlin Street at both ground and upper levels; and
 - d. provides a publicly accessible through site link between Blaxland Road and the pedestrian bridge across Devlin Street at the northern end of the site
2. To create a frontage along Devlin Street that provides for improved pedestrian amenity and a softening of the interface between future development and the high traffic environment of Devlin Street.
3. To ensure that an environment is created along the re-aligned Blaxland Road that contributes to pedestrian amenity and assists in providing for an appropriate transition in the height and scale of built form between future development within Site A and existing low density residential development to the west.
4. To ensure an environment is created along Parkes Street that contributes to an improved pedestrian environment and positively enhances the streetscape.

Controls

- a. The public domain areas and pedestrian links are to comply with the controls for the Site A and Site B in the following section of the DCP and the provisions of the *City of Ryde Public Domain Plan*.



Figure 4.4.12 Examples of high quality landscape and public domain

8.1.5 Precinct Access and Circulation

Objectives

1. To provide for road network improvements that are required to support the future redevelopment of the Precinct.
2. To integrate site vehicular access provision with the existing vehicular access arrangements that are in place for the Top Ryde Shopping Centre.
3. To ensure vehicular access to existing properties is maintained.
4. To provide for a shared pedestrian and vehicular environment at the termination of the realigned Blaxland Road with Devlin Street.

Controls

- e. Site access arrangements and road network improvements are to be provided in accordance with Figure 4.4.12.
- f. The detailed design of the realigned Blaxland Road as shown in Figure 4.4.09 and Figure 4.4.12 is to:
 - i. Have a road reserve that is a minimum of 17 metres wide;
 - ii. Incorporate short stay on-street parking;
 - iii. Maintain direct vehicle access to and from existing properties to the west;
 - iv. Provide a shared pedestrian and vehicular environment where appropriate;
 - v. Provide clearly delineated vehicle and pedestrian spaces at the northern end of the realigned Blaxland Road, to minimise opportunities for conflict; and
 - vi. Incorporate a vehicle turning circle and drop off area at the northern end of the site.

A cross section of Blaxland Road is illustrated in Figure 4.4.13.

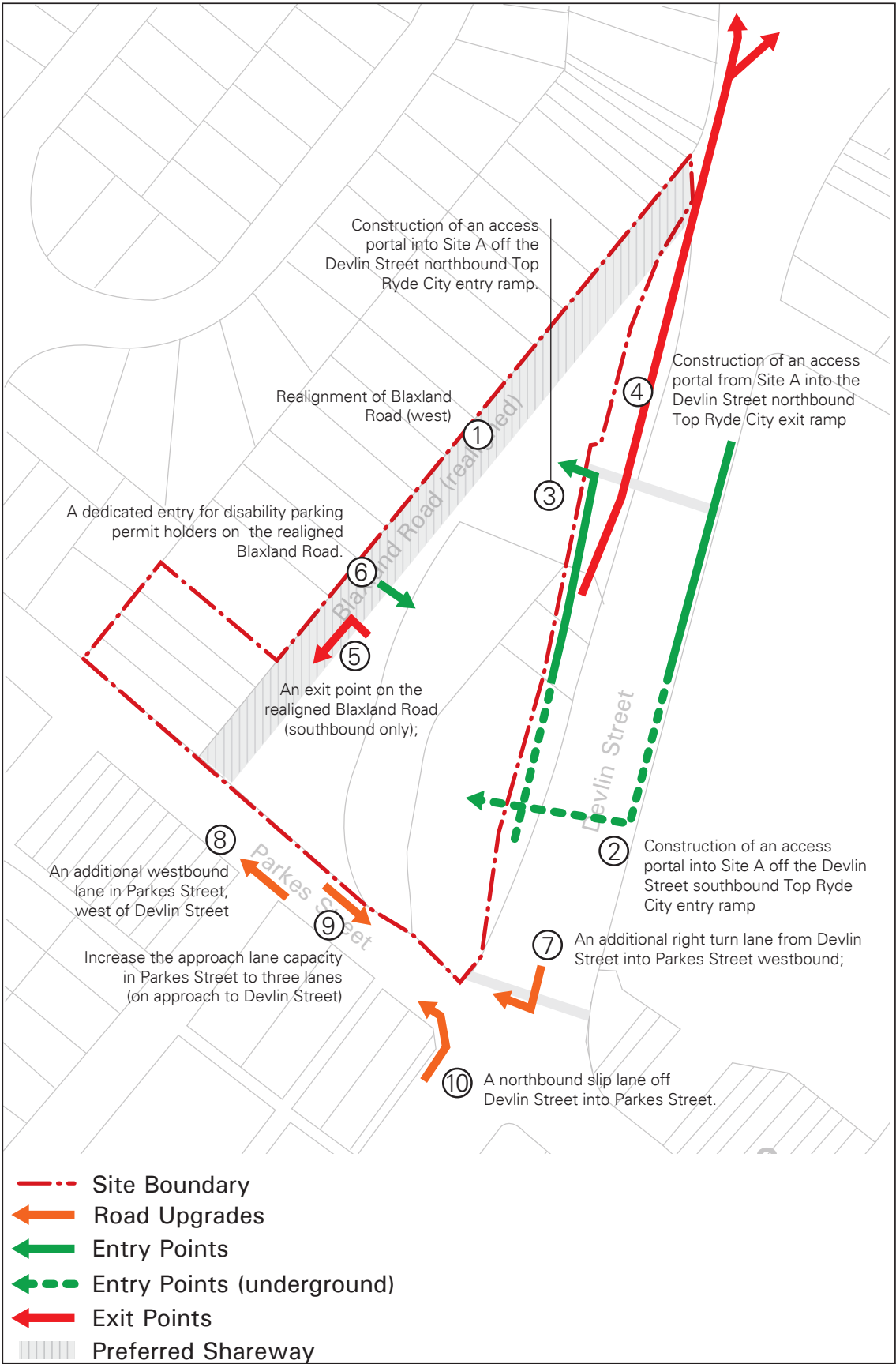


Figure 4.4.13 Vehicular access and road network improvements

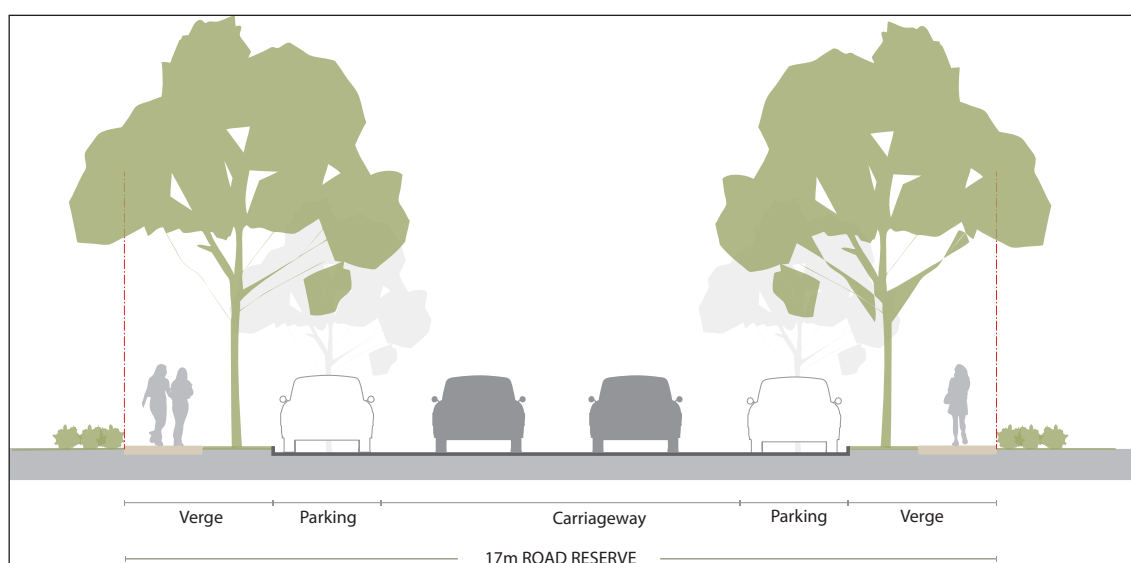


Figure 4.4.14 Illustrative cross section of realigned Blaxland Road carriageway

8.1.6 Site A

Site A is the larger and eastern most portion of the Precinct. The redeveloped Site will contain landmark buildings at its the northern and southern ends. The site is to comprise a mix of uses and will include tower buildings up to 75 m in height. The tower forms will take advantage of 360 degree view and vistas, and will be an identifiable landmark of the Ryde Town Centre.

Development of the site is to comply with the following controls and with the preceding architectural, built form, landscaping, public domain, access and circulation objectives and controls for the Precinct.

The location of Site A is illustrated in Figure 4.4.09.

Objectives

1. To encourage development of a scale and form that reinforces the prominence of the site on the ridgeline of the Top Ryde Town Centre, and is well proportioned.
2. To encourage a creative and articulated skyline.
3. To facilitate community interaction through the provision of civic and mixed use facilities, plazas, courtyards and the like.
4. To integrate development with the surrounding road network, while minimising impacts to local and regional traffic.
5. To respond to and minimise the effects of the high levels of wind and noise experienced on the site.
6. To ensure that the future development fronting the realigned Blaxland Road is designed to provide an interface with the adjacent lower residential development.

Controls

Land Uses

- Site A is to comprise mixed uses, with predominantly residential, retail, commercial and civic uses.
- New civic uses (approximately 2,600 m² net useable floor space / 3,000 m² GFA) are to include a new Council Chamber and associated facilities and flexible spaces for a range of community, function, Final and performance activities.
- The new civic uses should be designed and located to facilitate easy pedestrian access to the existing civic and community uses within Precinct 2 on the opposite side of Devlin Street. The preferred location for the provision of future civic uses is towards the northern end of Site A in proximity to the existing northern pedestrian bridge over Devlin Street (refer to Figure 4.4.14). Alternative options for the location of the future civic uses will be considered on their merit.
- Retail and/or commercial uses should be in proximity to the new civic uses in order to create active and vibrant public spaces.
- Ground floor uses fronting Devlin Street are to be predominantly non-residential (e.g. commercial, retail, civic, community, incubator commercial, SOHO apartments and the like).
- Ground floor uses elsewhere within Site A should activate street frontages and public spaces where there are higher levels of pedestrian activity. The active uses may include retail, commercial and civic uses or residential apartments with direct access from the street



Figure 4.4.15
Preferred Location of Civic Uses

Public Domain

- a. The public domain is to be a high quality design, embellished with quality and durable materials and be provided in accordance with the standards set out in the DCP and Ryde Town Centre Public Domain Plan.
- b. The Devlin Street frontage is to comprise a combination of hard and soft landscape elements that enhance the pedestrian amenity of this through route. Opportunities for substantial tree planting should be explored in the context of limited capacity to accommodate deep soil planting due to the portal vehicular access arrangement and future basement car parking.
- c. Street trees (8 m metre canopy diameter at maturity) should be planted along the realigned Blaxland Road and at the northern end of the site. Deep soil planting zones or pit structures should be provided to accommodate the large trees.
- d. Tree species should be selected to suit the streetscape including street width, building heights, setbacks and views.
- e. The design of new buildings and public domain is to minimise blind corners and recesses. Entrances to new civic buildings and spaces should be clear, well lit and well defined.
- f. Setbacks are to be provided to Devlin Street, Parkes Street and Blaxland Road in accordance with Figure 4.4.16 to provide for improved amenity.

Pedestrian Amenity

- a. Development within Site A is to reinforce Devlin Street, Parkes Street and Blaxland Road as the primary pedestrian network for the Precinct. Refer to Figure 4.4.15.
- b. New and improved pedestrian connections are to be provided to Devlin Street, Parkes Street and Blaxland Road.
- c. Future development is to provide for a good level of connectivity to the existing pedestrian bridges across Devlin Street at both ground and upper levels.
- d. The pedestrian environment on Devlin Street is to be enhanced through the provision of continuous weather protection between the existing northern and southern pedestrian bridges on Devlin Street (refer to Figure 4.4.15). This may be in the form of awnings attached to built form, free standing awnings, colonnades or the like and any combination of these.

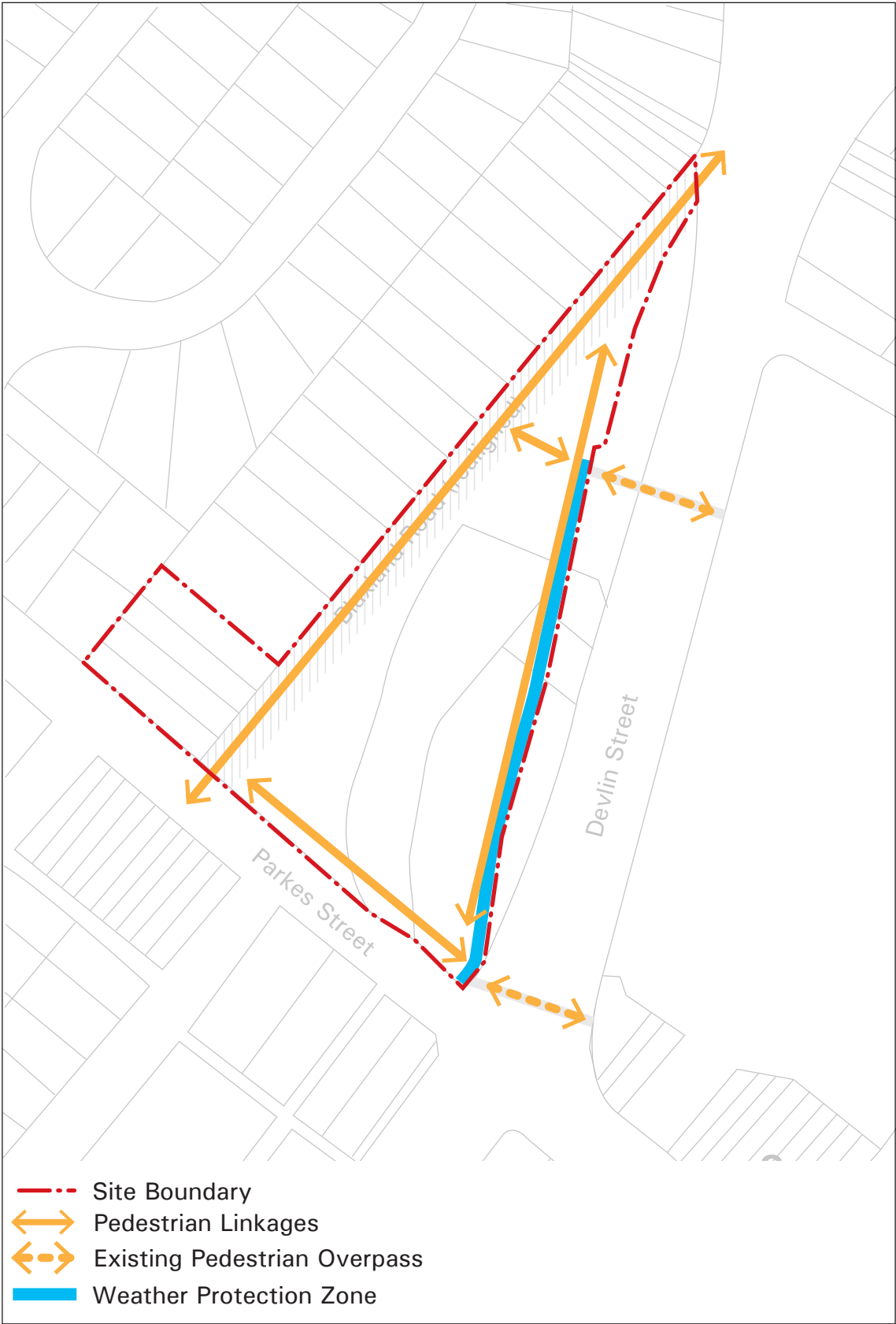


Figure 4.4.16 Pedestrian Connections

Built Form

- Future tower forms within Site A are to be located generally fronting Devlin Street and Parkes Street within the area shown on Figure 4.4.16.
- Ground level build to lines and building setbacks are to be in accordance with Figure 4.4.16. The setbacks are to be measured from existing property site boundaries or from the boundaries of newly realigned Parkes Street and Blaxland Road, as illustrated in Figure 4.4.16.



Figure 4.4.17 Setbacks and build to lines

- c. Buildings of 4-6 storeys are encouraged along Devlin Street and Parkes Street. A minimum 4 storey street wall height should be established on Devlin Street and Parkes Street.
- d. Buildings fronting the realigned Blaxland Road are to have upper levels above 4 storeys setback a minimum of 3 m (refer to Figure 4.1.17).

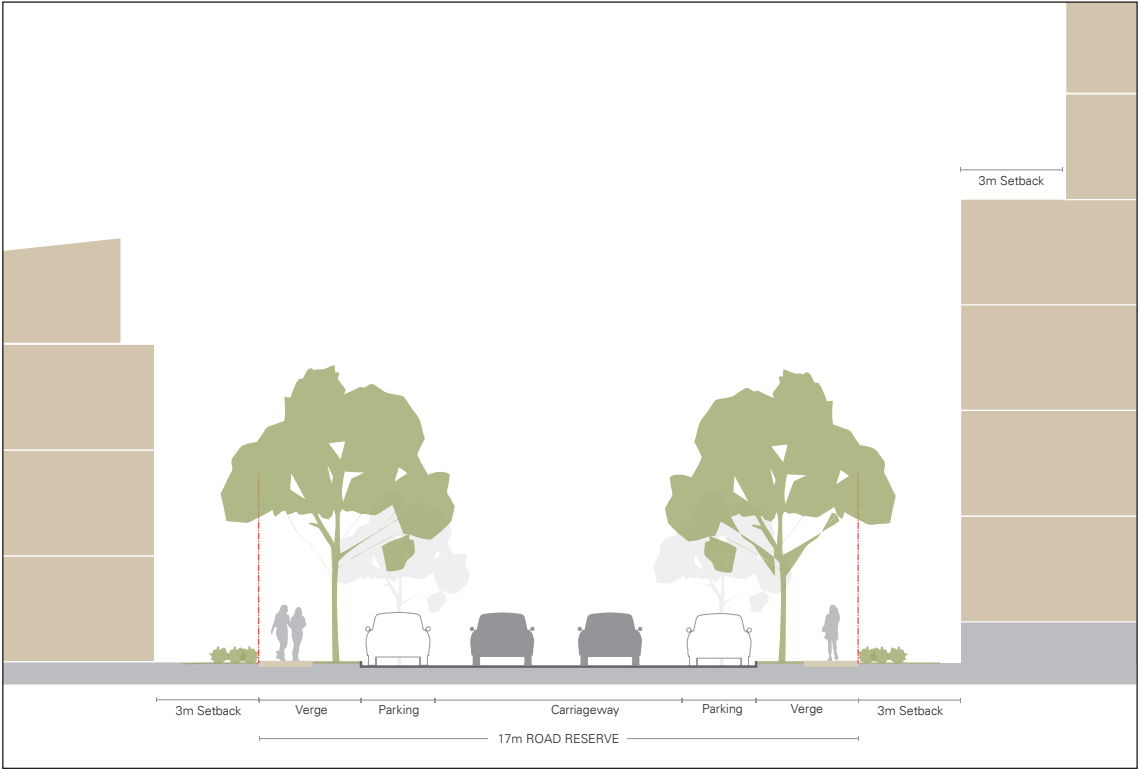


Figure 4.1.18 Section illustrating setbacks above 4 storeys

- e. Ground floor dwellings in buildings fronting Blaxland Road and Parkes Street are to have individual access off the street (refer to Figure 4.4.18).



Figure 4.1.19 Examples of apartments with individual street access

- f. Buildings fronting Blaxland Road should have facades that are articulated and modulated. This may include 'punctuated' walls, variation in setbacks, and building elements such as balconies, porches, and sun shading devices.
- g. Within the RL 130 height area shown on Figure 4.4.16 any tower / above podium building forms should have a maximum width (fronting the street) of approximately 40 m for residential development and approximately 50 m for commercial development.
- h. A maximum façade length of 40 m.

Note: At 40 m, the building can be physically or visually separated through design elements/ or articulation.

- i. For residential development, building separations are to be in accordance with the following:

HEIGHT	BETWEEN HABITABLE ROOMS AND BALCONIES	BETWEEN HABITABLE ROOMS/ BALCONIES AND NON-HABITABLE ROOMS	BETWEEN NON HABITABLE ROOMS
Three to four storeys (12 m)	12 m	9 m	6 m
Five to eight storeys (25 m)	18 m	13 m	9 m
Nine storeys and above (over 25 m)	24 m	18 m	12 m

- j. Towers forms within Site A must:
 - i. be designed as highly articulated, slender built form elements that allow for reasonable view sharing and outlook within and across the site;
 - ii. be separated by a minimum distance of 24 m (between habitable rooms and balconies), to ensure there is spatial delineation between tower forms when viewed from the broader urban context; and
 - iii. add to the interest of the skyline of the Precinct and Ryde Town Centre, through a modulated and articulated form and interesting roof elements.
- k. Tower elements should connect visually with ground level. This may be achieved by providing continuity in the vertical articulation of tower and podium elements.
- l. Residential building forms should be orientated to take advantage of sunlight and view opportunities. Façade elements that incorporate eastern, northern and western summer shade elements should be provided.
- m. Building bulk and massing is to be distributed on the site so as to ensure:
 - i. high amenity for public domain spaces, including good solar access and protection from high wind and noise levels; and
 - ii. to minimise loss of amenity to existing adjacent buildings and public streets and spaces.
- n. Building massing, scale and design is to minimise adverse wind impacts (such as down Adopeds) on the public domain in and around the development. Hence, the orientation, height and built form of development is to be designed to promote public safety and comfort at ground and publicly access podium levels.
- o. Lift overruns and plant areas are to be recessed and/or incorporated into interesting roof elements of buildings.

- p. Community/civic spaces are required to have a civic character which includes but is not limited to the following:
 - i. Design elements are to be generously scaled and of high quality materials expressive of contemporary best practice;
 - ii. Demonstrate best practice environmental sustainability outcomes;
 - iii. Generous floor to ceiling heights, where appropriate; and
 - iv. include multifunctional performance space, meeting and conference rooms and Council Chambers.
 - v. a plaza area to compliment the functions and use of the civic/community spaces.
- q. The built form should be designed to minimise shadow impacts on surrounding properties.
- r. The existing Obelisk on the site is to be relocated to a location approved by Council.

Sections illustrating the built form and height transitions are shown at Figure 4.4.19.

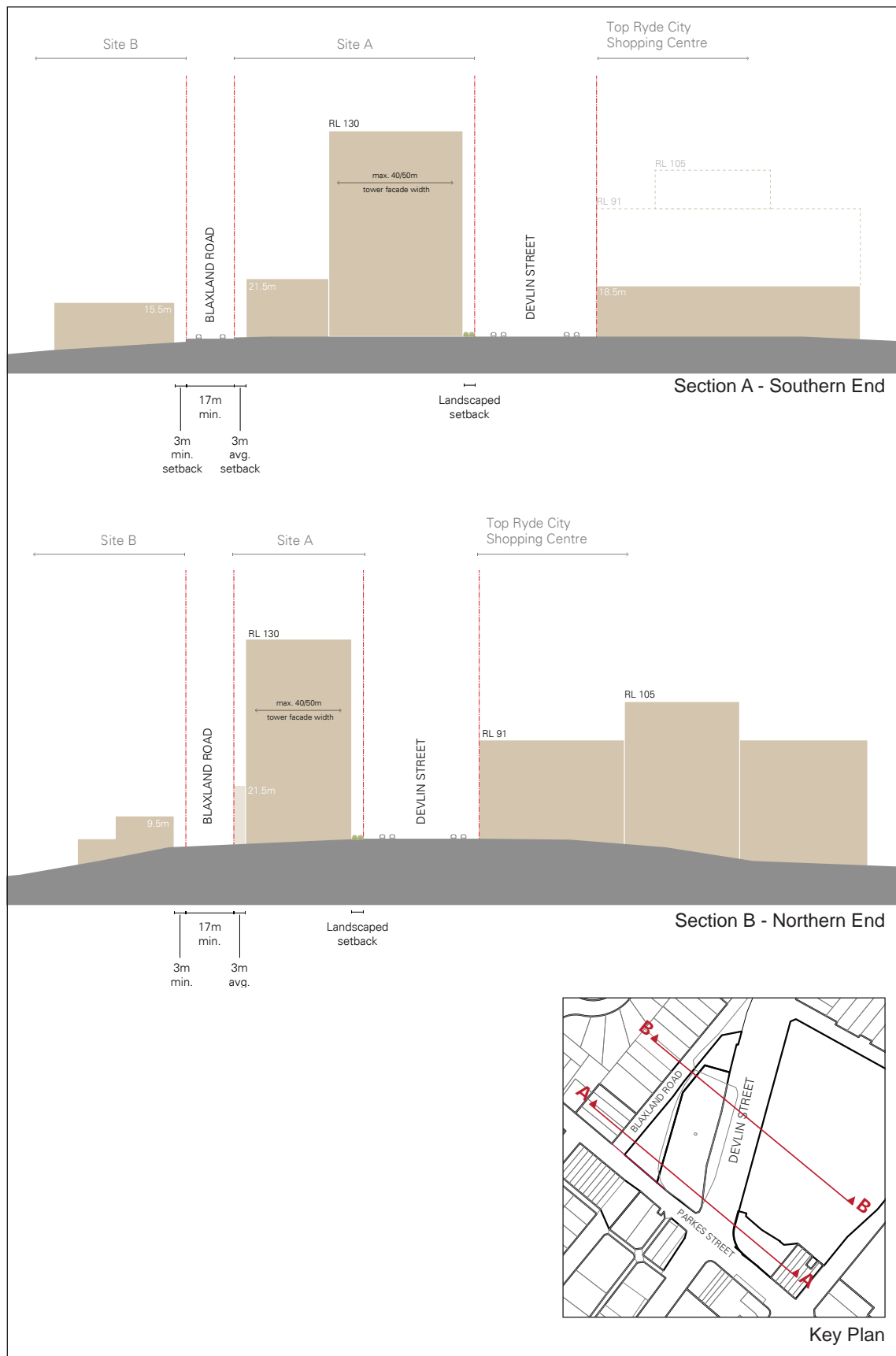


Figure 4.4.20 Sections illustrating the built form and height transitions

Residential Amenity

- a. Residential development is to provide a high level of amenity for residents and visitors and meet the requirements of SEPP 65 – Design Quality of Residential Flat Development and the accompanying Residential Flat Design Code.
- b. The Residential Amenity controls in Section 7.2 – 7.6 of Part 4.4 of the Ryde DCP apply to residential flat buildings.
- c. Private balconies are to be a minimum depth of 2.4 m and a minimum area of 10 m².
- d. Communal open space may be in a courtyard form and may also be provided on elevated gardens and roof tops.
- e. Communal open space should have a northerly aspect where possible.
- f. The design of private and communal open space is to address visual privacy, safety, security, wind and noise impacts.
- g. Communal open space should be a private area for use by residents only.

Parking

- a. Parking areas are to be integrated with the form and arrangement of buildings on the site, screened or concealed from view from the public domain and adjoining streets. Sleeving of any above ground parking areas or high quality, decorative screening is required.
- b. Loading of large vehicles to/from the site is to be made via Parkes Street only (excluding loading and unloading associated with performances and events).

Sustainability

- a. Residential development is to comply the requirements of BASIX and achieve a minimum 4.0 Greenstar rating.
- b. Commercial development is to achieve a minimum 5.0 Greenstar rating.
- c. Civic development is to achieve a minimum 5.0 Greenstar rating in accordance with the current Green Star - Public Building rating tool (which may be a pilot or adopted rating tool at the time the relevant DA is to be submitted for assessment and determination).

8.1.7 Site B

Site B is the smaller and western most portion of the Precinct. The redeveloped Site B will be lower scale building(s) which will provide a transition in height, bulk and scale between development on Site A to the east and lower density residential development to the west. Redevelopment of Site B must have regard to the adjoining heritage listed Hatton's Cottage.

Development of the site is to comply with the following controls and with the preceding architectural, built form, landscaping, public domain, access and circulation objectives and controls for the Precinct.

The location of Site B is illustrated in Figure 4.4.09.

Objectives

- 1. To ensure development respects the significance of Hatton's Cottage (heritage item) at 158 Blaxland Road, Ryde.
- 2. To encourage development that responds to the:
 - a. Existing low scale development to the west and north; and
 - b. Site's sloping topography.

3. To ensure non-residential or mixed use development of Site B is to respect surrounding residential development and minimise impact on residential amenity.

Controls

- Building setbacks to Blaxland Road (realigned), Parkes Street and the site's northern boundary are to be in accordance with Figure 4.4.16.
- The relevant controls in Part 3.4 Residential Flat Buildings and Multi Dwelling Housing Residential Amenity and the controls in Chapter 7.2 – 7.6 of Part 4.4 of the Ryde DCP apply to residential flat buildings.
- Residential development is to provide a high level of amenity for residents and visitors and meet the requirements of SEPP 65 – Design Quality of Residential Flat Development and the accompanying Residential Flat Design Code.
- For residential development, building separations are to be in accordance with the following:

HEIGHT	BETWEEN HABITABLE ROOMS AND BALCONIES	BETWEEN HABITABLE ROOMS/ BALCONIES AND NON-HABITABLE ROOMS	BETWEEN NON HABITABLE ROOMS
Three to four storeys (12 m)	12 m	9 m	6 m
Five to eight storeys (25 m)	18 m	13 m	9 m

- Buildings fronting Blaxland Road and Parkes Street should have facades that are articulated and modulated. This may include 'punctuated' walls, variation in setbacks, and building elements such as balconies, porches, and sun shading devices.
- Ground floor dwellings in buildings fronting Blaxland Road and Parkes Street are to have individual access off the street.
- Private balconies are to be a minimum depth of 2.4 m and a minimum area of 10 m².
- Common open space should be designed and landscape to optimise useability, privacy and for the amenity of adjoining neighbours. Landscaping should contribute to streetscape character of Parkes Street and Blaxland Road.
- Communal open space should have a northerly aspect where possible.
- The design of private and communal open space is to address visual privacy, safety, and security.
- Communal open space should be a private area for use by residents only.
- Non – residential or mixed use development should minimise noise, lighting, odour and glare (reflectivity) impacts on surrounding residential uses
- Plant and lift overruns are to be visually unobtrusive and are to be incorporated into the roof form, where possible.
- Main building entry(s) for non – residential developments should front the realigned Blaxland Road. Plaza/forecourt space(s) should be provided on the Blaxland Road frontage.

8.1.8 Development Application Requirements

- a. It is intended that future development within the Precinct will be the subject of a single development application (DA). As such any DA for the demolition of existing buildings and structures and the erection of new buildings is to address the following matters where relevant:
 - the consistency of the development with the above Objectives and Future Character statement for the Precinct;
 - whether the development is an appropriate design response to the opportunities and constraints of the Precinct;
 - proposed uses and use mix;
 - subdivision pattern;
 - sensitivity to heritage items and streetscape constraints;
 - the location of the proposed building envelopes and their relationship with the rest of the Precinct in terms of building separation, setbacks, amenity and urban form;
 - bulk, massing and modulation of buildings;
 - building heights (including street frontage heights);
 - the gross floor area of each building;
 - environmental impacts such as sustainable design, overshadowing, wind and reflectivity;
 - the achievement of the principles of ecologically sustainable development;
 - pedestrian, cycle, vehicular and service access, circulation and requirements, incorporating the realigned Blaxland Road;
 - impact on, and proposed improvements to, the public domain;
 - maximum car parking numbers for the Precinct;
 - indicative landscaping scheme;
 - Greenstar commitments; and
 - measures to incorporate Crime Prevention Through Environmental Design criteria.
- b. As a minimum, the DA must be supported by the following studies, plans and assessments:
 - Detailed site analysis of the Precinct;
 - Comprehensive Statement of Environmental Effects;
 - Architectural plans - demonstrating the proposed building envelopes and the general layout and configuration of land uses and development across the Precinct;
 - Shadow diagrams;
 - Design Quality Plan – including details of the architectural merit and quality of the development;
 - Traffic and Parking Assessment;
 - Landscape and Public Domain Plan; - Wind Impact Report;
 - Greenstar/ESD Assessment;
 - Heritage Impact Assessment;
 - 3D Model and Photomontage of the proposed building envelopes, illustrating key design and architectural elements/features;
 - Arts and Cultural Plan;
 - Accessibility Plan; and
 - Social Impact Assessment.

The consent authority may require additional information if it considers it necessary in the circumstances of the case.

8.2 Precinct 2 - Town Core

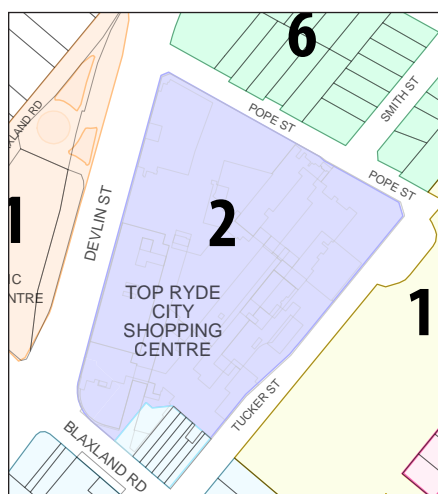


Figure 4.4.21
Town Core Precinct

Opened in 1957 the Top Ryde Regional Shopping Centre was only the second mall built in Australia on the American model and the first suburban centre in Sydney to have a big city department store. The completion of the shopping centre and a modern Civic Centre, together with the decision in 1963 to establish Macquarie University marked the emergence of Ryde as a “city”.

The development of major new shopping centres in Rhodes and North Ryde has seen the Top Ryde Shopping Centre decline in Sydney’s retail hierarchy from its original regional focus to a local focus. At the time of preparing this Part, the shopping centre was servicing the needs of local communities and was a place to meet and congregate informally.

Occupying almost an entire city block bounded by Blaxland Road, Pope, Tucker and Devlin Streets, the shopping centre was alienated from the Ryde Town Centre. Creating pedestrian walkways through the site and enhancing links with the main street, school and Ryde Park is an opportunity for future development. With effective management vehicular access to the shopping centre may be direct from Devlin Street, improving the amenity of nearby areas.



Figure 4.4.22 The Top Ryde Shopping Centre (late 1990’s) is pictured at right

8.2.1 Future Character

Town Centre Core Precinct will service the needs and expectations of local communities and include new public spaces and community facilities, residential and commercial opportunities. It will demonstrate design excellence and environmental sustainability.

Objectives

1. To redevelop the shopping centre to act as a catalyst for revitalisation of the Town Centre, to attract investment and create new jobs and better utilise public transport and public infrastructure.
2. To enhance pedestrian connections to Church Street and Blaxland Road, to the Civic Precinct and nearby residential communities, the school and Ryde Park.
3. To retain and enhance services and amenities for local communities, including youth, elderly and minority groups.
4. To redevelop the centre as a benchmark for design quality and environmental sustainability.
5. To promote access-for-all and community ownership by establishing a public domain and community facilities within the shopping centre.
6. To better manage vehicular access to the shopping centre and discourage through traffic.
7. To develop a high quality centre that will set the benchmark for Ryde Town Centre.

Controls

Land Use

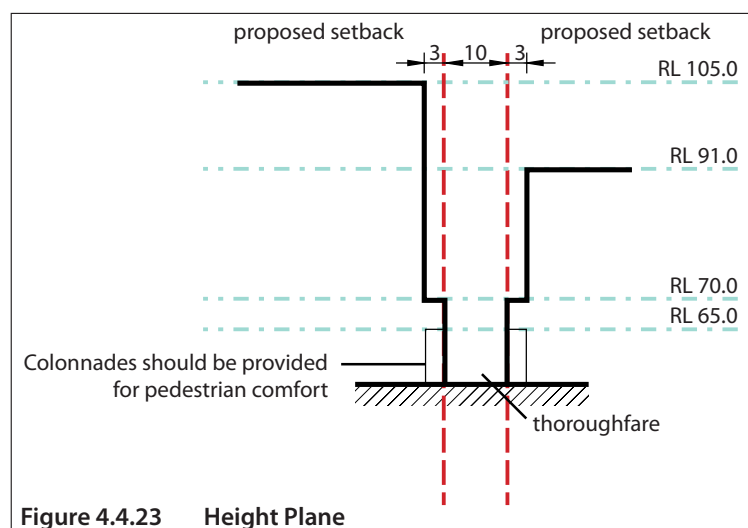
- a. A mix of land uses may be permitted or required including:
 - i. Public buildings, community and/or government uses of not less than 2500 m² nett usable floor area;
 - ii. Long Day Child care catering for 60 babies, toddlers and preschool children;
 - iii. A publicly accessible plaza of 2000 m²;
 - iv. Occasional day care catering for 40 children;
 - v. Shops up to a maximum 45% of the permissible development nett useable floor area of the precinct; and
 - vi. Residential development not less than 15% of the permissible nett useable floor area of the precinct.
- b. The street or plaza level, and the first storey immediately above, of all development in Precinct 2 shall be retail, commercial, government, community or other active uses to ensure well-used and safe (with ample casual surveillance opportunities) streets and public spaces.
- c. The floor to ceiling height of street and plaza levels and the first storey of any building must be a minimum 3.5 m regardless of the proposed use.
- d. Parts of Tucker Street, excluding street corners, may comprise residential development at the ground level subject to the provision of multiple entries and natural surveillance opportunities.

Compatible Land Use

- e. Public open space will be the subject of Management Plans that will safeguard use of public open space for community events, define minimum access requirements and maintenance regimes.
- f. Apartments near public open space must have built-in acoustic mitigation controls to ensure that activities in the public domain will not adversely affect the amenity of residents. The objective of this provision is to protect the long term use of public open space for civic and community events.
- g. The boundaries between adjoining publicly owned and privately owned public domain spaces should be indiscernible. Paving, soft landscaping, street furniture and the like shall be in accordance with the Ryde Town Centre Public Domain Plan.
- h. Outdoor dining, street markets and other active uses are encouraged in the public domain, subject to Council consent. Refer to Ryde Town Centre Public Domain Plan and Council's Footpath Activity Policy and discuss lease arrangements with the City of Ryde Property Services.
- i. Residential development should incorporate the principles the Coastal Apartment Building type outlined in the Residential Flat Design Pattern Book (NSW Government Architect and Urban Design Advisory Service). This building type emphasises outdoor living and an interactive public domain interface.

Development of the Whole of the Precinct

- j. This plan envisages the enhancement of public infrastructure and the demolition of the Top Ryde Shopping Centre as part of the redevelopment of the whole of Precinct 2.
- k. The redevelopment of the whole of Precinct 2 must include a public plaza, a pedestrian thoroughfare, a pedestrian footbridge over Devlin Street, grade separated vehicular access and new amenities for bus users.
- l. The pedestrian thoroughfare (provided in accordance with the Public Domain Control Drawing in this Plan) shall have the following attributes:
 - i. 10 m wide and connecting Pope Street and Blaxland Road;
 - ii. Clear sight lines from one end to the other;
 - iii. Active frontage lining both sides of the thoroughfare;
 - iv. Building Height Plane (refer to Figure 4.4.22) shall apply to the built form either side of the thoroughfare;
 - v. A preferred minimum 60% solar access on the ground plane for a minimum 2 hours between 10 am and 2 pm mid-winter; and
 - vi. Active frontages for the full length.



Note: Colonnades – To promote pedestrian comfort and safety, cover must be continuous, with unobstructed sightlines and a width to height ratio of at least 1:2. A benchmark example is the GPO colonnade, Martin Place.

- m. An application for the demolition of buildings within Precinct 2 will be considered as part of an application for the whole of the Precinct and must be accompanied by:
 - i. A full Archival Recording prepared in accordance with the NSW Heritage Division guidelines. Two original copies of the Archival Recording must be submitted to Council for accession to the Library collection;
 - ii. An Archaeological Management Strategy prepared in accordance with the NSW Heritage Division guidelines; and
 - iii. An Interpretation Plan that is linked to the Arts and Cultural Plan for the site.
- n. The public plaza shall have the following attributes:
 - i. An area not less than 2,000 m²;
 - ii. Dimensions not less than 30 m measured in any direction;
 - iii. Areas within the public plaza may be utilised for out-door dining and commercial activities subject to retaining 1,500 m² clear of obstructions;
 - iv. Paved and finished generally in accordance with the Ryde Town Centre Public Domain Plan to the satisfaction of Council;
 - v. Accessible from Pope Street including for people with disabilities;
 - vi. 80% solar access (excluding shadows cast by trees) for at least 2 hours between 10 am and 2 pm midwinter;
 - vii. Hard and soft landscaping that is attractive, sustainable, robust and durable;
 - viii. Capable of hosting civic and community events such as outdoor cinema or theatre performances, seminars, markets and the like;
 - ix. Accessed by the thoroughfare connecting Pope Street and Blaxland Road; and
 - x. Active frontages to all built edges.



Figure 4.4.24 An artist's impression of a public plaza and through site link in Precinct 2

- o. The pedestrian footbridges linking over Devlin Street shall demonstrate design excellence and be to the satisfaction of the Roads & Maritime Services and Council, and have the following attributes:
 - i. Footway widths as prescribed in LEP 2014;
 - ii. Safety barriers;
 - iii. Weather protection from wind and rain;
 - iv. Natural ventilation and natural light;

- v. Surveillance opportunities and clear sightlines from one end to the other;
- vi. Lighting in accordance with Australian Standard AS/NZS 1158.3.1:1999:Road lighting – Pedestrian area (Category P) lighting – Performance and installation design requirements.
- vii. Demonstrate design excellence;
- viii. Include public art and opportunities for community information signage; and
- ix. Accessibility for all (however, ramps are not preferred).



Figure 4.4.25 An example of design excellence: a footbridge designed by Ed Lippman, joint winner of a design competition sponsored by the RMS and NSW Government Architect.

- p. Advertising may be permitted on the footbridge provided that it:
 - i. Is integrated in the overall design;
 - ii. Contributes positively to the identity of Ryde Town Centre and does not detract from the civic qualities of the Town Centre;
 - iii. Targets road users and is not visible from nearby residential areas and from the wider view catchment; and
 - iv. Does not include flashing illuminated signage.
- q. Amenities for bus users are to be provided on Devlin Street and the whole of Blaxland Road as part of the redevelopment of Precinct 2. Amenities for bus users shall include but should not be limited to:
 - i. Weather protection in the form of shelters and / or continuous awnings. Glass awnings and shelter roofs will not be acceptable unless it can be demonstrated that: -
 - a cleaning and maintenance regime will be established;
 - solar protection can be achieved;
 - lighting will be installed to the underside of the awning;
 - Information and directional signage that will assist public transport users including maps and timetables;
 - Slip-lanes and like infrastructure that will facilitate road safety and reduce impacts on vehicular traffic movements to the satisfaction of the State Transit Authority, RMS and Council;
 - Appropriate lighting in accordance with Australian Standard AS/NZS 1158.3. 1:1999: Road lighting – Pedestrian area (Category P) lighting – Performance and installation design requirements; and
 - Clear unobstructed sightlines between bus waiting areas and kerb side road lane.
- r. Development is required to ensure appropriate provision for pedestrian access in Devlin Street in conjunction with the implementation of vehicular access ramps to the Precinct to the satisfaction of Council. A footpath 3 m wide is preferred between the building face and access ramp.

- s. The consolidation of bus stops in Blaxland Road and Devlin Street where user safety, amenities and convenience will be improved. The relocation of bus stops is to be to the satisfaction of Council, the Roads and Maritime Services and the State Transit Authority.
- t. Development is required to implement Part 7.1 Water Wise, Energy Smart by applying integrated management and design solutions to the site as a whole. The redevelopment of the whole of Precinct 2 should include the following:
 - i. Minimisation of potable water consumption including provision for water harvesting, storage and recycling;
 - ii. On site treatment to improve water quality; and
 - iii. Minimisation of energy consumption utilising a range of initiatives including roof gardens, daylight penetration, stack ventilation, energy cogeneration and so on.
- u. A Design Quality Plan that demonstrates, to the satisfaction of Council, how quality design will be achieved both for the site layout and built form. The Plan must include a design statement detailing how the objectives of this Part are addressed, and if relevant, the principles of the Residential Flat Design Code. The Design Quality Plan should include proposals to achieve high quality design outcomes that may include:
 - i. Proposals for more than one architect to design the buildings above the podium level in order to contribute interest and diversity to the outcome;
 - ii. Proposals to engage emerging and established design professionals with a reputation for high quality design; and
 - iii. Staging competitions for elements of the development including the design of individual buildings, the pedestrian footbridge, artworks, street furniture and the like.
- v. Public Domain Enhancement Plan that shows, to the satisfaction the Council, how:
 - i. Pedestrian amenities and the public domain around the site, including Devlin Street, Pope Street, Tucker Street and Blaxland Road are enhanced and expanded;
 - ii. Connections with Church Street and Smith Street are enhanced; and
 - iii. Wind impacts will be managed in addition to proposed design responses and mitigation measures to ensure the comfort of pedestrians.
- w. An Arts and Cultural Plan that shows to the satisfaction of Council how public art will be incorporated in the development. The arts and cultural plan should be prepared in accordance with section 3.9 of this plan. It should also include an Interpretation Strategy for the heritage significance – the aesthetic, social, historical and architectural qualities -- of the Top Ryde Shopping Centre.
- x. Traffic Management Plan that demonstrates to the satisfaction of Council and the RMS how access to the site will be managed including but not limited to demonstrating that:
 - i. Most traffic accessing Precinct 2 will have direct access from Devlin Street;
 - ii. The impact of vehicular traffic on nearby development, including the school and residential areas, is minimised; and
 - iii. The proposal facilitates convenient bus usage.
- y. A Pedestrian Access and Mobility Plan that demonstrates to the satisfaction of Council that pedestrian priority, safety and amenity is enhanced.
- z. A Staging Plan that demonstrates to the satisfaction of the Council that delivery of civic and public domain space is prioritized.
- aa. A Construction Management Plan that demonstrates to the satisfaction of council that social and environmental sustainability is addressed and potential adverse impacts on local communities appropriately managed during construction.

8.3 Precinct 3 - Main Street

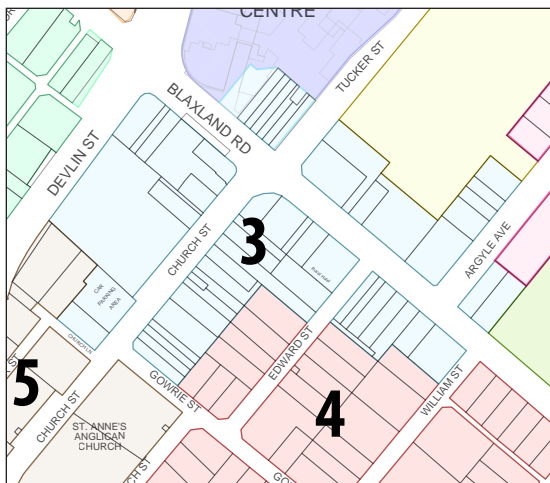


Figure 4.4.26
Main Street Precinct



Figure 4.4.27 **Indicative Plan - Main Street Precinct**

By 1919, Blaxland Road (then Parkes Street) was a thriving main street with at least two banks, the School of Arts, a cluster of shops and the Town Hall (before relocation to the Civic Centre in 1964). Trams ran along both Blaxland Road and Church Street and as the village expanded, shops were naturally located along the tram route in Church Street.

The Blaxland Road and Church Street are now characterised by two storey retail and commercial buildings, many dating from the early twentieth century. While the building stock and public domain is run down, the streetscape architectural charm is derived from the uniform scale and early twentieth century architecture.

8.3.1 Future Character

Main Street Precinct will be attractive, vibrant and safe with a diverse range of neighbourhood shops, living and business accommodation and a high quality public domain that encourages social interaction.

Objectives

1. To reclaim a role as the “main” street through public domain enhancements and encouraging development that activates the streets through at least a twelve-hour day.
2. To discourage through traffic.
3. To encourage new mixed-use development that includes residences, retail and commercial activities and will meet emerging work and lifestyle needs.
4. To adapt, re-use and recycle existing early twentieth century building stock, which underpins the established character of the precinct.
5. To establish a vibrant atmosphere with outdoor dining, markets and the like particularly in Church Street.

Controls

- a. Mixed-use development comprising a combination of residential development with compatible retail, commercial, residential and other uses are permitted.
- b. Active uses such as residential entries, civic, retail and commercial uses are required on ground level street and public domain frontages. Refer also Section 3, Public Domain of this Part.
- c. Active uses including commercial and retail uses shall comprise the street frontage for a depth of at least 10 m.
- d. The minimum floor to ceiling height for the street level and the first storey of any building must be 3.5 m to accommodate a range of uses over time.
- e. Provide laneways in accordance with Figure 4.4.29 Possible Laneways Control Drawing.
- f. All laneways indicated on Figure 4.4.29 Possible Laneways Control Drawing are to be a minimum of 8m wide. This is to include a 6m wide carriageway and a footpath a minimum 1.5m wide.
- g. Where a laneway is required, development incentives will apply. Refer Ryde Local Environmental Plan 2014.

Note: Reference to the provision of laneway access in LEP 2014 height and floor space incentive clauses means:

- (1) the provision of a new laneway in a location required by Council to achieve public benefit
 - (2) the provision of laneway widening of an existing laneway in a location required by Council to achieve public benefit
- h. Residential development shall incorporate the principles for Urban Apartments outlined in the Residential Flat Design Pattern Book, (NSW Government Architect and Urban Design Advisory Service).



Figure 4.4.28 The apartment building, pictured, is an example of the urban apartment typology in the Residential Flat Design Pattern Book. The scale and massing of this development responds to the existing shop-fronts.



Figure 4.4.29 Possible Laneways Control Drawing



Figure 4.4.30 Church Street, looking toward Blaxland Road c.1912

Note: The first storey verandahs over the footpath provide a historic precedent for new verandahs. Awnings and first storey verandahs extend over footpath.

- i. First storey verandahs over the pavement may be permitted in Church Street and Blaxland Road subject to RMS and Council approval.
- j. First storey verandahs must be setback at least 600 mm from the kerb edge and may not extend from the building face more than 3000 mm. They must have an awning or roof above and lighting to the underside to ensure safety and security for pedestrians.
- k. The boundaries between adjoining publicly owned and privately owned public domain spaces should be indiscernible. Paving, soft landscaping, street furniture and the like shall be in accordance with the Ryde Town Centre Public Domain Plan.
- l. Outdoor dining, street markets and other active uses are encouraged in the public domain, subject to Council consent Refer to Ryde Town Centre Public Domain Plan and Council's Footpath Activity Policy and discuss lease arrangements with the City of Ryde Property Services



**Figure 4.4.31
Blaxland Road and Church Street
Intersection c1919**

8.3.2 Retail Development In Precinct 3

Objectives

1. To establish a character that differentiates Ryde Town Centre and its retail environment from that of other retail environments and offers experiences that contrast with internalised shopping malls.
2. To reinforce the traditional main street character of Blaxland Road and Church Street.

Controls

- a. To promote pedestrian safety, security and amenity, the width of shops to streets where Active Frontage is required should be not greater than 20 lineal metres. Refer Active Frontages Control Drawing in section 3 Public Domain.
- b. Arcades, galleria and access ways shall be a minimum 3 m wide and clear of obstacles such as kiosks, seating, furniture advertising structures and the like.
- c. Vertical transportation within retail development shall be clearly visible and located for ease of access.

8.3.3 Argyle Street

Objectives

1. To provide a transition between the Main street retail character and Precinct 10 Low Density Fringe with its residential character, high levels of amenity bordering the park and connectivity with the town centre.
2. To protect the amenity of Ryde Public School.

Controls

- a. The maximum building length at the street frontage shall be 40 m to ensure that the building scale provides a transition between the Mainstreet Precinct and low density residential development. The design is to articulate the facade and reflect traditional shopfront or terrace housing widths of approximately 20 m.
- b. Where residential development is located at ground level provide:
 - i. Direct street access / entry for ground floor apartments
 - ii. Front Gardens in the street setback
- c. Development is to provide Setbacks in accordance with Figure 4.4.07 section 4.2 Setbacks and Build-to Lines of this Part of Ryde DCP
- d. Development is to comply with Figure 4.4.30 and to have regard to the amenity of Ryde Public School playgrounds, classrooms and other facilities.

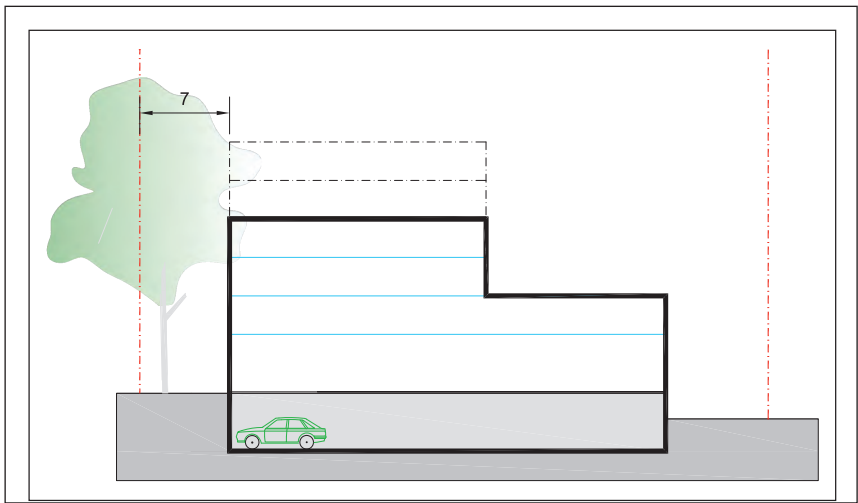


Figure 4.4.32 Height Control Plane

8.4 Precinct 4 - Residential

8.4.1 Future Character

Residential Precinct will be a compact living environment well serviced by public transport, retail, leisure and work opportunities within the Town Centre. It will comprise quality residential buildings in garden settings with a high level of amenity.

Objectives

1. To achieve quality design solutions.

Controls

- a. Applications for proposals that incorporate residential flats are to be accompanied by a Design Statement detailing how the proposal meets the Design Quality Principles of the Residential Flat Design Code.
- b. Residential development shall incorporate the Garden Apartment Building design principles expressed in the Residential Flat Design Pattern Book, NSW Government Architect and Urban Design Advisory Service.

8.5 Precinct 5 - Heritage

The Heritage Precinct is a cultural landscape that derives cultural and heritage significance from several Victorian civic and public buildings, such as the former Courthouse the Wesleyan Church complex and St Anne's Church and cemetery. The architecture of these public buildings is generously proportioned with high-pitched roofs, deeply set reveals and enriched by building materials such as sandstone, dark brick and slate.

St Anne's and the Wesleyan Church complex were significant as centres of community and public life and contribute to the longstanding civic role of the Ryde Town Centre. The hilltop location of this Church Group influenced the layout of the town plan, while the buildings help tell the story of Ryde's early history and development. The landscaped grounds and mature trees are important natural and open space resources for the area and contribute to the valued qualities of the Precinct. Sandstone kerb, fences and other historic elements enrich the settings of the many heritage items in the Precinct.

8.5.1 Future Character

Heritage Precinct will value enhance and interpret heritage resources and cultural landscapes.



Figure 4.4.33 Images from Precinct 5

Objectives

1. To protect and enhance significant views.
2. To conserve and enhance items of cultural and heritage significance, including significant mature landscapes.
3. To conserve and enhance heritage values of the area.
4. To ensure that a distinct character is retained and enhanced.

Controls

- a. Contributory Elements add to the significant qualities of Heritage Items and Precinct 5 as a whole. Contributory Elements within Precinct 5 include:
 - i. All structures, elements and landscapes within the property boundary of a Heritage Item.
 - ii. Sandstone kerbing, retaining walls, mature trees and like historic elements in the public domain.
 - iii. Streetscape Elements identified in section 4 of this Part.
- b. Contributory items should be retained and conserved. Intrusive features should be replaced with appropriate compatible features that are sympathetic with or will enhance the significance of heritage items and Precinct 5.
- c. All new development shall be compatible with the height, scale, built form, architectural character and curtilage of Heritage Items and Contributory Elements.
- d. The material qualities of new development shall reflect and include the predominant building materials of heritage items in the vicinity and precinct.
- e. New development shall retain the general existing pattern within Precinct 5 of buildings set within a landscaped grounds.
- f. Existing landscape settings shall be retained and conserved
- g. Places of heritage value shall be interpreted in appropriate and meaningful ways. An Interpretation Plan must be submitted to Council if requested by Council's heritage officer. An Interpretation Plan may be linked or part of an Arts and Cultural Plan. Refer section 3 of this Part.

8.6 Commercial Edge Precincts

The Commercial Edge Precincts are gateways to the Ryde Town Centre and negotiate a change from residential development to a vibrant urban environment. The commercial edge precincts are characterised by a mix of existing residential flats, commercial and entertainment activities and are located on important public transport and arterial road corridors. The objectives and controls relate to Precincts 6, 7, 8 and 12.

Objectives

1. To create an appropriate transition between the Ryde Town Centre and adjoining residential areas.
2. To encourage appropriate development on the arterial roads including Devlin Street, Church Street and Victoria Road.
3. To create a vibrant, active and safe pedestrian environment.
4. To encourage development that responds to the heritage significance of items in the centre including Ryde Public School, St Anne's and former Wesleyan Churches, Ryde Park, and the Queen Victoria Diamond Jubilee Fountain.
5. To encourage quality design and gateway development.

Controls

- a. Mixed-use development comprising a combination of residential development and compatible retail, commercial, entertainment and other uses is encouraged in order to achieve the Future Character for Commercial Edge Precincts
- b. Refer Active Frontage Control Drawing, section 3 of this Part. Where required, provide active frontage (including residential building entries, commercial and retail uses) at the ground level street frontage for a depth of at least 10 m.
- c. Provide paving, gateway and other signage, street furniture, public art and landscaping in accordance with the Ryde Town Centre Public Domain Plan.

8.6.1 Precinct 6 - Commercial Edge North

Future Character

The Commercial Edge North is located at the busy intersection of Blaxland Road, Devlin Street, Lane Cove Road and Pope Street. It negotiates a transition between the busy shopping centre, arterial roads, quiet residential streets and Ryde Public School (which incorporates a nineteenth century State Heritage listed building by Government Architect Edmund Blackett).

The Commercial Edge North will develop a character that responds to the public plaza located on Pope Street and a pedestrian thoroughfare through the shopping centre connecting to Blaxland Road, facilitating walking and cycling in the Ryde Town Centre. Pope Street will be suited to outdoor dining and other activities compatible with an urbane public domain.

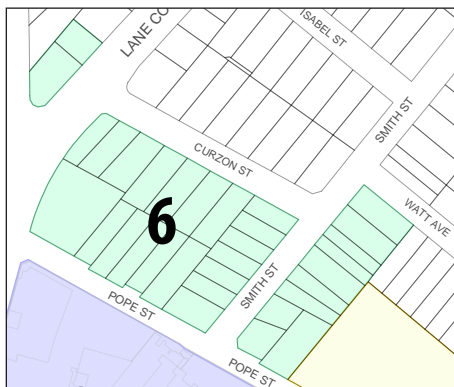


Figure 4.4.34
Commercial Edge North



Figure 4.4.35
Indicative Plan - Commercial Edge North

Note: This plan indicates the built form layout of the precinct

8.6.2 Precinct 7- Commercial Edge West

Future Character

The Commercial Edge West is located along Devlin Street terminating at the intersection of Victoria Road, Devlin Street and Church Street. Its location adjoining the grade-separated intersection of Victoria Road and Devlin Street contributes to its isolation from the Ryde Town Centre. The precinct runs along the ridgeline and has superb views to the south and west which are suited to residential development. Building design should respond to manage the western orientation and location on a very busy intersection.

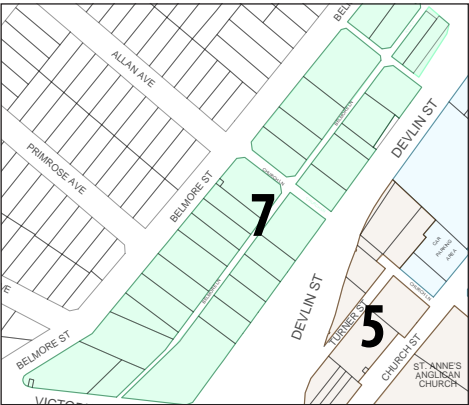


Figure 4.4.36
Commercial Edge West



Figure 4.4.37
Indicative Plan - Commercial Edge West

Note: This plan indicates the built form layout of the precinct. Uncoloured portions of the precinct are developed as residential flat buildings

8.6.3 Precinct 8 - Commercial Edge East

Future Character

The Commercial Edge East is centred on the busy intersection of Blaxland Road and Victoria Road. It negotiates a transition between the busy shopping precincts, arterial roads, quiet residential streets and heritage listed Ryde Park. Ryde Park supports residential amenity for the whole for the town centre.

The Commercial Edge East will be a gateway to the Ryde Town Centre and an anchor for Blaxland Road - Ryde's main street. Development will be designed to enhance views to and from Ryde Park and to promote pedestrian safety and activity.

Under the provisions of Ryde Local Environmental Plan 2014 the precinct includes both Mixed-Use and Enterprise Corridor Land Use Zones. In order to protect and enhance the commercial character and employment opportunities of the precinct, residential development is permitted in the Enterprise Corridor, but only as part of a mixed development.



Figure 4.4.38
Commercial Edge East



Figure 4.4.39
Indicative Plan - Commercial Edge East

Note: This plan indicates the built form layout of the precinct

Controls

- Provide modulation of the façade to reduce the mass and scale of buildings.
- The maximum length of buildings is to be 40 m.
- Articulate a strong top and base to built form. Roof treatments should be interesting and step with the topography.

Note: Upper level setbacks will assist to create a "top"

- A varied pallet of materials and finishes is required to assist with reducing massing and scale.
- Massing and height to be concentrated along Victoria Road.

- f. Ensure that parking is not visible from Victoria Road or Blaxland Road. Basement parking is encouraged.
- g. Retain the existing eucalypts along the street frontage adjoining 2-18 Blaxland Road. A setback of at least 7 m along Blaxland Road is required to retain the existing trees. An aborist's report must be provided to outline how the health of the trees will be protected during construction and in the long term. The building setback may be increased to ensure the long term health of the eucalypt trees. Refer to section 4.2 Setbacks and Build-to Lines Figure 4.4.07

Note: The eucalypts along Blaxland Road contribute to the streetscape, complementing Ryde Park opposite and provide gateway qualities to the entry to the town centre.

- h. The Princes Street road closure and Benson Place should be upgraded as part of future development of 2-18 Blaxland Road. A public domain upgrade should be sympathetic to the heritage significance of the Queen Victoria Diamond Jubilee Fountain.
- i. Provide pedestrian footbridges over Victoria Road in accordance with the Public Domain Control Drawing linking to residential areas within the Ryde Town Centre catchment. Pedestrian over bridges shall demonstrate design excellence and be to the satisfaction of the Roads & Maritime Services and Council, and have the following attributes:
 - i. A footway not less than 3 m clear wide;
 - ii. Safety barriers;
 - iii. Natural ventilation and natural light;
 - iv. Surveillance opportunities and clear sightlines from one end to the other;
 - v. Lighting in accordance with Australian Standard AS/NZS1158.3.1:1999: Road lighting – Pedestrian area (Category P) lighting – Performance and installation design requirements;
 - vi. Demonstrate design excellence and contribute to the identity of Ryde Town Centre;
 - vii. Include public art and opportunities for community information signage; and
 - viii. Accessibility for all (however, ramps are not preferred).
- j. Advertising may be permitted on the footbridge provided that it:
 - i. Is integrated in the overall design;
 - ii. Contributes positively to the identity of Ryde Town Centre and does not detract from the civic qualities of the Town Centre;
 - iii. Targets road users and is not visible from nearby residential areas and from the wider view catchment; and
 - iv. Does not include flashing illuminated signage.
- k. Traffic management solutions must be provided to the satisfaction of Council to enable appropriate transitions to occur between the Ryde Town Centre and the adjoining residential areas. Traffic management works may be necessary.
- l. The rear landlocked portion of 607-619 Victoria Road, located at the rear of properties fronting Arras Parade and Maze Avenue is to be landscaped and free of dwellings.
- m. The interface areas between low scale residential development and Precinct 8 are to be landscaped and treated to preserve the amenity of neighbouring development.

8.9 Precinct 9 - Ryde Park

8.9.1 Future Character

Ryde Park will be valued as a significant heritage, recreation, leisure and community resource and an important green space in the Town Centre.

Objectives

1. To ensure that the park supports recreation and community activities for visitors, workers and residents of the Ryde Town Centre and the communities of Ryde Local Government Area.

Controls

- a. Implement the principles and recommendations of the Ryde Park Master Plan.

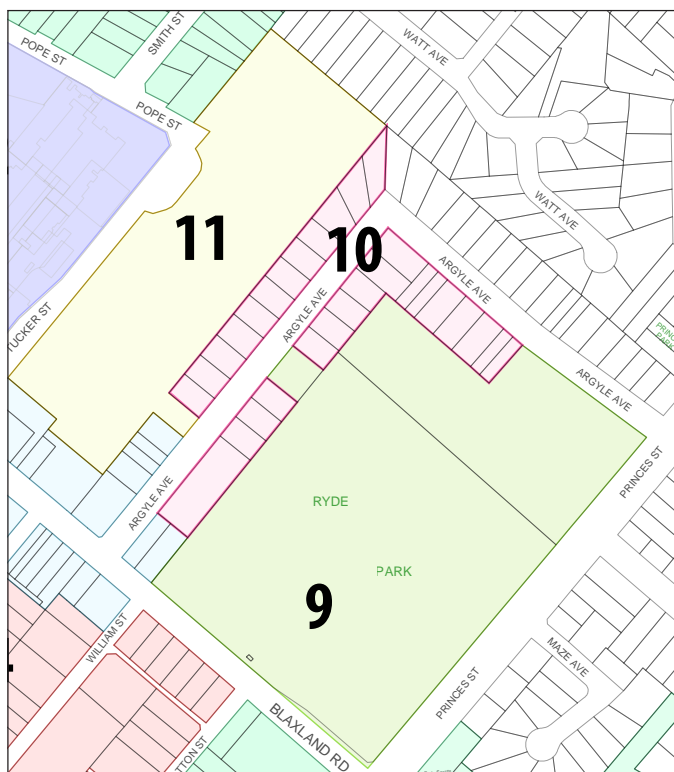


Figure 4.4.40

Ryde Park Precinct, Low Density Residential, Ryde School

8.10 Precinct 10 - Low Density Residential

8.10.1 Future Character

Low-density residential development with homes set in landscaped gardens, will border the park and school. The precinct will have a high level of amenity with proximity to the park shops school and public transport. The width of Argyle Street may be reduced to improve traffic management and pedestrian safety in the block adjoining Blaxland Road.

Objectives

1. Retain the character of homes set in landscaped gardens.

Controls

- a. Refer the *Ryde LEP 2014* for controls relating to low density residential development.

8.11 Precinct 11 - Ryde School

8.11.1 Future Character

Ryde School will be a centre of community life and contribute to a vibrant town centre.

Controls

- In the event of redevelopment, establish a through site link in accordance with the Public Domain Control Drawing in Section 3 of this Part (refer Figure 4.4.02).

8.12 Precinct 12

8.12.1 Commercial Edge South

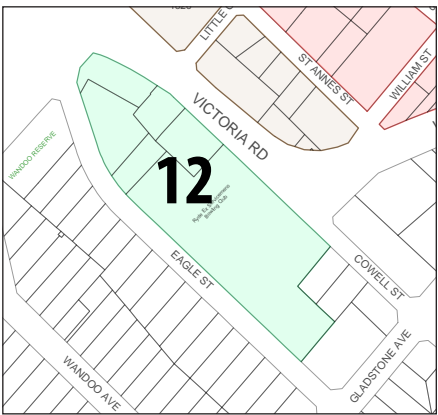


Figure 4.4.41
Commercial Edge South



Figure 4.4.42
Indicative Plan - Commercial Edge South

Controls

- Residential land uses are permissible but only as part of a mixed use development which may include clubs, entertainment, retail. Where residential development is proposed the design and disposition of uses within the precinct must have regard to the amenity of future residents.
- The maximum length of any building is 40 m.
- Notwithstanding the permissible height and FSR under the provisions of the Ryde Local Environmental Plan 2014, built form shall ensure that view lines to and from St Anne's Church and particularly the steeple are protected and that development steps with the topography. Refer to Figure 4.4.41 below.

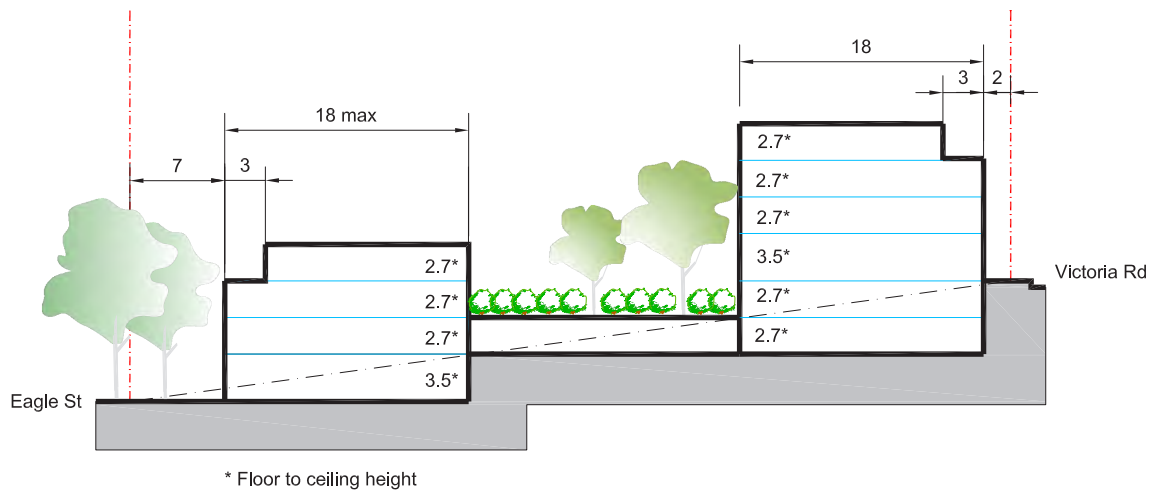


Figure 4.4.43 Cross section through Precinct 12

- d. Provide a pedestrian through-site link a minimum 6 m wide connecting Eagle Street to Victoria Road. The through site link is to have direct line of sight and be accessible for all.
- e. Residential land uses are not permitted at the ground level Victoria Road frontage
- f. The footpath is to be widened along Victoria Road and public domain designed so as to enhance accessibility and pedestrian safety.
- g. Retail and commercial land uses are not permitted fronting Eagle Street.
- h. On site car parking is not to be visible from Eagle Street.
- i. Direct street access and entry is required for ground floor apartments in Eagle Street. Terrace style 2 storey apartments with stack ventilation are preferred if residential development is proposed at the ground level in Eagle Street.
- j. Front gardens should be provided in the Eagle Street setback (Refer Figure 4.4.07).



City of Ryde
Civic Centre
1 Devlin Street
Ryde NSW 2112

www.ryde.nsw.gov.au

City of Ryde Development Control Plan 2014

Part: 4.5 Macquarie Park Corridor

Translation

ENGLISH

If you do not understand this document please come to Ryde Civic Centre, 1 Devlin Street, Ryde Monday to Friday 8.30am to 4.30pm or telephone the Telephone and Interpreting Service on 131 450 and ask an interpreter to contact the City of Ryde for you on 9952 8222.

ARABIC

إننا نعتذر عليك فهم محتويات هذه الوثيقة، نرجو للحضور إلى مركز بلدية رايد Ryde Civic Centre على العنوان: 1 Devlin Street, Ryde 1 من الاثنين إلى الجمعة بين الساعة 8.30 صباحاً والساعة 4.30 بعد الظهر أو الاتصال بمكتب خدمات الترجمة على الرقم 131 450 لكي تطلب من أحد المترجمين الاتصال بمجلس مدينة رايد، على الرقم 9952 8222، نيابة عنك.

ARMENIAN

Եթէ այս գրութիւնը չէք հասկնար, խնդրեմ եկէք՝ Բայր Սիվիլ Սենթըր, 1 Տելվին փողոց, Բայր, (Ryde Civic Centre, 1 Devlin Street, Ryde) Երկուշաբթիէն Ուրբաթ կ.ա. ժամը 8.30 – կ.ե. ժամը 4.30, կամ հեռաձայնեցէք Հեռաձայնի եւ Թարգմանութեան Սպասարկութեան՝ 131 450, եւ խնդրեցէք որ թարգմանիչ մը Բայր Քաղաքապետարանին հետ կապ հաստատուէ ձեզի համար, հեռաձայնելով՝ 9952 8222 թիվին:

CHINESE

如果您看不懂本文，請在周一至周五上午 8 時 30 分至下午 4 時 30 分前往 Ryde 市政中心詢問 (Ryde Civic Centre, 地址: 1 Devlin Street, Ryde)。你也可以打電話至電話傳譯服務中心，電話號碼是: 131 450。接通後你可以要求一位傳譯員為你打如下電話和 Ryde 市政廳聯繫，電話是: 9952 8222。

FARSI

اگر این مدرک را نمی فهمید لطفاً از 8.30 صبح تا 4.30 بعد از ظهر دوشنبه تا جمعه به مرکز شهرداری رايد، Ryde Civic Centre, 1 Devlin Street, Ryde مراجعه کنید یا به سرویس مترجم تلفنی، شماره 131 450 تلفن بزنید و از یک مترجم بخواهید که از طرف شما با شهرداری رايد شماره 9952 8222 تلفن بزند.

ITALIAN

Se non capite il presente documento, siete pregati di rivolgervi al Ryde Civic Centre al n. 1 di Devlin Street, Ryde, dalle 8.30 alle 16.30, dal lunedì al venerdì; oppure potete chiamare il Telephone Translating and Interpreting Service al 131 450 e chiedere all'interprete di contattare a vostro nome il Municipio di Ryde presso il 9952 8222.

KOREAN

이 문서가 무슨 의미인지 모르실 경우에는 1 Devlin Street, Ryde 에 있는 Ryde Civic Centre 로 오시거나 (월 – 금, 오전 8:30 – 오후 4:30), 전화 131 450 번으로 전화 통역 서비스에 연락하셔서 통역사에게 여러분 대신 Ryde 시청에 전화 9952 8222 번으로 연락을 부탁드립니다.

Amend. No.	Date approved	Effective date	Subject of amendment
	23 June 2015	1 July 2015	Updated to: - support the Ryde LEP 2014; - reflect NSW legislation; - provide amended Open Space and Access Network Plans; - support sustainable transport; and - consequential amendments.

Table of Contents

1.0	PRELIMINARY	5
1.1	Introduction	5
1.2	Citation	5
1.3	Land Covered by this Part	5
1.4	Relationship with Other Plans and Policies	7
1.5	Aims and Purpose of this Part	8
1.6	How to use this Plan	9
2.0	VISION	11
3.0	THE STRUCTURE PLAN	12
3.1	Introduction	12
3.2	Urban Structure Plan	12
4.0	ACCESS NETWORK	14
4.1	Streets	15
4.2	Pedestrian Connections	18
4.3	Bicycle Network	21
4.4	Sustainable Transport	23
5.0	PUBLIC DOMAIN	26
5.1	Open Space Network	26
5.2	New open space	28
5.3	Central Park	31
5.4	Shrimptons Creek Park	33
5.5	Riverside Park	34
5.6	Thomas Holt Drive Park	34
5.7	Rail Station Plazas	35
5.8	Street Trees, Front Setback Tree Planting, and Significant Trees	38
5.9	Community Facilities	39
5.10	Art in Publicly Accessible Places	41

Table of Contents

6.0	IMPLEMENTATION – INFRASTRUCTURE, FACILITIES AND PUBLIC DOMAIN IMPROVEMENTS	43
7.0	BUILT FORM	45
7.1	Site Planning and Staging	45
7.2	Activity Centres	45
7.3	Active frontage	46
7.4	Setbacks and Build-to Lines	49
7.5	Awnings and Canopies	51
7.6	Rear and Side Setbacks	53
7.7	Building Separation	54
7.8	Building Bulk and Design	55
8.0	SITE PLANNING AND STAGING	57
8.1	Site Planning and Staging	57
8.2	Site Coverage, Deep Soil Areas and private open space	58
8.3	Planting on Structures	59
8.4	Topography and Building Interface	60
8.5	Site Facilities	62
8.6	Vehicular Access	63
8.7	On-site Parking	64
8.8	Fencing	66
9.0	ENVIRONMENTAL PERFORMANCE	67
9.1	Wind Impact	67
9.2	Noise and Vibration	69
9.3	Bushfire Management	70
9.4	Soil Management	72

1.0 PRELIMINARY

1.1 Introduction

This Part provides a framework to guide future development in the Macquarie Park Corridor, North Ryde. The document specifies built form controls for all development within the Corridor, and sets in place urban design guidelines to achieve the vision for Macquarie Park as a vibrant community and as a place to live, work, and visit.

1.2 Citation

This Part may be cited as City of Ryde Development Control Plan 2014 Part 4.5 - Macquarie Park Corridor.

1.3 Land Covered by this Part

The land covered by this Part is shown in Figure 1.3.1 and is generally bounded by M2 Motorway and Delhi Road on the northeast, Epping Road on the southwest, Culloden Road on the northwest and Lane Cove River to the southeast.

This part does not apply to the North Ryde Station Urban Activation Precinct and the Macquarie University lands.

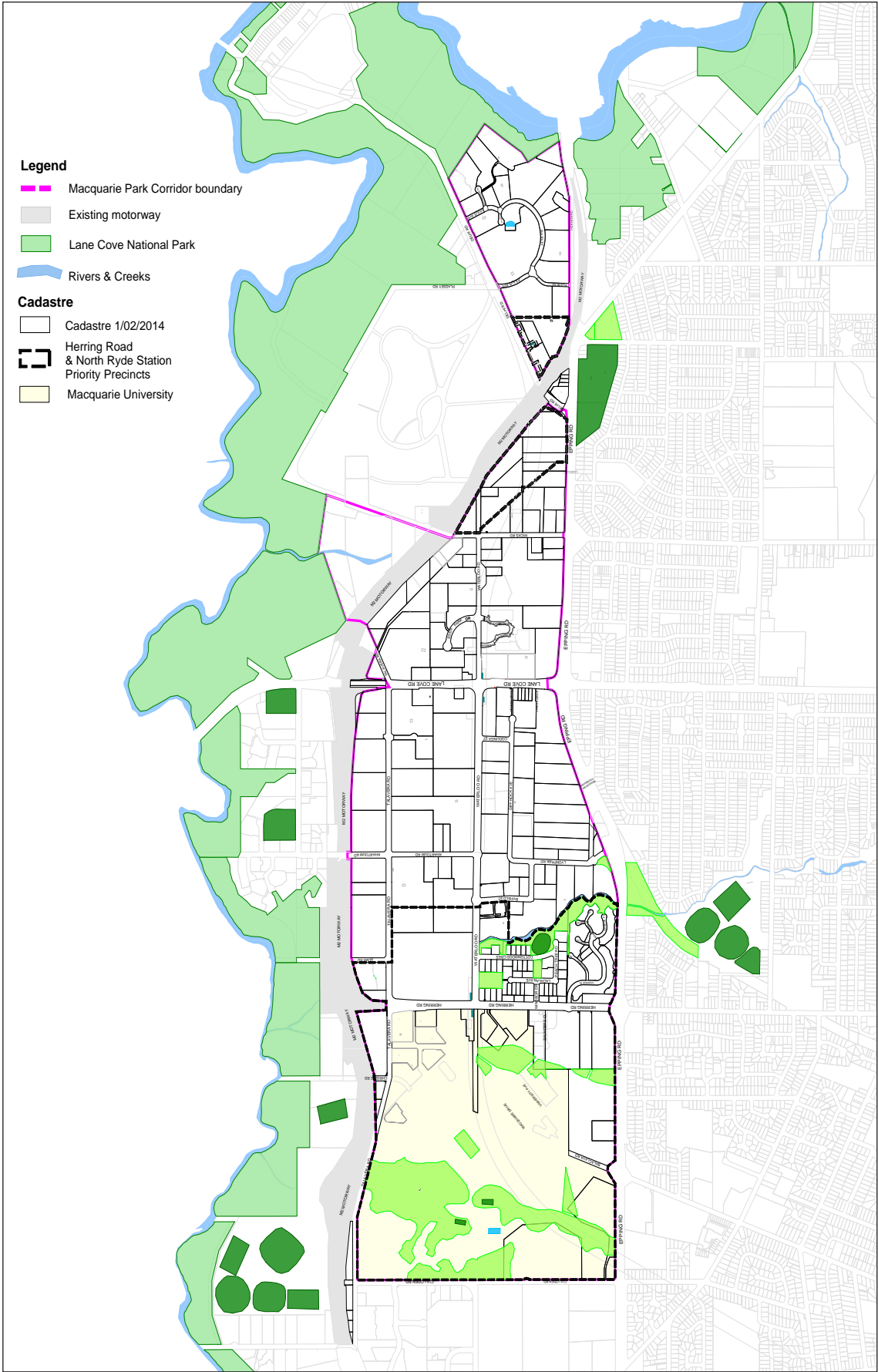


Figure 1.3.1 Land covered by this part

1.4 Relationship with other Plans and Policies

Ryde Local Environmental Plan (LEP) 2014

This DCP Part supplements the Ryde Local Environmental Plan (LEP) 2014 by providing detailed development principles, controls and guidelines. This DCP was brought into effect [insert date] to support planning incentives contained in Ryde LEP 2014 Amendment 1 (Macquarie Park).

In addition to this Part, Ryde LEP 2014, *State Environmental Planning Policy 65 – Design Quality of Residential Flat Development (SEPP 65)* and other relevant State Environmental Planning Policies must also be taken into account when making a development application.

Herring Road Urban Activation Precinct – now known as a Priority Precinct

The *Draft Herring Road Urban Activation Precinct (UAP)* completed exhibition mid-August 2014. The exhibition documents proposed that this DCP applied to the Herring Road UAP land and suggested amendments. The suggested amendments will be incorporated in this DCP when the Herring Road UAP is finalised.

North Ryde Station Urban Activation Precinct – now known as a Priority Precinct

This DCP Part does not apply to the North Ryde Station Urban Activation Precinct – now known as a Priority Precinct.

Macquarie University (shown pale yellow on Figure 1.3.1)

Under the provisions of SEPP (State and Regional Development) the university is listed as a State Significant Site, where development exceeds a capital value of \$30M. Under this SEPP the Ryde DCP does not apply.

The university has an existing Part 3A Concept Plan approval dated 2009. The Part 3A approval applies under the transitional provisions in the SEPP (Major Development). Development in the university is governed by the Part 3A approved Concept Plan and the Macquarie University Urban Design Guidelines and Design Excellence Strategy.

1.5 Aims and Purpose of this Part

The purpose of this Part is to provide objectives, controls and design criteria to achieve desirable development outcomes in line with Council's vision for the Macquarie Park Corridor.

The key aims of this Part are to:

1. To ensure that the Corridor matures into a premium location for globally competitive businesses with links to the University.
2. To ensure that the employment and educational activities within the Corridor are integrated with other businesses and activities within Sydney's global economic arc.
3. To reinforce the importance of the economic function of the Corridor and facilitate employment growth now and into the future (this will include retaining employment lands).
4. To create a centre that is sustainable and that incorporates the principles of ecologically sustainable development
5. To ensure the Corridor will be characterised by a high-quality, well-designed and safe environment that reflects the natural setting and promotes a sense of identity.
6. To create an urban structure that will:
 - a. Promote a balance of commercial and non-commercial (such as educational and residential) uses within the Corridor.
 - b. Promote the commercial core and business park areas for commercial activity and employment.
 - c. Provide a transition from the more intense development along the main boulevard - Waterloo Road - to peripheral areas characterised by lower-scaled development.
 - d. Focus street and place-making activities to create three accessible and vibrant railway station precincts.
 - e. Capitalise on magnet infrastructure, facilities and services such as the M2, Macquarie University and Macquarie Shopping Centre.
7. To create an access network that will:
 - a. Achieve a more permeable network promoting greater connectivity and integration between land uses and the station precincts.
 - b. Achieve a safe and convenient pedestrian environment that encourages public transport use and social interaction.
 - c. Create additional streets that will:
 - i. Reduce pressure on the existing road and pedestrian infrastructure; and
 - ii. Provide new opportunities for business and street addresses.
8. To create an open space network that will:
 - a. Include a network of diverse active and passive recreation spaces to support the residential and working populations of the Corridor; and
 - b. Provide safe, accessible, sustainable, well-used and designed public open spaces within the Corridor.

1.6 How to us this Plan

SECTION	INTENDED EFFECT
1.0 PRELIMINARY 1.1 Introduction 1.2 Citation 1.3 Land Covered by this Part 1.4 Relationship with other Plans and Policies 1.5 Aims and Purpose of this Part 1.6 How to use this Plan	This section gives an overview of the DCP and its relationship with other plans
2.0 VISION	Describes the future character of the Macquarie Park Corridor (derived from consultation and the Sydney Metro Strategy)
3.0 THE STRUCTURE PLAN 3.1 Introduction 3.2 Urban Structure Plan	Provides an urban structure plan that articulates the land use structure of the Macquarie Park Corridor including: <ul style="list-style-type: none"> - where residential communities will develop - the locations of the business and retail cores - the lower scaled, open landscaped, business parks located on the fringes of the corridor adjoining Epping Road, the M2
4.0 ACCESS NETWORK 4.1 Streets 4.2 Pedestrian Connections 4.3 Bicycle Network 4.4 Sustainable Transport	This section of the DCP includes the Access Network Map adopted by Council on 22 October 2103 and controls which support the Access Network
5.0 PUBLIC DOMAIN 5.1 Open Space Network 5.2 New open space 5.3 Central Park 5.4 Shrimptons Creek Park 5.5 Riverside Park 5.6 Thomas Holt Drive Park 5.7 Rail Station Plaza 5.8 Street Tree and Front Tree Planting 5.9 Community Facilities 5.10 Public Art	This section gives guidance to the scale, function, furniture and other requirements for proposed open space. Guidance is also given to the provision of public art and community facilities.
6.0 IMPLEMENTATION – INFRASTRUCTURE, FACILITIES AND PUBLIC DOMAIN IMPROVEMENTS	This section includes guidelines for the implementation of planning incentives (additional building height and floor space defined in RLEP Amendment 1) in return for public infrastructure, in particular streets and parks identified in Sections 4 and 5 of the DCP.

7.0 BUILT FORM 7.1 Site Planning and Staging 7.2 Activity Centres Structure Plan 7.3 Active frontage 7.4 Setbacks and Build-to Lines 7.5 Awnings and Canopies 7.6 Rear Setbacks 7.7 Building Separation 7.8 Building Bulk and Design	<p>This section of the DCP provides controls that determine building design and form – such as setbacks, active frontage, and building separation.</p> <p>Information regarding the zone of influence for the underground rail line (which impacts on setbacks and basement areas) has also been included in the DCP.</p>
8.0 SITE PLANNING AND STAGING 8.1 Site Planning and staging 8.2 Site Coverage, Deep Soil Areas and private open space 8.3 Planting on Structures 8.4 Topography and Building Interface 8.5 Site Facilities 8.6 Vehicular Access 8.7 On-site Parking 8.8 Fencing	<p>This section of the DCP provides controls that determine the overall site layout and design – such as parking design requirements, site coverage and deep soil requirements and even fencing design guidelines (to provide council the basis for not accepting high security fencing (that includes razor wire) such as that around at least one existing data centre in the Macquarie Park Corridor).</p>
9.0 ENVIRONMENTAL PERFORMANCE 9.1 Wind Impact 9.2 Noise and Vibration 9.3 Bushfire Management 9.5 Soil Management	<p>This section of the DCP ensures that environmental comfort (wind and noise) are considered in addition to property protection and safety (bushfire).</p>

2.0 VISION

The vision for the future of the Corridor was developed through a number of community and stakeholder workshops held during 2001. This has been further developed in the preparation of this Part to guide the formation of development objectives, public domain treatments and development controls for the Corridor.



Figure 2.0.1 View east over Macquarie Park Corridor

Macquarie Park Corridor Vision

‘Macquarie Park will mature into a premium location for globally competitive businesses with strong links to the university and research institutions and an enhanced sense of identity.

The Corridor will be characterised by a high-quality, well-designed, safe and livable environment that reflects the natural setting, with three accessible and vibrant railway station areas providing focal points.

Residential and business areas will be better integrated and an improved lifestyle will be forged for all those who live, work and study in the area.’

3.0 THE STRUCTURE PLAN

3.1 Introduction

The Structure Plan sets out the broad framework for development within the Macquarie Park Corridor. It underpins the development controls within this Plan, and is supported by Ryde LEP 2014.

3.2 Urban Structure Plan

The Urban Structure Plan reflects and builds on the existing land uses and functions within the Corridor to implement the vision for Macquarie Park as Australia's premier technology park and premier location for globally competitive business with strong links between Macquarie University and business.

Macquarie Park Corridor will include new residential communities around the North Ryde and Macquarie University Stations while the Commercial Core will be centred on the Macquarie Park Station and Waterloo Road. Intensive development centred on Waterloo Road is proposed to transition through the Business Park areas to the lower scaled residential areas adjoining the Macquarie Park Corridor.

The Commercial Core will evolve from its business park roots to become an urban employment centre supported by key public transport infrastructure notably the Epping to Chatswood Rail Link which opened in 2009 and is due to be expanded to link to Sydney's north west.

The Business Park areas at the edges of the Corridor are characterised by lower density development with green leafy setbacks and attractive landscaping. Many international and Australian technology, research and pharmaceutical companies are located in the business park areas including Optus, Laverty, Canon, CSIRO, Johnson and Johnson and Novartis.

The Macquarie Shopping Centre - NSW second largest shopping mall – has a regional catchment and anchors the Retail Core. This DCP will seek to reinforce the role of the shopping centre as a regional attractor and hub for recreation facilities for families and youth – which currently include one of only two ice skating rinks in Sydney, cinemas and restaurants. The DCP will also encourage the shopping centre to create a vibrant street interface.

Macquarie University is magnet infrastructure attracting tens of thousands of students and staff. The university vision is to integrate private sector research and development with education and health functions with the first stages of this plan realised in the development of the Hearing Hub specialising in auditory technology and the Macquarie University Hospital providing services across a broad range of specialties, including oncology, radiology, neurology and cardiology. The university grounds also include facilities that are open to public such as a swimming pool.

Planned residential communities centred on the North Ryde and Macquarie University Rail Stations provide for more than 10,000 new dwellings close to transport, employment and education facilities. Together the Herring Road and North Ryde Station UAPs and this DCP provide for new residential and working communities supported by new infrastructure including new parks, road connections and community facilities.

This Development Control Plan seeks to enhance the public domain and implement new roads and parks to support future residents, workers, university students and visitors.

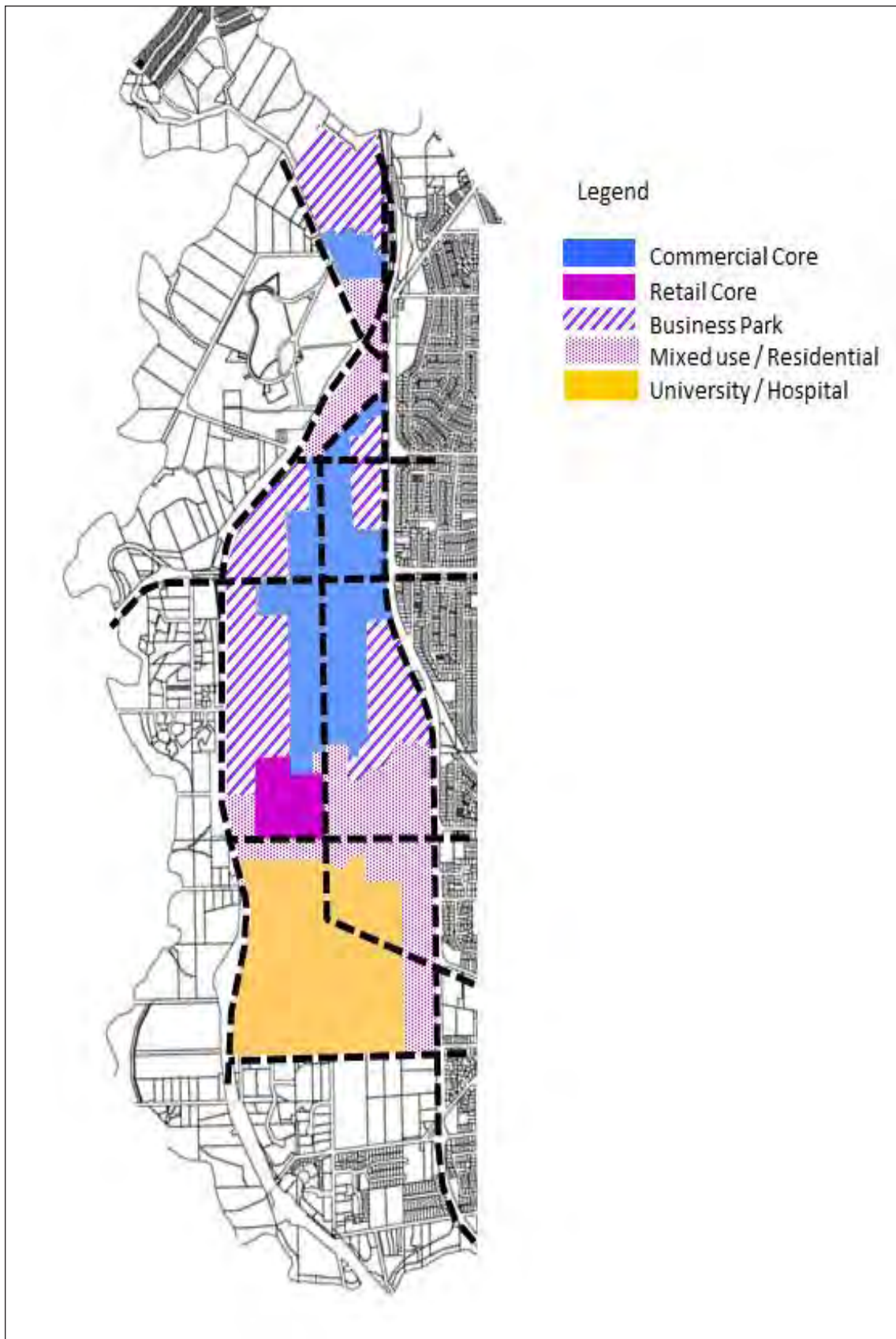


Figure 3.2.1 Urban Structure Plan

4.0 ACCESS NETWORK

The Macquarie Park Corridor is comparable in scale to the City of Sydney (refer below maps) but has fewer roads and route choice. The current block size and building footprint lengthens the walk time for foot trips within the precinct and increases reliance on driving, even for short trips.

The future character of Macquarie Park will include intensifying the Commercial Core and other functions of the Corridor, including its residential areas. An effective transport network is required to service anticipated growth within Macquarie Park.

This DCP aims to create a permeable network of streets and pedestrian ways and to create new streets and laneways. The implementation of this DCP will improve vehicular, pedestrian and cycle permeability within the Corridor.

The Access Network Structure Plan provides a clear hierarchy of street types, including the extension of existing streets and a network of new streets (20m and 14.5m) and pedestrian ways (8m). The Access Network maximises cross connections within the corridor and to surrounding areas.

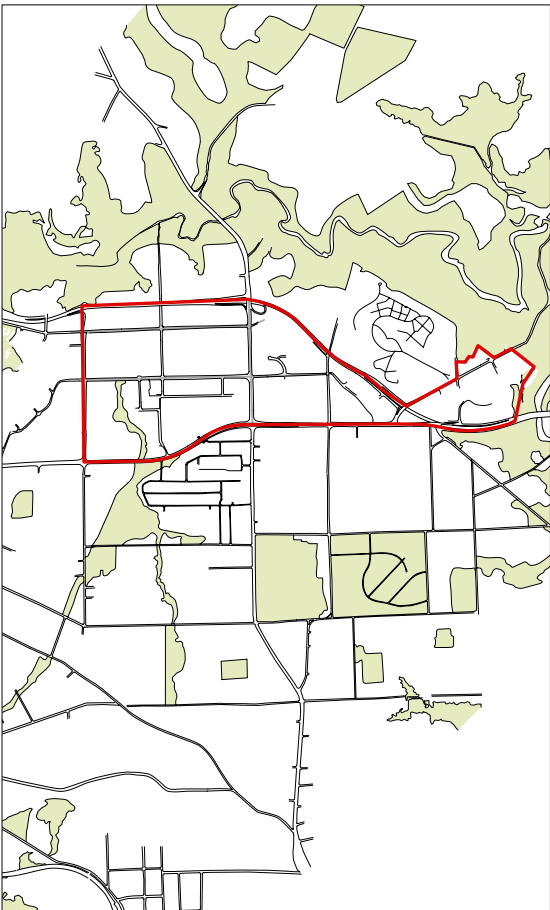


Figure 3.4.2 Macquarie Park Corridor



Figure 3.4.3 Sydney CBD

4.1 Streets

The location of new streets builds upon the existing configuration and layout of Waterloo and Talavera Roads. These streets establish the main alignment of streets with respect to the main axial configuration of the grid. This grid is supported by the alignment of Lane Cove Road in the north-south axis and also establishes the dominant configuration of property boundaries in the area.

Two street types have been identified:

- 20m wide streets
- 14.5m wide streets

These are based on the predominant use and frontages of existing buildings, the varying intensity of existing patterns of access, circulation and movement and the particular topographic conditions across the corridor.

Prior to redevelopment, landowners are to consult with Council at an early stage in the site planning process. Landowners are to consult with Council for details on location and set-out of new streets.

Objectives

1. To provide for new streets to improve pedestrian, cycle and vehicular connectivity within the Corridor.
2. To enhance connectivity with surrounding areas and provide new access points into the Corridor from the surrounding street network.
3. To establish a clear hierarchy of public streets, building on the existing street hierarchy within the Corridor.
4. To accommodate increased traffic movement within the Corridor.
5. To provide additional opportunities for on-street car parking.
6. To promote active transport including walking, cycling and bus public transport usage.
7. To provide a street network that responds to the constraints of topography, existing development and subdivision patterns.

Controls

- a. Provide new public streets and pedestrian connections in accordance with Figure 4.1.1 Access Network.
- b. New streets are to be dedicated to the Council. New streets are to be maintained by the landowner until dedicated to Council.
- c. Buildings are not permitted to be located on any proposed street and are required to be setback from proposed streets identified in Figure 4.1.1 Access Network.
- d. Each site is to provide for co-ordination of proposed streets with neighbouring sites, including level adjustments and detailed plans. This detail is to be provided together with the development application.
- e. Lighting, paving and street furniture, landscaped setbacks and tree planting are to be provided as required in the Macquarie Park Corridor Public Domain Technical Manual.
- f. Provide new Streets as follows
 - i. 20m wide (typical) streets in accordance with Figure 4.1.2
 - ii. 14.5m wide (typical) streets in accordance with Figure 4.1.3

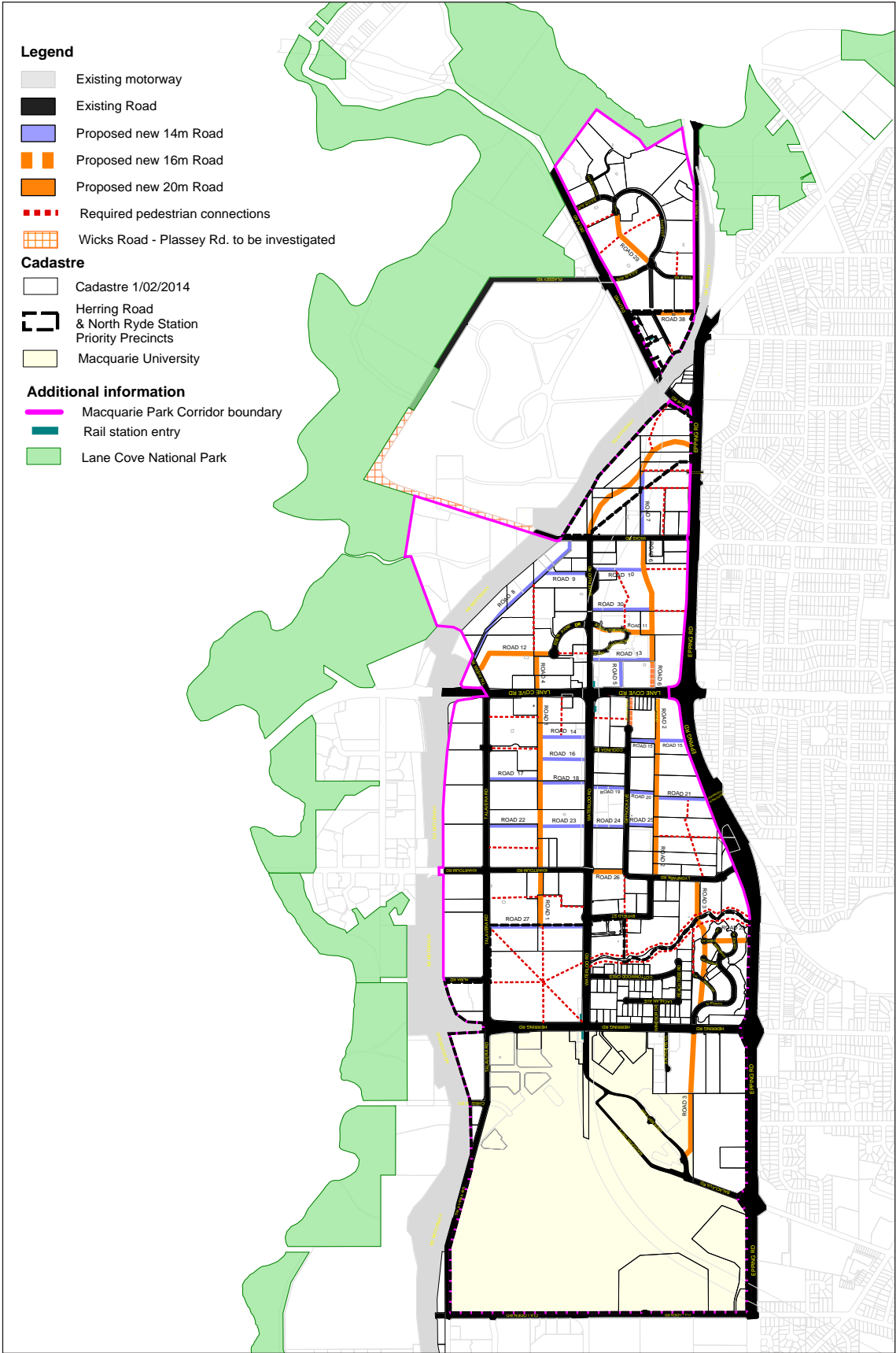


Figure 4.1.1 Access Network

Note: The locations for required pedestrian connections are flexible, subject to Council agreement. Connections should run street to street or connect key points of interest

- g. Where required by Council an additional 0.5m footpath is to be provided to augment the 14.5m streets to achieve a minimum 2.5m footpath

Note: City of Ryde aims to achieve footpaths a minimum of 2.5m wide throughout the Macquarie Park Corridor to cater for the 2031 worker and residential communities.

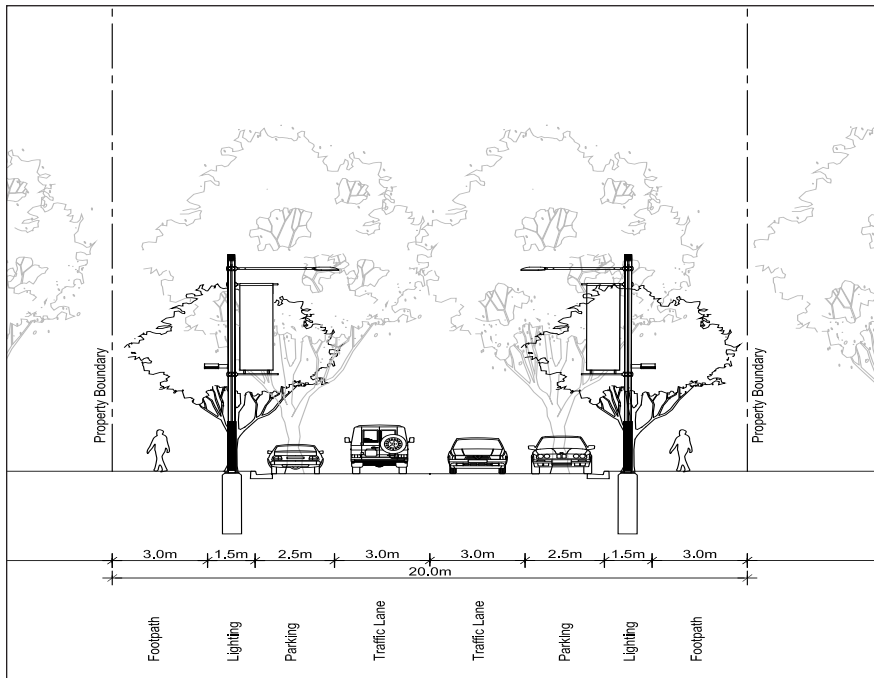


Figure 4.1.2 20m Wide Streets - Typical section

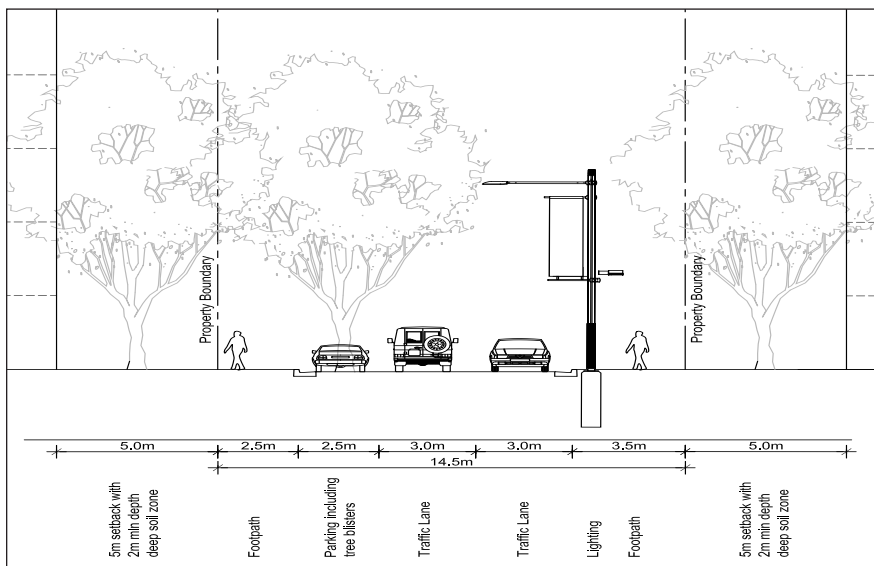


Figure 4.1.3 14.5m Wide Streets - Typical section

4.2 Pedestrian Connections

Through block connections provide a fine-grain overlay to the street and block structure of the Corridor. Pedestrian through-site links are to be provided as they contribute to the walkability of the Corridor by providing a useful addition to the street network and walkable destinations (e.g. building entries, shopfronts, courtyards, outdoor dining). The design of through-site links is to maximise pedestrian accessibility, walkability, amenity and safety. The most successful connections are accessible, continuous, well lit and safe.

Objectives

1. To expand and enhance the pedestrian network, and increase pedestrian permeability throughout the Macquarie Park Corridor.
2. To provide pedestrian connections, across barriers such as the M2, and link to pedestrian amenities, such as the Shrimptons Creek path, Macquarie University station and Macquarie Centre bus interchange in order to promote walking access to public space and public transport.
3. To ensure that through block connections are accessible at all times, continuous, well lit, safe.
4. To provide equitable access for all.
5. To promote pedestrian activity and contribute to the vitality of the Macquarie Park Corridor.
6. To encourage active uses adjoining pedestrian ways

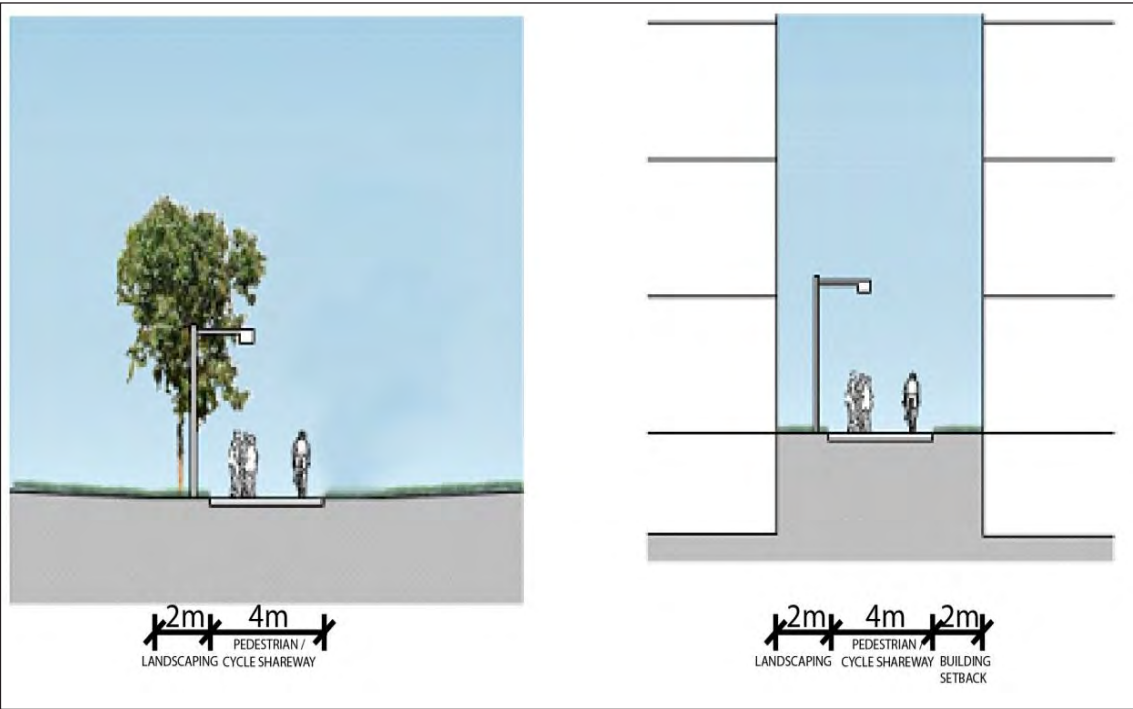


Figure 4.2.1 Pedestrian Ways Typical Sections

Controls

- a. Provide pedestrian bridges in accordance with the Access Structure Plan. Figure 3.4.1
 - i. Over the M2 connecting Christie Park to Macquarie Park Corridor
 - ii. Connecting across Shrimptons Creek
- b. Provide pedestrian connections in accordance with Figure 4.1.1 Access Network.

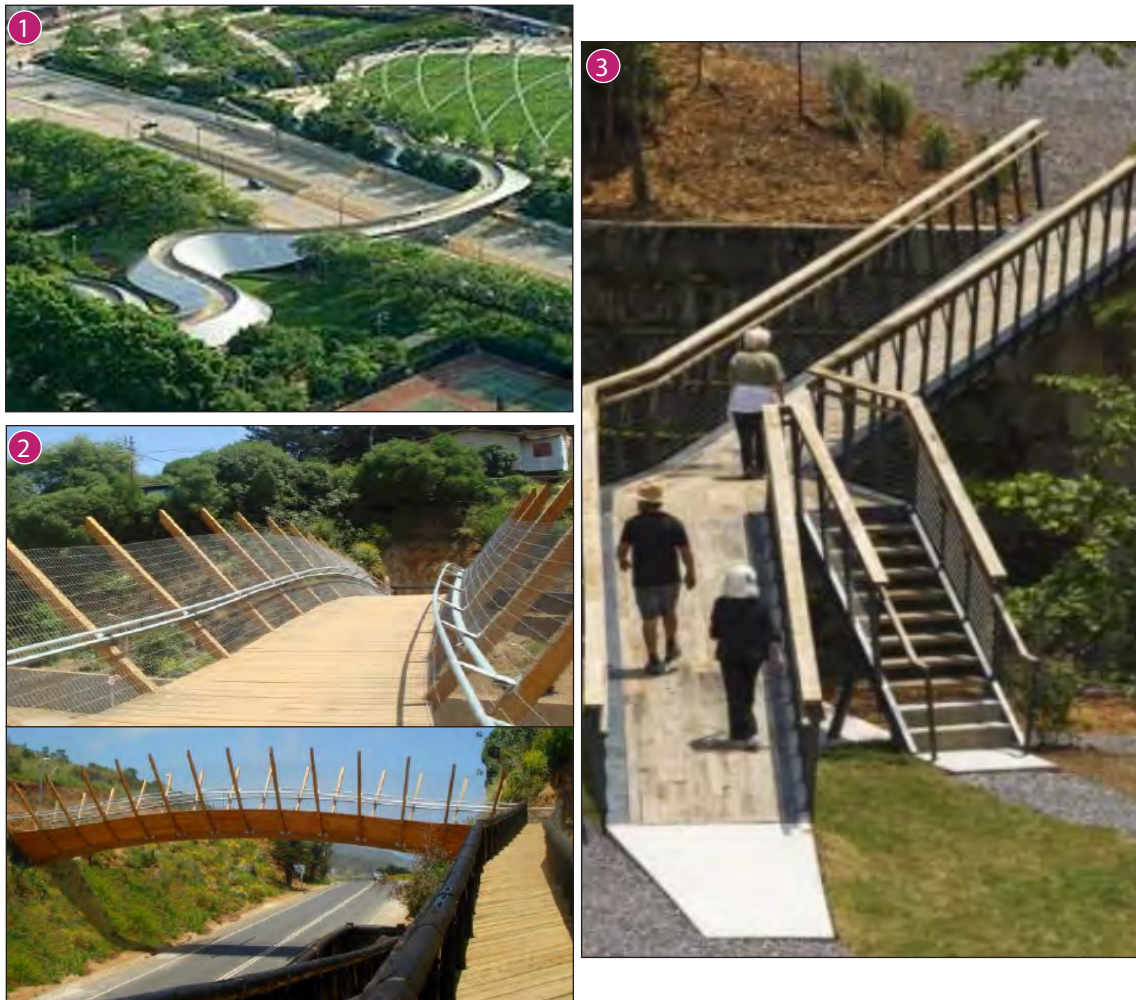


Figure 4.2.2 Pedestrian Bridge Exemplars

1. BP Bridge, Chicago
2. Pedestrian Bridge, Zapallar Chile
3. Smiths Creek Bridge

- b. Provide pedestrian connections in accordance with Figure 4.1.1 Access Network.

Note: Masterplan controls 8.1 provide guidance on varying the locations of pedestrian connections.

- c. Pedestrian connections are to:
 - i. Be a minimum of 6m wide comprising 4m wide paving and 2m wide soft landscaping as shown in Figure 4.2.1 (or as determined by Council).
 - ii. Be designed with a 2m setback to any building.
 - iii. Be publicly accessible at all times.

- iv. Provide a clear sightline from one end to the other for surveillance and accessibility;
- v. Maximise active frontages pedestrian connections
- vi. Be designed to consider pedestrian safety and the security of adjacent businesses, particularly at night. (For example, where pedestrian through-site links are provided between buildings, windows are to be provided between the internal ground floor space of the building and the pedestrian link)
- vii. Extend and enhance the public domain and have a public domain character.

Note: Where pedestrian through-site links are adjacent a courtyard or public space, the design of the pedestrian link is to be integrated with the design of the open space, and access is provided between the two spaces.

- viii. Be in accordance with Part 9.2 of this DCP Access for People with Disabilities and designed to provide barrier-free access in accordance with AS1428 and the Disability Discrimination Act 1992;
- ix. Paving shall be in accordance with the Macquarie Park Public Domain Technical Manual.
- x. Remain in private ownership and be created as Rights-of-Way in favour of Council or similar mechanism.



Figure 4.2.3 Through site links are to be integrated with the site design and consider pedestrian safety and security

- d. Each site is to provide for co-ordination of pedestrian connections with neighbouring sites, including level adjustments and detailed plans. Detailed plans, sections other material as necessary are to be provided together with the development application.

4.3 Bicycle Network

Dedicated cycle lanes are to be provided along all existing and new streets within the Corridor, as shown in Figure 4.1.1. This integrated cycle strategy maximises the opportunities for cycle circulation within the Corridor.

In addition to the street network, cycle/pedestrian paths provide additional connectivity to surrounding areas.

The cycle network maximises interchange opportunities with bus and rail public transport. The strategy is supported by the provision of end of trip facilities.

Objectives

1. To maximise cycle connections to regional cycle routes through and around the Corridor.
2. To maximise cycle permeability within the Corridor.
3. To create a safe, high quality cycle network.
4. To maximise interchange opportunities with public transport.

Controls

- a. Provide dedicated cycle access in accordance with Ryde Bicycle Strategy 2014 , refer Figure 4.3.1 Indicative Cycleways.
- b. The Regional Bicycle network is to be implemented as off-street shared cycleways in accordance with the Macquarie Park Public Domain Technical Manual. The Regional Bicycle network comprises:
 - i. Waterloo Road
 - ii. Delhi Road
 - iii. Epping Road
 - iv. Lane Cove Road
 - v. Khartoum Road
 - vi. The M2, and
 - vii. Shrimptons creek pathways
- c. The Local Bicycle Network is to be implemented as on-street shared ways in accordance with the Macquarie Park Public Domain Technical Manual. The Local Bicycle network comprises:
 - i. Lyon Park Road
 - ii. Talavera Road
 - iii. Wicks Road
 - iv. Proposed new roads in accordance with the Ryde Bicycle Strategy 2014

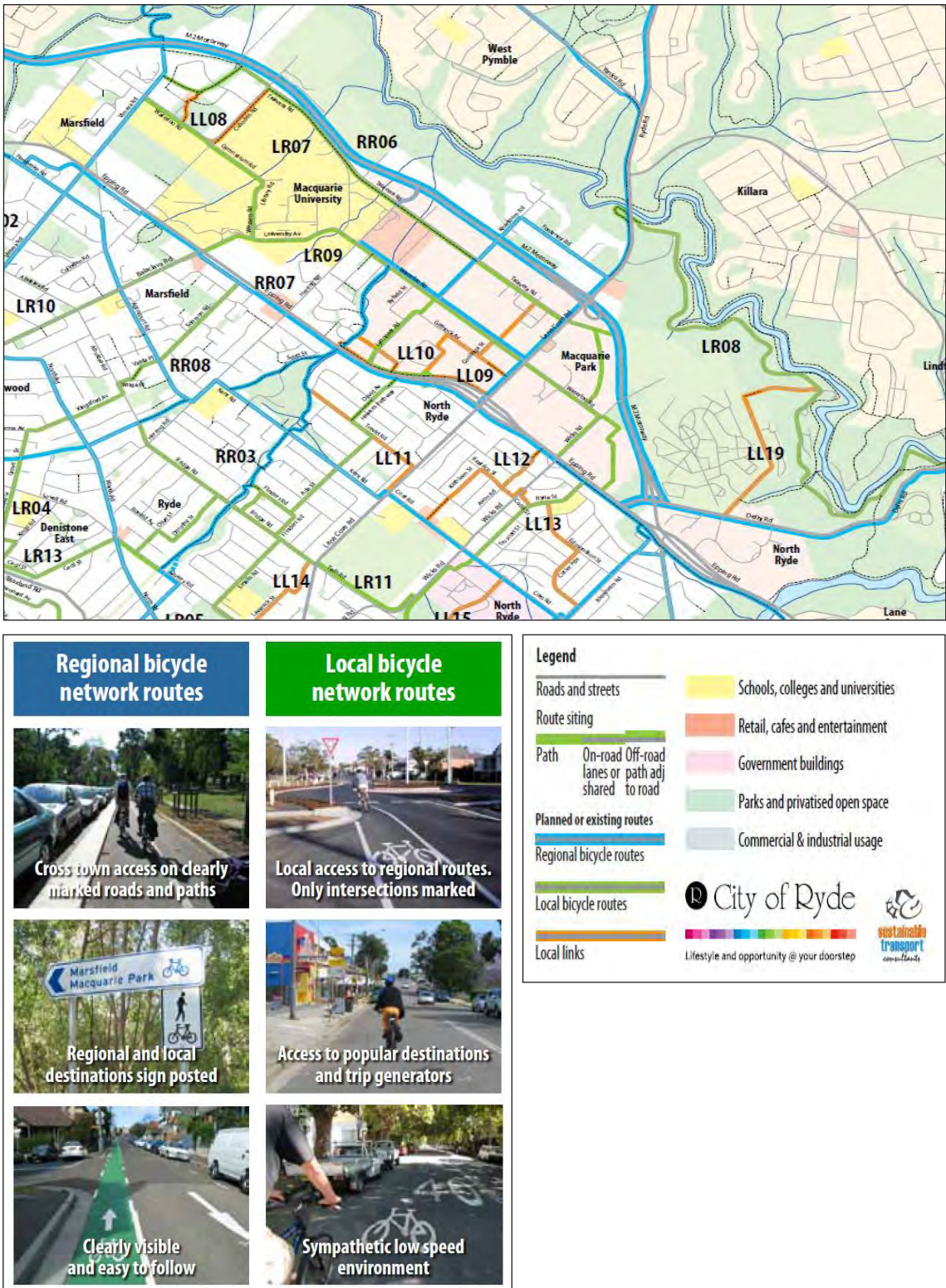


Figure 4.3.1 Indicative Cycleways

Note: Cycleways routes may be updated from time to time. Refer to Ryde Bicycle Strategy 2014 (as amended) for current information

4.4 Sustainable Transport

Travel demand management has become a major strategic concern for policy makers, businesses and the public within Macquarie Park Corridor.

The modal split for public transport usage in 2011 is 20%. This plan and other activities by the NSW state government and City of Ryde Council aim to assist to increase public transport use to 40% by 2031 including:

- 3 rail stations opened in 2009 and expansion of the rail network to the north west
- A transport interchange upgrade supported to increase bus usage
- The Macquarie Park Transport Management Association (TMA) has been established
- A review of the parking rates

A Travel Plan (TP) is a travel management tool that promotes the development, implementation and monitoring of a co-ordinated transport strategy for an individual business or residential building. The primary purpose of a Travel Plan is to influence the travel behaviour of employers, employees, residents and occasional visitors to an organisation, away from single-occupancy car use towards more efficient and sustainable forms of transport.

A Framework Travel Plan (FTP) is a travel demand management tool to promote the use of active and public transport to and from an entire development site. The primary purpose of the FTP is to coordinate a site-wide and building wide approach to influence the travel behaviour of employees, residents, clients and visitors, away from single-occupancy car use towards more efficient modes of transport, including active transport such as walking and cycling; public transport such as train and bus; and car-pooling and car sharing. The Framework Travel Plan is required where the future tenants are unknown.

Objectives

1. To adopt policies and procedures which encourage transport choice to and within the Macquarie Park Corridor.
2. To minimise rates of private vehicle use for commuters and business (particularly lone driver) trips and achieve a transport modal shift target of 40% public transport/60% private transport use for the journey to work in particular.
3. To support public transport, car-sharing, car-pooling, walking, taxi, and bicycle users by enhancing amenities and infrastructure.
4. To more effectively manage the use of private vehicle trips and parking within the area.
5. Reduce congestion and the cumulative impacts of vehicle emissions upon air quality.

Controls

Public transport

- a. Upgrade the bus interchange in Herring Road in accordance with the Access Structure Plan to:
 - i. Accommodate additional bus stops to provide for increased bus patronage
 - ii. Reduce pedestrian and vehicle conflict
 - iii. Enable active frontage
- b. Any DA that includes residential development on the Macquarie Shopping Centre site is to provide a master plan that demonstrates how the bus interchange upgrade may be achieved.

Travel Plans

- c. A Framework Travel Plan. (FTP) is required to be submitted to Council for approval together with a DA for all development that exceeds 10,000sqm new floor space. For all development (including residential development) the FTP must:
 - i. Adopt strategies and procedures to meet a 40% public transport/ 60% private transport target for the development for journey-to-work trips, to minimise drive-alone vehicle trips and to encourage transport choice to and within the Macquarie Park Corridor.
 - ii. Demonstrate how on-site parking provision and built form design will contribute to the Framework Travel Plan and assist meet the 40% public transport/60% private transport target for the development for the journey-to-work.
 - iii. Demonstrate infrastructure connections to the nearby footpath, bicycle and public transport networks including through site links where required
 - iv. Provide, to council satisfaction, supportive infrastructure for:
 - Public transport passengers (bus shelters and passenger waiting areas) to be provided where a new public bus stop or service is required to service the additional demand from the development or meet relevant mode share targets for the development.
- d. For all development (excluding residential development) the FTP must also:
 - i. Identify measures in an Action Plan that will implement the 40% public transport/ 60% private transport target for the journey to work, including appointing a Travel Plan co-ordinator, minimising drive alone trips to work, encouraging walking, cycling, car sharing, carpooling and public transport use.
- e. Provide a final Travel Plan to Council for certification prior to the issue of any occupation certificate.

Note: This infrastructure may be provided either within the development site or, subject to consultation with Council, within the adjoining public domain area.

- Taxi drop-off areas or parking (as appropriate) and carpooling and carshare dedicated parking in publicly accessible locations, within the development site. The number of dedicated parking spaces provided must support relevant mode share targets for the development. Carshare parking requirements are detailed in Clause 4.4.i below.
- Walking and cycling (lockers and end of trip facilities).

Note: Landowners should consult with the City of Ryde for the latest Travel Plan Guidelines. Landowners can also contact the Macquarie Park Travel Management Association (Connect - Macquarie Park + North Ryde) for further information and potential assistance with the development of Travel Plans.

Administrative Guidelines will include details of information that is proposed to be provided to City of Ryde Council in an annual monitoring report. Such information will monitor how the Action Plan is implemented including the journey -to-work modal split, actions undertaken and opportunities for improvement and future action etc. The annual monitoring report is to be submitted to Council for a minimum of 5 years after the issue of any occupation certificate.

Parking Rates

- f. Bicycle parking and end of trip facilities are to be provided in accordance with Ryde DCP Part 9.3 Parking.
- g. Parking is to be provided in accordance with DCP Part 9.3 Parking and clause 4.5B(2) Ryde LEP 2014
- h. Car parking within residential development is to be provided in accordance with the following maximums:
 - 0.6 space / one bedroom dwelling
 - 0.9 spaces / two bedroom dwelling
 - 1.4 spaces / three bedroom dwelling
 - 1 visitor space / 10 dwellings
 - 1 car share space per 50 proposed parking spaces.

Note: Development approval will be conditioned to require that the proponent demonstrate that an agreement with a car-share provider is executed prior to the issue of any Occupation Certificate (including an "Interim" Occupation Certificate)

Car Share Parking

- i. All parking spaces for car share schemes are to be:
 - i. Publicly accessible 24 hours a day seven days per week
 - ii. Located together in the most convenient locations
 - iii. Located near and with access from a public road and integrated with the streetscape through appropriate landscaping where the space is external
 - iv. Designated for use only by car share vehicles by signage
 - v. Parking spaces for car share schemes located on private land are to be retained as common property by the Owners Corporation of the site

Car-share Parking

City of Ryde Council supports the provision of car share parking spaces both within private development and on-street in the Macquarie Park Corridor as part of a commitment to sustainability and reducing private vehicle use for the journey-to-work.

5.0 PUBLIC DOMAIN

5.1 Open Space Network

The Open Space Structure Plan identifies new public space and augments existing public open spaces within the Corridor, to create a new open space network. The location of public open space is integrated with the street network to maximise pedestrian access opportunities. The public open space network includes a diverse range of open space including plazas, parks and natural areas along Shrimptons Creek.

The key urban plazas included in the structure plan are:

- North Ryde Station Precinct Square
- Macquarie Park Station Square - East
- Macquarie Park Station Square - West
- Macquarie University Station Square - East

The key public open spaces/parks included in the structure plan are:

- Central Park
- North Ryde Station Precinct Central Park
- Shrimptons Creek
- Riverside Park
- Thomas Holt Drive

The open space network is supported by Fitness trails that utilise the pedestrian access ways and connections through private open space on the peripheries of the town centre, allowing for extended pedestrian connections along creek corridors and into the Lane Cove National Park.

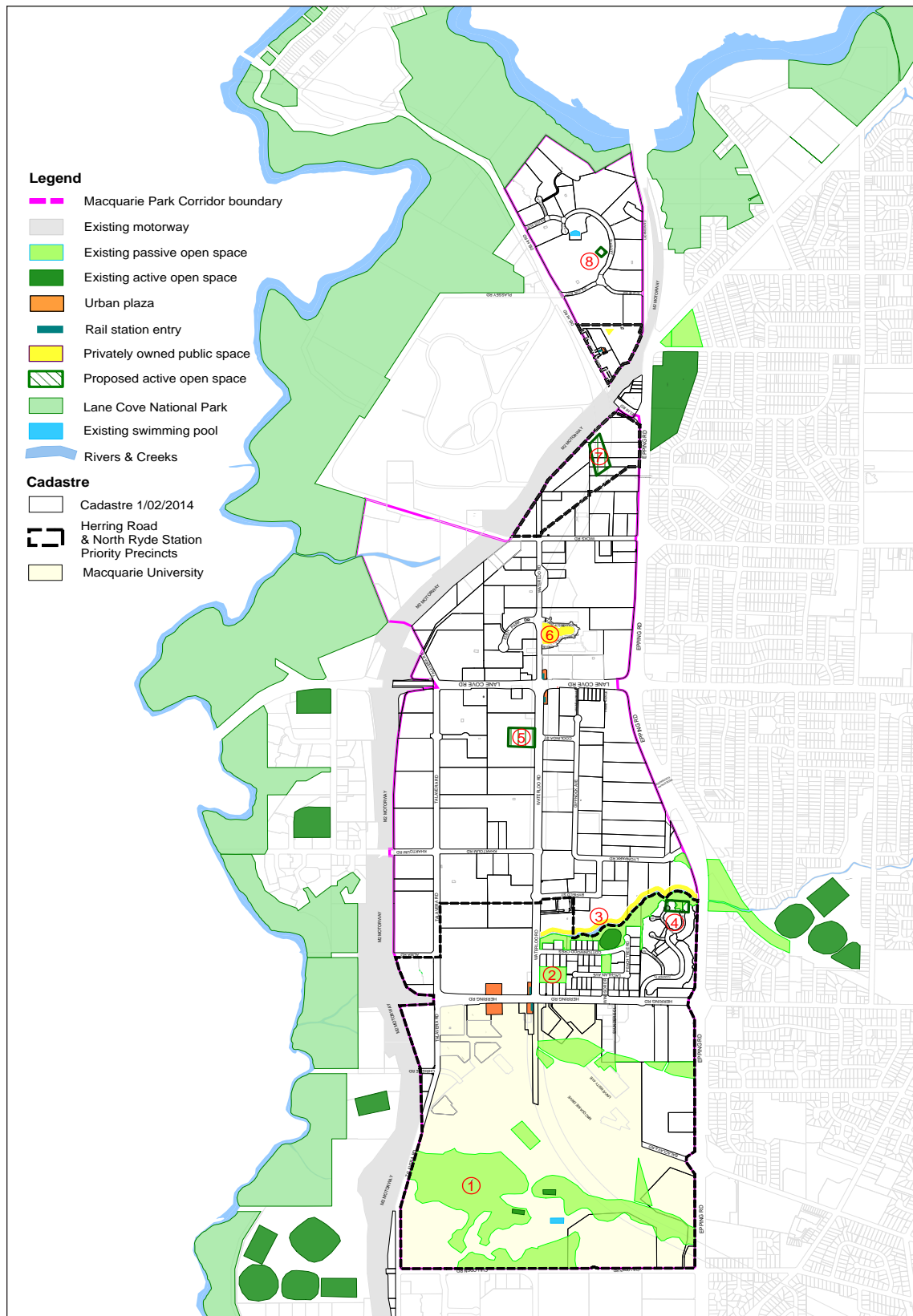


Figure 5.1.1 Proposed Open Space Network

- | | |
|--|-------------------------------------|
| 1. Macquarie University open space | 5. Central Park |
| 2. Elouera Reserve | 6. Thomas Holt Drive Park |
| 3. Shrimptons Creek Core Riparian Corridor | 7. North Ryde Station Precinct Park |
| 4. Shrimptons Creek Park | 8. Riverside Park |

5.2 New open space

Objectives

1. To meet the recreation needs of residents, workers and visitors to Macquarie Park Corridor.
2. To provide additional open space within a network of well-connected parks, plazas and green streets.
3. To provide diverse urban open spaces including plazas, parks and natural areas that will support active transport and recreation.
4. To provide well-used public space that accommodates a range of active and passive recreational uses.
5. To contribute to stormwater and ecological management.
6. To maximise the accessibility of public open space, and to contribute to the pedestrian and cycle network.
7. To create bio-links and canopy connections to existing vegetation communities surrounding the Corridor.

Controls

- a. Provide public open space as shown in Figure 5.1.1 Proposed Open Space Network and in accordance with Sections 5.3 – 5.6 of this Part (which contain specific requirements for each park). To vary public open space requirements, refer to master plan controls clause 8.1 Site Planning and Staging.
- b. Buildings are not permitted to be located on any proposed new park identified in The Open Space Structure Plan identified in Figure 5.1.1.
- c. Parks are to be dedicated to the Council, unless by agreement with Council where they may be provided as privately-owned public space (POPS).
- d. New parks are to be maintained by the landowner until dedicated to Council.
- e. POPS are to be created as rights of way in favour of Council.
- f. POPS are to be maintained by the landowner in perpetuity. Public Liability Insurances up to \$20,000,000 are to be maintained by the landowner.
- g. At least 50% of new public space is to receive 3 hours direct sunlight between 9am and 3pm on the 21st of June.
- h. Active frontages are to be provided in accordance with Section 6 Active Frontage controls.
- i. Provide internet connection to all publicly accessible space in Macquarie Park, particularly new parks.
- j. Provide Open Space in accordance with Table 5.2.1 Controls for Open Spaces.

Table 5.2.1 Controls for Open Spaces

PARK NAME AND ADDRESS	AREA DIMENSIONS	SPECIFIC CONTROLS	FUNCTION AND INDICATIVE CHARACTER
Central Park 43-61 Waterloo Road	1 Ha 75 m x 100 m (if the dimensions are altered a min. 65m is required in any direction) The park layout is to be generally in accordance with Figure 5.3.1	Central Park is to be located abounding Waterloo Road. Implement new roads in accordance with Figure 4.1.1 on two sides of the Central Park. (Note: Central Park will therefore have roads on three sides) <ul style="list-style-type: none"> Provide 10 park benches and 10 bicycle parking spaces Where practicable provide turf detention basin to minimum 50% of park area as the Central Park is on the overland flow alignment 	A multi-function park that provides for: Active recreation (informal sport) Passive recreation Community events (e.g. cinema, expos etc.) Children's play Refer to Figures: - 5.3.2 - 5.3.3 - 5.3.4
Shrimptons Creek Parklands	3.8 Ha Variable dimensions The park layout is to be generally in accordance with Figure 5.4.1	<ul style="list-style-type: none"> Provide active frontage in accordance with Figure 7.3.2 Provide a pedestrian bridge across Shrimptons Creek to improve connectivity between the existing residential precincts and Lyon Park Road. Bridge design must take into account ecology Council's relevant flood management plan. Future development is to address the creek corridor and minimise service entries and parking area fronting this space. Provide transparent or no fences to the park boundary Provide 20m riparian protection zones on private lands adjoining the park Implement pedestrian connections in accordance with Figure 4.1.1 Development is to plant endemic species only adjoining the park 	A multi-function park that provides for: Active transport – fitness trail, walking and cycling Active recreation (informal sport, skateboarding) Passive recreation Children's play Refer to Figures: - 5.4.2 - 5.4.3 - 5.4.4 - 5.4.5 - 5.4.6

Shrimptons Creek Core Riparian Corridor	20m measured from the top of the creek embankment	<ul style="list-style-type: none"> Provide 20m wide continuous riparian protection corridor on private lands adjoining Shrimptons Creek in accordance with NSW Office of Water Guidelines for Riparian Corridors on Waterfront Land Cycleways and paths may be located in the outer 50% of the riparian corridor 	Privately owned publicly accessible space (POPS) Passive recreation Vegetated riparian corridor that provides diverse native vegetation and connectivity between habitats
Riverside Park Julius Avenue	0.35 Ha 60 m x 60 m The park layout is to be generally in accordance with Figure 5.5.1	<ul style="list-style-type: none"> Facilitate through site access to public transport hubs Provide 6 park benches and 6 bicycle parking spaces 	A multi-function park that provides for: Passive recreation Children's play Outdoor dining Neighbourhood meeting place
Thomas Holt Park Thomas Holt Drive	0.4 Ha 100 m x 40 m approximately Refer Figure 5.6.1	<ul style="list-style-type: none"> Provide landscaping that responds to the natural topography of the park (such as terraced seating). Refer Figure 5.6.2 Provide 6 park benches and 6 bicycle parking spaces 	Passive recreation Children's play Neighbourhood meeting place

- k. Refer to the Macquarie Park Public Domain Technical Manual for detailed design requirements.
- l. Provide pedestrian pathways and cycleway connections to adjoining public domain spaces.
- m. Accommodate a range of seating areas with prospect and views across open space.
- n. Provide a mix of paved and open lawn/ turf areas, shaded and sunny areas.
- o. Provide infrastructure (such as power and water supply to support events and where appropriate gas for BBQ facilities).

Paving

- p. Provide high-quality pavement that relates to public domain of adjoining streets in accordance with Macquarie Park Public Domain Technical Manual.

Park furniture

- q. Install park lighting along key pedestrian routes. Reduce visual clutter by incorporating light fittings on built elements where possible.
- r. Provide a generous quantum of seating in sun/shade areas.
- s. Locate bins at park entries/exits.
- t. Provide directional/ information signage at key zones.

Vegetation

- u. Minimum 20% consolidated area of the open space area should be provided as deep soil zone to establish large trees.
- v. Provide exotic and endemic species (minimum 60%), large scale shade trees (over 8m height).
- w. Protect and retain existing trees over 5m in height.

Stormwater

- x. Implement water sensitive urban design. Provide for on site absorption, manage water quality and run off on site.
- y. Improve stormwater treatment through site and explore possibilities for incorporating stormwater drainage infrastructure as an evocative element within the urban design.

5.3 Central Park



Figure 5.3.1 Central Park Layout



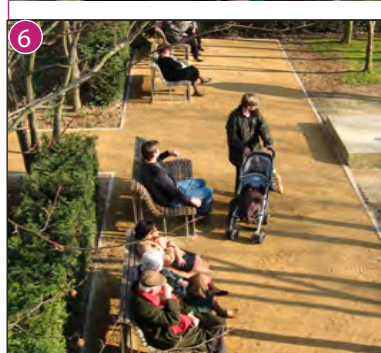
Figure 5.3.3 Cellar Door Expo Hyde Park



Figure 5.3.4 Night markets Hyde Park

Figure 5.3.2 Character images

1. Recreational night -t ime use (Moonlight cinema, Aspect Studios image library)
2. Group gatherings (BBQ area, Aspect Studios image library)
3. Large turf area (Citroen Park, Paris, G. Clement, 'Invented Landscapes', p. 115)
4. Seat ing wall steps (Garden of the Cercade Sao Bernado, ' Fieldwork, p. 117')
5. Detent ion basin (Victoria Park, Sydney, Aspect Studios Image Library)



6. Passive recreation area (Aspect Studios Image Library)
7. Informal cafe/seating ('New city spaces', p.83)
8. Main Plaza San Antonio - Shade structures

5.4 Shrimptons Creek Park



Figure 5.4.2 Como Pleasure Grounds



Figure 5.4.3 Olympic Park Fountain

Source <http://www.au.timeout.com/sydney/aroundtown/features/4300/best-picnic-spots>



Figure 5.4.4 Skate Park



Figure 5.4.5 Olympic Park Swing



Figure 5.4.6 Future Character Photos

1. Bio-swale (Victoria Park, Sydney, Aspect Studios Image Library)
2. Timber Bridge (Woolwash Park, Sydney, Aspect Studios Image Library)
3. Planted Swale (Victoria Park, 'Contemporary Australian Landscape Design, p. 179)
4. Endemic tree and understorey planting (Aspect Studios Image Library)

5.5 Riverside Park



Figure 5.5.1 Riverside Park Illustrative Plan

5.6 Thomas Holt Drive Park



Figure 5.6.1 Thomas Holt Drive Illustrative Plan



Figure 5.6.2 Bradleys Head Park amphitheatre or terraced seating

5.7 Rail Station Plazas

Objectives

1. To provide a square/ plaza, with active building frontages.
2. To provide clear unimpeded views and access from station square from surrounding streets.
3. To address level changes by creating a series of terraces that tie into adjoining footpath levels.

Controls

- a. Provide the following Station plazas (including fittings):
 - i. Macquarie Park Station Plaza - West
Area: Provide minimum 0.35 ha
Dimensions: Provide minimum 88 x 40m
Install minimum 10 park benches and 10 bicycle parking spaces.
 - ii. Macquarie Park Station Plaza – East
Area: Provide minimum 0.35 ha
Dimensions: Provide minimum 88 x 40m as shown in Figure 5.7.3.
Install minimum 10 park benches and 10 bicycle parking spaces.
 - iii. Macquarie University Station Plaza – East
Area: Provide minimum 0.67 ha
Dimensions: Provide minimum 80 x 80 m as shown in Figure 5.7.4.
Install minimum 10 park benches and 10 bicycle parking spaces.

Note: The Macquarie University Station Plaza - West has an approximate area of 0.5 ha

- b. Station plazas are to be privately owned public space. Station plazas are to be accessible at all times.
- c. Provide Continuous Active frontage to station plazas refer also Figure 5.7.3, 5.7.4, and 5.7.5.
- d. Minimise large banks of stairs. If stairs are used to provide alternative access to ensure equitable access for all.
- e. Provide unimpeded and generous entrances and circulation paths into and through the plaza.
- f. Provide infrastructure (such as gas, power and water supply) and subject to consent, appropriately scaled kiosks, vendor stalls, cafes and restaurants) that will enhance the rail station plazas as meeting places and support activities such as markets, community events, leisure and recreation.
- g. Provide wireless internet connection to all publicly accessible space, particularly station plazas.

Station Plaza Setbacks

- h. Provide building setbacks for adequate pedestrian circulation space around train stations.

Paving and Park Furniture

- i. Provide paving, lighting bins and directional and information signage in accordance with Macquarie Park Public Domain Technical Manual.
- j. Install lighting to contribute to public safety.

- k. Locate bins at square entries/exits.

Vegetation

- l. Endemic species to street edge.

Stormwater

- m. Minimise storm water runoff for irrigation. All storm water is to be filtered in accordance with Council requirements and tanks installed for irrigation storage.



Figure 5.7.1 Character Photo



Figure 5.7.2 Character Photo
Chifley Square Sydney
Federation Square Melbourne

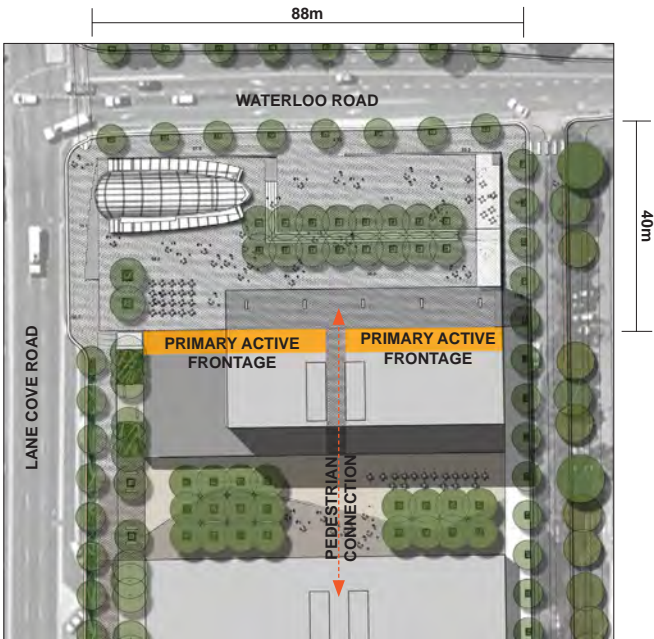


Figure 5.7.3 Macquarie Park Station Plaza - East
(Illustrative Plan Only)

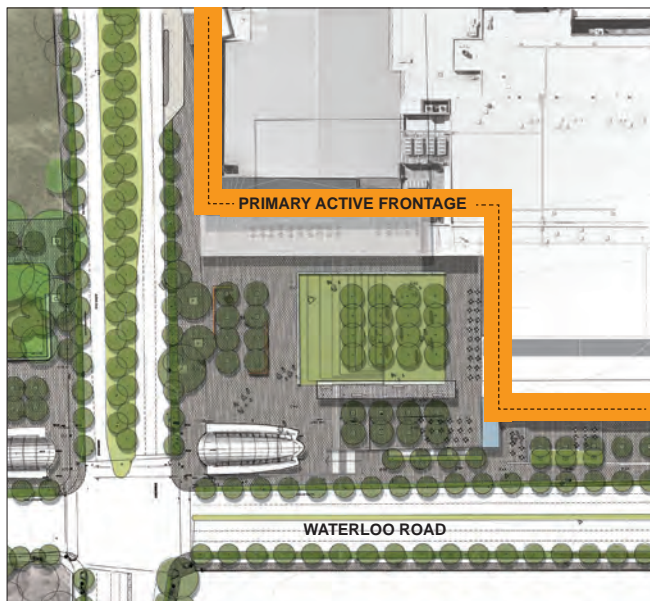


Figure 5.7.4 Macquarie Park Station Plaza - East (Illustrative Plan Only)

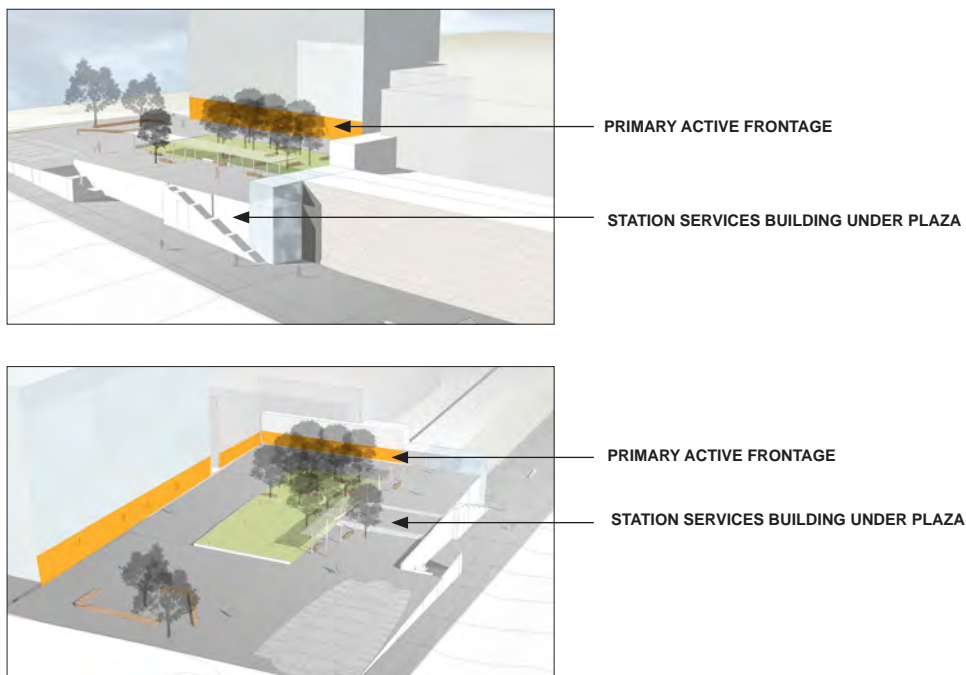


Figure 5.7.5 Macquarie Park Station Plaza - East (Illustrative perspective)

5.8 Street Trees, Front Setback Tree Planting, and Significant Trees

A broad strategy of new street tree planting is based on the four significant vegetation groups that would have been present on the site prior to development, reinforcing the unique landscape character of the area and minimising weed infestation. The location of the tree species enables a 'reading' of the geology and topography. This strategy allows for creation of bio-links and canopy connections to existing vegetation communities outside the site area and to the Lane Cove National Park.

Objectives

1. To respond to the unique natural character of the Macquarie Park Corridor.
2. To reinforce the street network and contribute to the legibility of streets.
3. To integrate best practice water sensitive urban design principles into the design and management of the public domain.
4. To reflect the endemic vegetation communities historically present within the Corridor.
5. To create bio-links and canopy connections to existing vegetation communities surrounding the Corridor.

Controls

- a. Street trees and front setback must be provided in accordance with the Street Tree Key Plan in Macquarie Park Public Domain Technical Manual, and their health guaranteed for a minimum of 5 years.
- b. At grade parking is not permitted in the front setback.

Note: Front setbacks may contribute to deep soil zones and site coverage calculations.

- c. Where
 - new floor space or parking areas are proposed and;
 - a site is shown part coloured on the Sydney Metropolitan Catchment Vegetation Mapping 2013 (unless identified as containing "Weeds and Exotics" only) and;
 - removal of native vegetation species is proposed

submit a Flora and Fauna Assessment prepared by a suitably qualified ecological consultant with the DA that has regard to:

- Part 9.6 Tree Preservation of the RDCP 2014
- NSW Threatened Species Conservation Act
- Sydney Metropolitan Vegetation Mapping, 2013

5.9 Community Facilities

Community facilities provide areas for social and recreational activity, as well as essential support services. These facilities strengthen and support the community, increasing the public life of the Corridor.



Figure 5.9.1 Excerpt from the City of Ryde's Social and Cultural Infrastructure Framework

Objectives

1. To provide services and facilities supporting the increasing employment and residential population within the Macquarie Park Corridor.
2. To enliven the public domain.
3. To encourage walking within the Corridor rather than driving to facilities in surrounding areas.
4. To provide a coordinated approach to the delivery of community facilities across the Corridor.

Controls

- a. Community facilities are to be provided in accordance with the relevant documentation prepared by Council, particularly the City of Ryde's *Social and Cultural Infrastructure Framework*. Based on population growth statistics (available 2011) within Macquarie Park Corridor the *Social and Cultural Infrastructure Framework* seeks:
 - One branch library 1,400 sqm
 - One community centre 2,000 sqm
 - One community arts centre 1,000 sqm and
 - One community hall 500 sqm

- b. Provide community space of not less than 3,000sqm within the Macquarie Park Shopping Centre (which may include a branch library or other function in accordance with the *Social and Cultural Infrastructure Framework*). The community space must be directly accessible from the public domain and within a short walk of the station and bus interchange. Community space must be discussed with City of Ryde prior to the lodgement of a Development Application.
- c. Provide community space within new development of not less than 500 sqm within the Primary Active Frontage facing Central Park. This may include community meeting space and associated amenities and should be discussed with Council prior to lodging a Development Application.
- d. Community facilities are to be located around public open spaces and along active frontages, with entries at street level. Active frontage must be in accordance with Figure 7.3.2.
- e. Within public streets, parks, squares and plazas provide infrastructure (such as gas, power and water supply) and appropriately scaled built forms (such as kiosks, vendor stalls, cafes and restaurants) that will enhance the public domain as a meeting place and support activities such as markets, community events, leisure and recreation.

5.10 Art in Publicly Accessible Places

Art can make urban spaces attractive and welcoming, promote local identity, evoke business confidence and attract investment. Artworks can enhance new development, streetscapes, gardens and other places and spaces, creating interesting and distinctive urban environments. They can create vital and engaging environments that connect private and public domains, attracting pedestrian activity and navigation. Good publicly accessible art can be a destination in itself.

The themes of innovation technology, natural environment, local history, transport and movement provide a spectrum of ideas that can be explored and expressed through public art. Artworks can be used to create emblems or symbols that depict the identity of the place. It can be used to distinguish special places or developments, enable new businesses to develop a strong identity or signatures, signify entry points, strengthen the character of the place and stimulate the interaction of ideas that is central to the vision of the Corridor. Artworks can be integrated into the landscape or building features.

Objectives

1. To include site-specific integrated artworks in new developments in Macquarie Park Corridor.
2. To create a distinctive urban environment and sense of place.
3. To reflect local character, cultural identity and the natural environment.
4. To create spaces (whether publicly or privately owned) incorporating art that is original, creative and innovative in its design and use of form, technique and materials, and at the forefront of new ideas and sustainable practice.
5. To ensure that art in publicly accessible arts conforms to standards in regard to public safety is robust, durable and low maintenance.



Figure 5.10.1 Police headquarters Parramatta. Here public art is incorporated into the building façade/sunscreens. The art work is based on forensic science and DNA graphs

Controls

- a. Art must be included in all new development with more than 10,000m² new floor space in the amount of 0.1% of the construction cost of the works capped at \$1,500,000.
- b. Art must be located within the site so as to be publicly accessible i.e. viewed or experienced from publicly accessible places.

Note: This may be within ground floor building foyers, on the building façade or within the front setback. Public art may also be funded by the developer and located within public parks or the public domain (e.g. banners on the light poles within the road reservation, purpose designed street furniture etc)

- c. A site specific Arts Plan is to be submitted together with the development application. The Arts Plan will include:
 - i. Arts project description and statement of artistic intent.
 - ii. Thematic framework for the artwork. Suggested themes arising from the history of the Macquarie Park Corridor are:
 - Innovation and / or technology
 - Transport (train, bus, car) and people movement
 - History of Macquarie Park Corridor e.g. market gardening
 - Future of Macquarie Park
 - Natural environment e.g. water

Note: Four creeks traversed the Macquarie Park Corridor. These were Industrial Creek, Porters Creek, Shrimptons Creek and University Creek. For the most part they have been piped and are not now visible.

- iii. Concept drawing and descriptions of proposed art works including:
 - Proposed location
 - Whether or not the artwork is integrated into the building design, landscape or other site features (including the building façade, paving, lighting design, outdoor seating, play equipment and the like)
 - Proposed use of materials with particular information to be provided on robustness, durability, and low maintenance
- iv. Implementation (detailing at what stage the artwork will be implemented etc)
- v. Preliminary construction details with particular emphasis on public safety considerations.

What documentation will be required before construction?

Detailed construction and engineering reports will be required prior to the issue of the Construction Certificate to ensure public safety; robustness and low maintenance are considered in the final design of the artwork. Conditions of consent will detail the documentation required prior to the issue of the construction certificate.



Figure 5.10. The Pool by Jen Lewin Des Moines (interactive lighting/artwork installed in the pavement)

6.0 IMPLEMENTATION – INFRASTRUCTURE, FACILITIES AND PUBLIC DOMAIN IMPROVEMENTS

New and improved infrastructure community facilities, (road network and drainage) and public domain improvements (landscaping, parks, public art) within the Corridor is necessary to support growth, to create a vibrant work and living environment and to strengthen and sustain the existing and future communities.

The basis for the infrastructure, facilities and public domain improvements within the Corridor are documented in the Access and Open Space Structure Plans within this DCP and in relevant City of Ryde Community Facilities Plans, particularly the City of Ryde's *Social and Cultural Infrastructure Framework*.

The provisions of these elements will be achieved through:

- Funds received from the Special Rate Levy applying to the Corridor.
- Development contributions under S94 of the Environment Planning and Assessment Act.
- The development process achieved through design and implemented as conditions of the development.
- Development process achieved through the provision of planning incentives (height and floor space) in return for new roads and parks identified in the Open Space and Access Structure Plans in this DCP. Under this scheme planning incentives applicable under Ryde LEP are deferred until a voluntary planning agreement (VPA) is executed between Council and the developer. This VPA secures infrastructure contributions in cash or works in kind to be delivered through redevelopment.

The planning incentives mechanism is considered fair and equitable in that all landowners receiving the benefit of increased FSR and or height will contribute whether there is infrastructure on their land or not. As a value capture mechanism it offers the opportunity to develop an infrastructure funding tool within the planning system which will address infrastructure needs in the Macquarie Park Corridor.

The principles of the planning incentives scheme is:

- **Nexus:** That some of the benefit afforded to sites within Macquarie Park (through an uplift in FSR under Amendment No. 1) is captured by Council to provide essential infrastructure required as a result of increased densities in the area
- **Transparency:** This includes a clear understanding of what infrastructure is to be funded and how contribution rates and community benefit are calculated and applied to individual sites
- **Equity:** A framework that treats landowners fairly and where both infrastructure and incentives for development are based on equity and fairness
- **Practical:** The implementation of the mechanism must be practical and occur in a timely fashion to avoid delays and provide certainty for commercial dealings
- **Feasibility:** The contributions must be reasonable and provide infrastructure without burdening land such that development is not feasible at each stage

Infrastructure to be provided

The proposed funding model will provide funding for roads and open space as identified in the Access and Open Space Structure Plans in the DCP as follows:

- 4.1 km of 20m wide roads
- 3.6 km of 14.5m wide roads
- 3.5 hectares of open space

This Part should be read in conjunction the City of Ryde LEP 2014, which allows for incentive floor space and building height. It is critical that any approval for incentive floor space makes provision for the infrastructure, public domain improvements and other community benefits necessary to support the generated demand.

Process for accessing the planning incentives

- The landowner inspects the planning incentives maps under the RLEP 2014, which allows for greater FSR and building height and wishes to lodge a development application.

Note: Refer to the Ryde DCP 2014 to determine if there is any public domain to be delivered on the site – as identified on the Access Structure Plan and / or Open Space Structure Plan or alternatively decides to provide a monetary contribution to support delivery of the proposed roads and open space.

Refer to Draft Guideline for 'Un-deferrals' and delivery of Public Infrastructure and Council's Voluntary Agreements Policy.

Refer to Council's current *Fees and Charges* for the charges levied on the incentive floor space developed on a site in accordance with the planning documents applying to the area.

- Contact council to arrange for a prelodgement meeting and to discuss accessing the incentive scheme
- The landowner or developer then makes an offer in writing to Council.

Objectives

1. To locate higher densities around significant places such as parks, local centres and train stations.
2. To provide FSR controls which correlate with height controls.
3. To allow bonuses for the provision of public infrastructure as demand for floor space increases.

Controls

- a. Floor Space Ratios and Height of Buildings are to comply with the Ryde LEP 2014.

Note: Where it is proposed to take advantage of Floor Space and/or Height Incentives, applicants are to present and discuss their scheme with Council prior to lodgement of a development application.

- b. The Access Network being roads and the Open Space Network being parks are to
 - i. be dedicated to Council as part of a new development and are to
 - ii. conform with the Macquarie Park Corridor Access Structure Plan. The
 - iii. be design and constructed in accordance with the Macquarie Park Corridor Public Domain Technical Manual and Section 4 of this Part.
- c. The public land such as the road verge adjoining a development site is to be embellished and dedicated to Council as part of any new development. The design and construction of the works are to be undertaken in accordance with the Macquarie Park Public Domain Technical Manual and Section 4 of this Part.

7.0 BUILT FORM

This section aims to encourage good design and to coordinate development within the Corridor.

Buildings should be sited to allow for the future provision of roads and open space as shown in this Part. Staged development should be planned to maximise building address to existing streets as well as frontages to new streets.

7.1 Site Planning and Staging

Objectives

1. To ensure that development occurs within the framework of proposed streets and open spaces.
2. To ensure that the built form structure plan is reinforced.
3. To encourage buildings to address existing and proposed streets.

Controls

- a. Sites are to be planned to allow for the future provision of new streets and open spaces in accordance the Figure 4.1.1 Access Network and Figure 5.1.1 Proposed Open Space Network.

7.2 Activity Centres

Due to the size of the Macquarie Park Corridor, it is recognised that not all streets will develop as active pedestrian environments or Activity Centres.

The planning controls for the corridor aim to create vibrant streetscapes in areas with high pedestrian traffic, located close to public transport and public open space. Three Activity Centres which represent an arrival point, for commuters travelling by both road and rail to the Corridor have been identified. These are:

- **Macquarie Park Station Activity Centre**
 - Centred on the intersection of Waterloo Road and Lane Cove Road this activity centre builds on symbiotic relationship between the train station and the commercial core of Macquarie Park.
 - The vitality of the Activity Centre is enhanced by the future Central Park, a major new public open space and recreation destination for the Corridor.
 - Waterloo Road will provide a civic streetscape with a high quality public domain and opportunities for a prestigious corporate address.
 - The accessibility of the precinct will be enhanced by new streets and pedestrian connections, creating a high level of permeability, opportunities for new building addresses, access and service retail.
- **Macquarie University Station Activity Centre**
 - Includes two of the main destinations within the Corridor - Macquarie University and the Macquarie Shopping Centre – which contribute to the diversity and vibrancy of the Precinct.
 - The Macquarie University Station and bus interchange service large numbers of students, visitors and workers each day.
 - The area is expected to accommodate diverse land uses, with the flexibility to change over time.

▪ North Ryde Station Activity Centre

Note: This precinct is deferred from this DCP however, for co-ordination purposes the following information is provided.

- Adjoins the Lane Cove River National Park and business park areas including Riverside Corporate Park, historic home of the CSIRO.
- The precinct includes two distinct sub-precincts: the North Ryde station mixed use / residential areas and residential areas to the west of the M2. The Activity Centres includes neighbourhood retail hub for daily shopping and community services and facilities;
- A future land bridge over the M2 provides the opportunity to unify the precinct and to increase the rail station catchment.

Objectives

1. To co-ordinate the orderly development of the Precinct and have regard to:
 - the Macquarie University Master Plan (Approved under Part 3A of the Act) and
 - the Herring Road Urban Activation Precinct
 - the North Ryde Station Urban Activation Precinct.

7.3 Active frontage

Active uses at ground level are encouraged within Macquarie Park generally but more particularly in Activity Centres in order to ensure vibrant streetscapes, community meeting places and the provision of local services and facilities. This is supported by controls for 'Active Frontages', which identify areas where active ground level uses are to be consolidated.

Objectives

1. To create a distinctive civic character to Waterloo Road around the stations.
2. To provide a mix of uses to support an increasing employment and residential population over time.
3. To create a vibrant local activity centre adjacent to the station and around new parks.
4. To provide a range of uses, including where permitted residential and retail, that complement the broader uses within the Corridor and that generate activity at ground level.
5. To create vibrant local activity hubs adjacent to stations and around new parks and rail station plazas.
6. To provide high quality public spaces suitable for active and passive recreation, for users of the rail stations and surrounding urban areas.
7. To ensure that public spaces and streets are activated along their edges.
8. To encourage safe well used public domain spaces.
9. To create vibrant streetscapes around areas of high pedestrian traffic.
10. To encourage activity within the Corridor outside commercial business hours.
11. To enhance pedestrian safety, security and amenity within the Corridor.

Controls

- a. Continuous ground level active uses must be provided where primary active frontages are shown in Figure 7.3.2 Active Frontage and Setback Control Drawing. Buildings must

address the street or public domain.

- b. Front door and street address is to be located on the primary frontage.
- c. Loading docks, vehicular access is not to be located where primary active frontages are shown in Figure 7.3.2 Active Frontage and Setback Control Drawing unless it can be demonstrated that there is no alternative.
- d. Active ground level uses are encouraged where secondary active frontages are shown in Figure 7.3.2 Active Frontage and Setback Control Drawing.
- e. Active uses are defined as one or more of the following:
 - i. shop fronts;
 - ii. retail/service facilities with a street entrance;
 - iii. cafe or restaurants with street entrance;
 - iv. community and civic uses with a street entrance;
 - v. recreation and leisure facilities with a street entrance;
 - vi. commercial or residential lobbies with a street entrance not more than 20% of the total length of the building's street frontage
- f. Entries to active frontage tenancies are to be accessible and at the same level as the adjacent footpath.
- g. Active uses must occupy the street frontage for a depth of at least 10m. Refer Figure 7.3.1 Active Frontages Plan Diagram and Active Frontages Elevation Diagram.
- h. On sloping sites, the maximum level change between ground floor tenancies and the adjacent footpath is 600 mm.
- i. Where active frontage is required a minimum of 90% of the building frontage is to be transparent i.e. windows and glazed doors (A maximum 10% active frontage may be fire stairs, plant, masonry walls and other non-active uses).
- j. Clear glazing is to be provided to windows and doors. The sill height for windows must be maximum 1200mm above the footpath, including for sloping sites. Refer Figure 7.3.1 below.

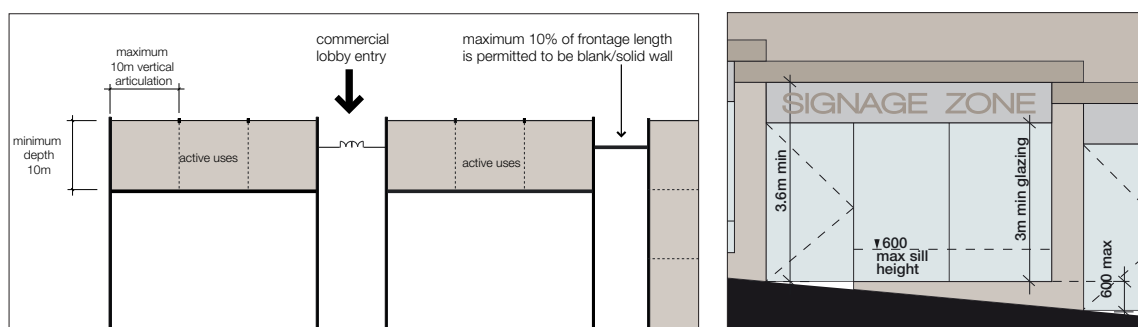


Figure 7.3.1 Active Frontages Plan Diagram and Active Frontages Elevation Diagram

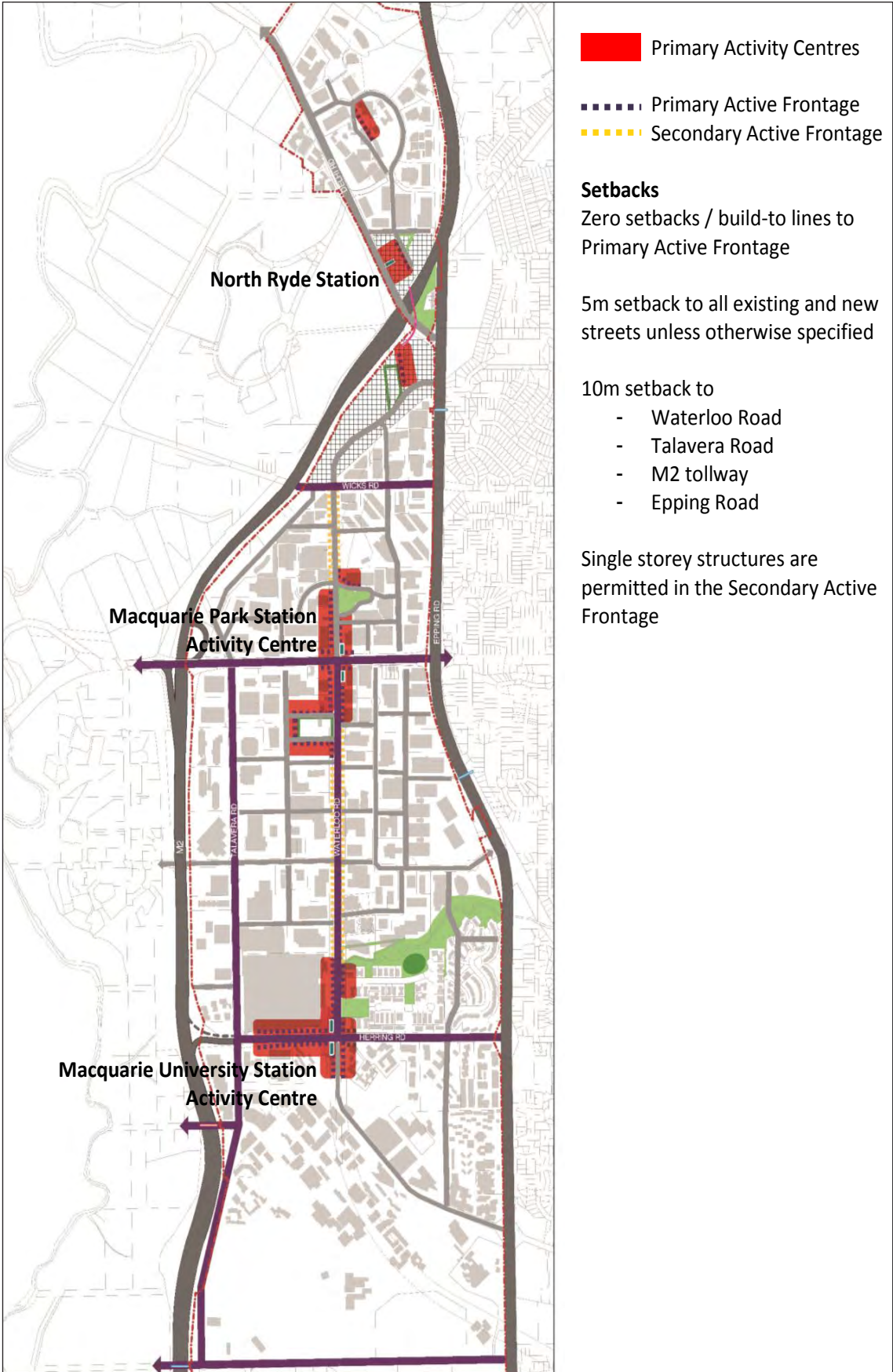


Figure 7.3.2 Active Frontage and Setback Control Drawing

7.4 Setbacks and Build-to Lines

Setback controls define the building line and determine the location of buildings relative to the street boundary. General setback controls apply throughout the corridor. Specific street setback controls are provided where a particular existing or desired future street character is to be reinforced.

Buildings are encouraged to treat the setbacks as build-to-lines in order to promote a consistent setback and safe attractive public domain. However, subject to negotiation with Council, buildings may setback further from the street or public domain according to specific site conditions. This will include consideration of the impacts on underground infrastructure associated with the Epping Chatswood Rail Link (ECRL) running under Waterloo Road.

Objectives

1. To enhance the existing character of streets within the Corridor.
2. To create new streets which contribute to the character and identity of the Corridor.
3. To increase pedestrian amenity and provide pedestrian sight lines to train stations.
4. To retain and reinforce the existing character of green setbacks with mature planting.

Controls

- a. Minimum setbacks and build-to lines must be provided as shown Figure 7.3.2 Active Frontage and Setback Control Drawing – summarised as follows:
 - i. Zero setbacks / build-to lines to Primary Active Frontage;
 - ii. 5m setback to all existing and new streets unless otherwise specified;
 - iii. 10m setback to Waterloo Road and Talavera Road;
 - iv. 10m green setbacks to the M2 tollway and Epping Road; and
 - v. 5m built form setback to all parks (existing and proposed – subject to providing a Riparian Corridor in accordance with the NSW Office of Water's *Guidelines for Riparian Corridors on Waterfront Land*).
- b. Subject to negotiation with Council single storey structures which include active uses may be located within the Secondary Active Frontage. These structures must address the public domain, be transparent as far as practicable and will be subject to the ECRL Guidelines.
- c. Provide 2m setbacks to pedestrian pathways (unless within a building).
- d. Despite clause 7.2.a development may be set back further from the street or public domain where it can be demonstrated to Council that the impacts of development on underground rail infrastructure are not in accordance with the ECRL Underground Infrastructure Protection Guidelines Report No. 20007300/ PO-4532 obtainable from Transport for NSW.
- e. Council encourages development that complies with Figure 7.3.2 Active Frontage and Setback Control Drawing and meets the requirements of the ECRL Second Reserve Support Zone. The following are permitted in the Second Reserve support zone:
 - i. Excavations less than 3m in depth are not required to be assessed. Excavations 3m or more in depth are required to be assessed for their impact on the underground infrastructure, including impacts during construction.
 - ii. Shallow footings with relatively light loadings (allowable bearing pressure of less than 150kPa on small pad or strip footings) are not required to be assessed. Other shallow footings and deep foundations are required to be assessed.
- f. Underground parking is not permitted to encroach into the front setback areas unless it can be demonstrated that the basement is designed to support significant mature trees and deep root planting. Refer to Figure 7.4.1.

- g. Awnings, canopies, balconies, sun shading and screening elements can project forward of the street setback line.
- h. 60% of the street setback area is to be soft landscaping. Existing mature trees are to be retained where possible. Paved areas are to relate to the materials and finishes of the adjacent streetscape. At grade car parking must not be located within this setback.

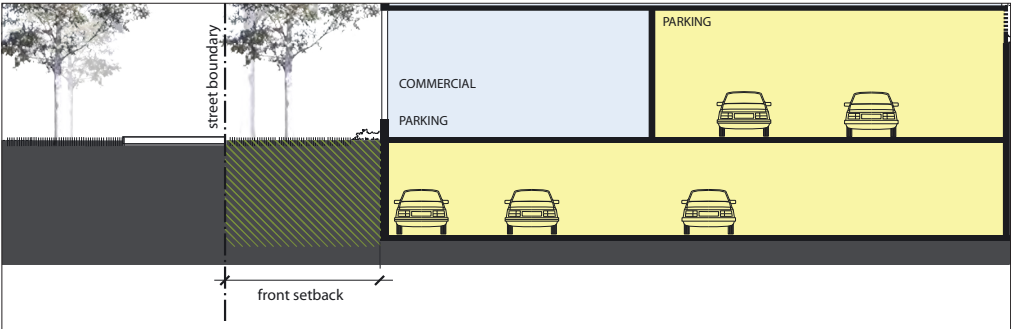


Figure 7.4.1 Parking is not permitted within required setbacks, allowing for deep soil landscaping along streets

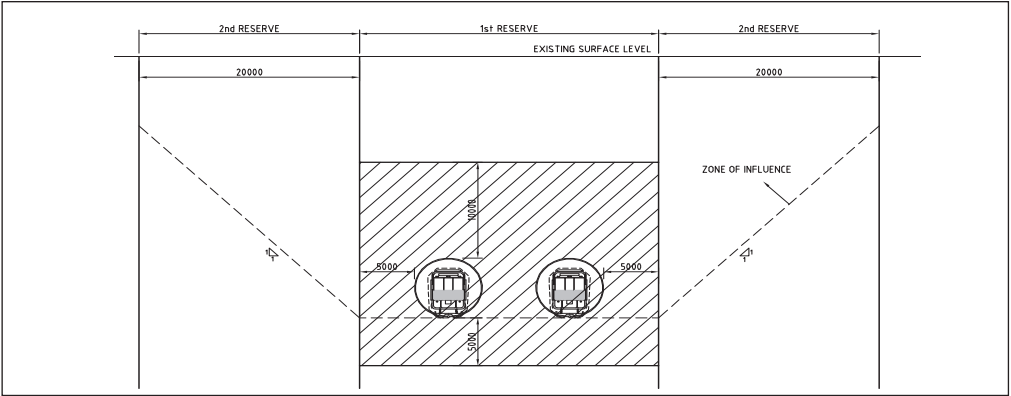


Figure 7.4.2 Section showing First and Second Reserve Zones associated with ECRL underground rail infrastructure in Macquarie Park Corridor

Source: ECRL Underground Infrastructure Protection Guidelines Report No. 20007300/ PO-4532

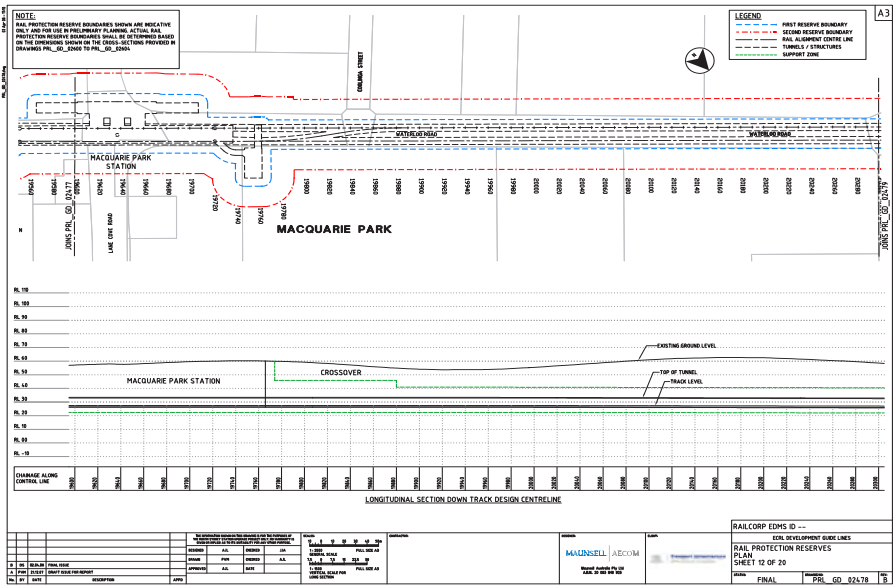


Figure 7.3.3 Sample plan showing First and Second Reserve Zones associated with ECRL underground Rail infrastructure in Macquarie Park Corridor

Source: ECRL Underground Infrastructure Protection Guidelines Report No. 20007300/ PO-4532

7.5 Awnings and Canopies

Awnings increase pedestrian amenity by providing shelter and enclosure at a pedestrian scale. They encourage pedestrian activity along streets and, in conjunction with active edges such as retail frontages, support and enhance the vitality of the local area. Awnings and entry canopies provide a public presence and interface within the public domain, contributing to the identity of a development.

Objectives

1. To unify the streetscape.
2. To provide weather protection, safety and security for pedestrians.
3. To demarcate building entries and contribute to the image and identity of development.

Controls

- a. Awnings must be provided where Primary Active Frontages are shown in Figure 7.3.2 Active Frontage and Setback Control Drawing. Entry canopies and discontinuous awnings and entry canopies are encouraged elsewhere in the Corridor.
- b. Awning width is to be 3 m. Refer to Figure 7.5.1 below.
- c. Provide awnings with a soffit height of 3.6 m above the finished ground floor level. On sloping sites, awning soffit height may vary from 3.6 m - 4.2 m. Refer to Figure 7.5.1 and 7.5.2 below.
- d. Awning heights are to be coordinated with adjoining properties.
- e. Where the topography slopes along the street, awnings are to step to provide a regular height over the footpath. Steps in awnings should not exceed 600 mm.
- f. Stepped awnings must be detailed to provide continuous weather protection.
- g. Glazing is not permitted in continuous awnings.
- h. Under awning lighting is to be provided to achieve appropriate luminance levels for pedestrians (Refer to relevant Australian Standards). This should be recessed into the soffit of the awning.

Entry Canopies

- i. Entry canopies and discontinuous awnings may be provided to building entries not located along Active Frontages.
- j. Entry canopies may be glazed or solid, and are to be coordinated with a soffit height of 3.6 m minimum.

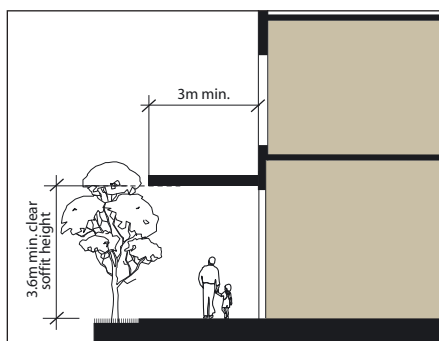


Figure 7.5.1 Awnings: Section

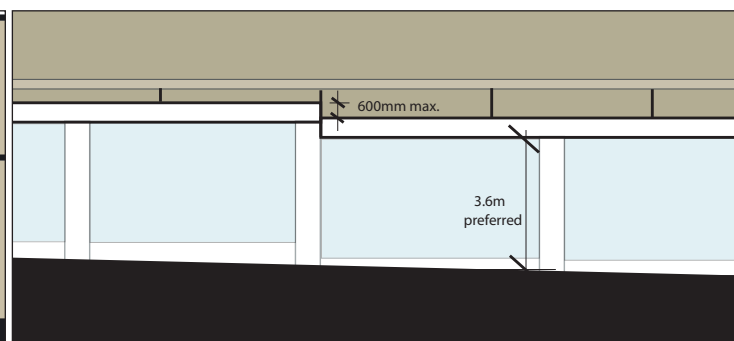


Figure 7.5.2 Awnings: Elevation



Figure 7.5.3 Continuous awnings integrating signage and recessed lighting



Figure 7.5.4 Entry canopy integrated with landscape and building design

7.6 Rear and Side Setbacks

Side and rear setback spaces provide a corridor of deep soil between sites. This area allows for the retention of existing mature trees, and future tree planting. Side and rear setbacks also provide an opportunity to resolve changes in level between sites.

Objectives

1. To create a pattern of development that positively defines the streetscape.
2. To provide building separation for visual and acoustic privacy
3. To provide deep soil zones, and maintain mature/significant vegetation.
4. To contribute to the landscape character of the Corridor.

Controls

- a. Buildings are to be set back 10m from the rear boundary and 5m from a side boundary unless a proposed new road is shown on the site.
- b. Buildings are not to be constructed on the locations for proposed new roads. An allowance for a 5m setback from a proposed road should also be made.
- c. Awnings, canopies, balconies, sun shading and screening elements may project into the rear setback zones.
- d. Basement car park structures should not encroach into the minimum required rear or side setback zone unless the structure can be designed to support mature trees and deep root planting.
- e. Above ground portions of basement car-parking structures are discouraged and deep soil planting is promoted.
- f. Natural ground level is to be retained throughout side and rear setbacks, wherever possible. Refer to Section 8.4 Topography and Building Interface for controls.

7.7 Building Separation

Where buildings face each other within the same site, provide adequate separation to allow visual privacy and solar access to buildings and courtyard spaces.

Objectives

1. To allow solar access to buildings and communal areas.
2. To retain mature vegetation between buildings and allow for deep soil planting.
3. To provide a visual break between buildings and reduce the perceived bulk and scale of the built environment.
4. To provide visual privacy between buildings.
5. To provide outlook from buildings.

Controls

Commercial:

- a. Provide minimum 20 m separation between buildings facing each other within a site. Refer to Figure 7.7.1 Commercial Building Separation Controls.
- b. Provide minimum 10 m separation between buildings perpendicular to each other within a site. This reduced building separation control only applies where the width of the facing facades does not exceed 20 m. Refer to Figure 7.7.1 Commercial Building Separation Controls.

Residential:

- c. Provide building separation as per SEPP 65 - Design Quality of Residential Apartment Development requirements.

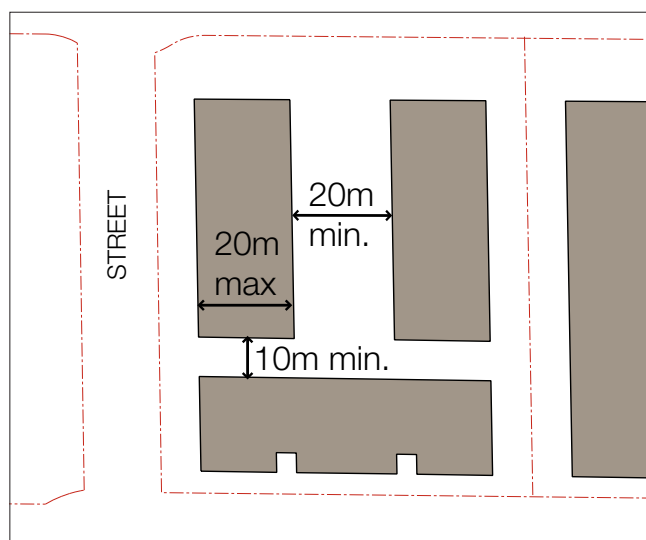


Figure 7.7.1 Commercial Building Separation Controls

7.8 Building Bulk and Design

To allow for a diversity of building types, flexible performance based controls are provided. Generally thin cross section buildings improve the amenity of living and working environments. Commercial buildings with larger footprint requirements can adopt creative solutions (such as atria or internal courtyards) to meet the environmental performance standards within this plan.

Taller buildings have an increased impact on their surroundings. As such, the bulk and form of taller buildings is numerically controlled. This ensures that the environmental impacts of taller buildings on the surrounding areas are minimised, and that the forms of these buildings contribute positively to the skyline of the Corridor.

Objectives

1. To minimise overshadowing and visual impact of taller buildings.
2. To contribute to the scale and proportion of the urban form.
3. To contribute to energy efficiency of buildings.
4. To provide internal spaces of a high quality and amenity.
5. To create modelled buildings which address the public domain.
6. To ensure that new developments have facades which define and enhance the public domain.
7. To ensure that building elements such as awnings, sun screens, shading devices, roof structures and services elements are integrated into the overall building form and façade design.

Controls

- a. The floor-plate of buildings above 8 storeys is not to exceed 2,000m², unless it can be demonstrated that slender building forms are achieved through courtyards, atria, articulation or architectural devices.
- b. Buildings are to address the street, and are to have a street address.
- c. Facade design is to
 - i. Reflect and respond to the orientation of the site using elements such as sun shading and other passive environmental controls where appropriate.
 - ii. Provide building articulation such as well design roof forms, expressed vertical circulation etc.
 - iii. Express corner street locations by giving visual prominence to parts of the façade (eg a change in building articulation, material or colour, or roof expression).
 - iv. Integrate and co-ordinate building services such as roof plant, parking and mechanical ventilation with the overall façade and building design, and be screened from view.
 - v. Roof forms, building services and screening elements are to occur within the overall height controls. Refer to Ryde LEP 2014 for height controls.
 - vi. Ventilation louvres and car park entry doors are to be coordinated with the overall façade design.

- d. The distance of any point on a habited floor from a source of natural daylight should not exceed 12m (such as from the core to an external window).
 - i. Atria and courtyards are to be used to promote access to natural light, pedestrian links and slender building forms.
 - ii. Arrange courtyards and atria to respond to street lot & solar orientation.
 - iii. The preferred height to width ratio of atria is 3:1.
- e. Buildings are to be designed to be flexible – car parking above the ground level is to have a floor to ceiling height of not less than 2.7m.

8.0 SITE PLANNING AND STAGING

8.1 Site Planning and Staging

Objectives

1. To ensure that development occurs within the framework of proposed streets and open spaces.
2. To ensure that the built form structure plan is reinforced.
3. To encourage buildings to address existing and proposed streets.

Controls

- a. Sites are to be planned to allow for the future provision of new streets, pedestrian connections and open spaces in accordance with Figure 4.1.1 Access Network and Figure 5.1.1 Proposed Open Space Network. Where it is proposed to vary the locations of open space, and roads; a master plan must be submitted with the development application in accordance with clause 8.1.b (below) and the following:
 - i. Equal or greater quantum of open space or road area than shown in Figure 4.1.1 Access Network and Figure 5.1.1 Proposed Open Space Network;
 - ii. A highly visible and publicly accessible location for passive open space bounding Waterloo Road;
 - iii. The same functional outcomes for open space as specified in Section 5.2;
 - iv. The same connection points to existing roads as shown in the Figure 4.1.1 Access Network and the ability to enhance connectivity; and
 - v. Where the site abounds Shrimptons Creek Parklands, a Riparian Corridor in accordance with the NSW Office of Water's *Guidelines for Riparian Corridors on Waterfront Land*.
- b. All sites 15,000m² or more in area should lodge a site-specific Master Plan and/or Stage 1 development application for approval. The Master Plan must be supported by a:
 - i. Transport Management and Access Plan that entails the following measures:
 - Maximise access by sustainable modes of transport and reduce cardependency (i.e. Public Transport, Cycling and Walking)
 - Maximise public access (example: Bus Stops, public pick-up and drop-off points, 'thru' pedestrian connections and links);
 - ii. Proposed vehicular access to and from the site; including the provisions parking;
 - iii. Economic Impact Report which details retail floor space and impacts on local centres with 5 kms, the quantum of employment floor space and likely employment generation;
 - iv. Proposed floor space and height and general site layout that preserve the natural heritage of the site (as appropriate) and protect the amenity of the local neighbours;
 - v. Details of any proposed public benefits and proposed incentive bonus;
 - vi. Arts Plan; and
 - vii. Social Impact Study.

Note: Stage 1 DAs (Master plans) approved by Council may guide general variations to the DCP provisions.

8.2 Site Coverage, Deep Soil Areas and private open space

Site coverage controls limit the extent of building footprint within each site, providing significant areas of open space and landscape. Within the remaining open space, deep soil areas are to be provided. Each site is to provide a consolidated area of deep soil, located to provide maximum benefit in terms of landscape planning. This may require the deep soil area to be located to retain significant vegetation, or to be located adjacent to deep soil areas on neighbouring sites.

Objectives

1. To maintain the 'campus style' industrial parklands character that typifies much of the Corridor.
2. To provide developments with a high level of amenity and landscape character.
3. To retain existing mature trees and allow for future tree planting.
4. To provide occupants with passive recreational opportunities.
5. To provide an area on site for soft landscaping and deep soil planting.
6. To improve stormwater quality and minimise water consumption through implementation of water sensitive urban design guidelines.

Controls

- a. A minimum 20% of a site must be provided as deep soil area.
- b. Deep soil areas must be at least 2 m deep.
- c. For the purpose of calculating deep soil areas, only areas with a minimum dimension of 20 m x 10 m may be included.
- d. A minimum 20% of the site area is to be provided as Landscaped Area. Landscaped Area is defined as: Area on the site not occupied by any buildings, except for swimming pools or open air recreation facilities, which is landscaped by way of gardens, lawns, shrubs or trees and is available for use and enjoyment by the occupants of the building, excluding areas used for driveways, parking areas or drying yards.
- e. Solar access to communal open spaces is to be maximised. Communal courtyards must receive a minimum of 3 hours direct sunlight between 9 am and 3 pm on the 21st of June.
- f. Appropriate shading is to be provided so that communal spaces are useable during summer.
- g. Communal open spaces are to incorporate the primary deep soil area where possible.
- h. Landscaping is to contribute to water efficiency and effective stormwater management. Landowners are to consult with Council for requirements to address stormwater quality.

8.3 Planting on Structures

Quality landscape design and open space amenity relies in part on the quality and health of plants. Planting above structures places a range of environmental stresses on vegetation as a result of limited soil depth, artificial soils, limited drainage and/or irrigation. Where landscaped courtyards are located above basement car parking or other structures, provide the following minimum standards to improve the quality and longevity of landscaping.

Objectives

1. To contribute to the quality and amenity of communal open space on roof tops, podiums, internal courtyards and above basement car parks.
2. To encourage the establishment and healthy growth of trees.
3. To promote 'green buildings' that reduce the overall environmental impact of development.

Controls

- a. Provide optimum conditions for plant growth by providing appropriate irrigation and drainage methods.
- b. Design planters to provide the largest possible volume of soil, in accordance with the following recommended standards:
 - i. Large trees (canopy diameter up to 16 m at maturity)
 - Min. soil volume 150 m³
 - Min. soil depth 1.3 m,
 - Min. soil area 10 m x 10 m or equivalent
 - ii. Medium trees (canopy diameter up to 8 m at maturity)
 - Min. soil volume 35 m³
 - Min. soil depth 1 m
 - Min. soil area 6 m x 6 m or equivalent
 - iii. Small trees (canopy diameter up to 4 m at maturity)
 - Min. soil volume 9 m³
 - Min. soil depth 800 mm
 - Min. soil area 3.5 m x 3.5 m or equivalent
 - iv. Shrubs
 - Min. soil depth 500-600 mm
 - v. Ground cover
 - Min. soil depth 300-450 mm
 - vi. Turf
 - Min. soil depth 100-300 mm

8.4 Topography and Building Interface

The topography within the Macquarie Park Corridor creates significant issues for the interface between buildings, private open spaces and streets. Roadways, landscape and open space infrastructure should address the interface between the public and private domain.

The design of private landscapes within this zone, both soft and hard, should integrate with the public domain landscape. In order to maximise continuity between these zones, the erection of boundary walls or fences should be minimised and at grade connections provided wherever possible.

Changes in level across a site should be accommodated internally within the building design to ensure that internal spaces integrate with external movement patterns and public uses (eg. cafés and shops). Designers should consider the degree to which building frontages can activate or enhance the use of the public domain. The success of the public domain will depend on the degree to which these sites can facilitate through connections and also provide facilities that encourage people to stop and linger.

Objectives

1. To ensure that buildings and courtyard spaces are connected to the street.
2. To ensure that building entries and forecourts contribute positively to the streetscape and public domain.
3. To address level changes across street frontages, and between adjoining properties.
4. To reduce the impact of site levelling on adjacent properties, and future site development opportunities.
5. To ensure visibility and surveillance of all publicly accessible open spaces from streets and the public domain.

Controls

- a. Level changes across sites are to be resolved within the building footprint.
 - i. Where buildings are built to the street boundary (i.e. zero setbacks, refer to Section 7.4 Setbacks and Build-to Lines), a level transition must be provided between the building and the adjacent footpath. This level must be maintained for a minimum depth of 10 m into the building.
 - ii. Where buildings are set back from the street boundary, entries are to be provided at street level wherever possible.
- b. An accessible path of travel is to be provided from the street through the main entry door of all buildings.
 - i. Where necessary, stairs and ramps are to be integrated with the landscape design of front setbacks.
- c. Natural ground level is to be retained for a zone of 4 m from the side and rear property boundaries. Retaining walls, cut and fill are not permitted within this zone.
- d. The maximum height of retaining walls within the front, side and rear setbacks is not to exceed 1.2 m.
- e. Publicly accessible open spaces under private ownership (courtyards, forecourts) must be provided at footpath level. Where level changes cannot be avoided due to topography, the finished level of the open space must not exceed 1.2 m above footpath level.

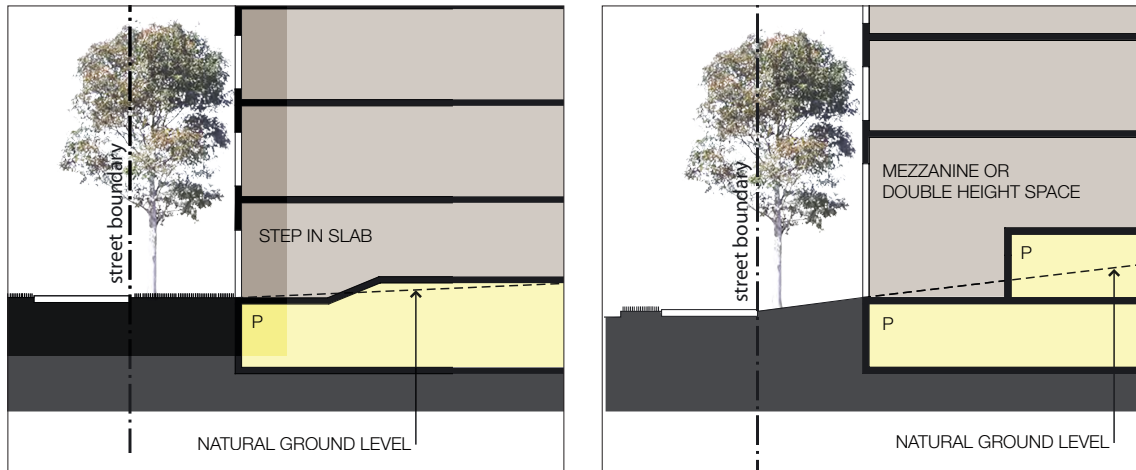


Figure 8.4.1 Level change across site resolved within building entry

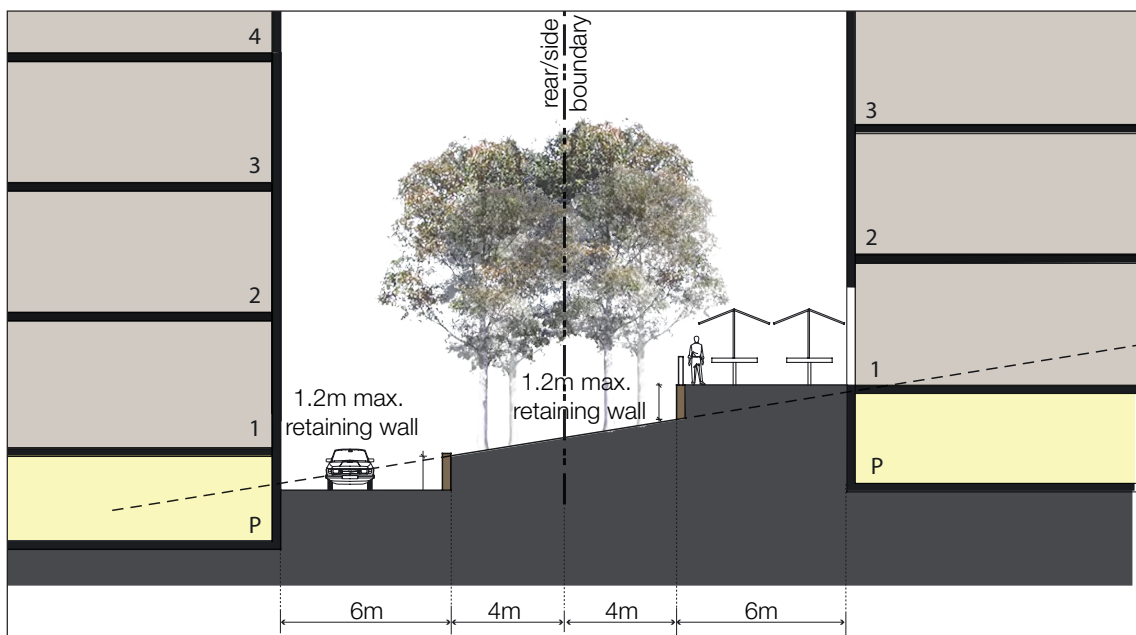


Figure 8.4.2 Level change controls at side and rear setbacks

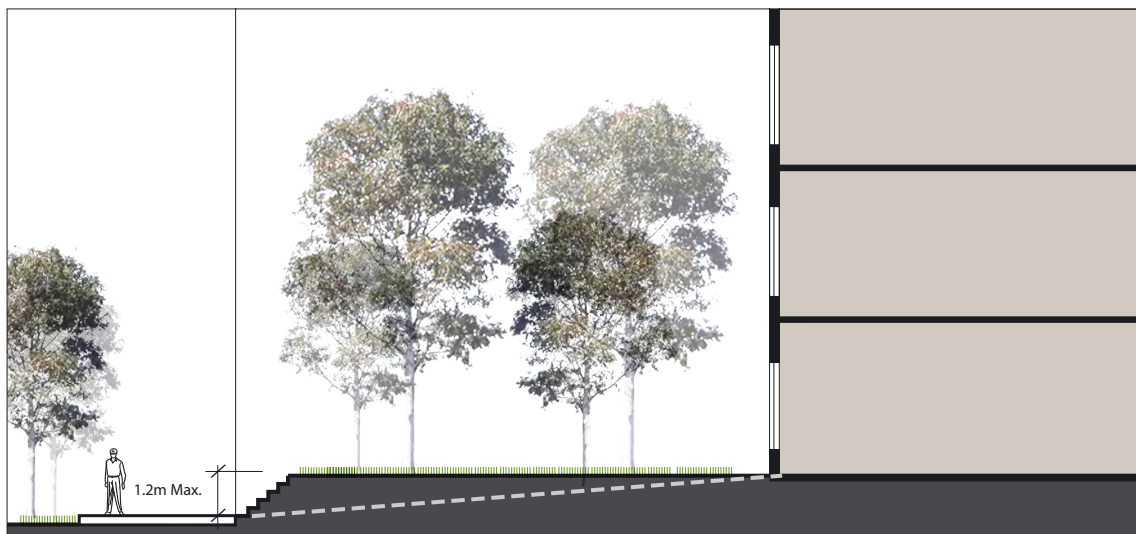


Figure 8.4.3 Level change controls where publicly accessible open space is located adjacent to a street

8.5 Site Facilities

Site facilities include loading areas, garbage areas, mail boxes, external storage areas, courier/service entries, and residential clothes drying facilities.

Site facilities are to be considered at an early stage of design development. This ensures that the impact of necessary site facilities on the public domain and adjacent properties can be minimised.

Objectives

1. To provide appropriate site facilities for retail, commercial and residential uses.
2. To minimise the impact of site facilities on the streetscape and public domain.
3. To provide adequate garbage and recycling areas to all developments.

Controls

Commercial

- a. Vehicular access to loading facilities is to be provided from secondary and tertiary streets where possible.
- b. Rubbish and recycling areas must be provided in accordance with Section 6.3 Waste Management. These areas must:
 - i. be integrated with the development;
 - ii. minimise the visibility of these facilities from the street; and
 - iii. be located away from openable windows to habitable rooms.
- c. Barrier free access is to be provided to all shared facilities.

Residential

- d. Provide either communal or individual laundry facilities to each dwelling, and at least one external clothes drying area. The public visibility of this area should be minimised. Clothesdrying is only permitted on balconies that are permanently screened from view from the public domain.
- e. Provide storage to dwellings in accordance with SEPP 65 requirements.
- f. Lockable mail boxes are to be provided in a location visible from the public domain. Mailboxes are to be integrated with the design of building entries and to Australia Post standards.

8.6 Vehicular Access

Vehicular access is the ability for cars and maintenance and service vehicles to access the development. The location, type and design of vehicle access points to a development will have significant impacts on the streetscape, the site layout and the building façade design. It is important that vehicle access is integrated into site planning from the earliest stages to balance any potential conflicts with streetscape requirements and traffic patterns and to minimise potential conflicts with pedestrians.

Objectives

1. To integrate adequate car parking and servicing access without compromising street character, landscape or pedestrian amenity and safety.
2. To encourage the active use of street frontages.

Controls

- a. Vehicular access is not permitted along streets identified as 'Active Frontages' (refer to Section 7.3 Active Frontages).
- b. Where practicable, vehicle access is to be from secondary streets.
- c. Potential pedestrian/vehicle conflict is to be minimised by:
 - i. limiting the width and number of vehicle access points
 - ii. ensuring clear site lines at pedestrian and vehicle crossings
 - iii. utilising traffic calming devices
 - iv. separating and clearly distinguishing between pedestrian and vehicular accessways
- d. The appearance of car parking and service vehicle entries is to be improved by
 - i. locating or screening garbage collection, loading and servicing areas visually away from the street
 - ii. setting back or recessing car park entries from the main façade line
 - iii. avoiding black holes in the façade by providing security doors to car park entries
 - iv. where doors are not provided, it is to be ensured that the visible interior of the car park is incorporated into the façade design and material selection and that building services pipes and ducts are concealed, and
 - v. returning the façade material into the car park entry recess for the extent visible from the street as a minimum.
- e. The width of driveways is to be determined in accordance with the requirements of Ryde DCP 2014 and the relevant Australian Standards.

8.7 On-site Parking

The accommodation of car parking on site, underground and on-grade, has a significant impact on the site layout, landscape design, deep soil zones and storm water management. It is important new developments consider the local context such as the location of public transport facilities, services and recreational facilities within walking or cycling distance, which will reduce the need for parking spaces.

Objectives

1. To minimise car dependency for commuting and recreational transport use, and to promote alternative means of transport - public transport, bicycling, and walking.
2. To minimise traffic congestion in the Corridor.
3. To provide adequate car parking for building users and visitors, depending on building use and proximity to public transport.
4. To minimise the visual impact of car parking on streets, public spaces and adjoining sites.
5. To maximise opportunities for consolidated areas of deep soil planting and landscaping.



Figure 8.7.1 Along Active Frontages, basement parking must be located fully below footpath level. However to accommodate topography, basement levels may protrude by a maximum of 1.2 m beyond ground level. Along street frontages, above ground parking must be laminated with another use

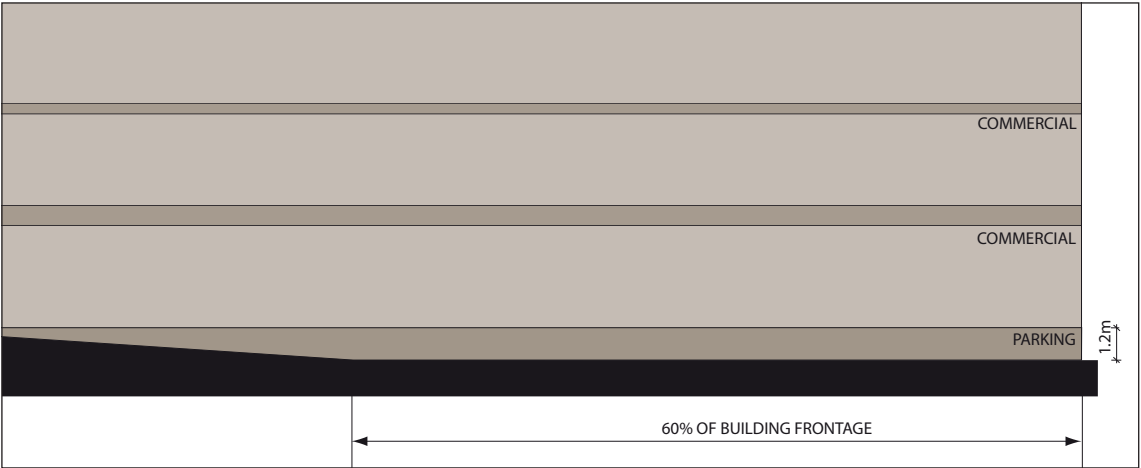


Figure 8.7.2 Along public streets, basement parking must protrude no more than 1.2 m above ground for no more than 60% of the building frontage

Controls

- a. Safe and secure 24-hour access to car parking areas is to be provided for building users.

At-grade parking

- b. Parking areas must not be located within the front, side, or rear setbacks.
- c. Parking areas are to be screened from view from the street, public domain and communal open space areas, using site planning and appropriate screen planting or structures.
- d. Provide safe and direct access from parking areas to building entry points.
- e. Provide appropriate mature vegetation between parking bays to provide shade and enhance visual impact.

Basement parking

- f. Basement parking areas should be located directly under building footprints to maximize opportunities for deep soil areas unless the structure can be designed to support mature plants and deep root plants.
- g. Basement parking areas must not extend forward of the building line along a street.
- h. Along active frontages, basement parking must be located fully below the level of the footpath. Refer to Section 7.3 Active Frontages.
- i. Basement parking should be contained wholly beneath ground level along public streets.
- j. Where this cannot be achieved due to topography, the parking level must protrude no more than 1.2 m above ground level for no more than 60% of the building frontage along a public street (Refer to Figures 8.7.1 and 8.7.2).
- k. Ventilation grills or screening devices of car park openings are to be integrated into the overall façade and landscape design of the development.

Parking in structures

- l. Along all street frontages, above ground parking levels are to be laminated with another use for a minimum depth of 10 m, e.g. building entry lobbies, retail tenancies, commercial floor space.
- m. Temporary above ground parking structures are to be designed to allow future adaptation to other uses. Ramps should be located internally rather than on the facades of parking structures to allow ease of adaptation of use.

8.8 Fencing

Security fencing is inconsistent with the vision of this DCP to promote and open landscaped centre.

Objectives

1. To create an attractive public domain and open landscaped character within the Macquarie Park Corridor.

Controls

- a. Fencing is not permitted on the perimeter boundary of sites. Security should be provided within buildings.

9.0 ENVIRONMENTAL PERFORMANCE

Assessment of both commercial and residential development within the Macquarie Park Corridor utilises comprehensive state and national building assessment and rating tools.

Commercial office design and construction is rated using the Green Building Council of Australia's Green Star rating system. Using this tool, projects are evaluated against eight environmental impact categories, plus innovation. Within each category, points are awarded for initiatives that demonstrate that a project has met the overall objectives of Green Star, and the specific criteria of the relevant rating tool credits. Points are then weighted and an overall score is calculated, determining the Green Star rating.

Residential developments, and the residential component of mixed-use development is required by legislation to pass BASIX. The Building Sustainability Index ensures homes are designed to use less potable water and be responsible for fewer greenhouse gas emissions by setting energy and water reduction targets.

Objectives

1. To reduce the necessity for mechanical heating and cooling.
2. To reduce reliance on fossil fuels.
3. To minimise greenhouse gas emissions.
4. To reduce environmental impact over the life cycle of a building.
5. To promote renewable energy initiatives.

Controls

- a. Commercial development is required to achieve a 4 Star Green Star Certified Rating.
- b. Additional floor space maybe permitted within a development where the building can demonstrate design excellence and environmental sustainability. For consideration of the additional floor space a minimum 5 Green Star- Green Building Council of Australia (GBCA) should be provided. Refer to Ryde LEP 2014 and Section 6 of this Part.
- c. Residential development is to comply with BASIX (Building Sustainability Index) requirements.
- d. Development is required to comply with Section 7 Built Form.

9.1 Wind Impact

Being located on a ridge above the Lane Cove River, the Corridor is relatively exposed to prevailing winds. In order to maximize the amenity of new developments and their adjoining public domains it is important that the design of new buildings incorporate measures to minimize any wind impacts, particularly on the proposed public spaces.

Objectives

1. To protect the public domain from the impact of undesirable winds while allowing the penetration of cooling summer breezes, and
2. To minimise any adverse wind impacts from the introduction of new structures.

Controls

- a. Buildings shall not create uncomfortable or unsafe wind conditions in the public domain which exceeds the Acceptable Criteria for Environmental Wind Conditions. Carefully locate or design outdoor areas to ensure places with high wind level are avoided.
- b. All applications for buildings over 5 storeys in height shall be accompanied with a wind environment statement. For buildings over 9 storeys and for any other building which may be considered an exposed building shall be accompanied by a wind tunnel study report. Refer to Council for documentation and report requirements.
- c. Calculation rules
 - i. Natural wind conditions are intensified by certain types of buildings by the way they relate to the surrounding area. In this section, those buildings are called exposed buildings.
 - ii. A building may be considered exposed if half or more of its height rises above surrounding buildings and/or the building lies on the perimeter of a built up area.
 - iii. Exposed buildings are likely to create unpleasant and even dangerous high winds, mainly in three locations: at the base, around corners or through arcades or other openings at the base of the building.
 - iv. In addition the areas within the exposed buildings that could potentially experience adverse wind effects are the areas on the podium, terraces on the roof or on setbacks in the tower as well as projecting or corner balconies.

Acceptable criteria for environmental wind conditions:

AREA CLASSIFICATION	LIMITING WEEKLY MAXIMUM GUST- EQUIVALENT MEAN	LIMITING ANNUAL MAXIMUM GUST
Outdoor dining areas, amphitheatres etc	3.5 m/s	10 to 13 m/s
Main retail centres and retail streets, parks, communal recreational areas	5.5 m/s	13 m/s
Footpaths and other pedestrian accessways	7.5 m/s	16 m/s
Infrequently used laneways, easements, private balconies	10 m/s	23 m/s

Note: The Gust -Equivalent Mean is defined as the maximum 3 second gust divided by a local Gust Factor for the local wind speed. It is recommended that the local gust factor be derived from the measured local turbulence intensity. If the mean wind speed happens to be greater than the Gust -Equivalent Mean then the Mean wind speed is to be adopted in place of the Gust -Equivalent Mean.

The Annual Maximum Gust wind speed criteria can be used as an alternative to the Gust-Equivalent Mean Criteria.

If the Gust-Equivalent Mean criteria are being used then a check should also be made to ensure that all areas studied are within the Annual Maximum Gust wind speed of 23 m/s.

When assessing the impact of a proposed development, no increase over the existing wind conditions is acceptable unless the increase over the existing conditions is such that the relevant criterion for that type of space is still satisfied.

9.2 Noise and Vibration

Loud noise affects the amenity of places, particularly in mixed-use areas where developments need to consider the amenity of a range of occupants. The impact of rail, commercial and industrial noise and vibration on residential development and pedestrian amenity is to be considered in the design and siting of all commercial, mixed use, industrial and community developments. Commercial and industrial developments can be designed and managed to minimise noise and vibration generation and intrusion.

Objectives

1. The impacts of noise and vibration on residential development are to be mitigated through appropriate design and the use of insulation.
2. The operation of commercial and industrial developments is to protect the amenity of residential and public spaces.

Controls

- a. An Acoustic Impact Assessment report prepared by a suitably qualified acoustic consultant is required to be submitted with all development applications for commercial, industrial, retail and community buildings, with the exception of applications minor building alterations.
- b. Development is to comply with all relevant statutory regulations.
- c. Where light industrial and commercial development adjoins residential development, the use of mechanical plant equipment and building services will be restricted and must have appropriate acoustic insulation.
- d. Loading and unloading facilities must not be located immediately adjacent to residential development.
- e. Retail premises must limit any spruiking and the playing of amplified music or messages so as not to disturb the amenity of other public and private places.
- f. Air conditioning ducts shall not be situated immediately adjacent to residential development.

9.3 Bushfire Management

This section is based on the Planning for *Bushfire Protection Guidelines* prepared by the NSW Rural Fire Service.

Council’s customer service department has copies of the Bushfire Hazard and Fire Prone Lands maps produced by the Rural Fire Service which identify hazard risk based on vegetation and slope classes.

AS 3959 currently sets out requirements for the construction of buildings in designated bushfire prone areas. It is referred to by the BCA as a Standard, which is, deemed-to-satisfy the Performance Requirements of that Code relating to bushfire protection.

Objectives

- 1. Consider bushfire protection and management issues in land use planning and development decisions, to provide a safe environment for the community.
- 2. Manage vegetation to reduce potential bushfire attack in the vicinity of habitable buildings.
- 3. Design and siting of habitable buildings to improve the survivability of the building and the protection of life during the passage of the fire front.
- 4. Provide safe access for emergency and other vehicles at all times.
- 5. Ensure water is available to landholders and emergency services to enable the defence of habitable buildings against bushfire attack.
- 6. Establish a maintenance regime for fire protection for the life of the habitable building.



Figure 9.3.1 Bushfire Prone Land - 01 January 2006

Controls

- a. A Bushfire Threat Assessment report, prepared by a suitably qualified bush fire consultant, must form part of all development applications for lands identified as 'fire prone' on the Bush Lands Maps. This assessment is to be prepared in accordance with the Planning for Bushfire Protection Guidelines, prepared by the Rural Fire Service.
- b. Assessment of threat from bushfire must examine impacts of the proposal both within and external to the site, including the capacity of the existing road network serving the site to accommodate traffic in emergency situations.
- c. Preparation of an assessment of threat from bushfire should include reference to:
 - i. NSW Rural Fire Service (RFS) - Planning for Bushfire Protection - a guide for land use planners, fire authorities, developers and home owners; and
 - ii. Consultation with Council and RFS staff.
- d. The recommendations of the Assessment report must be incorporated into the design of the proposed development.
- e. Fire protection measures must be capable of being maintained by owners and users.
- f. The design of a development in a fire prone area must provide for adequate emergency vehicle access to those parts of the site fronting a potential bushfire source.

9.4 Soil Management

Management of soil loss during construction is an important consideration in ensuring the continued health of the nearby waters of the Lane Cove River and groundwater. Sediments can also mobilize pollutants, which may have an adverse impact on natural bushland areas. It is essential that adequate soil management practices are followed during the development of the Corridor.

Objectives

1. To ensure that development does not contribute to environmental damage of waterways and bushland in and adjacent to Macquarie Park.
2. To minimise air and water pollution due to soil loss either through erosion or poor site practices.

Controls

- a. Development is to comply with the City of Ryde DCP 2014.
- b. Development is to be designed and constructed to integrate with the natural topography of the site to minimise the need for excessive sediment disturbance and prevent soil loss.
- c. Effective site management and maintenance practices are to be followed to prevent soil loss.
- d. Ensure that suspended Solid concentrations in stormwater leaving the site do not exceed more than 50 mg/litre.
- e. An Erosion and Sediment Control Plan (ESCP), prepared by a suitably qualified environmental engineer, is required to be submitted in support of all development proposals requiring development consent under the Ryde Local Environmental Plan, (other than for minor building modifications) including: Demolition; Excavation; Trenching and Building.
- f. The ESCP must make reference to the entire construction and post construction period, and all devices must be installed prior to commencement of any demolition or construction works on-site.
- g. The ESCP is to be prepared in conjunction with the Site Stormwater Management Plan and as a minimum contain the following information:
 - i. Property details;
 - ii. Site analysis (contours, access points, location of existing vegetation/creeks or other features);
 - iii. Extent and degree of clearing works and any excavations;
 - iv. Conservation/protection of sensitive areas and trees either on site or adjoining development;
 - v. Truck movements and access arrangements/routes (load limits);
 - vi. Sediment and Erosion Control Measures (location and type of all control measures);
 - vii. Excavation pit protection;
 - viii. Material stockpile location and control method, waste management;
 - ix. Pump out method (if required);
 - x. Dust control measures to reduce surface or airborne movement of sediment from exposed areas of the site;
 - xi. Hours of operation
 - xii. Ongoing maintenance methods
 - xiii. Risks, safeguards and safety precautions; and
 - xiv. Contingencies.

THIS PAGE HAS BEEN
INTENTIONALLY LEFT BLANK



City of Ryde
Civic Centre
1 Devlin Street
Ryde NSW 2112

www.ryde.nsw.gov.au

City of Ryde Development Control Plan 2014

Part: 4.6 Gladesville Town Centre and Victoria Road Corridor

Translation

ENGLISH

If you do not understand this document please come to Ryde Civic Centre, 1 Devlin Street, Ryde Monday to Friday 8.30am to 4.30pm or telephone the Telephone and Interpreting Service on 131 450 and ask an interpreter to contact the City of Ryde for you on 9952 8222.

ARABIC

إننا نعتذر عليك فهم محتويات هذه الوثيقة، نرجو للحضور إلى مركز بلدية رايد Ryde Civic Centre على العنوان: 1 Devlin Street, Ryde من الاثنين إلى الجمعة بين الساعة 8.30 صباحاً والساعة 4.30 بعد الظهر أو الاتصال بمكتب خدمات الترجمة على الرقم 131 450 لكي تطلب من أحد المترجمين الاتصال بمجلس مدينة رايد، على الرقم 9952 8222، نيابة عنك.

ARMENIAN

Եթե այս գրությունը չէք հասկնալ, խնդրեմ եկե՛ք՝ Րայդ Սիվիկ Սենթրը, 1 Տեյվլին փողոց, Րայդ, (Ryde Civic Centre, 1 Devlin Street, Ryde) Երկուշաբթիէն Ուրբաթ կ.ա. ժամը 8.30 – կ.ե. ժամը 4.30, կամ հեռաձայնեցե՛ք Հեռաձայնի եւ Թարգմանություն Սպասարկության՝ 131 450, եւ խնդրեցե՛ք որ թարգմանիչ մը Րայդ Քաղաքապետարանին հետ կապ հաստատուէ՝ ձեզի համար, հեռաձայնելով՝ 9952 8222 թիվին:

CHINESE

如果您看不懂本文，請在周一至周五上午 8 時 30 分至下午 4 時 30 分前往 Ryde 市政中心詢問 (Ryde Civic Centre, 地址: 1 Devlin Street, Ryde)。你也可以打電話至電話傳譯服務中心，電話號碼是: 131 450。接通後你可以要求一位傳譯員為你打如下電話和 Ryde 市政廳聯繫，電話是: 9952 8222。

FARSI

اگر این مدرک را نمی فهمید لطفاً از 8.30 صبح تا 4.30 بعد از ظهر دوشنبه تا جمعه به مرکز شهرداری رايد، Ryde Civic Centre, 1 Devlin Street, Ryde مراجعه کنید یا به سرویس مترجم تلفنی، شماره 131 450 تلفن بزنید و از یک مترجم بخواهید که از طرف شما با شهرداری رايد، شماره 9952 8222 تلفن بزند.

ITALIAN

Se non capite il presente documento, siete pregati di rivolgervi al Ryde Civic Centre al n. 1 di Devlin Street, Ryde, dalle 8.30 alle 16.30, dal lunedì al venerdì; oppure potete chiamare il Telephone Translating and Interpreting Service al 131 450 e chiedere all'interprete di contattare a vostro nome il Municipio di Ryde presso il 9952 8222.

KOREAN

이 문서가 무슨 의미인지 모르실 경우에는 1 Devlin Street, Ryde 에 있는 Ryde Civic Centre 로 오시거나 (월 – 금, 오전 8:30 – 오후 4:30), 전화 131 450 번으로 전화 통역 서비스에 연락하셔서 통역사에게 여러분 대신 Ryde 시청에 전화 9952 8222 번으로 연락을 부탁드립니다.

Amend. No.	Date approved	Effective date	Subject of amendment
	14 July 2015	Upon notification of Ryde LEP (Amendment 6) - 2 College Street and 10 Monash Road, Gladesville	<p>Replacement with revised Part 4.6 Gladesville Town Centre and Victoria Road amended in response to Council resolution on planning proposal for 2 College Street/10 Monash Road, Gladesville, effecting key changes including:</p> <ul style="list-style-type: none">Text amendments to built form controls under 4.3.1 for the Monash Road Key Site precinct - Block 02Figures/drawings amendments (various throughout) to ensure 2 College Street is included in the Part 4.6 land areas covered by each map, and to illustrate the built form controls including block diagrams, maximum building heights and setbacks as applicable to 2 College Street and 10 Monash Road.

Table of Contents

CONTENTS

1.0 PRELIMINARY	5
1.1 Introduction	5
1.2 Purpose of this Part	5
1.3 Land affected by this Part	5
1.4 Relationship of this Part to other Plans and Policies	6
1.5 Interpretation	6
1.6 Structure of this Part	6
2.0 VISION	7
2.1 Vision Statement	7
2.2 Vision Statement - Precincts	7
2.2.1 Monash Road Precinct	7
2.2.2 North Gladesville Precinct	7
2.2.3 Town Centre Precinct	7
2.2.4 South Gladesville	8
2.3 Public Domain	8
2.3.1 Street Hierarchy	9
2.3.2 Public Spaces	9
3.0 OBJECTIVES AND CONTROLS	10
3.1 Built Form	10
3.1.1 Built Form Heights	10
3.1.2 Active Street Frontages	11
3.1.3 Buildings Abutting the Street Alignment	13
3.1.4 Setbacks	13
3.1.5 Rear Setbacks and Residential Amenity	17
3.1.6 Conservation Area Built Form Design Guidelines	18
3.2 Access	21
3.2.1 Minimum Street Frontage / Site Amalgamation	21
3.2.2 Vehicular Access	21
3.2.3 Parking	22
3.3 Public Domain	23
3.3.1 Pedestrian Connections	23
3.3.2 Public Domain Framework	25

Table of Contents

3.3.3	Landscape Character	26
3.3.4	Urban Elements	27
3.3.5	Street Sections Introduction	28
3.3.6	Victoria Road Section	28
3.3.7	Victoria Road - Town Centre Precinct Section	30
3.3.8	Western Crescent Section	32
3.3.9	Coulter Street Town Centre Precinct Section	34
4.0	KEY SITES	36
4.1	Key Sites Introduction	36
4.2	Key Sites Plan	38
4.3	Key Sites Built Form and Public Domain Controls	39
4.3.1	Monash Road Key Site Build Form Controls	39
4.3.2	Block 05 (Primrose Hill) Built Form Controls	43
4.3.3	Block 05 (Primrose Hill) Public Domain/ Community Space Controls	47
4.3.4	Block 11 (Council Carpark) Built Form Controls	49
4.3.5	Block 11 (Council Carpark) Public Domain Controls	53
4.3.6	Block 18 (Coulter Street) Built Form Controls	55
4.3.7	Block 18 (Coulter Street) Public Domain Controls	58
4.3.8	Block 20, 25 & 28 (Wharf Road) Built Form Controls	60
4.3.9	Block 20, 25 & 28 (Wharf Road) Public Domain Controls	65

1.0 PRELIMINARY

1.1 Introduction

This Part provides a vision and development controls for the long term redevelopment of the Gladesville Town Centre and Victoria Road Corridor. The vision for the town centre has been developed through extensive consultation and analysis through the preparation and exhibition of the Gladesville Town Centre and Victoria Road Master Plan. The Development Control Plan process included the preparation of built form, public domain and land economics studies to inform and create environmentally desirable, practical and viable development controls.

1.2 Purpose of this Part

This Part facilitates the revitalisation of Gladesville Town Centre as a vibrant, attractive and safe urban environment with a diverse mix of retail, commercial, residential and leisure opportunities.

1.3 Land affected by this Part

This Part applies to all land shown within the shaded area identified on the plan below (known as the Gladesville Town Centre and Victoria Road Corridor).

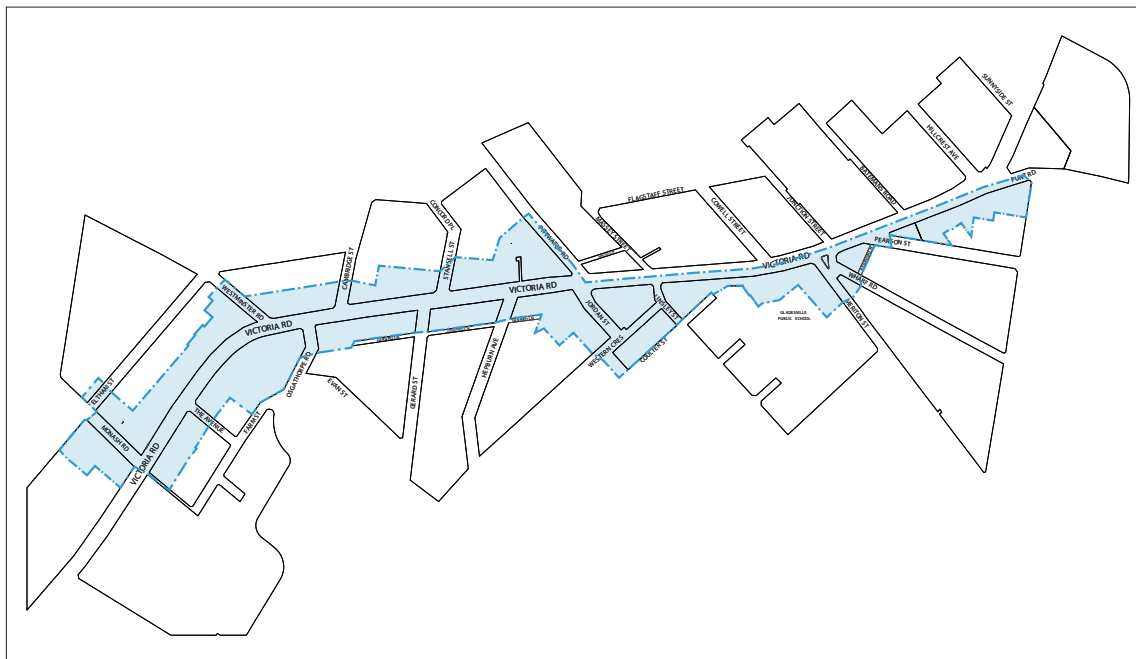


Figure 4.6.01 Land to which this Part applies

1.4 Relationship of this Part to other Plans and Policies

This Part supplements and gives guidance to the controls and objectives of Ryde Local Environmental Plan 2014 (LEP). It is also part of a series of plans promoting the revitalisation of Ryde's business centres and should be read in conjunction with other relevant Council plans and policies, including but not limited to:

- City of Ryde Section 94 Development Contributions Plan
- Ryde Public Domain Technical Manual

This Part should also be read in conjunction with the requirements of the State Environmental Planning Policy (SEPP) (Infrastructure) as provisions of that instrument have implications for building use, form and design and for the development application process.

In particular:

Clause 102 of SEPP (Infrastructure) will apply to development on land in or adjacent to Victoria Road. The clause will require consideration of design guidelines for sensitive developments

Clause 104 (Traffic-generating development) of SEPP (Infrastructure) requires referral of certain development types to the RMS and consideration of any comments in determining these applications.

1.5 Interpretation

In this Part, terms have the same meaning as in the Environmental Planning and Assessment Act 1979 (as amended) and the Ryde LEP 2014 Gladesville Town Centre and Victoria Road Corridor. If there is an inconsistency between this part and other parts of the City of Ryde DCPs, Codes or Policies this Part shall prevail.

1.6 Structure of this Part

This Part identifies objectives and controls that will shape the future development of Gladesville Town Centre and Victoria Road Corridor to create an attractive, accessible and unique urban environment in which to live, work, shop and visit.

Development controls are provided for strategic sites in the town centre. Five sites have been identified as key sites ("Key Blocks") in the redevelopment of the town centre. These five sites have been tested in detail regarding built form, public domain design and economic viability. The detailed development controls for these sites are provided in Section 4.0 of this Part.

Built form development controls for all sites in the town centre include building heights, building alignments, building setbacks, active street frontages, awnings and street sections. Active street frontages and building uses are shown in town centre plans and street sections. Building articulation zones are shown in plans and street sections.

Public domain development controls (Section 3.0) complement the built form controls with urban spaces being defined by built form and landscape elements. New streets and squares are designed as part of a comprehensive built form and public domain strategy for key sites. The range of desired future character for various precincts is defined by landscape character and built form.

2.0 VISION

2.1 Vision Statement

Gladesville Town Centre is the town centre serving Hunters Hill and the southern part of the Ryde local government area. Gladesville will serve its local communities with a wide range of retail, commercial, community, entertainment, religious, residential and other uses appropriate to a vibrant and growing town centre.

- Gladesville Town Centre and Victoria Road will:
- serve its local communities better with a diverse range of revitalised uses;
- include major retail, commercial and residential developments on key sites;
- develop a more cohesive built form and better landscaped public domain;
- define urban spaces as outdoor rooms lined by consistent built form and street trees;
- have heritage items and conservation areas protected and enhanced;
- contain new buildings which relate in built form to existing streetscapes and heritage items;
- enhance pedestrian links and public domain design to attract people to shop, work and live in the town centre; and
- be accessible for residents and for users of the centre.

2.2 Vision Statement - Precincts

The linear form of the town centre extending along Victoria Road has 4 distinct character areas which are to be enhanced in future development. The 4 precincts are identified in Figure 4.6.02 Precincts Vision Plan.

The character of each precinct is reinforced in the built form and public domain design controls. Building setbacks, active street frontages, upper level setbacks and landscape character controls relate to the precincts.

2.2.1 Monash Road Precinct

The northern precinct at Monash Road is to maintain its local retail role, whilst gaining additional retail, commercial and residential development. The precinct's heritage items and main street retail character are to be protected and enhanced with narrow frontage shopfronts and built forms that relate to the scale and character of existing buildings. The precinct will provide local shopping within a more cohesive built form and an improved public domain.

2.2.2 North Gladesville Precinct

The North Gladesville precinct between Pittwater Road and Monash Road is to be transformed from a visually cluttered commercial strip into a cohesive built form corridor of mixed retail, commercial and residential uses. The existing poorly defined spaces and visual clutter will be replaced with buildings which address the road with major façades. Large canopy street trees will be planted in building setbacks, and footpaths widened, to create a landscaped setting leading to the town centre precinct.

2.2.3 Town Centre Precinct

The town centre precinct is to be transformed from a poorly functioning strip shopping centre

into a genuine mixed use town centre. The existing shops and pedestrian amenity on Victoria Road have been degraded by traffic and lack of renewal in recent years. The town centre will be revitalised with new large retail developments in Cowell Street and Coulter Street, which will support the existing retail shops with parking and greater pedestrian amenity. An enhanced pedestrian network and new public spaces will be created off Victoria Road, with a new square at the end of Wharf Road and street tree planting around the Coulter Street retail development. A pedestrian bridge across Victoria Road will link the existing shops and the proposed “one-stop” parking in large new retail developments in Cowell and Coulter Streets. Better pedestrian amenity on and around Victoria Road and a greater range of services will revitalise the town centre as the focus of urban life for the communities on both sides of the town centre. The intersection of Wharf Road, Meriton Street and Victoria Road is a key site (refer section 4.3 of this part). The Clocktower marks this important intersection, which will be strongly defined by appropriately scaled buildings built to the street alignments.

2.2.4 South Gladesville

South Gladesville extends south of the town centre to Punt Road. It is the main approach to the town centre from Central Sydney, and provides a visual impression of Gladesville upon arrival. The character of this precinct will be reinforced as a well- landscaped entry to the town centre. The existing uses are predominantly low rise residential on the eastern side of Victoria Road, and commercial with residential flat buildings on the western side. Future development on the western side will have taller buildings set back from the street frontage with trees in the front setback providing the landscaped setting.



Figure 4.6.02 Precincts Vision Plan

2.3 Public Domain

The public domain is made up of streets, pedestrian connections, small civic parks and squares. Streets form the framework of the public domain connecting people to shopping, services, recreation and residential. Public spaces are the outdoor rooms of the town centre, providing focal points for community life.

Refer Figure 4.6.03 Public Domain Vision Plan in relation to the following sections.

2.3.1 Street Hierarchy

The hierarchy of town centre streets is characterised by land use, traffic flows and scale. This hierarchy will be maintained and enhanced to create a legible framework for the town centre.

Victoria Road is the primary road in the town centre, with two distinct characters:

- the gateways to the core at the South Gladesville and North Gladesville Precincts defined through building setbacks and street tree planting, forming a transition from residential areas;
- the Town Centre Precinct defined with new paving and urban elements, retaining existing building setbacks and awnings.

The east west through streets of the Town Centre Precinct, provide important vehicle and public transport connections. They will be reinforced with street tree planting, new paving, urban elements and building alignment.

The streets and lanes of the Town Centre Precinct, including the proposed new street will be reinforced as important pedestrian connections, with street tree planting, paving, urban elements and building alignment where appropriate.

2.3.2 Public Spaces

The public spaces within the Gladesville Town Centre and Victoria Road Corridor will be provided within the Key Sites.

Refer to sections 3.3. and 4.0 of this Part and relevant Council Policies, Plans and Public Domain Guidelines.

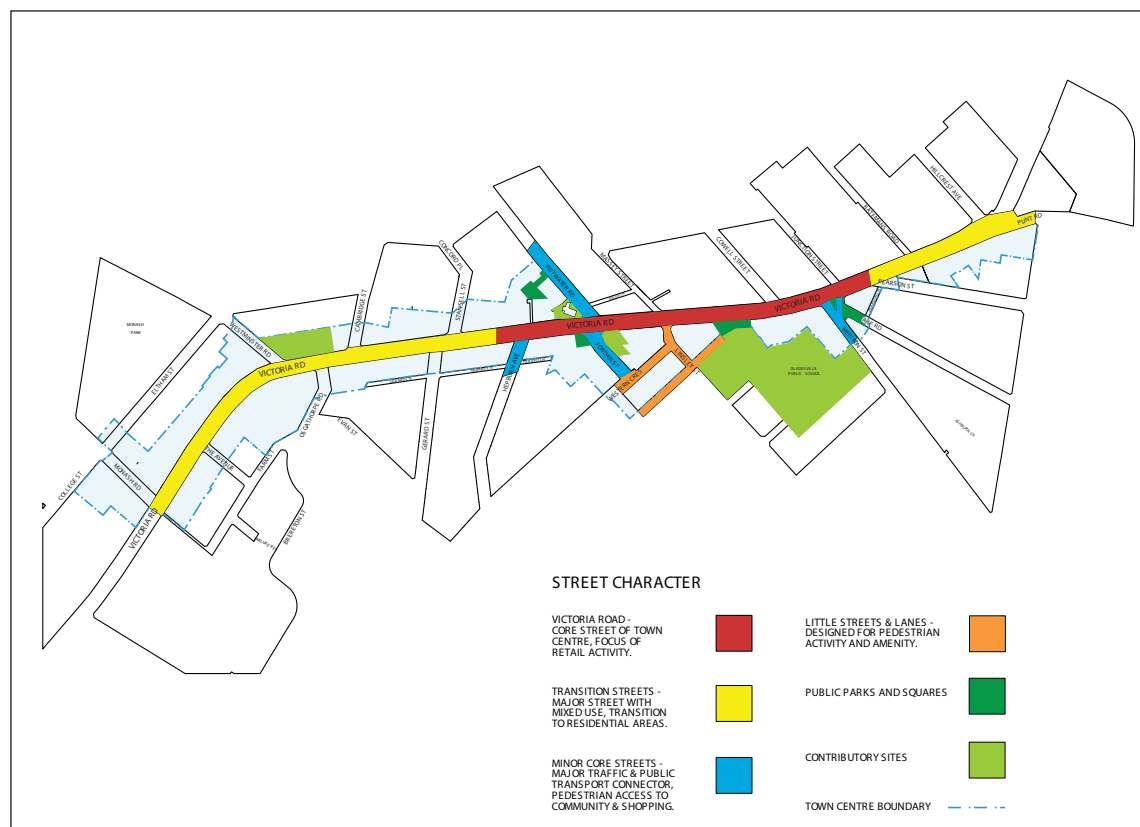


Figure 4.6.03 Public Domain Vision Plan

3.0 OBJECTIVES AND CONTROLS

3.1 Built Form

3.1.1 Built Form Heights

Objectives

- 1. To promote an urban design scale in retail, civic and business precincts.
- 2. To promote opportunities for landmark development in appropriate locations.
- 3. To enhance the existing streetscape and ensure appropriate development scale in predominately residential and heritage precincts.
- 4. To ensure adequate sunlight is available for all buildings, streets and public open space.
- 5. To ensure the ground floor levels are adaptable over time to a wide range of uses.
- 6. To attract investment, new employment opportunities and enhance economic sustainability.
- 7. To give guidance to the Ryde Local Environmental Plan 2014 Height Controls.

Controls

- a. Buildings must comply with the maximum heights described in the Ryde Local Environmental Plan 2014 (LEP).
- b. Floor to ceiling height must be a minimum of 2.7 m for residential uses.
- c. To ensure that the ground floor levels are adaptable over time for a range of uses, the floor to floor height at ground level in all mixed use developments is to be a minimum of 3.6 m, regardless of the initial proposed use.

3.1.2 Active Street Frontages

Objectives

1. To reinforce the commercial uses that currently exist in the town centre.
2. To avoid privacy problems for residential buildings built on or close to the street frontage.
3. To allow for a wide range of retail, commercial, entertainment and community uses at ground floor level.
4. To promote appropriate residential development.
5. To enhance personal safety and security.
6. To promote the commercial viability and function of the centre/corridor.

Controls

- a. Provide ground level active uses where indicated on the Active Street Frontages Control Drawing (Figure 4.6.05).
- b. Active uses contribute to personal safety in the public domain and comprise:
 - i. Community and civic facilities;
 - ii. Recreation and leisure facilities;
 - iii. Shops;
 - iv. Commercial premises;
 - v. Residential uses, particularly entries and foyers, however, these must not occupy more than 20% of the total length of each street frontage.
- c. Where required, active uses must comprise the street frontages for a depth of at least 10 m.
- d. Vehicle access points may be permitted where Active Street Frontage is required if there are no practicable alternatives.
- e. Ground floor shop fronts may incorporate security grills provided these ensure light falls onto the footpath and that the interior of the shop is visible. Blank roller-shutter doors are not permitted.
- f. Serviced apartments, hotels and motels shall not have apartments at the ground level. Locate retail, restaurants and / or other active uses at the ground level.



Figure 4.6.05 Active Street Frontages Control Drawing

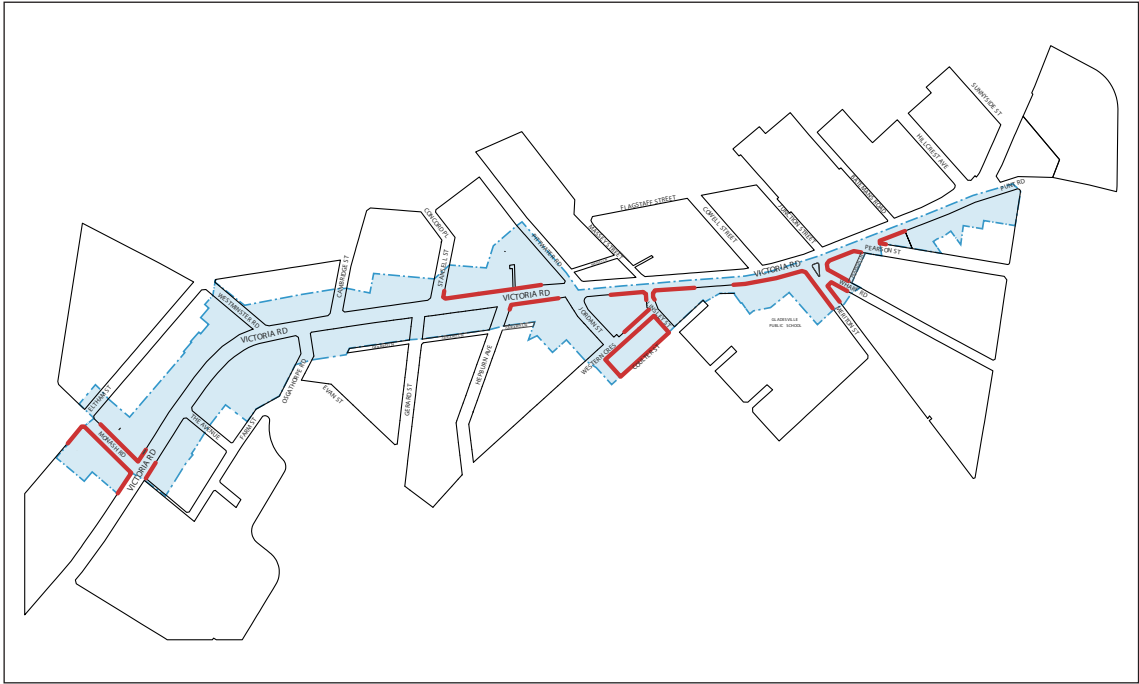


Figure 4.6.06 Buildings abutting the Street Alignment Control Drawing

3.1.3 Buildings Abutting the Street Alignment

Objectives

1. To retain the existing alignment of buildings in streets with continuous alignments.
2. To promote level continuity for pedestrians and shoppers in the retail cores of the town centre.
3. To strengthen the urban character and identity of the town centre with continuous building alignments which define the space of the street.
4. To promote pedestrian safety and security.

Controls

- a. Provide continuous street frontages with buildings built to the street boundary in the Gladesville Town Centre and in Monash Road Precincts except as shown in the Key Sites Diagrams (Refer to Figure 4.6.06).
- b. Ground level architectural features, such as recessed doors and windows, are permitted to a maximum of 400 mm from the street boundary to design out concealment opportunities and promote personal safety and security.

3.1.4 Setbacks

Objectives

Ground Level Setbacks

1. To create a landscaped character to areas outside the retail cores of the town centre.
2. To differentiate the urban cores of the town centre from the North and South Gladesville Precincts.
3. To allow for street trees and awnings without reducing the width of the road for vehicular traffic in Victoria Road.
4. To improve the spatial definition of Victoria Road.
5. To promote walking.
6. To extend and enhance the public domain.

Upper Level Setbacks

7. To relate the scale and height of new buildings to heritage items and areas of consistent existing building height.
8. To create a street frontage building height which varies within a limited range in areas of consistent existing building height.
9. To create quality built forms with a distinctive base, middle and roofline relative to the particular height.
10. To allow for upper levels outdoor terraces.

Controls

a. Setbacks shall be in accordance with the following Table and Figures 4.6.07 and 4.6.08.

SETBACK REQUIREMENTS			
SETBACK DIAGRAM	STREET FRONTAGE / LOCATION	GROUND LEVEL SETBACK FROM STREET BOUNDARY	UPPER LEVEL SETBACK FROM STREET BOUNDARY
A	Victoria Road South-western side North Gladesville Precinct	2 m	4 m, above Level 5
B	Osgathorpe Street North Gladesville Precinct	3 m	3 m
C	Farm Street, Oxford Street North Gladesville Precinct	6 m	6 m unless key site (refer to key site plans)
D	Pittwater Road Town Centre Precinct	3 m	3 m
E	Victoria Road Town Centre Precinct	0 m	5 m, Level 4 and above
F	Victoria Road North-eastern side North Gladesville Precinct and South-western side South Gladesville Precinct	2 m	4 m, Level 4 and above
G	Monash Road North Gladesville Precinct	0 m	2 m, Level 4 and above
H	Meriton Road and side streets (unless otherwise noted) All Precincts	0 m	0 m
I	College Street	2 m	2 m

Note: This table must be read in conjunction with the key site plans where applicable. If there is a discrepancy between this table and the key site plans the key site plans shall prevail.

- b. The ground floor and lower levels of buildings on Victoria Road (except within the Gladesville Town Centre precinct) must be set back 2 m from the front property boundary and built to this alignment. Paving and footpath treatments are to be provided within the setback area in accordance with Section 3.3 of this DCP and Ryde Public Domain Technical Manual.
- c. All levels of buildings in side streets must be setback a minimum 2 m except as shown in Key Site Diagrams (Refer chapter 4.0 this Part) or the Setbacks Control Drawing Figure 4.6.07. Street trees and deep soil are to be provided within the setback area.

Note: Balconies may not protect into the setback. Refer cross hatching on sections.

- d. All levels of buildings on the western side of Osgathorpe Street must be set back 3 m and built to this alignment, with deep soil and large canopy trees in the front setback.
- e. All levels of buildings in Farm Street must be set back 6 m, and built to this alignment with deep soil and large canopy trees in the front setback.

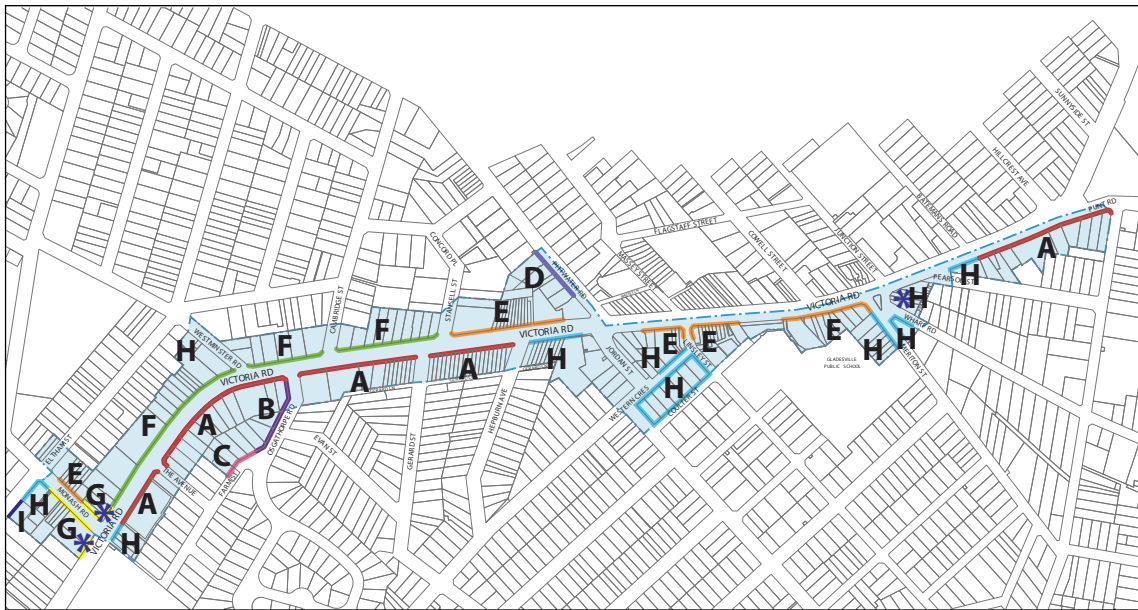
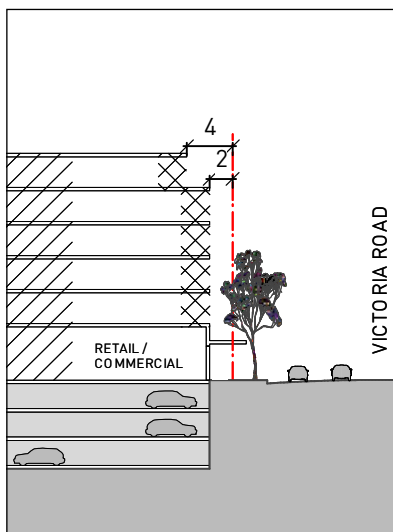
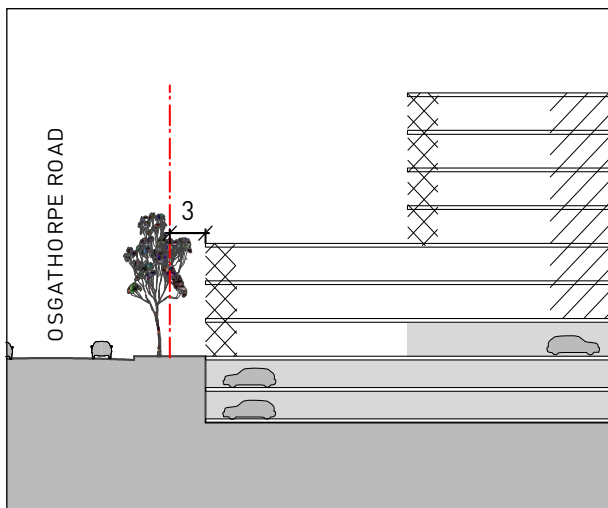


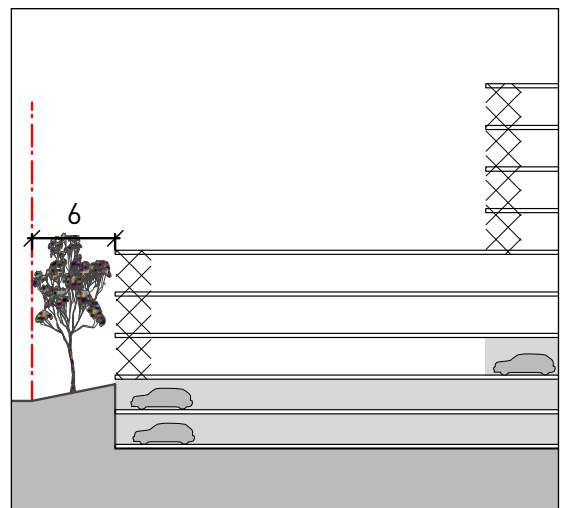
Figure 4.6.07 Setbacks Control Drawing



SETBACK A



SETBACK B



SETBACK C

Figure 4.6.08 Ground Floor Setbacks

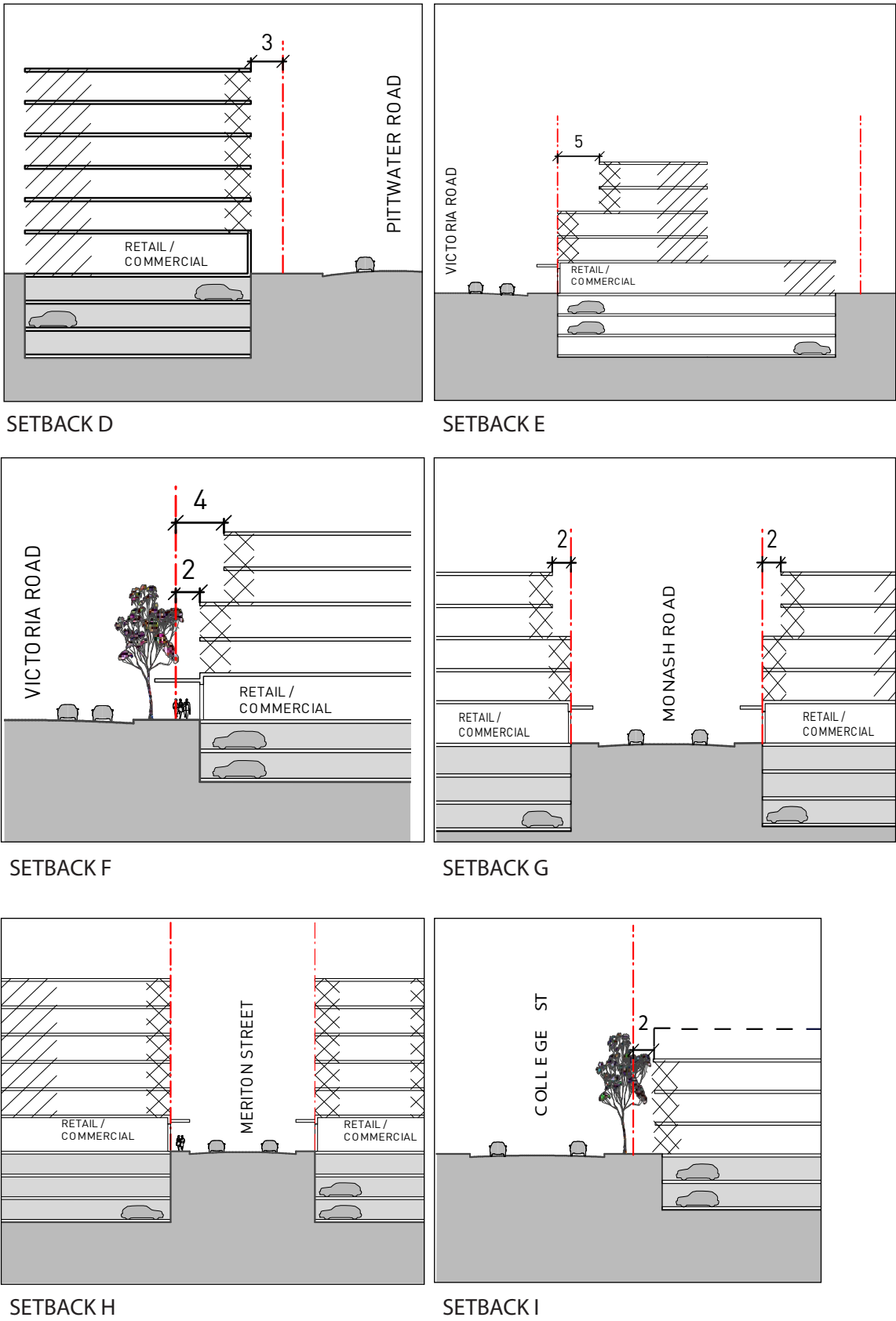


Figure 4.6.08 Ground Floor Setbacks (cont.)

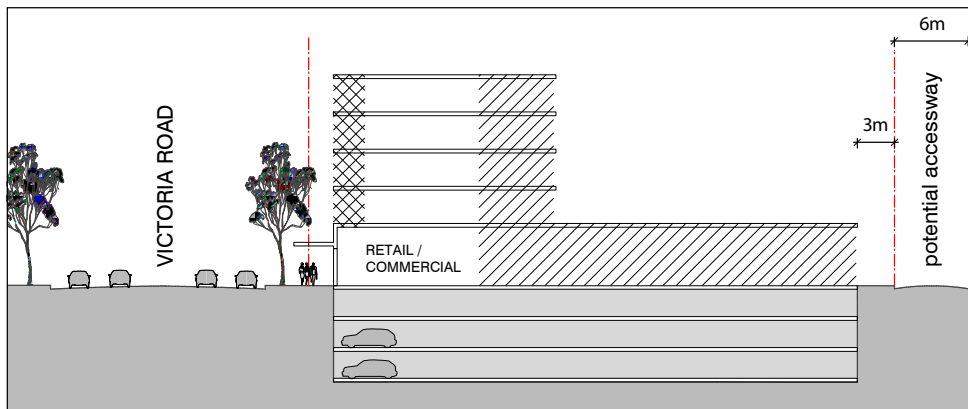
3.1.5 Rear Setbacks and Residential Amenity

Objectives

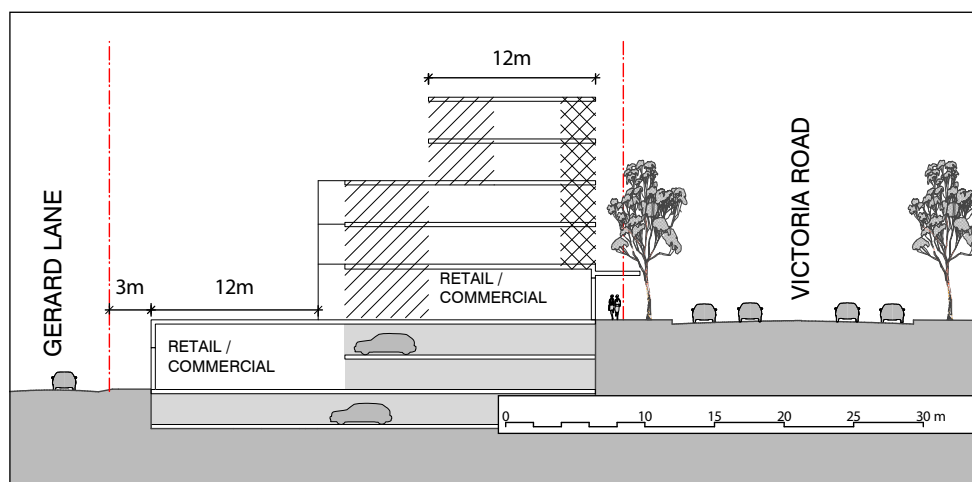
1. To restrict development at the rear of sites along Victoria Road and provide for building separation.
2. To promote the amenity of adjoining residents.
3. To encourage access alternatives to Victoria Road.

Controls

- a. Provide 9 m ground level setback generally at the rear of sites fronting Victoria Road in the North Gladesville and Monash Road Precincts except where adjoining Gerard Lane and as shown in Key Sites Diagrams. Refer Figure 4.6.09 Setback I and Figure 4.6.09 Setback J.
- b. Provide 12 m separation minimum above the ground floor between residential buildings (including existing residential buildings on adjacent sites).
- c. Buildings fronting Victoria Road may build to the side boundary for a depth of 20 m measured from the street frontage. A side setback is then required to achieve 12 m separation between proposed and potential residential land uses.
- d. Predominantly residential activities should be located adjoining low density residential areas including at the rear. If this is not practicable, activities that do not produce negative impacts in terms of noise, light, sound and odour are encouraged.



SETBACK I: Typical section for lots in north Gladesville Precinct.



SETBACK J: Typical section for lots with rear to Gerard Lane.

Figure 4.6.09 Setbacks

3.1.6 Conservation Area Built Form Design Guidelines

Objectives

1. To protect and complement the scale of buildings in the Conservation area.
2. To maintain the existing rhythm of small lot subdivisions in the façade design of new developments.
3. To reflect the façade proportions and composition of the existing buildings in new developments.
4. To identify and provide guidance with respect to contributory items/elements.

Controls

- a. All development proposals within the Conservation Area shall be assessed for their impact on the heritage significance of the Conservation Area and have regard to the Statement of Significance.

Statement of Significance For the Gladesville Town Centre Conservation Area:

"The Conservation Area comprises a mix of commercial, educational and ecclesiastical buildings which in its extent and diversity provides a rare linear streetscape in the region with high aesthetic and historic values... The Conservation Area is representative of the historic main commercial centres established in area in the nineteenth century."

Source: "The Gladesville Shops Heritage Assessment and Conservation Guidelines"

- March 2004, Paul Davies Pty Ltd

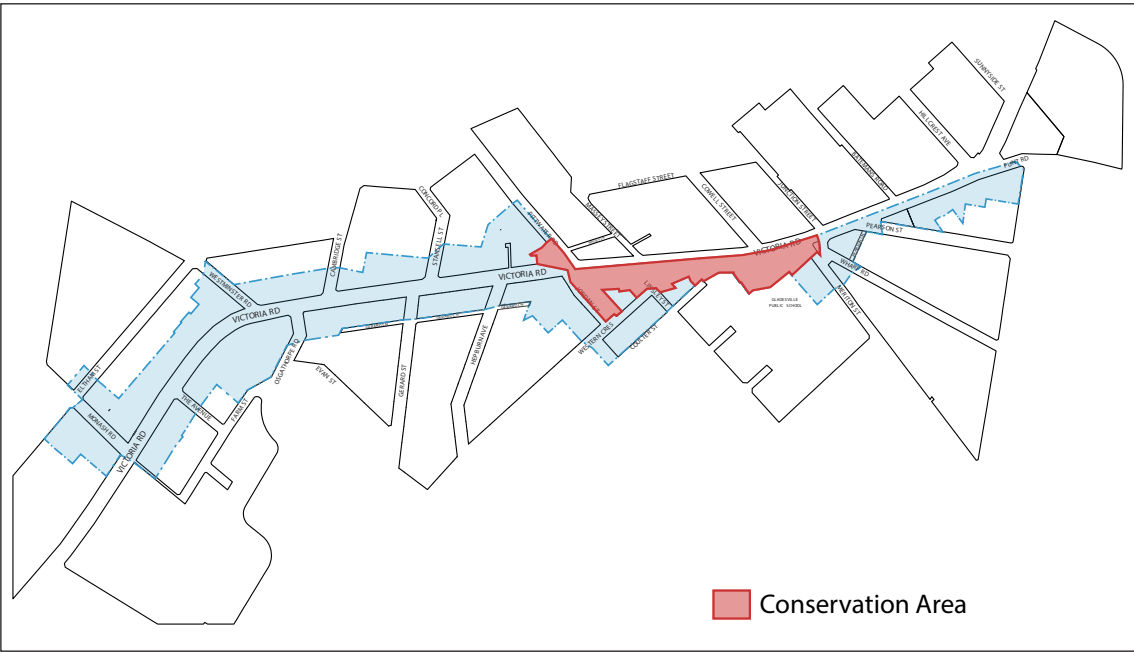


Figure 4.6.10 Gladesville Conservation Area Control Drawing

- b. Development is to comply with the setback and key site controls. The specified building envelopes relate the scale of new buildings to the scale of the existing main street shops in Victoria Road.
- c. Reflect the existing lot structure and subdivision pattern in the design of façades and ground floor shop fronts.

- d. Create vertically proportioned window and balcony openings in new development to relate to the existing fenestration patterns.
- e. Provide a combination of fully glazed and masonry façades with punched window openings formed into a balanced composition.
- f. Provide tops to building façades, such as masonry parapets and extended roof lines. The following are to be noted as contributory items in the Conservation Area:

CONTRIBUTORY ITEMS IN CONSERVATION AREA	
ADDRESS	DESTINATION
142 -154 Victoria Road (cnr Meriton and Victoria Road)	1930s commercial shops and flats
1B Western Crescent	Former rectory associated with Christ Church
6-8 Western Crescent	Jordan Hall - early 20th century community hall

- g. The contributory items identified in the table above should be retained.
- h. With regard to development involving 1B Western Crescent, community floor space equivalent to that existing is to be provided in any new development.
- i. With regard to development involving Jordan Hall, 6-8 Western Crescent, community floor space equivalent to that of the existing hall, ground floor and mezzanine will be required to be provided in any new development.
- j. The following controls also apply to all contributory items identified in the above table:
 - i. a heritage assessment of all contributory items is to be included with the development application. The heritage assessment is to be prepared in accordance with the NSW Heritage Office guidelines and is to consider the setting of the item;
 - ii. a pre-lodgement meeting is to be held with Council staff for all proposals which include contributory items;
 - iii. if the contributory item is found to have heritage significance sufficient to list as a local heritage item then the heritage provisions of this DCP [and Ryde LEP 2014] apply to the subject site;
 - iv. new development adjacent to contributory items should reflect the scale, massing, parapet lines, string courses, material qualities and fenestration patterns of the contributory items.

Objectives

1. To provide shelter for pedestrians in the majority of streets in the town centre.
2. To provide shelter at bus stops along Victoria Road.
3. To allow for awnings without impeding vehicular movement or the provision of street trees along Victoria Road.
4. To ensure a continuity of design in awnings.

Controls

- a. Provide awnings over footpaths for ground-level building frontages where shown on the Awnings Control Drawing below (Figure 4.6.11).
- b. Set back buildings in the North and South Gladesville precincts to allow for the provision of awnings and street trees. Refer setbacks A and B (Figure 4.6.08).
- c. Awning height is to be generally a minimum of 3 m from the pavement and setback 600 mm from the kerb edge. The heights of adjoining awnings should be considered (refer to Figure 4.6.17 and Figure 4.6.18).
- d. Design awnings to protect pedestrians from sun and rain. Glazed awnings will not be permitted where awnings are required unless it can be demonstrated that:
- e. Cleaning and maintenance regime will be established; and
- f. Solar protection (shade) can be achieved; and
- g. Lighting will be installed to the underside of the awning that will light the footpath.
- h. Provide lighting, preferably recessed, to the underside of awnings, sufficient to ensure a high level of safety for pedestrians at night.
- i. Vertical canvas drop blinds may be used along the outer edge of awnings. Drop blinds may not carry advertising signage but may carry business identification signage.
- j. Where the street or ground level is sloped, awnings should step down the hill.
- k. Council may not require awnings on heritage buildings where an awning would be inappropriate due to the cultural significance or architectural qualities of the heritage item.

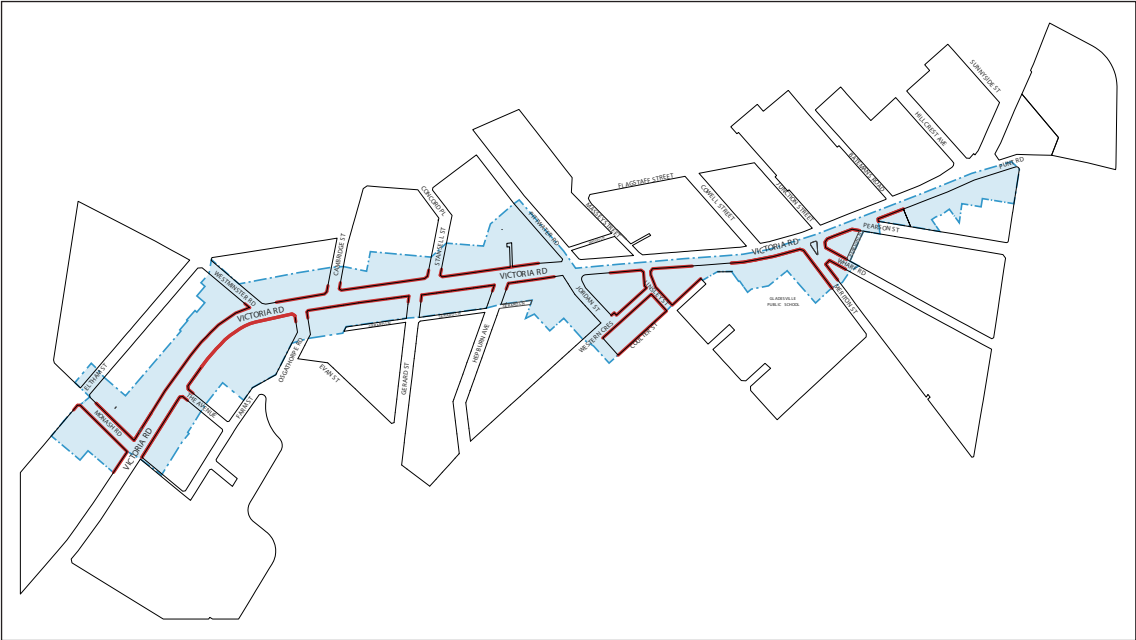


Figure 4.6.11 Awnings Control Drawing

3.2 Access

3.2.1 Minimum Street Frontage / Site Amalgamation

Objectives

1. Ensure as few driveways as possible off Victoria Road in order to promote public transport (bus priority lanes) and road safety.
2. Encourage access from the local roads network and the provision of new laneways.

Controls

- a. Any development within the North and South Gladesville Precincts is to have a minimum 40 m frontage to Victoria Road and one driveway crossing maximum, unless it can be demonstrated that access may be achieved from the local road network.

Note: This may require lot amalgamation in order to carry out development.

3.2.2 Vehicular Access

Objectives

- a. Ensure as few driveways as possible off Victoria Road in order to promote public transport (bus priority lanes) and road safety.
- b. Encourage access from the local roads network and the provision of new laneways.

Controls

- a. Provide vehicular access from the local roads network in preference to Victoria Road. This will require development of public laneways within the rear setback of most sites in the North Gladesville and Monash Road Precincts in particular.
- b. For all existing and proposed laneways, the laneway must include a 2-way carriageway, 6 m wide (regardless of traffic generation) and a footpath along one side 1.5 m wide, to the satisfaction of Council. A setback of 0.5 m may also be required to any built form (total 8 m allowance).

Note: Where a laneway is provided basement carparking may extend under the lane subject to Council approval.

- c. Gerard Lane shall be extended to create a connection running from Osgathorpe Street to Gerard Street.
- d. Where a new lane is proposed to extend an existing lane, the new lane must be designed to seamlessly connect to the existing lane. The new lane may be required to be wider than the existing to Council's satisfaction to ensure adequate sightlines and safety to take into account the cumulative traffic demand in relation to the development capacity of the area, vehicular types and other relevant matters.

3.3 Public Domain

3.3.1 Pedestrian Connections

Objectives

1. To improve the amenity of existing pedestrian routes.
2. To supplement the existing on-street pedestrian system with off street connections such as pedestrian lanes.
3. To provide a fine grain of pedestrian connections, linking streets, community facilities and public spaces, and making easy connections from shopping precincts to Victoria Road.
4. To provide accessible, safe pedestrian links on public and private property.
5. To provide a public domain that is well-used by residents, workers and visitors.
6. To promote walking in the town centre by the introduction of clear direct walkways and connections to street, good lighting and clear sight lines.

Controls

- a. Provide street furniture, lighting and generous paved areas along the main pedestrian routes within the retail and commercial core with clear direct sight lines and direct linkages.
- b. Provide an elevated connection across Victoria Road to Council and RMS satisfaction (refer to Figure 4.6.13 and Figure 4.3.06).
- c. Improve the pedestrian environment around Western Crescent and Coulter Street, with a better link to Trim Place.
- d. Provide pedestrian through-site connections and public domain parks, squares and plaza's in accordance with the Pedestrian Connections Control Drawing (Figure 4.6.13) and the Public Domain Control Drawing (Figure 4.6.14).
- e. Pedestrian through-site connections must be:
 - i. direct, without concealment opportunities and designed to provide clear sightlines from one end to the other;
 - ii. a minimum of 3 m wide;
 - iii. designed to consider pedestrian safety and the security of adjacent businesses;
 - iv. activated by retail, civic and / or commercial land-uses;
 - v. naturally lit and ventilated, and well lit at night;
 - vi. publicly accessible between at least 7am and 7pm daily, however 24 hour public access is preferred;
 - vii. accessible to all and designed to provide barrier free access (i.e. have regard to the Disability Discrimination Act and relevant Australian Standards);
 - viii. have regard to Safer-by-Design Principles.
- f. Courtyards, plazas or squares should be provided to complement and adjoin pedestrian through-site connections. See also Public Domain Controls in Section 4 of this Part.

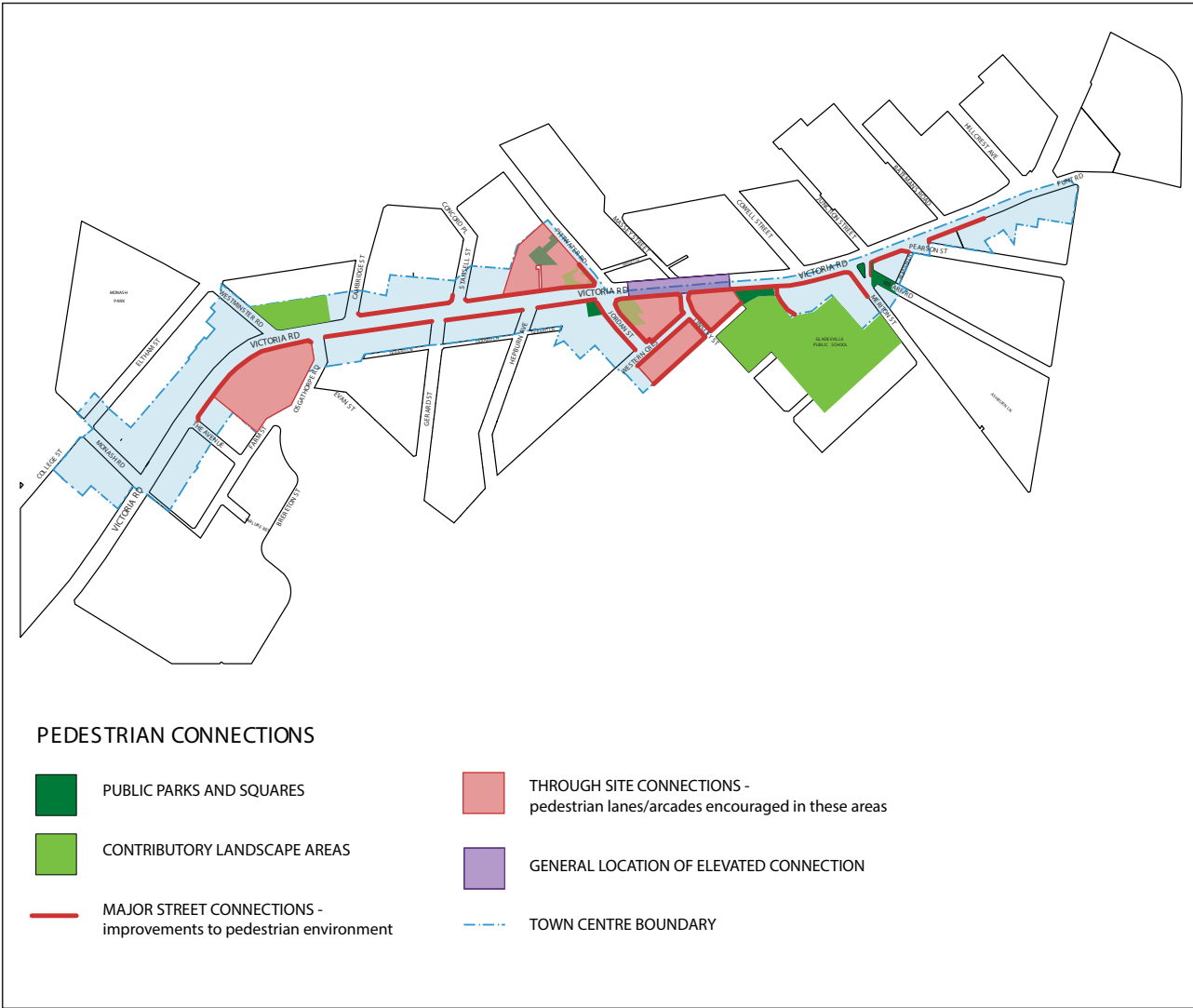


Figure 4.6.13 Pedestrian Connections Control Drawing

3.3.2 Public Domain Framework

Objectives

1. To create a network of streets, parks and civic spaces that provide opportunities for recreation and leisure for workers, visitors and residents.
2. To provide opportunities for social gathering and leisure away from Victoria Road, but well connected to the main commercial and transport spine.
3. To ensure that all public spaces are safe and accessible, with high levels of amenity and design quality.
4. To ensure that development of key sites results in an increase in the area and quality of public space.

Controls

- a. Improve Trim Place connections with the public domain network.
- b. Improve the quality and function of the small park space on the corner of Victoria Road and Jordan Street.
- c. Increase the quantum and diversity of public space in the heart of the town centre, by:
 - i. redevelopment of the City of Ryde car park site on Pittwater Road, to include a public square (refer to Section 4.3.5); and
 - ii. street closure at Meriton Street and Wharf Road to create a new public square away from Victoria Road (refer to Section 4.3.9).
- d. Create vehicular and/pedestrian connections through major development sites (see Public Domain Controls in Section 4.0 for specific sites).

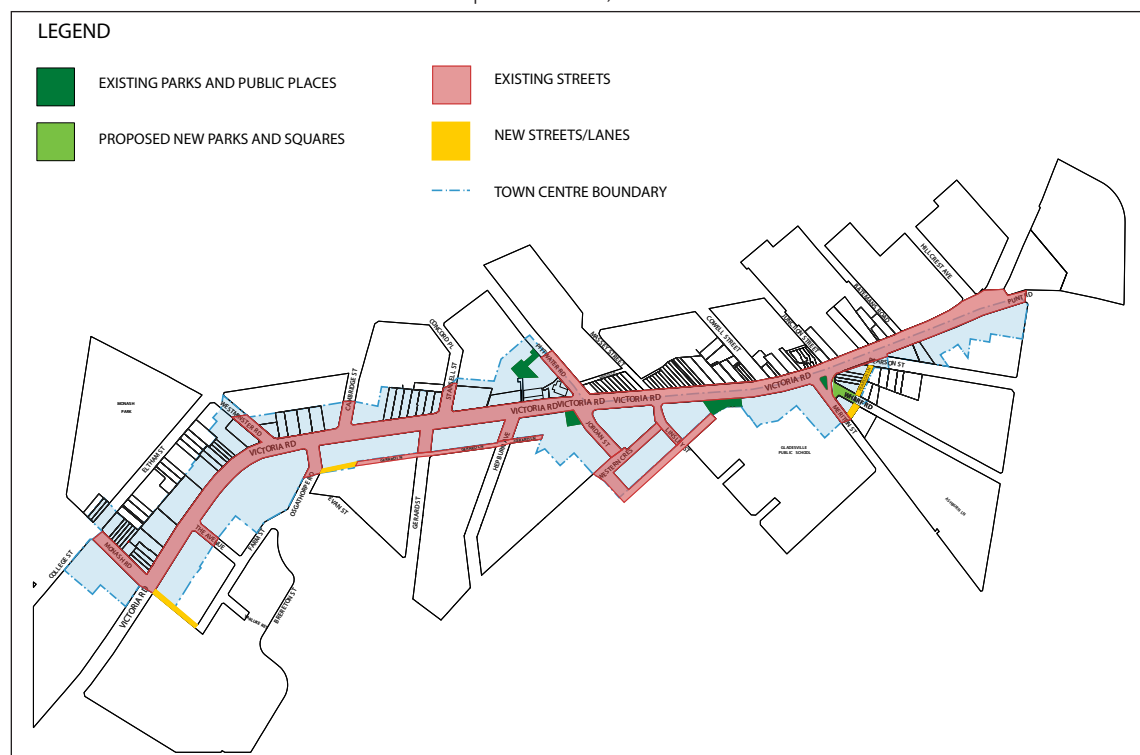


Figure 4.6.14 Public Domain Framework Control Drawing

3.3.3 Landscape Character

Objectives

1. To create a memorable landscape image for the town centre, which builds on the positive characteristics of topography, landscape character and views.
2. To define the changing character of Victoria Road through variations to streetscape design.
3. To protect, through planning controls, those spaces in private lands that contribute to the character and quality of the town centre.
4. To enhance the quality of existing parks and squares.
5. To create a hierarchy of tree planting for key streets, to reinforce spatial quality, provide shade for pedestrians, and improve the image of the town centre.

Controls

- a. Create a consistent planting theme with a number of species to ensure that the planting gives a visual coherence. Build on the palette of existing species in streets.
- b. Provide street trees as shown on the Landscape Character Control Drawing (Figure 4.6.15) and in accordance with the Ryde Public Domain Technical Manual and relevant street tree master plans.
- c. Select street trees based on the scale of buildings, width of the street, aspect, and on environmental parameters such as soil type.
- d. Build on the visual significance of the Church site and the Clocktower site, to emphasis the edges of core urban area.

See also Sections 2.3 and Section 3.2 for specific controls

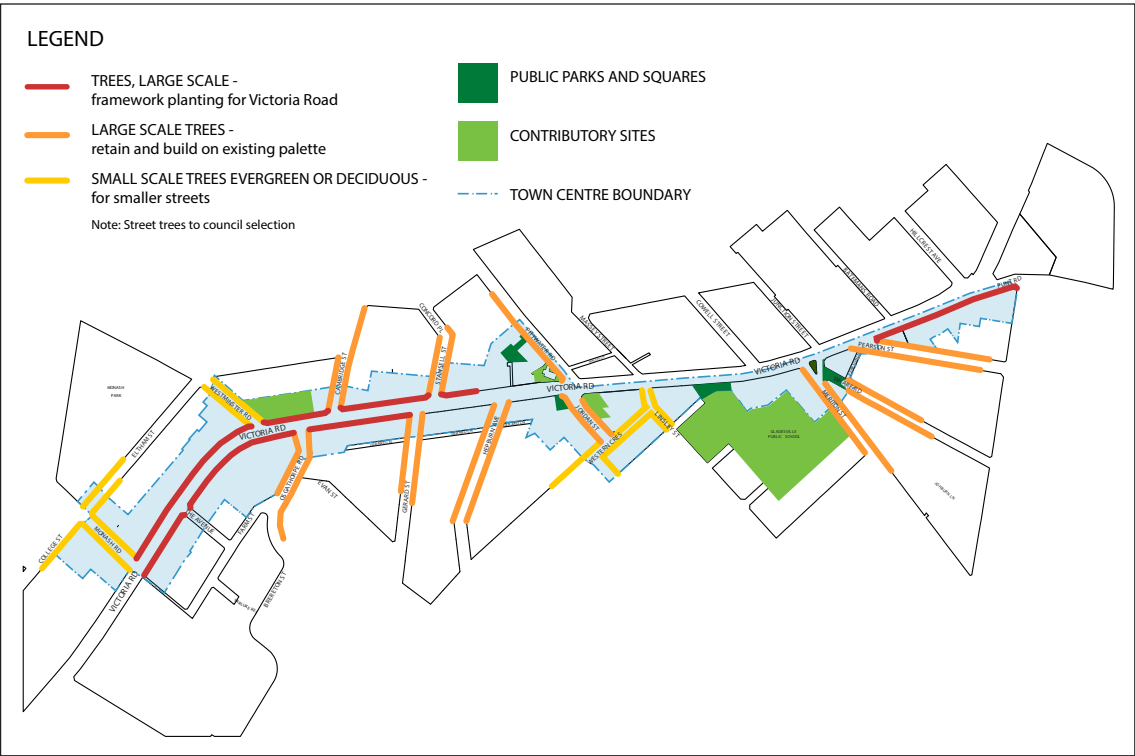


Figure 4.6.15 Landscape Character Control Drawing

3.3.4 Urban Elements

Objectives

1. To coordinate paving and urban elements within the Centre.
2. To improve the image, quality and amenity of streets and public spaces through quality paving, lighting and street furniture.
3. To ensure that the selection of urban elements and level of provision is based on the hierarchy of streets and intensity of use.

Controls

- a. Provide paving, seats, benches and bins as selected by Council in accordance with the Ryde Public Domain Technical Manual.
- b. Provide seating and shelter (awnings or bus shelter) at all bus stops, and provide seating at community facilities and drop off points. Seating shall be in accordance with Ryde Public Domain Technical Manual.
- c. Provide new street lighting to primary and secondary streets as selected by Council and underground power cables.
- d. Provide pole lighting, lighting from building awnings and structures, in new public spaces, to ensure night time pedestrian safety to Council satisfaction.

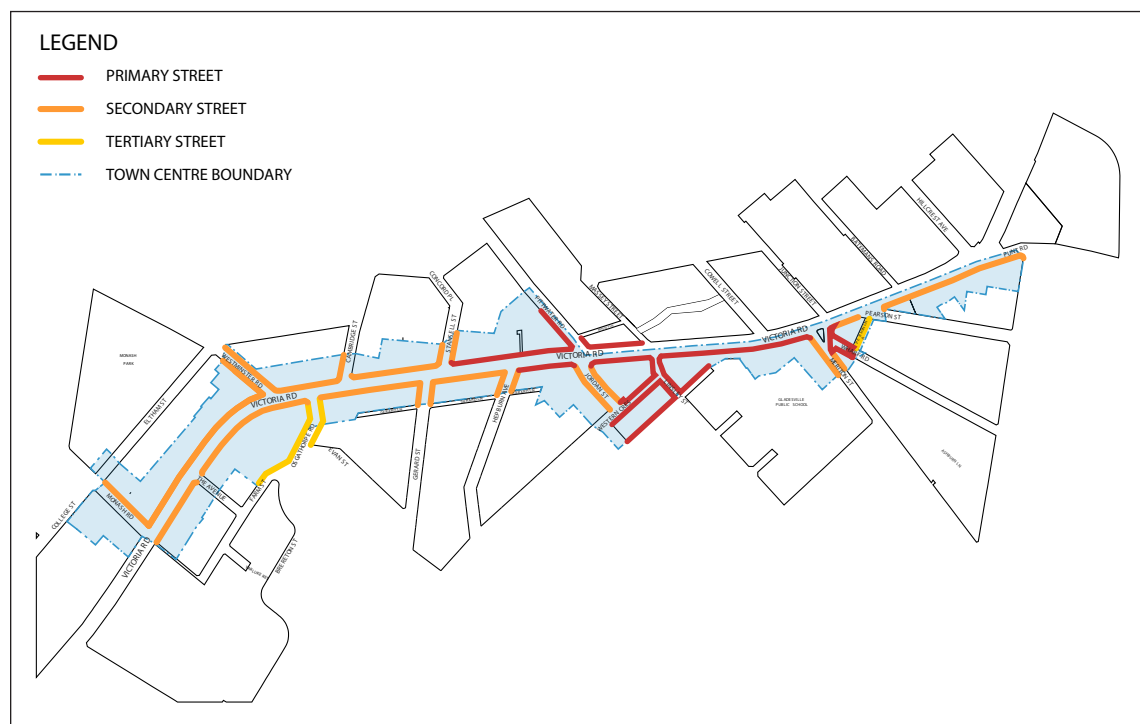


Figure 4.6.16 Urban Elements Control Drawing

3.3.5 Street Sections Introduction

Introduction

Streets are the primary structuring elements of the urban form, providing connection and address. They form the greater part of the public domain and should be conceived of as social spaces, not dominated by vehicles. There is a hierarchy of existing streets within the town centre that includes major streets for through traffic and public transport, and local streets for local traffic and pedestrians.

Street trees, furniture, paving and lighting create the detail and quality of the streets. The level and quality of provision can reinforce the hierarchy of streets and public places.

The following section contains objectives and controls for upgrading of existing streets, and the design of new streets in the town centre. Street section controls are provided for:

- Victoria Road (in general) (3.3.6);
- Victoria Road - Town Centre Precinct (3.3.7);
- Western Crescent (3.3.8);
- Coulter Street (3.3.9);

For information on paving, street furniture and lighting, and selection of street trees, reference is made to the Ryde Public Domain Technical Manual.

3.3.6 Victoria Road Section

North Gladesville and South Gladesville Precincts

Victoria Road is the spine, and the public face of the town centre. The southern and northern ends form transition zones between the greener residential areas of smaller buildings in a landscape setting and the highly urban setting of the town centre core. The transition zones have commercial and retail uses at ground floor with a building setback which allows generous street tree planting.

Victoria Road corridor is typically 26 m wide and parking and access is restricted both sides of Victoria Road (refer Figure 4.6.17 Victoria Road Section).

Objectives

1. To create a specific and consistent identity for Victoria Road consistent with the surrounding public domain areas.
2. To provide a robust public domain and to minimise ongoing maintenance requirements.
3. To enhance pedestrian safety, security and amenity along the Victoria Road corridor.

Controls

- a. Set back buildings 2 metres to provide a continuous paved surface typically 5.5 m wide both sides of Victoria Road.
- b. Provide continuous paving for the full footpath width in accordance with the Ryde Public Domain Technical Manual.
- c. Provide street furniture in accordance with Ryde Public Domain Technical Manual including:
 - i. provide seats and bins at 200 m intervals and at bus stops, OR a minimum one per block, if required by Council;

- ii. provide new street lighting, staggered at 40 m intervals on both sides of street; or to Council satisfaction.
- iii. provide lighting to the underside of awnings for the safety and security of pedestrians.
- d. Powerlines are to be underground in locations specified by Council.
- e. Incorporate street tree planting of species to be approved by Council.

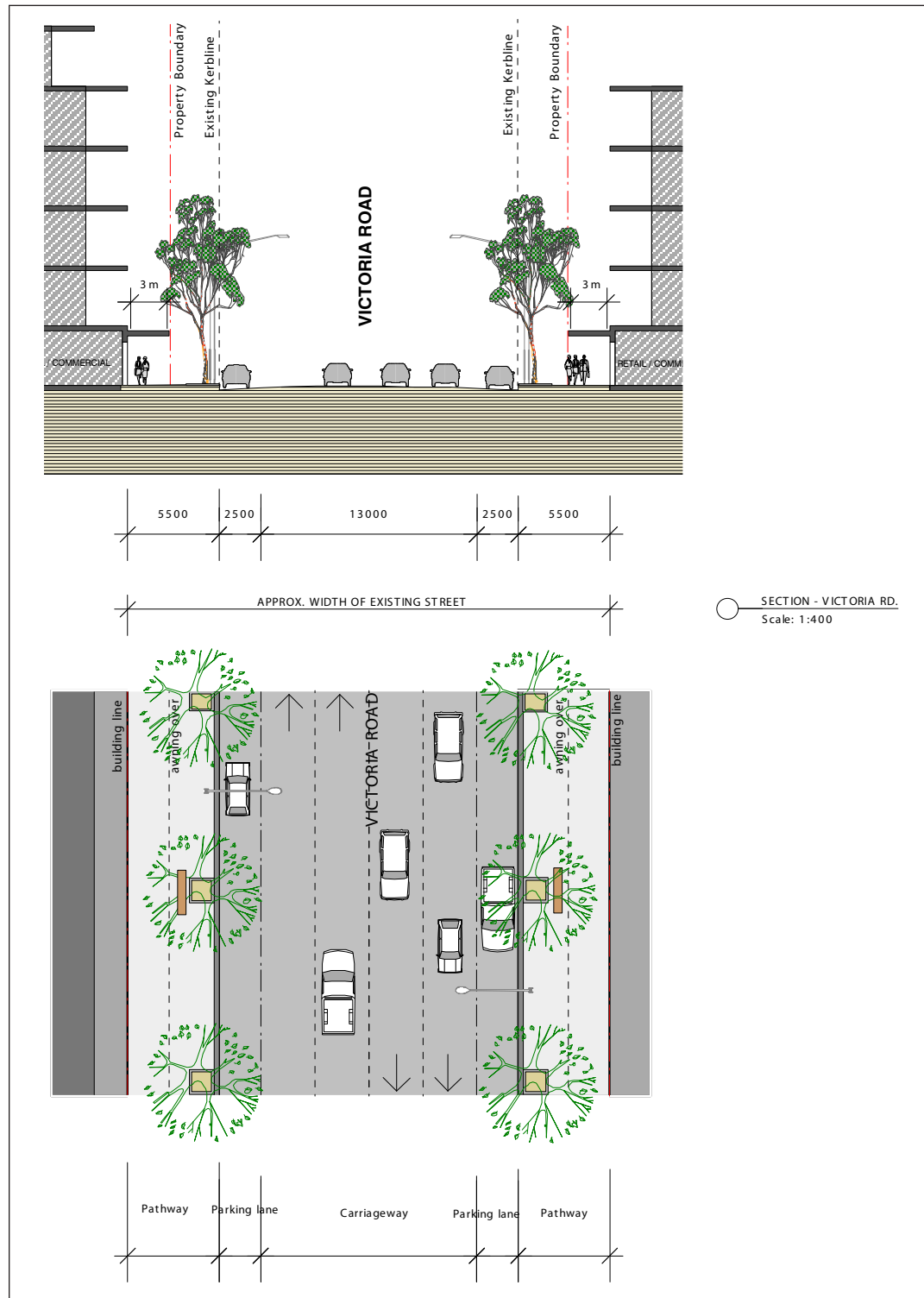


Figure 4.6.17 Victoria Road Section - North and South Gladesville Precincts

3.3.7 Victoria Road - Town Centre Precinct Section

Victoria Road in the Town Centre Precinct is highly urbanised, with predominantly retail use at ground floor and a high intensity of pedestrian use. Buildings form the edges of the street, with awnings over the footpath restricting tree planting. Trim Place forms a green break in the street.

Parking and access is restricted on both sides of Victoria Road.

Street trees are generally not provided except for special places such as Trim Place. Refer diagram Figure 4.6.18 Victoria Road - Town Centre Precinct Section

Objectives

1. To create a distinctive character for the Town Centre Precinct.
2. To enhance pedestrian amenity.
3. To minimise visual clutter in the public domain.

Controls

- a. Provide a 3.5 m wide footpath and buildings typically built to the boundary defining both sides of Victoria Road.
- b. Provide continuous granite paving for the full footpath width in accordance with the Ryde Public Domain Technical Manual.
- c. Provide landscaping consistent with an urban setting including planter boxes and the like.
- d. Provide street furniture in accordance with Ryde Public Domain Technical Manual including:
 - i. provide seats and bins at 50 m intervals and at bus stops, a minimum one per block, if required by Council;
 - ii. provide new street lighting, staggered at 20 m intervals on both sides of street; or to Council satisfaction;
 - iii. provide lighting to the underside of awnings for the safety and security of pedestrians.
- e. Powerlines are to be underground in locations specified by Council.

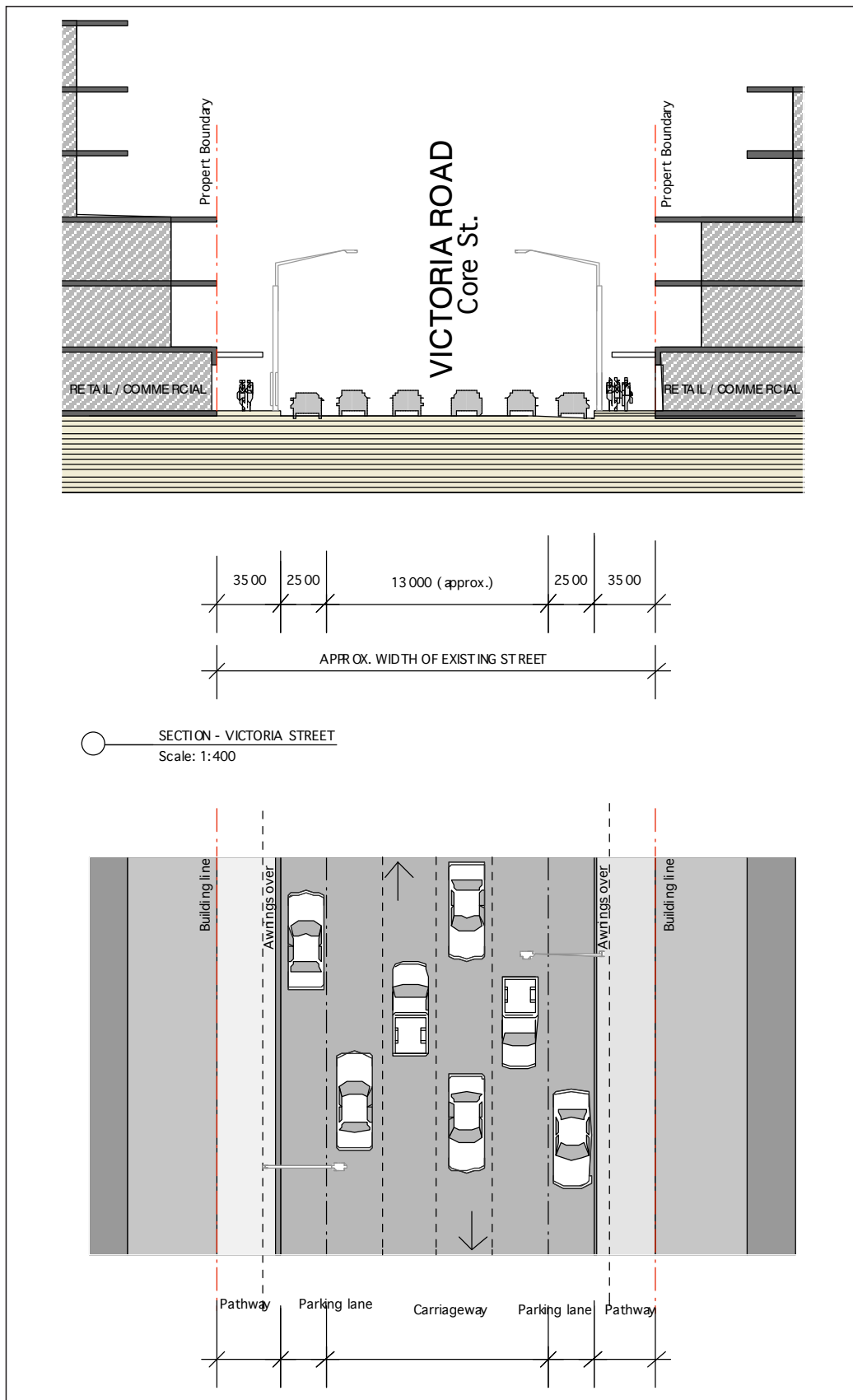


Figure 4.6.18 Victoria Road - Town Centre Precinct Section

3.3.8 Western Crescent Section

Town Centre Precinct

Western Crescent is a little street, currently with poor pedestrian amenity. With future development, this street should be part of a network of little streets with high pedestrian amenity, shopping and small public domain spaces, away from, but connected to, Victoria Road. Future setbacks on the eastern side are proposed to balance the scale of buildings and provide an expanded pedestrian area.

Refer diagram Figure 4.6.19 Western Crescent Section

Objectives

- a. To provide improved pedestrian amenity to Western Crescent.
- b. To provide improved pedestrian connections to Trim Place and the Town Centre Precinct.
- c. To provide public domain enhancements.

Controls

- a. Provide a 14.5 metre wide street defined by built edge both sides and a 3.5 m continuous paved footpath both sides.
- b. Provide parking one side and one way traffic as directed by Council.
- c. Provide continuous granite paving for the full footpath width in accordance with Ryde Public Domain Technical Manual.
- d. Provide small scale street trees in the carriageway on the western side, and on the footpath on the eastern side in accordance with the Ryde Public Domain Technical Manual.
- e. Provide street furniture in accordance with the Ryde Public Domain Technical Manual including:
 - i. provide seat and bins at 50 m intervals and at bus stops, minimum one per block, if required by Council;
 - ii. provide new street lighting, staggered at 40 m intervals on both sides of street;
 - iii. provide lighting to the underside of awnings for the safety and security of pedestrians.
- f. Powerlines are to be underground in locations specified by Council.

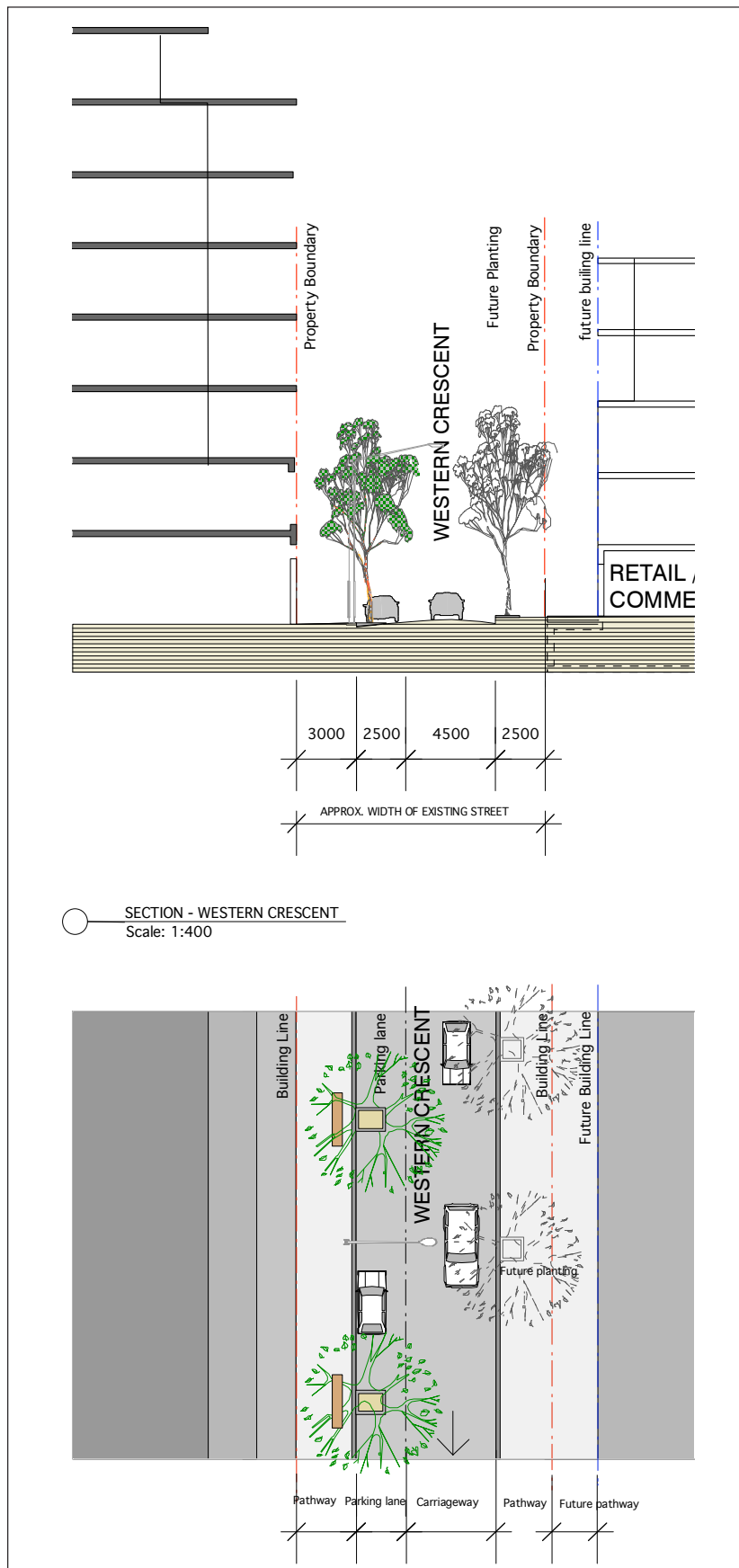


Figure 4.6.19 Western Crescent Section

3.3.9 Coulter Street Town Centre Precinct Section

Coulter Street forms the western edge of the retail and commercial core, with possible retail on the eastern side and existing residential on the western side. Expansion of the footpath on the retail side is proposed to allow street tree planting and improved pedestrian amenity. Extension of pavement and street tree planting along the lane to the south is proposed to form a better connection to Trim Place.

Parking and access is restricted both sides of Coulter Street. Refer diagram Figure 4.6.20 Coulter Street Section.

Objectives

1. To provide improved pedestrian amenity to Western Crescent.
2. To provide improved pedestrian connections to Trim Place and the Town Centre Precinct.
3. To provide public domain enhancements.

Controls

- a. Provide a 12.5 metre wide street defined by a built edge on the eastern side, and a landscape setback on the western, residential side.
- b. Provide small scale street trees in footpath on the eastern side, continuing to Trim Place.
- c. Provide continuous paved surface 3.5 m wide on the eastern side, with granite paving for the full width. Paving is to be in accordance with Ryde Public Domain Technical Manual.
- d. Provide street furniture in accordance with the Ryde Public Domain Technical Manual including:
 - i. provide seat and bins at 50 m intervals and at bus stops, minimum one per block, if required by Council;
 - ii. provide new street lighting, staggered at 40 m intervals on both sides of street.
- e. Powerlines are to be underground in locations specified by Council.

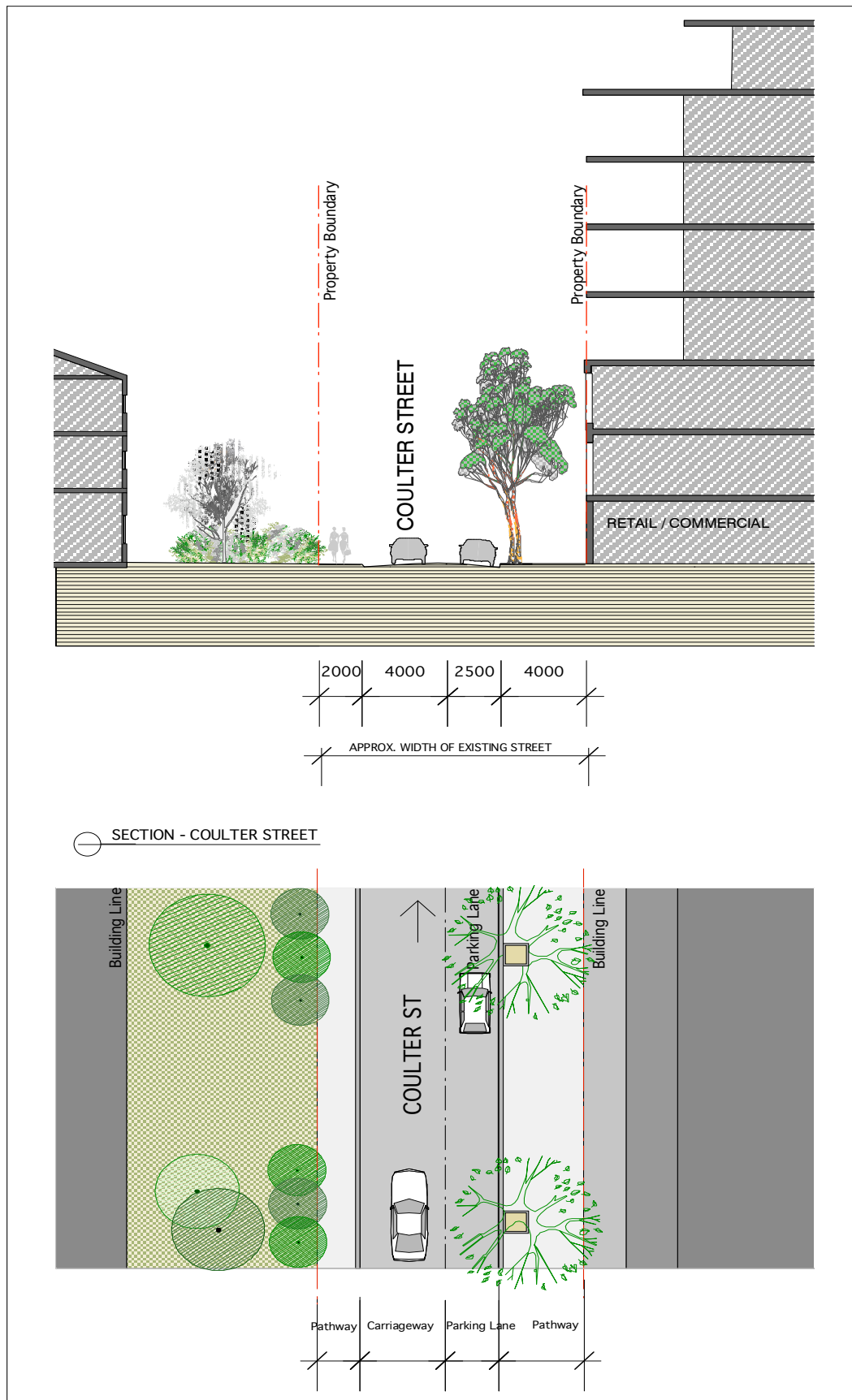


Figure 4.6.20 Coulter Street Section

4.0 KEY SITES

4.1 Key Sites Introduction

Gladesville Town Centre functions primarily as a ribbon shopping strip containing many actively used sites and also under-utilized sites. The Gladesville Town Centre and Victoria Road Corridor Master Plan identified a number of key sites, which have potential to revitalise the centre through their redevelopment and related public domain improvements. The key sites identified in this section were previously identified in the Gladesville Master Plan for public domain and development projects.

Four of the key sites (Coulter Street, Wharf Road, Massey-Cowell Streets and the Pittwater Road Council Carpark site) are in close proximity to the shopping precinct. The opportunity exists with their development to:

- Create a better pedestrian environment in and around the town centre shopping precinct;
- Assist pedestrian movement with new streets, pedestrian through site connections, widened footpaths and pedestrian squares;
- Create pleasant outdoor places for recreation away from the traffic on Victoria Road;
- Provide a wide range of retail shopping, including expanded supermarkets, big box retail and a greater range of specialty shops.
- Provide better public underground carparking; and
- Renew community facilities such as libraries and child care centres.

The Primrose Hill site is currently under- utilised and the opportunity exists to provide a landscaped pedestrian link through the site, a hotel and retail /commercial uses at the ground floor and residential development above.

The Monash Road area is a prominent entry to the corridor with a small scale retail presence that is in need of revitalisation. Appropriately scaled development aims to unify the built form at this important intersection with Victoria Road and relate to existing near by low scale buildings.

The development controls in section 4 of this Part provide detailed guidance to create cohesive built form and public domain outcomes for Key sites. All the Key sites have public domain improvements, some with new streets, squares and lanes and widened footpaths.

The detailed envelopes shape future built forms and establish relationship to the public domain spaces, topography, heritage items and conservation areas.

Objectives

The public domain improvements and development of these key sites in this Part will:

1. Support the existing town centre shopping precinct;
2. Contribute to expanding and enhancing the pedestrian network around the town centre shopping precinct;
3. Provide an expanded range of uses in the town centre;
4. Provide better public domain access and amenity through existing under- utilised sites; and
5. Create an enhanced image of the town centre as its entries and major intersections.

Controls

- a. Future design and development proposals for Key Sites are to be reviewed by a Design Review Panel to ensure design quality in design proposals.
- b. The Key Sites Plans in Section 4 of this Part may be varied subject to preparation of a new Comprehensive Plan for the subject land that demonstrates the following to Council's satisfaction:
 - i. Publicly accessible open space exceeding that shown in the Key Sites Plans within this Part OR publicly accessible open space that exceeds 30% of the site area.
 - ii. Community benefit in the form of facilities such as child care, community meeting space, library space, commuter parking, business incubator or other. The Comprehensive Plan must demonstrate the demand for such facilities to Council satisfaction.
 - iii. Environmental impacts (such as overshadowing and overlooking) are managed.
 - iv. Environmentally sustainable design is implemented. Water and energy consumption are minimised.
 - v. Transport Management is to Council and, where applicable, RMS satisfaction including pedestrian access, public transport access, parking quantum and layout, and intersection level of service.

4.2 Key Sites Plan

Key Sites are detailed in the following pages.

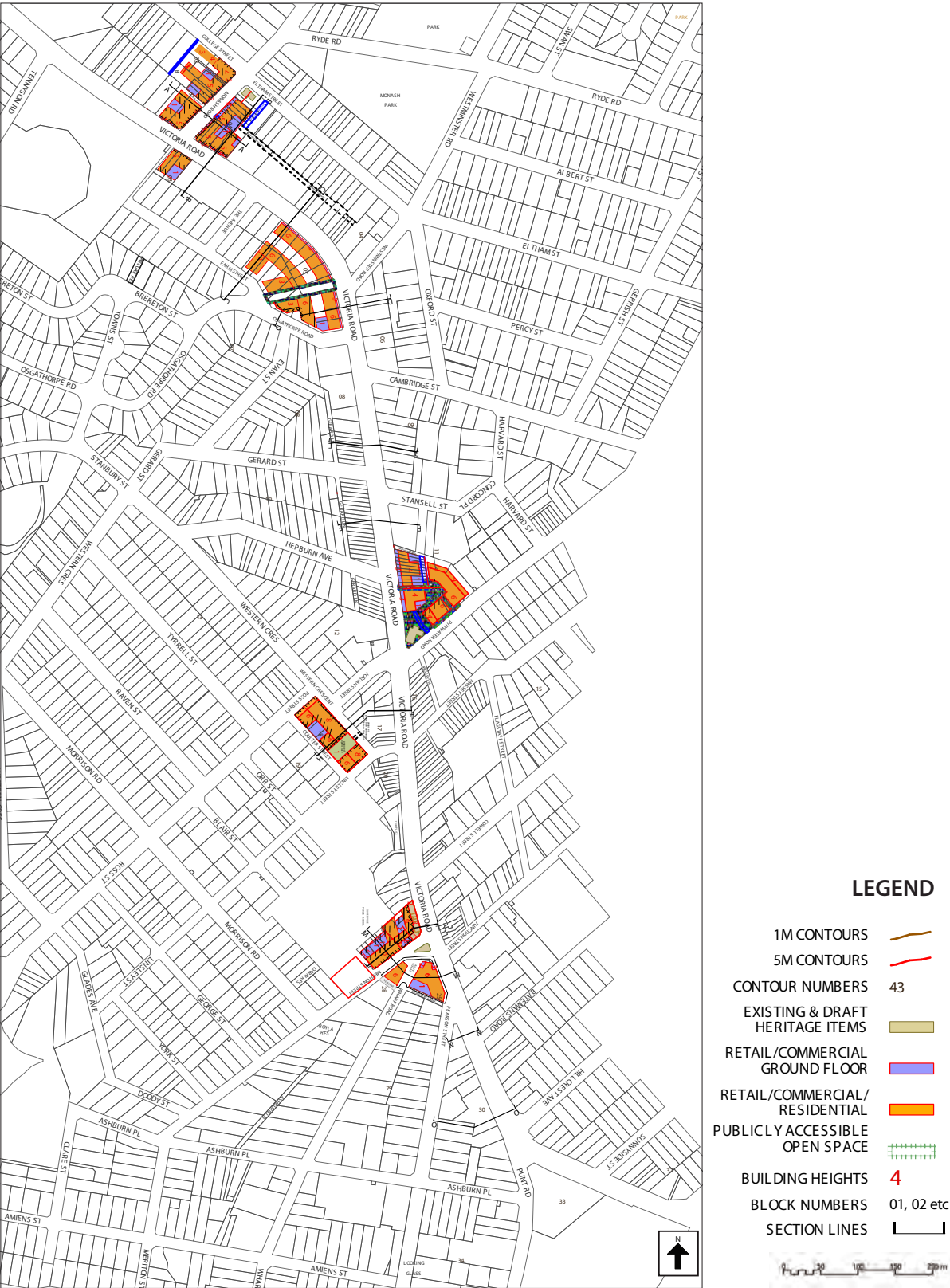


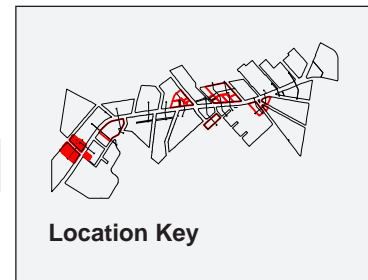
Figure 4.6.21 Key Sites Plan

4.3 Key Sites Built Form and Public Domain Controls

4.3.1 Monash Road Key Site Built Form Controls

Objectives

1. Create a thriving retail block containing specialty retail, commercial and residential uses.
2. Create a cohesive small centre with a continuous retail or commercial ground level abutting the street frontage of Victoria Road and Monash Road.
3. Ensure the built heritage value of the existing buildings is taken into consideration.



Controls

Building Uses and Ground Floor Activities

- a. Provide mixed use development with retail or commercial activities on the ground level particularly on Victoria Road and Monash Road frontages, with commercial, retail or residential upper floors.
- b. Provide commercial or retail uses fronting Monash Road.

Street Frontages

- c. Provide a continuous active frontage at ground level abutting the property boundary on Victoria Road and Monash Road.
- d. Provide a setback from Victoria Road on the southern end of Block 04A to enable tree planting.

Building Heights

- e. Provide development in accordance with Figure 4.6.23 Built Form Plan for building heights in storeys.

Note: The articulation of the top floor in the 3 dimensional building envelope drawing (Figure 4.6.22) is indicative of a top floor treatment.

Building Depth and Separation

- f. Must be in accordance with Figure 4.6.23 Built Form Plan building depth and separation requirements.
- g. An 18 m wide building envelope maximum including balconies and façade articulation is preferred.

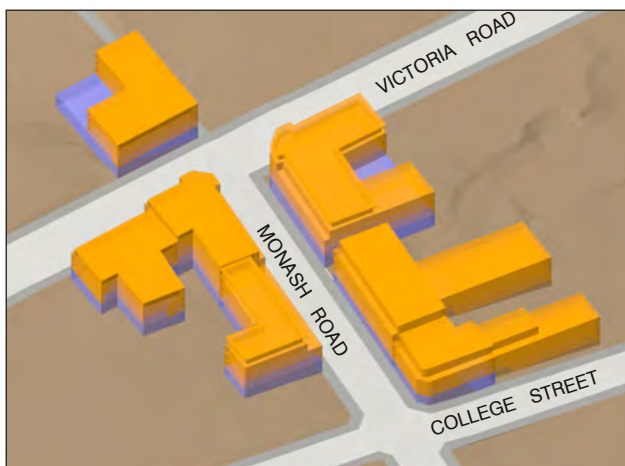


Figure 4.6.22 Block 02, 03 & 04 3D Model

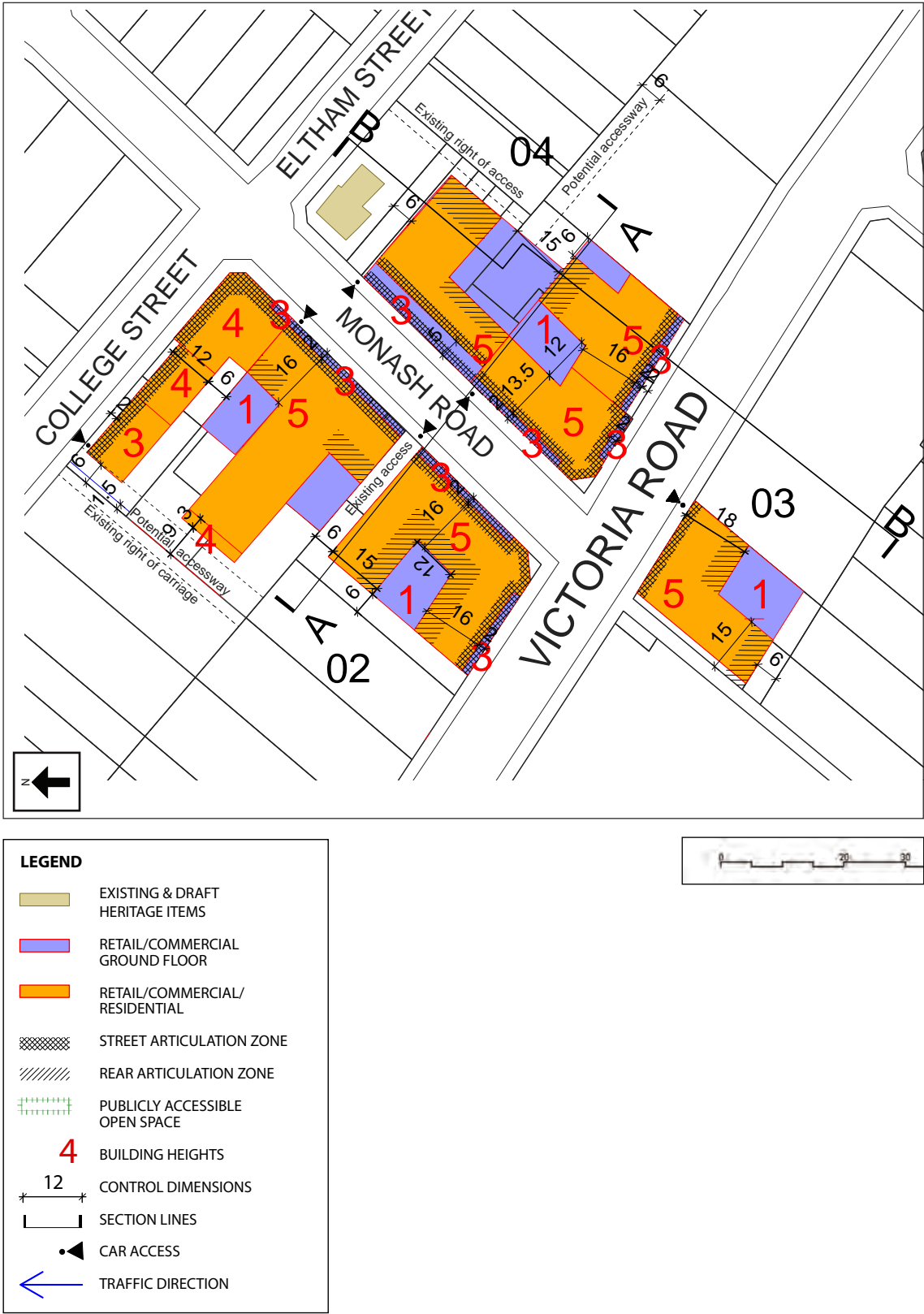
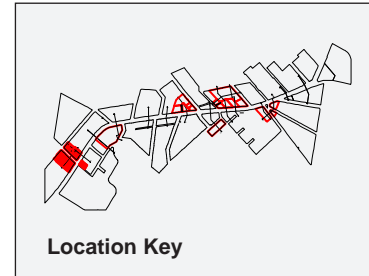


Figure 4.6.23 Block 02, 03 & 04 Built Form Plan

Building Setbacks

- h. Provide zero setbacks along Victoria Road and Monash Road on the ground, first and second floors in accordance with Figure 4.6.23 Built Form Plan and Figure 4.6.24 Setbacks.
- i. Provide upper level setbacks in accordance with Figure 4.6.23 Built Form Plan and Figure 4.6.24 Setbacks. Upper level setbacks are measured to the edge of any balcony or building façade.
- j. Provide a 2m setback for ground floor fronting College Street. Upper levels above the ground floor residential uses should also be setback 2m.



Note: Balconies may not protect into the setback. Refer cross hatching on sections.

- k. Provide zero setbacks at the corner of Monash Road and College Street for ground floor and upper levels to a maximum of 3 storeys to maintain a 3 storey built form on the corner of Monash Road and College Street.

Minimising Vibration, Noise and Air Pollution in Residential Buildings Near Busy Roads

- l. Design to minimise vibration, noise and air pollution in the internal layout and materials selection of residential buildings. Development must comply with NSW Planning & Infrastructure, Development Near Rail Corridors and Busy Roads - Interim Guidelines.
- m. Internal circulation corridors, bathrooms, laundries and other non-habitable spaces should be located adjacent to the busy road.
- n. Living rooms and primary balconies should be located and oriented away from the main road.
- o. Additional techniques to minimise the impacts of a busy road include glazed balconies or wintergardens, louvred balcony screens and double glazing.
- p. Cross ventilation is to be maintained by means such as glass and metal louvres, and cross over or two storey apartment types.

Public Domain

- q. At least 10% of the site area is to be provided as public domain or community space in the form of a potential vehicular access way 6 m wide and a footpath 1.5 m wide to connect to the local street network OR to Council's approval.
- r. A development application for new floor space that exceeds 500m² is to provide a detailed traffic and pedestrian access study that demonstrates safe and convenient access, including consideration of loading/unloading arrangements.

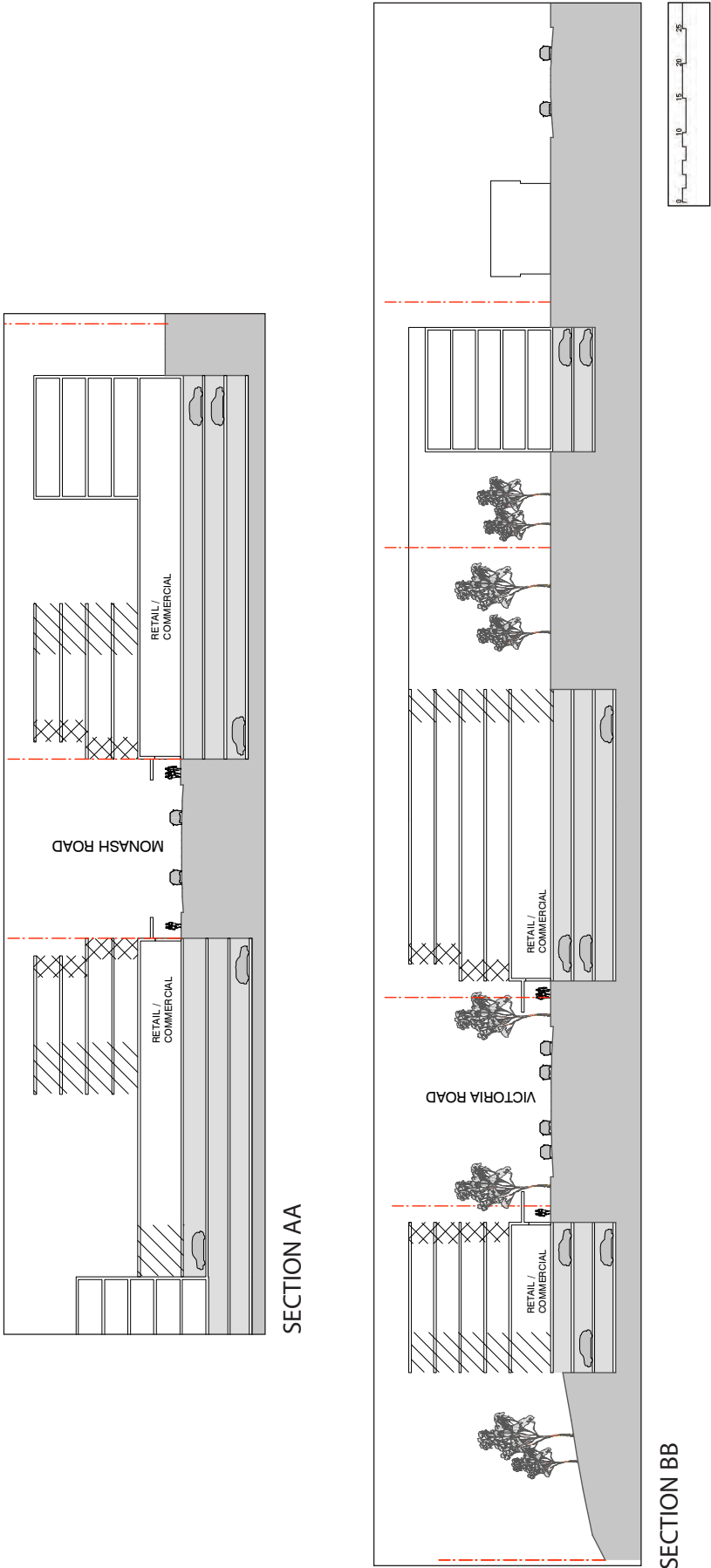
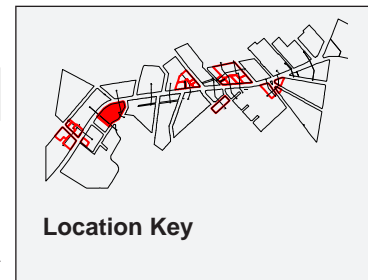


Figure 4.6.24 Setbacks

4.3.2 Block 05 (Primrose Hill) Built Form Controls

Objectives

1. Create a thriving, mixed use area, with a range of commercial, retail or residential uses along Victoria Road and extending down Osgathorpe Road.
2. Create a landscaped character and landscaped setting for buildings facing Osgathorpe Road and Farm Street.
3. Create a well-articulated sequence of built forms in Victoria Road, Osgathorpe Road and Farm Street.
4. Protect the residential amenity of development fronting Victoria Road.



Controls

Building Uses and Ground Floor Activities

- a. All development must include commercial and/or retail land uses.
- b. Provide mixed use development with retail or commercial activities on the ground level fronting Victoria Road and the corner of Osgathorpe Road, with commercial, retail or residential upper floors.
- c. Create a mix of residential or commercial activities in the buildings facing Osgathorpe Road. Land uses on Farm St are to be residential or compatible with residential land uses

Street Frontages

- d. Provide an active frontage at ground level on Victoria Road.
- e. Provide a building setback with a landscaped setting for the residential buildings facing Osgathorpe Road and Farm Street.

Building Heights

- f. Provide development in accordance with Block 05 Built Form Plan (Figure 4.6.26) for building heights in storeys.

Note: The articulation of the top floor in the 3 dimensional building envelope drawing (Figure 4.6.25 is indicative of a top floor treatment, and is not a development control.

- g. Step built forms down from Victoria Road to relate the built form to the change in the topography.

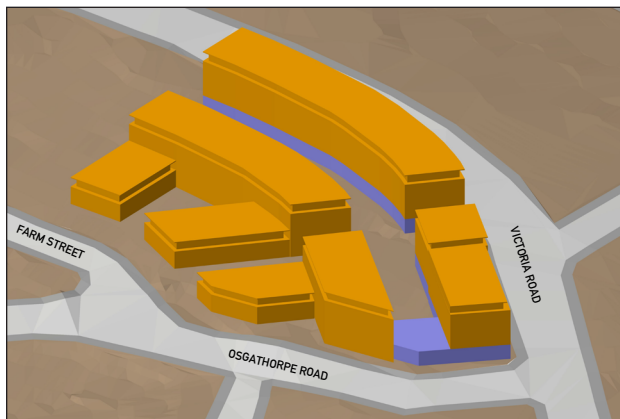


Figure 4.6.25 Block 05 3D Model

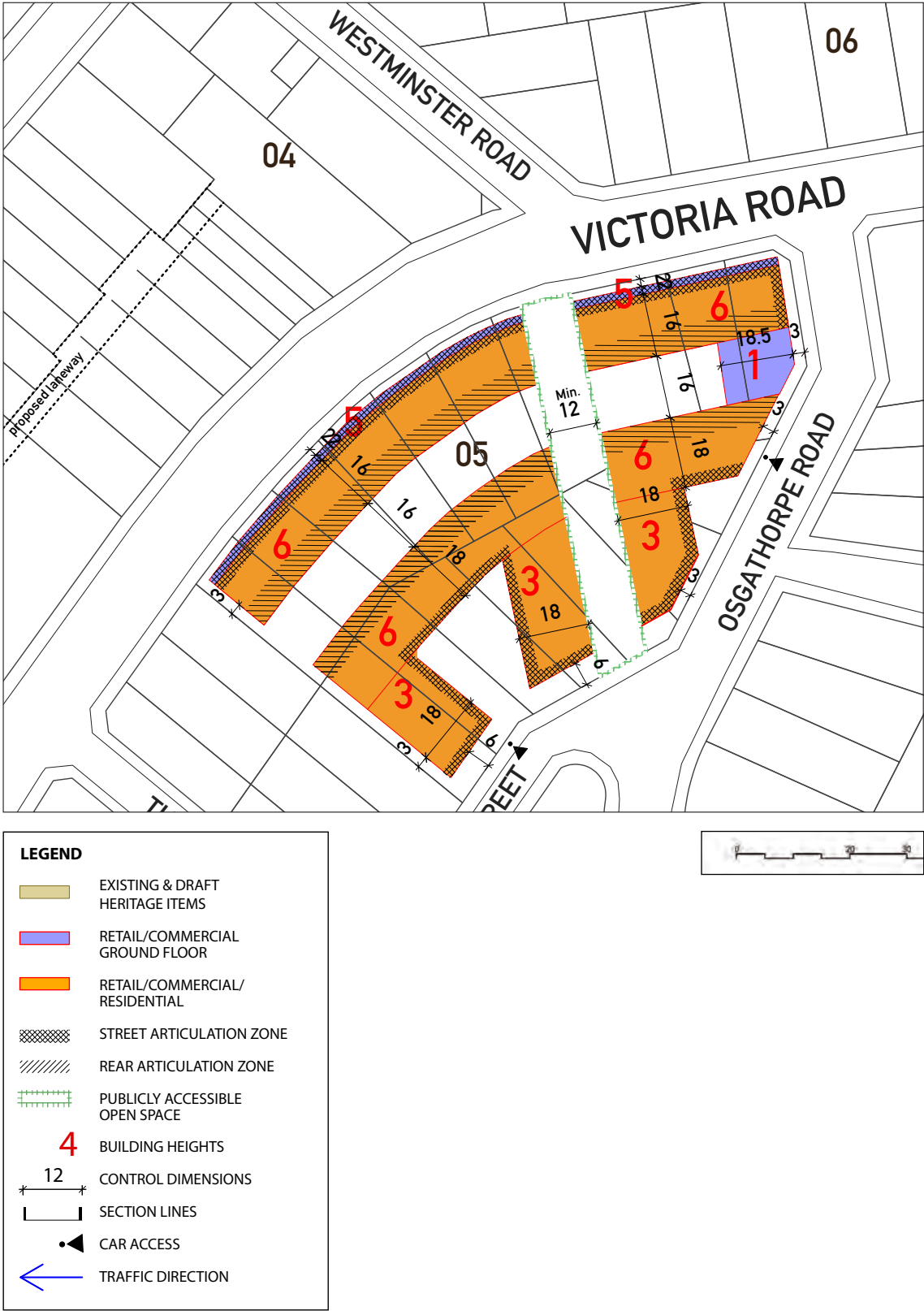
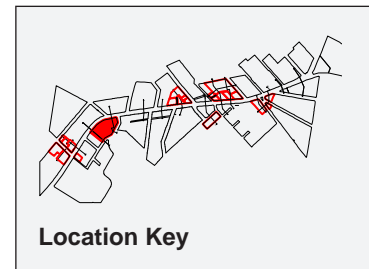


Figure 4.6.26 Block 05 Built Form Plan

Building Depth and Separation

- h. Provide building depth and separation in accordance with Figure 4.6.26 Block 05 Built Form Plan.
- i. An 18 m wide maximum building envelope, including balconies and façade articulation, is preferred.



Building Setbacks

- j. Provide 2 m setbacks along Victoria Road on the ground, first and second floors in accordance with Figure 4.6.26 Built Form Plan and Figure 4.6.27 Setbacks.
- k. Provide upper level setbacks in accordance with Figure 4.6.26 Built Form Plan and Figure 4.6.27 Setbacks. Upper level setbacks are measured to the edge of any balcony or building façade.
- l. Provide 3 m setbacks in Osgathorpe St at the ground, first and second floors.
- m. Provide 6 m setbacks in Farm St at the ground, first and second floors.

Minimising Vibration, Noise and Air Pollution in Residential Buildings Near Busy Roads

- n. Design to minimise vibration, noise and air pollution in the internal layout and materials selection of residential buildings. Development must comply with NSW Planning & Infrastructure, Development Near Rail Corridors and Busy Roads - Interim Guidelines.
- o. Internal circulation corridors, bathrooms, laundries and other non-habitable spaces should be located adjacent to the busy road.
- p. Living rooms and primary balconies should be located and oriented away from the main road. Additional techniques to minimise the impacts of a busy road include glazed balconies or wintergardens, louvred balcony screens and double glazing.
- q. Cross ventilation is to be maintained by means such as glass and metal louvres, and cross over or two storey apartment types

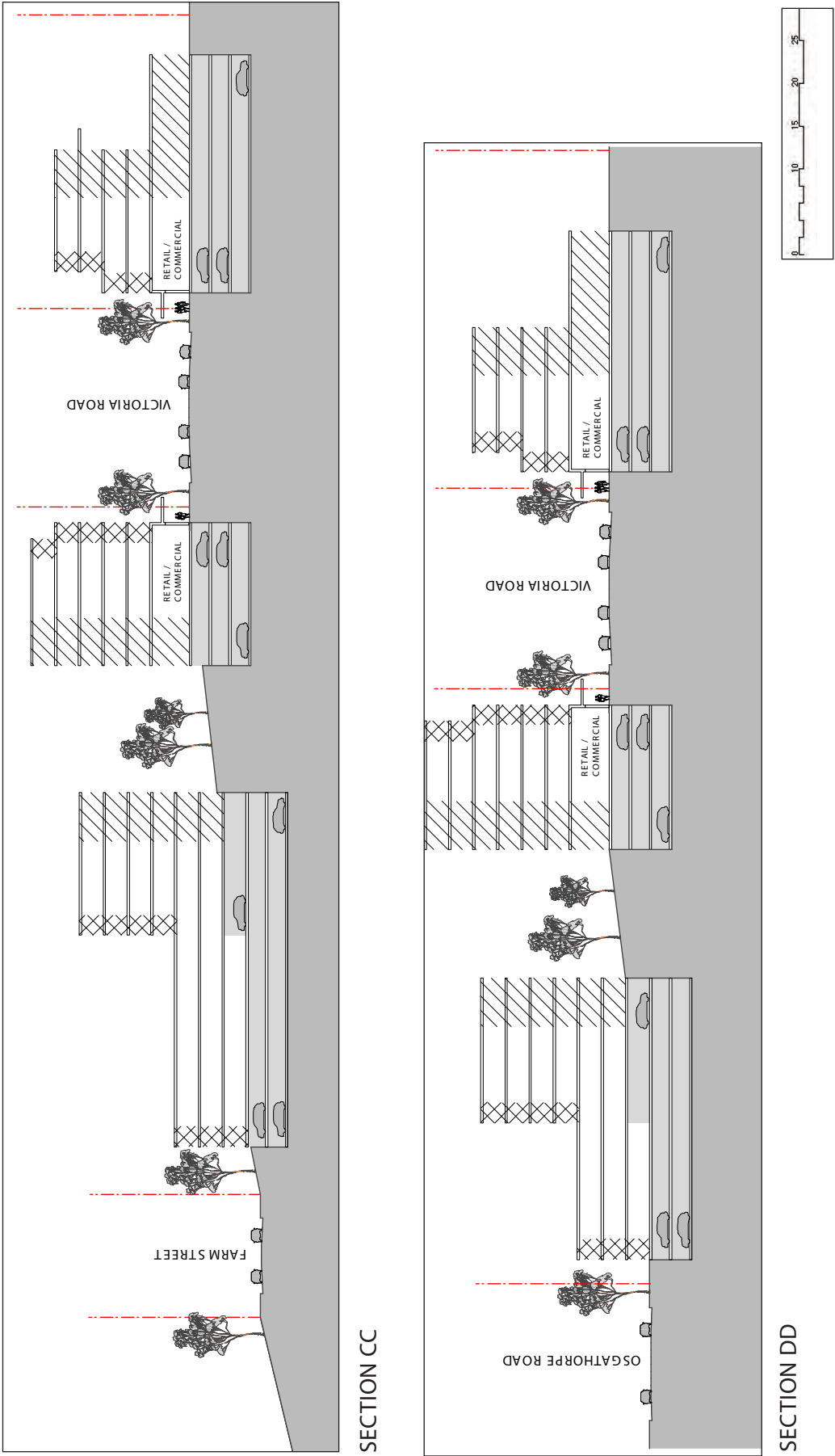
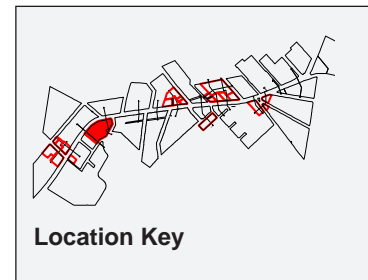


Figure 4.6.27 Block 05 (Primrose Hill) Setbacks

4.3.3 Block 05 (Primrose Hill) Public Domain/ Community Space Controls

Introduction

The site is highly visible at the top of a hill, on a bend on Victoria Road. Development of this key site will potentially improve the visual quality of the streetscape of Victoria Road, and form a gateway to the town centre.



Objectives

1. Maximise opportunities for pedestrian connections and landscape improvement.

Controls

- a. Provide street enhancements and landscaping in accordance with Block 05 Public Domain Plan (Figure 4.6.30).
- b. Provide street tree planting in accordance with Draft Ryde Public Domain Technical Manual.
- c. Provide a pedestrian connection, public domain and or community space equivalent to at least 10% of the site area in the form of a through- site-link as shown on the key site drawing or to Council's approval. A through site link shall have the following characteristics:
 - i. Connects Farm St with the signalised pedestrian crossing at Victoria/Westminster Rds; and
 - ii. open to the sky; and
 - iii. a minimum dimension of at least 12 m across; and
 - iv. a minimum 15 m separation between buildings on either side of the through site link; and
 - v. paved in accordance with Ryde Council's Public Domain Technical Manual.
- d. Create a landscape edge along Farm Street and Osgathorpe Road, to suit the character of the surrounding streetscape.
- e. Extend the kerb at the corner of Farm Street and Osgathorpe Road, to reduce the pedestrian crossing distance and make an opportunity for tree planting.
- f. Widen pavements to improve pedestrian circulation, and provide more seating.

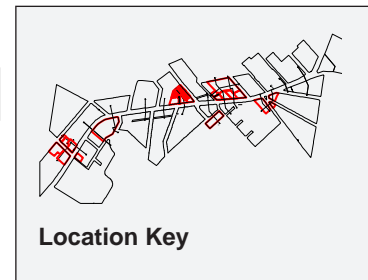


Figure 4.6.28 Block 05 Public Domain Plan

4.3.4 Block 11 (Council Carpark) Built Form Controls

Objectives

1. Create a mixed use area, with a range of community, commercial, retail or residential uses along Victoria Road and Pittwater Road.
2. Create a continuous retail or commercial ground level abutting the street frontage of Victoria Road.
3. Reinforce the existing civic role of the site fronting Pittwater Road, by relocating the library and child care centre to the new development.
4. Create new public spaces on the street frontage to Pittwater Road and within the new development.
5. Link the developments to Victoria Road and Pittwater Road through an existing public walkway.
6. Enhance the heritage character of the Presbyterian Church.
7. Ensure the heritage and landscape values of the heritage listed church are taken into consideration.



Controls

Building Uses and Ground Floor Activities

- a. Provide commercial or retail uses to the ground floor along Victoria Road.
- b. Provide community and retail/commercial uses to the ground floor along Pittwater Road. Encourage community activities at the ground floor level.
- c. Provide residential or commercial uses on the upper floors.

Street Frontages

- d. Provide a landscaped setting for the Presbyterian Church on the corner of Pittwater Road and Victoria Road, with a row of closely spaced trees planted between future development and the rear façade of the church.
- e. Setback the building on Pittwater Road to create a forecourt to the building, addressed by the library, child care centre and possible retail uses.
- f. Provide a continuous active frontage at ground level abutting the property boundary on Victoria Road

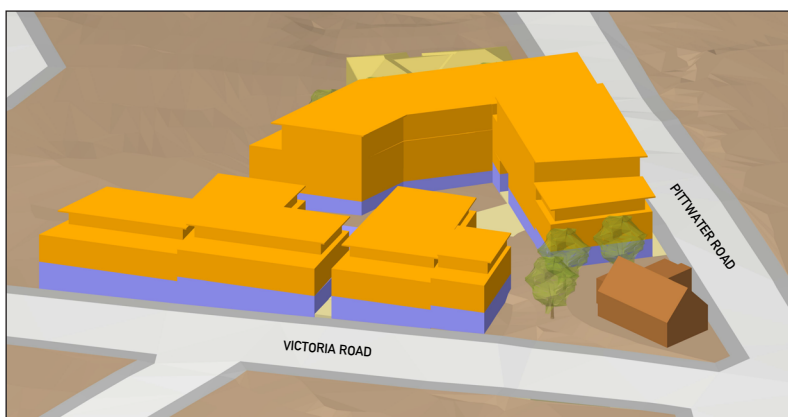


Figure 4.6.29 Block 11 3D Model



Figure 4.6.30 Block 11 Built Form Plan

Building Heights

- g. Provide development in accordance with Block 11 Built Form Plan (Figure 4.6.29) per building heights in storeys, measured to the ceiling of the top most floor.

Note: The articulation of the top floor in the 3 dimensional building envelope drawing (Figure 4.6.28) is indicative of a top floor treatment, and is not a development control.

Building Depth and Separation

- h. Provide building depth and separation in accordance with Block 11 Built Form Plan (Figure 4.6.29).

Building Setbacks

- i. Provide setbacks to Pittwater Road as shown on Block 11 Built Form Plan (Figure 4.6.29).
- j. The ground, first and second floors along Victoria Road are to be built to the existing street boundary.
- k. The upper floors along Victoria Road are to be set back a minimum 5 metres from the edge of any balcony or building façade.

Minimising Vibration, Noise and Air Pollution in Residential Buildings Near Busy Roads

- l. Design to minimise vibration, noise and air pollution in the internal layout and materials selection of residential buildings. Development must comply with NSW Planning & Infrastructure, Development Near Rail Corridors and Busy Roads - Interim Guidelines.
- m. Internal circulation corridors, bathrooms, laundries and other non-habitable spaces should be located adjacent to the busy road.
- n. Living rooms and primary balconies should be located and oriented away from the main road. Additional techniques to minimise the impacts of a busy road include glazed balconies or wintergardens, louvred balcony screens and double glazing.
- o. Cross ventilation is to be maintained by means such as glass and metal louvres, and cross over or two storey apartment types.

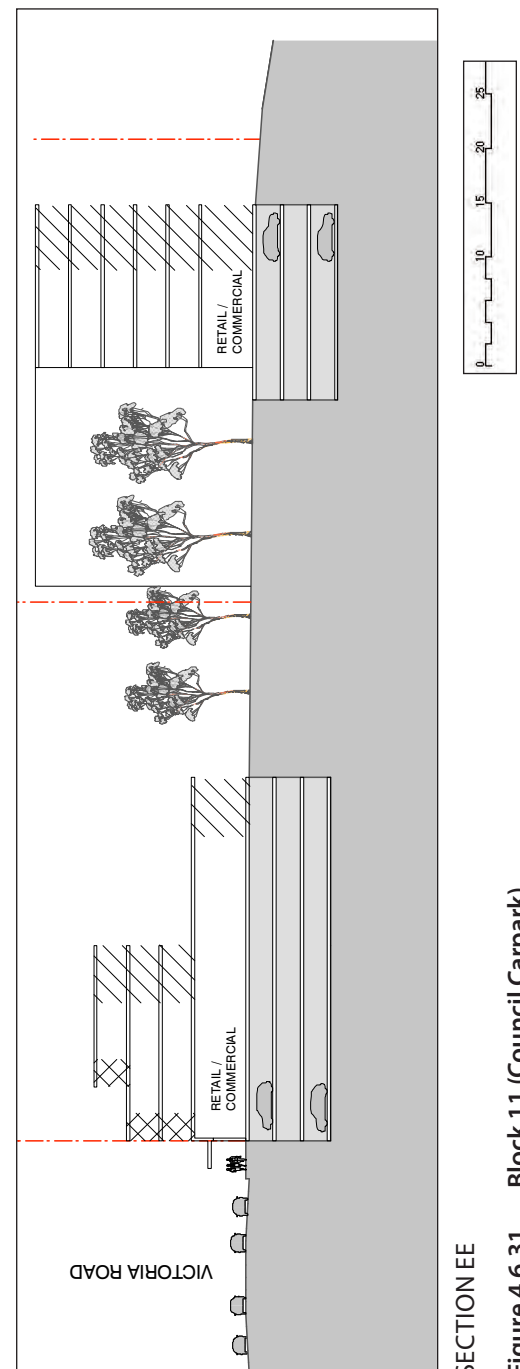
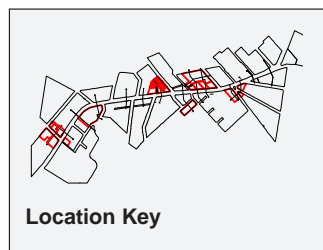


Figure 4.6.31 Block 11 (Council Carpark)

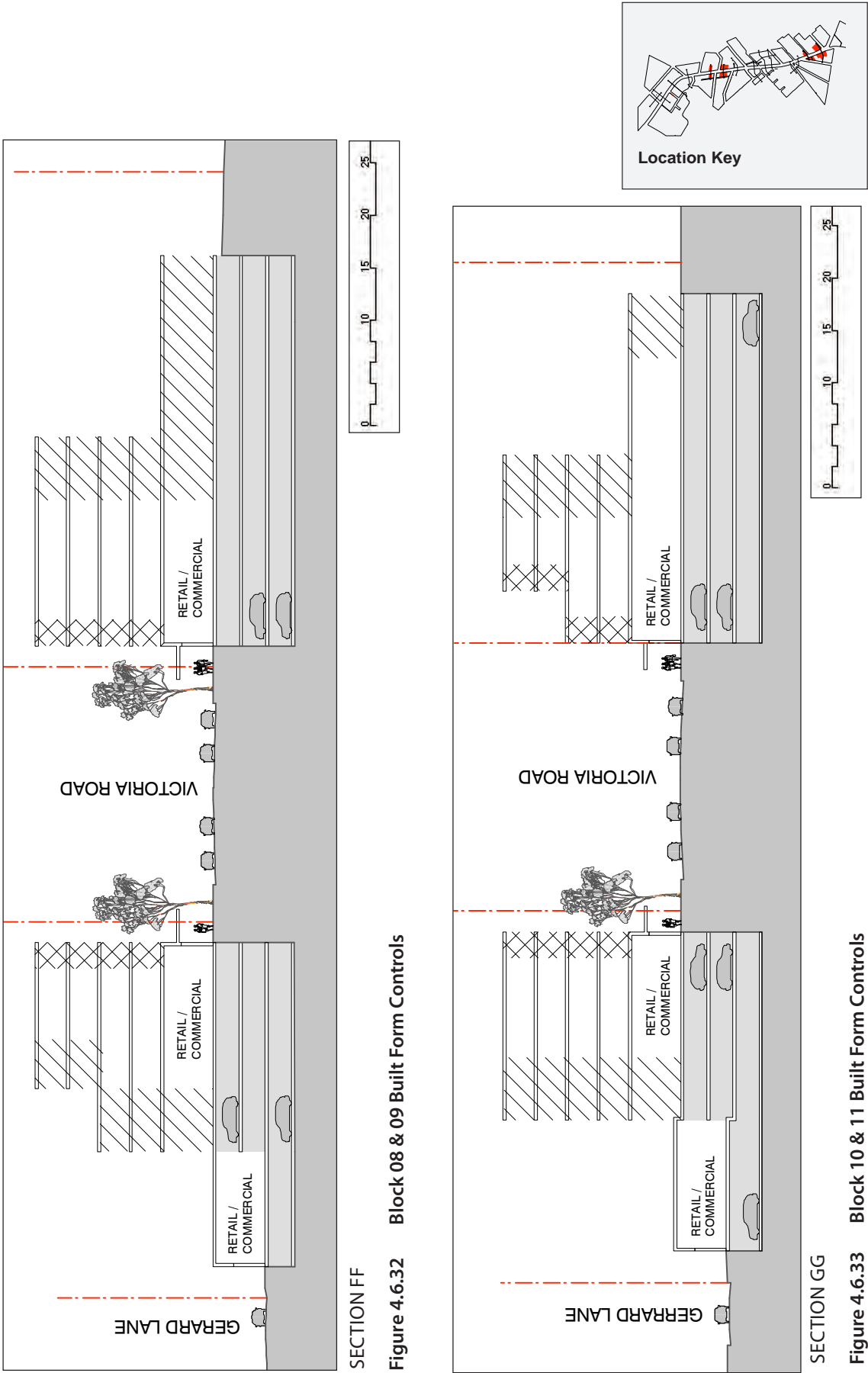


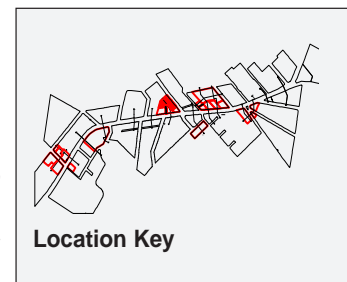
Figure 4.6.32 Block 08 & 09 Built Form Controls

Figure 4.6.33 Block 10 & 11 Built Form Controls

4.3.5 Block 11 (Council Carpark) Public Domain Controls

Introduction

The church grounds and small open space opposite form a significant green pocket on Victoria Road that makes a positive contribution to the street character. The green space at the corner of Jordan Street is exposed to traffic and not well used, but the paved space below this is used for outdoor dining.



Objectives

1. Create a civic precinct associated with the new library and community facilities.
2. Maximise the opportunity for pedestrian connections.
3. Reinforce the positive qualities of the church site and open space opposite.

Controls

- a. Provide public domain / community space equivalent to at least 10% of the site area in the form of a public plaza as shown on the key site drawing or to Council's approval. The public plaza is to have the following characteristics:
 - i. Open to the sky; and
 - ii. A minimum dimension of at least 9 m in any one direction; and
 - iii. A minimum 15 m separation between buildings on either side of the plaza; and
 - iv. paving seating and lighting in accordance with Council's Public Domain Technical Manual.
- b. Create pedestrian connections to Victoria Road.
- c. Widen pavement on Pittwater Road to improve pedestrian circulation, and provide seating.
- d. Provide streetscape improvements including planting in accordance with Block 11 Public Domain Plan (Figure 4.6.34).
- e. Provide a tall dense plant screen as a backdrop to the church. Plant tall native species such as Spotted Gum to screen the residential building behind.





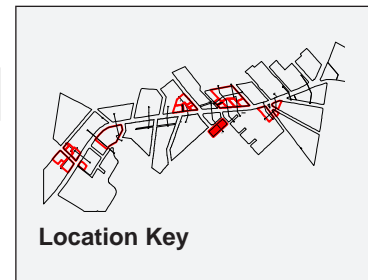
Figure 4.6.34 Block 11 Public Domain Plan



4.3.6 Block 18 (Coulter Street) Built Form Controls

Objectives

1. To create and sustain safe pedestrian access.
2. To create a vibrant hub with activities to complement community, education and entertainment facilities within the precinct.
3. To create a well-articulated sequence of built forms in Coulter Street, Ross Street and Western Crescent, with residential or commercial uses at the upper levels separated into discrete buildings.



Controls

Building Uses

- a. Land-use must complement community, education and entertainment facilities within the precinct.

Street Frontages

- b. Provide active uses including retail or commercial at the first floor and ground level frontage to Coulter Street, Ross Street, Linsley Street and Western Crescent.

Building Heights

- c. Views from nearby sites are to be considered in any redevelopment. Height and Built Form shall comply with Block 18 Built Form Plan (refer to Figure 4.6.36).

Note: The articulation of the top floor in the 3 dimensional building envelope drawing (Figure 4.6.35) is indicative of a top floor treatment, and is not a development control.

Building Depth and Separation

- d. Provide building depth and separation in accordance with Block 18 Built Form Plan (Figure 4.6.36).

Note: All dimensions are to the building envelope.

- e. The building envelope in residential buildings including all balconies and façade articulation is 18 m wide.
- f. The building depth in commercial and retail buildings also includes balconies and façade articulation. Façade articulation such as the use of balconies, bays, entry portals and the expression of structure are desirable architectural expressions.

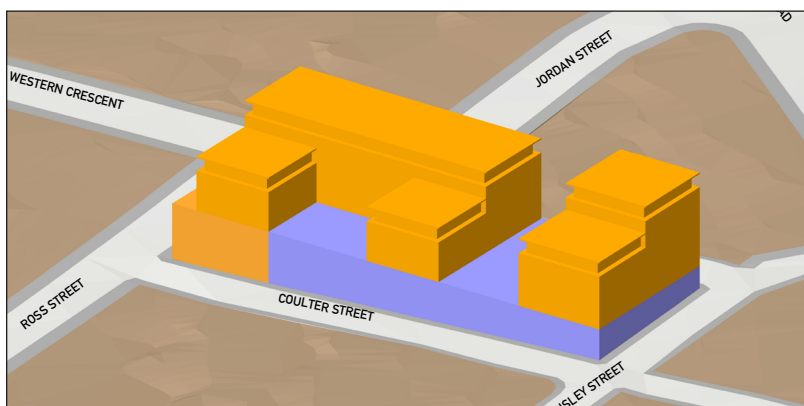
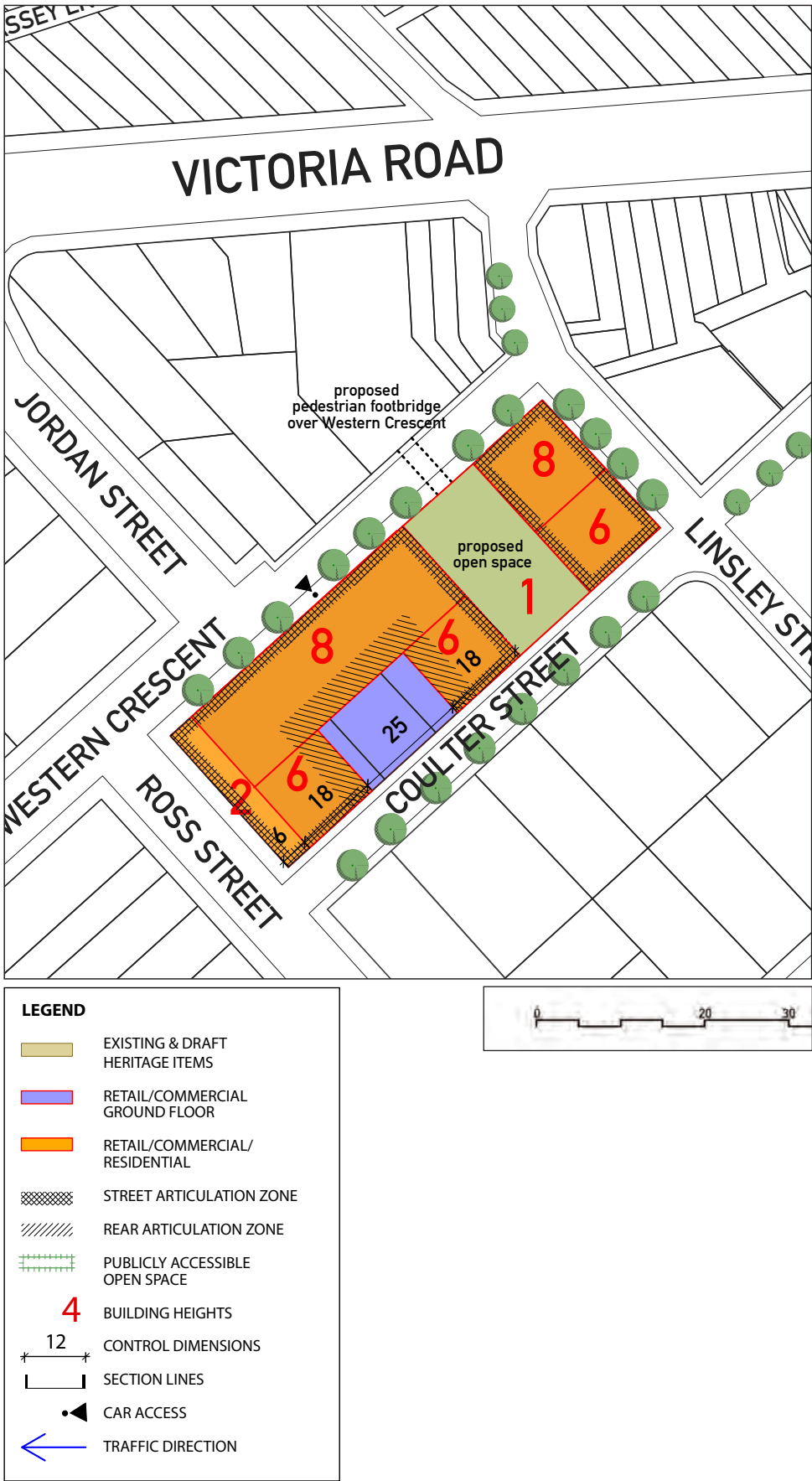


Figure 4.6.35 Block 18 3D Model



Building Setbacks

- g. All levels are to have a zero setback from Coulter Street, Ross Street, Linsley Street and Western Avenue.

Access

- h. Provide a pedestrian footbridge at a location to the satisfaction of Council and the RMS that links Block 18 with Block 21.
- i. The footbridge shall be lit to P4 Australian Standard, provide weather protection and be fully accessible.
- j. A DA application for new floor space that exceeds 500 m² is to provide a detailed traffic and pedestrian access study that demonstrates safe convenient access.
- k. Parking and safe access must be provided during construction of any new development that exceeds 500 m² (including consideration of kiss and ride for the school and childcare).

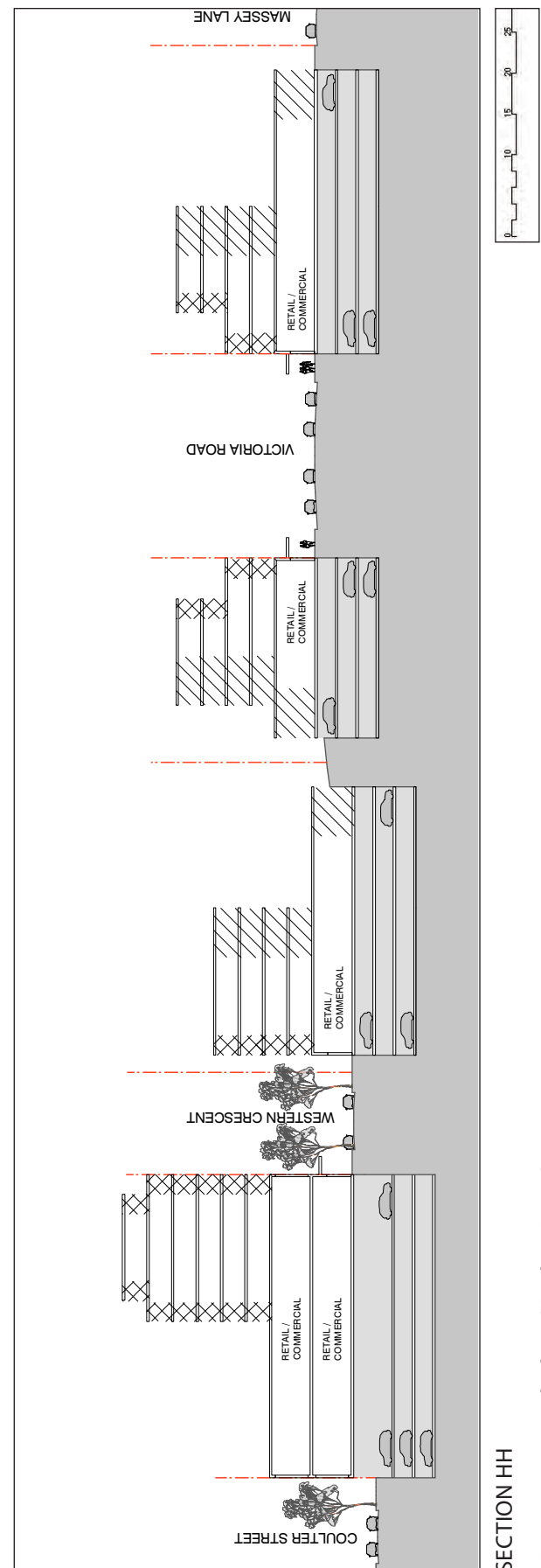
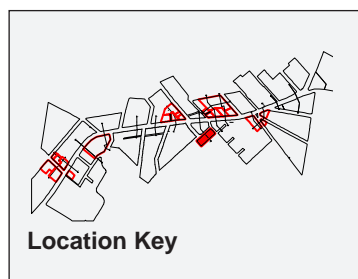
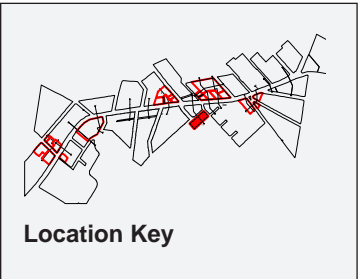


Figure 4.6.37

4.3.7 Block 18 (Coulter Street) Public Domain Controls

Introduction

Coulter Street, Western Crescent and Linsley Street are narrow one way streets around the existing car park. There is a very poor pedestrian environment, with narrow footpaths and no shade. Coulter Street extends to Trim Place, but the footpath is narrow with poor pedestrian amenity.



Objectives

1. Create a civic precinct associated with new shopping development, with a good pedestrian environment away from Victoria Road.
2. Enhance pedestrian links to create a walkable network of public spaces.
3. Create network of streets with an intimate scale, forming a pedestrian orientated environment.

Controls

- a. Provide public domain and community space equal to 10% of the key site area or 500 m² (whichever is the greater) and generally in accordance with Block 18 Public Domain Plan (Figure 4.6.38). Public Domain space must meet demands created by the site redevelopment and may include pedestrian connections, laneways and public plazas. Public plazas must be:
 - i. Open to the sky; and
 - ii. A minimum 15 m separation between buildings on either side of the public plaza; and
 - iii. Paved in accordance with Ryde Council's Public Domain Technical Manual.
- b. Set back future buildings on eastern side of Western Crescent for street tree planting, and plant in carriageway on the western side.
- c. Widen footpaths on Linsley Street and Coulter Street to improve pedestrian amenity and allow street tree planting.
- d. Widen footpath on Coulter Street and plant, to enhance the connection to Trim Place.

See also Section 3.3.8 and 3.3.9

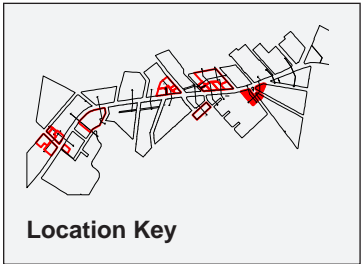


Figure 4.6.38 Block 18 Public Domain Plan

4.3.8 Block 20, 25 & 28 (Wharf Road) Built Form Controls

Objectives

1. Create a coherent town centre commercial or retail character with a continuous commercial or retail ground level abutting the street frontage of Victoria Road and extending down Meriton Street and Wharf Road.
2. Create enhanced pedestrian and shopper amenity in Wharf Road and Meriton Street, with active ground level uses and widened footpaths.
3. Provide a New Lane from Meriton Street to Wharf Road. The creation of this New Lane will benefit the flow of traffic in the Wharf Road area and will provide enhanced pedestrian amenity in Wharf Road and Meriton Street. The increased yields are dependent upon the provision of the New Lane.
4. Retain the existing residential/commercial building on the corner of Victoria Road and Meriton Street.



Controls

Building Uses and Ground Floor Activities

- a. Provide mixed use development with retail or commercial uses at the ground floor, with a continuous retail or commercial frontage to Victoria Road, Meriton Street and Wharf Road.

Street Frontages

- b. Provide an active frontage at ground level abutting the property boundaries on Victoria Road, Meriton Street and Wharf Road.
- c. Locate intensely used, small scale retail frontages, such as cafes, restaurants and specialty shops addressing the proposed landscaped pedestrian area at the northern end of Wharf Road.

Building Heights

- d. Provide development in accordance with Block 20, 25 & 28 Built Form Plan (Figure 4.6.40) for building heights in storeys.

Note: The articulation of the top floor in the 3 dimensional building envelope drawing is indicative of a top floor treatment, and is not a development control.

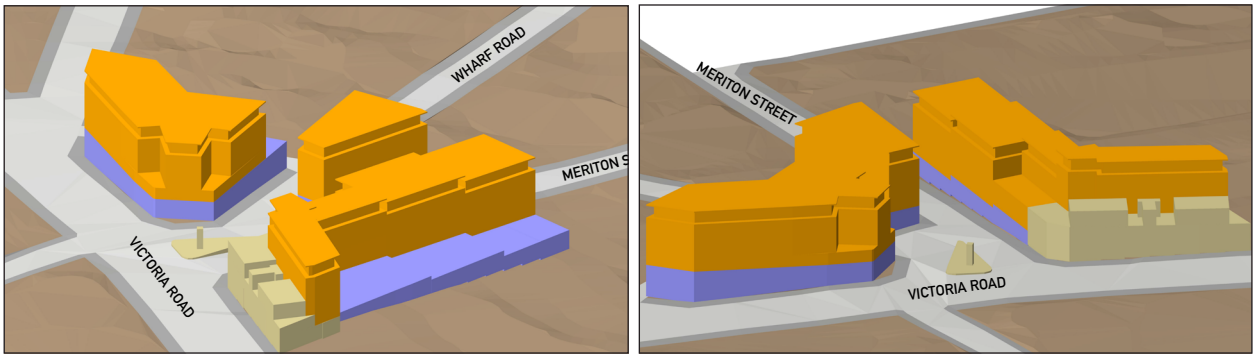


Figure 4.6.39 Block 20, 25 & 28 3D Model

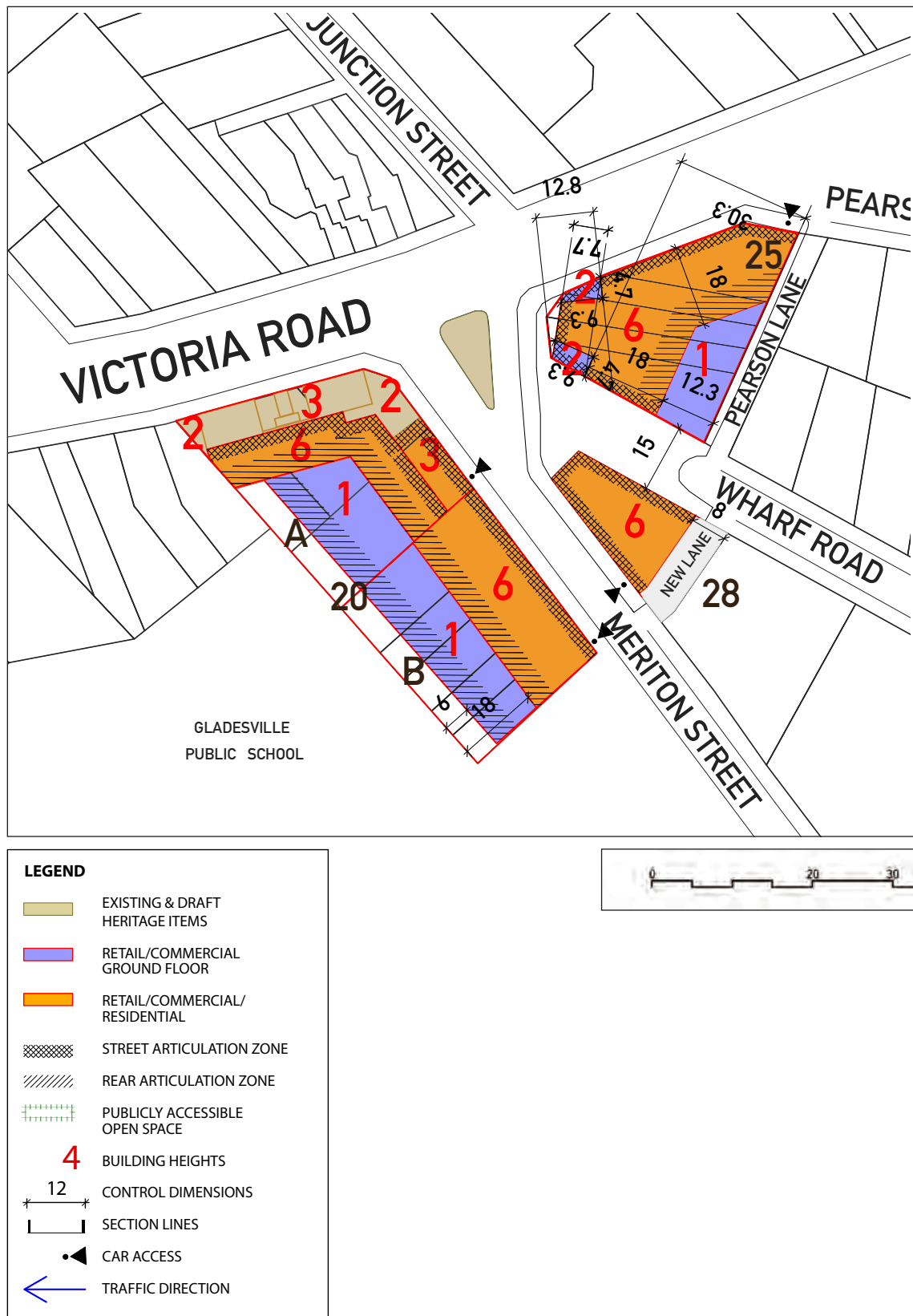
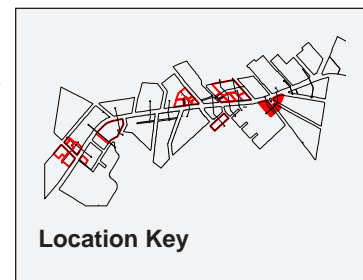


Figure 4.6.40 Block 20, 25 & 28 Built Form Plan

Building Depth and Separation

- e. Provide building depth in accordance with the Block 20, 25 & 28 Built Form Plan (Figure 4.6.40).
- f. Provide 12 m building separation between proposed development and existing or proposed residential development.
- g. An 18 m wide building envelope maximum, including balconies and façade articulation, is preferred.



Building Setbacks

- h. Provide zero setback to Meriton Street and Wharf Road.
- i. The ground and first floors on site 25 have a zero setback to Victoria Road, Wharf Road and Pearson Lane.
- j. The upper floors on site 25 are to comply with the building envelope setbacks to form a splayed corner form that relates to site 28.

Avoiding Noise and Air Pollution in Residential Buildings

- k. Barriers to noise and air pollution are to be provided by the internal layout and design of residential buildings. Barriers are to be created by the location of internal circulation corridors, bathrooms, laundries, storage and other non-habitable spaces adjacent to the road. Living rooms and primary balconies are to be located and oriented away from the main road. Additional barrier techniques include glazed balconies or wintergardens to bedroom balconies, louvred screens to balconies and windows and double glazing to windows and doors. Cross ventilation is to be maintained by means such as glass and metal louvres, and cross over or two storey apartment types.

Access

- l. Provide a new laneway that is 8 m wide and enhances pedestrian and vehicular access to and from the site and the public plaza.
- m. Laneway shall implement Local Area Traffic Management in accordance with RMS guidelines (to ensure that the new laneway does not become a rat run between Victoria Road and Meriton Street).

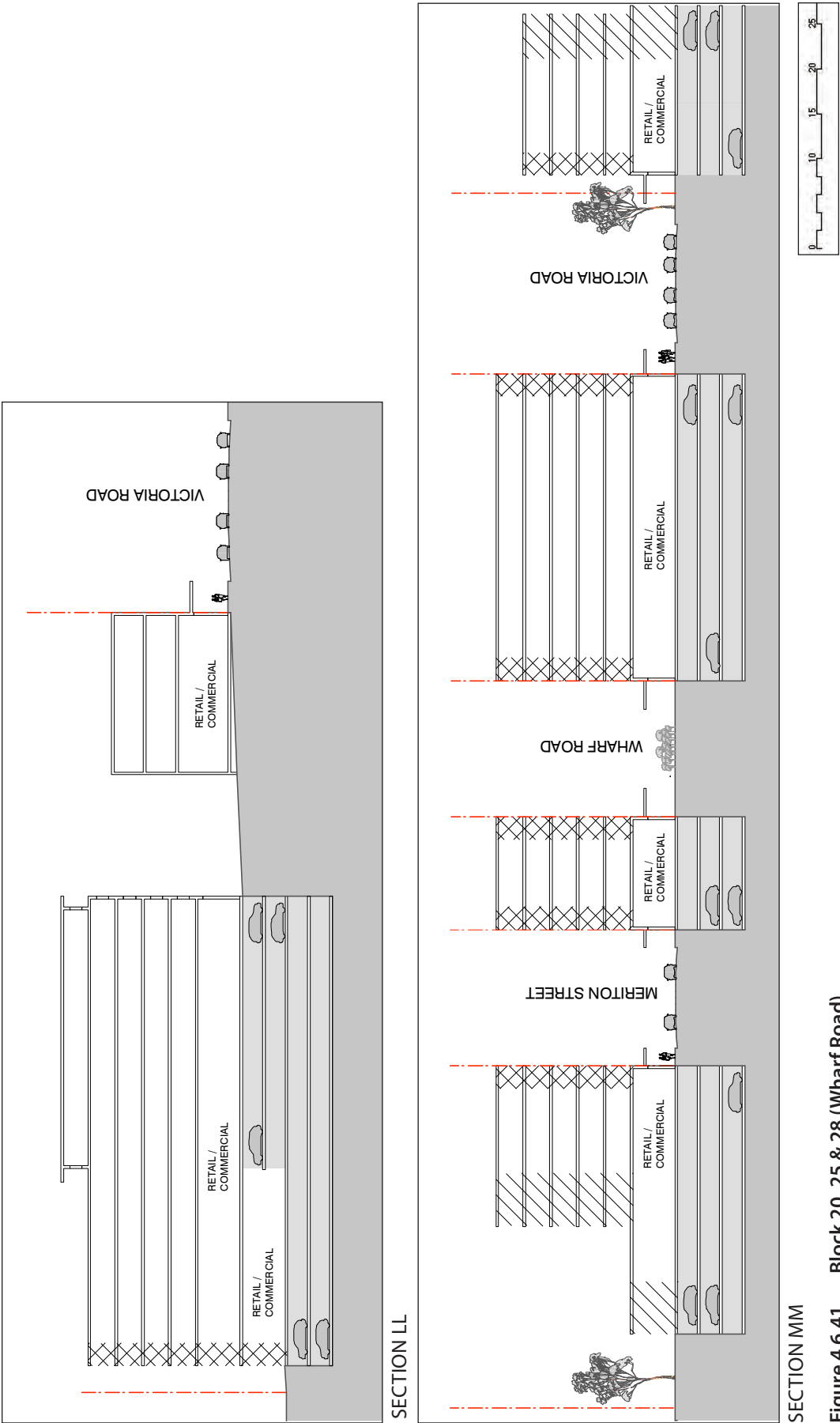


Figure 4.6.41 Block 20, 25 & 28 (Wharf Road)

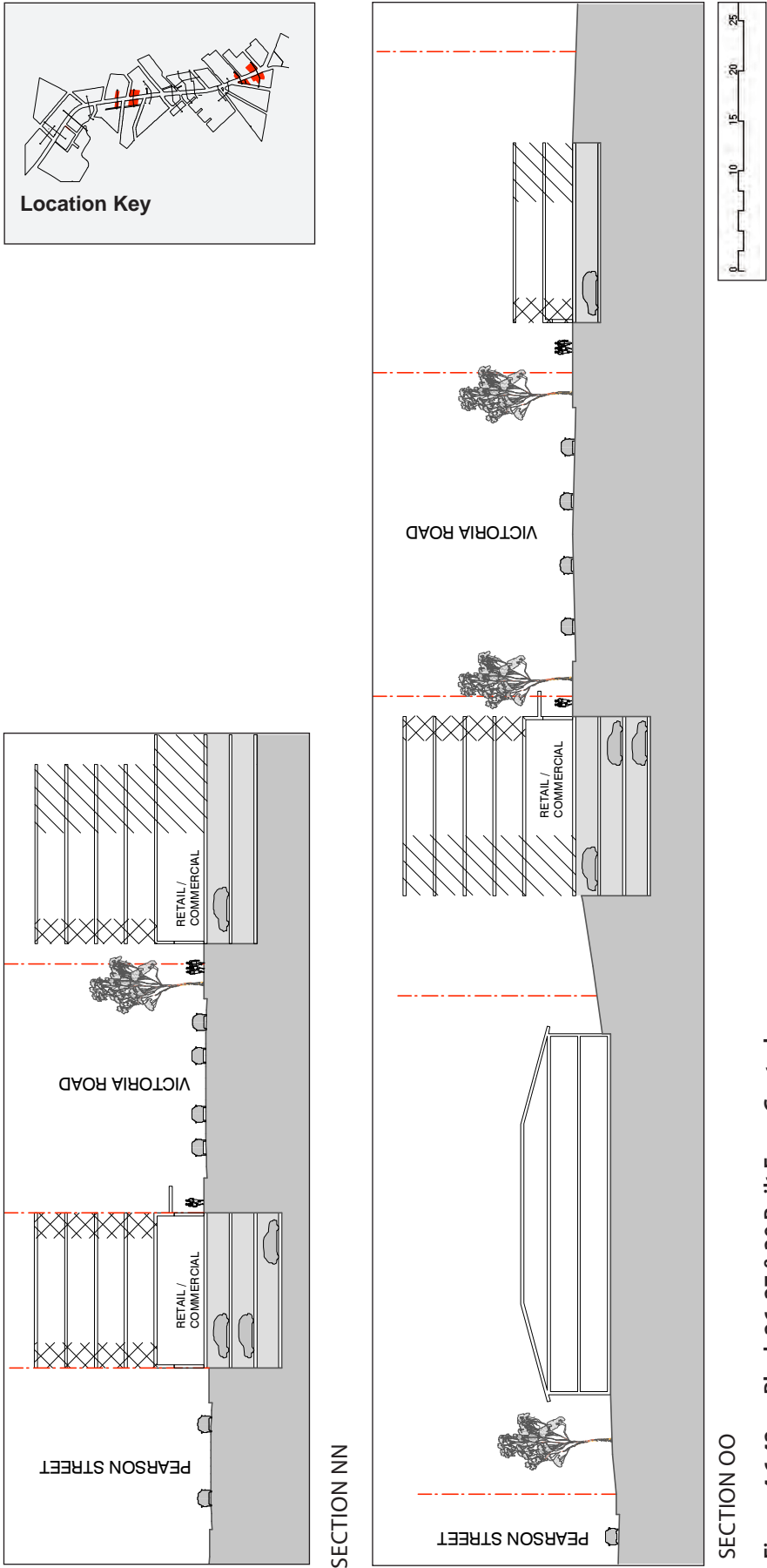
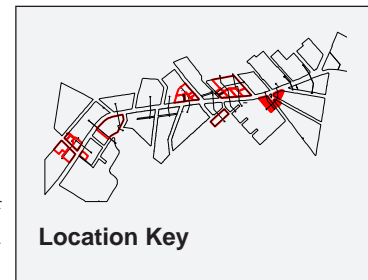


Figure 4.6.42 Block 26, 27 & 30 Built Form Controls

4.3.9 Block 20, 25 & 28 (Wharf Road) Public Domain Controls

Introduction

This is a significant site on Victoria Road, with high visibility on the journey south. It is a potential gateway site, forming the edge of the town centre core. The clock tower has iconic significance for the town centre.



The end of Wharf Road is currently partially closed with traffic calming devices, but still occupied by roadway, with little amenity for pedestrians. Closing the road creates an opportunity to make a new public space, that can complement commercial activity and support community life.

Objectives

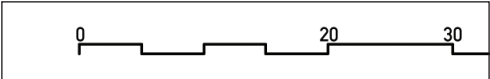
1. Create a new public space off Victoria Road that provides opportunities for a range of community and commercial activities that enhance the life and viability of the town centre.

Controls

- a. Close Wharf Road, and provide a new vehicular laneway connection to Meriton Street. (Refer Access)
- b. Provide a public plaza that:
 - i. is open to the sky; and
 - ii. has a minimum dimension of at least 15 m in any one direction; and
 - iii. A minimum area of 500 m² ; and
 - iv. 15 m separation between buildings on either side of the Wharf Road street closure; and
 - v. Paved in accordance with City of Ryde's *Public Domain Technical Manual*.
- c. Provide clear unobstructed and identifiable pathways and open spaces.
- d. Provide generous planting to make a green pocket that contributes to the character of Victoria Road, and is a green backdrop to the clock tower.
- e. Narrow the carriageway to maximise the size of the new public space.
- f. Enhance the landscape surrounding the clock tower.



Figure 4.6.43 Block 20, 25 & 28 Public Domain Plan



THIS PAGE HAS BEEN
INTENTIONALLY LEFT BLANK



City of Ryde
Civic Centre
1 Devlin Street
Ryde NSW 2112

www.ryde.nsw.gov.au

City of Ryde Development Control Plan 2014

Part: 5.1 Coronation Avenue and Trelawney Street, Eastwood Character Area

Translation

ENGLISH

If you do not understand this document please come to Ryde Civic Centre, 1 Devlin Street, Ryde Monday to Friday 8.30am to 4.30pm or telephone the Telephone and Interpreting Service on 131 450 and ask an interpreter to contact the City of Ryde for you on 9952 8222.

ARABIC

إننا نعتذر عليك فهم محتويات هذه الوثيقة، نرجو للحضور إلى مركز بلدية رايد Ryde Civic Centre على العنوان: 1 Devlin Street, Ryde 1 من الاثنين إلى الجمعة بين الساعة 8.30 صباحاً والساعة 4.30 بعد الظهر أو الاتصال بمكتب خدمات الترجمة على الرقم 131 450 لكي تطلب من أحد المترجمين الاتصال بمجلس مدينة رايد، على الرقم 9952 8222، نيابة عنك.

ARMENIAN

Եթէ այս գրութիւնը չէք հասկնար, խնդրեմ եկէք՝ Րայդ Սիվիկ Սենթըր, 1 Տելվին փողոց, Րայդ, (Ryde Civic Centre, 1 Delvin Street, Ryde) Երկուշաբթիէն Ուրբաթ կ.ա. ժամը 8.30 – կ.ե. ժամը 4.30, կամ հեռաձայնեցէք Հեռաձայնի եւ Թարգմանական Սպասարկութեան՝ 131 450, եւ խնդրեցէք որ թարգմանիչ մը Րայդ Քաղաքապետարանին հետ կապ հաստատուէ ձեզի համար, հեռաձայնելով՝ 9952 8222 թիվին:

CHINESE

如果您看不懂本文，請在周一至周五上午 8 時 30 分至下午 4 時 30 分前往 Ryde 市政中心詢問 (Ryde Civic Centre, 地址: 1 Devlin Street, Ryde)。你也可以打電話至電話傳譯服務中心，電話號碼是: 131 450。接通後你可以要求一位傳譯員為你打如下電話和 Ryde 市政廳聯繫，電話是: 9952 8222。

FARSI

اگر این مدرک را نمی فهمید لطفاً از 8.30 صبح تا 4.30 بعد از ظهر دوشنبه تا جمعه به مرکز شهرداری رايد، Ryde Civic Centre, 1 Devlin Street, Ryde مراجعه کنید یا به سرویس مترجم تلفنی، شماره 131 450 تلفن بزنید و از یک مترجم بخواهید که از طرف شما با شهرداری رايد شماره 9952 8222 تلفن بزند.

ITALIAN

Se non capite il presente documento, siete pregati di rivolgervi al Ryde Civic Centre al n. 1 di Devlin Street, Ryde, dalle 8.30 alle 16.30, dal lunedì al venerdì; oppure potete chiamare il Telephone Translating and Interpreting Service al 131 450 e chiedere all'interprete di contattare a vostro nome il Municipio di Ryde presso il 9952 8222.

KOREAN

이 문서가 무슨 의미인지 모르실 경우에는 1 Devlin Street, Ryde 에 있는 Ryde Civic Centre 로 오시거나 (월 – 금, 오전 8:30 – 오후 4:30), 전화 131 450 번으로 전화 통역 서비스에 연락하셔서 통역사에게 여러분 대신 Ryde 시청에 전화 9952 8222 번으로 연락을 부탁드립니다.

Amend. No.	Date approved	Effective date	Subject of amendment

Table of Contents

1.0 INTRODUCTION	5
1.1 Background	5
1.2 Objectives	6
1.3 Contributory Elements	6
2.0 THE PLACE	8
2.1 History	8
2.2 Description	9
2.3 Positive Characteristics	9
3.0 STRATEGY AND DEVELOPMENT CONTROLS	10
3.1 Strategy	10
3.2 Building Form, Scale and Massing	10
3.3 Building Details	12
3.4 Roofs	14
3.5 Building Siting	15
3.6 Car Parking	16
3.7 Materials and Colours	17
3.8 Gardens	18
3.9 Street Elements	19

THIS PAGE HAS BEEN
INTENTIONALLY LEFT BLANK

1.0 INTRODUCTION

The character area boundaries are shown on “Coronation Avenue and Trelawney Street Character Area” map.

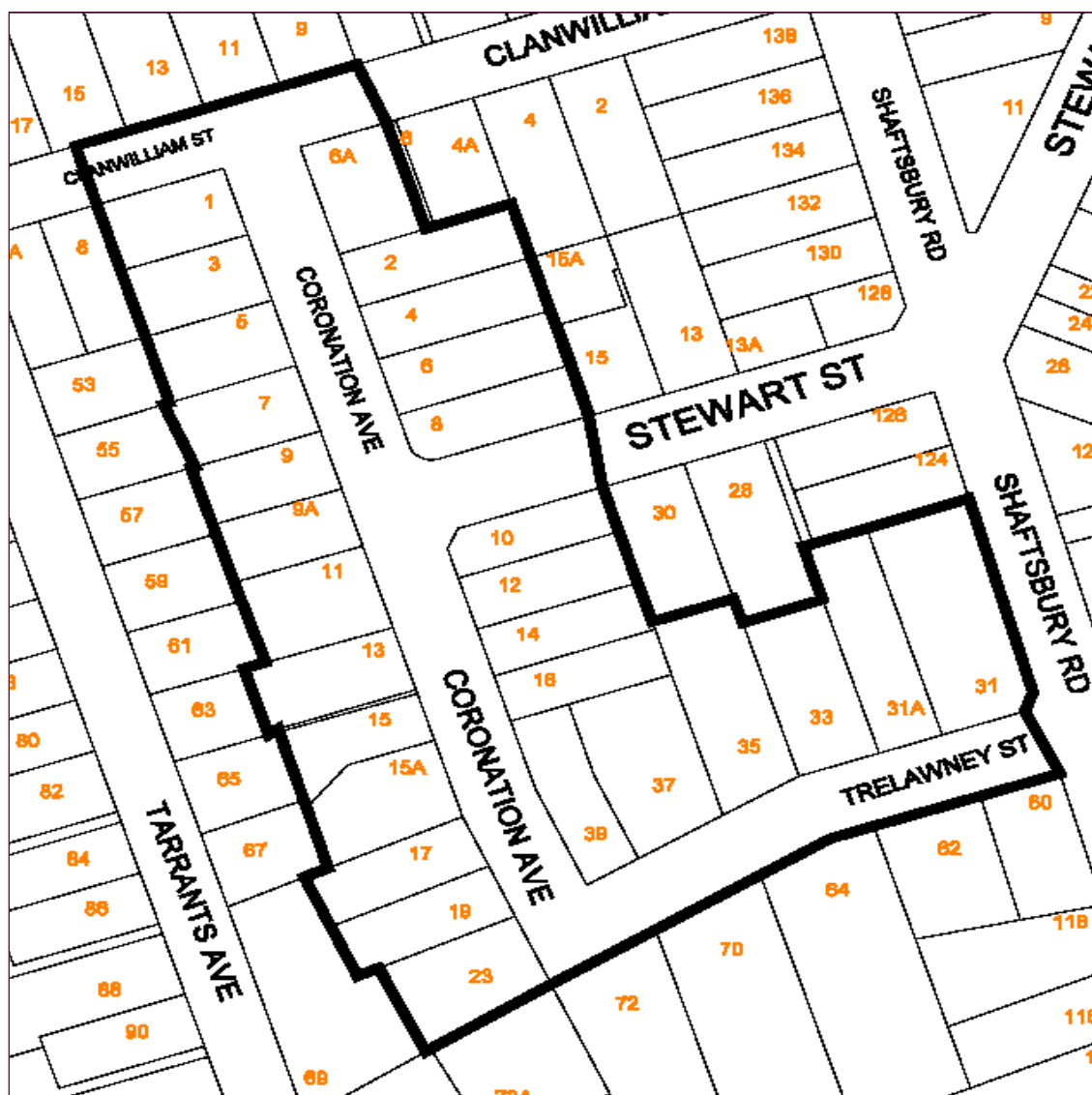


Figure 5.1.01 Coronation Avenue & Trelawney Street Character Area Extent

1.1 Background

This Area was selected because it includes several houses of high architectural quality and an attractive streetscape characterised by grass verges, low fences, open landscaped front gardens and picturesque Federation period housing.

This Part has been introduced to provide clear controls and guidelines that will ensure the retention of built and natural elements that contribute to the character of the Area, while allowing for sympathetic changes that meet the needs of the contemporary community.

The objectives and controls in this Part have been developed following extensive consultation with residents and owners of property in the area consultation included a survey, community workshops and meetings.

1.2 Objectives

The objectives of this Part are:

- 1. To conserve and enhance the positive characteristics and high level of amenity of the Coronation Avenue and Trelawney Street area;
- 2. To identify and protect buildings and other elements that make a positive contribution to the area; and
- 3. To provide for future development that is compatible with the character of the area.

1.3 Contributory Elements

The properties including buildings and other elements within the Area are considered of special value because collectively they contribute to the positive characteristics. Each property within the Area has been noted according to the contribution it makes. The properties are nominated as “highly contributory”, “contributory”, “neutral items” or “uncharacteristic”.

Highly Contributory Items	These properties display most of the positive characteristics of the area. They have a collective significance and their retention is essential if the character of the area is to be kept.
Contributory Items	These properties display use of some of the positive characteristics such as characteristic compatible forms and materials, that contribute to the area as a whole, but to a lesser extent than highly contributory items. Any alterations or additions to contributory items should aim to make them highly contributory items.
Neutral Items	These properties display use of some of the positive characteristics that contribute to the area as a whole, but to a lesser extent than contributory items. These items may be demolished or altered so long as the work result in a building that possesses the characteristics of the highly contributory items.
Uncharacteristic Items	These properties display qualities that detract from the character of the area. They are not to be considered as a precedent for new work when assessing the merit of an application for development. These items may be demolishes or altered so long as the works result in a building that possesses the characteristics of the highly contributory items.

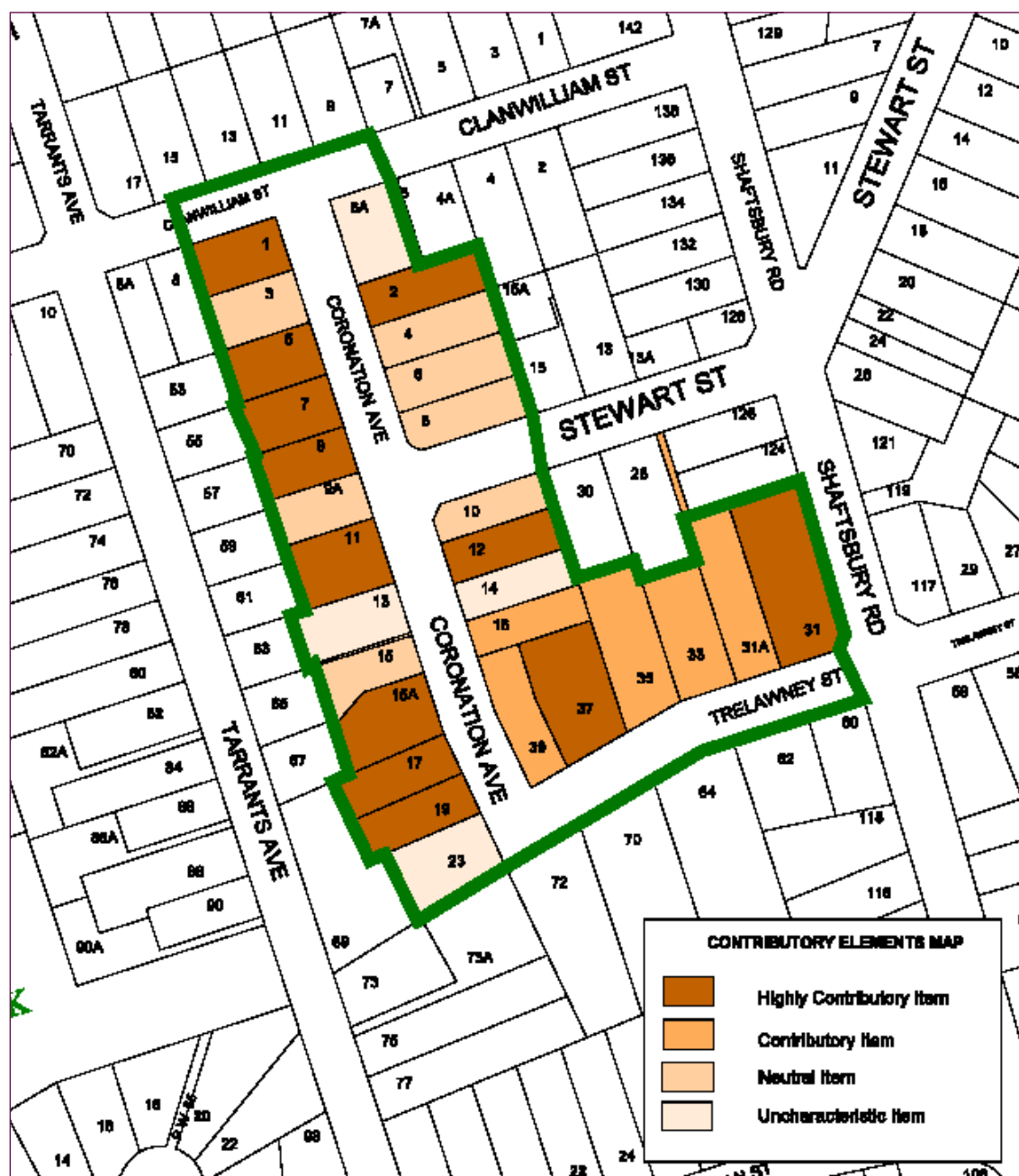


Figure 5.1.02 Map of Contributory Elements Coronation Avenue & Trelawney Street

2.0 THE PLACE

2.1 History

The area is part of the Eastwood Heights Estate created 1903, but prior to this the land had undergone a series of subdivisions. The area was originally part of the Field of Mars land grants. The Coronation Avenue and Trelawney Street area occupied land which was part of a 100 acre land grant made in 1794 to William Patullo, an ensign in the NSW Corps.

This grant, known as Craigie Farm, was bought by William Cox about in 1800. Cox consolidated the land into Brush Farm. Brush Farm remained intact until it was subdivided in 1881. The character area is part of Section 13, which was purchased by George Pile in 1883.

The construction of the railway to Hornsby late in the nineteenth century created the village of Eastwood. Eastwood railway station was opened in 1886 and this encouraged the development of the township. As a result the first two decades of the century saw the demise of the large rural estates, although during this time the Eastwood area did not become closely settled. In the years between the World Wars, the population of Eastwood only grew from 1,880 in 1920 to 3,230 in 1939. The population increased dramatically after WWII.

The area, which formed Eastwood Height Estates, was purchased by Charles Summerhayes, a local architect and developer, who subdivided the land in 1903 and placed it up for sale. The Eastwood Height Estates subdivision was bounded by Shaftesbury Road, Clanwilliam Street, Railway Street (now Tarrants Ave) and included Rose Street (now Stewart Street), Lily Street (now Coronation Avenue), and Alice Street (now Trelawney Street). Rose and Alice were the names of Summerhayes' daughters, and Lily the name of his wife.

Summerhayes was a prominent member of the community and an Alderman on Ryde Council. He was responsible for a number of subdivisions in the Eastwood area, as well as the architect of a number of shops and residences. Summerhayes built his own house 'Womerah', which still stands at No. 31 Trelawney Street, on lots 32 and 33 of the Eastwood Heights Estate.

Eastwood Height Estates subdivision was promoted *"magnificent panoramic views of the city and suburbs. Mountain altitude with suburban conveniences only 33 minutes train journey to the city"*, and was intended for middle class residents who would commute by train to the city for work.

Mura's estate, a larger parcel of land that ran from Tarrants Avenue through to the southern end of Coronation Avenue, was subdivided in 1923. In 1927 unsold lots were for sale as the 'Glorious Views Estate'. The properties that ran between Coronation St and Tarrants Avenue were re-subdivided between the 1930s and 1960s resulting in blocks with a street frontage to Tarrants Avenue.

The historical pattern of subdivision has established a pleasing rhythm of houses and gardens, and the area includes several individual houses of high architectural quality. Overall the land was originally subdivided with the intention of building residences, and this residential pattern of use continues today. Many properties, while not individually outstanding, still make an important contribution to the character of the area. The dominant character of the Area results from the groups of fine Federation bungalows with attractive front gardens set in tree lined streets.

A slight "L" shaped ridge runs along the eastern side of Coronation Avenue and along the Trelawney Street blocks in the south. The land along the ridges was the most favourable for building, and the earliest houses of the original subdivision are located along this slight ridge. At the northern end of Coronation Avenue the land slopes to the east and the ground floors of houses built on these blocks are generally set below street level.

2.2 Description

The houses in the Character Area are mainly single-storey moderate sized suburban bungalows. The Area reflects the traditional preference of Australians for single-storey family houses and provides a diverse range of house sizes from relatively small homes to large family homes. The residences are relatively homogeneous in their single storey scale, form, attention to detail and materials. The predominant materials are face brick walls, terracotta tile roofs and timber windows and doors.

The streetscape is characterised by grass verges, low fences, open landscaped front gardens and picturesque Federation period housing. The private gardens with their lawns, garden beds and specimen trees make an important contribution to the streetscape.

Coronation Avenue has a very different character to that of Trelawney Street, its wide flat openness providing a strong contrast to the split level, narrow and slightly winding quality of Trelawney Street.

The Area is well served by local services and is within walking distance of Eastwood shopping centre and railway station.

2.3 Positive Characteristics

The following set of Positive Characteristics define the Area and should be conserved and used as a tool in decision making.

1. Expansive neighbourhood views from the majority of properties;
2. A consistent streetscape in terms of:
 - siting of dwellings
 - dwelling setbacks
 - landscaped front yards with trees
 - building form, bulk and setbacks
 - garage location
 - materials and colours
 - wide verges with trees
3. Houses are generally consistent in style and materials and display key features of their architectural style:
 - single storey
 - set above grade on piers often with a stone foundation
 - simple, large roofs of similar heights
 - gabled or hipped roofs with a 30 - 40% roof pitch
 - large simple planes for the roof and walls
 - face brick relieved by stucco or timber detailing
 - slate or terracotta tiled roofing materials
 - set in an extensive, landscaped garden
 - contain a verandah with low parapet walls
 - garages located to the rear and only partly visible from the street
 - contain side landscaping
 - building generally framed by vegetation
 - vertically - oriented windows set in groups, often aggregated into a square shape
 - low front fences, or walls or hedges
4. A high level of amenity, i.e. many elements that make the Area an attractive and pleasant place to live.

3.0 STRATEGY AND DEVELOPMENT CONTROLS

3.1 Strategy

The objectives of this part are to be achieved through the following strategy:

- 1. building or design elements that comply with or complement the Positive Characteristics of the Area are to be retained;
- 2. highly contributory and contributory buildings are to be retained but inconspicuous additions to the rear may be acceptable;
- 3. new buildings and alterations and additions to existing building are to match or complement the Positive Characteristics; and
- 4. neutral or uncharacteristic items may be demolished or altered.

3.2 Building Form, Scale and Massing

The buildings in the area are generally single storey.

The houses along the western side of Coronation Avenue sit prominently along the ridgeline. Together they form a dominant element in the Coronation Avenue streetscape.

The houses along Trelawney Street are set high on the ridge and well back from the street. Because of the narrowness and split in the street the houses cannot be viewed as a group from any distance.

The distinctiveness of many older buildings is found features such as verandahs, stepping roofs and walls, decorative details and variation in materials. The texture and shadow of verandahs, for example, provides an attractive contrast to the solidity of the brick dwellings.

New buildings, alterations and additions should be compatible with the character of the area, the immediate streetscape context and to the building to which they belong. Alterations should aim to enhance the contribution the dwelling makes.

New dwellings built between existing dwellings should be consistent with the existing scale of buildings in the street and, in particular, that of the immediately adjacent buildings.

Objectives

- 1. To ensure new development is compatible with the form, scale and massing of contributory building.
- 2. To ensure that any new development visible from the street complements the Positive Character as defined in Clause 2.3 above.

Controls

- a. New development is to reflect height of existing buildings:
 - i. Foundation at front building line: 0.3 m minimum to 0.75 m maximum above ground level (existing);
 - ii. Floor to ceiling: 2.7 m minimum to 3.0 m maximum;
 - iii. Original main roof ridge line: 4.2 m – indicative height.

- b. The extensions to the roof ridge may be up to 1.5 m higher, providing it is set back so that at least 50% of the original roof remains the dominant feature. The extension is to be set behind the front ridge line, and verandah roofs and the like must be retained. The verandah roof area is not to be included in calculating of the roof area.
- c. New development is to be a simple design, and must be broken into smaller sections similar to those in the Area, e.g. by including a porch.
- d. Visibility of additions and garages from the street must be minimised, e.g. by setting them in the rear of the block.

Guidelines

- 1. Second storey additions to contributory buildings are not encouraged. It is preferred that attic space be created within the existing roofline, where possible.
- 2. Existing rooflines may be extended to the rear and dormers may be added to the extension, provided development does not impact negatively on the streetscape and the character of the house. In particular, the roof silhouette should remain;
- 3. Additions at the side of the house may be acceptable providing it is setback a minimum of 5 metres from the front building line and softened by planting and vegetation.
- 4. Two storey developments on the high side of the street are not encouraged due to the potential bulk and scale of the buildings, but existing dwellings may be extended towards the street.

Variations

Major variations may be approved depending on their merit as assessed by an architectural panel (including heritage expertise) selected by the City of Ryde.



Figure 5.1.03 The volume of the house is broken down by elements such as off-set gables, verandahs and bay windows 3.3 Building Details

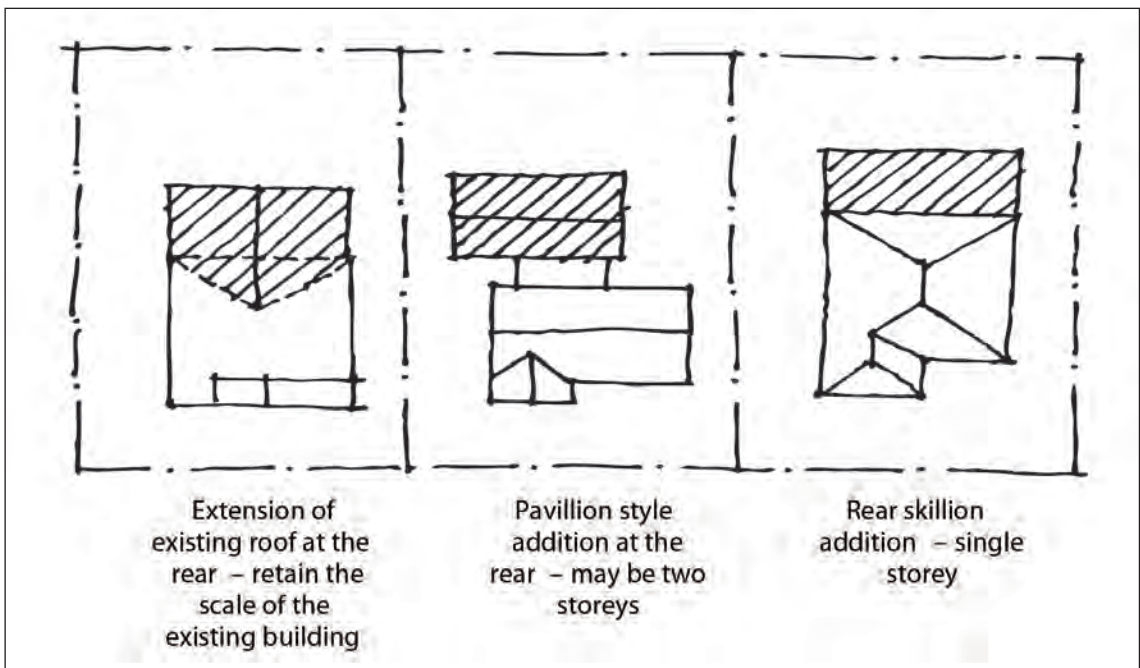


Figure 5.1.04 Siting of Additions

3.3 Building Details

Building details provide visual interest and assist in defining the character of an area. Building elements such as timber doors and windows and the decorative timber work of verandahs adds visual interest and individual character to dwellings.



Figure 5.1.05 The volume of the house is broken down by elements such as off-set gables, verandahs and bay windows

Objectives

1. To ensure that the facades of buildings reflect the detailing and architectural style of the Area.
2. To ensure that new work has a level of detailing compatible with contributory buildings.
3. To encourage the conservation of original facades.

Controls

- a. Building details must be used to provide visual interest, texture and contrast.
- b. The front facades of new dwellings must contain the following:
 - i. Walls with more than 50% of solid wall
 - ii. Walls with solid corners
 - iii. Individual windows with vertical proportions
 - iv. A porch (i.e. a verandah with low parapet walls)
- c. Solar panels and skylights are to be located so that they are not visible from the street.

Guidelines

- Where porches are missing or enclosed, reconstruction to the original design is encouraged.

Variations

Major variations may be approved depending on their merit as assessed by an architectural panel (including heritage expertise) selected by the City of Ryde.



Figure 5.1.06

Details of front wall featuring different coloured brickwork, casement window with awning, half timbered golden and solid base course



Figure 5.1.07 Architectural features add visual interest and help make the street facade the main facade. Note the use typical of face brickwork, tiled roof and timber joinery, and the front fence which matches the style of the house.

3.4 Roofs



Figure 5.1.08 The house roof is a dominant element of the Area Their shape and material unify the area and contribute to its distinctive character. Pitched roofs, both hipped and gabled, are the typical roof forms in the Coronation and Trelawney Street area. Roof forms are generally asymmetrical and the mass is broken into sections.

The pitch of the roof varies with the style of building. Federation bungalows have more steeply pitched and complex roofs than later bungalows. There are no parapets or flat roofs in the street.

Dormer windows are not characteristic of the Area, however they are characteristic of some building styles. Therefore it may be appropriate to provide additional accommodation within the roof space of steeply pitched roofs by adding a dormer. Lower pitched roofs are generally not suitable for additions in the roof.

The decorative features of the roof such as chimneys and ridge cappings make a significant contribution to the character of the area.

Objectives

1. To conserve and enhance the original roof characteristics in the Area.

Controls

- a. New roofs, unless rear skillion roofs, are to be gabled (with a gable facing the street) or hipped.
- b. New roofs, unless rear skillion roofs, are to be pitched between 30 and 40 degrees.
- c. All eaves must have at least 500 mm of overhang.
- d. Unless on a Federation style building, new roofs should have a large, dominant, simple roof plane facing the street.
- e. Roof extensions should be compatible with the original roof and should have the same slope.

Guidelines

Additional accommodation may be provided within the roofline.

- Dormers and 'eyelid' dormers may be used, depending on their visual impact on the building and the streetscape;
- Dormers should not be set in roofs with less than a 35 degree slope;
- Dormer ridge line should be set a minimum 600 mm below the roof ridge line;
- Dormers should not obscure the original chimneys; and
- Skillion roofs may be appropriate at the rear of buildings where the roof will not be visible from the street.

Variations

Major variations may be approved depending on their merit as assessed by an architectural panel (including heritage expertise) selected by the City of Ryde.

3.5 Building Siting

The siting of houses in the Coronation Avenue and Trelawney Street are generally uniform. The front setbacks of houses in Trelawney Street are 12 m and are greater than those in Coronation Avenue at 7 m.

Houses are set in relatively large well-established gardens. The front gardens make an important contribution to the garden character of the area.

Objectives

1. To conserve and enhance the original pattern of dwelling setbacks.
2. To conserve and enhance the distinctive garden setting.

Controls

- a. New dwellings are to be free-standing in a garden setting.
- b. New dwellings are to present their main facade to the street and are to be sited parallel with the street boundary.
- c. The side setbacks are to be a minimum of 1.5 metres on one side and 4.0 m on the other extending at least 5.0 m past the building line, where it may be reduced to 1.0 m.
- d. Side setbacks on corner blocks shall be 4.0 m on the Coronation Avenue frontage and 2.5 m on a Stewart Street frontage.

Guidelines

- Freestanding garages may be set closer to the side and rear boundaries, providing they are set back from the front building line by at least 5 metres.

Variations

Major variations may be approved depending on their merit as assessed by an architectural panel (including heritage expertise) selected by the City of Ryde.

3.6 Car Parking

Garages, carports and off street car parking areas can have a dramatic effect on the character of the Area. Dwellings, not garages, carparks or off street parking, should dominate the streetscape as they contribute more to the positive character of the streetscape.

The location and style of the garages/carports in Coronation Avenue generally varies with the style of the house, but are generally located to the rear of the block.

Objectives

1. To ensure garages, carports and off street parking do not dominate the streetscape.

Controls

- a. Car parking structures must reflect the architectural style of the dwelling.
- b. Garages must be set at least 5 metres behind the front building line and are preferably to be freestanding.
- c. Driveways are to be single width.
- d. Driveways are to comprise concrete wheel strips or brick paving.
- e. Car parking structures are to accommodate important landscape features and their design elements, i.e. should retain items like existing tree plantings.

Guidelines

- Car parking structures should be simple in design.
- Car parking structures should be softened by vegetation, preferably screened by low shrubs and medium sized trees.
- Hard-stand parking areas in front of the building line are not encouraged.
- Driveways should be concrete or brick strips or gravel.
- Carports may be permitted if they are set at least 2.0 m behind the front face of the building.

Variations

Major variations may be approved depending on their merit as assessed by an architectural panel (including heritage expertise) selected by the City of Ryde.

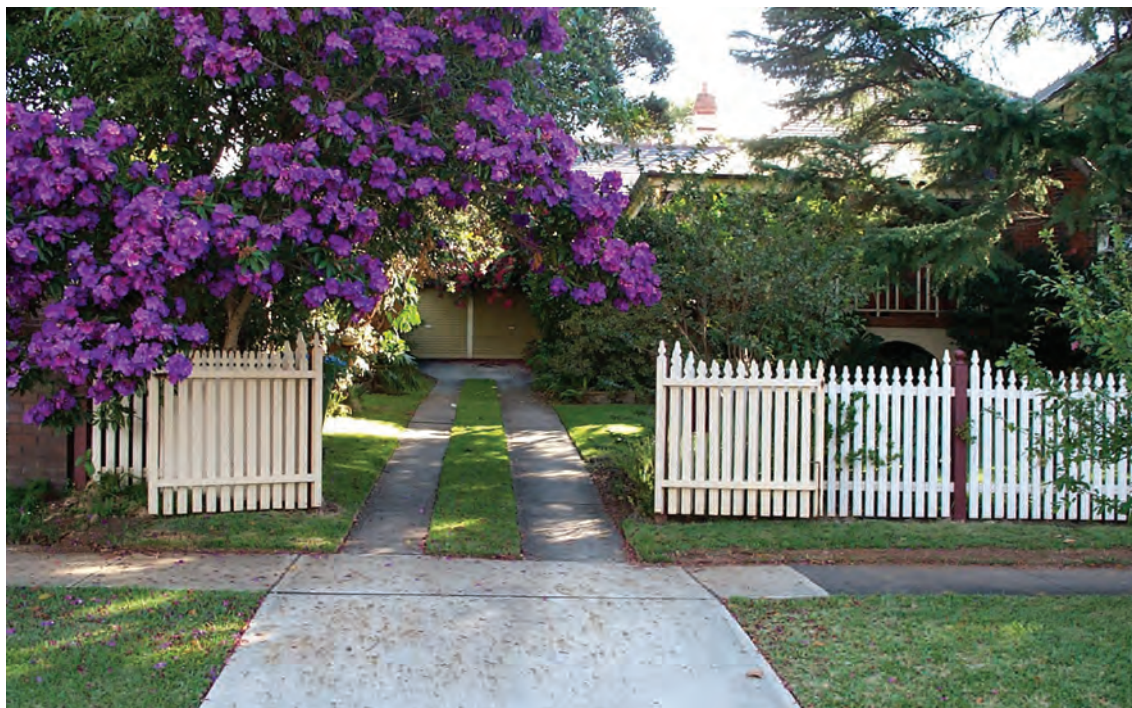


Figure 5.1.09 The garage has limited visibility from the street and is accessed by a single width driveway. Note the grassed section between the concrete wheel strips.

3.7 Materials and Colours

Materials and colours provide an important unifying element for the area. The predominant materials within the area include face brick, rendered surfaces such as stucco, terracotta tiles and timber joinery.

New dwellings and alterations and additions are encouraged to use colours, materials and finishes that are consistent with the predominant materials and colour schemes of the existing houses of the Area.

Objectives

1. To ensure new development complements the existing characteristic materials and colour.

Controls

- a. Materials, finishes and colours on contributory items are to match those already existing on the item where possible.
- b. New roofing is to be slate or terracotta tiles.
- c. The majority of new external walls are to be face brick in a dark red or similar, to match existing, or as compatible with the brickwork of contributing buildings.
- d. An external finishes and colour schedule is to be submitted with the development application.

Guidelines

- Original materials should be reused if practicable.
- Doors and windows facing the street should be wooden.
- External colour schemes are to complement the existing brickwork.
- Originally unpainted finishes such as face brickwork and stonework should not be painted, bagged or rendered.

Variations

Major variations may be approved depending on their merit as assessed by an architectural panel (including heritage expertise) selected by the City of Ryde.



Figure 5.1.10

Front facade displaying a variety of material which provides visual interest: shingle and half timbered gable, rough cast rendered piers, face brickwork balustrade, diamond patterned glass window, smooth render base course, and terrazzo steps.

3.8 Gardens

Within the Coronation Avenue and Trelawney Street Character Area houses sit in large well-established gardens and this landscape setting makes an important contribution to the high residential amenity of the area. Within these streets the garden elements include mature tree specimens, defined garden beds, front fences, gates, paths and expansive lawns.

In the Area the fences are generally low and many front boundaries are edged with a garden bed rather than a fence. The low front fences allow the gardens to be highly visible from the street and to reinforce the garden character of the street. The style of fences generally matches that of the house.

Objectives

1. To encourage the retention and enhancement of the garden setting.
2. To ensure new gardens reflect the character of existing gardens.
3. To conserve original garden elements, like walls and hedges.

Controls

- a. A front garden is to be provided and it must contain:
 - i. lawn;
 - ii. shrubs; and
 - iii. tree(s).

- b. Hard paving is to be restricted to paths and driveways and must be of a minimum width, i.e. driveway of 2.4 m and path of 1.2 m.
- c. The front boundary is to be marked by either a wall or fence or hedge no more than 750 mm in height and are to complement the architectural features of the house.
- d. A matching side fence is to be provided to at least the building line.
- e. All mature or semi-mature tree planting in the front and side gardens are to be retained.

Guidelines

- New plantings must be provided if currently they do not exist or are minimal in order to soften and frame the buildings.
- Garden style should be informal, curvilinear or of space free form rather than rectangular and architectural.

Variations

Major variations may be approved depending on their merit as assessed by a landscape architect (including heritage expertise) selected by the City of Ryde.

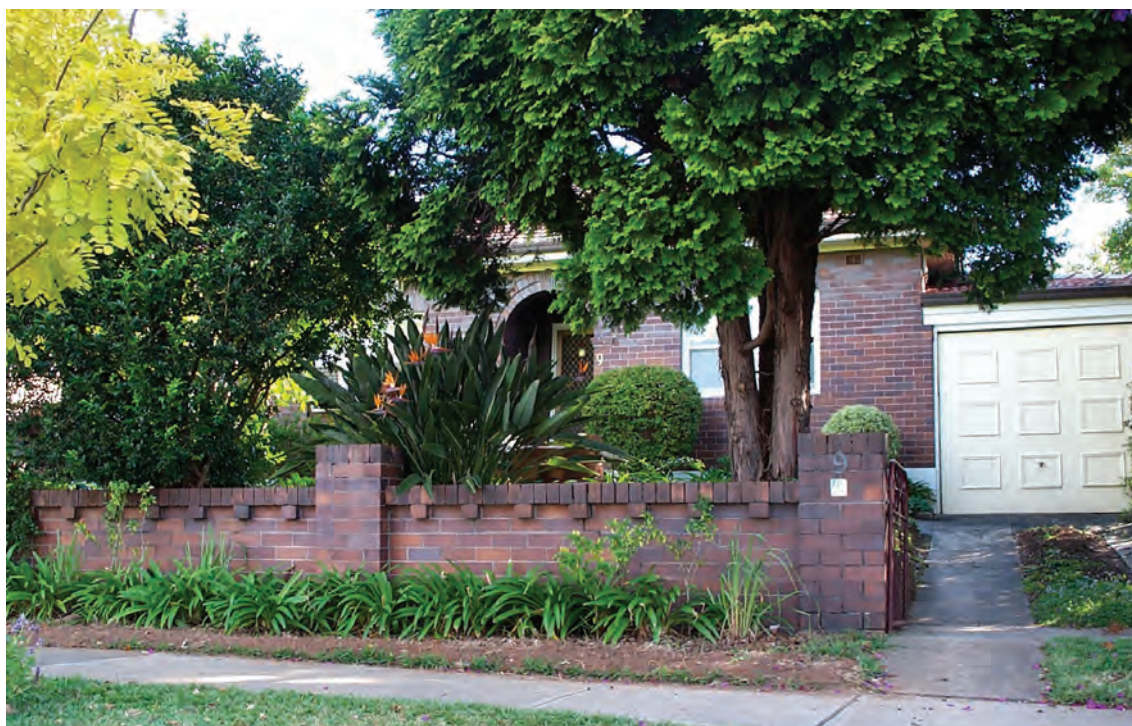


Figure 5.1.11 Fences should allow the garden to be seen from the street

3.9 Street Elements

The streetscape is made up of many elements, such as street trees and grassed verges, which together contribute to determine its character. The incremental removal of streetscape elements would lead to the character of the street being lost.

Coronation Avenue and Trelawney Streets provide a strong contrast in streetscape character. This contrast results from the difference in such things as topography, road pattern, and street tree planting.

Objective

- 1. To retain and enhance the positive characteristics of Coronation Avenue and Trelawney Street.
- 2. To retain and enhance the high level of streetscape amenity.

Controls and Guidelines

- a. The existing footpath configuration of wide grass section with a relatively narrow hard surface walkway strip in Coronation Avenue, is to be retained.
- b. Driveway footpath crossings are to be a single car width with a maximum of 1 driveway crossing per property.
- c. Street trees are to be provided on the verge of each property.

THIS PAGE HAS BEEN
INTENTIONALLY LEFT BLANK



City of Ryde
Civic Centre
1 Devlin Street
Ryde NSW 2112

www.ryde.nsw.gov.au

City of Ryde Development Control Plan 2014

Part: 5.2 Eastwood House Estate Heritage Conservation Area

Translation

ENGLISH

If you do not understand this document please come to Ryde Civic Centre, 1 Devlin Street, Ryde Monday to Friday 8.30am to 4.30pm or telephone the Telephone and Interpreting Service on 131 450 and ask an interpreter to contact the City of Ryde for you on 9952 8222.

ARABIC

إننا نعتذر عليك فهم محتويات هذه الوثيقة، نرجو للحضور إلى مركز بلدية رايد Ryde Civic Centre على العنوان: 1 Devlin Street, Ryde 1 من الاثنين إلى الجمعة بين الساعة 8.30 صباحاً والساعة 4.30 بعد الظهر أو الاتصال بمكتب خدمات الترجمة على الرقم 131 450 لكي تطلب من أحد المترجمين الاتصال بمجلس مدينة رايد، على الرقم 9952 8222، نيابة عنك.

ARMENIAN

Եթէ այս գրութիւնը չէք հասկնար, խնդրեմ եկէ՛ք՝ Րայդ Բիւրօ Սիւիլիք Սենթըր, 1 Տելվին փողոց, Րայդ, (Ryde Civic Centre, 1 Devlin Street, Ryde) Երկուշաբթիէն Ուրբաթ կ.ա. ժամը 8.30 – կ.ե. ժամը 4.30, կամ հեռաձայնեցէ՛ք Հեռաձայնի եւ Թարգմանական Սպասարկութեան՝ 131 450, եւ խնդրեցէ՛ք որ թարգմանիչ մը Րայդ Քաղաքապետարանին հետ կապ հաստատուէ ձեզի համար, հեռաձայնելով՝ 9952 8222 թիվին:

CHINESE

如果您看不懂本文，請在周一至周五上午 8 時 30 分至下午 4 時 30 分前往 Ryde 市政中心詢問 (Ryde Civic Centre, 地址: 1 Devlin Street, Ryde)。你也可以打電話至電話傳譯服務中心，電話號碼是: 131 450。接通後你可以要求一位傳譯員為你打如下電話和 Ryde 市政廳聯繫，電話是: 9952 8222。

FARSI

اگر این مدرک را نمی فهمید لطفاً از 8.30 صبح تا 4.30 بعد از ظهر دوشنبه تا جمعه به مرکز شهرداری رايد، Ryde Civic Centre, 1 Devlin Street, Ryde مراجعه کنید یا به سرویس مترجم تلفنی، شماره 131 450 تلفن بزنید و از یک مترجم بخواهید که از طرف شما با شهرداری رايد شماره 9952 8222 تلفن بزند.

ITALIAN

Se non capite il presente documento, siete pregati di rivolgervi al Ryde Civic Centre al n. 1 di Devlin Street, Ryde, dalle 8.30 alle 16.30, dal lunedì al venerdì; oppure potete chiamare il Telephone Translating and Interpreting Service al 131 450 e chiedere all'interprete di contattare a vostro nome il Municipio di Ryde presso il 9952 8222.

KOREAN

이 문서가 무슨 의미인지 모르실 경우에는 1 Devlin Street, Ryde 에 있는 Ryde Civic Centre 로 오시거나 (월 – 금, 오전 8:30 – 오후 4:30), 전화 131 450 번으로 전화 통역 서비스에 연락하셔서 통역사에게 여러분 대신 Ryde 시청에 전화 9952 8222 번으로 연락을 부탁드립니다.

Amend. No.	Date approved	Effective date	Subject of amendment

Table of Contents

1.0	INTRODUCTION	5
1.1	Background	6
1.2	Objectives of this Part	6
2.0	THE PLACE	7
2.1	History	7
2.2	Description	7
2.3	Desired Future Character	8
3.0	DEVELOPMENT OF CONTRIBUTORY ITEMS	9
3.1	Design	9
4.0	DEVELOPMENT OF NON-CONTRIBUTORY ITEMS AND NEUTRAL ITEMS	10
5.0	THINGS TO AVOID	11

THIS PAGE HAS BEEN
INTENTIONALLY LEFT BLANK

1.0 INTRODUCTION

This Part applies to the land shown edged by a thick black line on the map marked "Eastwood House Conservation Area"



Figure 5.2.01 Eastwood House Conservation Area

1.1 Background

Due to the proximity to transport and its high quality existing residential development there is pressure to redevelop this area. The controls in this part have been introduced to assist owners by providing strong guidelines which will ensure retention of existing housing stock that contributes to the character and heritage significance of the area while allowing sympathetic additions and alterations, to meet the requirements of modern families.

In developing this Part, the following guiding principles were taken into account:

- the Part should identify buildings that contribute to the streetscape of the area and buildings which do not contribute (i.e. non-contributing items);
- those attributes that contribute to the heritage value and character of the area should be kept;
- the residential amenity of the area should be maintained and where possible enhanced;
- development that is compatible with the architectural style of the existing dwellings in the area should be allowed;
- redevelopment of non-contributing items, including replacement, should be allowed provided the design of the new dwelling is in keeping with the existing streetscape;
- the scale, general form and architectural details of existing contributing items should be maintained; and
- materials used in alterations should be compatible with the existing house.

1.2 Objectives of this Part

Objectives

1. To identify houses that are contributing items to the area.
2. To retain original building stock, where practicable, particularly those buildings that are listed as contributing to the character of the neighbourhood.
3. To retain the homogeneous bungalow and Federation streetscape characterised by uniform single storey dwellings with regular setbacks and spacing.
4. To allow for the contributing items to be sympathetically extended without compromising the nature of the existing property.
5. To ensure that alterations, additions and infill development do not result in excessive site cover that eliminates useable landscaped area and private open space.
6. To provide guidelines for development which reflect the existing pattern of development while providing for additional floor area without compromising the character of the street.

2.0 THE PLACE

2.1 History

The original paved level on which Eastwood House stands was part of land granted to Private John Love of the NSW Corps. It was given to him by the acting Governor of the colony Lt. Colonel Paterson on March 14, 1795 (Governor Phillip had returned to England in 1792 due to ill health). The property was next owned by William Kent, who sold it to William Rutledge in 1835. It is thought that Rutledge built the original section of Eastwood House in 1840, and gave it its name.

The occupancy passed from Rutledge to James Beuzeville (a Frenchman) in 1848. Beuzeville, with government assistance, began a silk industry on the property. Samuel Terry the grandfather of Edward Terry (a former Mayor of Ryde) lived in Eastwood House from 1865 till the early 1900's.

In 1915, the Eastwood House Estate was subdivided and sold. Due to the area's proximity to the railway station, the station was renamed Eastwood. The land sold quickly and the houses were built resulting in a bungalow suburb. The adjacent area within the Parramatta Council area, has a similar character.

2.2 Description

The land falls gently from Eastwood House, which is on the crest of the hill at a point 80 m higher than Eastwood station. The 1915 subdivision resulted in numerous regular blocks all approximately 50 m deep, with a frontage of 16 m and an area of approximately 840 m².

The area developed quickly, largely because to the proximity to the railway. These factors contribute to a high level of consistency of building stock which is primarily double fronted detached bungalow style dark face brick cottages with gables facing the street. Driveways of five m generally occur on the same side of each of the houses. Most houses are single storey, with a building footprint of 9.6 m by 18 m being 160 m² and, in general, a Floor Space Ratio of approximately 0.2:1.

Whilst this is a cohesive and generally intact Californian Bungalow suburb, it does contain houses of the Federation style. Generally, the houses in the conservation area are in good condition, with minimal unsympathetic or irreversible alterations such as verandah enclosures or aluminium windows. Few carports occur forward of the building line. The row of consistently pitched gabled roof forms along these gently sloping streets create pleasant rhythmic vistas, which together with consistent setbacks, wide grassy verges, mature trees and gardens create a sense of space and harmony of design.

Whilst Californian bungalows rarely had rooms in the roof space, the requirements of modern families are different from those at the time when the houses were built. It is considered that provided the house still appeared to be single storey from the street it would be possible to build a second storey in the roof space, if it were carefully and skilfully designed and does not present as a full two storey house.

To ensure that such alterations are not visible from the street they will need to be toward the rear of the house and retain at least 65% of the original house. If this is achieved, an increase in the ridge height of not more than 25% will be considered. Should the retention of at least 70% of the original dwelling occur, then an increase in ridge height of no more than 35% will be considered. In order to achieve the desired outcome such extensions in all probability will need to be designed by someone with considerable experience with heritage houses, particularly Californian Bungalows and their sympathetic extension.

2.3 Desired Future Character

Development must be undertaken in accordance with the desired future character.

The desired future character of the area is:-

1. Retain original building stock
2. Retain the homogeneous bungalow streetscape characterised by uniform single storey gabled bungalows with regular setbacks and spacing.
3. Alterations, additions and infill development should not result in excessive site cover that reduces the useable landscaped area and private open space.
4. Generally, extensions on the side of dwellings would not be favoured. However, if it can clearly be demonstrated that such an extension will not compromise the nature of the dwelling or the view of the dwelling from the street, such an application will be considered, but only where the extension is located at least 5 m behind the front building line. Alterations and additions to the front of the dwellings will not be permitted.
5. Alterations and additions must take place toward the rear of the existing dwelling. This can be achieved by demolishing part of the rear of the existing house and then extending the dwelling, or by linking the existing dwelling to the new extension by way of an integrated walkway around an external courtyard.
6. Alterations and additions should repeat details of the important elements of the original building.
7. Second storey additions are only permitted toward the rear of the site. Given the desired ground floor level of such alterations, second storey additions can be largely accommodated with an increase to the ridge height of no more than 25%, provided at least 65% of the original house is retained. Should at least 70% of the original house be retained, then an increase of 35% in ridge height will be considered. The roof of the new addition should be integrated with the existing roof form to avoid extensive vertical wall surfaces at the upper level.
8. Additional accommodation such as attic rooms need to be accommodated within the original roof form. Minimal fenestration in the form of roof plane skylights will be allowed to any roof plane not visible from the street.
9. No buildings or structures (other than a fence along the front property boundary) will be permitted in front of the building line.
10. Garages should be located toward the rear of the lot and behind the dwelling. However, consideration will be given to a location closer to the street, provided it is behind the building line and it can be clearly demonstrated that the streetscape will not be compromised.
11. A carport can be constructed level with the front of the house, provided it is open at the building line and includes details of the house, such as pitch of roof and is constructed of similar materials.
12. Single width driveways should occur and widen behind building line to double garage if necessary. Wheel strips should occur between the building line and the street alignment.

3.0 DEVELOPMENT OF CONTRIBUTORY ITEMS

3.1 Design

Such extensions, in all probability will need to be designed by someone with considerable experience with extending heritage houses, particularly Californian bungalows.

Whilst Californian bungalows rarely have rooms in the roof space the requirement of modern families are different from those at the time when the homes were built. With this in mind, and provided the house still appeared to be a single storey from the street, it would be possible to build a second storey in the roof space if it were carefully and skilfully designed and does not present as a full two storey house.

To ensure that such alterations are not visible from the street they will need to be located at the rear of the house and with an increase to the ridge height of no more than 25%, where 65% of the original house is retained. Where at least 70% of the original house is retained, an increase in ridge height of 35% will be considered.

4.0 DEVELOPMENT OF NON-CONTRIBUTORY ITEMS AND NEUTRAL ITEMS

Neutral item: A house that was constructed after the area was developed, but because of its design and scale does not detract from the area. Non-contributory and neutral items are identified on the map.

A neutral item would be dealt with in the same manner as a non-contributing item.

Whilst these items may be replaced by new dwellings or substantial modification to the existing building, they must still be in scale compatible with the other houses in the area.

Whilst it is possible to erect new dwellings on these sites, the design must be compatible with the style of houses dominant in the area. However, there is no need to replicate the design, but rather to have a design that does not imitate or compete with the adjoining properties.

These developments should utilise dark finishes and avoid white or strong contrasting colours. Decorative details should be similar to the existing houses.

Garages and other utility buildings must be placed behind the front building line and fully paved driveways must be avoided for the distance from the street to the building line. Carports will be considered, provided they are level with the front of the house.

Development of these properties must still comply with the other development criteria contained in this Development Control Plan, including the number of storeys and height provisions.

Should a house classified as a contributing item need rebuilding (e.g. due to fire) the new house would need to follow the above guidelines.

5.0 THINGS TO AVOID

1. Painting, cement rendering or re-skinning of original brick walls.
2. Re-roofing the main body of the house in material that does not match the original.
3. Removal of original details from façades.
4. Extension to the front of the existing house.
5. Extension to the side of the house within 5 m of building line.
6. Garages that are integrated with the existing house.
7. Fully paved driveways from the building line to the street alignment.
8. High front fences - front fences to be no higher than 1 metre.
9. Closed verandahs and aluminium windows which are visible from the street.



City of Ryde
Civic Centre
1 Devlin Street
Ryde NSW 2112

www.ryde.nsw.gov.au

City of Ryde Development Control Plan 2014

Part: 5.3 Tyrell Street, Gladesville, Character Area

Translation

ENGLISH

If you do not understand this document please come to Ryde Civic Centre, 1 Devlin Street, Ryde Monday to Friday 8.30am to 4.30pm or telephone the Telephone and Interpreting Service on 131 450 and ask an interpreter to contact the City of Ryde for you on 9952 8222.

ARABIC

إننا نعتذر عليك فهم محتويات هذه الوثيقة، نرجو للحضور إلى مركز بلدية رايد Ryde Civic Centre على العنوان: 1 Devlin Street, Ryde 1 من الاثنين إلى الجمعة بين الساعة 8.30 صباحاً والساعة 4.30 بعد الظهر أو الاتصال بمكتب خدمات الترجمة على الرقم 131 450 لكي تطلب من أحد المترجمين الاتصال بمجلس مدينة رايد، على الرقم 9952 8222، نيابة عنك.

ARMENIAN

Եթէ այս գրութիւնը չէք հասկնար, խնդրեմ եկէ՛ք Րայդ Բիւրոյ Սիւվիլ Ենթըր, 1 Տելվին փողոց, Րայդ, (Ryde Civic Centre, 1 Devlin Street, Ryde) Երկուշաբթիէն Ուրբաթ կ.ա. ժամը 8.30 – կ.ե. ժամը 4.30, կամ հեռաձայնեցէ՛ք Հեռաձայնի եւ Թարգմանական Սպասարկութեան՝ 131 450, եւ խնդրեցէ՛ք որ թարգմանիչ մը Րայդ Քաղաքապետարանին հետ կապ հաստատուէ ձեզի համար, հեռաձայնելով՝ 9952 8222 թիւին:

CHINESE

如果您看不懂本文，請在周一至周五上午 8 時 30 分至下午 4 時 30 分前往 Ryde 市政中心詢問 (Ryde Civic Centre, 地址: 1 Devlin Street, Ryde)。你也可以打電話至電話傳譯服務中心，電話號碼是: 131 450。接通後你可以要求一位傳譯員為你打如下電話和 Ryde 市政廳聯繫，電話是: 9952 8222。

FARSI

اگر این مدرک را نمی فهمید لطفاً از 8.30 صبح تا 4.30 بعد از ظهر دوشنبه تا جمعه به مرکز شهرداری رايد، Ryde Civic Centre, 1 Devlin Street, Ryde مراجعه کنید یا به سرویس مترجم تلفنی، شماره 131 450 تلفن بزنید و از یک مترجم بخواهید که از طرف شما با شهرداری رايد شماره 9952 8222 تلفن بزند.

ITALIAN

Se non capite il presente documento, siete pregati di rivolgervi al Ryde Civic Centre al n. 1 di Devlin Street, Ryde, dalle 8.30 alle 16.30, dal lunedì al venerdì; oppure potete chiamare il Telephone Translating and Interpreting Service al 131 450 e chiedere all'interprete di contattare a vostro nome il Municipio di Ryde presso il 9952 8222.

KOREAN

이 문서가 무슨 의미인지 모르실 경우에는 1 Devlin Street, Ryde 에 있는 Ryde Civic Centre 로 오시거나 (월 – 금, 오전 8:30 – 오후 4:30), 전화 131 450 번으로 전화 통역 서비스에 연락하셔서 통역사에게 여러분 대신 Ryde 시청에 전화 9952 8222 번으로 연락을 부탁하십시오.

Amend. No.	Date approved	Effective date	Subject of amendment

Table of Contents

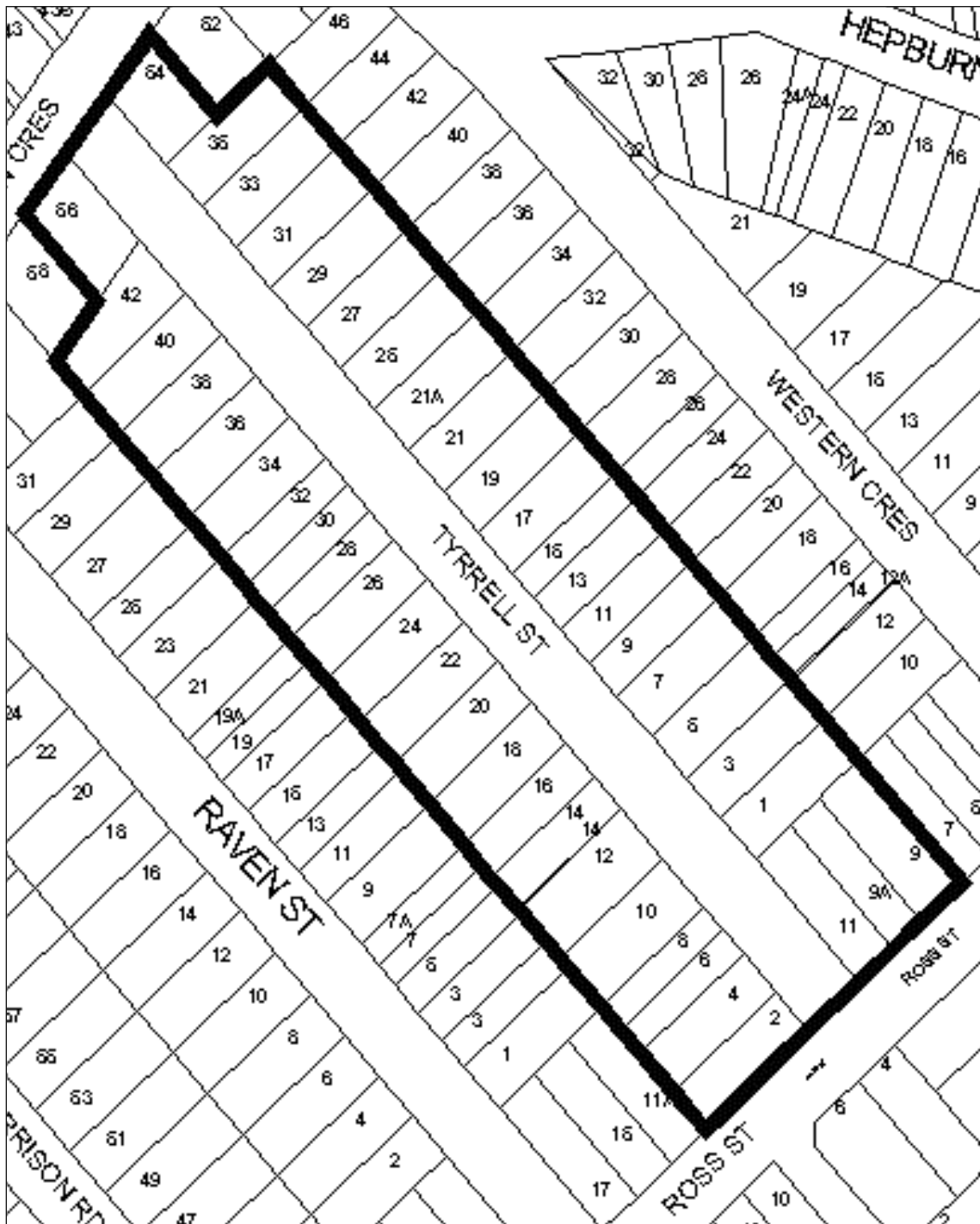
1.0 INTRODUCTION	5
1.1 Land to Which this Part Applies	5
1.2 Background	6
1.3 Objectives	6
1.4 Contributory Items	6
2.0 TYRELL STREET - THE PLACE	8
2.1 History	8
2.2 Description of the Area	8
2.3 Positive Characteristics	9
3.0 STRATEGY AND DEVELOPMENT CONTROLS	10
3.1 The Strategy	10
3.2 Building Form and Scale	10
3.3 Building Details	12
3.4 Roofs	14
3.5 Building Siting	16
3.6 Car Parking	17
3.7 Materials and Colours	19
3.8 Gardens	21
3.9 Street Elements	22

THIS PAGE HAS BEEN
INTENTIONALLY LEFT BLANK

1.0 INTRODUCTION

1.1 Land to Which this Part Applies

This Part applies to the land shown edged by a thick black line on the map marked “Tyrell Street Character Area”.



1.2 Background

This Part provides objectives, controls and guidelines to ensure the retention and enhancement of existing built and natural elements that contribute to the character, while allowing for sympathetic changes which meet the needs of the contemporary community.

The objectives and controls in this part were developed following extensive consultation with residents and owners of property in the area and included a survey, community workshops and meetings.

1.3 Objectives

The objectives of this Part are:

1. To conserve and enhance the positive characteristics and high amenity of the Tyrell Street Area.
2. To identify buildings and other elements that make a positive contribution to the character of Area.
3. To provide for future development that is sympathetic to the character of the Area.

1.4 Contributory Items

Buildings and other elements within the Area are of special value because collectively they contribute to the positive characteristics. Each property within the Area has been noted according to the contribution it makes. The properties are nominated as “highly contributory”, “contributory” or “uncharacteristic”. The relevant definitions are below.

Highly Contributory Items

These items display most of the important characteristics of the Area. They have a collective significance and their retention is essential if the character of the area is to be kept.

Contributory Items

These items generally display use of characteristic compatible forms, materials, and other characteristic features that contribute to the area as a whole, but to a lesser extent than highly contributory items. Alterations to contributory items should aim to make them highly contributory items.

Uncharacteristic Items

These items display qualities that detract from the character of the area. They are not to be considered as a precedent for new work when assessing the merit of an application.

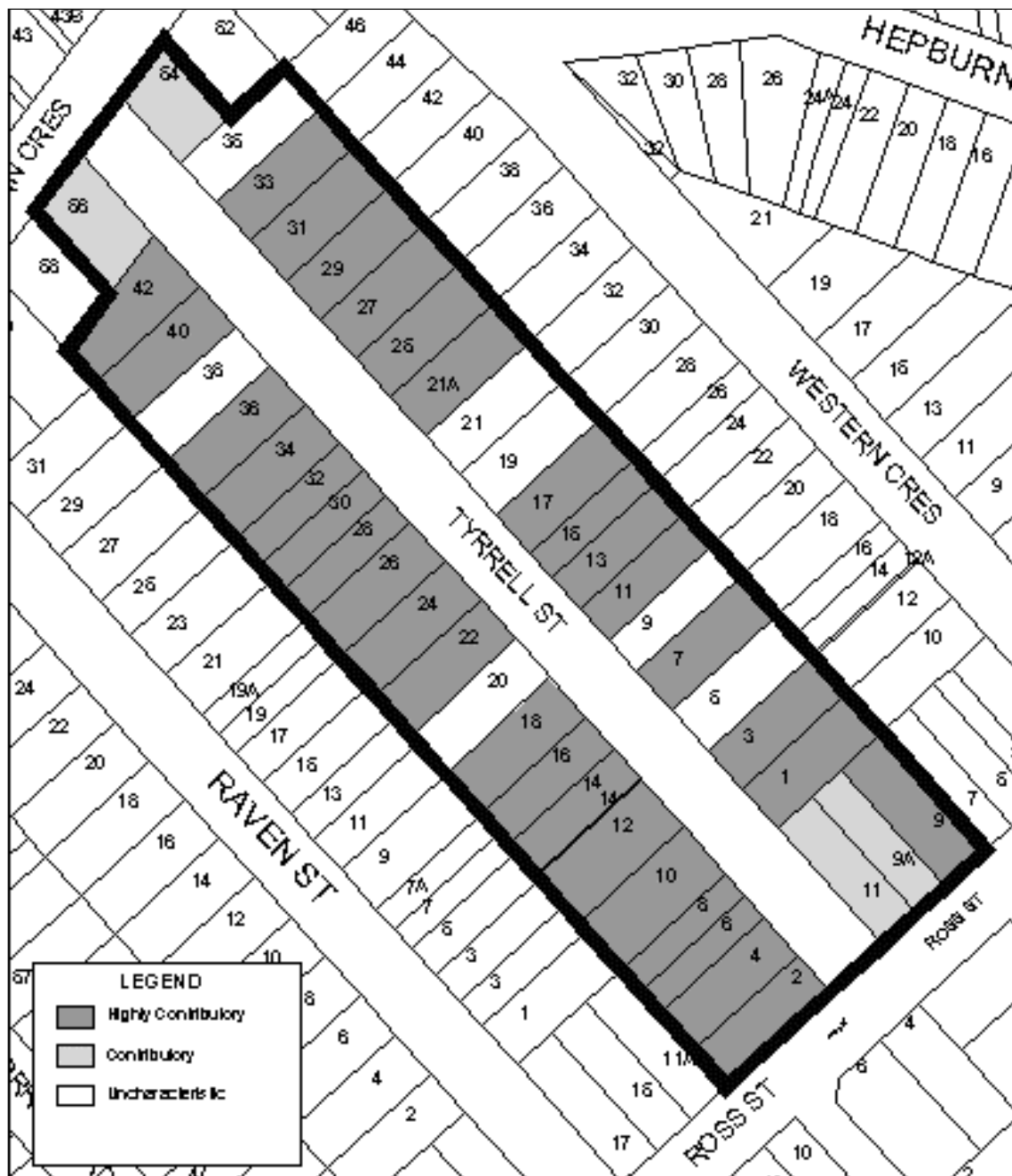


Figure 5.3.02 Contributory Items Map

2.0 TYRELL STREET - THE PLACE

2.1 History

The Area was originally part of land granted to Mrs Thompson in the Eastern Farm area. This locality had been settled as farm land by ex-convicts to provide food for the growing colony.

The Tyrell Street Area was part of the Gladesville Park subdivision created in 1886 and offered for sale in the same year. The opening of the Gladesville Bridge in 1881 and Iron Cove bridge in 1882 increased the desirability of the area. Gladesville village had grown up around the Great North Road and in 1887 Gladesville consisted of a public school, a church, two hotels and a post office and a few small residences.

Tyrell Street is named after William Tyrell, a convict on the First Fleet. In 1792, with his wife Ann and son George, he moved onto the land granted to him in the Eastern Farms district. One of his blocks was to the north of the present day Tyrell Street.

Despite the creation of a subdivision towards the end of the 19th century, building in the street did not commence until after the start of the tram service to Gladesville in 1910. The tram provided convenient access to the city and other places of employment. *Sands Directory* shows only one person living in the street in 1910. A large amount of building work appears to have occurred between 1912 and 1918, interestingly the years of WW1. By 1924 *Sands Directory* shows that there were 26 houses in the street, 12 on the north side and 14 on the south side.

The Area retains its historical residential use of detached housing. Many of the lots from the original subdivision survive, although some of the lots have been subdivided again. The historical pattern of subdivision and detached housing has established a pleasing rhythm of houses and gardens. Many properties, while not individually outstanding, still make an important contribution to the character of the Area.

2.2 Description of the Area

Tyrell Street has a gentle slope from Ross Street to Western Crescent. The land on the northern side of the street is relatively flat while the land on the southern side falls to the south.

The houses in the Character Area are generally single-storey moderate sized suburban bungalows with fairly consistent street setbacks.

The Area reflects the traditional preference of Australians for single family houses and provides a diverse range of house sizes from relatively small homes to large family homes. There are no villa developments.

The residences, although of different styles, are relatively homogeneous in their single storey scale, form, attention to detail and materials, although there are a few large double storey homes are not consistent with the general character of the Area. The predominant materials are face brick walls, painted timber weatherboard, terracotta tile roofs and timber windows and doors.

The attractive private front gardens make an important contribution to the streetscape. Garages are generally located behind the houses, although some properties without side driveways have carports or car standing area in the front garden. There is a variety of front fences although most are low.

The Area is well served by local facilities being within walking distance of Gladesville shops and public transport along Victoria Road.

2.3 Positive Characteristics

The following set of Positive Characteristics define the Area and should be conserved and used as a tool in decision making.

A consistent streetscape in terms of:

- siting of dwellings;
- dwelling setbacks;
- landscaped front yards with trees;
- building form, bulk and setbacks;
- garage location;
- materials and colours; and
- wide verges with trees.

Houses are generally consistent in style and materials and display the key features of their architectural style, including:

- single storey;
 - set above grade on piers often with a stone foundation;
 - roofs of similar heights;
 - gabled or hipped roofs with a 30 – 40% roof pitch;
 - slate or terracotta tiled roofing materials;
 - large simple planes for the roof and walls;
 - made of face brick relieved by stucco or timber detailing;
 - set in an extensive, landscaped garden;
 - contain a porch (i.e. a verandah with low parapet walls);
 - garages located to the rear and only partly visible from the street;
 - contain side landscaping;
 - dwellings generally framed by vegetation;
 - vertically - oriented windows set in groups, often aggregated into a square shape; and
 - low front fences, or walls or hedges.
- A high level of amenity, i.e. many elements that make the Area an attractive and pleasant place to live in.

3.0 STRATEGY AND DEVELOPMENT CONTROLS

3.1 The Strategy

The objectives of this Part are to be achieved through the following strategies:

1. elements that comply with or complement the Positive Characteristics of the Area are to be retained;
2. highly contributory and contributory buildings are to be retained, but inconspicuous additions to the rear may be acceptable;
3. new buildings, alterations and additions to existing buildings are to comply with or complement the Positive Characteristics of the area; and
4. neutral or uncharacteristic items may be demolished or altered.

3.2 Building Form and Scale

The distinctiveness of many older buildings is found in the way larger volumes are broken down into smaller volumes by means such as verandahs, stepping roofs and walls, decorative details and variation in materials. The texture and shadow of verandahs, for example, provide an attractive contrast to the solidity of the brick dwellings.

New development should maintain and enhance the character of the Area by responding appropriately to the surrounding positive elements. However, new dwellings and alterations and additions to existing buildings do not need to replicate or mimic traditional styles.

New buildings and alterations and additions to existing buildings should be compatible with the character of the Area, the immediate streetscape context and with the building to which they belong. All development should enhance the contribution the dwelling makes to the Area.

Dwellings tend to be economically, but elegantly designed and detailed. Roofs present a simple, uncluttered silhouette to the skyline.

Objectives

1. To ensure new development is compatible with the form, scale and massing of contributory buildings.
2. To ensure new development visible from the street complements the Positive Character as defined in 2.3 above.

Controls

- a. New development is to reflect height of existing buildings:
 - i. Foundation at front building line: 0.3 m minimum to 0.75 m maximum above ground level (existing);
 - ii. Floor to ceiling: 2.7 m minimum to 3.0 m maximum; and
 - iii. Original main roof ridge line 4.6 m – indicative height.
- b. Extensions to the roof may be 1.5 m higher than the original main roof line, providing it is set back so that at least 50% of the original roof area remains the dominant feature from the street. The extension is to be set behind the front ridge line and verandah roofs and the like must be retained. The verandah roof area is not to be included in calculating the roof area.

- c. While new development should have a simple design, it must be broken into smaller sections similar to those in the Area, e.g. by including a porch.
- d. Visibility of additions and garages from the street must be minimised, e.g. by setting them in the rear of the block.

Guidelines

- Second storey additions to contributory buildings are not encouraged. It is preferred that attic space be created within the existing roofline, where possible.
- Existing rooflines may be extended to the rear and dormers may be added to the extension, provided they do not impact negatively on the streetscape and the character of the house. In particular, the roof silhouette should remain.
- Additions at the side of the house may be acceptable, providing they are setback a minimum of 5 metres from the building line and softened by vegetation.

Variations

Major variations may be approved depending on their merit as assessed by an architectural panel selected by the City of Ryde.



Figure 5.3.03 Photograph of the streetscape showing the predominant single storey scale.

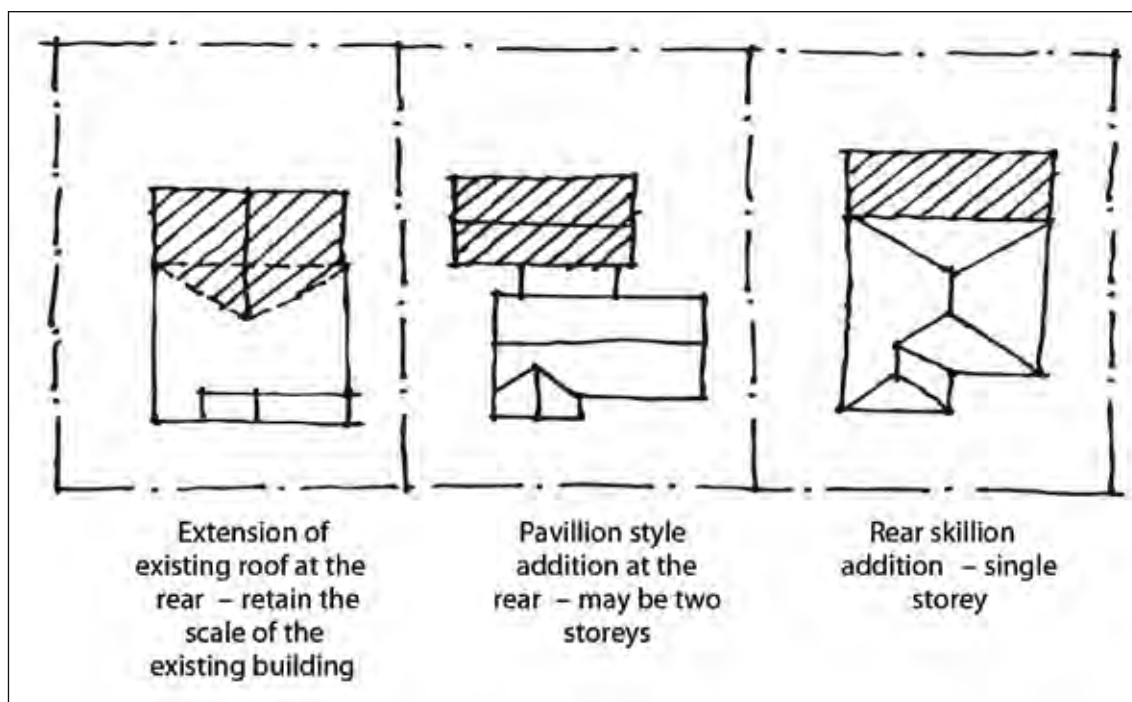


Figure 5.3.04 Siting of Additions

3.3 Building Details

Building details provide visual interest and assist in defining the character of the dwelling and then of an area. Building elements such as timber doors and windows and the decorative timber work of verandahs adds visual interest and individual character to dwellings.

Objectives

1. To ensure that the facades of buildings reflect the detailing and architectural style of the Area.
2. To ensure that new work has a level of detailing compatible with contributory buildings.
3. To encourage the conservation of original facades.

Controls

- a. Building details must be used to provide visual interest, texture and contrast.
- b. The front facades of new dwellings must contain the following:
 - i. walls with more than 50% of solid wall;
 - ii. walls with solid corners;
 - iii. individual windows with vertical proportions; and
 - iv. a porch.
- c. Solar panels and skylights are to be located so that they are not visible from the street.

Guidelines

- Where porches are missing or enclosed, reconstruction to the original design is encouraged.
- Windows on the front facade should be wooden.

Variations

Major variations may be approved depending on their merit as assessed by an architectural panel selected by the City of Ryde.



Architectural features add visual interest and help promote the main street facade.

Figure 5.3.05 Photograph taken 1917 of number 22 Tyrell Street showing the original house when built. The reinstatement of original architectural details to front facades is encouraged. Note that the original front fence is not a picket fence.



Figure 5.3.06 An example of how visual bulk can be reduced by breaking down the volume of the building into different elements e.g. this example uses a porch and stepped front. Changes in materials also help reduce visual bulk.



Figure 5.3.07 Elements such as front porch can be used to break down massing as well as adding visual interest.

3.4 Roofs

The house roof is a dominant element in the Area and its shape and material add unity and contribute to the distinctive character of the area. Pitched roofs, both hipped and gabled, are the typical roof form in Tyrell Street. Roof forms are generally asymmetrical with portions of the main roof mass broken into smaller sections and other forms, e.g. gables.

The pitch of the roof varies with the style of building. Federation bungalows have more steeply pitched and complex roofs than later bungalows. There are no parapets or flat roofs in the street. Dormer windows are not characteristic of the Area, however they are characteristic of some building styles. Therefore it may be appropriate to provide additional accommodation within the roof space of steeply pitched roofs by adding a dormer. Lower pitched roofs are generally not suitable for additions in the roof.

The decorative features of the roof such as chimneys and ridge cappings, especially when seen against the sky, make significant contribution to the character of the Area.

Objectives

1. To conserve and enhance the original roof characteristics in the Area.

Controls

- a. New roofs, unless rear skillion roofs, are to be gabled (with a gable facing the street) or hipped.
- b. New roofs, unless rear skillion roofs, are to be pitched between 30 and 40 degrees.
- c. All eaves must have at least 500 mm of overhang.
- d. Unless on a Federation style building, new roofs should have a dominant, large, simple roof plane facing the street.
- e. Roof extensions should be compatible with the original roof and should have the same slope.

Guidelines

- Additional accommodation may be provided within the roofline.
- Dormer and 'eyelid' dormers may be used, depending on their visual impact on the building and the streetscape.
- Dormers should not be set in roofs with less than a 35 degree slope.
- Dormer ridge line should be set a minimum 600 mm below the roof ridge line.
- Dormers should not obscure the original chimneys.
- Skillion roofs may be appropriate at the rear of buildings where the roof will not be visible from the street.



Figure 5.3.08 A common roof form in the street is a simple hipped roof with an asymmetrical stepped gable in front. The chimneys add visual interest. There is a variety of gable and chimney forms.

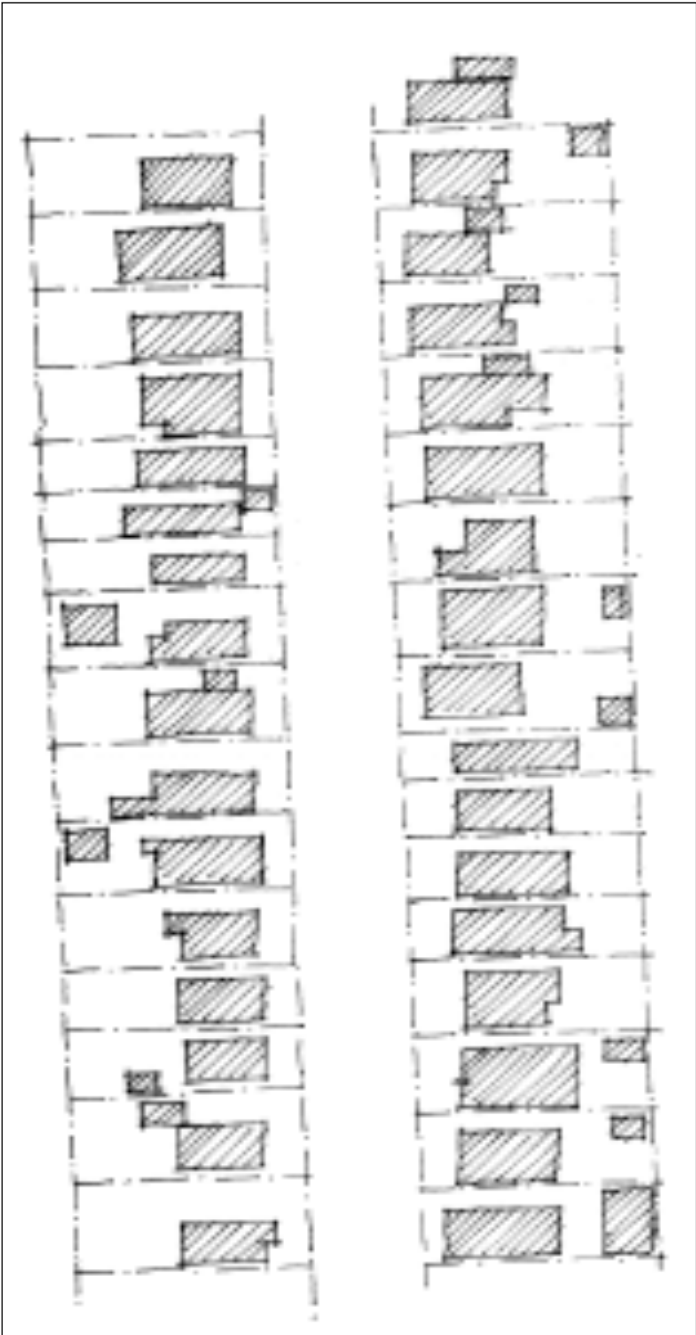
3.5 Building Siting

The siting of houses in Tyrell Street is generally uniform. The front setback of houses from the street on the northern side of Tyrell Street is typically greater than those on the southern side. The front setback in the Area is approximately 6 metres.

The established gardens within this front setback make an important contribution to the garden character of the Area.

Objectives

- 1. To conserve and enhance the original pattern of dwelling setbacks.
- 2. To conserve and enhance the distinctive garden setting.



Controls

- a. New dwellings are to be free-standing in a garden setting.
- b. New dwellings are to present their main facade to the street and are to be sited parallel with the street boundary.
- c. The side setbacks are to be a minimum of 1.5 m on one side and 4.0 m on the other extending at least 5.0 m past the building line, where it may be reduced to 1.0 m.
- d. Side setbacks on corner blocks shall be 4 metres on both street frontages.

Variations

Major variations may be approved depending on their merit as assessed by an architectural panel selected by the City of Ryde.

Figure 5.3.09
Diagram showing the pattern of development in Tyrell Street. Note the fairly consistent front setback and detached garages.

3.6 Car Parking

Garages, carports and off street car parking areas can have a dramatic effect on the character of the Area. Dwellings, not garages or car parks, should dominate the streetscape as they are more interesting architecturally and contribute more to the positive character of the streetscape.

The location and style of the garages/carports in Tyrell Street generally varies with the style of the house, but are generally located to the rear of the block.

Objectives

1. To ensure garages, carports and off street parking do not dominate the streetscape.

Controls

- a. Car parking structures must reflect the architecture of the dwelling.
- b. Garages must be set at least 5 metres behind the building line – preferably freestanding.
- c. Driveways are to be single width.
- d. Driveways are to be concrete wheel strips or brick paving.
- e. Car parking structures are to accommodate important landscape elements, like trees.

Guidelines

- Car parking structures should be simple in design.
- Car parking structures should be softened by vegetation, preferably screened by low shrubs and medium sized trees.
- Hard-stand parking areas in front of the building line are not encouraged.
- Driveways should be concrete or brick strips or gravel.
- Carports may be permitted if they are set at least 2.0 m behind the front face of the building.

Variations

Major variations may be approved depending on their merit as assessed by an architectural panel selected by the City of Ryde.

Note: In the case of properties number 11, 13, 15, 28, 30, 32 Tyrell Street and 9A Ross Street, carports (but not garages) in the front of the building line are allowed so long as they reflect the style of the building which they front and character of the area.

Garage and carport locations



Figure 5.3.10 Garages must be set a minimum of 5 m behind the front facade

Note: The garage has limited visual impact on the street because of vegetation and is accessed by a single width driveway.



Figure 5.3.11
The garage has higher visibility from the street due to the lack of screening vegetation. But its impact is less than if it were situated on the building line.

Note: the grassed section between the wheel strips.

3.7 Materials and Colours

Materials and colours provide an important unifying element for the area. The predominant materials within Tyrell Street include face brick, rendered surfaces such as stucco, terracotta tiles and timber joinery. Several buildings also have painted timber weatherboards.

New dwellings and alterations/additions to existing dwellings are encouraged to use materials and finishes that are consistent with the predominant traditional materials and colours schemes of the existing houses of the area.

Objectives

1. To ensure new development complements the existing character materials and colour.

Controls

- a. Materials, finishes and colours on contributory buildings are to match the existing where possible.
- b. New roofing is to be slate or terracotta tiles.
- c. The majority of new external walls is to be face brick in a dark red or similar, to match existing, or as is compatible with the brickwork of contributing buildings.
- d. An external finishes and colour schedule is to be submitted with the development application.

Guidelines

- Original materials should be reused if practicable.
- Doors and windows facing the street should be wooden.
- External colour schemes are to complement the brickwork.
- Painted timber weatherboards are acceptable.
- Originally unpainted finishes such as face brickwork and stonework should not be painted, bagged or rendered.

Variations

Major variations may be approved depending on their merit as assessed by an architectural panel selected by the City of Ryde.



Figure 5.3.12 There are several weatherboard houses in the street.

Note: The characteristic tiled roof and variety of materials.



Figure 5.3.13 Face brickwork is a common external finish. Timber windows, coloured glass, and timber verandah posts and detailing are also characteristics of the houses in the street.

3.8 Gardens

The front gardens make an important contribution to the streetscape and the character of the area. In the Tyrell Street Area the garden elements include mature specimen trees, defined garden beds, front fences, gates, paths and lawns. The Area also has a variety of fences and walls. They are low enough to allow the gardens to be highly visible from the street.

Objectives

1. To encourage the retention and enhancement of the garden setting.
2. To ensure new gardens reflect the character of existing gardens.
3. To conserve original garden elements, like walls and hedges.

Controls

- a. A front garden is to be provided and shall contain:
 - i. Lawn;
 - ii. Shrubs; and
 - iii. Tree(s).
- b. Hard paving is to be restricted to paths and driveways and must be of a minimum width, i.e. driveway of 2.4 m and path of 1.2 m.
- c. The front boundary is to be marked by either a wall or fence or hedge no more than 750 mm in height and are to complement the architectural features of the house.
- d. A side fence is to be provided to at least the building line.
- e. All mature or semi-mature trees in the front and side gardens are to be kept.
- f. Where existing landscaping is minimal, additional plantings must occur to soften and frame the buildings.

Guidelines

- Garden style should be informal, curvilinear or freeform rather than rectangular and architectural.

Variations

Major variations may be approved depending on their merit as assessed by a landscape architect selected by the City of Ryde.



Figure 5.3.14 Front gardens characterised by lawns, garden beds and specimen tree planting and low front walls provide an attractive setting for the houses and make a positive contribution to the streetscape.

3.9 Street Elements

The streetscape is made up of many elements, such as street trees and grassed verges, which together determine its character. Incremental removal of elements would lead to a loss of character.

Objective

- 1. To conserve and enhance the positive character of the streetscape.
- 2. To conserve and enhance the existing level of streetscape amenity.

Controls

- a. The existing footpath configuration of a wide grass verge with a narrow footpath must be retained.
- b. Driveway footpath crossings must be single car width and one driveway only per property.
- c. Street trees are to be provided on the verge of each property.

Guidelines

- Locations and species of street trees to be determined with Council’s Landscape Assessment Officer.

Variations

None.

THIS PAGE HAS BEEN
INTENTIONALLY LEFT BLANK



City of Ryde
Civic Centre
1 Devlin Street
Ryde NSW 2112

www.ryde.nsw.gov.au

City of Ryde Development Control Plan 2014

Part: 5.4 Blenheim Road Small Centre

Translation

ENGLISH

If you do not understand this document please come to Ryde Civic Centre, 1 Devlin Street, Ryde Monday to Friday 8.30am to 4.30pm or telephone the Telephone and Interpreting Service on 131 450 and ask an interpreter to contact the City of Ryde for you on 9952 8222.

ARABIC

إننا نعتذر عليك فهم محتويات هذه الوثيقة، نرجو للحضور إلى مركز بلدية رايد Ryde Civic Centre على العنوان: 1 Devlin Street, Ryde من الاثنين إلى الجمعة بين الساعة 8.30 صباحاً والساعة 4.30 بعد الظهر أو الاتصال بمكتب خدمات الترجمة على الرقم 131 450 لكي تطلب من أحد المترجمين الاتصال بمجلس مدينة رايد، على الرقم 9952 8222، نيابة عنك.

ARMENIAN

Եթէ այս գրութիւնը չէ՞ք հասկնար, խնդրեմ եկէ՛ք՝ Բայր Սիվիլ Ենթըր, 1 Տելվին փողոց, Բայր, (Ryde Civic Centre, 1 Devlin Street, Ryde) Երկուշաբթիէն Ուրբաթ կ.ա. ժամը 8.30 – կ.ե. ժամը 4.30, կամ հեռաձայնեցէ՛ք Հեռաձայնի եւ Թարգմանական Սպասարկութեան՝ 131 450, եւ խնդրեցէ՛ք որ թարգմանիչ մը Բայր Քաղաքապետարանին հետ կապ հաստատուէ ձեզի համար, հեռաձայնելով՝ 9952 8222 թիվի:

CHINESE

如果您看不懂本文，請在周一至周五上午 8 時 30 分至下午 4 時 30 分前往 Ryde 市政中心詢問 (Ryde Civic Centre, 地址: 1 Devlin Street, Ryde)。你也可以打電話至電話傳譯服務中心，電話號碼是: 131 450。接通後你可以要求一位傳譯員為你打如下電話和 Ryde 市政廳聯繫，電話是: 9952 8222。

FARSI

اگر این مدرک را نمی فهمید لطفاً از 8.30 صبح تا 4.30 بعد از ظهر دوشنبه تا جمعه به مرکز شهرداری رايد، Ryde Civic Centre, 1 Devlin Street, Ryde مراجعه کنید یا به سرویس مترجم تلفنی، شماره 131 450 تلفن بزنید و از یک مترجم بخواهید که از طرف شما با شهرداری رايد شماره 9952 8222 تلفن بزند.

ITALIAN

Se non capite il presente documento, siete pregati di rivolgervi al Ryde Civic Centre al n. 1 di Devlin Street, Ryde, dalle 8.30 alle 16.30, dal lunedì al venerdì; oppure potete chiamare il Telephone Translating and Interpreting Service al 131 450 e chiedere all'interprete di contattare a vostro nome il Municipio di Ryde presso il 9952 8222.

KOREAN

이 문서가 무슨 의미인지 모르실 경우에는 1 Devlin Street, Ryde 에 있는 Ryde Civic Centre 로 오시거나 (월 – 금, 오전 8:30 – 오후 4:30), 전화 131 450 번으로 전화 통역 서비스에 연락하셔서 통역사에게 여러분 대신 Ryde 시청에 전화 9952 8222 번으로 연락을 부탁드립니다.

Amend. No.	Date approved	Effective date	Subject of amendment

Table of Contents

1.0	PRELIMINARY	5
1.1	Introduction	5
1.2	Purpose of this Part	5
1.3	Objectives of this Part	5
1.4	Land affected by this Part	6
1.5	Relationship of this Part to other Plans and Policies	6
1.6	Interpretation	7
1.7	Structure of this Part	7
2.0	VISION	8
2.1	Blenheim Road, North Ryde - Vision Statement	8
3.0	OBJECTIVES AND CONTROLS	9
3.1	Site Amalgamation	9
3.2	Built Form	10
3.2.1	Urban and Environmental Design	10
3.2.2	Residential Private Open Space	10
3.2.3	Solar Access and Sun Shading	11
3.2.4	Visual Privacy	11
3.2.5	Acoustic Privacy	11
3.2.6	Built Form Heights	12
3.2.7	Setbacks	14
3.2.8	Building Depth	16
3.2.9	Active Street Frontages	17
3.2.10	Awnings + Entry Canopies	17
3.2.11	Services Access and Parking	18
3.3	Public Domain	20
3.3.1	Access and the Public Domain	20
3.3.2	Landscape Character	20
3.3.3	Urban Elements and Finishes	21
3.3.4	Signage	21

THIS PAGE HAS BEEN
INTENTIONALLY LEFT BLANK

1.0 PRELIMINARY

1.1 Introduction

This Part will facilitate the revitalisation of the Small Centre at Blenheim Road, North Ryde.

This Part should be read in conjunction with other City of Ryde Planning Policies and Development Standards as covered in Section 1.5.

1.2 Purpose of this Part

This Part provides principles for the public domain and development controls for sites within the Small Centre.

1.3 Objectives of this Part

Objectives of this part are :

- 1. To reinforce Blenheim Road as a retail, employment and residential location**
 - a. Develop a mixed-use small centre with a range of housing and employment opportunities.
 - b. Create sustainable employment opportunities that are compatible with shopping and living environments.
 - c. Create residential development that contributes to street life with increased activity at the weekends and in the evenings.
- 2. To enhance the qualities of the Blenheim Road**
 - a. Develop quality, sustainable buildings and public domain spaces and improve the existing public domain.
 - b. Enhance and increase the physical and visual prominence of the Mixed Use centre.
- 3. To create an attractive, safe, convenient and well-used pedestrian environment and public domain**
 - a. Create a high quality public domain that is safe and accessible for all within the small centre, during and outside business hours.
 - b. Improve pedestrian connections within the small centre and surrounding areas.
 - c. Ensure positive interfaces between public space and private development.
- 4. To develop a quality centre**
 - a. Reinforce the legibility of Blenheim Road.
 - b. Protect sun access to significant public domain spaces.
 - c. Ensure that the relationship between buildings is positive and that all development addresses the public domain and street frontages.
 - d. Protect streetscapes and the pedestrian environment from adverse impacts of site servicing, garage doors, driveways and loading docks.
- 5. To develop high quality built form**
 - a. Give detailed guidance to development standards.
 - b. Ensure well-designed buildings constructed of durable and attractive materials.
 - c. Ensure development is flexible and durable and able to accommodate a range of uses over time.

- 6. To develop a sustainable small centre that balances social, economic and environmental objectives**
 - a. Encourage efficient and appropriate land-use.
 - b. Revitalise the small centres with economically sustainable commercial, retail and residential development.
 - c. Intensify land-use to better utilise public transport and other public infrastructure.
 - d. Support facilities for public transport use, walking and cycling.
 - e. Maintain access and minimise the impacts of traffic congestion in the small centres.
 - f. Ensure personal safety and security in the public domain and shared space in private ownership.
 - g. Develop sustainable buildings that are robust and adaptable to a variety of uses over time
 - h. Develop environmentally sustainable shopping, living and working environments that conserve resources and:
 - Minimise long term energy and water consumption.
 - Protect and improve water and air quality.
 - Minimise waste production and encourage materials recycling and reuse.
 - Integrate environmental management.

1.4 Land affected by this Part

This Part applies to land identified in Fig. 5.4.01.

1.5 Relationship of this Part to other Plans and Policies

This Part supplements and gives guidance to the controls and objectives of Ryde LEP 2014. It is also part of a series of plans promoting the revitalisation of Ryde's business centres and should be read in conjunction with other relevant Council plans and policies, including but not limited to:

- *Ryde Public Domain Technical Manual*
- *Section 94 Development Contributions Plan 2007*
- *DCP 2014 - Other Relevant Sections*

This Part should also be considered in conjunction with the State Environmental Planning Policies (SEPP) including *SEPP 65, Design Quality for Residential Flat Buildings*.

1.6 Interpretation

In this Part, terms have the same meaning as in the Environmental Planning and Assessment Act 1979 (as amended) and the Ryde Local Environmental Plan 2014. If there is an inconsistency between this part and other parts of the City of Ryde DCP 2014 and other codes or policies this Part shall prevail.

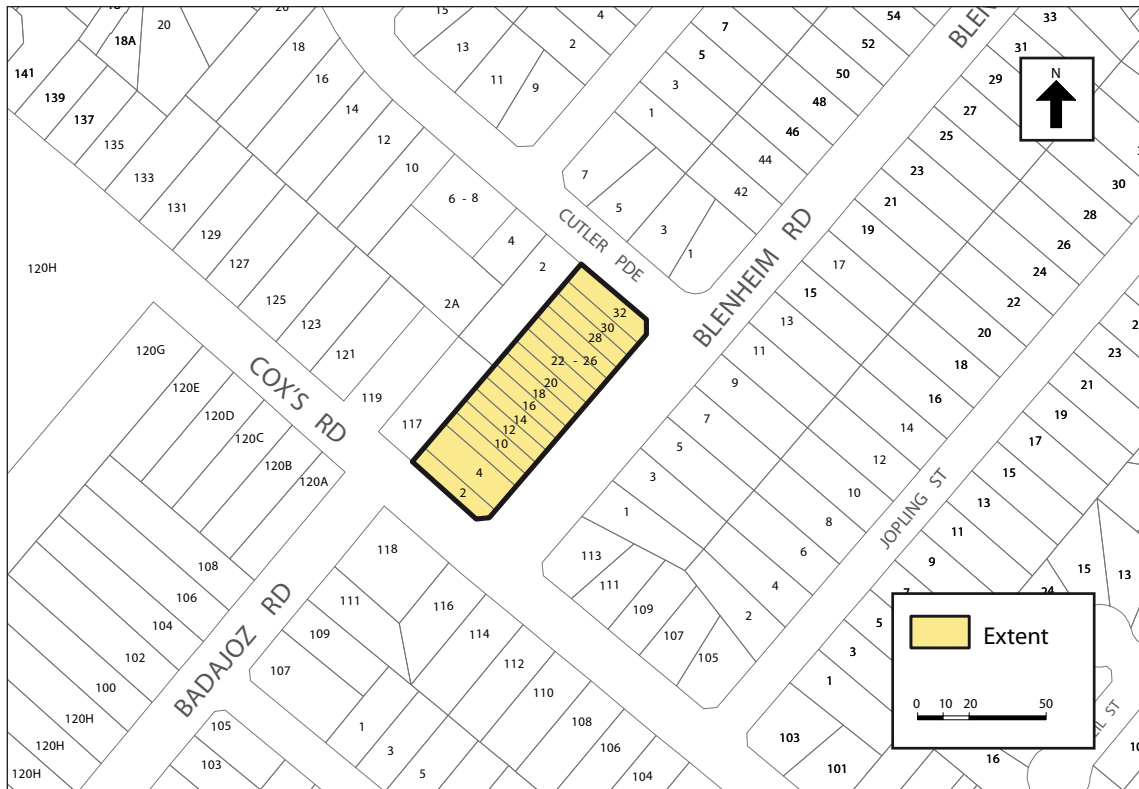


Figure 5.4.01 Map showing Blenheim Road Small Centre Extent.

1.7 Structure of this Part

This Part identifies objectives and controls that will shape the future development of Blenheim Road to create attractive, accessible and unique urban environments in which to live, work, shop, and visit.

Development controls are provided for strategic sites identified as Ryde Small Centres within the City of Ryde LGA. The identified centre is Blenheim Road, North Ryde. This site has been tested with regards to built form, public domain, design and traffic. The detailed development controls for these sites are provided in Section 3.0 of this Part.

Specific built form development controls for both sites include building heights, building setbacks, active street frontages, awnings and built form sections.

2.0 VISION

2.1 Blenheim Road, North Ryde - Vision Statement

This part is a planning initiative undertaken by the city of Ryde to revitalise the small centre of Blenheim Road, North Ryde. The vision is to create an attractive place to live, work, shop and visit, arising from Blenheim Road's natural and built features, history and community expectations.

Blenheim Road is a vibrant local centre located in a low density residential area at the intersection of two busy through roads. It has a relatively large number of shops and services and community facilities for the local community. The centre has good connections with the wider road network and good access to public transport. It is located near a major employment area and is well serviced by parkland and recreation opportunities.

In the future the Blenheim Road, North Ryde Small Centre will retain its local retail role, whilst gaining residential development above. The existing rear lane, currently in poor condition, is to be transformed into an accessible rear laneway for pedestrians and private & service vehicles.

The overall built form is to ensure an appropriate scale within the predominately residential context. High quality built form will define and edge public spaces.

3.0 OBJECTIVES AND CONTROLS

3.1 Site Amalgamation

Objectives

1. To ensure as few driveways as possible in order to promote pedestrian amenity and road safety.
2. To encourage access from the local roads network and the provision of new laneways.
3. To encourage development quality & amenity and meet other parts of the controls setout.

Controls

- a. Minimum lot sizes shall comply with Ryde LEP 2014 Clauses 4.3A and 4.4A.

Note: 1. To achieve the optimum development outcome within a small centre a minimum lot size is required for particular development to occur. Clauses 4.3A Exceptions to height of buildings and 4.4A Exceptions to floor space ratio make provision for additional height and floor space to be available when lots over a particular size are being developed. A preferred amalgamation is shown in Figure 5.4.03 and Figure 5.4.04.

2. To achieve the required lot size may require the amalgamation of lots. If amalgamation is required an application for consolidation should be included as part of the development application.

3. Building envelopes (Figure 5.4.03, Figure 5.4.04, Figure 5.4.05, Figure 5.4.06, Figure 5.4.07, and Figure 5.4.09) are based on the preferred amalgamation pattern. They are indicative only.



Figure 5.4.02 Map showing Blenheim Road Small Centre Preferred Amalgamation Site Pattern

3.2 Built Form

3.2.1 Urban and Environmental Design

The quality of streets and public spaces may be enhanced by the way buildings address these spaces. Good environmental design includes the control of solar access and overshadowing.

Objectives

1. To ensure new buildings contribute positively to the urban built form and environment.
2. To ensure appropriate scale and good environmental amenity, such as sun access.
3. To ensure a built form of a high quality that successfully integrates environmental sustainability with architectural design.

Controls

- a. Development on corners must address all street frontages. Entries, windows and other architectural elements should be placed to reinforce the corner.
- b. Provide building articulation elements including awnings, verandahs, decks, loggias, pergolas, bay windows and recessed doors.
- c. Windows and entries shall be placed to overlook public spaces and streets to provide surveillance opportunities.
- d. Balconies may not be continuous along the whole length of building facades.
- e. Provide solar protection, including awnings, recessed windows, roof overhangs, external shutters and screens to the western and northern elevations of buildings.
- f. Where sites are amalgamated, express the existing or prevalent lot structure in the design of new buildings. For example the width of shop-fronts should reflect the predominant lot structure prior to the amalgamation taking place.

3.2.2 Residential Private Open Space

Private open space such as front gardens, private gardens, above ground open space and the like where located adjacent to the public domain contributes to the character of the public domain and provides amenity to residents.

Objectives

1. To contribute to the character and environmental quality of the landscape of the Small Centres.
2. To enhance the micro-climate created by development, in development and the Small Centres.
3. To ensure that every dwelling in the Ryde Small Centres has access to usable private open space.

Controls

Private open space

Refer to the *SEPP 65 Residential Flat Design Code (Planning NSW) - Open Space*.

- a. Single aspect apartments set below the natural ground level are not permitted.
- b. Comply with *SEPP 65* Rule of Thumb.

3.2.3 Solar Access and Sun Shading

Sunlight is a major determinant of environmental comfort. Good passive solar design offers financial benefits, by reducing the need for artificial heating and cooling.

Objectives

1. To provide solar access to habitable rooms and external areas of dwellings in mid winter.
2. To achieve the development of living and working environments not reliant on artificial heating, cooling, and lighting with passive heating/cooling, solar orientation, appropriate shading treatments.

Controls

Refer to the *SEPP 65 Residential Flat Design Code (Planning NSW) - Daylight Access*.

- a. Comply with *SEPP 65* rule of thumb.
- b. The *SEPP 65* controls for lightwells apply to apartments below ground level for the purpose of satisfying *SEPP 65* requirements.

Note: Single aspect apartments set below the natural ground level are not permitted.

3.2.4 Visual Privacy

Objectives

1. To maximise the visual privacy of on-site and neighbouring residents.
2. To maximise outlook and views from habitable rooms and private open space without compromising visual privacy

Controls

Refer to the *SEPP 65 Residential Flat Design Code (Planning NSW) - Visual Privacy*.

- a. Comply with *SEPP 65* rule of thumb.

3.2.5 Acoustic Privacy

Potential unwanted noise sources increase in more densely developed areas. In mixed-use areas developments need to consider the amenity of a range of occupants. The impact of commercial and retail noise on residential development and pedestrian amenity needs to be considered. Residential, commercial and retail developments can be designed and managed to minimise noise generation and intrusion.

Objectives

1. To achieve an appropriate acoustic environment, by giving design consideration to the following:
 - i. Siting of buildings.
 - ii. Building planning.
 - iii. Internal room layout.
 - iv. Location of private open space.
 - v. Location and treatment of windows.
 - vi. Building materials.
 - vii. Location and design of waste storage and collection for commercial component.

Controls

Refer to the *SEPP 65 Residential Flat Design Code (Planning NSW)- Acoustic Privacy*.

- a. Acoustic separation between commercial and residential uses shall be attained.

3.2.6 Built Form Heights

Development within the small centre is of a scale and character that promotes an attractive and sustainable urban environment.

Objectives

1. To attract investment, new employment opportunities and enhance economic sustainability.
2. To promote an urban scale to the retail and commercial development.
3. To enhance the existing streetscape and ensure appropriate development scale in predominantly residential and heritage precincts.
4. To ensure adequate sunlight is available for all buildings, streets and public domain.

Controls

- a. Buildings must comply with the maximum heights described in *Ryde LEP 2014* Height of Buildings Map.
- b. Building height must comply with the Building Height Control Figure 5.4.03 and Figure 5.4.04.
- c. The height limits in the LEP and the DCP must be read in conjunction and they correlate to each other. The LEP provides building heights in metres and the DCP provides building heights in storeys. The DCP does not restrict the height limit allowed under the LEP.
- d. Floor to ceiling height must be a minimum of 2.7 m for residential uses.
- e. To ensure that ground floor levels are adaptable over time for a wide range of uses, the floor to ceiling height must be a minimum of 3.5 m clear for the ground floor.

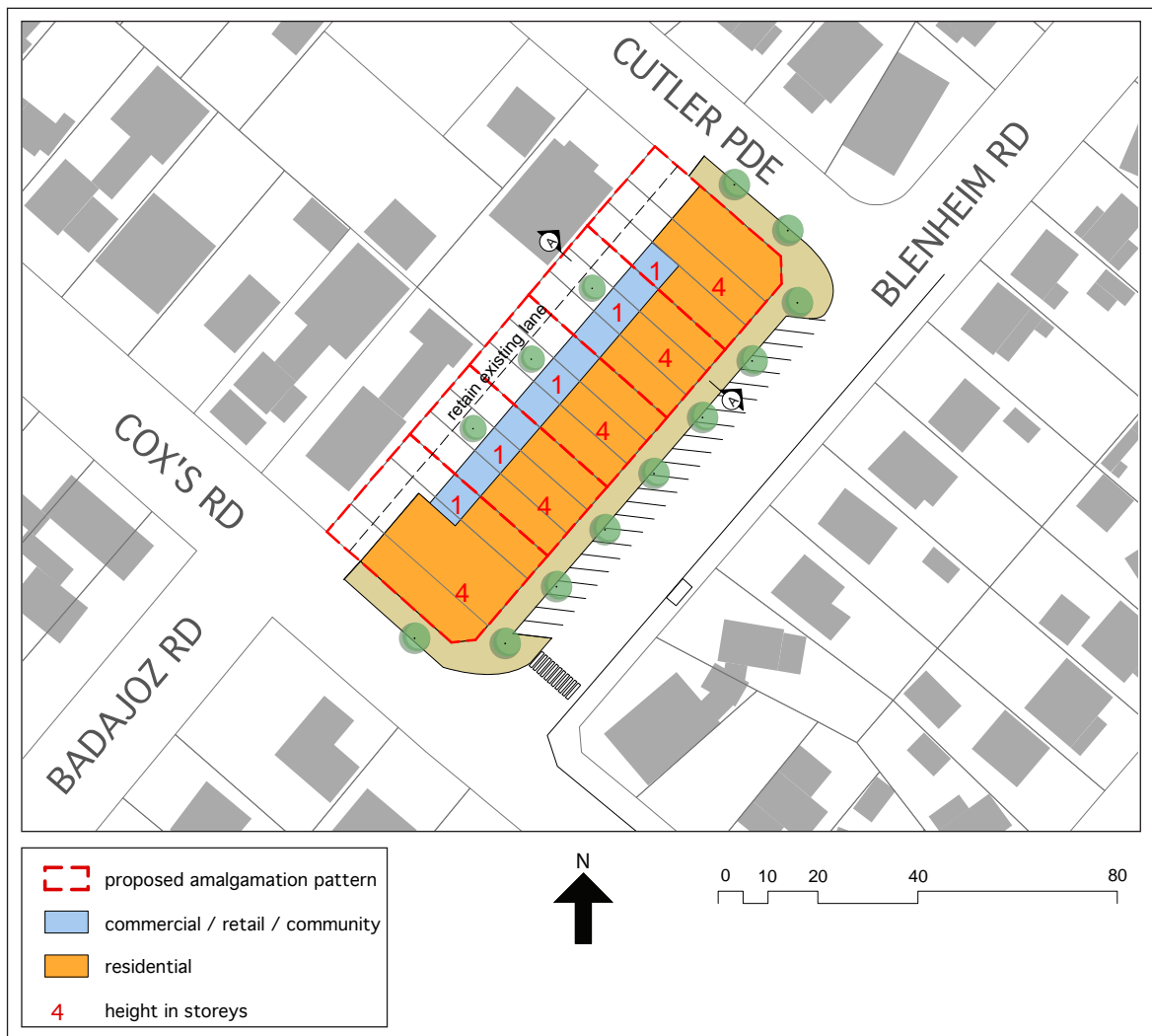


Figure 5.4.03 Blenheim Road Small Centre Building Height Control

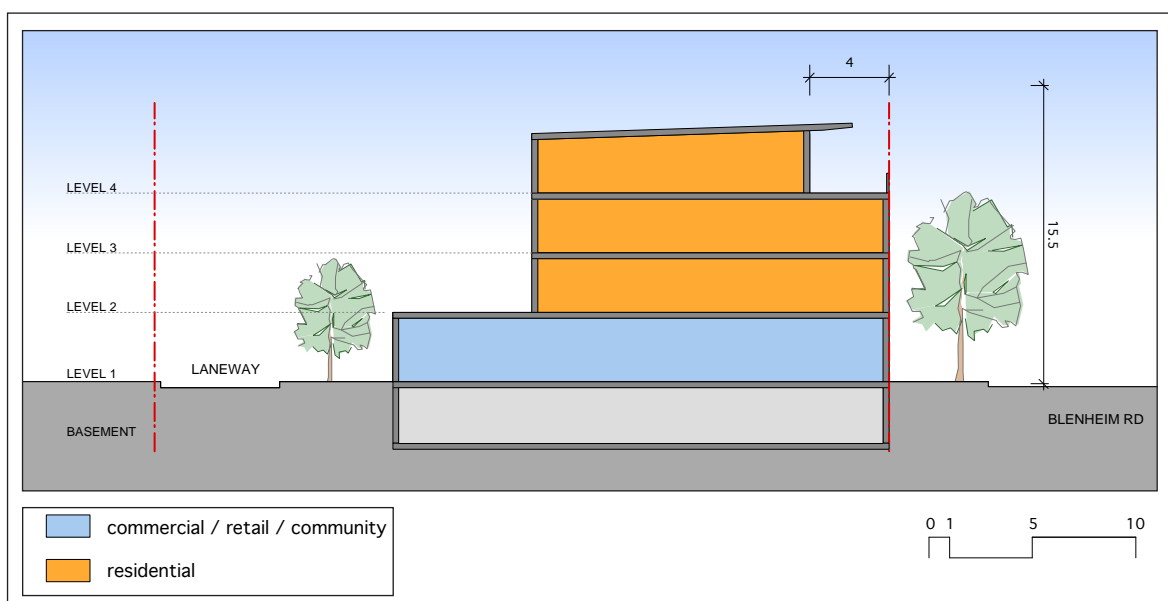


Figure 5.4.04 Blenheim Road Small Centre Building Height Control - Cross Section

3.2.7 Setbacks

Front setbacks give streets and public domain physical definition and control the relationships of buildings to each other. The front setbacks defined in this Part will reflect and reinforce the character of the Blenheim Road Small Centre. Business and retail areas are to be built to the street frontage to reinforce and promote a positive urban character and personal safety and security. Rear and side setbacks control the relationships of buildings to each other and provide visual and acoustic privacy. Upper level setbacks reduce the visual bulk and scale of buildings; promote an interesting skyline and access to sunlight and fresh air.

Objectives

1. To establish an individual identity for the small centre and influence street character.
2. To integrate Safer-by-Design principles into the design of the public domain and built form.
3. To effect positive relationships between buildings.
4. To create an interesting skyline.
5. To promote sunlight access to the public domain and buildings.

Controls

- a. Building setbacks at the ground level and upper levels must comply with the Setbacks Control Drawing.
- b. Building setbacks must comply with the Building Setback Controls Figure 5.4.05 and Figure 5.4.06.
- c. The build to boundary line applies to the ground, first and second floors.
- d. The top floor must be setback 4 m from the boundary.

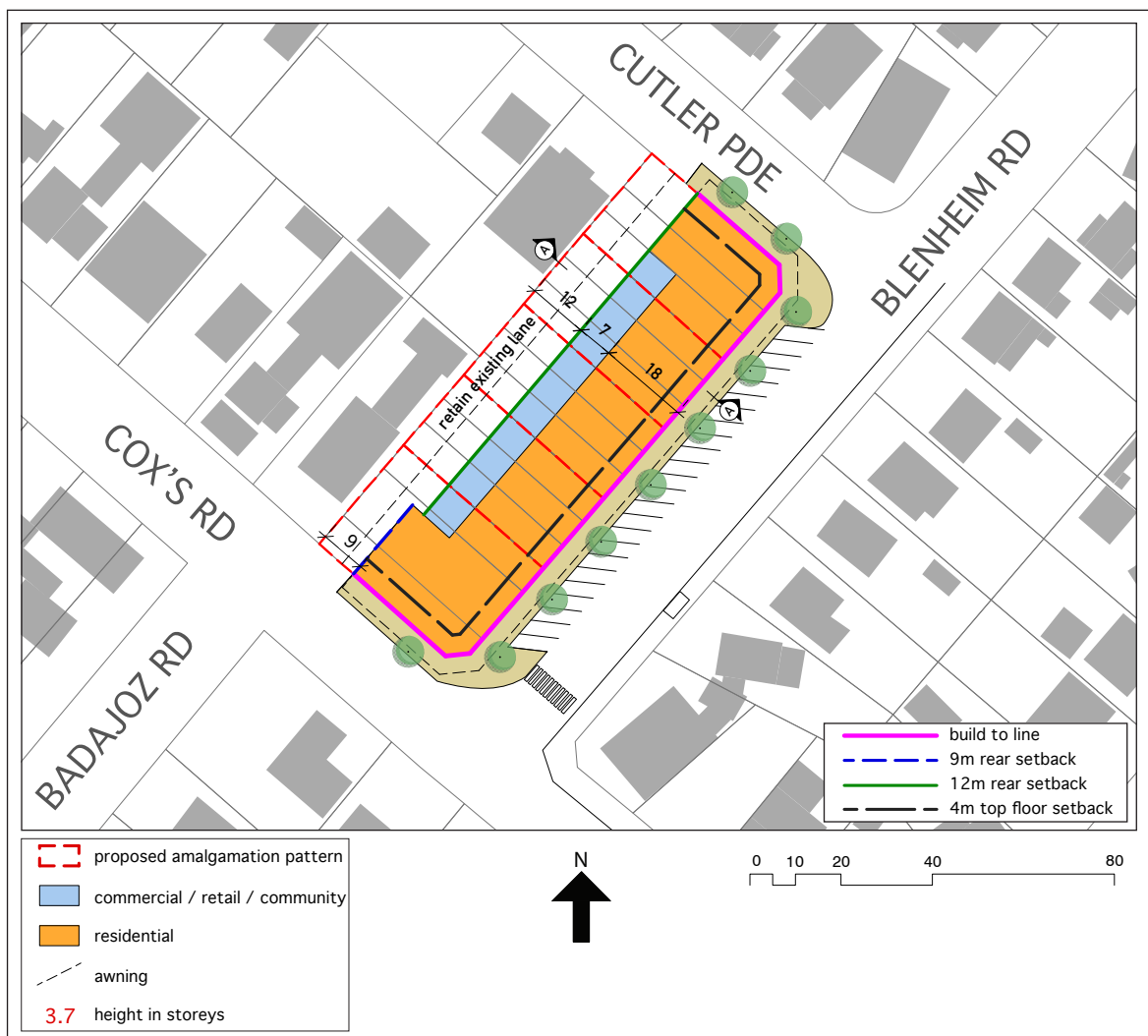


Figure 5.4.05 Blenheim Road Small Centre Setback Controls Drawing

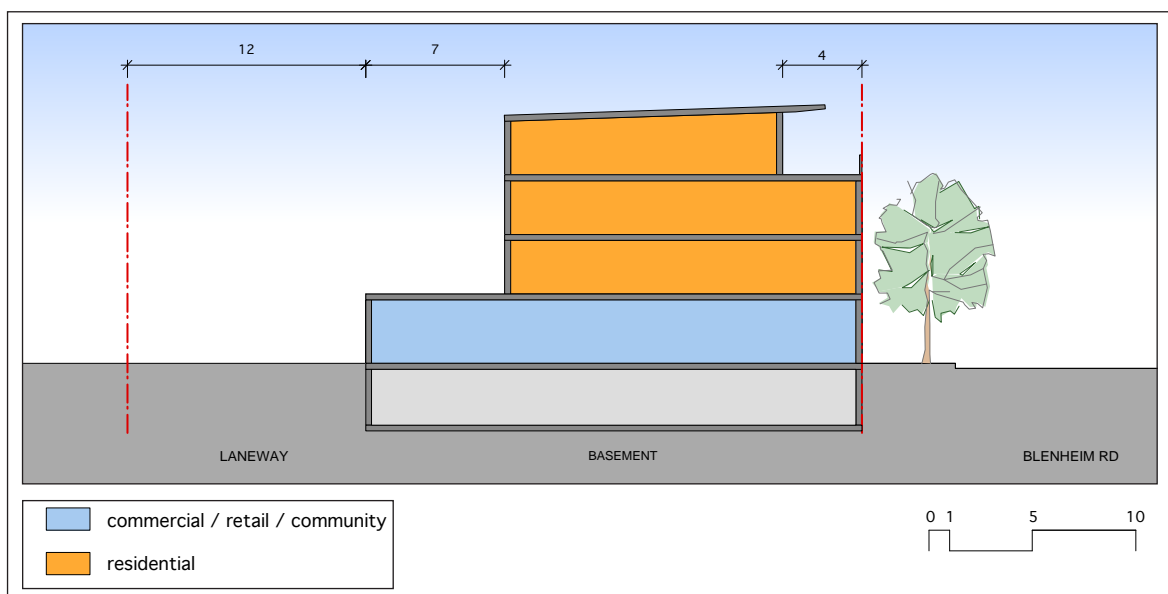


Figure 5.4.06 Blenheim Road Small Centre Setback Controls - Cross Section

3.2.8 Building Depth

Objectives

1. To promote sustainable built form.
2. To improve the amenity of buildings for users.

Controls

- a. Building depth must comply with the Building Depth Control Drawing Figure 5.4.07.
- b. Achieve natural ventilation in residential buildings by having window openings in opposite directions and walls where possible. Comply with *SEPP 65* rule of thumb.
- c. The maximum overall depth of residential buildings is 18 m unless design excellence can be demonstrated and natural ventilation is achieved.



Figure 5.4.07 Blenheim Road Small Centre Building Depth Control / Active Street / Extent of Awning Control

3.2.9 Active Street Frontages

Objectives

1. To enhance personal safety and security within the small centres.

Controls

- a. Provide ground level active uses where indicated on the Active Street Frontages Control Drawing Figure 5.4.07.
- b. Active uses contribute to personal safety in the public domain and comprise:
 - i. Community and civic facilities;
 - ii. Recreation and leisure facilities;
 - iii. Shops;
 - iv. Commercial premises;
 - v. Residential uses, particularly entries and foyers, however, these must not occupy more than 20% of the total length of each street frontage.
- c. Where required, active uses must comprise the street frontages for a depth of at least 10 m from the front setback.
- d. Ground floor shop fronts may incorporate security grills provided these ensure light falls onto the footpath and that the interior of the shop is visible. Blank roller-shutter doors are not permitted.
- e. Serviced apartments, hotels, motels and boarding houses shall not have apartments at the ground level. Locate retail, restaurants and / or other active uses at the ground level.

3.2.10 Awnings + Entry Canopies

Objectives

1. To create a consistent streetscape.
2. To contribute to pedestrian amenity (all-weather protection), safety and security (lighting).

Controls

- a. Provide continuous awnings as indicated in Awnings Control Drawing Figure 5.4.07 and Figure 5.4.08.
- b. Awning height shall be a minimum of 3m from the pavement and setback 600mm from the kerb edge. The heights of adjoining awnings must be considered.
- c. Design awnings to protect pedestrians from sun and rain. Glazed awnings will not be permitted where awnings are required unless it can be demonstrated that:
 - i. A cleaning and maintenance regime will be established;
 - ii. Solar protection (shade) can be achieved; and
 - iii. Lighting will be installed to the underside of the awning that will light the footpath.
- d. Provide lighting, preferably recessed, to the underside of awnings, sufficient to ensure a high level of safety and security for pedestrians at night.
- e. Where the street or ground level is sloped, awnings shall step down the hill.

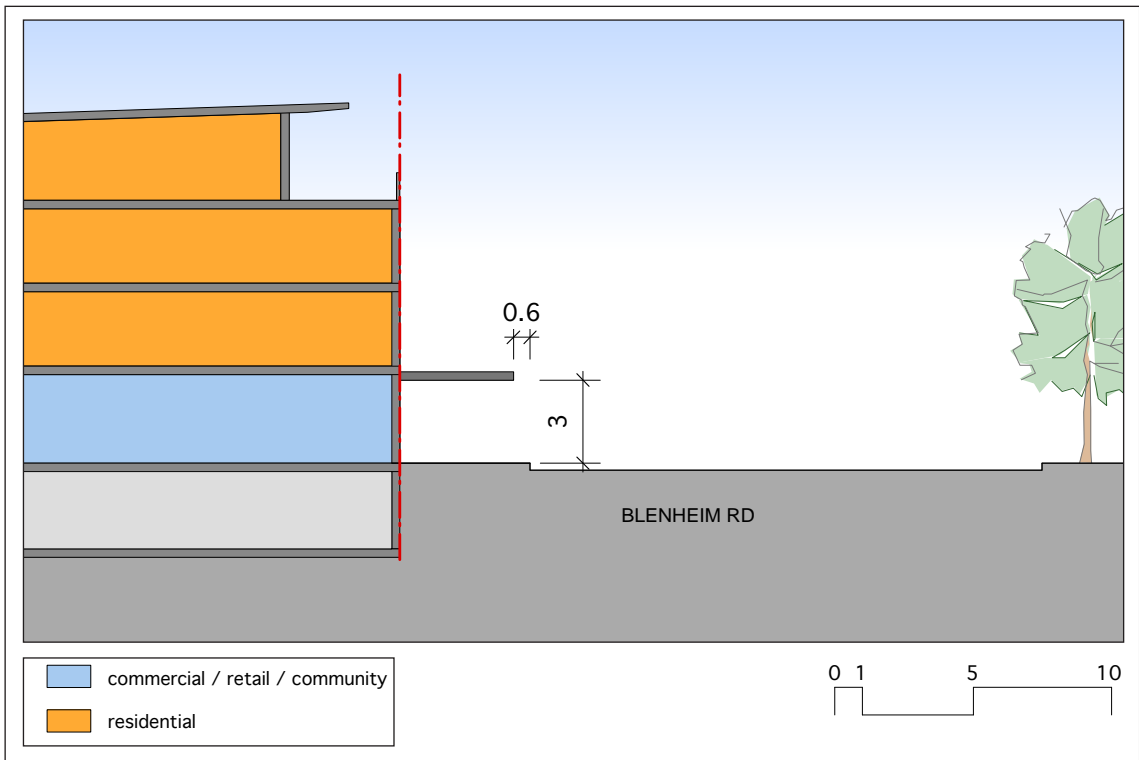


Figure 5.4.08 Blenheim Road Small Centre Awning Control Cross Section

3.2.11 Services Access and Parking

Objectives

1. To provide adequate and accessible parking and on-site service areas.
2. To provide size and number of service areas in proportion to the scale and intensity of the proposed use.
3. To ensure that service facilities do not detract from the amenity of nearby public spaces and residential areas.

Controls

Service Access

- a. Buildings are to provide a shared rear lane for vehicle access points. Refer to Figure 5.4.09 Laneway Section.
- b. All service and vehicle access must be from rear lane.
- c. On-site car and service vehicle access must be provided and designed in accordance with the following:
 - i. a driveway and footpath must be established that is of adequate strength, width and design for the intended car, pedestrian and service vehicle characteristics. (Refer to Figure 5.4.09 for minimal width.)
 - ii. the driveway is to be designed such that service vehicle movement is in a forward direction, both when entering and exiting the site;
 - iii. on-site manoeuvrability must be unimpeded for all site users.
- d. Generally service vehicle access is to be combined with parking access.

- e. Waste and recycling space are to be provided in accordance with *DCP Part 7.2 Waste Minimisation and Management Facilities for Waste*. The Facilities for Waste must be located within the building envelope, access and collection should be via the rear laneway.

Parking

- f. Parking to be provided in accordance with Part 9.3 Parking Controls of this DCP.
- g. Parking shall be located under ground.

Services

- h. All services infrastructure including fire hydrant, gas meters and the like shall be located within the building envelope and are not to be visible from the public domain.

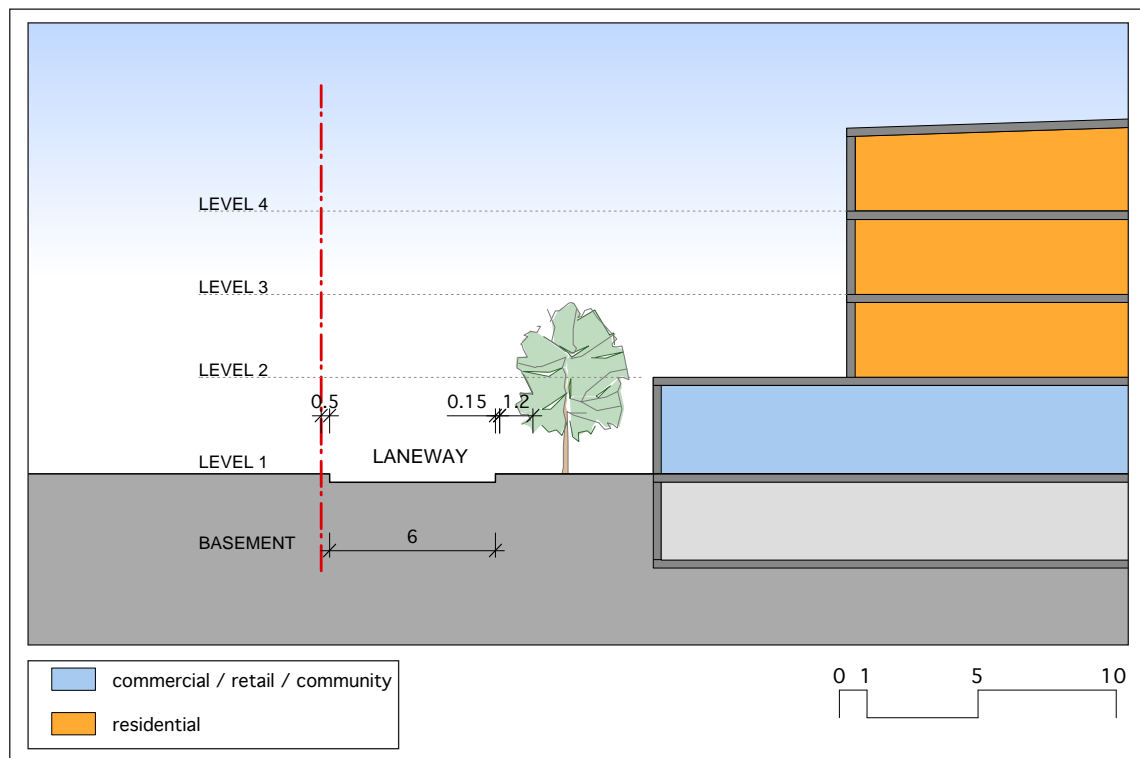


Figure 5.4.09 Blenheim Road Small Centre Laneway Section.

3.3 Public Domain

The public domain is made up of streets, pedestrian connections, small civic parks and squares.

Streets form the framework of the public domain connecting people to shopping, services, recreation and residential. Public spaces are the outdoor rooms of the small centres, providing focal points for community life.

Refer to the *City of Ryde Public Domain Technical Manual* in relation to the following sections.

3.3.1 Access and the Public Domain

Public domain spaces within the Ryde Small Centres need to be designed and sited so that the areas are safe at all times for all pedestrians and cyclists and that they are accessible to all.

Objectives

1. To reduce vehicular conflicts through good design of building entrances and reducing footpath cross-overs.
2. To clearly differentiate uses and separate conflicting uses.
3. To use appropriate lighting levels.
4. To encourage 'safe' pedestrian access and mobility.

Controls

- a. To be in accordance with the *City of Ryde Public Domain Technical Manual* and are to be implemented by the developer.
- b. Adequate parking and safe convenient access to buildings for people with disabilities must be provided.
- c. To provide active frontage and quality building design, where applicable vehicular access ramps must enter and exit from the rear lane.
- d. Vehicular traffic must be separated from pedestrians and vehicular access points clearly identified with paving, signage and the like.
- e. Loading docks must be located to the rear of the retail / commercial premises so that vehicles do not stand on any public road, footway and vehicles entering and leaving the site move in a forward direction.

3.3.2 Landscape Character

Objectives

1. To create a memorable landscape image for the small centre, which builds on the positive characteristics of topography, landscape character and views.
2. To protect, through planning controls, those spaces in private lands that contribute to the character and quality of the small centre.
3. To create tree planting, to reinforce spatial quality & build on the palette of existing species in the street, provide shade for pedestrians, and improve the image of the small centre.

Controls

- a. Select street trees based on the scale of buildings, width of the street, aspect, and on environmental parameters such as soil type shall be provided in accordance with the *City of Ryde Public Domain Technical Manual*

3.3.3 Urban Elements and Finishes

Objectives

1. To coordinate paving and urban elements within the small centres.
2. To improve the image, quality and amenity of streets and public spaces through quality paving, lighting and street furniture.
3. To ensure that the selection of urban elements and level of provision is based on the hierarchy of streets and intensity of use.

Controls

- a. Provide paving, seats, benches and bins as selected by Council in accordance with the *City of Ryde Public Domain Technical Manual*.
- b. Provide seating and shelter (awnings or bus shelter) at all bus stops, and provide seating at community facilities and drop off points. Seating shall be in accordance with *City of Ryde Public Domain Technical Manual*.
- c. Provide new street lighting to council satisfaction.

3.3.4 Signage

The aim is to provide consistent, attractive signage that enhances the built form within the Centre.

Objectives

1. To reduce visual clutter through the control and coordination of signage.
2. To reinforce the streetscape and enhance the character of the area.

Controls

- a. Signage shall comply with DCP Part 9.1 Signage of this DCP.



City of Ryde
Civic Centre
1 Devlin Street
Ryde NSW 2112

www.ryde.nsw.gov.au

City of Ryde Development Control Plan 2014

Part: 6.1 Blaxland Road (601-607) Eastwood

Translation

ENGLISH

If you do not understand this document please come to Ryde Civic Centre, 1 Devlin Street, Ryde Monday to Friday 8.30am to 4.30pm or telephone the Telephone and Interpreting Service on 131 450 and ask an interpreter to contact the City of Ryde for you on 9952 8222.

ARABIC

إننا نعتذر عليك فهم محتويات هذه الوثيقة، نرجو للحضور إلى مركز بلدية رايد Ryde Civic Centre على العنوان: 1 Devlin Street, Ryde 1 من الاثنين إلى الجمعة بين الساعة 8.30 صباحاً والساعة 4.30 بعد الظهر أو الاتصال بمكتب خدمات الترجمة على الرقم 131 450 لكي تطلب من أحد المترجمين الاتصال بمجلس مدينة رايد، على الرقم 9952 8222، نيابة عنك.

ARMENIAN

Եթէ այս գրութիւնը չէք հասկնար, խնդրեմ եկէք՝ Րայդ Սիվիկ Սենթըր, 1 Տելվին փողոց, Րայդ, (Ryde Civic Centre, 1 Devlin Street, Ryde) Երկուշաբթիէն Ուրբաթ կ.ա. ժամը 8.30 – կ.ե. ժամը 4.30, կամ հեռաձայնեցէք Հեռաձայնի եւ Թարգմանական Սպասարկութեան՝ 131 450, եւ խնդրեցէք որ թարգմանիչ մը Րայդ Քաղաքապետարանին հետ կապ հաստատուէ ձեզի համար, հեռաձայնելով՝ 9952 8222 թիվի:

CHINESE

如果您看不懂本文，請在周一至周五上午 8 時 30 分至下午 4 時 30 分前往 Ryde 市政中心詢問 (Ryde Civic Centre, 地址: 1 Devlin Street, Ryde)。你也可以打電話至電話傳譯服務中心，電話號碼是: 131 450。接通後你可以要求一位傳譯員為你打如下電話和 Ryde 市政廳聯繫，電話是: 9952 8222。

FARSI

اگر این مدرک را نمی فهمید لطفاً از 8.30 صبح تا 4.30 بعد از ظهر دوشنبه تا جمعه به مرکز شهرداری رايد، Ryde Civic Centre, 1 Devlin Street, Ryde مراجعه کنید یا به سرویس مترجم تلفنی، شماره 131 450 تلفن بزنید و از یک مترجم بخواهید که از طرف شما با شهرداری رايد شماره 9952 8222 تلفن بزند.

ITALIAN

Se non capite il presente documento, siete pregati di rivolgervi al Ryde Civic Centre al n. 1 di Devlin Street, Ryde, dalle 8.30 alle 16.30, dal lunedì al venerdì; oppure potete chiamare il Telephone Translating and Interpreting Service al 131 450 e chiedere all'interprete di contattare a vostro nome il Municipio di Ryde presso il 9952 8222.

KOREAN

이 문서가 무슨 의미인지 모르실 경우에는 1 Devlin Street, Ryde 에 있는 Ryde Civic Centre 로 오시거나 (월 – 금, 오전 8:30 – 오후 4:30), 전화 131 450 번으로 전화 통역 서비스에 연락하셔서 통역사에게 여러분 대신 Ryde 시청에 전화 9952 8222 번으로 연락을 부탁하십시오.

Amend. No.	Date approved	Effective date	Subject of amendment

Table of Contents

1.0	INTRODUCTION	5
1.1	Land to which this Part applies	5
1.2	Objectives of this Part	5
2.0	CONTROLS	6
2.1	Vehicular Access	6
2.2	Car Parking	6
2.3	Lighting	6
2.4	Drainage	6
2.5	Signage	6
2.6	Water Quality Measures	6
2.7	Operational	7
2.8	Design	7
2.9	Road Widening	7

THIS PAGE HAS BEEN
INTENTIONALLY LEFT BLANK

1.0 INTRODUCTION

1.1 Land to which this Part applies

This Part applies to 601-607 Blaxland Road, Eastwood, inclusive.

1.2 Objectives of this Part

Objectives

The objectives of this Part are:

1. To provide appropriate development control principles for the redevelopment of the land to which this plan applies.
2. To ensure that any future extension of the existing use of the land is compatible with adjacent development.

2.0 CONTROLS

2.1 Vehicular Access

- a. Only one vehicular access point for ingress and egress shall be permitted to the subject land. The access point must be agreed to by the Roads and Maritime Services.

2.2 Car Parking

- b. Car parking for the motor showroom shall be provided by the provision of space for at least 257 cars.
- c. All visitors parking shall be easily identified and accessible from Blaxland Road.
- d. Vehicles for sale must not be displayed on access ramps or in car spaces allocated for visitor parking.
- e. All loading and unloading of new and used vehicles shall take place wholly on site.

2.3 Lighting

- f. All lighting shall be designed and installed so as to minimise spillage into the adjoining residential area. Lighting must be designed and installed to the requirements of the Department of Environment and Conservation.

2.4 Drainage

- g. Prior to any application being lodged with Council a drainage plan must be prepared in accordance with Part 8.2 Stormwater Management. As part of the preparation, detailed consultation must be undertaken with Council's Development Engineers.
- h. Provision must be made to ensure that no adjoining property is detrimentally affected by any redevelopment of the subject land.

2.5 Signage

- i. Any signage or advertising structures shall be designed and located on the site in accordance with Part 9.1 Signage and must be submitted with either the Local Development Application for the motor showroom or as a separate application. No signs shall be erected without Council consent.

2.6 Water Quality Measures

- j. An appropriate first flush system is to be installed on the site to direct any pollutants from the pavement areas within the site to the sewer.
- k. Any fuel storage facilities are to be installed and maintained in accordance with any relevant State Government requirements.

2.7 Operational

- l. All mechanical plant and equipment on the site to be selected, installed and operated to satisfy any relevant State Government requirements.

2.8 Design

- m. The design of any motor showroom proposed to be erected on the land shall generally be in accordance with the plans prepared by KDG Architects, numbered A.Sk.20g to A.Sk.27. No work shall take place without Council consent.

2.9 Road Widening

- n. The area along the Blaxland Road frontage of the subject land that is required for road widening must not be utilised for the display of vehicles or signage.



City of Ryde
Civic Centre
1 Devlin Street
Ryde NSW 2112

www.ryde.nsw.gov.au

City of Ryde Development Control Plan 2014

Part: 6.2 Pennant Avenue (1-13) Denistone

Translation

ENGLISH

If you do not understand this document please come to Ryde Civic Centre, 1 Devlin Street, Ryde Monday to Friday 8.30am to 4.30pm or telephone the Telephone and Interpreting Service on 131 450 and ask an interpreter to contact the City of Ryde for you on 9952 8222.

ARABIC

إننا نعتذر عليك فهم محتويات هذه الوثيقة، نرجو للحضور إلى مركز بلدية رايد Ryde Civic Centre على العنوان: 1 Devlin Street, Ryde 1 من الاثنين إلى الجمعة بين الساعة 8.30 صباحاً والساعة 4.30 بعد الظهر أو الاتصال بمكتب خدمات الترجمة على الرقم 131 450 لكي تطلب من أحد المترجمين الاتصال بمجلس مدينة رايد، على الرقم 9952 8222، نيابة عنك.

ARMENIAN

Եթէ այս գրութիւնը չէ՞ք հասկնար, խնդրեմ եկէ՛ք՝ Րայդ Սիվիկ Սենթըր, 1 Տելվին փողոց, Րայդ, (Ryde Civic Centre, 1 Devlin Street, Ryde) Երկուշաբթիէն Ուրբաթ կ.ա. ժամը 8.30 – կ.ե. ժամը 4.30, կամ հեռաձայնեցէ՛ք Հեռաձայնի եւ Թարգմանական Սպասարկութեան՝ 131 450, եւ խնդրեցէ՛ք որ թարգմանիչ մը Րայդ Քաղաքապետարանին հետ կապ հաստատուէ ձեզի համար, հեռաձայնելով՝ 9952 8222 թիվին:

CHINESE

如果您看不懂本文，請在周一至周五上午 8 時 30 分至下午 4 時 30 分前往 Ryde 市政中心詢問 (Ryde Civic Centre, 地址: 1 Devlin Street, Ryde)。你也可以打電話至電話傳譯服務中心，電話號碼是: 131 450。接通後你可以要求一位傳譯員為你打如下電話和 Ryde 市政廳聯繫，電話是: 9952 8222。

FARSI

اگر این مدرک را نمی فهمید لطفاً از 8.30 صبح تا 4.30 بعد از ظهر دوشنبه تا جمعه به مرکز شهرداری رايد، Ryde Civic Centre, 1 Devlin Street, Ryde مراجعه کنید یا به سرویس مترجم تلفنی، شماره 131 450 تلفن بزنید و از یک مترجم بخواهید که از طرف شما با شهرداری رايد شماره 9952 8222 تلفن بزند.

ITALIAN

Se non capite il presente documento, siete pregati di rivolgervi al Ryde Civic Centre al n. 1 di Devlin Street, Ryde, dalle 8.30 alle 16.30, dal lunedì al venerdì; oppure potete chiamare il Telephone Translating and Interpreting Service al 131 450 e chiedere all'interprete di contattare a vostro nome il Municipio di Ryde presso il 9952 8222.

KOREAN

이 문서가 무슨 의미인지 모르실 경우에는 1 Devlin Street, Ryde 에 있는 Ryde Civic Centre 로 오시거나 (월 – 금, 오전 8:30 – 오후 4:30), 전화 131 450 번으로 전화 통역 서비스에 연락하셔서 통역사에게 여러분 대신 Ryde 시청에 전화 9952 8222 번으로 연락을 부탁드립니다.

Amend. No.	Date approved	Effective date	Subject of amendment

Table of Contents

1.0 INTRODUCTION	5
1.1 Objectives of this Part	5
1.2 Land to which this Part applies	5
2.0 DEVELOPMENT CONTROLS	6
2.1 Heritage Considerations	6
2.2 Landscaping and Streetscape	6
2.3 Restoration of The Hermitage	7
2.4 Building Form and Height	7
2.5 Setbacks from Boundaries	8
2.6 Fencing	8
2.7 Parking	8
2.8 Access	9
2.9 Density	9
2.10 Development at rear of "Wollondilly"	9
2.11 Services	10
2.11.1 Water and Sewerage	10
2.11.2 Stormwater Drainage	10
2.11.3 Land Contamination	10
SCHEDULES	11
Schedule 1 - Maps	11

THIS PAGE HAS BEEN
INTENTIONALLY LEFT BLANK

1.0 INTRODUCTION

1.1 Objectives of this Part

The objectives of this Part are:

1. To ensure that any redevelopment of the site is undertaken in a manner that is sympathetic to the heritage significance of “The Hermitage” and “Wollondilly” and their settings through the provision of appropriate design parameters for redevelopment of the two sites;
2. To provide appropriate development controls on the sites to ensure that redevelopment is compatible with existing residential development on adjoining properties and the existing heritage buildings “The Hermitage” and “Wollondilly” on the site;
3. To ensure that all significant existing landscape elements on the site are retained and incorporated into any redevelopment of the property, and that any proposed landscaping is sympathetic to the heritage significance of “The Hermitage” on the south-western portion of the site and “Wollondilly” to the north of the site and their gardens; and
4. To ensure that the site is adequately provided with water, sewerage and stormwater drainage services, and that the location of these services does not adversely affect the heritage buildings on the site or any significant vegetation on the site.

1.2 Land to which this Part applies

This Part applies to Lots 2 and 4, DP 1144636, SP 82952, SP 82951, previously known as 1-13 Pennant Avenue, Denistone, including the heritage buildings known as “The Hermitage” and “Wollondilly” and their settings where they are specifically referred to in this plan.

2.0 DEVELOPMENT CONTROLS

Controls

2.1 Heritage Considerations

- a. The settings of both “The Hermitage” and “Wollondilly” will be best suited to development of the land identified as R3 Medium Density Residential with single residence, detached houses, comparable in scale with those around it. This would maintain the established pattern of development around the site, and entail the least cost to the amenity of both the historically significant houses, and the neighbouring residences.
- b. Whilst Council would prefer and encourage such development economically the yield from this may be less than from more dense residential development. With great emphasis to be placed upon boundary placement, setback and intervening landscape treatment as determining parameters, townhouse or attached housing of a modern, site-specific design could also be suitable provided its scale and bulk did not produce competition with “The Hermitage” or “Wollondilly”. Such housing should not unduly overlook or focus upon the setting and garden areas retained by both existing houses.
- c. A Heritage Statement must be submitted to Council with any Local Development Application for redevelopment of the site. This Statement must be prepared by a qualified Heritage Architect who is recognised by The Heritage Office of New South Wales and the Australian Heritage Commission.
- d. Prior to any construction work being undertaken on the site, archaeological digs shall be carried out in accordance with the recommendations of the Conservation Plan prepared by Perumal Murphy Wu Pty Ltd dated November 1995. An excavation permit, as required under the Heritage Act (NSW) 1977, shall be obtained from The Heritage Office of New South Wales prior to any such work commencing on the site. An archaeological assessment of the site shall be prepared and submitted to Council prior to any construction work on the site being commenced. Council is required to notify The Heritage Office of New South Wales of such an assessment and consider any comments The Heritage Office may wish to make. These requirements should be noted in association with the Land Contamination requirements cited below.
- e. Both “The Hermitage” and “Wollondilly” shall be retained in their current positions on the site. Any proposed works to “The Hermitage” or “Wollondilly” shall be carried out in accordance with the Conservation Plans prepared by Perumal Murphy Wu Pty Ltd dated November 1995 and Clive Lucas and Partners Pty Ltd dated July 1987. Where these two Plans conflict, the Plan prepared by Clive Lucas and Partners Pty Ltd shall take precedence. Additionally the heritage study prepared by Robert Moore Pty Ltd should also be consulted. Copies of these Plans are held by Ryde City Library.

2.2 Landscaping and Streetscape

- f. The visual quality of the site is created by the existing landscape features adjacent to Blaxland Road and Anzac Avenue alignments of the site, and the gardens and existing vegetation surrounding “Wollondilly” and “The Hermitage”. The garden of “The Hermitage” is also classified as a heritage item item by Council and the National Trust. The existing vegetation must be preserved in any development of the site, and the trees on adjoining sites shall not be adversely affected by any redevelopment of the site. The development is to be designed to maintain and enhance the streetscape presentation of the property that the existing vegetation provides. The location of significant trees are shown on the attached plan (Schedule 1 Figure 6.2.S2).

- g. The landscaping to be provided in the vicinity of "The Hermitage" is to be compatible and complementary to the existing landscaping in the curtilage of that building. The setback from the eastern-most wall of "The Hermitage" shall be landscaped with species that are sympathetic to the heritage significance of the original and existing plantings contained within "The Hermitage" garden and shall be fenced with traditional hardwood timber palings.
- h. A survey plan of the site prepared by a qualified surveyor shall be submitted with any local development application for redevelopment of the site. This plan shall accurately indicate the position of all existing trees on the site and the design for the site shall incorporate these trees wherever possible but shall, at the very minimum, include the retention of the following:-
 - i. The two (2) existing Blackbutt trees (*Eucalyptus pilularis*), and the surrounding stand of trees and vegetation along the Blaxland Road frontage shall be retained. Any buildings proposed to be located on the site shall be completely clear of the canopies of these trees.
 - ii. The three (3) Chinese Weeping Elm trees (*Ulmus parvifolia*) and the Lemon-Scented Gum tree (*Corymbia citriodora*) to the east of The Hermitage, the White Cedar tree (*Melia azedarach* var. *australasica*) and the Gossamer Wattle (*Acacia floribunda*), shall be retained as part of any redevelopment of the site.
- i. The above trees shall be suitably protected during construction works in accordance with a report to be prepared by a qualified arborist and submitted to Council with any local development application for the site.
- j. The five (5) Narrow-leaved Black Peppermint trees (*Eucalyptus nicholii*) on the nature strip in Anzac Avenue shall be retained and protected during the course of construction works in accordance with the above requirements.
- k. The existing landscape features are to be supplemented by additional planting to be provided in accordance with a landscape plan to be submitted to, and approved by, Council with any local development application for the site.

2.3 Restoration of The Hermitage

- l. No development is to take place on the site until the curtilage of "The Hermitage" is restored by demolition of buildings located on the land. Additionally and as mentioned above the restoration and subsequent development of "The Hermitage" must be undertaken in accordance with the Clive Lucas Stapleton and Partners Conservation Plan to the satisfaction of the Council.
- m. Consent must not be granted for development of the site unless a condition is included in the consent that requires "The Hermitage" to be restored in accordance with this Part and that an occupation certificate for the development on the site shall not be granted until the restoration of "The Hermitage" and its gardens are completed to the satisfaction of Council.
- n. A Heritage Agreement has been placed on the Title of the land, which addresses details regarding the restoration of "The Hermitage" The agreement takes the form of positive covenants and restrictions on the use of the land. Any reference in the agreement to DCP 26B is to be taken as a reference to this Part of DCP 2014.

2.4 Building Form and Height

- o. No buildings should exceed two floors in height above ground level (existing) or above basement level with a maximum number of dwellings in the R3 Medium Density Residential zone, being 32. Dwellings abutting the boundary with "The Hermitage" must not include dormer windows, gables or large skylights which facilitate undue overlooking of "The Hermitage" site, or create inappropriately complex, "historicism" rooflines.
- p. Basement parking levels should not mean that new buildings have a ground floor level more than 900mm above existing ground level.

- q. No new dwellings shall exceed or unduly compete with the height, scale and bulk of the main roof of "The Hermitage".

2.5 Setbacks from Boundaries

- r. Any buildings to be constructed on the Blaxland Road frontage are to maintain similar setbacks to the property adjoining at No. 358 Blaxland Road. Additionally a setback of at least three metres will need to be observed on the boundary adjoining 358 Blaxland Road to ensure privacy. It will also be necessary to ensure that no windows or balconies along this boundary overlook No. 358 Blaxland Road.
- s. Buildings on the Anzac Avenue frontage must be set back to ensure that the existing vegetation is not compromised during either construction or occupation.
- t. Buildings adjoining the curtiledge of "The Hermitage" must be set back at least 31.5m from the northeast corner of "The Hermitage".

2.6 Fencing

- u. The boundary between "The Hermitage" and any new development on the south-eastern portion of the site is to be fenced with traditional hardwood palings.
- v. The boundary to Anzac Avenue in the vicinity of any new development on the south-eastern portion of the site shall not be fenced.
- w. Any fencing proposed for the Blaxland Road frontage shall not have any adverse impact on the existing vegetation identified in the *Landscaping and Streetscape* section above (2.2) and shall be erected in accordance with the protection measures required for the existing vegetation in this area of the site.

2.7 Parking

- x. Parking for any residential redevelopment on the site should be provided on the following basis:
 - i. 1 car space per one or two bedroom dwelling;
 - ii. 2 car spaces per three or four bedroom dwelling; and
 - iii. 1 visitor car space per 4 dwellings.
- y. Any car parking area included in any development shall be designed in accordance with the provisions of Part 9.3 Parking Controls in this DCP and any fractional amounts shall be rounded up to the nearest whole number.

Note: Council would also support the provision of basement level parking which does not adversely affect existing vegetation rather than at grade parking spaces or areas. Below ground parking would maximise the amount of open space available around proposed buildings and minimise the amount of hard paved and building areas provided within the development.

However Council will not agree to basement parking which will raise the ground floor level of any new dwelling more than 900mm above finished adjacent external ground.

2.8 Access

- z. The vehicular access to the land zoned R3 Medium Density Residential and facing Blaxland Road is to be provided from Anzac Avenue but no closer than 18 metres to the intersection of Blaxland Road.
- aa. All driveways should be designed in accordance with Part 9.3 Parking Controls and in accordance with the requirements of Council's Development Engineers.

2.9 Density

- ab. In any development of the site the following densities shall apply:

DWELLING SIZE	SITE AREA REQUIRED PER DWELLING	LANDSCAPED AREA REQUIRED PER DWELLING
1 bedroom	70 m ²	30 m ²
2 bedroom	100 m ²	40 m ²
3 bedroom	130 m ²	50 m ²

2.10 Development at rear of "Wollondilly"

- ac. The land at the rear of "Wollondilly" which is zoned R3 Medium Density Residential must not be developed for more than eight town houses with a maximum of two floors.
- ad. The existing trees located between "Wollondilly" and the proposed development must be maintained. These trees shall be suitably protected during construction works in accordance with a report to be prepared by a qualified arborist and submitted to Council with any local development application for the site.
- ae. Any development of the land zoned R3 Medium Density Residential must be so designed as to ensure the privacy of adjoining properties. This will entail the placement of windows in such a way as to ensure that there is no overlooking. Balconies must also be placed in such a way as to ensure the privacy of adjoining properties.
- af. The historic house "Wollondilly" is an important part of the heritage of Ryde and any development at the rear of this building must ensure that the integrity of the building is not compromised. This can be achieved by ensuring that there is adequate setback and that the design of the town house development is such that it does not compete with "Wollondilly" in terms of design. The design should not attempt to replicate or imitate either "Wollondilly" or "The Hermitage" but rather complement both houses.

2.11 Services

2.11.1 Water and Sewerage

- ag. Development must not be carried out on the land until arrangements satisfactory to Sydney Water have been made for the provision of water and sewerage services to the land.

2.11.2 Stormwater Drainage

- ah. Arrangements are to be made for the proper management of stormwater drainage to Council's satisfaction so as to ensure that stormwater disposal can be effected without any adverse impact on other properties in the catchment area within which the land is situated. Drainage is to be in accordance with Part 8.2 Stormwater Management.
- ai. All stormwater facilities shall be located so that they do not adversely affect "The Hermitage" or "Wollondilly" or any tree identified in this Part. Stormwater facilities shall also be located so that they do not interfere with any archaeological evidence discovered on the site as required by this Part.

2.11.3 Land Contamination

- aj. Council must be satisfied that any land contamination detected on the site has been remediated to the requirements of the Environment Protection Authority. A field investigation of the site shall be carried out by a qualified geotechnical engineer. The results of this investigation shall be lodged with the Local Development Application for the site. Any remediation works shall be undertaken prior to the approval of the Construction Certificate for the site. This work shall also be carried out in accordance with the requirements for an archaeological dig on the site as referred to above.

Refer also to Council's adopted *Contaminated Land Policy*.

SCHEDULES

Schedule 1 - Maps

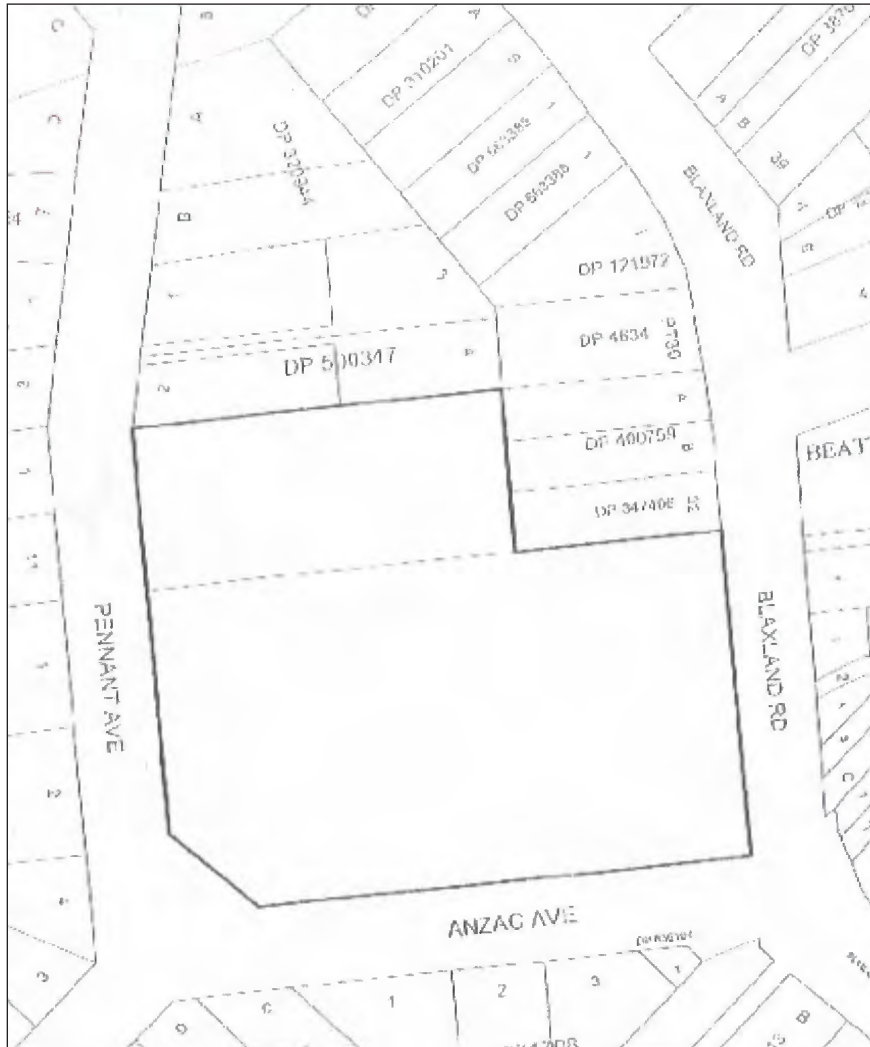


Figure 6.2.1 Location Map

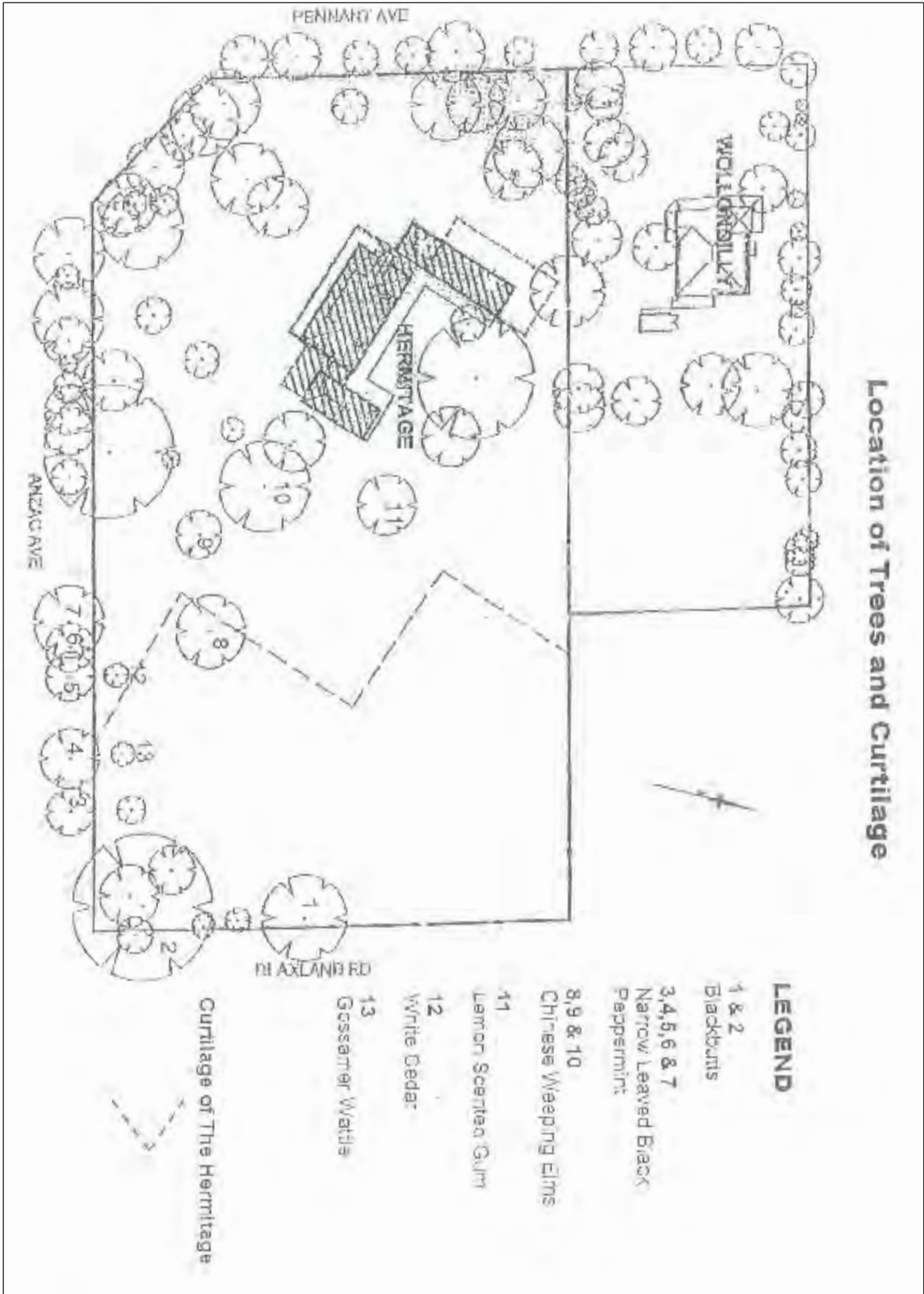


Figure 6.2.2 Location of Trees and Curtilage

THIS PAGE HAS BEEN
INTENTIONALLY LEFT BLANK



City of Ryde
Civic Centre
1 Devlin Street
Ryde NSW 2112

www.ryde.nsw.gov.au

City of Ryde Development Control Plan 2014

Part: 6.3 Second Avenue (9-19) Eastwood

Translation

ENGLISH

If you do not understand this document please come to Ryde Civic Centre, 1 Devlin Street, Ryde Monday to Friday 8.30am to 4.30pm or telephone the Telephone and Interpreting Service on 131 450 and ask an interpreter to contact the City of Ryde for you on 9952 8222.

ARABIC

إننا نعتذر عليك فهم محتويات هذه الوثيقة، نرجو للحضور إلى مركز بلدية رايد Ryde Civic Centre على العنوان: 1 Devlin Street, Ryde 1 من الاثنين إلى الجمعة بين الساعة 8.30 صباحاً والساعة 4.30 بعد الظهر أو الاتصال بمكتب خدمات الترجمة على الرقم 131 450 لكي تطلب من أحد المترجمين الاتصال بمجلس مدينة رايد، على الرقم 9952 8222، نيابة عنك.

ARMENIAN

Եթէ այս գրութիւնը չէք հասկնար, խնդրեմ եկէ՛ք՝ Րայդ Սիվիք Սենթըր, 1 Տելվին փողոց, Րայդ, (Ryde Civic Centre, 1 Devlin Street, Ryde) Երկուշաբթիէն Ուրբաթ կ.ա. ժամը 8.30 – կ.ե. ժամը 4.30, կամ հեռաձայնեցէ՛ք Հեռաձայնի եւ Թարգմանական Սպասարկութեան՝ 131 450, եւ խնդրեցէ՛ք որ թարգմանիչ մը Րայդ Քաղաքապետարանին հետ կապ հաստատուէ ձեզի համար, հեռաձայնելով՝ 9952 8222 թիվի:

CHINESE

如果您看不懂本文，請在周一至周五上午 8 時 30 分至下午 4 時 30 分前往 Ryde 市政中心詢問 (Ryde Civic Centre, 地址: 1 Devlin Street, Ryde)。你也可以打電話至電話傳譯服務中心，電話號碼是: 131 450。接通後你可以要求一位傳譯員為你打如下電話和 Ryde 市政廳聯繫，電話是: 9952 8222。

FARSI

اگر این مدرک را نمی فهمید لطفاً از 8.30 صبح تا 4.30 بعد از ظهر دوشنبه تا جمعه به مرکز شهرداری رايد، Ryde Civic Centre, 1 Devlin Street, Ryde مراجعه کنید یا به سرویس مترجم تلفنی، شماره 131 450 تلفن بزنید و از یک مترجم بخواهید که از طرف شما با شهرداری رايد شماره 9952 8222 تلفن بزند.

ITALIAN

Se non capite il presente documento, siete pregati di rivolgervi al Ryde Civic Centre al n. 1 di Devlin Street, Ryde, dalle 8.30 alle 16.30, dal lunedì al venerdì; oppure potete chiamare il Telephone Translating and Interpreting Service al 131 450 e chiedere all'interprete di contattare a vostro nome il Municipio di Ryde presso il 9952 8222.

KOREAN

이 문서가 무슨 의미인지 모르실 경우에는 1 Devlin Street, Ryde 에 있는 Ryde Civic Centre 로 오시거나 (월 – 금, 오전 8:30 – 오후 4:30), 전화 131 450 번으로 전화 통역 서비스에 연락하셔서 통역사에게 여러분 대신 Ryde 시청에 전화 9952 8222 번으로 연락을 부탁드립니다.

Amend. No.	Date approved	Effective date	Subject of amendment

Table of Contents

CONTENTS

1.0 INTRODUCTION	4
1.1 Land to which this Part applies	4
1.2 Objectives of this Part	5
1.3 Purpose of this Part	5
2.0 DEVELOPMENT CONTROLS	6
2.1 Consolidation	6
2.2 Density	7
2.3 Dwelling Mix	7
2.4 Streetscape	8
2.5 Building Form	9
2.6 Setbacks	9
2.6.1 Front Setbacks	10
2.6.2 Side and Rear Setbacks	11
2.6.3 Internal Setbacks	11
2.7 Privately Owned Public Open Space	11
2.8 Private Outdoor Space	12
2.9 Landscaping	13
2.10 Overshadowing and Access to Sunlight	13
2.11 Visual and Acoustic Privacy	14
2.12 Car Parking	14
2.13 Accessibility	15
2.14 Stormwater Management	15
2.15 Waste Minimisation and Management	15

1.0 INTRODUCTION

1.1 Land to which this Part applies

This part applies to land contained in:

- Lots 77 to 79, DP 4684;
- Lot B and part of Lot C, DP 341289;
- Lot B and part of Lot A, DP 342511;
- Lot B, DP 365296;
- Lot A and B, DP 386523; and
- Lot 1, DP 455457.

The land to which this Part applies is shown on Figure 6.3.1.



Figure 6.3.1 Land to which this Part Applies

1.2 Objectives of this Part

The objectives of this Part are:

1. To ensure the economic use and development of the land (to which this Part applies) for residential purposes.
2. To create high quality well used publicly accessible open space that is overlooked by buildings and pedestrian ways.
3. To promote development that is compatible with surrounding residential development.
4. To maintain appropriate residential amenity to existing adjoining and surrounding residential developments.
5. To provide safe well used pedestrian access to the site and within the site.
6. To provide safe and convenient vehicular access and servicing of the site.
7. To implement Ryde Council's resolution (b) of 11 October 2011 (ITEM 4) as follows:

That Council enter into a Deed of Agreement with the Ryde-Eastwood Leagues Club Limited to require a master plan to be prepared for the site(s) in the event of the land being developed for housing. Such a plan is to allocate 10% of the total site area to be publicly accessible open space. The Deed of Agreement is to be registered against the land title of all the following parcels of land:

- LOT 1 in DP 455457;
- LOT A in DP 386523;
- LOTS 77, 78 and 79 in DP 4684;
- LOT B in DP 342511;
- LOT B in DP 341289; and
- LOT B in DP 365296.

1.3 Purpose of this Part

The purpose of this DCP Part is to provide guidance on:

- giving effect to the aims and objectives of *Ryde Local Environmental Plan 2014*;
- facilitating development that is permissible under that *Plan*; and

This Part has been prepared to provide guidance for the design and assessment of any application to be submitted for the redevelopment of the land to which it applies.

The controls contained in this Part are not focussed on compliance with numerical requirements, but are predicated on achieving the objectives specified for various design elements.

These controls are based on development outcomes which relate to:

- the character of the streets in this locality;
- achieving desired development outcomes; and
- achieving a desirable streetscape presentation,

and are to be applied flexibly to achieve the desired urban design outcome for the redevelopment of the land.

2.0 DEVELOPMENT CONTROLS

This section provides controls designed to guide the redevelopment of the land to which this Part applies and to ensure that:

- Development is appropriately designed to be compatible with and have a satisfactory interface with surrounding residential development;
- Development does not have any adverse effect on the amenity enjoyed by residents of surrounding properties;
- Development provides satisfactory and desirable streetscapes in both Second Avenue and Young Parade; and
- Privately owned public space is implemented adjacent to the corner of Second Avenue and Young Parade.
- The development controls promote an appropriate degree of flexibility in applying certain development standards to the development,
- The development controls achieve better outcomes for and from development by allowing flexibility in particular circumstances.

2.1 Consolidation

Objectives

1. To ensure the development is carried out as a single fully planned and integrated complex.
2. To meet the aims of the *Metropolitan Plan for Sydney 2036* to locate 80% of all new housing within walking catchments of existing centres with good public transport.

Controls

- a. The allotments comprising the land to which this Part applies should be consolidated to form a single allotment.
- b. Once consolidated, the land will not be re-subdivided unless the subdivision:
 - i. is by way of strata title under the *Strata Schemes (Freehold Development) Act 1973*; and
 - ii. identifies the privately owned public open space within the common property of the proposed strata scheme.

2.2 Density

Objectives

1. To create a balanced relationship between the site area, dwelling size and residential population living on the site.
2. To ensure the economic use and development of the land for residential purposes in terms of area and opportunities available for its redevelopment and to facilitate the establishment of public open space on the land.

Controls

- a. Development on the land must not exceed a floor space ratio of 0.5:1.
- b. Where multi dwelling housing is proposed:
 - i. A master plan is to be prepared for the site that illustrates how this DCP is implemented including the location and quantum of privately owned public space.
 - ii. Provide 645m² privately owned public space on the corner of Young Parade and Second Avenue (Refer 2.5 Privately Owned Public Space).
 - iii. A maximum of 31 dwellings is permitted.
 - iv. The maximum site coverage for dwellings is 40% calculated at the time of the development application.

Note: For the purposes of calculating site coverage the land that is to be provided as privately owned public space may be included as unbuilt upon land.

2.3 Dwelling Mix

Objectives

1. To create a balanced relationship between the site area, dwelling size and residential population living on the site.
2. To ensure the economic use and development of the land for residential purposes
3. To ensure multi dwelling housing developments contain a mix of dwelling sizes to meet the needs of different household groups.

Controls

- a. Where multi dwelling housing is proposed not more than 80% of dwellings should have the same number of bedrooms.

Note: Information regarding the % breakdown of dwelling size by number of bedrooms is to be included with the development application.

2.4 Streetscape

Objectives

1. To ensure that the development is designed and constructed to complement and enhance the existing streetscape of the locality.
2. To provide interest and variation in the appearance of the development and enhance and complement the existing streetscapes.
3. To ensure a satisfactory presentation of buildings to the street, with dwellings facing the street, wherever possible, to enable casual surveillance from living rooms and verandas to the street, internal driveways, public spaces and public parks.

Controls

- a. The development should be compatible in scale and form with the established streetscape patterns along both Second Avenue and Young Parade.
- b. Dwellings adjacent to the Second Avenue and Young Parade boundary should be oriented toward the street and to the privately owned public open space.
- c. Direct access from the street should be provided to the dwellings fronting both Second Avenue and Young Parade.
- d. The existing sandstone wall along the Second Avenue boundary should be retained to a maximum of 1.5 metres in height above the adjoining footpath level to provide a front fence for the dwellings fronting Second Avenue.
- e. The sandstone fence should be punctuated to provide direct pedestrian access to each dwelling fronting Second Avenue.

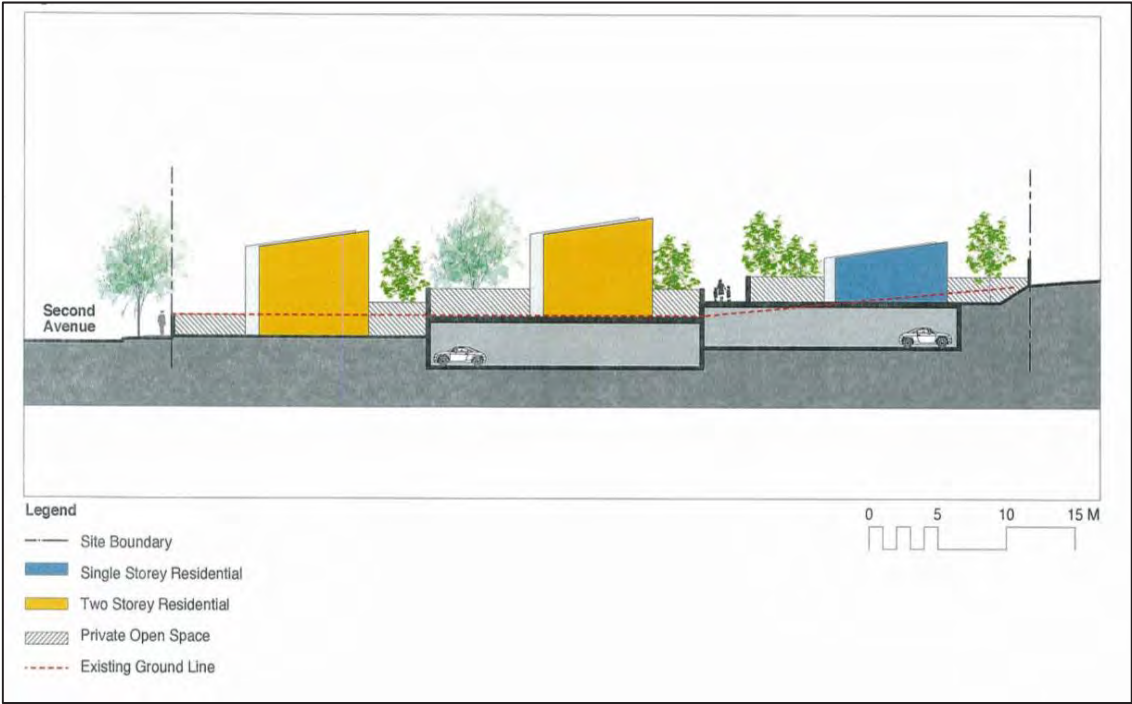


Figure 6.3.2 Ground Plane Section

2.5 Building Form

Objectives

1. To ensure the scale of development is related to the character and streetscape of the surrounding area.
2. To ensure compliance with height controls under *Ryde Local Environmental Plan 2014*.
3. To ensure privacy of adjoining development.
4. To ensure maximum opportunity for natural light and ventilation through the dwellings.

Controls

- a. The design of the development should be modulated to provide a built form transition to adjoining residential properties and articulated to provide visual interest.
- b. All buildings are to have a maximum depth dimension of 12 metres.
- c. Where multi dwelling housing development is proposed, dwellings fronting Second Avenue and Young Parade (including the privately owned public space) should not exceed two (2) storeys and a building height of 8 metres, in accordance with requirements for multi dwelling housing under *Ryde Local Environmental Plan 2014* Clause 4.3(2A)(a).
- d. Dwellings adjacent to the land's common boundary with 14-18 Third Avenue should not exceed one (1) storey in height and a building height of 5 metres.
- e. Where multi dwelling housing is proposed, the remainder of the dwellings on the land should not exceed two (2) storeys in height and a building height of 5.0 metres measured from the ground level, as provided for in *Ryde Local Environmental Plan 2014*. Flexibility in the style of roof forms may be considered for dwellings in order to achieve maximum height requirements.
- f. A ground plane section demonstrating indicative building heights relative to existing ground levels is contained in Figure 6.3.2.
- g. A minimum floor to ceiling height of 2.7m should be provided within dwellings.
- h. Figure 6.3.3 indicates the built form plan for development on the land.

Note: Under Ryde LEP 2014, "building height" is defined as follows:

building height (or **height of building**) means the vertical distance between ground level (existing) and the highest point of the building.

2.6 Setbacks

Objectives

1. To allow sufficient building separation within the development and with adjoining properties to ensure privacy.
2. To allow for substantial landscaping and pervious areas.
3. To ensure the development is in keeping with the existing streetscape.
4. To ensure that the density of development to be permitted can be achieved.

2.6.1 Front Setbacks

Controls

- a. The setbacks of dwellings from streets and privately owned public space must be in accordance with Figure 6.3.3.



Figure 6.3.3 Building Form Plan

2.6.2 Side and Rear Setbacks

Controls

- a. The walls of dwellings adjacent to the land's eastern common boundary with 21 Second Avenue should be setback 4 metres minimum from that boundary. Habitable rooms, balconies and upper levels must be setback a minimum of 4.5 metres.
- b. Walls at the first floor level of buildings adjacent to the eastern boundary which contain windows to habitable rooms, (such as living rooms and kitchens), and balconies should be setback 4.5m minimum from the boundary.
- c. The walls of dwellings adjacent to the land's southern common boundary with 14-18 Third Avenue should be setback a minimum of 6m.
- d. Development should be designed to maintain the appropriate spatial separation, privacy and amenity to adjoining residential properties.
- e. The setbacks required of dwellings is indicated on Figure 6.3.3.

2.6.3 Internal Setbacks

Controls

- a. The development should be designed so that the windows of habitable rooms of one dwelling do not overlook habitable room windows of another dwelling.
- b. A minimum of 9m separation should be provided between the windows of habitable rooms of facing dwellings within the site.

2.7 Privately Owned Public Open Space

Objectives

1. To provide public open space on the land as part of its redevelopment.
2. To enable the development design to be integrated with the public open space.
3. To improve the public domain areas surrounding the site.

Controls

- a. Privately owned public open space with a minimum area of 645m² is to be provided at the intersection of Second Avenue and Young Parade in accordance with Figure 6.3.4.
- b. Privately owned public open space is to have a minimum dimension of 18m in any direction.
- c. The privately owned public open space must be accessible to the public at all times.
- d. The privately owned public open space is to be developed in accordance with a landscape plan that is to be submitted and approved by Council prior to the commencement of any works on the site (including demolition). The landscape design must reflect Safer by Design Principles.
- e. The privately owned public open space must be complete and ready for public access prior to any occupation or any issue of a subdivision certificate (whichever occurs first).
- f. The privately owned public open space is to be provided as a deep soil zone.



Figure 6.3.4 Location of Privately owned Publicly Accessible Open Space

2.8 Private Outdoor Space

Objectives

1. To provide private outdoor spaces that are functional and relate to the activity areas of the dwelling.
2. To ensure all private outdoor spaces receive satisfactory access to sunlight.

Controls

- a. Primary private outdoor areas should provide the following minimum areas:
 - i. 30m² for 2 bedroom dwelling; and
 - ii. 35m² for 3 or more bedroom dwelling.
- b. Primary private outdoor space should have a minimum dimension of 4m and should generally coincide with the level of the living room in the dwelling.
- c. Primary private outdoor space should be orientated or be sufficiently large enough so that sunlight to at least 50% of the area is achieved for 2 hours between 9am and 3pm on June 21.
- d. Primary private outdoor space should be securely enclosed (fences and gates), clearly visible from the living areas of the dwelling to enable young children to play in a safe environment.

- e. Fencing adjacent to internal pedestrian ways is to be designed to be 1m high if solid and 1.5m high maximum if transparent. Height is to be measured from the pedestrian walkway.
- f. A minimum 1.2m wide landscaped privacy strip should be provided adjacent to the land's common boundary with adjoining properties.

2.9 Landscaping

Objectives

1. To ensure the landscaping of the site complements or enhances the desired future neighbourhood character by:
 - i. providing sufficient open space for planting trees and shrubs;
 - ii. retaining, protecting, or replacing, existing vegetation where possible; and
 - iii. protecting neighbouring trees from damage to their root systems.
2. Landscaping designs should seek to:
 - i. ensure that trees and shrubs will have a softening effect on buildings and the overall environment and trees should be planted in sufficient numbers and scale to achieve this aim;
 - ii. give privacy to occupants and neighbouring properties;
 - iii. be easily maintained;
 - iv. use native plant material, particularly material indigenous to the area; and
 - v. provide for sufficient depth of soil to support the long term viability of the landscaping.

Controls

- a. A Landscape Concept Plan is to be submitted with the development application.
- b. A final landscape plan is to be submitted and approved prior to the issue of the Construction Certificate.
- c. Landscaping should include a watering system that meets current Sydney Water usage requirements, to assist in the establishment and maintenance of the landscaping.
- d. Landscaping, including for publicly accessible open space area, is to be completed prior to the dwellings being occupied.

2.10 Overshadowing and Access to Sunlight

Objectives

1. To ensure buildings are sited and designed to maximise access to daylight to habitable rooms.
2. To ensure daylight to habitable rooms in neighbouring dwellings is not significantly reduced.
3. To maximise winter sunlight to courtyards within the site and the open space areas and roof areas of neighbouring dwellings.

Controls

- a. Habitable room windows should face a courtyard or other outdoor space which is open to the sky. Habitable room windows should be no closer than 1.5 m (horizontal distance) from the wall of a building.
- b. Sunlight to at least 50% of each courtyard within the development and the principal area of ground level private open space of adjacent properties should not be reduced to less than 2 hours between 9am and 3pm on June 21. Where existing overshadowing by buildings and fences is greater than this on adjoining properties, sunlight should not be further reduced by more than 20%.
- c. The proposed development should not overshadow the roof areas of adjoining development.
- d. Shadowing diagrams are to be submitted to Council with the development application indicating solar access within the development and to adjoining properties. Fences and existing vegetation maybe required to be provided on the shadow diagram where Council considers it necessary.
- e. Dwellings should have a maximum depth of 12m to facilitate natural ventilation and daylight access.

2.11 Visual and Acoustic Privacy

Objectives

1. To ensure that direct overlooking of main internal living areas and private open spaces of other dwellings both within the development and adjoining is minimised by the design of windows, screening devices and/or landscaping.

Controls

- a. Direct overlooking of private outdoor areas and/or living rooms of adjoining residential properties should be prevented by fixed screening, landscaping, spatial separation or a combination of these elements. Details of all such treatments, including locations and dimensions of screening, are to be included on the plans and elevations submitted with the development application.

2.12 Car Parking

Objectives

1. To provide sufficient car parking on-site to satisfy the needs of the residents and visitors to the site.

Controls

- a. Except as provided in this part, on-site parking is to be provided in accordance with the requirements of Part 9.3 Parking Controls in this DCP.
- b. Parking is to be provided in a basement level under the complex if the density is greater than 300 m² site area per dwelling.
- c. All vehicular access is to be provided from Second Avenue, and designed so as to minimise conflict with pedestrians.

2.13 Accessibility

Objectives

1. To ensure that the development meets the needs of all households including older persons and people with disabilities.

Controls

- a. The development should be designed and constructed so that dwellings are safe and accessible for pedestrians, including children, people with disabilities and older people.
- b. Pedestrian access should be provided throughout the development using a continuous accessible path of travel to all dwellings where the level of the land permits. Such access where practicable should be separate from vehicle access.
- c. Dwellings which have been designed in accordance with AS 4299 (Australian Standard: AS4299-1995 Adaptable Housing) should be able to access the street, car parking and common areas using a continuous path of travel.
- d. An access audit of development should be conducted by a qualified and accredited access auditor.

2.14 Stormwater Management

Objectives

1. To provide an acceptable means of controlling stormwater runoff from properties that will not cause nuisance or damage to other private or council properties.

Controls

- a. A stormwater management system is to be provided in accordance with the requirements of Part 8.2 Stormwater Management provisions under this DCP.

2.15 Waste Minimisation and Management

Objectives

1. To provide a storage area for rubbish and recycle bins which has minimal visual impact on adjoining dwellings, the streetscape and within the development.

Controls

- a. The storage, management and collection of waste is to be in accordance with the requirements of Part 7.2 Waste Minimisation and Management under this DCP.
- b. A central garbage bin enclosure should be provided.
- c. The garbage bin enclosure should be located behind the building line and suitably screened by landscaping. A plan indicating the design and location of the garbage bin enclosure should be submitted with the development application.



City of Ryde
Civic Centre
1 Devlin Street
Ryde NSW 2112

www.ryde.nsw.gov.au

City of Ryde Development Control Plan 2014

Part: 6.4 Blaxland Road (283 – 289) Ryde

Translation

ENGLISH

If you do not understand this document please come to Ryde Civic Centre, 1 Devlin Street, Ryde Monday to Friday 8.30am to 4.30pm or telephone the Telephone and Interpreting Service on 131 450 and ask an interpreter to contact the City of Ryde for you on 9952 8222.

ARABIC

إننا نعتذر عليك فهم محتويات هذه الوثيقة، نرجو للحضور إلى مركز بلدية رايد Ryde Civic Centre على العنوان: 1 Devlin Street, Ryde من الاثنين إلى الجمعة بين الساعة 8.30 صباحاً والساعة 4.30 بعد الظهر أو الاتصال بمكتب خدمات الترجمة على الرقم 131 450 لكي تطلب من أحد المترجمين الاتصال بمجلس مدينة رايد، على الرقم 9952 8222، نيابة عنك.

ARMENIAN

Եթէ այս գրութիւնը չէք հասկնար, խնդրեմ եկէք՝ Բայր Սիվիլ Ենթըր, 1 Տելվին փողոց, Բայր, (Ryde Civic Centre, 1 Devlin Street, Ryde) Երկուշաբթիէն Ուրբաթ կ.ա. ժամը 8.30 – կ.ե. ժամը 4.30, կամ հեռաձայնեցէք Հեռաձայնի եւ Թարգմանական Սպասարկութեան՝ 131 450, եւ խնդրեցէք որ թարգմանիչ մը Բայր Քաղաքապետարանին հետ կապ հաստատուէ ձեզի համար, հեռաձայնելով՝ 9952 8222 թիվին:

CHINESE

如果您看不懂本文，請在周一至周五上午 8 時 30 分至下午 4 時 30 分前往 Ryde 市政中心詢問 (Ryde Civic Centre, 地址: 1 Devlin Street, Ryde)。你也可以打電話至電話傳譯服務中心，電話號碼是: 131 450。接通後你可以要求一位傳譯員為你打如下電話和 Ryde 市政廳聯繫，電話是: 9952 8222。

FARSI

اگر این مدرک را نمی فهمید لطفاً از 8.30 صبح تا 4.30 بعد از ظهر دوشنبه تا جمعه به مرکز شهرداری رايد، Ryde Civic Centre, 1 Devlin Street, Ryde مراجعه کنید یا به سرویس مترجم تلفنی، شماره 131 450 تلفن بزنید و از یک مترجم بخواهید که از طرف شما با شهرداری رايد شماره 9952 8222 تلفن بزند.

ITALIAN

Se non capite il presente documento, siete pregati di rivolgervi al Ryde Civic Centre al n. 1 di Devlin Street, Ryde, dalle 8.30 alle 16.30, dal lunedì al venerdì; oppure potete chiamare il Telephone Translating and Interpreting Service al 131 450 e chiedere all'interprete di contattare a vostro nome il Municipio di Ryde presso il 9952 8222.

KOREAN

이 문서가 무슨 의미인지 모르실 경우에는 1 Devlin Street, Ryde 에 있는 Ryde Civic Centre 로 오시거나 (월 – 금, 오전 8:30 – 오후 4:30), 전화 131 450 번으로 전화 통역 서비스에 연락하셔서 통역사에게 여러분 대신 Ryde 시청에 전화 9952 8222 번으로 연락을 부탁드립니다.

Amend. No.	Date approved	Effective date	Subject of amendment

Table of Contents

1.0	INTRODUCTION	5
1.1	Objectives of this Part	5
1.2	Land to which this Part applies	5
2.0	DEVELOPMENT CONTROLS	6
2.1	Design Quality	6
2.2	Height and Density	6
2.3	Siting and Design	6
2.4	Streetscape	6
2.5	Setback from Boundaries	7
2.6	Solar Access	7
2.7	Access	7
2.8	Stormwater Management	7
2.9	Car Parking	7
2.10	Tree Preservation	7
2.11	Waste Minimisation and Management	7

THIS PAGE HAS BEEN
INTENTIONALLY LEFT BLANK

1.0 INTRODUCTION

1.1 Objectives of this Part

Objectives

The objectives of this Part are:

1. To provide appropriate development control and design quality principles for the redevelopment of the site;
2. To ensure that the future development of the land appropriately responds to the zone boundary interface and is compatible with existing adjoining development; and
3. To maintain appropriate residential amenity to existing adjoining development.

1.2 Land to which this Part applies

This Part applies to the land in Lot 20, DP 565527, No. 283 - 289 Blaxland Road, Ryde.

2.0 DEVELOPMENT CONTROLS

This section provides detailed planning controls for the subject site that will ensure that future development is of high design quality. The controls will also minimise negative amenity impacts on adjoining and adjacent properties.

2.1 Design Quality

- a. A residential flat building to be erected on the land shall be designed in accordance with the Design Quality Principles of State Environmental Planning Policy No. 65 – Design Quality of Residential Flat Development and the associated Residential Flat Design Code.

2.2 Height and Density

- b. The development to be erected on the land shall have a maximum building height of 11.5 metres being the maximum height shown for the land on the *Height of Buildings Map of Ryde Local Environmental Plan 2014*.
- c. The building height of development on the land shall be distributed across the site generally as nominated on the attached plans (Figure 6.4.01 and 6.4.02).
- d. The maximum floor space ratio for a building on the land shall not exceed 1.0:1 being the floor space ratio shown for the land on the *Floor Space Ratio Map of Ryde Local Environmental Plan 2014*.

Note: “building height” means the vertical distance between ground level (existing) and the highest point of the building, including plant and lift overruns, but excluding communication devices, antennae, satellite dishes, masts, flagpoles, chimneys, flues and the like.

2.3 Siting and Design

- e. Development shall be designed and sited to maintain appropriate spatial separation, privacy and amenity to the adjoining residential properties.
- f. The siting of any development on the land shall be consistent with that depicted on the attached plan (Figure 6.4.01).
- g. Direct overlooking of private open space areas and / or living rooms of adjoining residential properties shall be prevented by building layout, fixed screening devices, landscaping, greater spatial separation or a combination of these elements.

2.4 Streetscape

- h. The development of the land must be compatible with the established streetscape patterns along Kulgoa Avenue and Blaxland Road.
- i. The streetscape and residential amenity is to be enhanced through landscaping, incorporating canopy tree plantings, along both street frontages.
- j. The height and scale of the development is to be modulated to provide for an appropriate built form transition to the adjoining residential properties along Kulgoa Avenue as depicted on the attached plans (Figure 6.4.01 and 6.4.02).
- k. The development must be suitably articulated along Kulgoa Avenue and Blaxland Road to provide visual interest. This is to be achieved through careful consideration of scale, proportions, rhythm, building materials and the location of entry points, windows and balconies.

2.5 Setback from Boundaries

- l. The development of the land shall generally maintain the front, side and rear boundary setbacks as nominated on the attached plan (Figure 6.4.01).
- m. Appropriate intervening landscape treatments shall be provided within the side and rear setback areas to soften and screen the development when viewed from adjoining residential properties.
- n. The development must allow for adequate building modulation and articulation along rear and side boundaries to reduce visual bulk when viewed from adjoining properties.

2.6 Solar Access

- o. The development of the land shall not reduce solar access to the living rooms and private open space areas of adjoining residential development to less than 3 hours of sunlight between 9am and 3pm in mid winter.

2.7 Access

- p. Vehicular access is to be provided from Kulgoa Avenue.

2.8 Stormwater Management

- q. A stormwater management system is to be provided in accordance with the requirements of Part 8.2 Stormwater Management of this DCP.

2.9 Car Parking

- r. Car parking is to be designed and provided in accordance with Part 9.3 Parking Controls of this DCP.

2.10 Tree Preservation

- s. Development is to comply with the Part 9.5 Tree Preservation provisions of this DCP.

2.11 Waste Minimisation and Management

- t. The storage, management and collection of waste is to be in accordance with the requirements of Part 7.2 Waste Minimisation and Management provisions of this DCP.

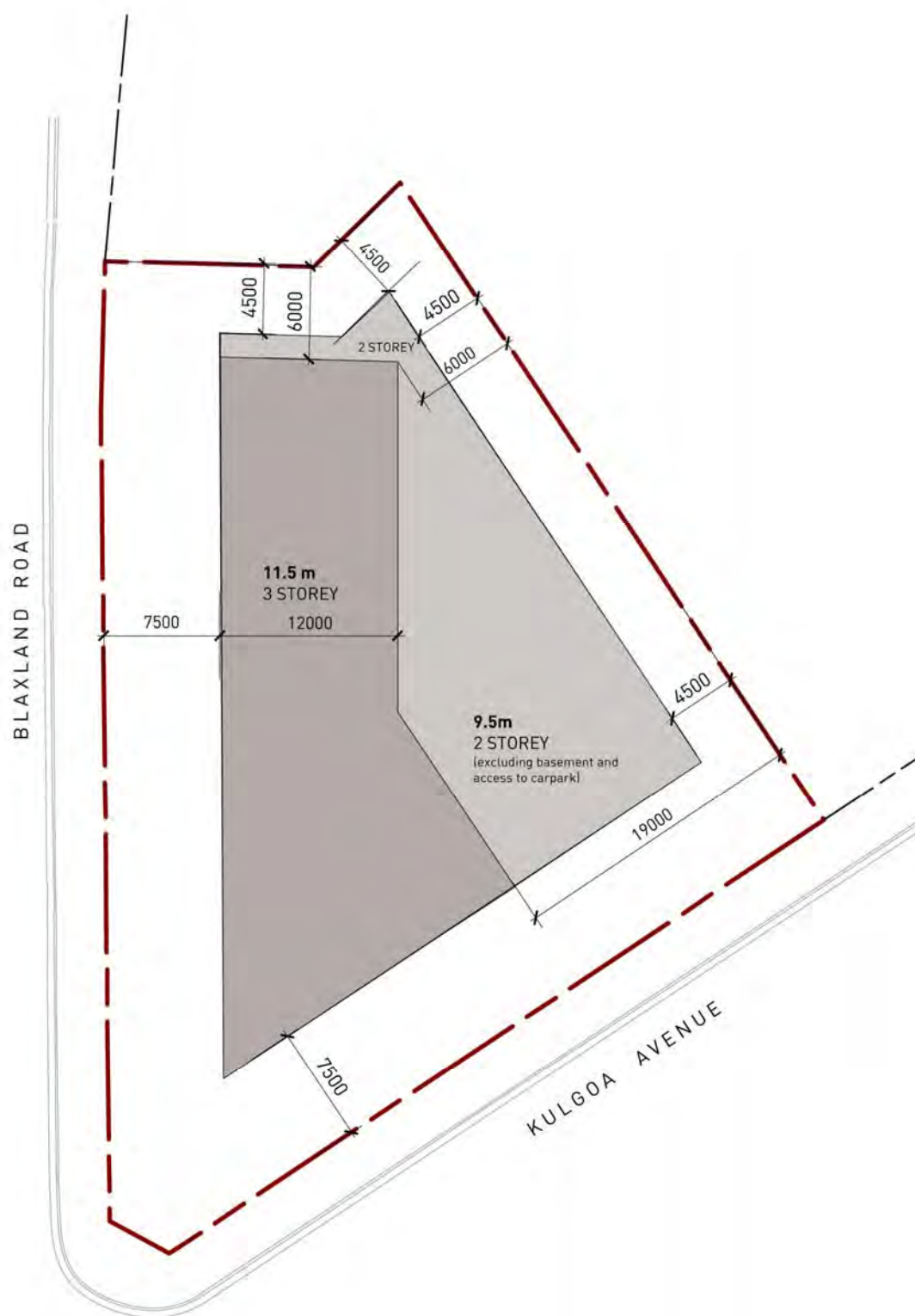


Figure 6.4.01 Height and Setbacks Diagram

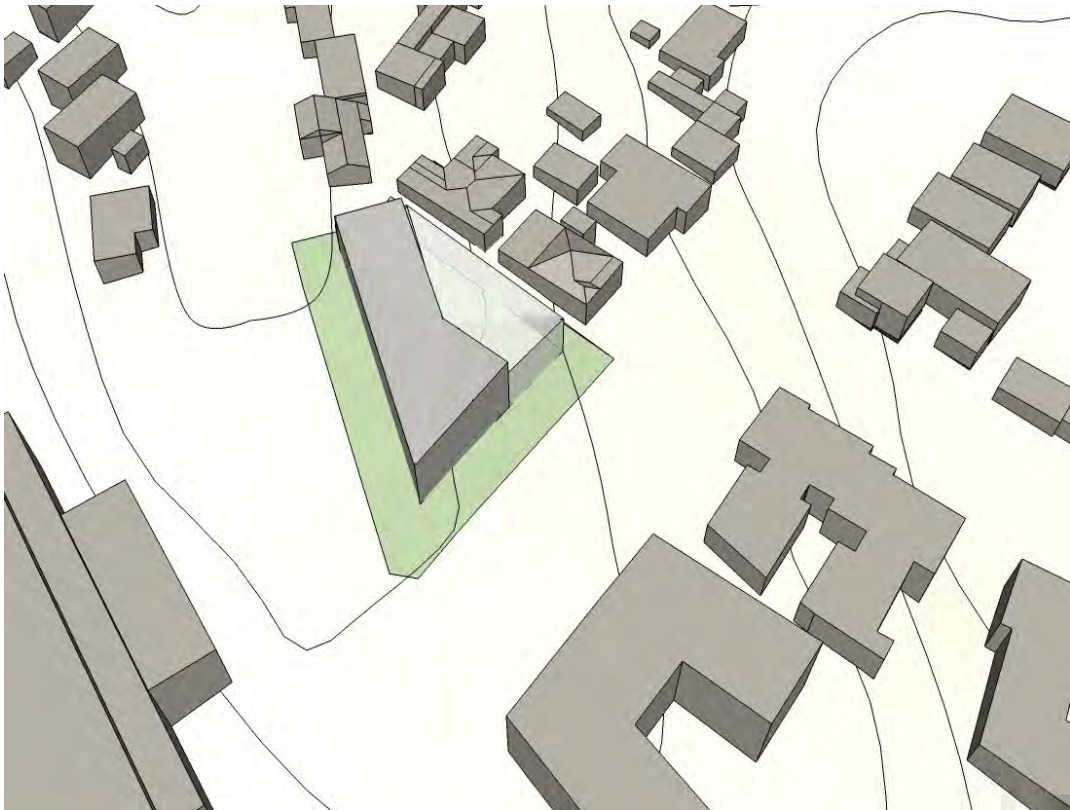


Figure 6.4.02 3D Building Envelope Diagrams



City of Ryde
Civic Centre
1 Devlin Street
Ryde NSW 2112

www.ryde.nsw.gov.au

City of Ryde Development Control Plan 2014

Part: 6.5
461-495 Victoria Road, Gladesville

Translation

ENGLISH

If you do not understand this document please come to Ryde Civic Centre, 1 Devlin Street, Ryde Monday to Friday 8.30am to 4.30pm or telephone the Telephone and Interpreting Service on 131 450 and ask an interpreter to contact the City of Ryde for you on 9952 8222.

ARABIC

إذا لم تفهم هذا المستند، يرجى الحضور إلى مركز بلدية رايد Ryde Civic Centre، 1 Devlin Street، Ryde، من الاثنين إلى الجمعة بين الساعة 8.30 صباحاً والساعة 4.30 بعد الظهر، أو الاتصال بمكتب خدمات الترجمة على الرقم 131 450 لكي يتصل أحد المترجمين الاتصال بمجلس مدينة رايد، على الرقم 9952 8222، نيابة عنك.

ARMENIAN

Եթե այս փաստաթուղթը չէք հասկանալ, խնդրեմ եկե՛ք՝ Րայդ Բիվիկ Սենտրը, 1 Devlin Street, Ryde, (Ryde Civic Centre, 1 Devlin Street, Ryde) Երկուշաբթի՛ն Ուրբաթ կա. ժամը 8.30 – կէ. ժամը 4.30, կա՛մ հեռաձայնեցե՛ք հեռաձայնի եւ Թարգմանության Ապաստարաններ՝ 131 450, եւ խնդրեցե՛ք որ թարգմանիչ մը Րայդ Թաղապետարանին հետ կապ հաստատի՝ ձեզի համար, հեռաձայնելով՝ 9952 8222 թիվին:

CHINESE

如果您看不懂本文，請在周一至周五上午 8 時 30 分至下午 4 時 30 分前往 Ryde 市政中心詢問 (Ryde Civic Centre, 地址: 1 Devlin Street, Ryde)。你也可以打電話至電話傳譯服務中心，電話號碼是: 131 450。接過後你可以要求一位傳譯員為你打如下電話和 Ryde 市政廳聯繫，電話是: 9952 8222。

FARSI

اگر این مدرک را نمی فهمید لطفاً از 8.30 صبح تا 4.30 بعد از ظهر دوشنبه تا جمعه به مرکز شهرداری رايد، Ryde Civic Centre, 1 Devlin Street، Ryde مراجعه کنید یا به سرویس مترجم تلفنی شماره 131 450 تلفن کنید و از یک مترجم بخواهید که او طرف شما را شهرداری رايد شماره 9952 8222 تلفن کند.

ITALIAN

Se non capite il presente documento, siete pregati di rivolgervi al Ryde Civic Centre al n. 1 di Devlin Street, Ryde, dalle 8.30 alle 16.30, dal lunedì al venerdì; oppure potete chiamare il Telephone Translating and Interpreting Service al 131 450 e chiedere all'interprete di contattare a vostro nome il Municipio di Ryde presso il 9952 8222.

KOREAN

이 문서가 무슨 의미인지 모르실 경우에는 1 Devlin Street, Ryde 에 있는 Ryde Civic Centre 로 오시거나 (월 – 금, 오전 8:30 – 오후 4:30), 전화 131 450 번으로 전화 통역 서비스에 연락하셔서 통역사에게 여러분 대신 Ryde 시청에 전화 9952 8222 번으로 연락을 부탁하십시오.

Amend #	Date Approved	Effective date	Subject of Amendment
	28/04/2015	Upon Notification of Ryde LEP (amendment 5) 461-495 Victoria Road	This new DCP Part 6.5 was included in the Ryde DCP in response to the Planning Proposal to change the land use zone from IN2 to B5 and to introduce new height controls in the Ryde LEP, that would enable a Bunnings / bulky goods development on the site

Contents

1.0	INTRODUCTION	4
1.1	Objectives of this Part	4
1.2	Land to which this Part applies	4
1.3	Purpose of this Part	4
2.0	DESIGN QUALITY	9
2.1	Built Form	10
2.2	Height	12
2.3	Setbacks	13
2.4	Site Landscaping and Tree Preservation	17
2.5	Solar Access	17
2.6	Visual Privacy	18
2.7	Acoustic Privacy	18
3.0	PUBLIC DOMAIN	19
3.1	Access and the Public Domain	19
3.2	Public Domain Landscape	21
3.3	Urban Elements and Finishes	23
3.4	Signage	24
4.0	TRAFFIC, ACCESS AND PARKING	25
4.1	Traffic Management	25
4.2	Vehicular Access	26
4.3	Car Parking	27
5.0	SITE SERVICES	28
5.1	Tree Preservation	28
5.2	Stormwater and Water Management	28
5.3	Waste Minimisation and Management	29
5.4	Services	29
	SCHEDULE 1 – Public Domain Technical Details	30

1.0 Introduction

1.1 Objectives of this Part

Objectives

The objectives of this Part are:

1. To provide a site responsive development control framework.
2. To ensure future redevelopment of the site provides for a design that is considerate of adjoining development to minimise any adverse impacts, particularly to surrounding residential land uses.
3. To ensure new development contributes positively to the public domain and streetscape.
4. To ensure facades/elevations of buildings and structures are designed to be sympathetic to surrounding development.
5. To integrate landscaping into the design and site planning to improve the visual quality of the development.
6. To provide safe and convenient vehicular access and servicing of the site and minimise the impact of vehicle access points on the streetscape and on surrounding land uses.
7. To ensure development maximises pedestrian amenity and safety.
8. To protect the visual and acoustic amenity of adjoining properties.
9. To ensure implementation of the recommendations of the Bunnings Gladesville Traffic and Parking Study as adopted by Council.
10. To give detail to the Ryde Local Environmental Plan 2014, Amendment 5

1.2 Land to which this Part applies

This Part applies to the land known as Lot 300 DP 1194688, 461 - 495 Victoria Road, Gladesville.

1.3 Purpose of this Part

The purpose of this DCP Part is to provide guidance to:

- give effect to the aims and objectives of *Ryde Local Environmental Plan 2014*; and
- Facilitate development that is permissible under that *Plan*.

In particular this Part aims to guide the development of a high quality public domain and built form around and on the site in recognition of the following factors:

- The site is sizeable, prominent, and highly visible (due to significant passing traffic) on Victoria Road, Gladesville
- The potential scale of any development permissible on the site (such as bulky foods, commercial retail)
- The site is within proximity of the Holy Cross College - a school and heritage item
- The site is within proximity of the Ryde Aquatic Leisure Centre which is also a significant attractor in the area.

A number of controls address the above matters. These controls are based on development outcomes which in particular relate to:

- achieving desired development outcomes, including mitigating impacts of size and scale,
- the character of the streets in this locality, and
- achieving a desirable streetscape presentation.

This part has been designed to be read in conjunction with the following:

- Ryde Local Environmental Plan (LEP) 2014
- Other parts of Development Control Plan 2014
- Section 94 Development Contributions Plan 2007
- Bunnings Gladesville Traffic and Parking Study, December 2014 (as amended by City of Ryde Council resolutions 28 April 2015).

City of Ryde Council resolutions 28 April 2015 as they affect the subject site

This DCP comprised part of a Planning proposal for 461-495 Victoria Road Gladesville. When the Planning Proposal was publicly exhibited in 2013; significant community interest was expressed in relation to traffic impacts. Accordingly, a traffic and parking study was undertaken.

The Bunnings Gladesville Traffic and Parking Study was publicly exhibited commencing December 2014. On 28 April 2015 the traffic study and community response was reported to Council. Taking into account all submissions Council resolved to adopt the *Bunnings Gladesville Traffic and Parking Study* recommendations as follows:

That Council exercise the delegation issued by the Minister for Planning and Infrastructure to make the planning proposal to amend the land use zone applicable to 461-495 Victoria Road from IN2 Light Industrial to B5 Business Development and the permissible height under Ryde Local Environmental Plan (LEP) 2014 applicable to the site from 10m to RL63, RL52 and RL42 (stepping down from 12-15m on Victoria Road to approximately 7-17m on College Street).

That in making the LEP amendment Council will adjust the exhibited map site boundaries to reflect the Victoria Road widening in accordance with recent subdivision approval to create LOT 300 DP 1194688, 461-495 Victoria Road, Gladesville.

That Council adopt the following for inclusion in the Bunnings Gladesville Traffic and Parking Study:

- *Trial full closure of College Street to be implemented prior to Bunnings commencing construction (at no cost to Council by Bunnings). The trial shall be reviewed after 12 months of operation of the Bunnings store and the results reported back to Council at that time. The applicant shall cover the full cost of the traffic review, surveys and any supporting technical studies*
- *Cressy Road carriageway widening to be implemented prior to Bunnings commencing operations (at no cost to council by Bunnings)*

- *Cressy Road (eastern side) full width footpath and safety fence from Victoria Road corner to Holy Cross College entry to be implemented prior to Bunnings commencing operations (at no cost to council by Bunnings)*
- *Tennyson Road and Frank Street site access to be implemented at stage 1 and operable on commencement of Bunnings operations (at no cost to Council by Bunnings)*
- *Traffic signals changes and site access at Tennyson Road to be implemented prior to Bunnings commencing operations (at no cost to Council by Bunnings)*
- *Pedestrian and road safety audit and management plan be prepared that considers the high probability that parents will park at Bunnings to pick up school children or for access to sporting fields (at no cost to council by Bunnings) and also to consider the impact of the two proposed child care centres in that location*
- *A parking optimisation plan for Frank Street and College Street between Frank Street and Orient Street be prepared to counteract any loss of parking due to the Bunnings development and implemented (at no cost to Council by Bunnings)*
- *Roundabout at Monash/Buffalo Road intersection*
- *Detailed study into the impacts of a right hand turn at Westminster Street and a right hand turn ban during the evening peak at Jordan Street from Victoria Road (at no cost to Council - developer funded)*
- *Detailed study into the traffic and parking impacts be undertaken for any proposed rezoning that includes land use changes and increased densities for sites adjoining Tennyson Road. The aforementioned traffic and parking impact study is to be modelled on the Bunnings Gladesville Traffic and Parking Impact Study in terms of its scope and deliverables. (at no cost to Council – developer funded).*
- *An additional traffic and parking study, as detailed in part (x) above, be undertaken for the area bounded by Pittwater Road to Monash Road and Ryde Road to Victoria Road. (at no cost to Council – developer funded).*

That a Roundabout at Monash/Buffalo Road intersection be included in the 2016/2017 City of Ryde Delivery Plan with the funds drawn from the Section 94 reserve.

That Council refer the following matters to the Traffic Committee for consideration:

- *Speed management for the area bounded by Cressy, Pittwater, Higginbotham and Victoria Roads*
- *Parking optimisation for Eltham Street*

At this meeting the Council resolved to adopt a site specific Development Control Plan for 461-495 Victoria Road Gladesville amended in accordance with the above changes in the Bunnings Gladesville Traffic and Parking Study.

An objective of this DCP Part is to implement the above Council resolutions as they apply to the subject site.

1.4 The Local Road Authority

This DCP requires that road and public domain works (associated with the development of the subject land) are to be delivered in accordance with the Council resolutions of 28 April 2015. Accordingly this DCP requires the works to be to the satisfaction of the Local Road Authority to ensure that the works are fit-for-purpose and meet the City of Ryde engineering standards.

The Roads and Maritime Services concurrence must be obtained in relation to network changes to Victoria Road and traffic signals. All changes to public domain lighting, footpaths and the local road network* are required to be to the satisfaction of the Local Road Authority. Where the satisfaction of the Local Road Authority is required the matter must be referred to the City of Ryde Group Manager Public Works (or his representative – Manager Assets Systems) for approval. (Note: A private certifier is not the delegate of the Local Road Authority)

It is recommended that discussions are held with the Local Road Authority prior to the lodgement of material for approval (whether at the DA stage or at other milestones as required by this DCP).

*Note: For the purposes of clarity the Local Road Authority satisfaction is required for the public domain (footpaths, lighting etc.) along Victoria Road and the RMS concurrence for changes to the Victoria Road carriageway (including deceleration lanes, traffic signals, bus stops or the like etc.).



Figure 1.0.1 Aerial photo highlighting Lot 300 DP 1194688, 461 - 495 Victoria Road, Gladesville



Figure 1.0.2 Cadastre map

Note: the contours are indicative of the former use of the site as a quarry and of relevance to height controls

2.0 DESIGN QUALITY

This section provides detailed planning controls for the subject site designed to ensure the future development is of high design quality. The controls are designed to assist in minimising negative amenity impacts on adjoining and adjacent properties.

Objectives

1. To ensure new buildings contribute positively to the urban built form and environment.
2. To ensure appropriate scale and good environmental amenity, such as sun access.
3. To ensure a built form of a high quality that successfully integrates environmental sustainability with architectural design.
4. To identify appropriate building setbacks for integration with the land uses in the context of the site.
5. To improve the visual and architectural quality of the buildings within the streetscape to reduce the bulk and scale of the buildings from the public domain and neighbouring sites.
6. To ensure well-designed buildings constructed of durable and attractive materials.
7. To maximise outlook and views from habitable rooms and private open space without compromising visual privacy.
8. To protect the amenity of neighbours including
 - i. The visual privacy of neighbouring residents
 - ii. Eliminate light spill from the Bunnings site to neighbouring residents including from vehicle headlights
 - iii. Sunlight access
 - iv. To achieve the appropriate acoustic attenuation between the site and neighbouring properties, by giving design consideration to site planning, the location of landscaped buffer zones, plant, and service areas, waste collection and loading docks.

2.1 Built Form

The quality of streets and public spaces may be enhanced by the way buildings address these spaces. Good environmental design includes the control of solar access and overshadowing.

Controls

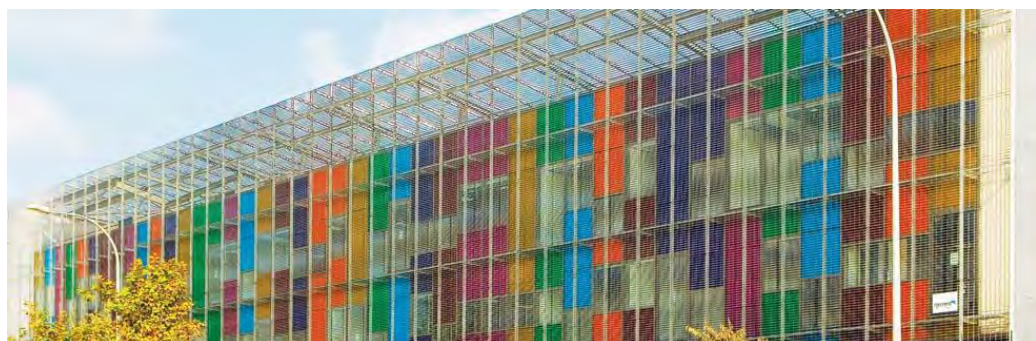
- a. Provide Active Frontage to Victoria Road. Active Frontage will comprise elements including building entries, display windows and retail addressing the street.
- b. Development on corners must address all street frontages. Entries, windows and other architectural elements should be placed to reinforce the corner.
- c. Provide architectural articulation, modulation and design elements to improve aesthetic appearance and also to minimise blank wall lengths and the bulk and scale of the proposed building. Articulation, modulation or design elements are required at no greater than 30m intervals on the facades facing Victoria Road and College Street. These may include:
 - i. Vertical or horizontal setbacks in the façade
 - ii. Pedestrian entries
 - iii. Windows
 - iv. Sunshade devices, awnings, and sunscreens,
 - v. Expressed structural elements including columns, trusses and the like



Figure 2.1.1

Left - expressed structural elements, setbacks and sun shade devices

Below – expressed structure, colour and polycarbonate cladding used to enhance architectural quality.



- d. Provide solar protection, including awnings, recessed windows, roof overhangs, external shutters and screens to the western and northern elevations of the buildings.
- e. Car parking, driveways, ramps, loading docks and associated vehicular entry/exit structures shall be incorporated into the building façade design and screened from view to improve aesthetic appearance.
- f. Car park and vehicular ramp screening is to ensure that vehicular headlights do not shine into residential living spaces and residential outdoor open space.
- g. Noise attenuation, sound walls and screens designed to minimise the transmission of noise to residential properties in College Street and Orient Street shall be sympathetically integrated into the design of the building to improve aesthetic appearance and unify other facade elements.
- h. Plant and service areas shall be incorporated into the building façade or architecturally screened so that they are not visible from the public domain or neighbouring sites.
- i. The building shall incorporate a variety and finishes which create visual interest and are durable.
- j. A design quality statement shall be submitted together with the DA that details to the satisfaction of Council;
 - i. How the design meets the Built Form requirements of this DCP
 - ii. How the building relates to and enhances its context
 - iii. Colour and materials selection

2.3 Setbacks

Controls

- a. Buildings are to be set back from the street frontage and other boundaries in accordance with Figure 2.3.1 Building Setback Control Drawing.
- b. Minor projections such as entry awnings, sun shading devices and the like may be permissible (see 2.1 Built Form) within the building setback, provided they do not encroach upon the 6m landscaped setback area or impact on the amenity of residential sites.

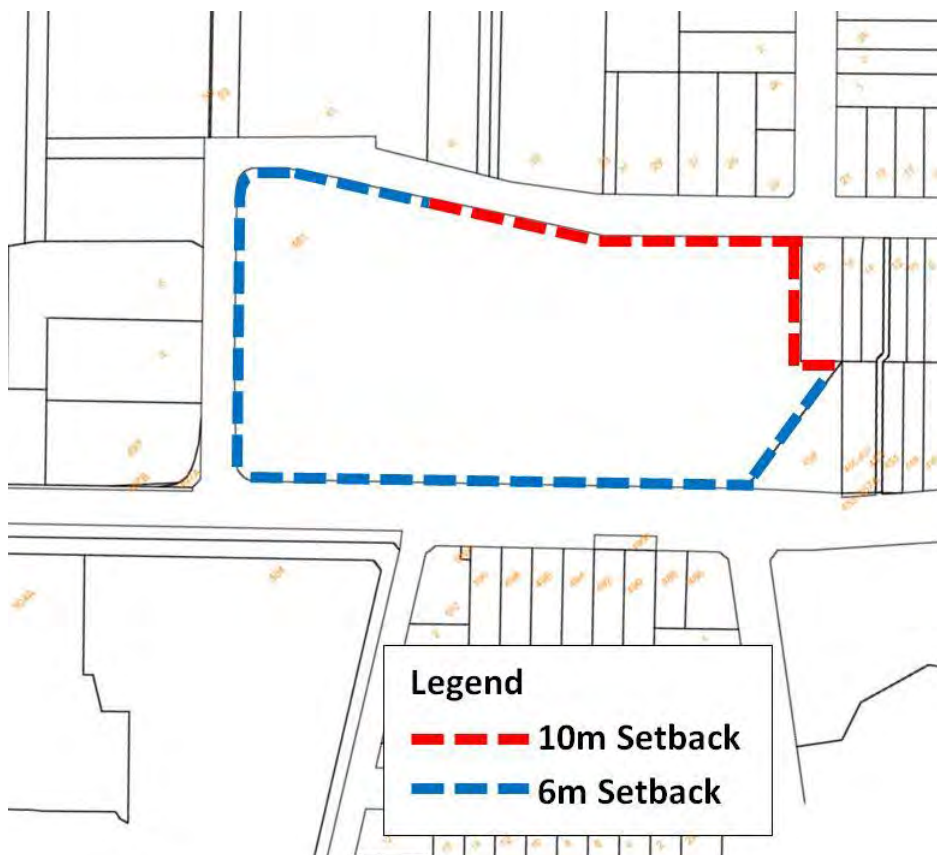
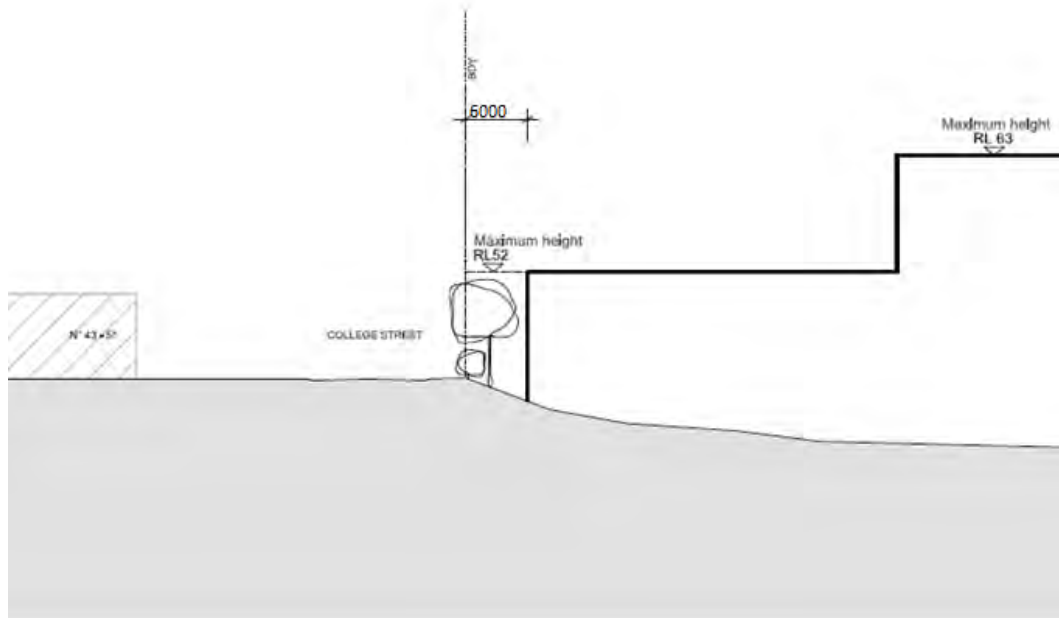


Figure 2.3.1: Building Setback Control Drawing



Figure

2.3.2: Section A College Street frontage setbacks

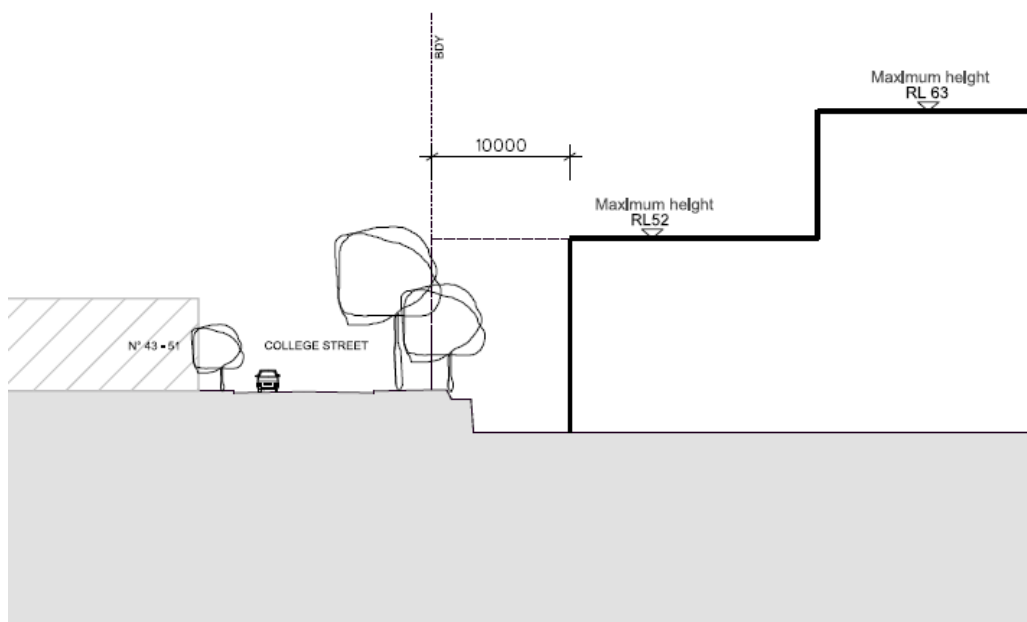


Figure 2.3.3 Section B College Street frontage setbacks

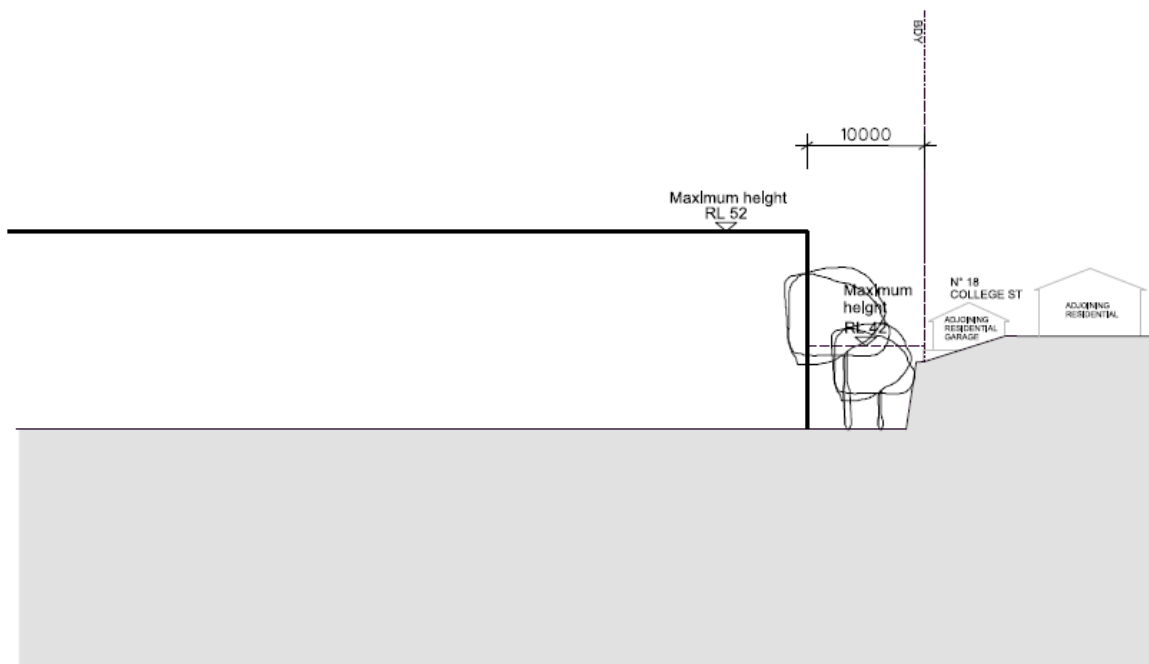


Figure 2.3.4: Section C Setbacks to neighbouring residential property at 18 College Street

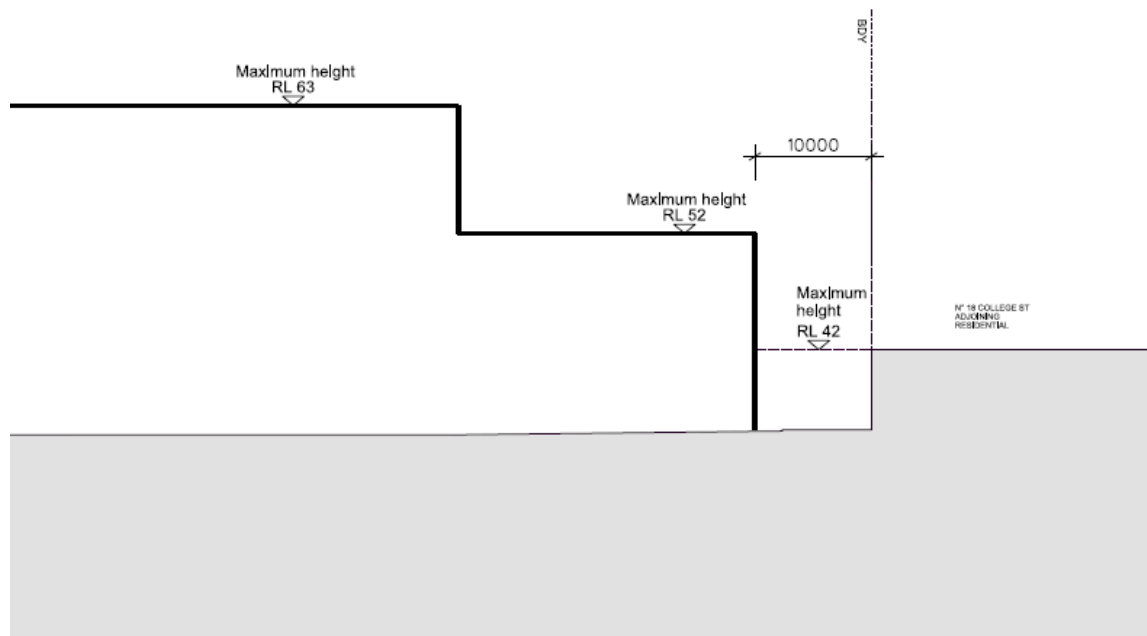


Figure 2.3.5: Section D Setbacks to neighbouring residential property at 18 College Street

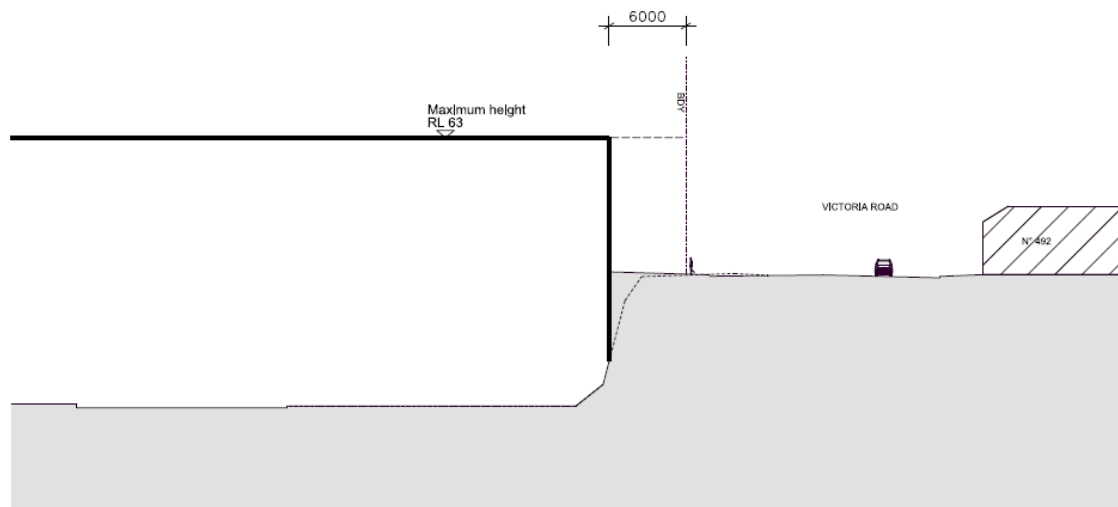


Figure 2.3.6: Section E Victoria Road street frontage setbacks.

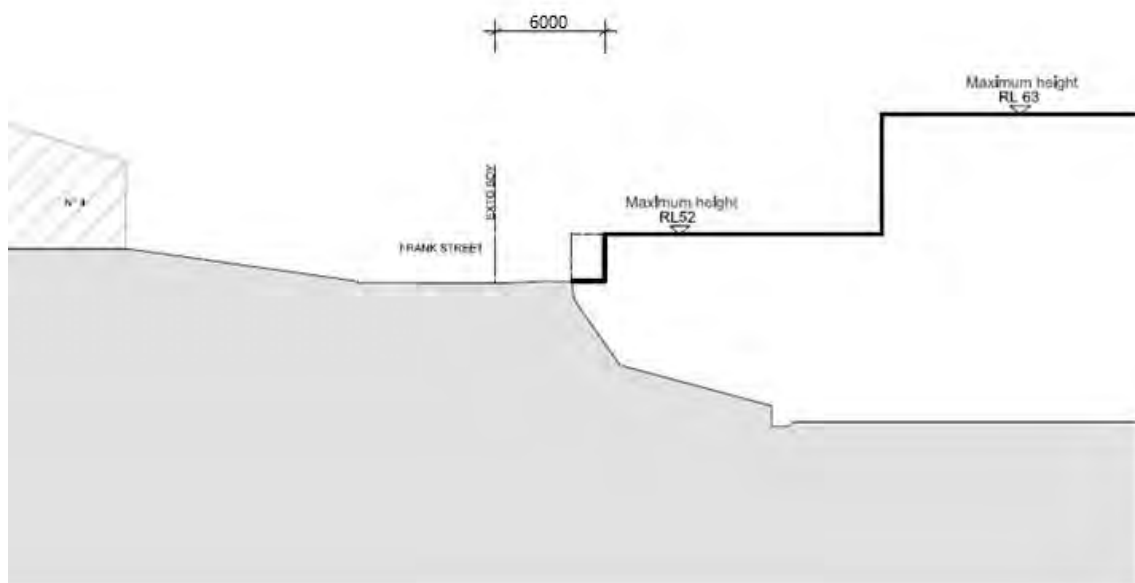


Figure 2.3.7 Section F Frank Street frontage setbacks

2.4 Site Landscaping and Tree Preservation

Controls

- a. A minimum 6m landscape setback is required along all street frontages in accordance with Figures 2.3.2, 2.3.6 and 2.3.7.
- b. A minimum 10m landscape setback is required on the boundaries that adjoin residential property in accordance with figures 2.3.3, 2.3.4, 2.3.5 and 2.3.6.
- c. Landscaping is to be designed to screen the building, (including car parking, loading docks, waste collection and ramp structures) in order to enhance the presentation and architectural quality of the development and to also provide for a landscape buffer for adjoining residential properties that will contribute to neighbours' amenity
- d. Retain on site mature trees where appropriate and practicable, and incorporate additional large growing screen trees as key elements of a landscaping plan that seeks to reduce the visual presence of the buildings.
- e. Soft landscaping of an appropriate scale is to be provided along the Victoria Road frontage to reduce and soften the visual impact of the buildings, create interest in the streetscape whilst also facilitating active frontage and "Safer by Design" principles.
- f. Provide deep soil zone, water capture and recycling in the landscaped area in accordance with City of Ryde *Water Sensitive Urban Design Guidelines*.
- g. Existing street trees in College Street are to be retained including protected during the construction period.
- h. Development is to comply with the provisions contained in Part 9.6 Tree Preservation of this DCP.
- i. A landscape plan prepared by a suitably qualified landscape designer/architect is to be prepared for the subject site and submitted with DA demonstrating compliance with the landscape requirements of this DCP.

Note: A separate public domain plan is also required demonstrating compliance with this DCP Part.

2.5 Solar Access

Controls

- a. The development of the land shall not reduce solar access to the habitable rooms (excluding bath, laundry rooms and the like) and private open space areas of any nearby residential development in College and Orient Streets to less than 3 hours of sunlight between 9am and 3pm in midwinter.

2.6 Visual Privacy

Controls

- a. Windows may not directly face into nearby residential properties.
- b. Apply screens or other façade treatments to parking areas, access, loading docks, storage and waste collection areas, and the like to minimise viewing into and from adjoining residential properties and the public domain.

2.7 Acoustic Privacy

Potential unwanted noise sources increase in more densely developed areas. In mixed use areas, developments need to consider the amenity of a range of surrounding occupants. The impact of commercial and retail noise on residential development and pedestrian amenity needs to be considered. Commercial and retail developments should be designed and managed to minimise noise generation and intrusion.

Controls

- a. Provide appropriate acoustic attenuation between the site and neighbouring properties, by giving design consideration to
 - i. site planning,
 - ii. the location of landscaped buffer zones,
 - iii. Location of plant, service areas, waste collection areas and loading docks.
 - iv. Acoustic treatments such as sound walls and screens to be provided to reduce the transmission of noise to residential land uses in Orient Street and College Street.
- b. The use of premises and any plant, equipment and building services associated with a premises must not:
 - i. Create an offensive noise as defined by the Protection of the Environment Operations Act and
 - ii. Add significantly to the background noise experienced in the locality. Council may require a statement of compliance.
- c. Loading and unloading facilities must not be located immediately adjacent to residential development.
- d. Acoustic treatments are to be integrated into the design of the building to provide interest and improve its aesthetic appearance.
- e. Above grade carparks, ramps, driveways and loading docks shall be contained within the building envelope.

3.0 PUBLIC DOMAIN

The public domain is made up of streets, pedestrian connections, small civic parks and squares. Controls apply to the land adjoining outside the site.

Streets form the framework of the public domain connecting people to shopping, services, recreation and residential. A well designed public domain can provide a focal point for community interaction.

3.1 Access and the Public Domain

Public domain spaces within Ryde need to be designed and sited so that the areas are safe at all times for all pedestrians and cyclists and so that they are accessible to all.

Objectives

1. To reduce vehicular conflicts through good design of building entrances and reducing footpath cross-overs.
2. To clearly differentiate uses and separate conflicting uses.
3. To use appropriate lighting levels.
4. To encourage and maximise environments for 'safe' pedestrian access and mobility.

Controls

- a. Where a development proposal includes new floor space that exceeds 2000 sqm; a pedestrian and road safety audit and management plan must be prepared and submitted with the Development Application that:
 - i. Addresses *Safer by Design* principles
 - ii. Considers the high probability that people will park at the site to pick up Holy Cross College students, to access to the Holy Cross sporting fields, nearby childcare centres and /or the Ryde Aquatic Leisure Centre.
 - iii. Provides safe convenient access to and from the site for pedestrians particularly within Frank and College Streets
 - iv. Demonstrates that the proposed road design, traffic mitigation measures and access and egress from the site caters appropriately for future interactions between pedestrians, vehicles and heavy vehicles.
 - v. Considers providing safe through-site links between College Street and Victoria Road to facilitate public transport access for local residents and industrial area employees.
 - vi. Details how vehicular access points are to be clearly identified with paving, signage and the like.
 - vii. Maximise active frontages on Victoria Road including windows and pedestrian entries
 - viii. Demonstrates that pedestrian ways are well lit and subject to passive surveillance
 - ix. Is to the satisfaction of the Local Road Authority.

Note: In this DCP part the Local Road Authority is the City of Ryde Group Manager Public Works. Where the satisfaction of the Local Road Authority is required the matter is to be referred to the City of Ryde Group Manager Public Works (or his representative – Manager Assets Systems).

- b. A public domain plan must be prepared by a suitably qualified landscape architect/designer and submitted with the Development Application to the satisfaction of the Local Road Authority that:
- i. Addresses issues identified by the aforementioned pedestrian and road safety audit and management plan.
 - ii. Demonstrates compliance with the requirements of clause 3.2 Public Domain Landscape including:
 - i. Details how the existing street trees in College Street are proposed to be protected and retained
 - ii. Details of new street tree plantings and nature strips
 - iii. Demonstrates compliance with the requirements of clause 3.3 Urban Elements and Finishes including:
 - i. Details of new paving (including locations of granite banding, kerb ramps and driveway crossings)
 - ii. Details of street lighting (including pole and associated metre box locations)
 - iii. Details of street furniture (seats, bins and benches) in accordance with the *City of Ryde Public Domain Technical Manual – Gladesville*.
 - iv. Details of seating and shelter at bus stops adjacent the site in accordance with the *City of Ryde Public Domain Technical Manual* as a guide.
 - iv. Demonstrates road network changes in accordance with clause 4.1 Traffic Management and consequential changes to the public domain, including:
 - i. Carriageway widening in Cressy Road, new full width concrete footpath and safety fence from the Victoria Road to the Holy Cross College entry
 - ii. College Street road closure details and consequential footpath changes.
 - iii. Victoria Road footpath details, street tree and bus stop locations.
 - iv. Frank Street footpath, driveway crossings and landscaping.
- c. All kerbs, driveway crossings, carriageway median strips and other elements of the public domain / road network shall be generally in accordance with the relevant sections of Schedule 1: Public Domain Technical Details attached to this DCP Part.

3.2 Public Domain Landscape

Objectives

1. To create memorable landscape image, which builds on the positive characteristics of topography, landscape character and views.
2. To create tree planting, to reinforce spatial quality and build on the palette of existing species in the street, provide shade for pedestrians, and improve the image of the streetscape clearly differentiate uses and separate conflicting uses.

Controls

- a. Existing street trees in College Street and Cressy Road are to be protected during construction and retained.
- b. Provide landscaped nature strips as part of the public domain. These may include trees and ground covers or grass verge as appropriate.
- c. New street trees are to be provided along the Victoria Road frontage. The trees are to be:
 - i. 200L size at installation, planted in 3m x 1.5m pits and their health guaranteed for 2 years
 - ii. Provided generally in accordance with Figure 3.2.1 and the *City of Ryde Public Domain Technical Manual – Gladesville*. The selection is to be based on the scale of proposed buildings, the context such as the width of the street, aspect, and on environmental parameters such as soil type

Note: The City of Ryde Public Domain Technical Manual - Gladesville. Requires that new street trees in Victoria Road are to be either *Pyrus calleryana* 'Capital' (Ornamental Pear) or *Platanus acerifolia* (London Plane Tree)

GLADESVILLE STREET TREES Data sheet

Pyrus flower and bark

Pyrus in Victoria Road, Gladesville (summer)

Pyrus calleryana 'Capital' – Capital Pear

- Narrow shape to fit limited space on Victoria Road
- Deciduous – good shade in summer, sun in winter
- Autumn colour
- White flowers in spring
- Tolerates full sun and air pollution



Platanus bark and foliage

Platanus acerifolia – London Plane Tree

- Excellent shade tree, hardy and long-lived
- Tolerates full sun and air pollution
- Quick growing, establishing in 3 to 5 years

Figure 3.2.1 Victoria Road street tree options.

3.3 Urban Elements and Finishes

Objectives

1. To coordinate paving and street furniture with other urban elements for consistency in approach in the City of Ryde
2. To ensure maximised safe and accessible pedestrian environments.
3. To improve the image, quality and amenity of streets and public spaces through quality finishes, lighting and street furniture.
4. To ensure the selection of urban elements and level of provision is based on the hierarchy of streets and intensity of use.

Controls

- a. Where road network changes are required to be implemented under the provisions of clause 4.1 Traffic Management, new footpaths shall be installed to the satisfaction of the Local Road Authority.
- b. Provide paving of a strength, grade and finish which maximises safe pedestrian usage to the satisfaction of the Local Road Authority as follows:
 - i. Comply with Australian Standard 1428 and Ryde DCP Part 9.2 Access for People with Disability.
 - ii. A minimum 1.5m wide concrete footpath on all street frontages to the subject site
 - iii. The footpath shall be full width from boundary to kerb at the Victoria Road and Frank Street corner, at bus stops and at pedestrian entries to the building.
 - iv. Granite banding at 7.5m intervals maximum in accordance with Figure 3.3.3 and Detail Pv1.2a Schedule 1: Public Domain Technical Details attached to this DCP Part.

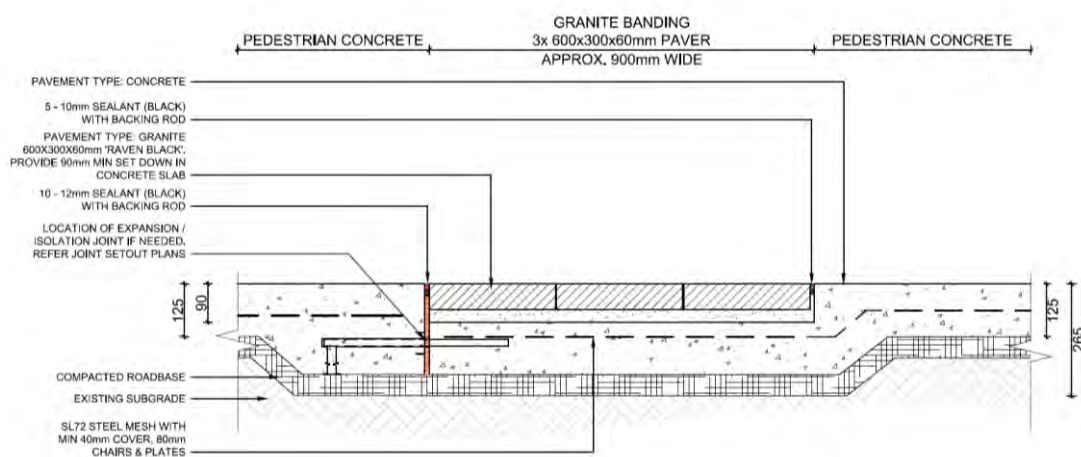


Figure 3.3.3 Detail: Granite banding in concrete footpath

- c. Provide a pedestrian safety fence and new full width concrete footpath from kerb to boundary along the eastern side of Cressy Road from Victoria Road to the Holy Cross College entry.
- d. Provide lighting of public domain areas, including installation of multi-function light poles in the road reserve along the Victoria Road frontage accordance with Figure 3.3.2 to the satisfaction of the Local Road Authority.

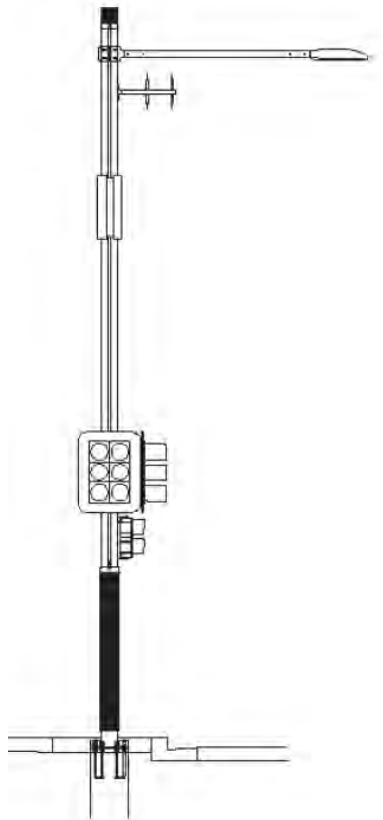


Figure 3.3.2 Multi-Function Light Pole

- To achieve P2 Light levels in accordance with the relevant Australian Standard and the satisfaction of the Local Road Authority
- Capable of taking banners

3.4 Signage

Objectives

1. To minimise visual clutter through the control and coordination of signage.
2. To reinforce the streetscape and enhance the character of the area.

Controls

- a. Signage is to designed to comply with the provisions contained in Part 9.1 Signage of this DCP.
- b. Signage may not dominate the Victoria Road façade of the development.
- c. A signage plan is to be prepared and submitted with DA detailing locations and size of signage and demonstrating compliance with Part 9.1 Signage under this DCP.

4.0 TRAFFIC, ACCESS AND PARKING

Objectives

1. To ensure the recommendations of the Bunnings Gladesville Traffic and Parking Study, as adopted by Council, are implemented through development.
2. To provide a framework for ensuring effective monitoring and review of operation of traffic
3. To provide adequate and accessible parking and on-site service areas.
4. To manage traffic in and around the site so as to minimise disruption to the local road network
5. To protect the amenity of neighbouring residents, business and workers
6. To manage potential through traffic
7. To enhance road safety in the local area

4.1 Traffic Management

Controls

- a. Prior to the issue of a Construction Certificate for new works on the subject site, the closure of College Street (in both directions) at approximately the boundary between the R2 Low density residential zone and the IN2 Light Industrial zone is to be implemented by the developer at no cost to Council and to the satisfaction of the Local Road Authority.

Note: To determine the location for the College Street Road closure and boundary of the IN2 Light Industrial and the R2 Low Density Residential land use zones refer to Ryde LEP 2014 Land Use maps. The College Street road closure shall be implemented such that it may be readily converted to a partial / one way road closure.

The procedure for knowing the "satisfaction of the Local Road Authority" is to submit plans for the road closure to the Local Road Authority for approval allowing at least 3 weeks for a response – see clause 1.4. Approval will be provided in a written format.

- b. The proponent shall provide a quarterly traffic management report to the Local Road Authority for the first 12 months of site operations to document any traffic and parking issues arising that have affected the external road system and how they have been or are proposed to be mitigated.

Note: In accordance with City of Ryde Council resolutions 28 April 2015, the abovementioned traffic management reports will be presented to the Council 12 months after commencement of operations on site. Should it be warranted, the full closure of College Street may subsequently be converted to a partial / one-way closure and / or other network changes considered.

- c. Prior to the commencement of on-site operations and the issue of any occupation certificate (including “interim”) provide the following traffic management mitigation measures at no cost to Council and to the satisfaction of the Local Road Authority:
 - i. Cressy Road carriageway widening to include an additional traffic lane at the northern approach to the Victoria Road intersection.
 - ii. Cressy Rd (eastern side) full width concrete footpath and safety fence from the Victoria Road intersection to the Holy Cross College entry
 - iii. Tennyson Road and Frank Street site access to be implemented at stage 1 of the site development
 - iv. Traffic signals changes at Tennyson Road, Cressy Road and Frank Street to be implemented as required by the Roads and Maritime Services and / or the Local Road Authority
- d. Together with any Development Application (for new floor space on the site) that is submitted to Council; provide a Traffic and Parking Report detailing:
 - i. The quantum of proposed parking on the site
 - ii. The traffic generation of the proposed development and land uses
 - iii. How controls 4.1(a) and 4.1(b) traffic management mitigation measures are proposed to be implemented to the satisfaction of the Local Road Authority
 - iv. A Statement of Commitment to provide the required traffic mitigation measures

4.2 Vehicular Access

Controls

- a. No vehicular entries or exits to the site are to be located on College Street.
- b. A new vehicular entry/exit is to be provided on Victoria Road at the signalised intersection at Tennyson Road. This access is to be implemented at stage 1 of the on site development.
- c. Vehicular entries and exits are to be provided on Frank Street and implemented at stage 1 of the development.
- d. Ensure vehicular entries, vehicular circulation and loading docks are designed in accordance with Australian Standards AS 2890.1, 2, 3, 5, and 6 Parking Facilities.
- e. All kerbs, driveway crossings, carriageway median strips and the like shall be generally in accordance with the relevant sections of Schedule 1: Public Domain Technical Details attached to this DCP Part.

4.3 Car Parking

Controls

- a. Provide a parking optimisation and implementation plan for Frank Street and College Street to counteract any loss of parking due to the Bunnings development
Implementation of the parking optimisation plan:
 - i. is to occur prior to the commencement of on-site operations and the issue of any occupation certificate (whether interim or final)
 - ii. be at no cost to Council and to the satisfaction of the Local Road Authority
- b. Ensure car parking areas and ramps are designed in accordance with Australian Standards AS 2890.1, 2, 3, 5, and 6 Parking Facilities.
- c. Off street car parking is to be provided in accordance with Ryde DCP Part 9.3 and must provide adequate parking for employees and patrons.
- d. Where possible, parking, loading docks ramps and driveways shall be located underground or under cover and within the building envelope. As a minimum, a high quality architectural screen is required so that these facilities are not visible from the public domain and so that acoustic intrusion and headlights from vehicle movements is minimised for residential properties in College Street and Orient Street.
- e. Parking is to be accessible to all stages and components of the eventual development. All vehicular site entries and exits are to access all vehicular parking areas.
- f. Parking within the development is to be designed so as to minimise impacts on the road network such as queuing in Frank Street and Victoria Road.

5.0 SITE SERVICES

Objectives

1. To provide for the size and number of service areas in proportion to the scale and intensity of the proposed use.
2. To ensure that service facilities do not detract from the amenity of nearby public spaces and residential areas.
3. To ensure appropriate stormwater design and management having regard to the characteristics of this site and catchment area.
4. To ensure that the design of waste storage and collection facilities are integrated into the design of the development.

5.1 Tree Preservation

Controls

- a. Street trees in College Street are to be retained and protected during the construction period.
- b. Development is to comply with the provisions contained in Part 9.6 Tree Preservation under this DCP.

5.2 Stormwater and Water Management

Controls

- a. Stormwater management system is to be designed and provided in accordance with the requirements of the:
 - i. City of Ryde DCP 2014 - Part 8.2 Stormwater and Floodplain Management and supporting documents
 - ii. City of Ryde Water Sensitive Urban Design Guidelines (WSUD)
 - iii. Stormwater and Floodplain Management Technical Manual
- b. A detailed site specific flood study report and stormwater drainage plan are required to be submitted with the Development Application, demonstrating compliance with the requirements of DCP Part 8.2 Stormwater Management. The study should consider the downstream draining system in the analysis. In addition, a design solution is required to ensure the downstream properties will not be subject to increased risk of flooding after the development. If required the downstream stormwater pipe system shall be amplified to the current standard.

5.3 Waste Minimisation and Management

Controls

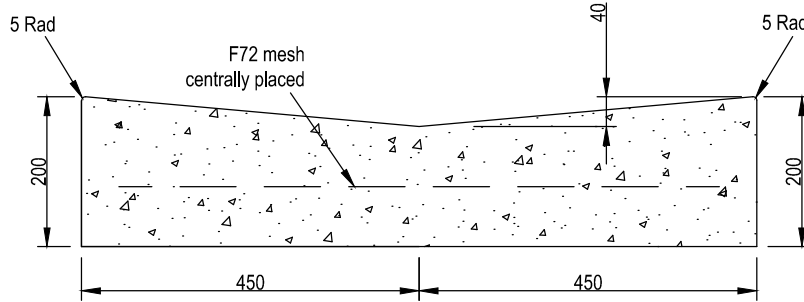
- a. The storage, management and collection of waste is to be designed and provided in accordance with the requirements contained in Part 7.2 Waste Minimisation and Management of this DCP.

5.4 Services

Controls

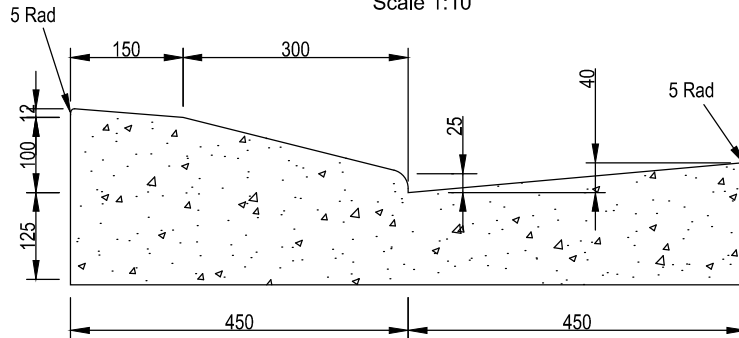
- a. All services infrastructure including the fire hydrant, gas meters and the like shall be located within the building envelope and, where not otherwise required to be visible, to be screened from view from the public domain.
- b. Power shall be undergrounded all-round the site.

SCHEDULE 1 – Public Domain Technical Details



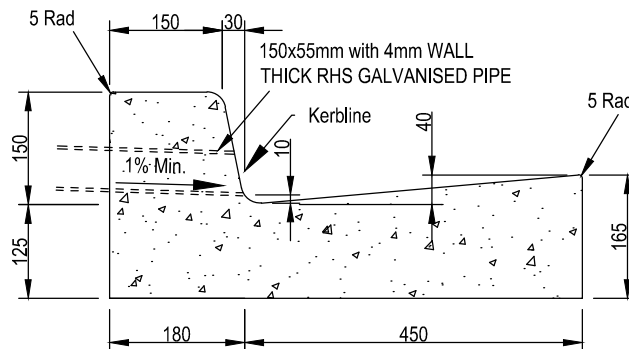
DISH CROSSING

Scale 1:10



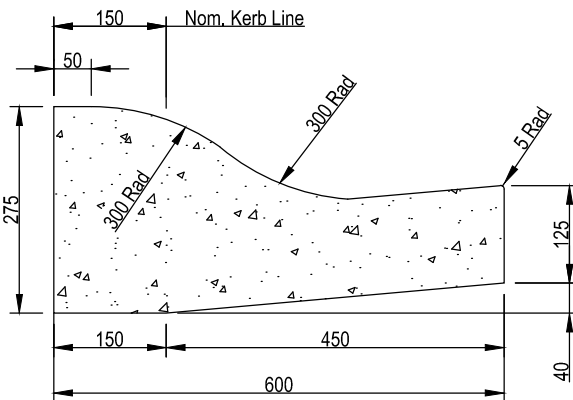
MOUNTABLE KERB

Scale 1:10



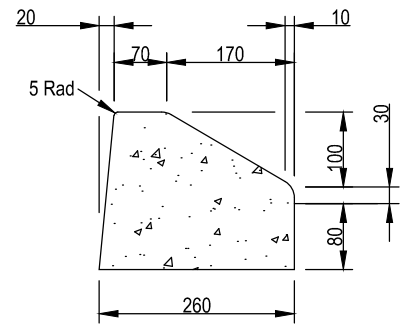
STANDARD KERB & GUTTER

Scale 1:10



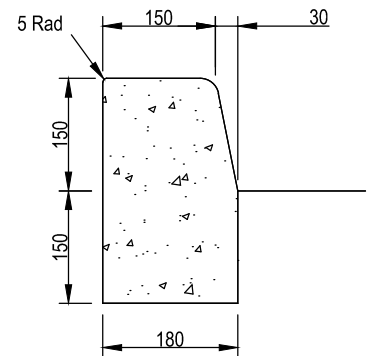
ROLL KERB

Scale 1:10



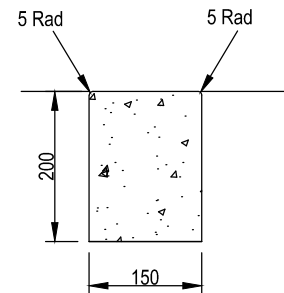
MEDIAN KERB

Scale 1:10



KERB ONLY

Scale 1:10



EDGE STRIP

Scale 1:10

NOTES

1. Scales shown are for A4 size drawing.
2. All roadside kerbs shall be laid on a minimum 150mm thickness compacted Porters Creek or equivalent recycled roadbase.
3. All corners shall have a 25mm radius unless noted otherwise.
4. All kerbs, gutters and edge strips shall be steel float finished.
5. Expansion joints shall be full depth 6mm bituminous mastic jointing material at intervals of 6m maximum and 4m minimum.
6. Concrete shall have a 28 day strength of 25MPa minimum.
7. Concrete shall be placed with a maximum slump of 80mm.
8. Refer to Drawing CIV 02 for standard kerb ramps.
9. Refer to Drawings CIV 03 and CIV 04 for standard and heavy duty driveway laybacks.
10. All dimensions in mm unless noted otherwise (U.N.O)

DISCLAIMER:



Public Works - Project Development

STANDARD DRAWING:

KERBS AND GUTTERS

DRAWING NO:

CIV 01

SCALE:

1:10@A4

SHEET:

1 OF 1

DATE:

20/05/2014

REV:

B

DRAWN: M.C

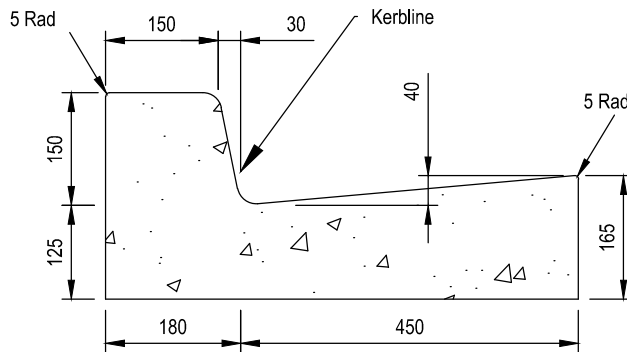
APPROVED: I.A

CHECKED: JSB/TM

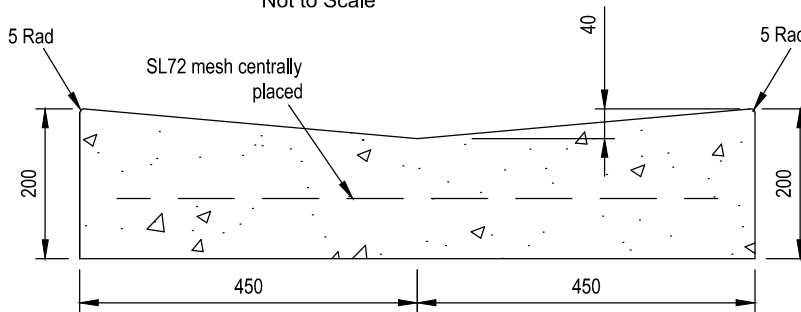
DESIGN MANAGER

VERIFIED: V.P

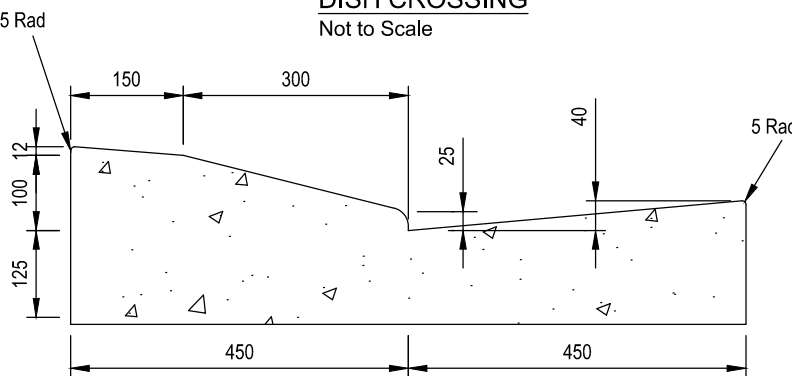
...../...../.....



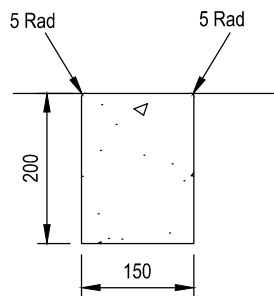
KERB & GUTTER
Not to Scale



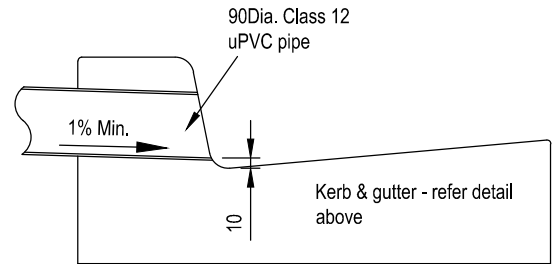
DISH CROSSING
Not to Scale



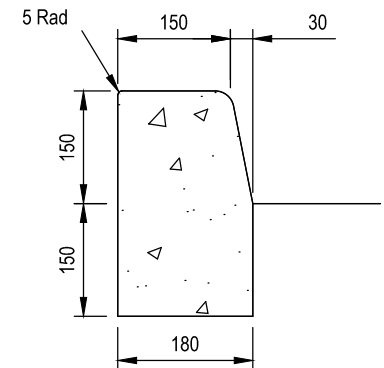
MOUNTABLE KERB
Not to Scale



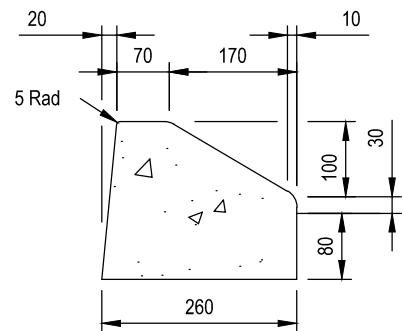
EDGE STRIP
Scale 1:10



KERB OUTLET PIPE
Not to Scale



KERB ONLY
Not to Scale



MEDIAN KERB
Scale 1:10

NOTES

1. Scales shown are for A4 size drawing.
2. All roadside kerbs shall be laid on a minimum 150mm thickness compacted Porters Creek or equivalent recycled roadbase.
3. All corners shall have a 25mm radius unless noted otherwise.
4. All kerbs, gutters and edge strips shall be steel float finished.
5. Expansion joints shall be full depth 6mm bituminous mastic jointing material at intervals of 6m maximum and 4m minimum.
6. Concrete shall have a 28 day strength of 25MPa minimum.
7. Concrete shall be placed with a maximum slump of 80mm.
8. Refer to Drawing CIV 02 for standard kerb ramps.
9. Refer to Drawings CIV 03 and CIV 04 for standard and heavy duty driveway laybacks.
10. All dimensions in mm unless noted otherwise (U.N.O)

DISCLAIMER:



Public Works - Project Development

STANDARD DRAWING:

KERBS AND GUTTERS

DRAWING NO:

CIV 01-2

SCALE:

1:10@A4

SHEET:

1 OF 1

DATE:

20/05/2014

REV:

B

DRAWN: M.C

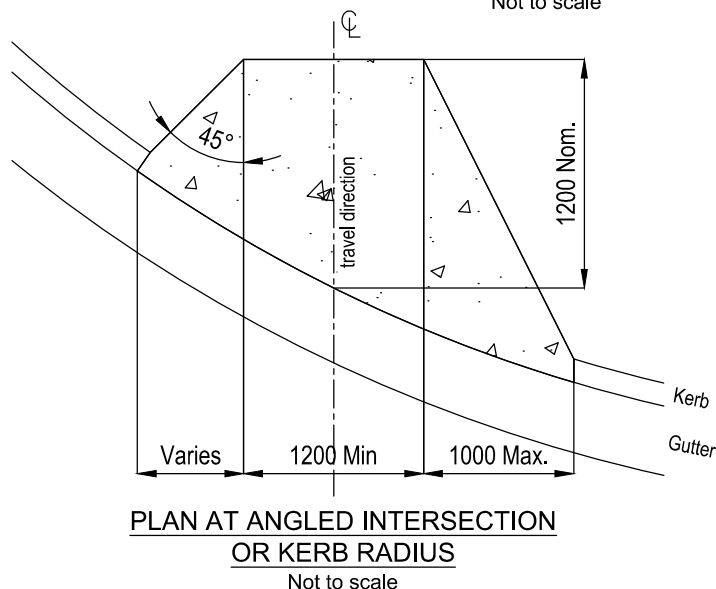
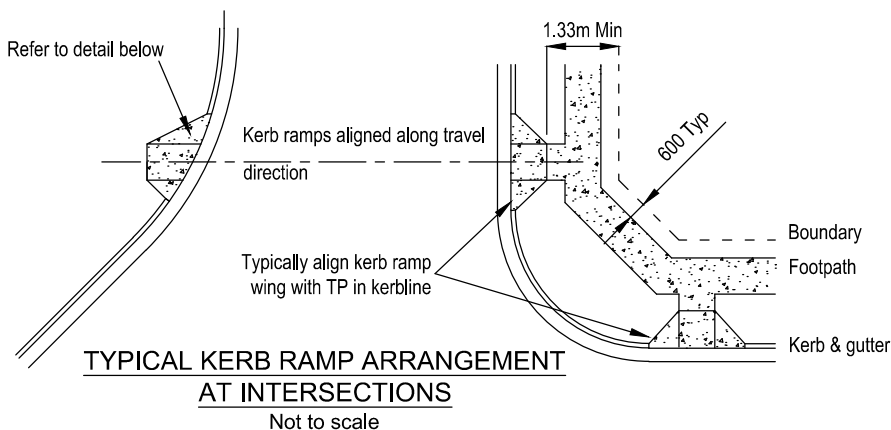
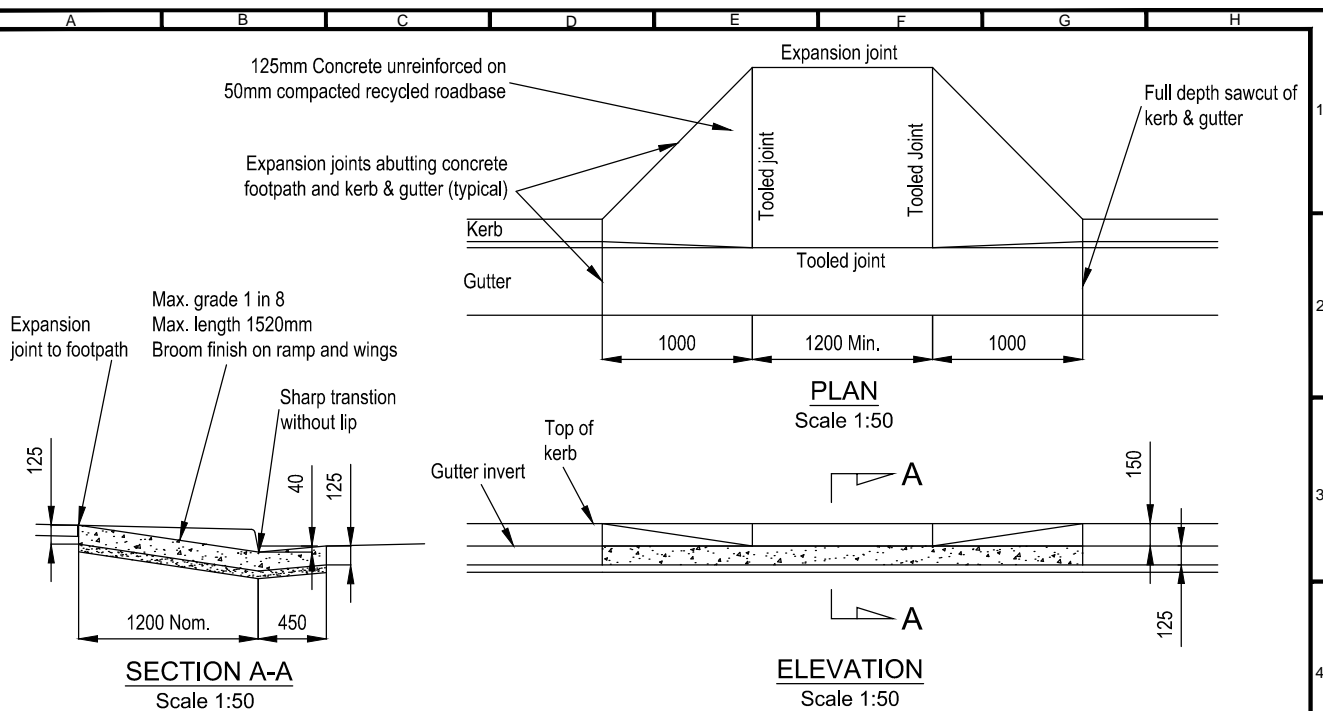
APPROVED: I.A

CHECKED: JSB/TM

DESIGN MANAGER

VERIFIED: V.P

...../...../.....



NOTES

1. Scales shown are for A4 size drawing.
2. Kerb ramps shall consist of 125mm thick broom finished unreinforced concrete over 50mm thick recycled roadbase.
3. The gutter shall be steel float finished.
4. Expansion joints shall be full depth 6mm bituminous mastic jointing material.
5. Kerb ramps shall be aligned with the direction of pedestrian travel.
6. Concrete shall have a 28 day strength of 25MPa minimum.
7. Concrete shall be placed with a maximum slump of 80mm.
8. Refer to Drawing CIV 07 for standard concrete footpath details.
9. Refer to Drawing CIV 02 Sheet 2 of 2 for kerb ramps on Shared Paths.
10. All dimensions in mm Unless Noted Otherwise (U.N.O)

DISCLAIMER:



Public Works - Project Development

DRAWN: M.C

APPROVED: I.A

CHECKED: JSB/TM

DESIGN MANAGER

VERIFIED: V.P

...../...../.....

STANDARD DRAWING:

KERB RAMP - FOOTPATH

DRAWING NO:

CIV 02-1

SCALE:

AS SHOWN

SHEET:

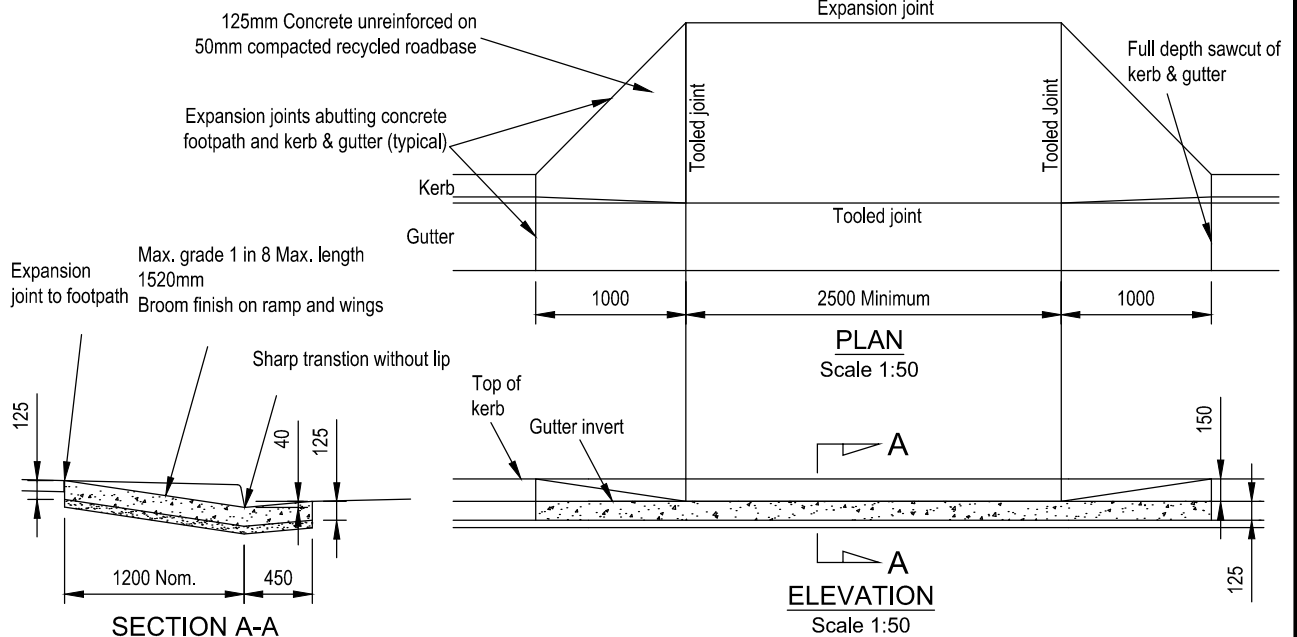
1 OF 2

DATE:

20/05/2014

REV:

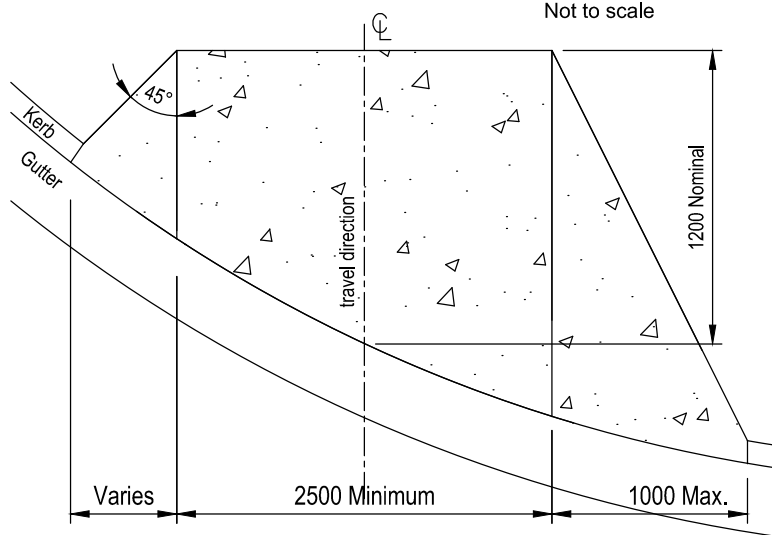
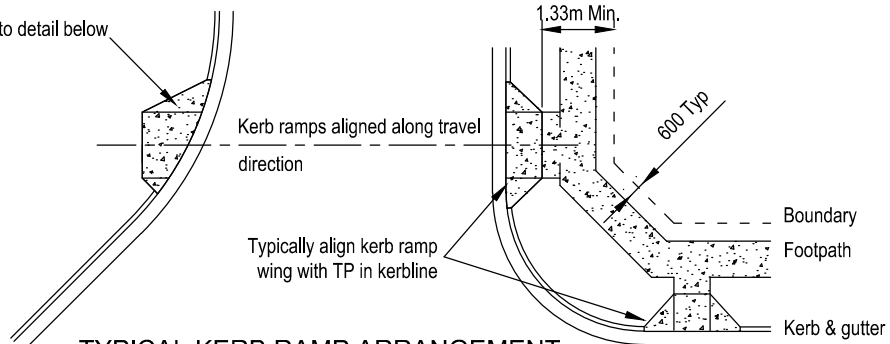
B



SECTION A-A

Scale 1:50

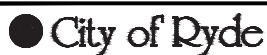
Refer to detail below



NOTES

1. Scales shown are for A4 size drawing.
2. Kerb ramps shall consist of 125mm broom finished concrete (SL72 reinforced or unreinforced according to design) over 50mm thick layer of Porters Creek or equivalent recycled roadbase.
3. The gutter shall be steel float finished.
4. Expansion joints shall be full depth 6mm bituminous mastic jointing material.
5. Kerb ramps shall be aligned with the direction of pedestrian travel.
6. Concrete shall have a 28 day strength of 25MPa minimum.
7. Concrete shall be placed with a maximum slump of 80mm.
8. Refer to Drawing CIV 08 for standard concrete footpath details.
9. Refer to Drawing CIV 02 Sheet 1 of 2 for kerb ramps on Footpaths only.
10. All dimensions in mm Unless Noted Otherwise (U.N.O)

DISCLAIMER:



Public Works - Project Development

DRAWN: M.C

APPROVED: I.A

CHECKED: JSB/TM

DESIGN MANAGER

VERIFIED: V.P

...../...../.....

STANDARD DRAWING:

**KERB RAMP -
SHARED PATH**

DRAWING NO:

CIV 02-2

SCALE:

AS SHOWN

SHEET:

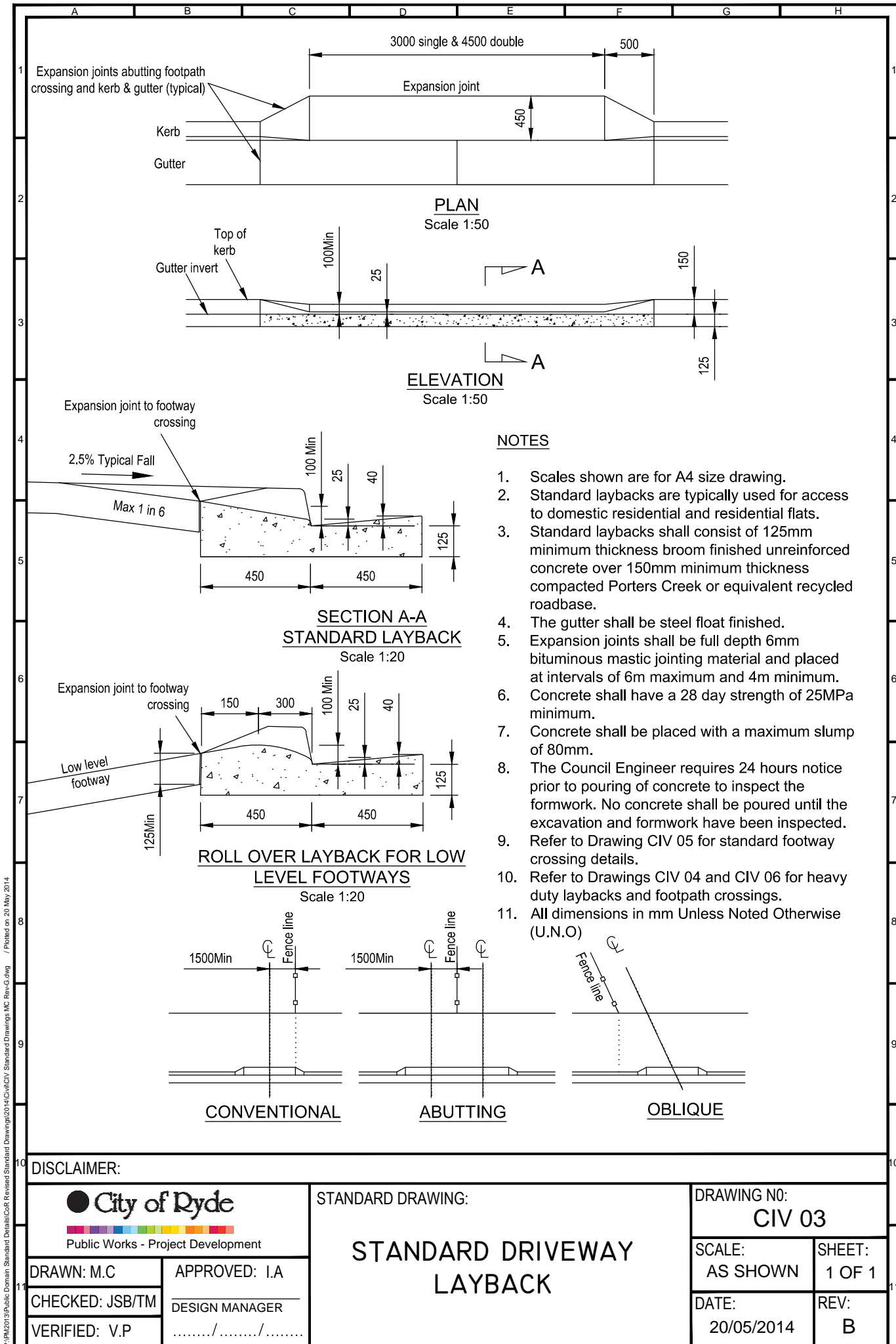
2 OF 2

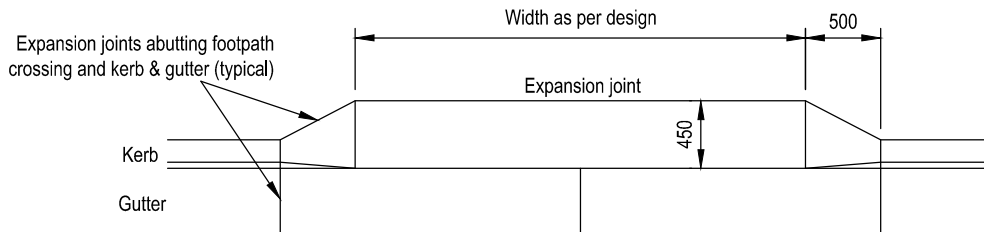
DATE:

20/05/2014

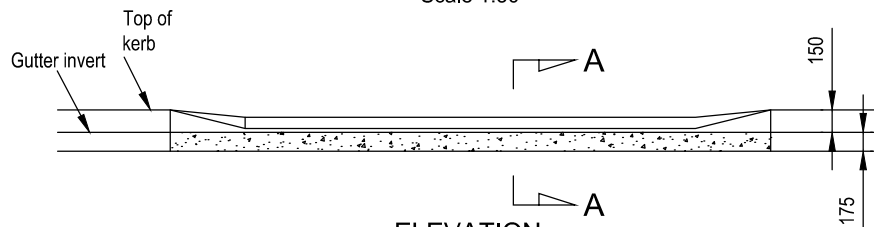
REV:

B





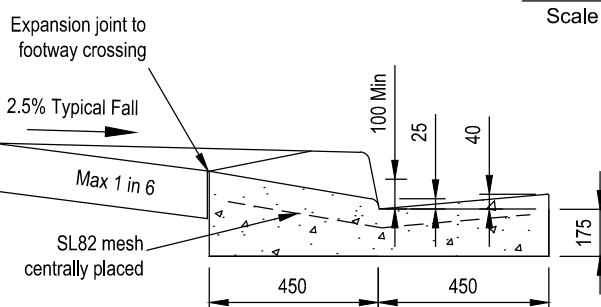
PLAN
Scale 1:50



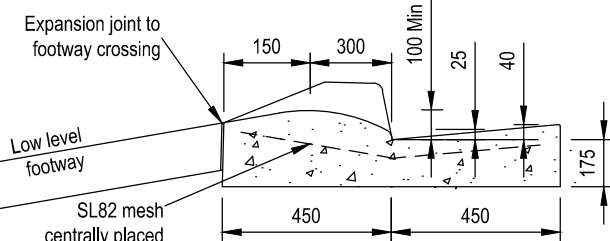
ELEVATION
Scale 1:50

NOTES

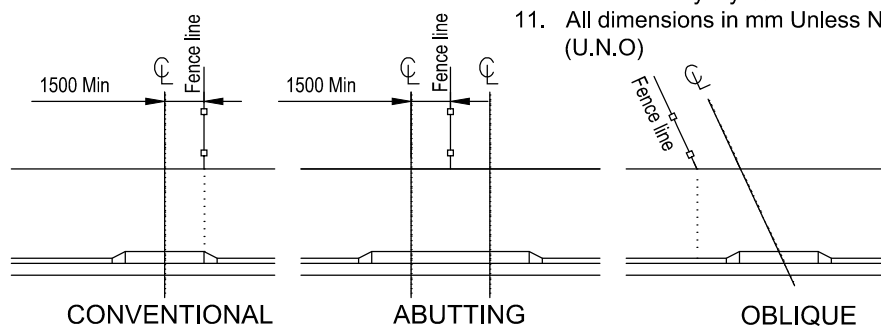
1. Scales shown are for A4 size drawing.
2. Standard laybacks are typically used for accesses to industrial and commercial properties.
3. Heavy duty laybacks shall consist of 175mm minimum thickness broom finished concrete with SL82 mesh over 150mm minimum thickness compacted Porters Creek or equivalent recycled roadbase.
4. The gutter shall be steel float finished.
5. Expansion joints shall be full depth 6mm bituminous mastic jointing material and placed at intervals of 6m maximum and 4m minimum.
6. Concrete shall have a 28 day strength of 32MPa minimum.
7. Concrete shall be placed with a maximum slump of 80mm.
8. The Council Engineer requires 24 hours notice prior to pouring of concrete to inspect the formwork. No concrete shall be poured until the excavation and formwork have been inspected.
9. Refer to Drawing CIV 06 for heavy duty footway crossing details.
10. Refer to Drawings CIV 03 and CIV 05 for standard duty laybacks and footpath crossings.
11. All dimensions in mm Unless Noted Otherwise (U.N.O)



**SECTION A-A
STANDARD LAYBACK**
Not to Scale



**ROLL OVER LAYBACK FOR LOW
LEVEL FOOTWAYS**
Not to Scale



DISCLAIMER:



Public Works - Project Development

DRAWN: M.C

APPROVED: I.A

CHECKED: JSB/TM

DESIGN MANAGER

VERIFIED: V.P

...../...../.....

STANDARD DRAWING:

**HEAVY DUTY
DRIVEWAY LAYBACK**

DRAWING NO:

CIV 04

SCALE:

AS SHOWN

SHEET:

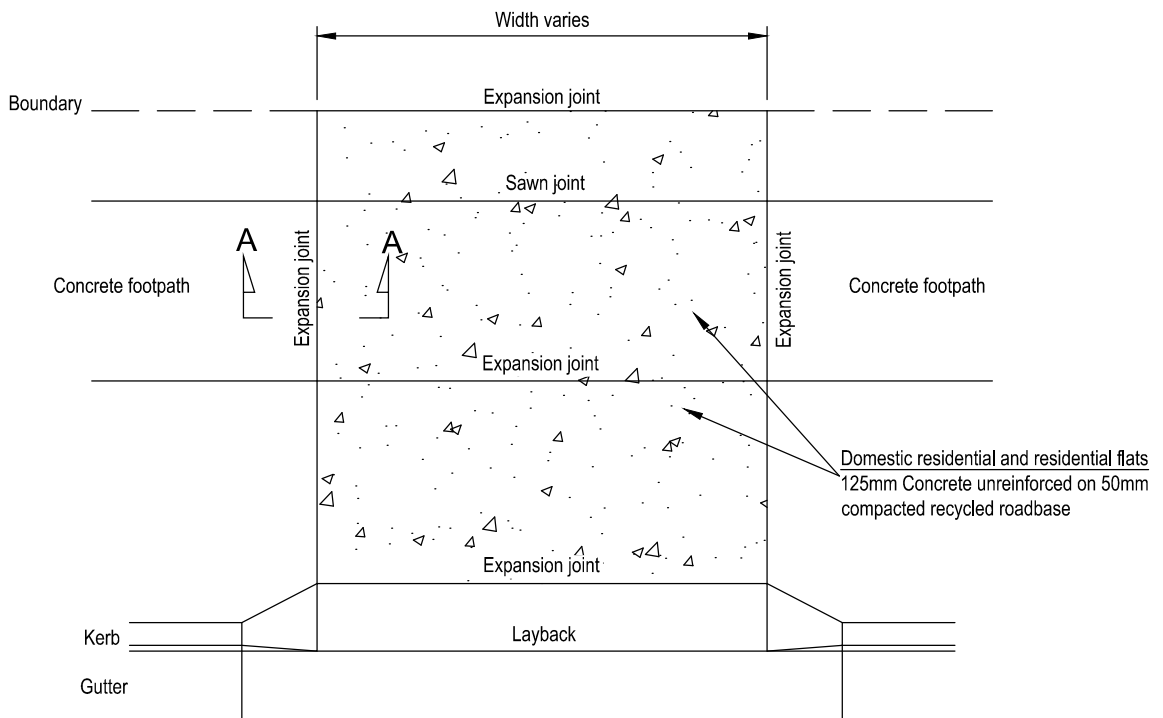
1 OF 1

DATE:

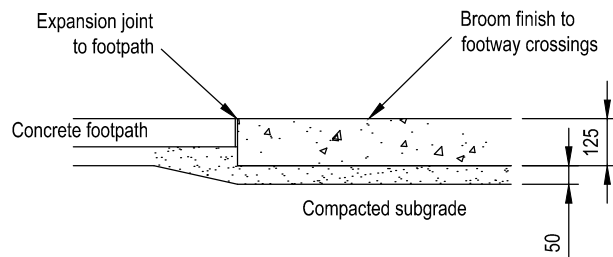
20/05/2014

REV:

B



PLAN
Not to scale



SECTION A-A
Scale 1:20

NOTES

1. Scales shown are for A4 size drawing.
2. Footpath crossings shall consist of 125mm thick broom finished unreinforced concrete over 50mm thick compacted Porters Creek or equivalent recycled roadbase.
3. Expansion joints shall be full depth 6mm bituminous mastic jointing material.
4. Sawn joints shall be 40mm deep.
5. Concrete edges shall be finished with an edging tool.
6. Concrete shall have a 28 day strength of 25MPa minimum.
7. Concrete shall be placed with a maximum slump of 80mm.
8. The Council Engineer requires 24 hours notice prior to pouring of concrete to inspect the formwork. No concrete shall be poured until the excavation and formwork have been inspected.
9. Refer to Drawing CIV 07 for standard footpath details.
10. Refer to drawing CIV 03 for driveway layback details.
11. All dimensions in mm unless noted otherwise (U.N.O)

DISCLAIMER:



Public Works - Project Development

STANDARD DRAWING:

**STANDARD FOOTWAY
CROSSING**

DRAWING NO:

CIV 05

SCALE:

1:20@A4

SHEET:

1 OF 1

DATE:

20/05/2014

REV:

B

DRAWN: M.C

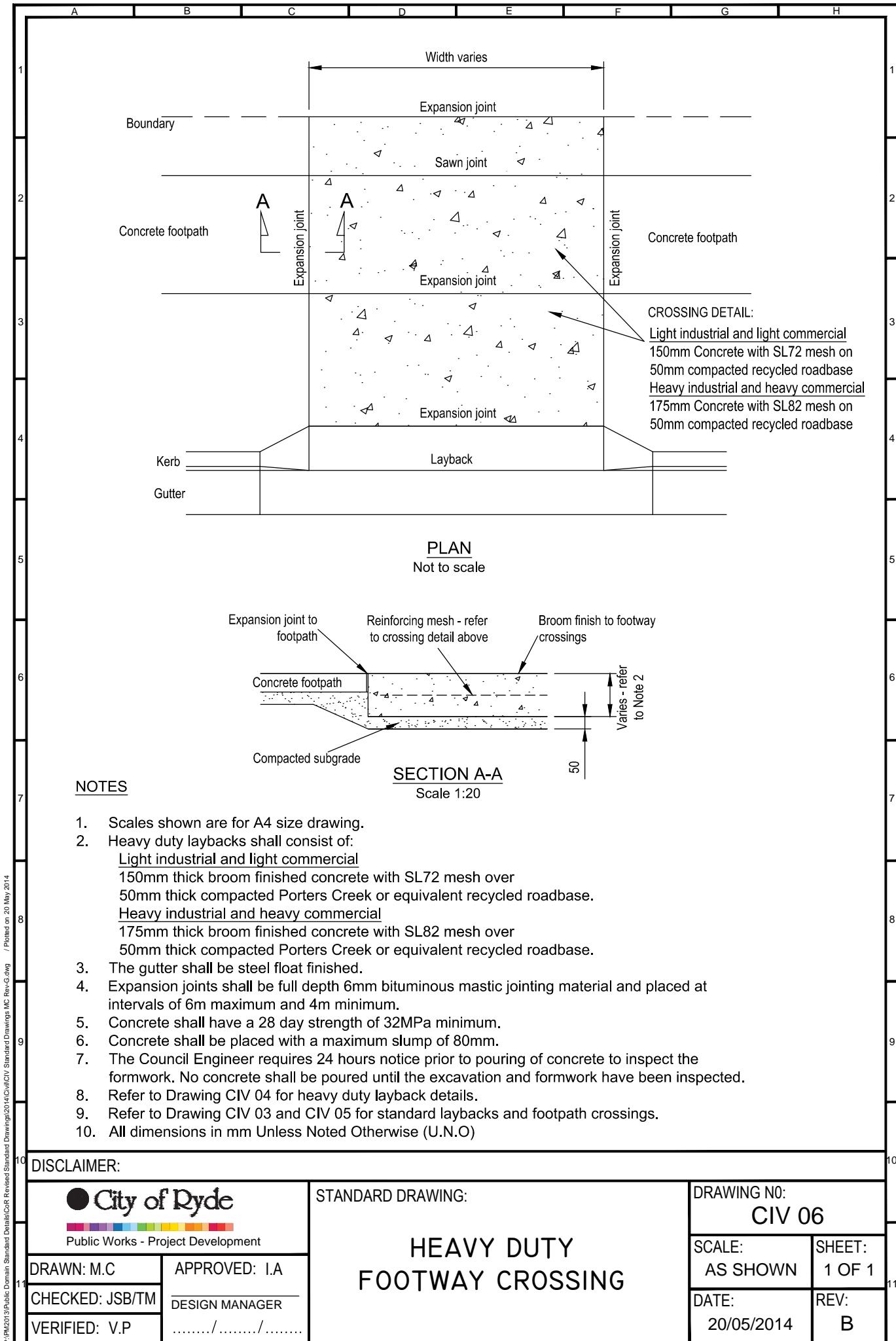
APPROVED: I.A

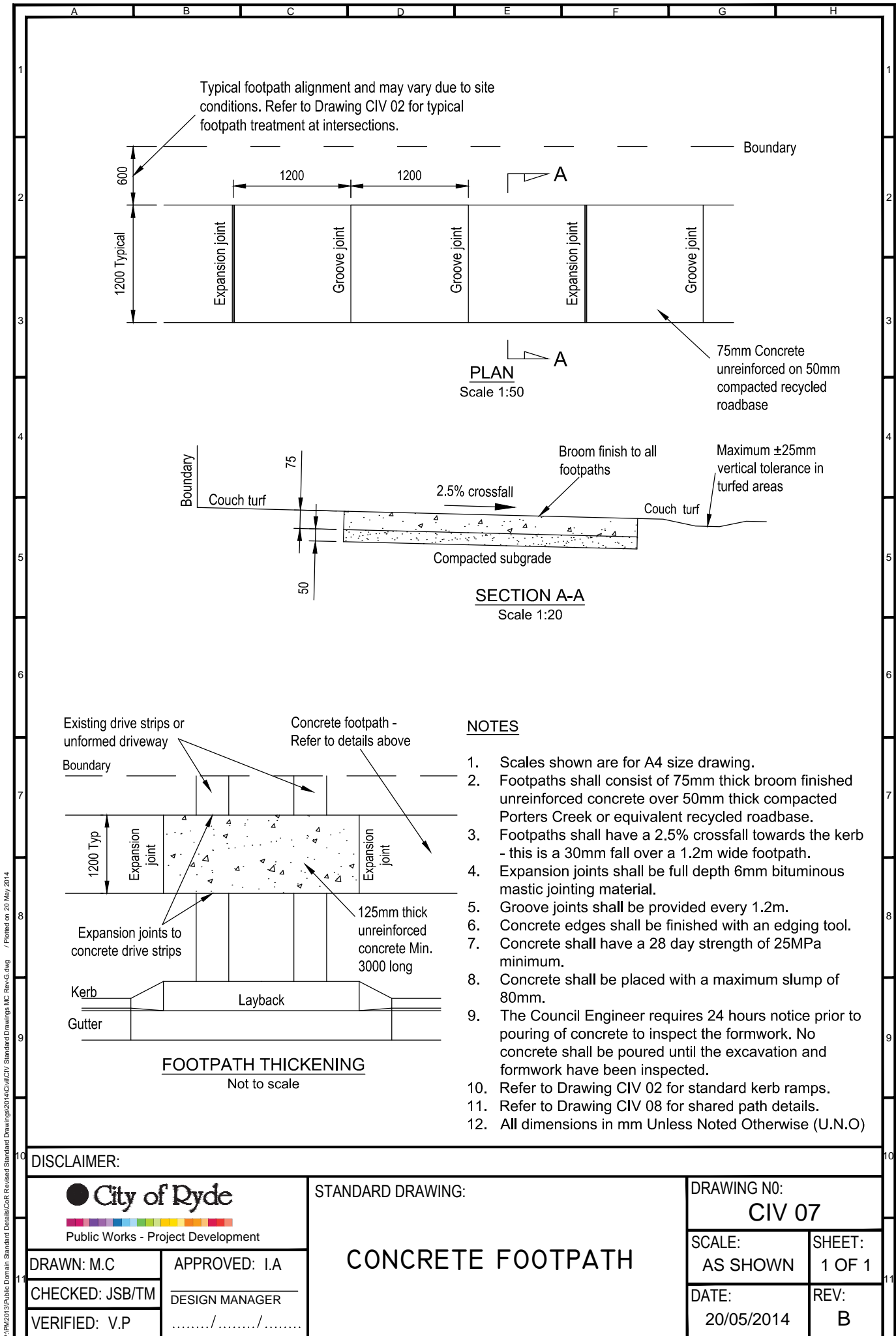
CHECKED: JSB/TM

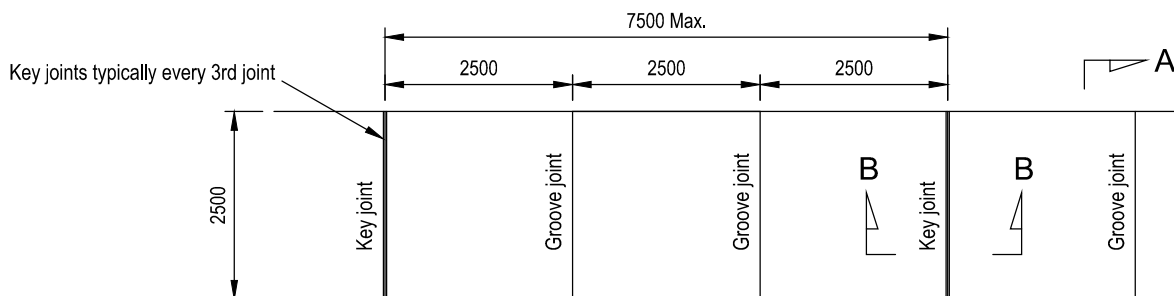
DESIGN MANAGER

VERIFIED: V.P

...../...../.....

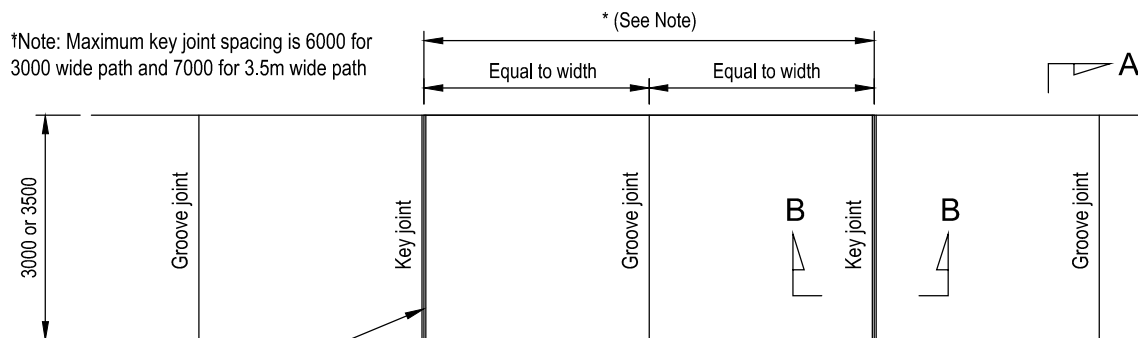






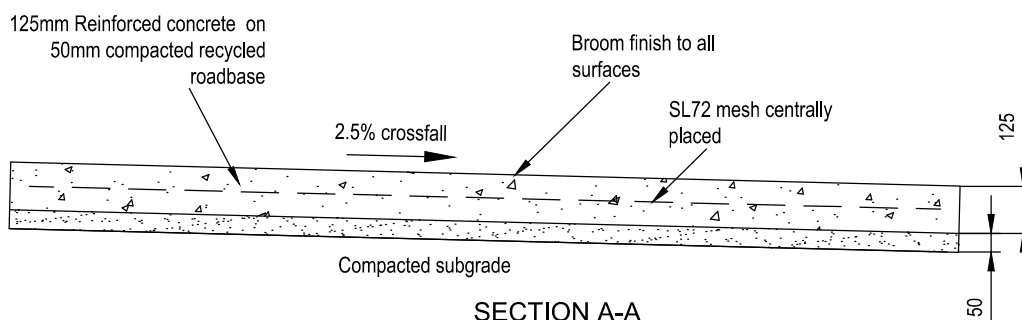
PLAN - 2.5m WIDE SHARED PATH

Scale 1:100



PLAN - 3.0m AND 3.5m WIDE SHARED PATH

Scale 1:100



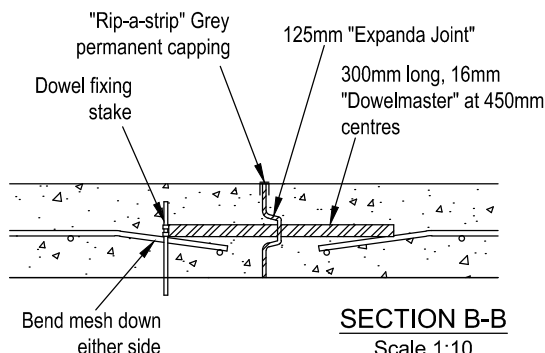
SECTION A-A

Scale 1:20

Note: Key joints and dowels shown are by Danley Construction Products or approved equivalent

NOTES

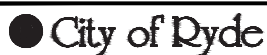
1. Scales shown are for A4 size drawing.
2. Shared paths and bikeways shall consist of 125mm thick broom finished concrete with SL72 mesh over 50mm thick compacted Porters Creek or equivalent recycled roadbase.
3. Key joints and dowels shall be placed and staked according to the Manufacturer's specification.
4. Groove joints shall be provided every 2.5m.
5. Paths shall have a 2.5% crossfall towards the kerb.
6. Concrete edges shall be finished with an edging tool.
7. Concrete shall have a 28 day strength of 25MPa minimum.
8. Concrete shall be placed with a maximum slump of 80mm.
9. The Council Engineer requires 24 hours notice prior to pouring of concrete to inspect the formwork. No concrete shall be poured until the excavation and formwork have been inspected.
10. Refer to Drawing CIV 09 for signage and linemarking details.
11. All dimensions in mm Unless Noted Otherwise (U.N.O)



SECTION B-B

Scale 1:10

DISCLAIMER:



Public Works - Project Development

STANDARD DRAWING:

SHARED PATH TWO WAY, OFFROAD PAVEMENT AND JOINTING

DRAWING NO:

CIV 08

SCALE:

AS SHOWN

SHEET:

1 OF 1

DATE:

20/05/2014

REV:

B

DRAWN: M.C

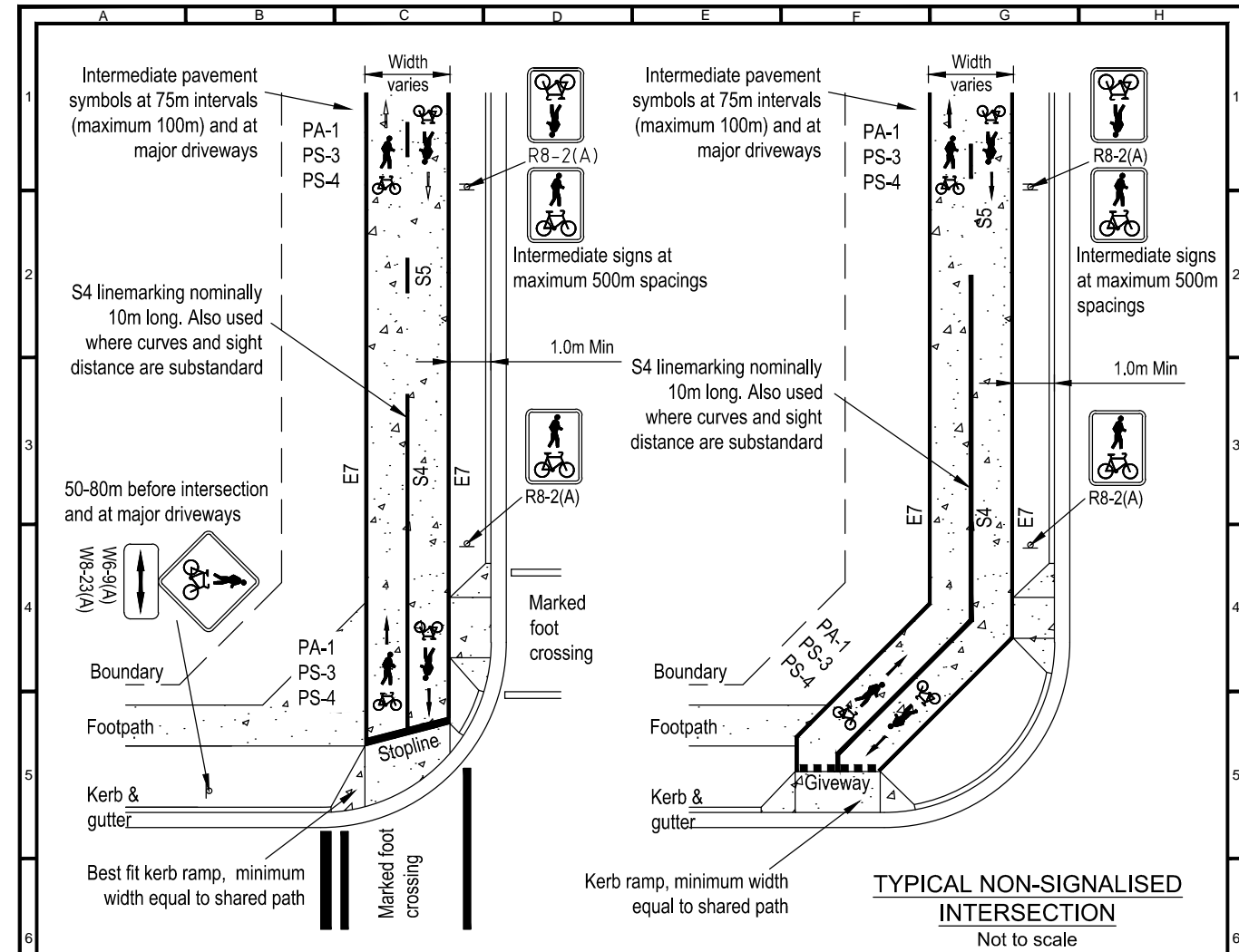
APPROVED: I.A

CHECKED: JSB/TM

DESIGN MANAGER

VERIFIED: V.P

...../...../.....

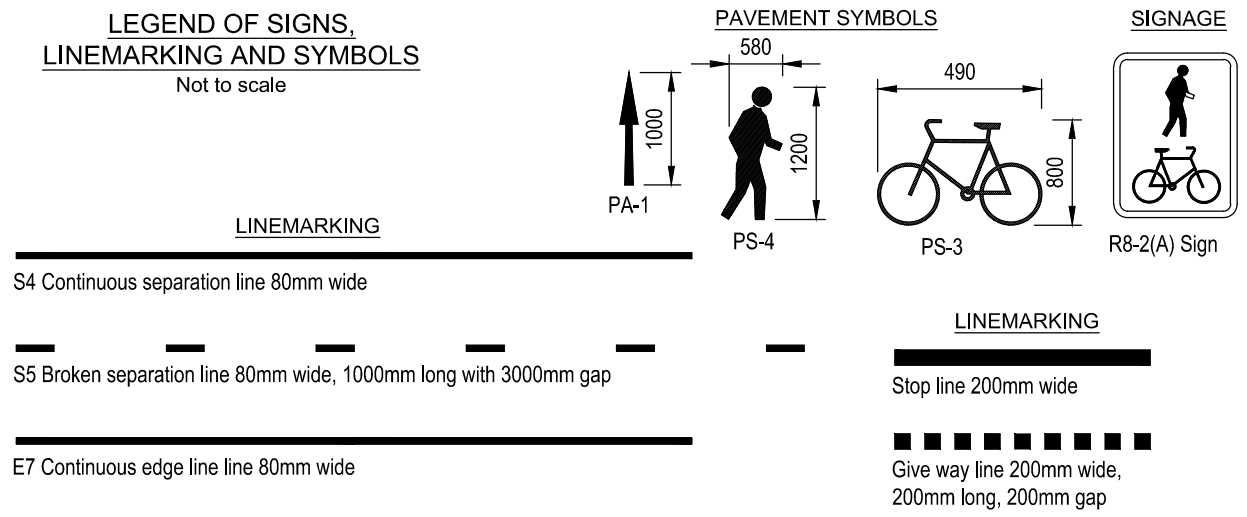


NOTES

1. All linemarking shall be white paint.
2. Also refer to the Roads and Maritime Services "NSW Bicycle Guidelines" for further layout details.
3. Refer to Drawing CIV 08 for pavement and jointing details.

LEGEND OF SIGNS, LINEMARKING AND SYMBOLS

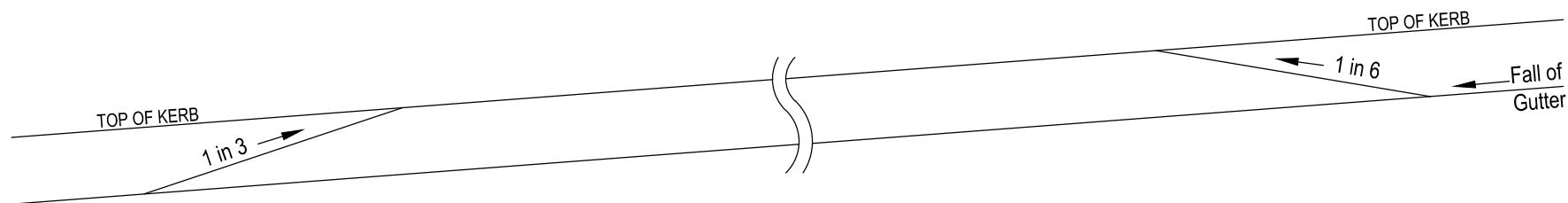
Not to scale



DISCLAIMER:

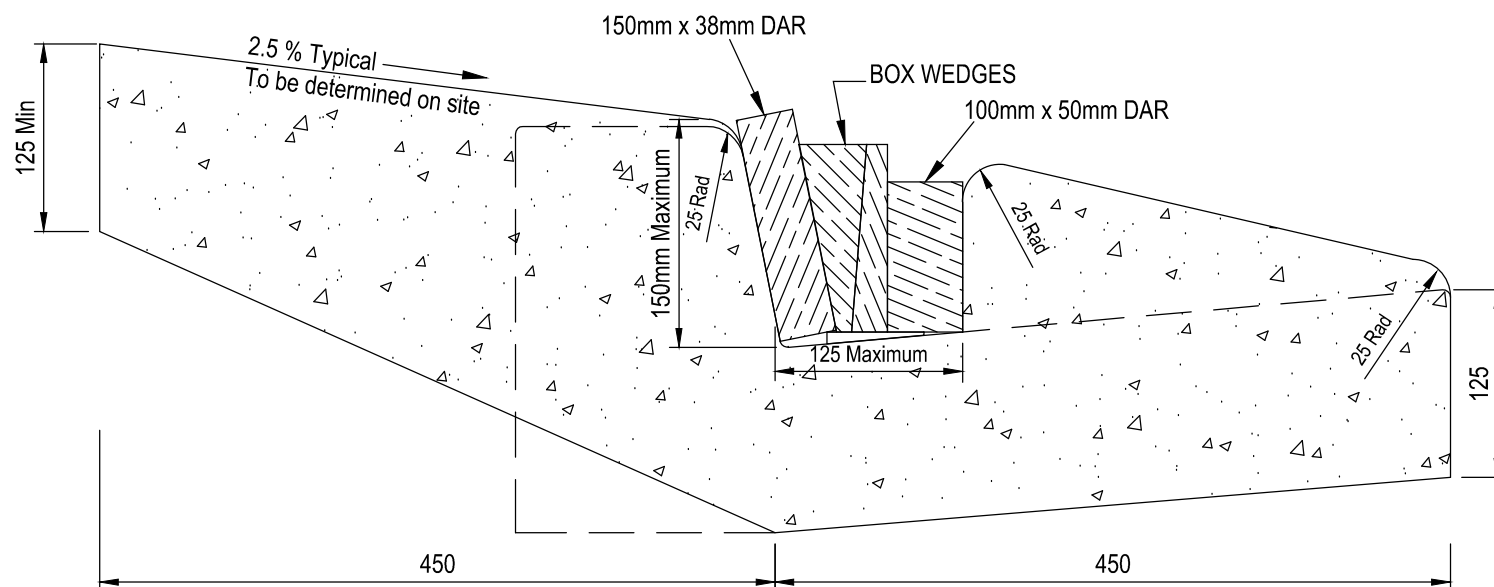
<p>Public Works - Project Development</p>		STANDARD DRAWING: SHARED PATHS TWO WAY, OFFROAD SIGNAGE AND LINEMARKING		DRAWING NO: CIV 09	
DRAWN: M.C/R.L. CHECKED: JSB/TM VERIFIED: V.P.		APPROVED: I.A. DESIGN MANAGER/...../.....		SCALE: NTS	SHEET: 1 OF 1
				DATE: 20/05/2014	REV: B

P:\PM2013\Public Domain Standard Details\COR Revised Standard Drawings\014\Civil\CIV Standard Drawings MC Rev-G.dwg / Plotted on: 20 May 2014



GUTTER ELEVATION SHOWING TREATMENT OF ENDS

Not to Scale



SECTION THROUGH CROSSING SHOWING DETAILS OF GUTTER BLOCK

Scale 1:5

NOTES

1. Scales shown are for A4 size drawing.
2. Installation of Gutter block involves the removal of the existing layback and gutter and the construction of the Gutter Block/Layback/Gutter as one unit.
3. Concrete edges shall be finished with an edging tool.
4. Concrete shall have a 28 day strength of 25MPa minimum.
5. Concrete shall be placed with a maximum slump of 80mm.
6. All dimensions in mm Unless Noted Otherwise (U.N.O)

DISCLAIMER:



DRAWN: M.C

CHECKED:

VERIFIED: V.P

APPROVED: I.A

DESIGN MANAGER

...../...../.....

STANDARD DRAWING:

STANDARD VEHICLE CROSSING GUTTER BLOCK

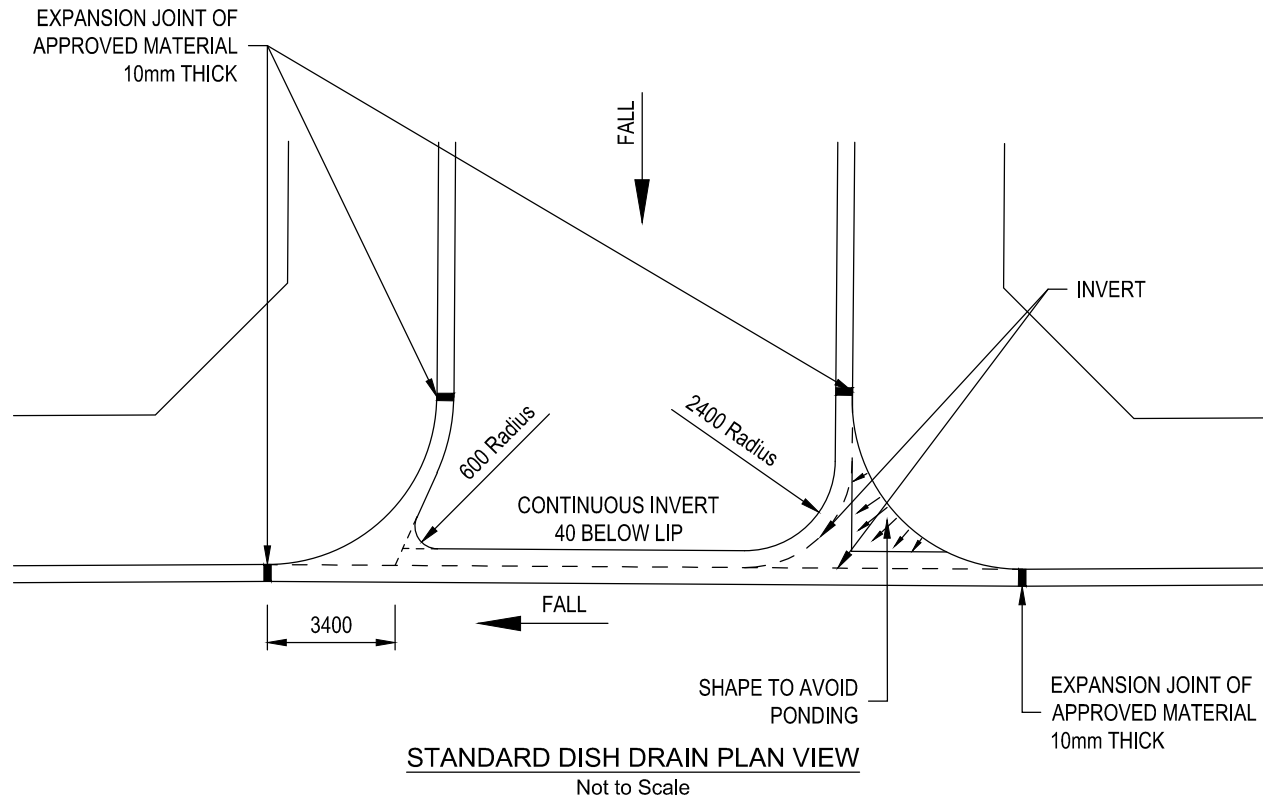
DRAWING NO: CIV 10

SCALE: AS SHOWN

SHEET: 1 OF 1

DATE: 20/05/2014

REV: B



NOTES

1. Gutters shall be reinforced with SL72 Mesh and formed integral with kerbs.
2. All kerbs, gutters and edge strips shall be steel float finished
3. Concrete shall have a 28 day strength of 25MPa minimum.
4. Concrete shall be placed with a maximum slump of 80mm.
5. Refer to Drawing CIV 01 for Dish Drain Profile.
6. All dimensions in mm Unless Noted Otherwise (U.N.O)

DISCLAIMER:



DRAWN: M.C / D.S

CHECKED:

VERIFIED: V.P

APPROVED: I.A

DESIGN MANAGER

...../...../.....

STANDARD DRAWING:

DISH DRAIN CROSSING DETAIL

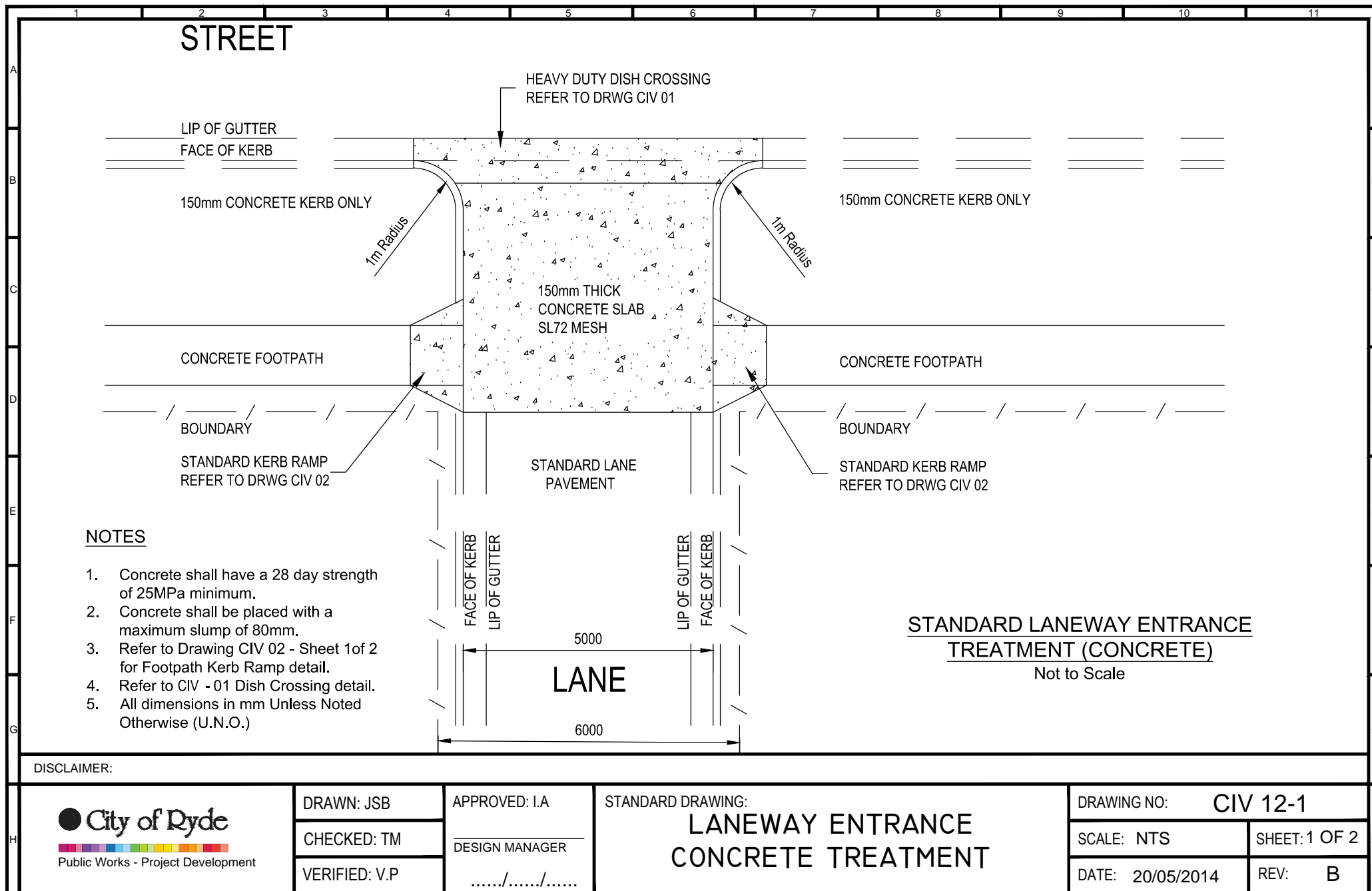
DRAWING NO: CIV 11

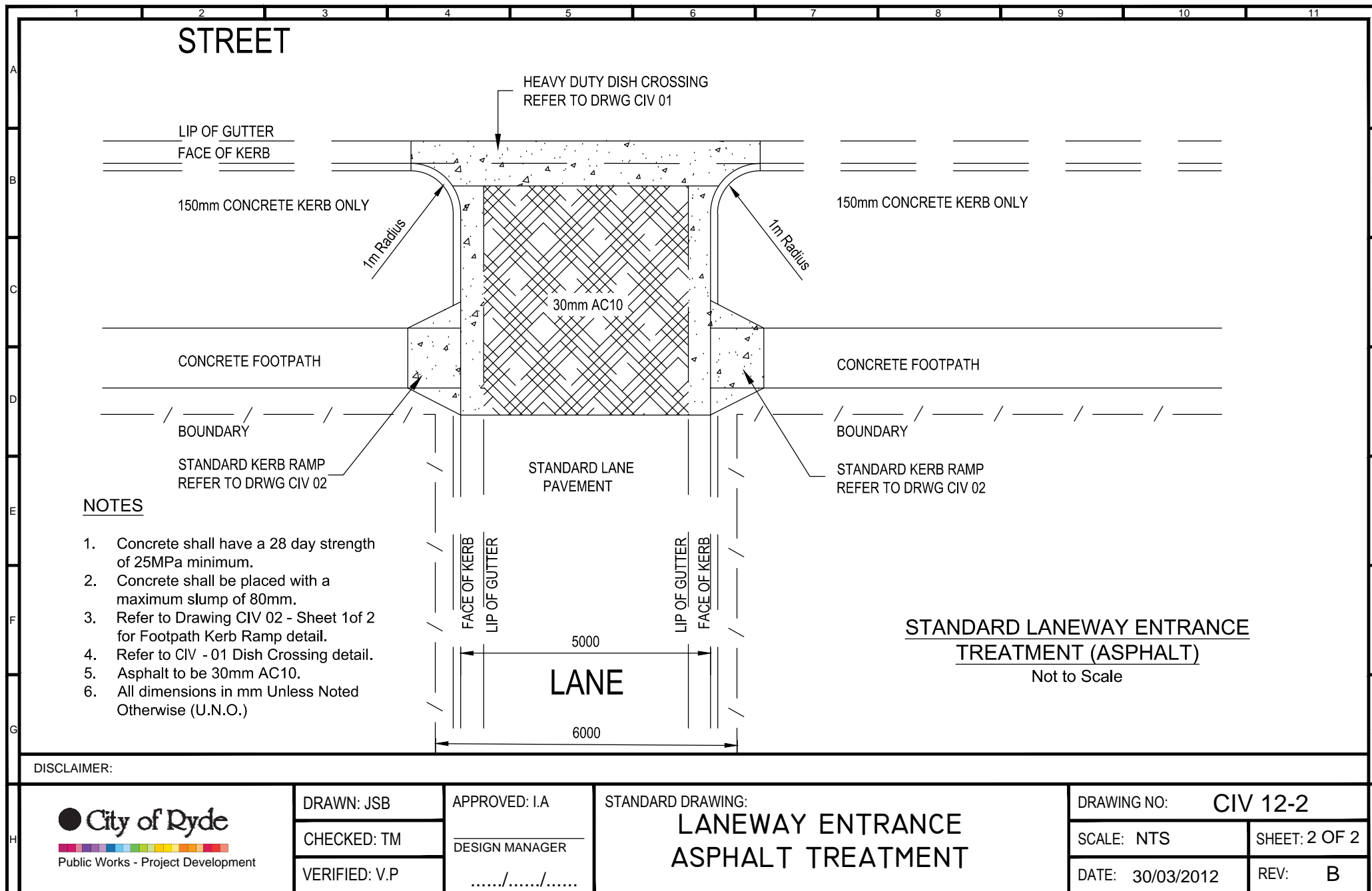
SCALE: NTS

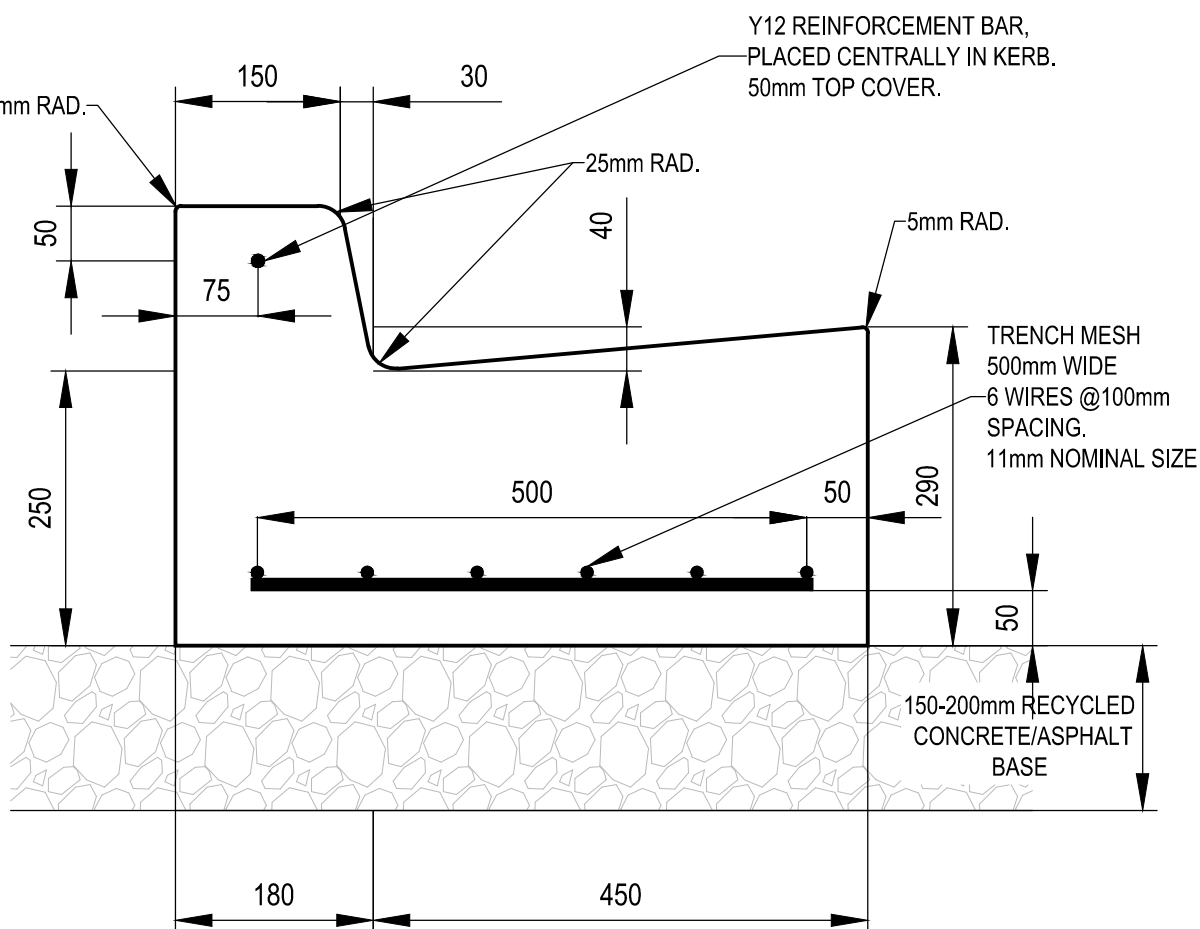
DATE: 20/05/2014

SHEET: 1 OF 1

REV: B







NOTES:

1. THIS TYPE OF KERB AND GUTTER TO BE USED WHERE BUSES TRAVERSE THE GUTTER.
2. USE TRENCH MESH 500mm WIDE WITH 6 WIRES OF 11mm NOMINAL DIAMETER AT 100mm SPACING TO REINFORCE THE HORIZONTAL FACE.
3. MINIMUM COVER FOR REINFORCEMENT IS 50mm.
4. REINFORCE KERB WITH A Y12 REINFORCEMENT BAR PLACED CENTRALLY (75mm FROM THE VERTICAL FACE) WITH 50mm MINIMUM COVER FROM THE TOP.
5. USE EARLY SETTING 32MPa STRENGTH CONCRETE (32MPa IN 3 DAYS).
6. MAXIMUM SLUMP 80mm.
7. LAY THE KERB AND GUTTER ON A 150-200mm THICK COMPACTED PORTERS CREEK OR EQUIVALENT RECYCLED ROADBASE.

DISCLAIMER:



Public Works - Project Development

STANDARD DRAWING:

REINFORCED KERB & GUTTER OF BUS STOPS

DRAWING NO:

CIV 13

SCALE:

NTS

SHEET:

1 OF 1

DATE:

20/05/2014

REV:

B

DRAWN: MC

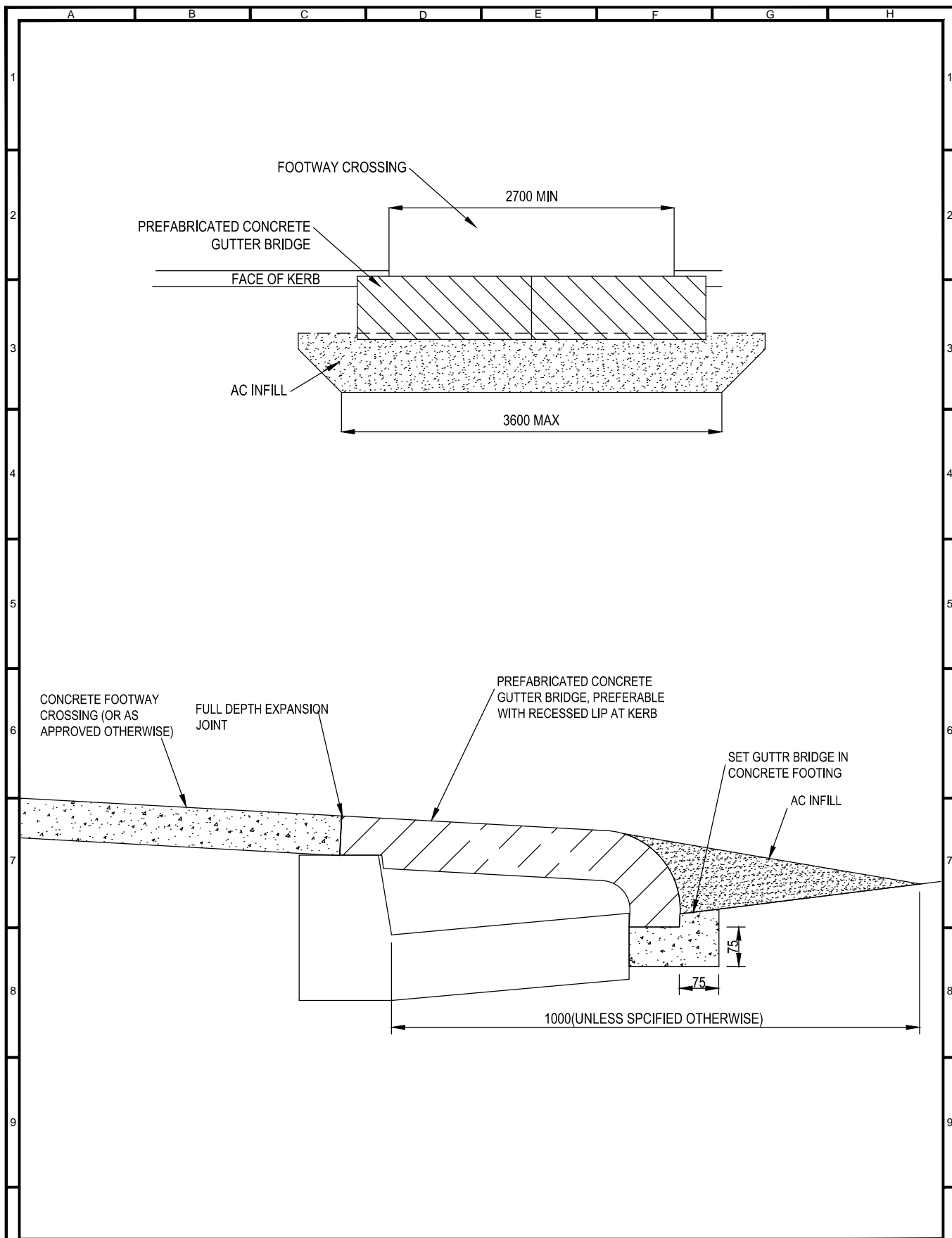
APPROVED: I.A

CHECKED: VM

DESIGN MANAGER

VERIFIED: V.P

...../...../.....



DISCLAIMER:



Public Works - Project Development

STANDARD DRAWING:

GUTTER BRIDGE

DRAWING NO:

CIV 14

SCALE:

NTS

SHEET:

1 OF 1

DATE:

20/05/2014

REV:

B

DRAWN: MC

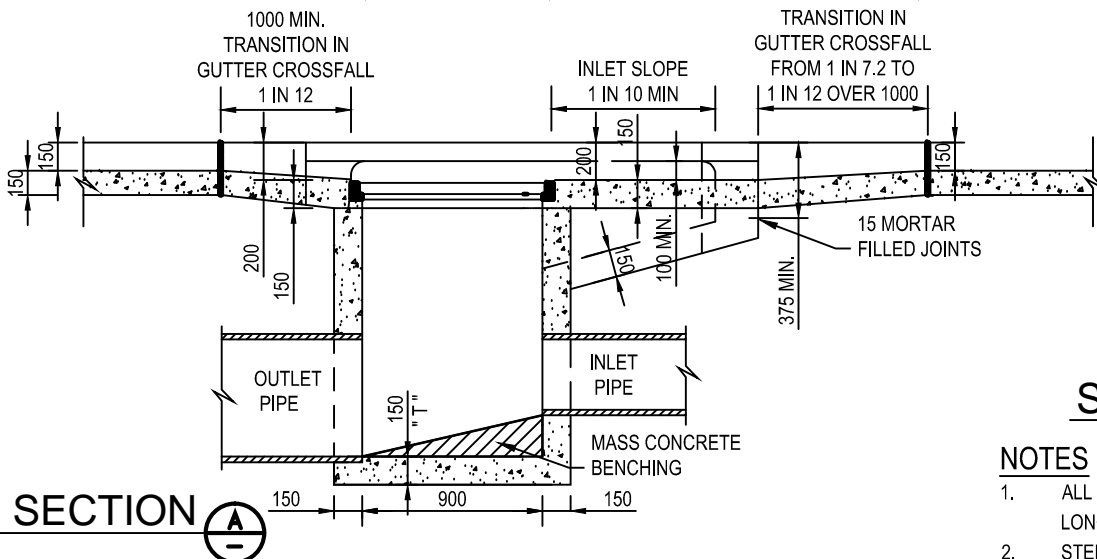
APPROVED: I.A

CHECKED: VM

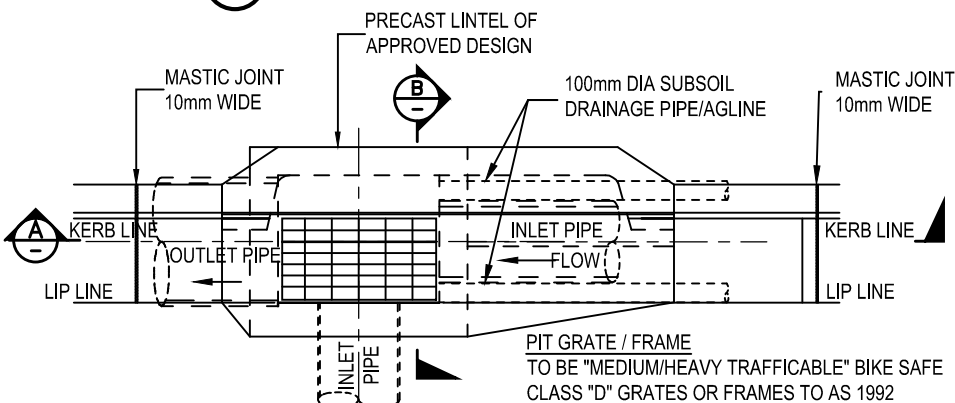
DESIGN MANAGER

VERIFIED: V.P

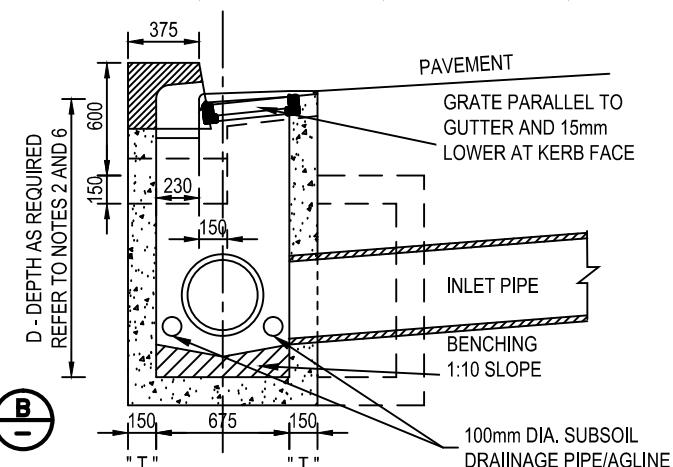
...../...../.....



SECTION A



PLAN



SECTION B

NOTES

1. ALL KERB INLET PITS (ON GRADE) SHALL BE PROVIDED WITH AN EXTENDED INLET 900mm (MIN) LONG ON THE HIGHER SIDE.
2. STEP IRONS TO BE PROVIDED AT 300mm CENTRES FOR PITS DEEPER THAN 1200mm AND PLACED ON A WALL CLEAR OF FLOW WHERE POSSIBLE.
3. THE COMPRESSIVE STRENGTH OF ALL CONCRETE USED SHALL BE 25MPa AT 28 DAYS.
4. MINIMUM COVER TO ALL PIPES TO BE 600mm UNDER ROADS AND 450 ELSEWHERE
5. ALL INTERNAL PIT CORNERS TO BE PROVIDED WITH BENCHING TO IMPROVE FLOW.
6. WHERE INTERNAL WIDTH EXCEEDS 750mm OR DEPTH EXCEEDS 1200mm WALLS TO BE REINFORCED IN ACCORDANCE WITH THE TABLE SHOWN BELOW.
7. SELECTED GRANULAR MATERIAL BACKFILL SHALL BE PLACED TO FILL ALL EXCAVATED VOIDS. (REFER TO AS 3725-2007)
8. ALL PIPES TO BE LAID SO THAT THEIR CENTRELINES INTERSECT AT THE CENTRE OF THE PIT.
9. 100mm DIA. SUBSOIL DRAINAGE PIPE/AGLINE 3.0m LONG WRAPPED IN FABRIC SOCK TO BE PLACED ADJACENT TO INLET PIPES ON BOTH SIDES AND 100mm MINIMUM ABOVE PIT FLOOR. SURROUND SUBSOIL DRAINAGE PIPE/AGLINE WITH 10mm AGGREGATE
10. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE (U.N.O.)

DEPTH TO INVERT "D"	WALL & BASE THICKNESS "T"	SPACING OF "N16" WALL & BASE REINFORCEMENT MAXIMUM INTERNAL PLAN DIMENSION "W"				
		0 - 1190	1200 - 1790	1800 - 2390	2400 - 2690	2700 - 3000
0 - 1990	150	NIL.REINF.	250 CP	250 CP	250 CP	250 CP
2000 - 2490	200	250 CP	250 CP	250 CP	250 CP	250 CP

DISCLAIMER:



DRAWN: JSB/MC

CHECKED: JSB/MC

VERIFIED: VP

APPROVED: IA

DESIGN MANAGER

...../...../.....

STANDARD DRAWING:

**STANDARD KERB INLET PIT
(ON GRADE)**

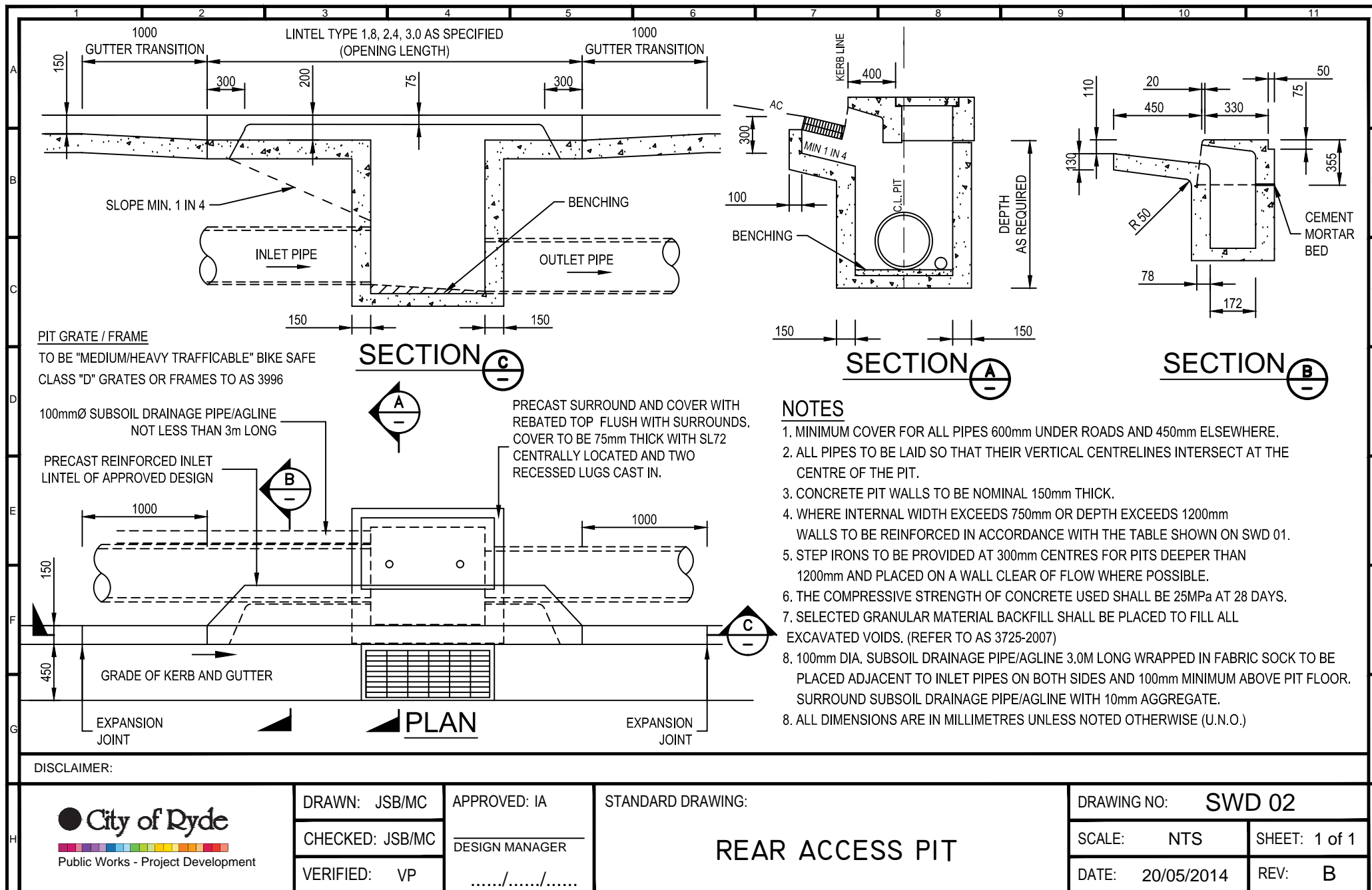
DRAWING NO: **SWD 01**

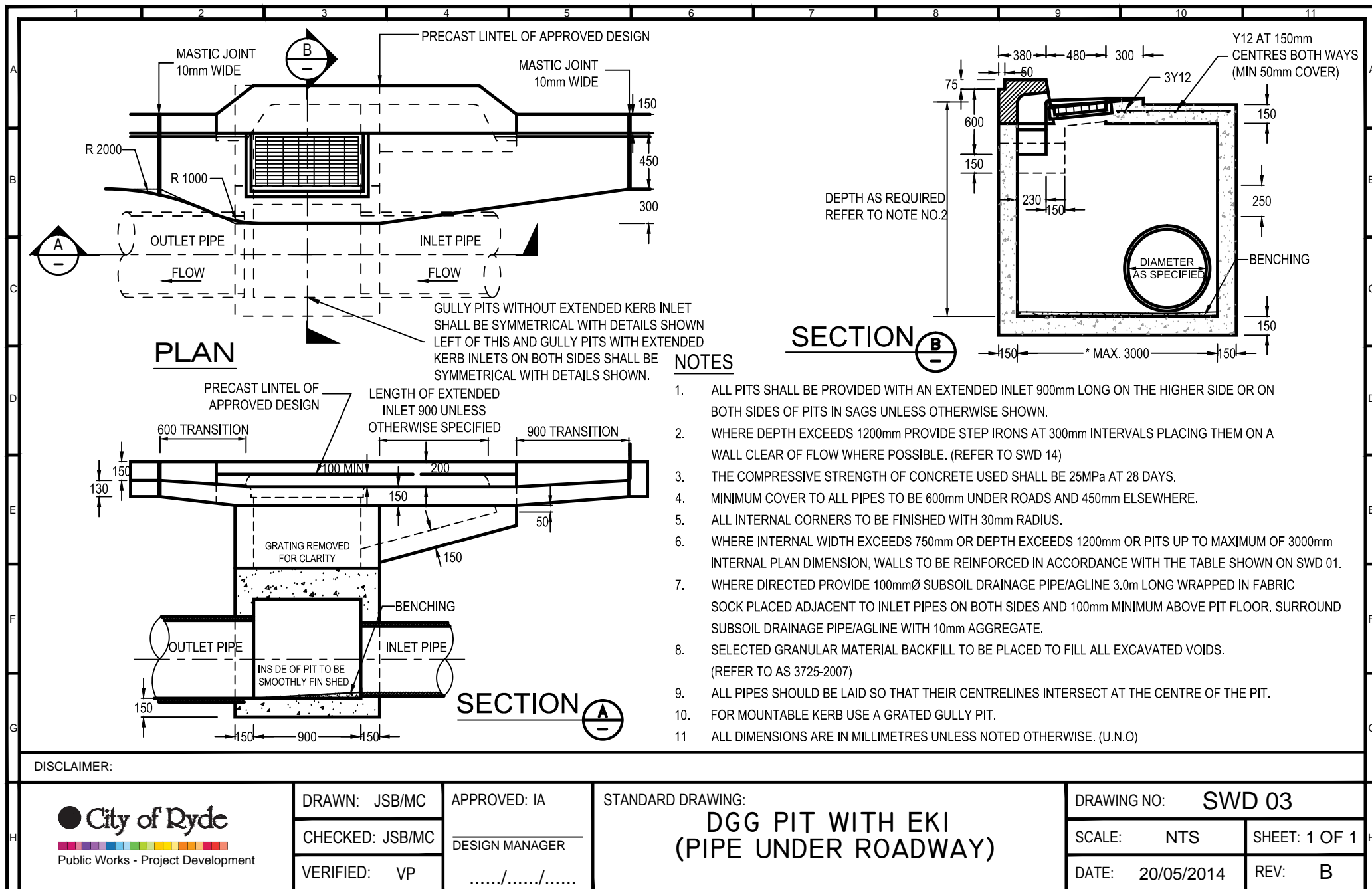
SCALE: NTS

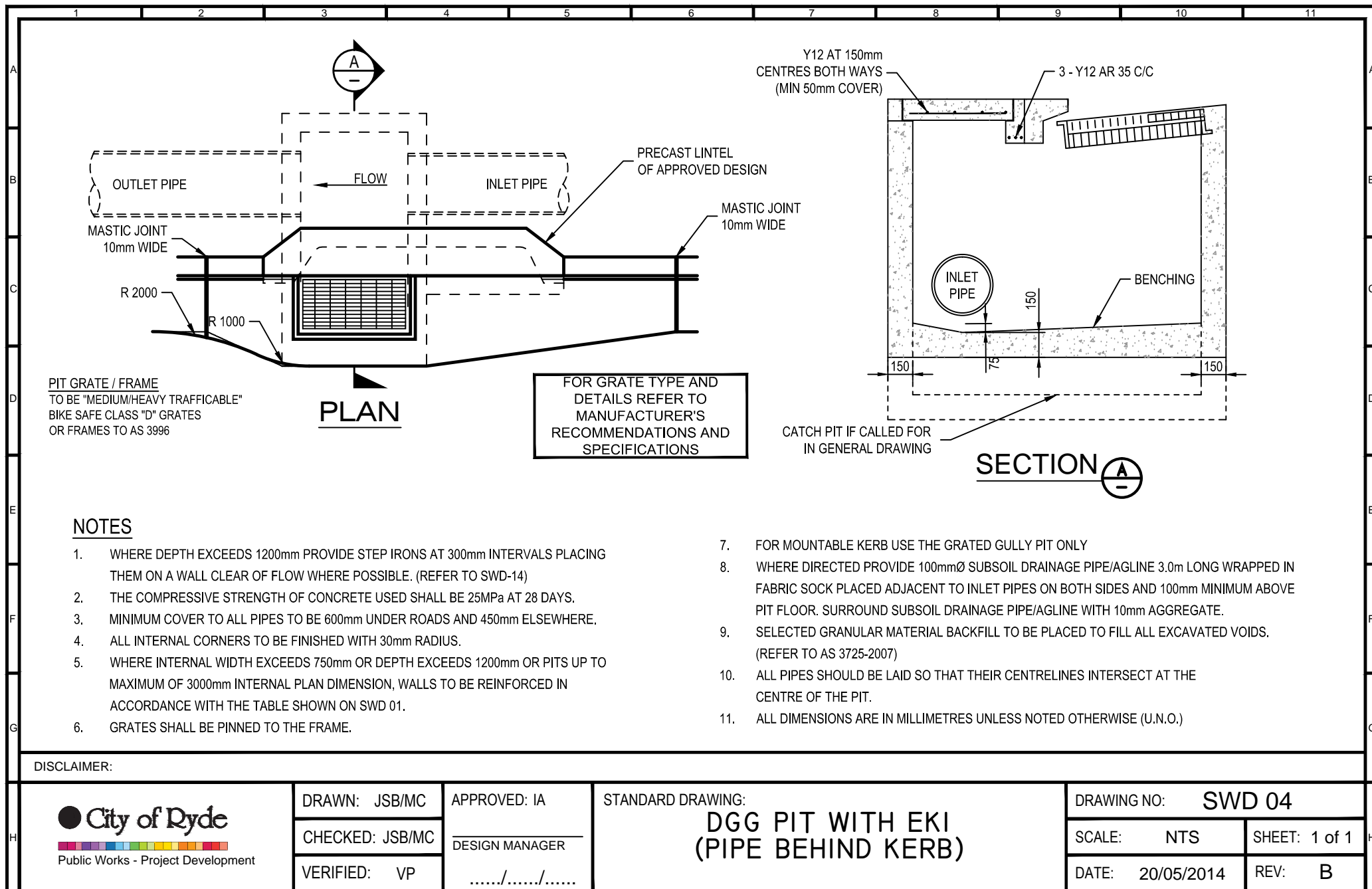
DATE: 20/05/2014

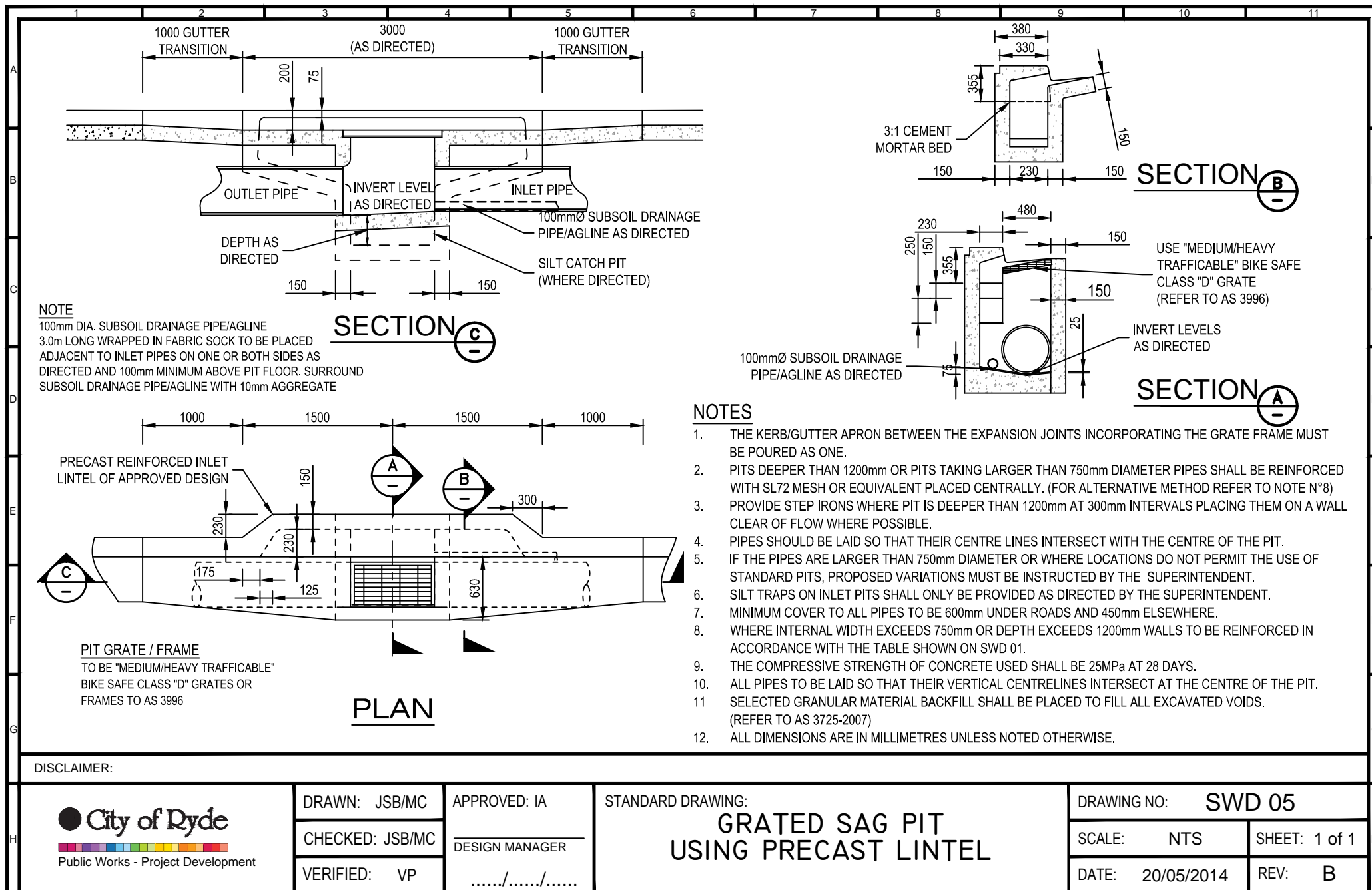
SHEET: 1 of 1

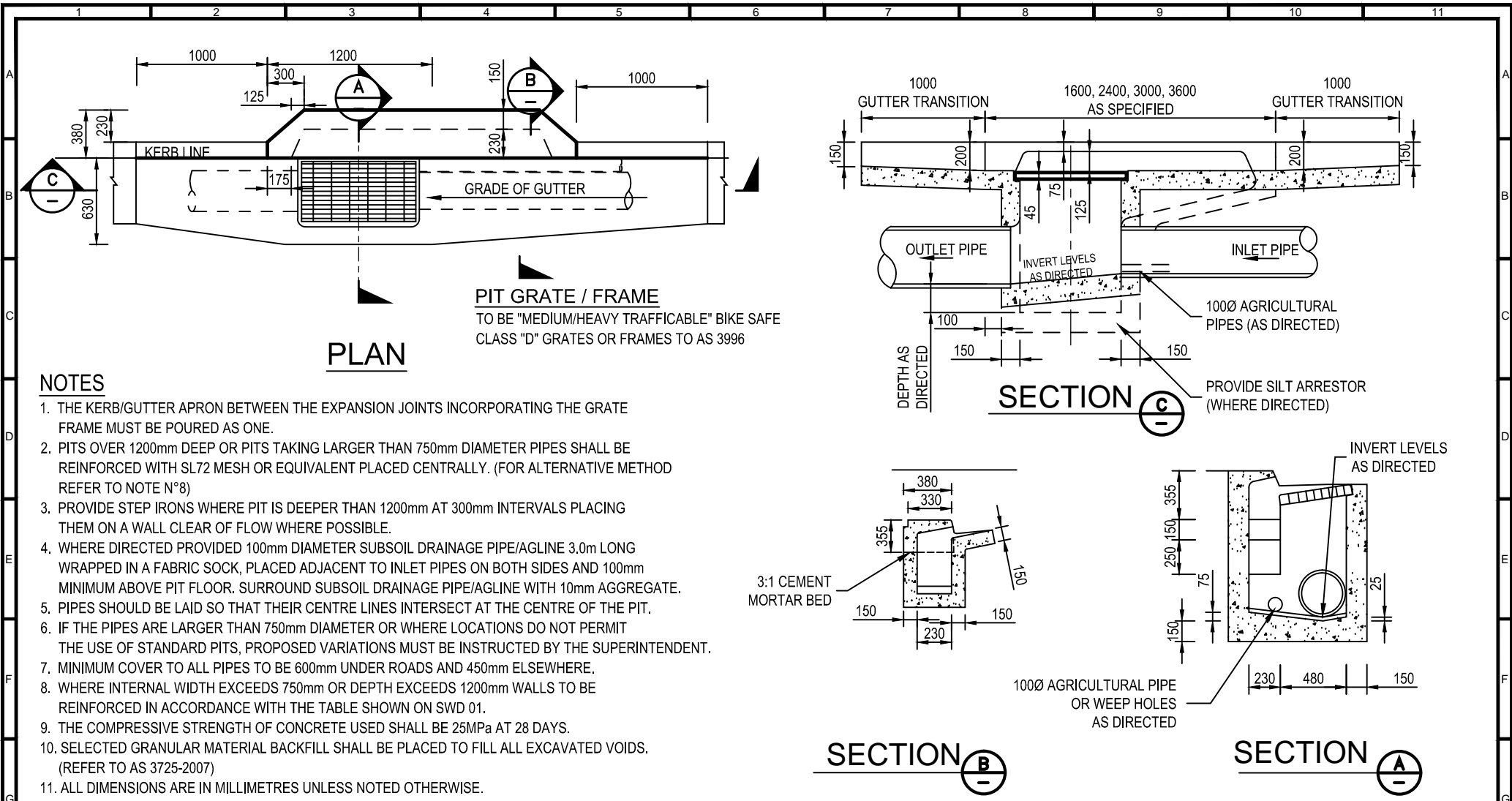
REV: B











NOTES

1. THE KERB/GUTTER APRON BETWEEN THE EXPANSION JOINTS INCORPORATING THE GRATE FRAME MUST BE POURED AS ONE.
2. PITS OVER 1200mm DEEP OR PITS TAKING LARGER THAN 750mm DIAMETER PIPES SHALL BE REINFORCED WITH SL72 MESH OR EQUIVALENT PLACED CENTRALLY. (FOR ALTERNATIVE METHOD REFER TO NOTE N°8)
3. PROVIDE STEP IRONS WHERE PIT IS DEEPER THAN 1200mm AT 300mm INTERVALS PLACING THEM ON A WALL CLEAR OF FLOW WHERE POSSIBLE.
4. WHERE DIRECTED PROVIDED 100mm DIAMETER SUBSOIL DRAINAGE PIPE/AGLINE 3.0m LONG WRAPPED IN A FABRIC SOCK, PLACED ADJACENT TO INLET PIPES ON BOTH SIDES AND 100mm MINIMUM ABOVE PIT FLOOR. SURROUND SUBSOIL DRAINAGE PIPE/AGLINE WITH 10mm AGGREGATE.
5. PIPES SHOULD BE LAID SO THAT THEIR CENTRE LINES INTERSECT AT THE CENTRE OF THE PIT.
6. IF THE PIPES ARE LARGER THAN 750mm DIAMETER OR WHERE LOCATIONS DO NOT PERMIT THE USE OF STANDARD PITS, PROPOSED VARIATIONS MUST BE INSTRUCTED BY THE SUPERINTENDENT.
7. MINIMUM COVER TO ALL PIPES TO BE 600mm UNDER ROADS AND 450mm ELSEWHERE.
8. WHERE INTERNAL WIDTH EXCEEDS 750mm OR DEPTH EXCEEDS 1200mm WALLS TO BE REINFORCED IN ACCORDANCE WITH THE TABLE SHOWN ON SWD 01.
9. THE COMPRESSIVE STRENGTH OF CONCRETE USED SHALL BE 25MPa AT 28 DAYS.
10. SELECTED GRANULAR MATERIAL BACKFILL SHALL BE PLACED TO FILL ALL EXCAVATED VOIDS. (REFER TO AS 3725-2007)
11. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

DISCLAIMER:



DRAWN: JSB/MC

CHECKED: JSB/MC

VERIFIED: VP

APPROVED: IA

DESIGN MANAGER

...../...../.....

STANDARD DRAWING:

GGPIT WITH EKI
USING PRECAST LINTEL

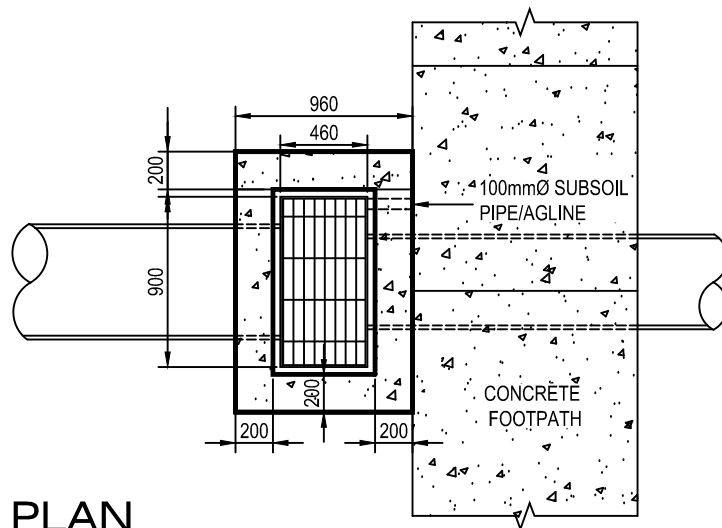
DRAWING NO: SWD 06

SCALE: NTS

DATE: 20/05/2014

SHEET: 1 of 1

REV: B



PLAN

PIT GRATE / FRAME

TO BE "MEDIUM/HEAVY TRAFFICABLE"
BIKE SAFE CLASS "C" GRATES OR
FRAMES TO AS 3996 - 1992



NOTES

1. CONCRETE APRONS TO BE INCLUDED WHEN CONSTRUCTING ADJACENT TO CONCRETE PATHS.
2. SILT TRAPS ON INLET PITS SHALL ONLY BE PROVIDED AS DIRECTED BY THE SUPERINTENDENT.
3. ALL PIPES SHOULD BE LAID SO THAT THEIR CENTRELINES INTERSECT AT THE CENTRE OF THE PIT.
4. MINIMUM COVER TO ALL PIPES TO BE 600mm UNDER ROADS AND 450mm ELSEWHERE.
5. PROVIDE STEP IRONS WHERE PIT IS DEEPER THAN 1200mm AT 300mm INTERVALS PLACING THEM ON A WALL CLEAR OF FLOW WHERE POSSIBLE. REFER TO SWD-14)
6. WHERE INTERNAL WIDTH EXCEEDS 750mm OR DEPTH EXCEEDS 1200mm WALLS TO BE REINFORCED, ACCORDING TO SWD 01.
7. 100mm SUBSOIL DRAINAGE PIPE/AGLINE 3.0m LONG WRAPPED IN FABRIC SOCK TO BE PLACED ADJACENT TO INLET PIPES ON ONE OR BOTH SIDES AND 100mm ABOVE PIT FLOOR. SURROUND SUBSOIL DRAINAGE PIPE/AGLINE WITH 10m AGGREGATE.
8. THE COMPRESSIVE STRENGTH OF CONCRETE USED SHALL BE 25MPa AT 28 DAYS.
9. SELECTED GRANULAR MATERIAL BACKFILL SHALL BE PLACED TO FILL ALL EXCAVATED VOIDS.
10. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE (U.N.O.).

PROVIDE 100mm THICK
CONCRETE APRON
ON 50mm BEDDING

FOOTPATH SLAB AT PIT TO HAVE EXTRA
CROSS FALL OF 25mm TOWARDS PIT

100mm SLAB ON 50mm
APPROVED BEDDING

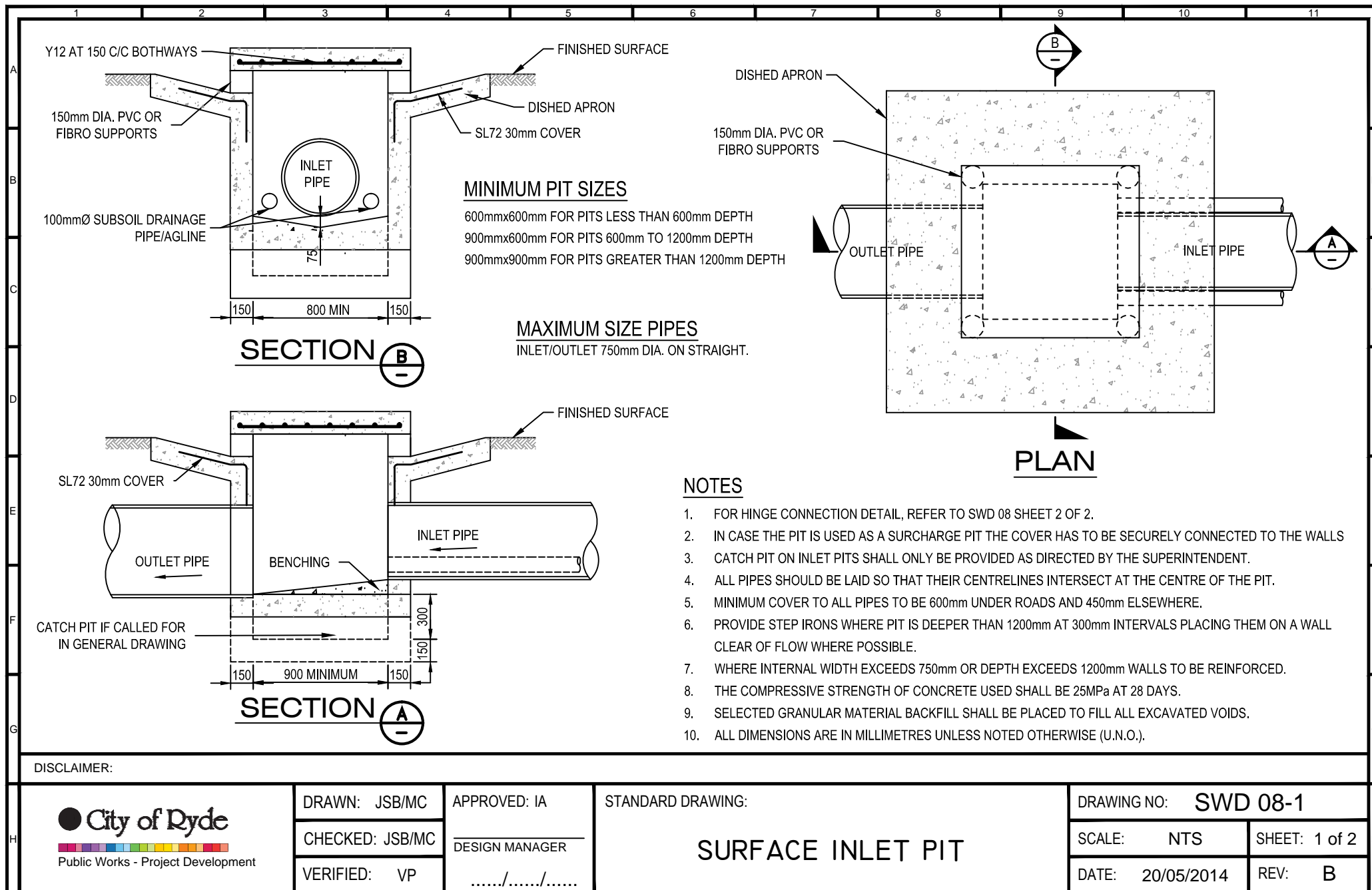
BENCHING

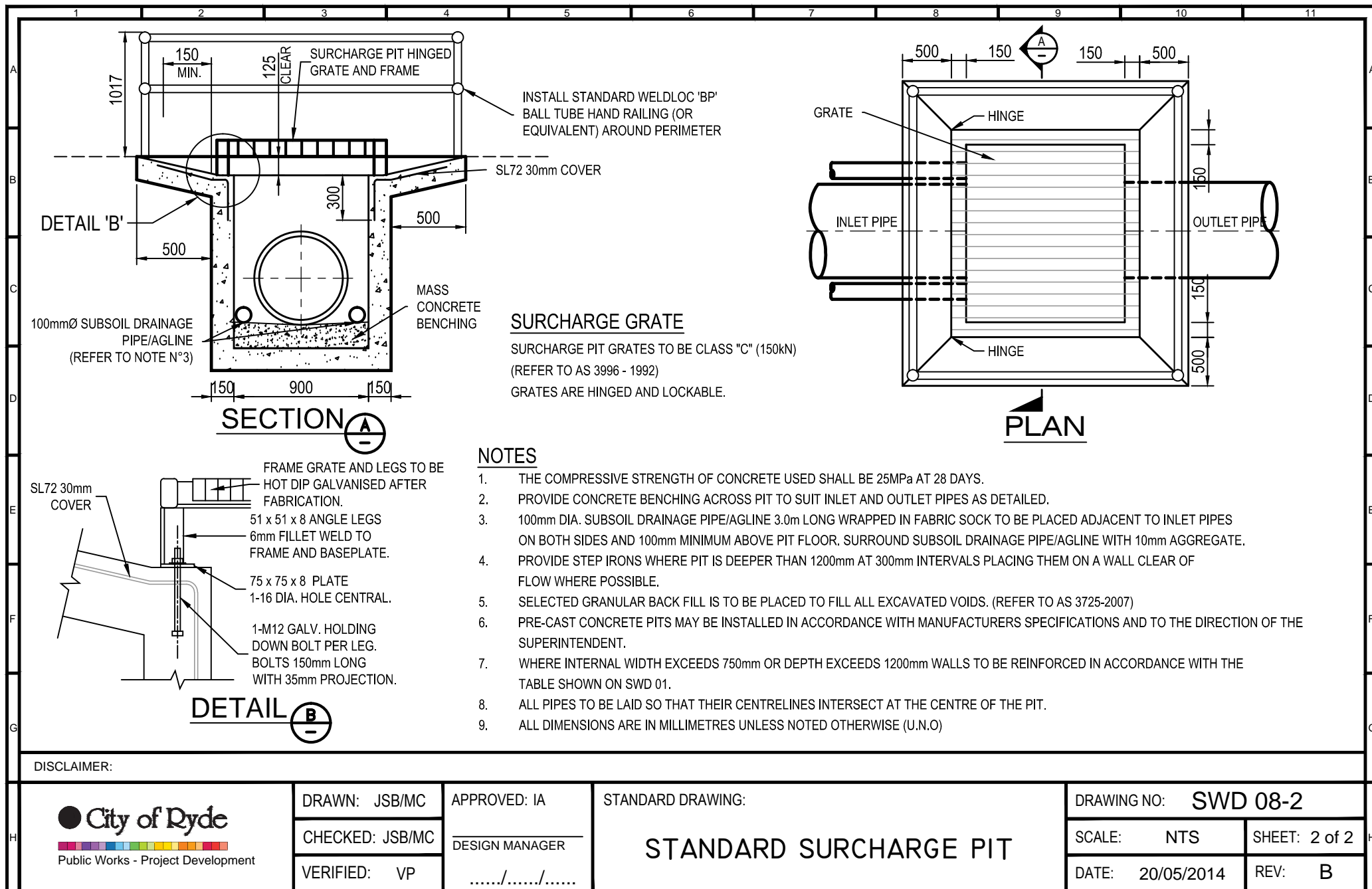
MIN 150 DIA.

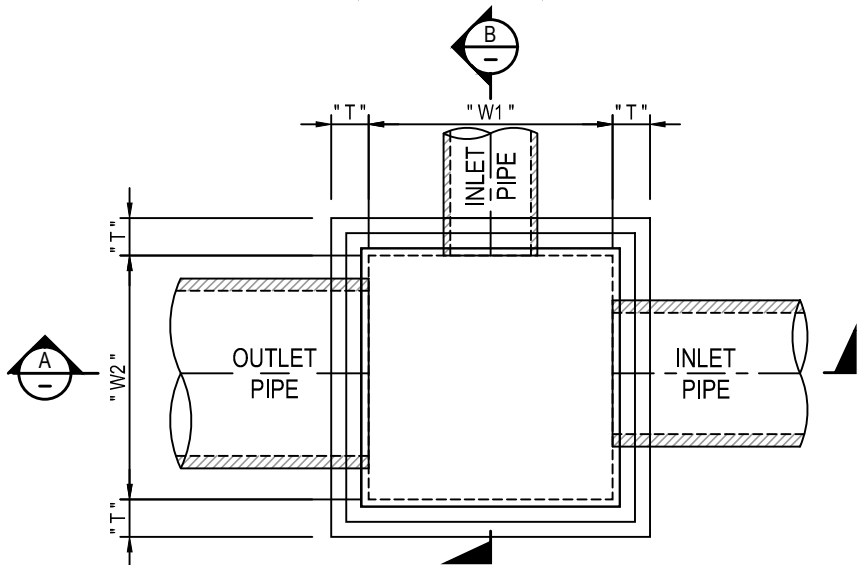
SECTION



DISCLAIMER:



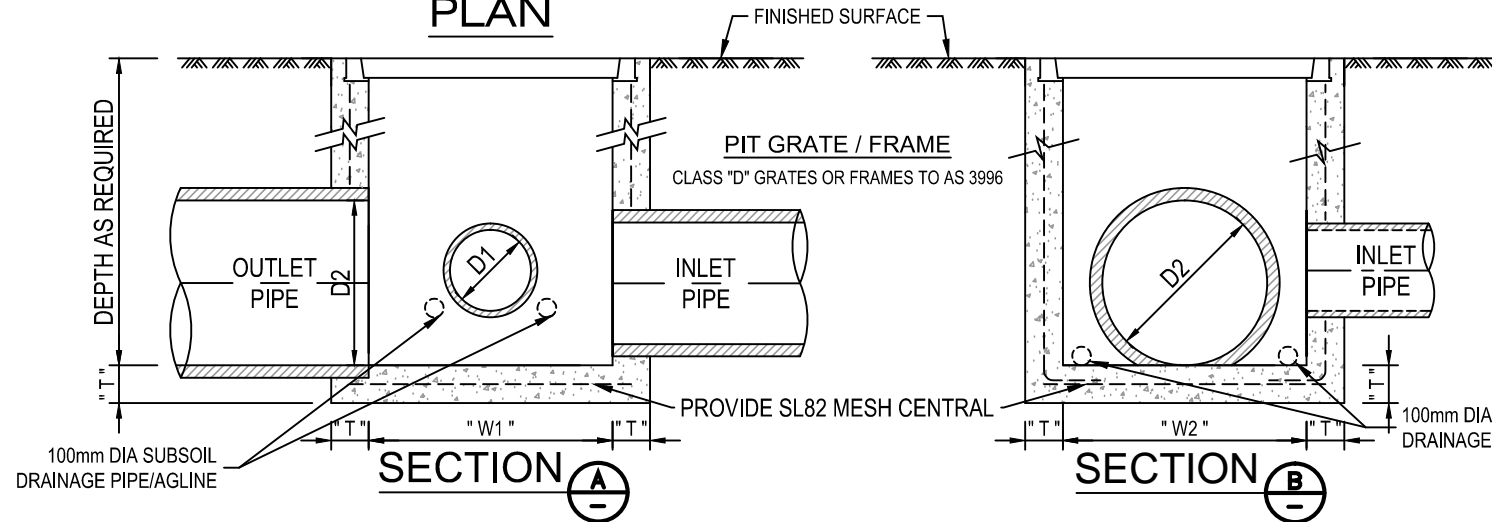




PLAN

NOTES

1. STEP IRONS TO BE PROVIDED AT 300mm CENTRES FOR PITS DEEPER THAN 1200mm AND PLACED ON A WALL CLEAR OF FLOW WHERE POSSIBLE . (REFER TO SWD-14)
2. THE COMPRESSIVE STRENGTH OF CONCRETE USED SHALL BE 25MPa AT 28 DAYS.
3. 100mm DIAMETER SUBSOIL DRAINAGE PIPE/AGLINE 3.0m LONG WRAPPED IN FABRIC
4. SOCK TO BE PLACED ADJACENT TO INLET PIPES ON BOTH SIDES AND 100mm MINIMUM ABOVE THE PIT FLOOR. SURROUND SUBSOIL DRAINAGE PIPE/AGLINE WITH 10mm AGGREGATE
5. PROVIDE STEP IRONS WHERE PIT IS DEEPER THAN 1200mm DEEP AT 300mm INTERVALS PLACING THEM ON A WALL CLEAR OF FLOW WHERE POSSIBLE.
6. SELECTED GRANULAR MATERIAL BACK FILL SHALL BE PLACED TO FILL ALL EXCAVATED VOIDS. (REFER TO AS 3725-2007)
7. APPROVED PRE CAST CONCRETE PITS MAY BE USED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATION AND TO THE DIRECTION OF THE SUPERINTENDENT.
8. WHERE INTERNAL WIDTH EXCEEDS 750mm OR DEPTH EXCEEDS 1200mm WALLS TO BE REINFORCED IN ACCORDANCE WITH THE TABLE SHOWN.
9. THE INLET PIPE OBVERT IS TO BE NO HIGHER THAN THE OUTLET PIPE OBVERT.
10. ALL PIPES TO BE LAID SO THAT THEIR CENTERLINES INTERSECT AT THE CENTRE OF THE PIT
11. DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.



SECTION A

SECTION B

PIT SIZE

INLET PIPE DIAMETER (D1)	MINIMUM PIT WIDTH (W1)	OUTLET PIPE DIAMETER (D2)	MINIMUM PIT WIDTH (W2)
225	600	225	600
300	600	300	600
375	600	375	600
450	600	450	600
525	680	525	680
600	760	600	760
675	830	675	830
750	900	750	900
825	990	825	990
900	1050	900	1050
1050	1200	1050	1200
1200	1370	1200	1370

PIT DEPTH

0 - 2m	T = 150
2m - 2.5m	T = 200

DISCLAIMER:



DRAWN: JSB/MC

CHECKED: JSB/MC

VERIFIED: VP

APPROVED: IA

DESIGN MANAGER

...../...../.....

STANDARD DRAWING:

STANDARD JUNCTION PIT

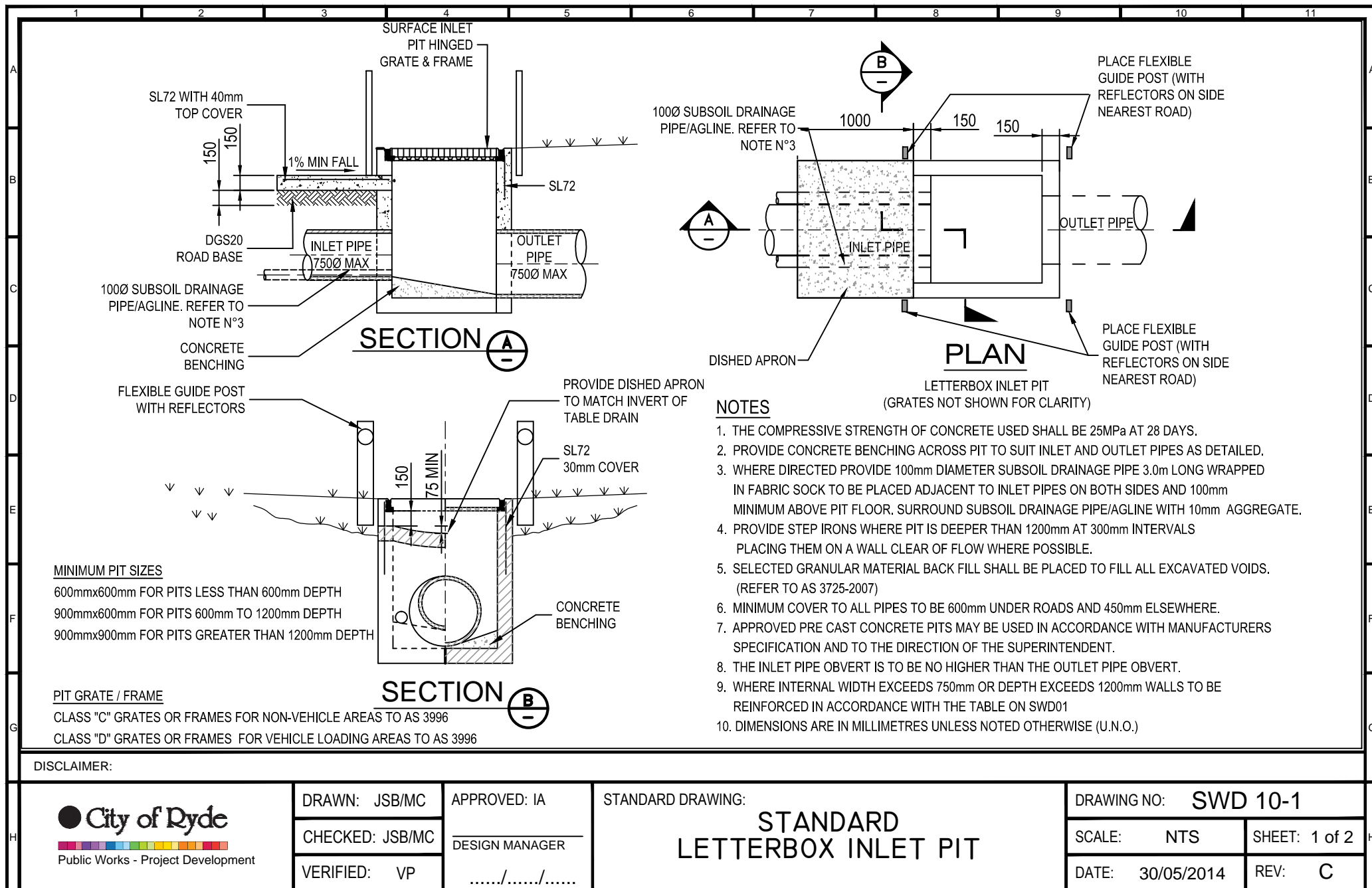
DRAWING NO: **SWD 09**

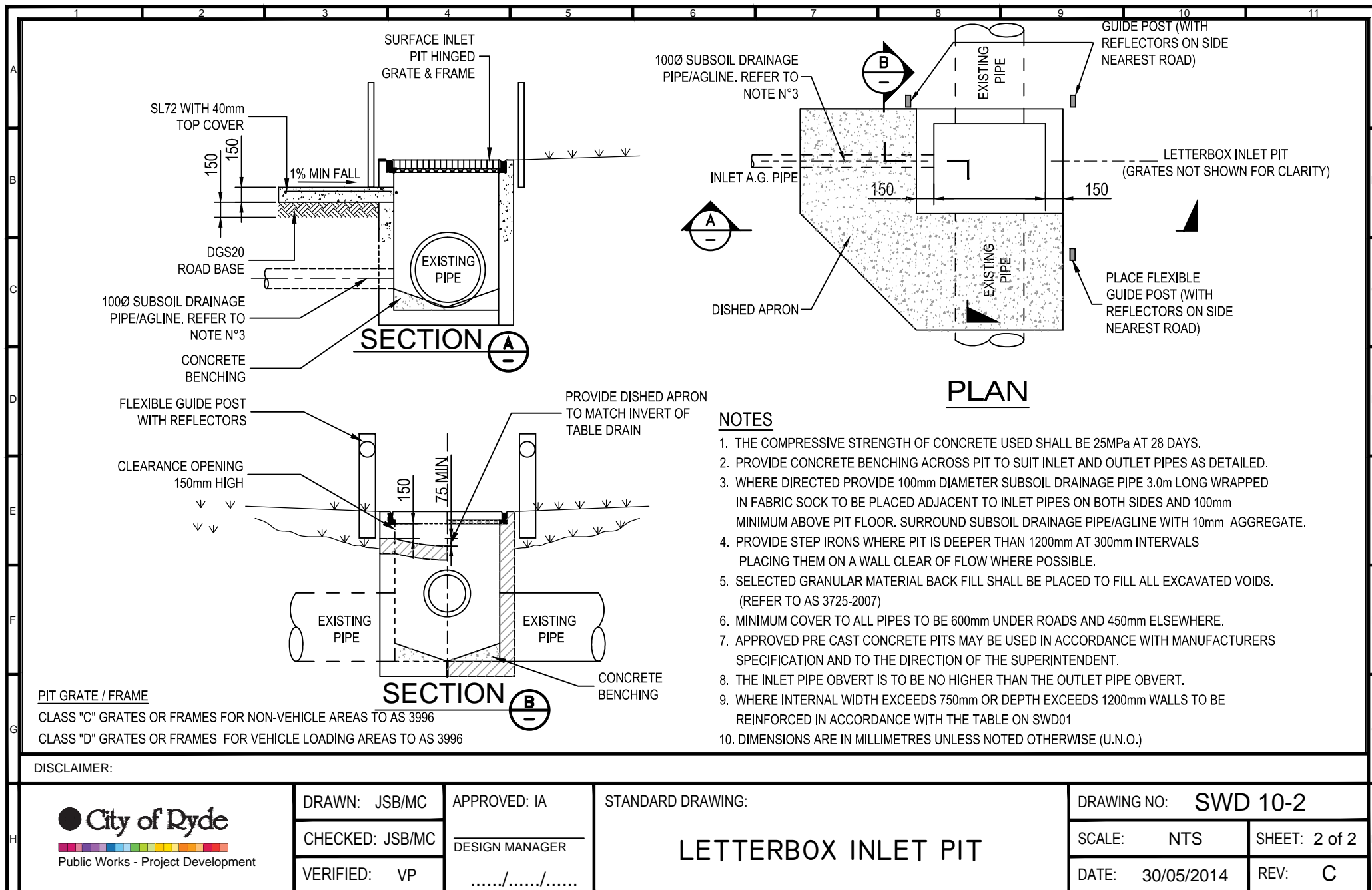
SCALE: NTS

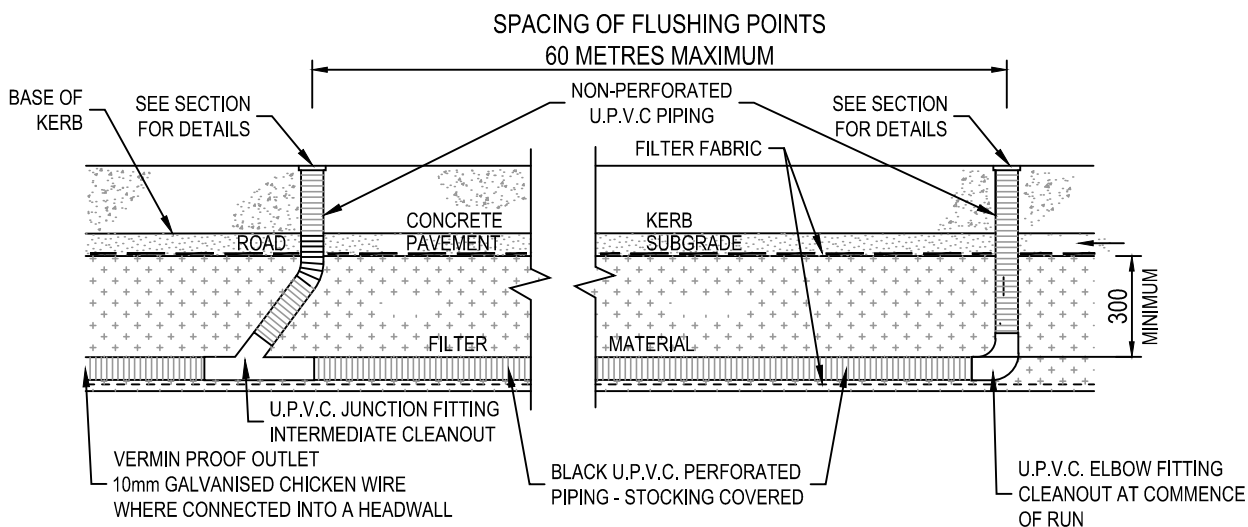
DATE: 20/05/2014

SHEET: 1 of 1

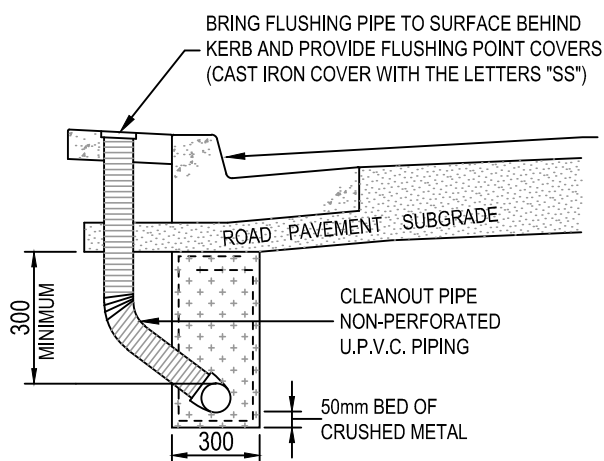
REV: B



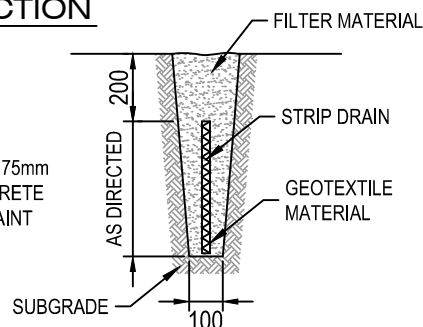




TYPICAL LONGITUDINAL SECTION

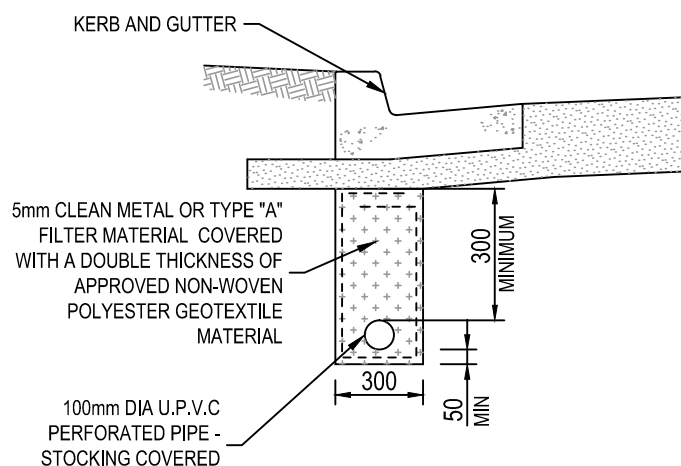


SECTION AT FLUSHING POINT



STRIP DRAIN
(SAND AS FILTER MATERIAL)

SAND FILTER MATERIAL GRADING	
AS. SIEVE SIZE mm	% PASSING
4.750	100
2.360	95-100
0.425	20-80
0.300	0-30
0.150	0-2
0.075	0-0.1



TYPICAL SECTION

NOTES

1. EXACT LOCATION WHETHER IN ROAD OR BEHIND KERB AND GUTTER TO BE DETERMINED ON SITE PENDING NUMBER OF CONCRETE DRIVEWAYS THAT NEED TO BE DISTURBED.
2. THE MINIMUM GRADE OF THE LINE TO BE 1 IN 200. THE GRADE SHALL FALL CONTINUOUSLY TO PREVENT SILTING UP AND BLOCKAGES.
3. SELECTED GRANULAR MATERIAL BACKFILL SHALL BE PLACED TO FILL ALL EXCAVATED VOIDS. (REFER TO AS 3725-2007)
4. A MAXIMUM FILTER AGGREGATE SIZE OF 10mm TO BE USED TO AVOID PUNCTURING THE PIPE.
5. ALL WORKS AND MATERIALS ACCORDING TO "AUSPEC" AND A.S. 3500.3-2003 SECTION 6
6. A MINIMUM OF 50mm LAYER OF FILTER MATERIAL TO BE FIRST PLACES IN THE TRENCH TO PROVIDE A DRAINAGE PATH UNDERNEATH THE PLASTIC PIPE.
7. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE. (U.N.O.)

DISCLAIMER:



Public Works - Project Development

DRAWN: JSB/MC

APPROVED: IA

CHECKED: JSB/MC

BUSINESS MANAGER

VERIFIED: VP

...../...../.....

STANDARD DRAWING:

**SUB-SOIL
DRAINAGE DETAILS**

DRAWING NO:

SWD 11

SCALE:

NTS

SHEET:

1 of 1

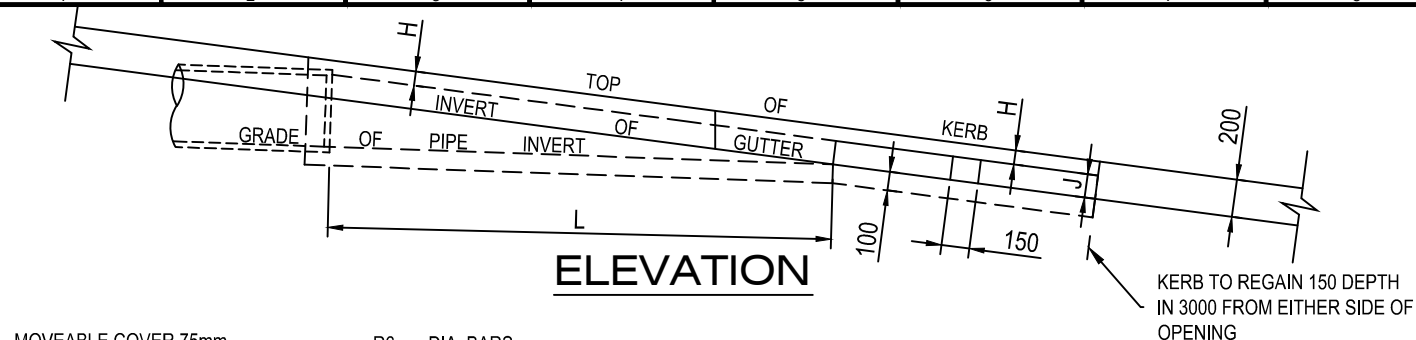
DATE:

02/05/2012

REV:

B

ELEVATION



DIMENSION TABLE

DIMENSION	300mm PIPE	375mm PIPE	450mm PIPE
A	450	500	830
B	1200	1200	1300
C	800	800	830
D	2200	2700	3600
E	1300	1800	2700
F	300	450	600
G	900	900	1200
H	75	75	90
J	125	125	115
STEEL in COVER SLAB	R 6 at 100	R 6 at 100	R 6 at 90
No. of CONCRETE CYLINDERS	-	1	1

MOVEABLE COVER 75mm
THICK REINFORCED
WITH R6mm BARS AT
100c/c BOTH WAYS.

R6mm DIA. BARS
AT 100c/c WITHIN
THESE LIMITS

R6mm DIA. BARS AT SPACING SHOWN IN
DIMENSION TABLE.

R6mm DIA. BARS AT NOT MORE THAT 300 c/c

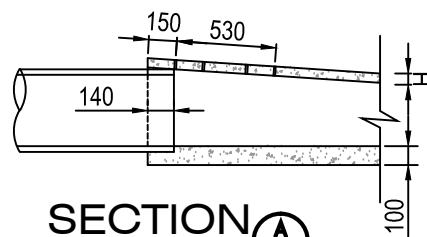
150

530

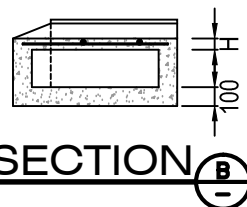
L/2

EXPANSION JOINT

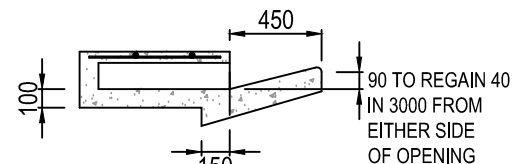
PLAN



SECTION A



SECTION B



SECTION C

CONCRETE CYLINDER
150mm DIA. x J

EXPANSION
JOINT

NOTES

1. THE COMPRESSIVE STRENGTH OF CONCRETE USED SHALL BE 25MPa AT 28 DAYS 75 MAXIMUM SLUMP.
2. APPLICABLE FOR INLET PIPES WITH A MAXIMUM DIAMETER OF 225mm.
3. SELECTED GRANULAR MATERIAL BACKFILL SHALL BE PLACED TO FILL ALL EXCAVATED VOIDS. (REFER TO AS 3725-2007)
4. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED.

DISCLAIMER:



DRAWN: JSB/MC

CHECKED: JSB/MC

VERIFIED: VP

APPROVED: IA

DESIGN MANAGER

...../...../.....

STANDARD DRAWING:

CONCRETE CONVERTER

DRAWING NO: SWD 12-1

SCALE: 1:40 @ A4

DATE: 20/05/2014

SHEET: 1 of 2

REV: B

LENGTH "L"									
300mm dia PIPES									
KERB GRADE		3%	4%	5%	6%	7%	8%	9%	10%
PIPE GRADE	0.50%	7300	5100	3900	3300	2700	2400	2100	1800
	1%	8800	6000	4500	3600	3000	2400	2100	1800
	2%		8800	6000	4500	3600	3000	2400	2100
	3%			8800	6000	4500	3600	3000	2400
375mm dia PIPES									
KERB GRADE		3%	4%	5%	6%	7%	8%	9%	10%
PIPE GRADE	0.50%	10000	7300	5500	4500	3900	3300	3000	2700
	1%		6000	6400	3300	4200	3600	3000	2700
	2%			6700	6400	5100	4200	3600	3000
	3%				8500	6400	5100	4200	3600
450mm dia PIPES									
KERB GRADE		3%	4%	5%	6%	7%	8%	9%	10%
PIPE GRADE	0.50%		9700	7600	6000	5100	4500	3900	3600
	1%			8500	7000	5700	4800	4200	3900
	2%				8500	7000	5700	4800	4200
	3%					8500	7000	5700	4800
NOTE: CONVERTERS IF USED FOR THE GRADE BELOW THE HEAVY LINES IN THE TABLE WILL OVERLOAD THE STREET GUTTER DISCHARGED INTO.									

TABLE FOR CONCRETE CONVERTER

DISCLAIMER:



DRAWN: JSB/MC

CHECKED: JSB/MC

VERIFIED: VP

APPROVED: IA

DESIGN MANAGER

...../...../.....

STANDARD DRAWING:

**TABLE FOR
CONCRETE CONVERTER**

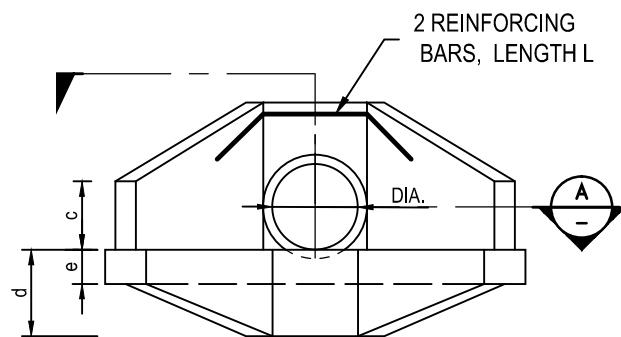
DRAWING NO: **SWD 12-2**

SCALE: 1:40 @ A4

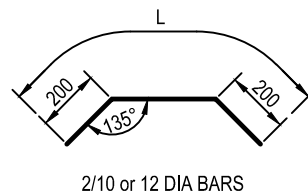
DATE: 20/05/2014

SHEET: 2 of 2

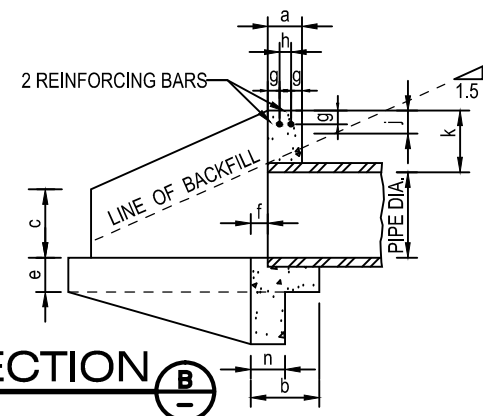
REV: B



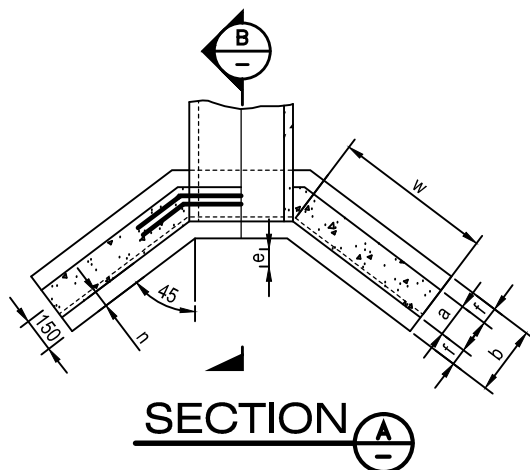
ELEVATION



REINFORCING BAR



SECTION B-B



SECTION A-A

PIPE DIAMETER: DIA	375	450	525	600	675	750	825	900
a	150	150	150	180	190	205	215	230
b	300	300	300	450	450	450	450	450
c	300	300	300	380	380	380	380	380
d	380	380	380	530	530	530	530	530
e	150	150	150	180	190	205	215	230
f	75	75	75	110	110	110	110	110
g	40	40	40	50	50	50	50	50
h	70	70	70	80	90	105	115	130
j	100	100	100	100	100	100	100	100
k	230	230	230	300	300	300	300	300
n	150	150	150	150	150	150	150	150
w	690	840	990	1120	1285	1450	1615	1780
L	840	915	950	1100	1200	1250	1350	1400
REINFORCEMENT DIA	10	10	10	12	12	12	12	12
REINFORCEMENT LENGTH	1680	1830	1845	2200	2400	2500	2700	2800
REINFORCEMENT Kg.MASS	1.100	1.200	1.300	2.000	2.300	2.600	2.775	2.950
VOLUME OF CONCRETE m ³	0.27	0.33	0.38	0.67	0.85	1.02	1.21	1.4

NOTES

1. CONCRETE APRON MAY BE REQUIRED AS DIRECTED BY THE ENGINEER.
2. MINIMUM COVER TO ALL PIPES TO BE 600mm UNDER ROADS AND 450mm ELSEWHERE.
3. THE COMPRESSIVE STRENGTH OF CONCRETE USED SHALL BE 25MPa AT 28 DAYS.
4. SELECTED GRANULAR MATERIAL BACKFILL SHALL BE PLACED TO FILL ALL EXCAVATED VOIDS. (REFER TO 3725-2007)

5. WHERE DIRECTED PROVIDE 100mmØ SUBSOIL DRAINAGE PIPE/AGLINE 3.0m LONG WRAPPED IN FABRIC SOCK PLACED ADJACENT TO INLET PIPES ON BOTH SIDES AND 100mm MINIMUM ABOVE PIT FLOOR. SURROUND SUBSOIL DRAINAGE/AGLINE WITH 10mm AGGREGATE.
6. REINFORCING BARS TO BE STRUCTURAL GRADE DEFORMED.
7. ALL EXPOSED CORNERS TO HAVE 12mm CHAMFER.
8. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE (U.N.O.)

DISCLAIMER:



DRAWN: JSB/MC

CHECKED: JSB/MC

VERIFIED: VP

APPROVED: IA

DESIGN MANAGER

...../...../.....

STANDARD DRAWING:

**STANDARD CONCRETE HEADWALL
375 TO 900MM DIA PIPES**

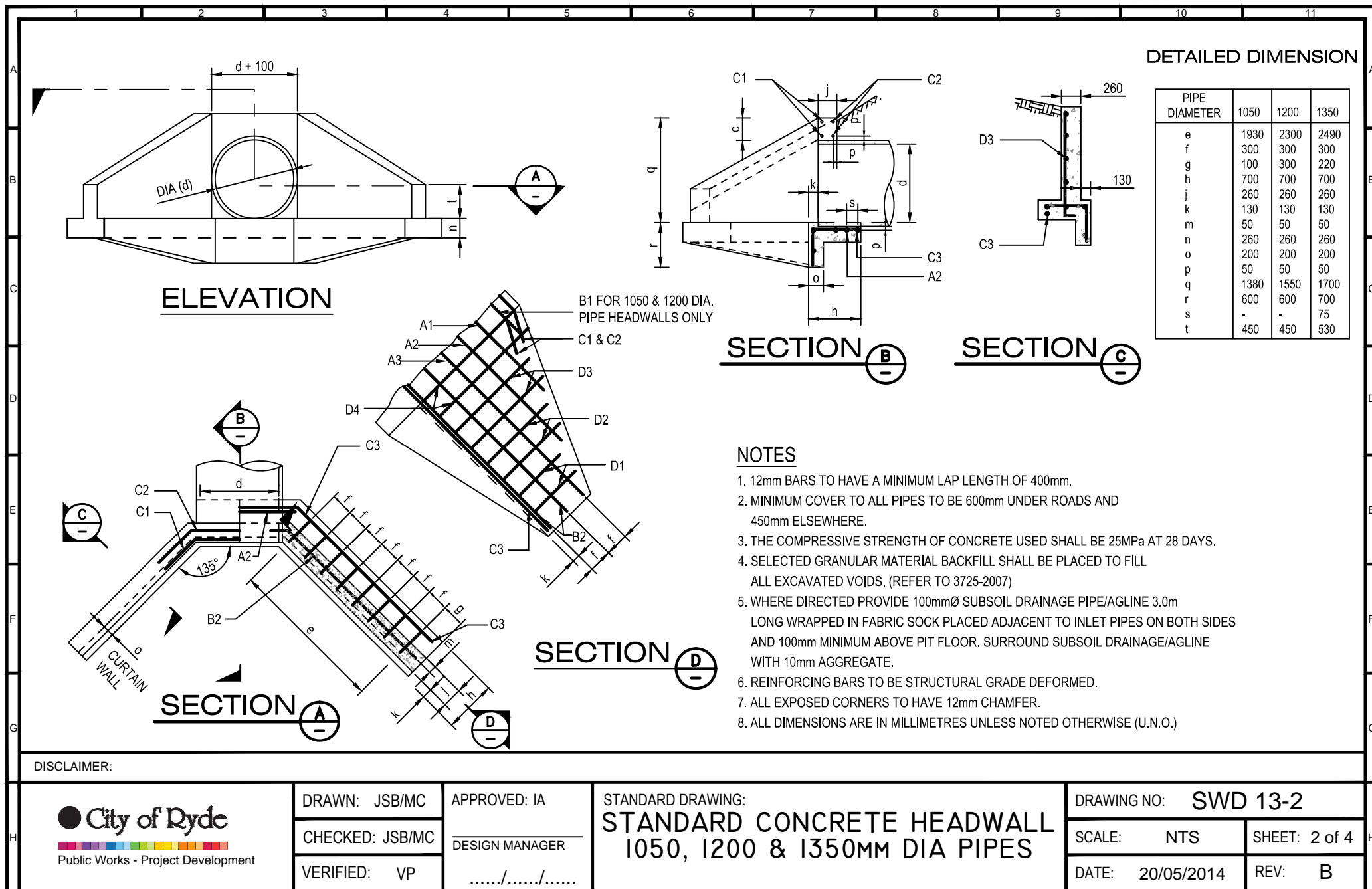
DRAWING NO: **SWD 13-1**

SCALE: NTS

DATE: 20/05/2014

SHEET: 1 of 4

REV: B



DISCLAIMER:

DRAWN: JSB/MC

CHECKED: JSB/MC

VERIFIED: VP

APPROVED: IA

DESIGN MANAGER

...../...../.....

STANDARD DRAWING:

STANDARD CONCRETE HEADWALL

1050, 1200 & 1350MM DIA PIPES

DRAWING NO: **SWD 13-2**

SCALE: NTS

DATE: 20/05/2014

SHEET: 2 of 4

REV: B

P:\PM2013\Public Domain Standard Details\CoR Revised Standard Drawings\2014\Drainage\SWD Standard Drawings Rev.dwg / Plotted on 20 May 2014

ELEVATION

SECTION **B**
—

SECTION 

DETAILED DIMENSION

PIPE DIAMETER	1500	1650	1800
e	2850	3150	3450
f	300	300	300
g	260	260	260
h	900	900	900
j	200	200	200
k	150	150	150
m	130	130	130
n	50	50	50
o	75	75	75
p	150	150	150
q	700	800	900
r	700	725	750
s	1880	2050	2210
t	530	560	600
u	160	160	160

SECTION D

NOTES

1. 12mm BARS TO HAVE A MINIMUM LAP LENGTH OF 400mm.
2. MINIMUM COVER TO ALL PIPES TO BE 600mm UNDER ROADS AND 450mm ELSEWHERE.
3. THE COMPRESSIVE STRENGTH OF CONCRETE USED SHALL BE 25MPa AT 28 DAYS.
4. SELECTED GRANULAR MATERIAL BACKFILL SHALL BE PLACED TO FILL ALL EXCAVATED VOIDS. (REFER TO 3725-2007)
5. WHERE DIRECTED PROVIDE 100mmØ SUBSOIL DRAINAGE PIPE/AGLINE 3.0m LONG WRAPPED IN FABRIC SOCK PLACED ADJACENT TO INLET PIPES ON BOTH SIDES AND 100mm MINIMUM ABOVE PIT FLOOR. SURROUND SUBSOIL DRAINAGE/AGLINE WITH 10mm AGGREGATE.
6. REINFORCING BARS TO BE STRUCTURAL GRADE DEFORMED.
7. ALL EXPOSED CORNERS TO HAVE 12mm CHAMFER.
8. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE (U.N.O.)

DISCLAIMER:

DRAWN: JSB/MC

APPROVED: IA

CHECKED: JSB/MC

DESIGN MANAGER

VERIFIED: VP

.....//.....//.....

STANDARD DRAWING:

STANDARD CONCRETE HEADWALL 1500, 1650 & 1800MM DIA PIPES

DRAWING NO: SWD 13-3

SCALE: NTS

SHEET: 3 of 4

DATE: 20/05/2014

REV: B

REINFORCEMENT FOR HEADWALLS (1050, 1200 & 1350mm DIA PIPES)

REINFORCEMENT FOR HEADWALL

1050 DIA PIPE							1200 DIA PIPE							1350 DIA PIPE						
MARK	DIA.	L1	L2	LGHT	No REQD	TOTAL LGHT	MARK	DIA.	L1	L2	LGHT	No REQD	TOTAL LGHT	MARK	DIA.	L1	L2	LGHT	No REQD	TOTAL LGHT
mm	mm	mm	mm	mm		m	mm	mm	mm	mm	mm		m	mm	mm	mm	mm	mm		m
A1	12	1150		1150	2	2.30	A1	12	1600		1600	2	3.20	A1	12	1250		1150	2	2.30
A2	12	1780		1780	2	3.56	A2	12	2250		2250	2	4.50	A2	12	1950		1950	3	5.85
A3							A3							A3	12	2550		2550	2	5.10
B1	12	350	250	600	2	1.20	B1	12	1000	250	1250	2	2.50	B1						
B2	12	1950	250	2200	4	8.80	B2	12	2350	250	2600	4	10.40	B2	12	2525	300	2825	4	11.30
C1	12	1200	750	2700	2	5.40	C1	12	1350	750	2850	2	5.70	C1	12	1575	750	3075	2	6.15
C2	12	1330	750	2830	2	5.66	C2	12	1470	750	2970	2	5.94	C2	12	1675	750	3175	2	6.35
C3	12	1500	2100	5800	1	5.80	C3	12	1750	2450	6650	1	6.65	C3	12	1950	2150	7250	1	7.25
D1	12	580	380	1360	2	2.72	D1	12	600	380	1380	4	5.52	D1	12	700	380	1450	4	5.80
D2	12	740	380	1520	4	6.08	D2	12	900	380	1650	4	6.60	D2	12	1000	380	1750	4	7.00
D3	12	1010	380	1790	4	7.16	D3	12	1200	380	1950	4	7.80	D3	12	1300	380	2050	4	8.20
D4	12	1320	380	2100	4	8.40	D4	12	1500	380	2250	4	9.00	D4	12	1575	380	2325	4	9.30
MASS	=	54.9	Kg			57.08	MASS	=	60.6	Kg			67.81	MASS	=	72	Kg			74.60
VOLUME OF CONCRETE = 2.15m ³							VOLUME OF CONCRETE = 2.80m ³							VOLUME OF CONCRETE = 3.2m ³						

REINFORCEMENT FOR HEADWALLS (1500, 1650 & 1800mm DIA PIPES)

REINFORCEMENT FOR HEADWALL

1500 DIA PIPE							1650 DIA PIPE							1800 DIA PIPE						
MARK	DIA.	L1	L2	LGHT	No REQ	TOTAL LGHT	MARK	DIA.	L1	L2	LGHT	No REQ	TOTAL LGHT	MARK	DIA.	L1	L2	LGHT	No REQ	TOTAL LGHT
mm	mm	mm	mm	mm		m	mm	mm	mm	mm	mm		m	mm	mm	mm	mm	mm		m
A1	12	1725		1725	2	3.45	A1	12	1400		1400	2	2.80	A1	12	1750		1750	2	3.50
A2	12	2300		2300	1	2.30	A2	12	2300		2300	1	2.30	A2	12	2300		2300	1	2.30
A3	12	2375		2375	2	4.75	A3	12	1950		1950	2	3.90	A3	12	2400		2400	2	4.80
A4	12	2875		2875	2	5.75	A4	12	2550		2550	2	5.10	A4	12	3050		3050	2	6.10
A5							A5	12	3050		3050	2	6.10	A5	12	3400		3400	2	6.80
B1	12	1000	400	1500	2	3.00	B1	12	800	375	1175	2	2.35	B1	12	1000	350	1350	2	2.70
B2	12	2850	400	3250	4	13.00	B2	12	3150	375	3525	4	14.10	B2	12	3450	350	3800	4	15.20
C1	12	1750	750	3250	2	6.50	C1	12	1925	750	3425	2	6.85	C1	12	2100	750	3600	2	7.20
C2	12	1800	750	3300	2	6.60	C2	12	1975	750	3475	2	6.95	C2	12	2150	750	3650	2	7.30
C3	12	2250	3000	8250	1	8.25	C3	12	2425	3325	9075	1	9.08	C3	12	2600	3650	9900	1	9.90
D1	12	650	620	1650	4	6.60	D1	12	650	620	1650	4	6.60	D1	12	650	620	1650	4	6.60
D2	12	950	620	1950	4	7.80	D2	12	975	620	1975	4	7.90	D2	12	1000	620	2000	4	8.00
D3	12	1200	620	2200	4	8.80	D3	12	1225	620	2225	4	8.90	D3	12	1250	620	2250	4	9.00
D4	12	1500	620	2500	4	10.00	D4	12	1825	620	2550	4	10.20	D4	12	1600	620	2600	4	10.40
D5	12	1800	620	2800	4	11.20	D5	12	2100	620	2720	4	10.88	D5	12	1850	620	2850	4	11.40
D6							D6	12	2100	620	3100	2	6.20	D6	12	2150	620	3150	4	12.60
MASS	=	94.34	Kg			98.00	MASS	=	98.21	Kg			110.21	MASS	=	109.93	Kg			123.80
VOLUME OF CONCRETE = 4.1m ³							VOLUME OF CONCRETE = 5.18m ³							VOLUME OF CONCRETE = 5.65m ³						

DISCLAIMER:



Public Works - Project Development

STANDARD DRAWING:

REINFORCEMENTS
FOR HEADWALL

DRAWING NO:

SWD 13-4

SCALE:

NTS

SHEET:

4 OF 4

DATE:

20/05/2014

REV:

B

DRAWN: JSB/MC

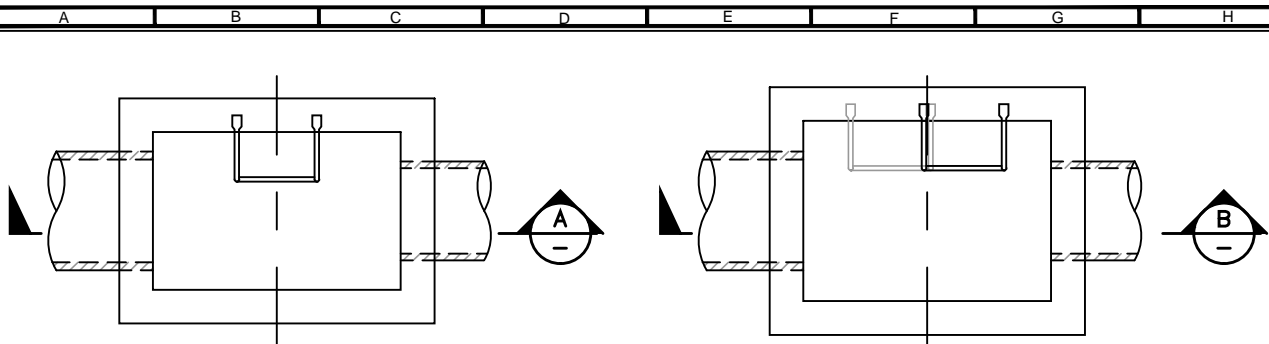
APPROVED: IA

CHECKED: JSB/MC

BUSINESS MANAGER

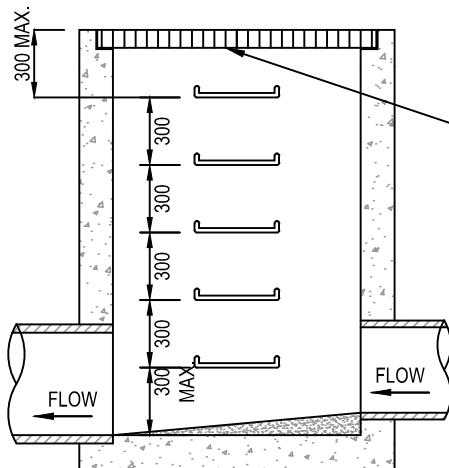
VERIFIED: VP

...../...../.....

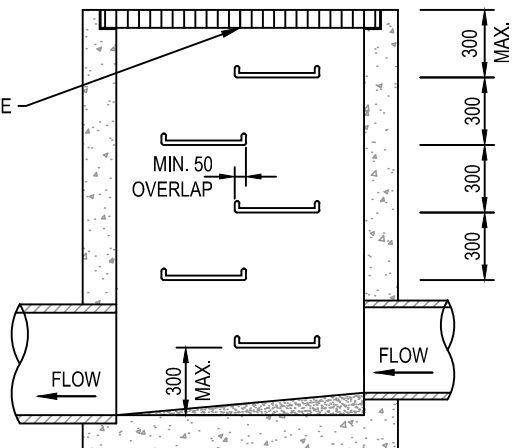


PLAN - OPTION 1

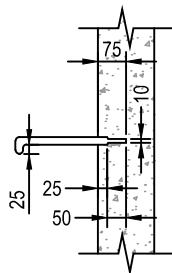
PLAN - OPTION 2



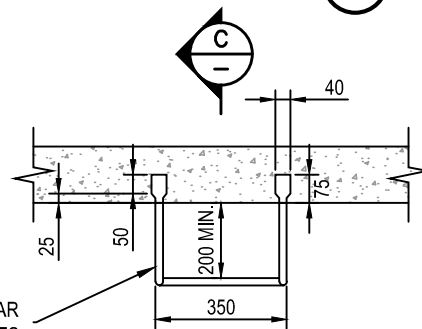
SECTION A-A



SECTION B-B



SECTION C-C



STEP-IRON DETAILS

NOTES:

- PITS DEEPER THAN 1200mm TO BE FITTED WITH STEP IRONS.
- STEP IRONS TO BE LOCATED:
 - DIRECTLY BELOW THE OPENING IN THE COVER.
 - DESIRABLY ON A WALL WITHOUT PIPE OPENINGS.
 - DESIRABLY ON ONE OF THE LONG SIDES OF THE PIT.
 STEP IRONS CHANGING PIT FACE ARE TO BE PROVIDED WITH 1.2m OVERLAP.
- MATERIAL FOR STEP-IRONS TO BE STRUCTURAL GRADE 250 MADE TO AS1204. STEP IRONS TO HAVE SHARP EDGES ROUNDED AND BE HOT-DIPPED GALVANIZED.
- PROPRIETARY STEPS SUCH AS THE GATIC PS2-PF POLYPROPYLENE STEPS (OR APPROVED EQUIVALENT) MAY BE USED AND INSTALLED ACCORDING TO THE MANUFACTURERS SPECIFICATIONS.
- ALL PITS TO BE LOCATED A MINIMUM OF 1000mm CLEAR OF VEHICLE CROSSINGS
- CONCRETE TO HAVE A MINIMUM STRENGTH OF 25MPa AT 28 DAYS.
- ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE.

DISCLAIMER:



Public Works - Project Development

DRAWN: JSB/MC

APPROVED: IA

CHECKED: JSB/MC

BUSINESS MANAGER

VERIFIED: VP

...../...../.....

STANDARD DRAWING:

STEP IRON DETAILS FOR DRAINAGE PITS DEEPER THAN 1200MM

DRAWING NO:

SWD 14

SCALE:

NTS

SHEET:

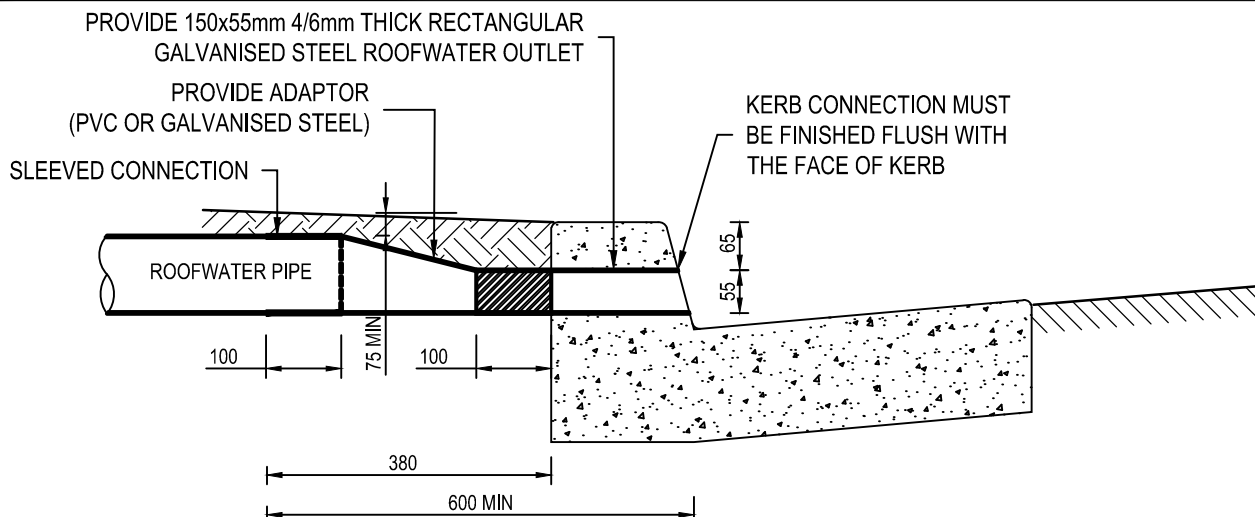
1 OF 1

DATE:

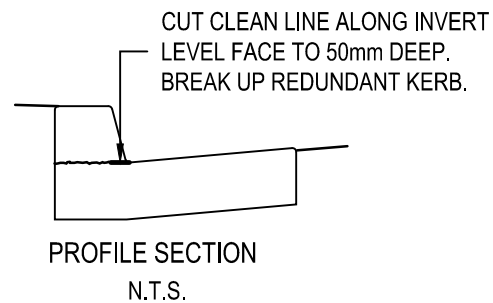
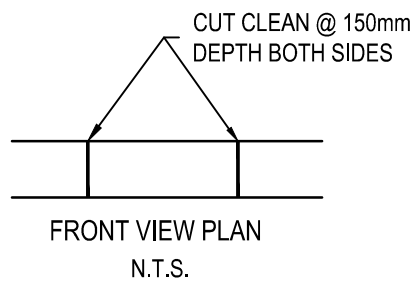
20/05/2014

REV:

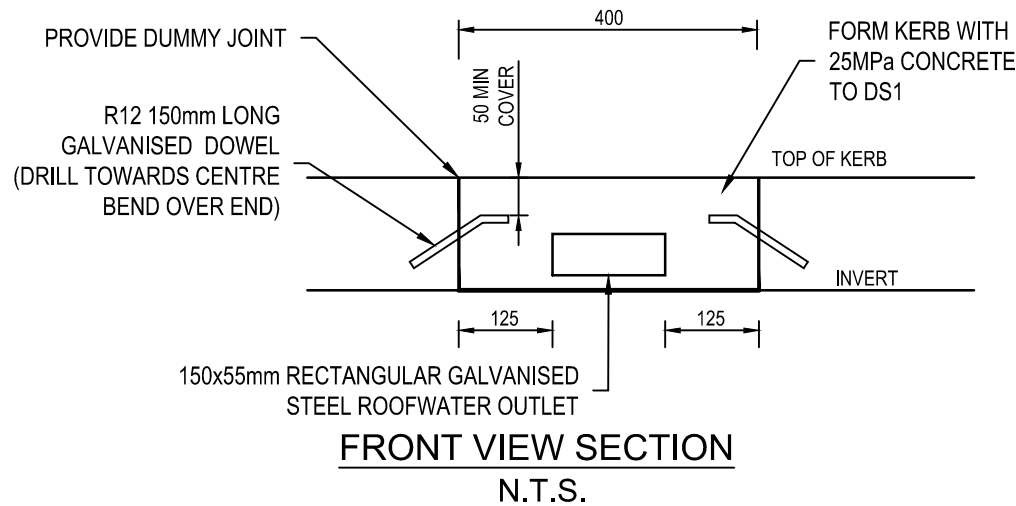
B



ROOFWATER OUTLET CONNECTION
SCALE 1:10




KERB SAW CUTTING DETAILS



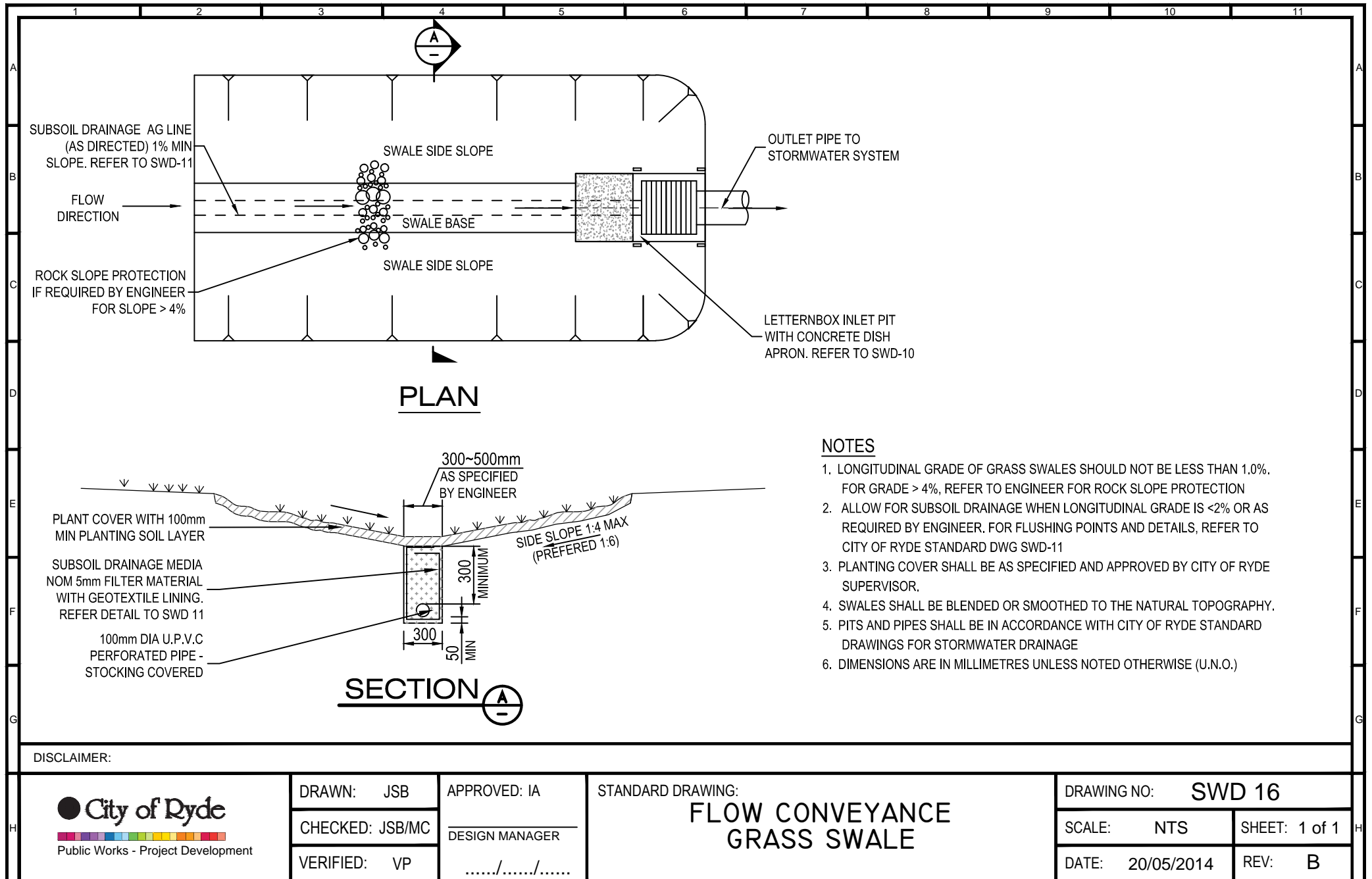
NOTES

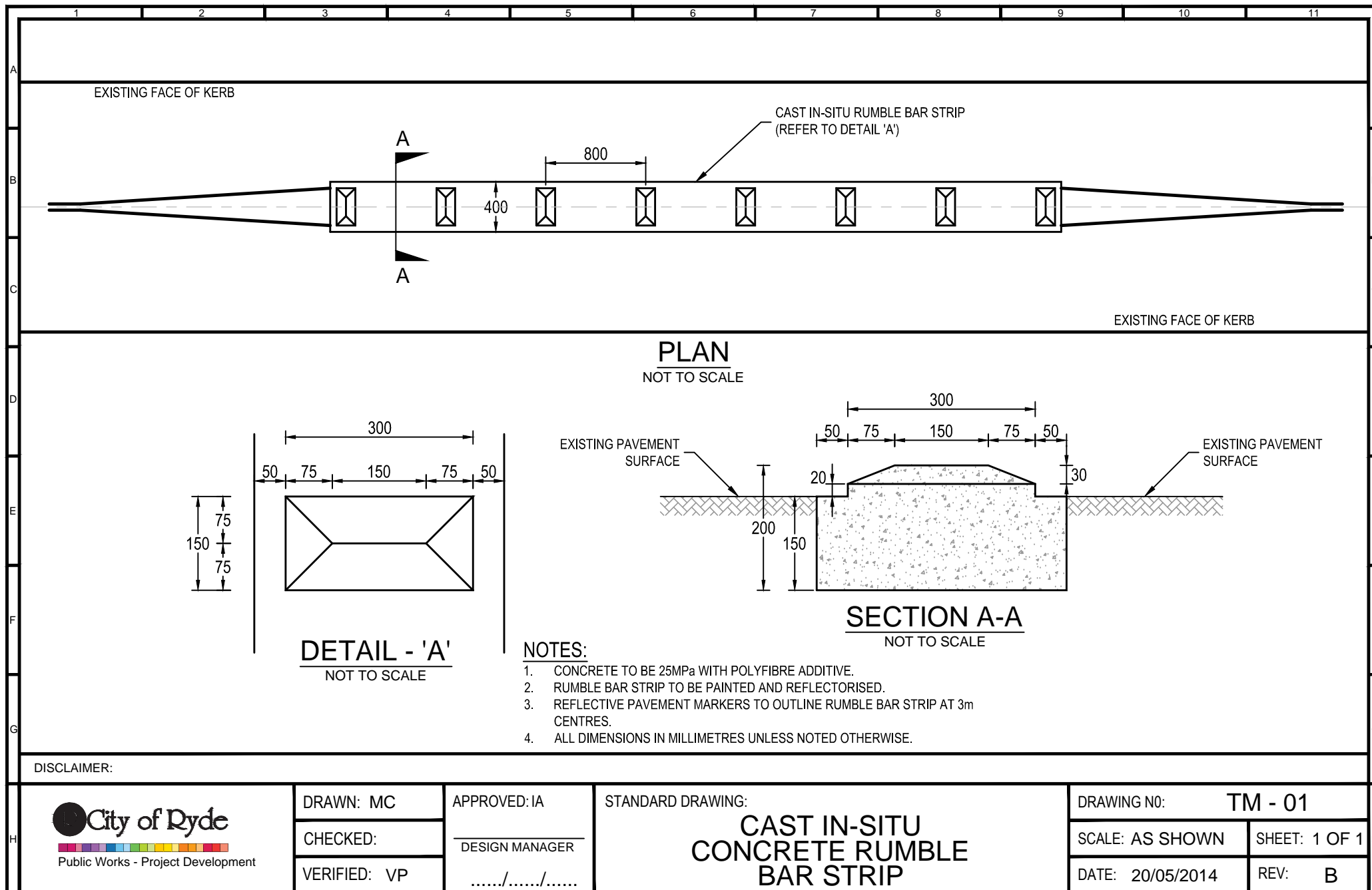
1. ENSURE THAT ALL CONNECTIONS ARE WATER TIGHT.
2. FOR TRAFFICABLE AREAS SUCH AS DRIVEWAYS, USE RECTANGULAR GALVANISED STEEL ROOFWATER OUTLET FOR FULL LENGTH, EG. BOUNDARY TO KERB.
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN.

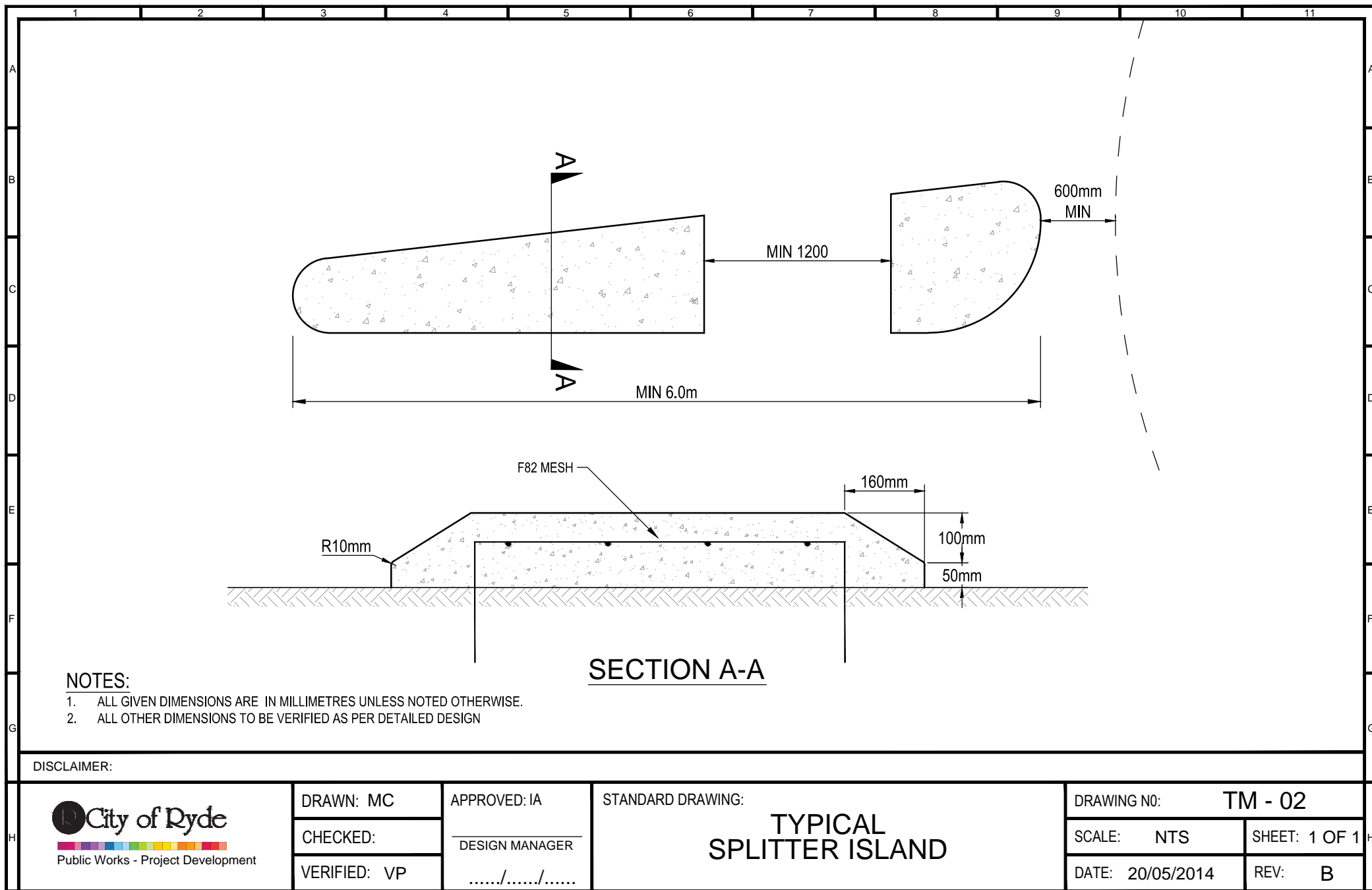
DISCLAIMER:

 Public Works - Project Development		STANDARD DRAWING:		DRAWING NO:	
				SWD 15	
DRAWN: JSB/MC		APPROVED: IA		SCALE:	SHEET:
CHECKED: JSB/MC		BUSINESS MANAGER		NTS	1 OF 1
VERIFIED: VP	/...../.....		DATE:	REV:
				20/05/2014	B

ROOFWATER OUTLET







100mm WHITE LINE
PAINTED TO EDGE OF
ANNULUS (ON ROAD
PAVEMENT)

COLLAR.
PLAIN CONCRETE

500mm
TYPICAL

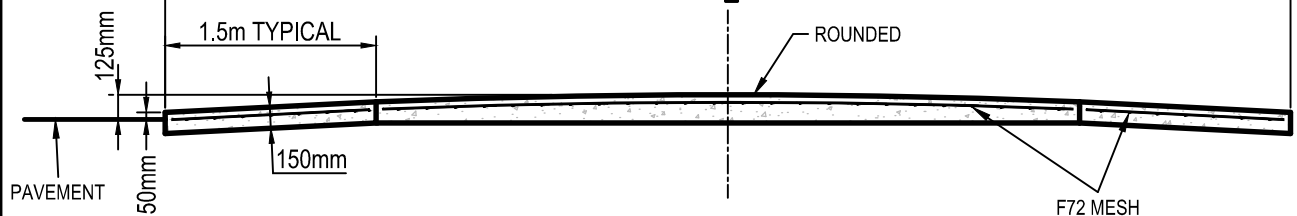
REFLECTIVE MARKERS.
SEE NOTES FOR DETAILS

CONCRETE CENTRE ISLAND
TO HAVE CONCRETE
COLOUR SYSTEMS BRICK
RED OXIDE AND MEDIUM
BROOM FINISH.

4.0m MINIMUM

PLAN

4.0m MINIMUM



SECTION A-A

NOTES:

1. REFLECTORS TO BE INSTALLED AS SHOWN ONTO ISLAND. UNI-DIRECTIONAL RAISED REFLECTIVE PVT MARKERS EPOXIED TO PLAIN CONCRETE SURFACE. REFLECTIVE SIDE TO FACE ONCOMING TRAFFIC.
2. MINIMUM CONCRETE STRENGTH OF 25MPa AFTER 28 DAYS.
3. COLLAR TO BE LOAD BEARING PLAIN CONCRETE.
4. INSTALL F72 REINFORCEMENT MESH WITH 50mm TOP AND SIDE COVER.
5. CONCRETE CENTRE ISLAND TO HAVE CONCRETE COLOUR SYSTEMS BRICK RED OXIDE THOROUGHLY MIXED THROUGH CONCRETE AT RATES SPECIFIED BY MANUFACTURER AND MEDIUM BROOM FINISH.
6. ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE.

DISCLAIMER:



Public Works - Project Development

STANDARD DRAWING:

TYPICAL CENTRE ISLAND (ROUND-ABOUT)

DRAWING NO:

TM - 03

SCALE:

NTS

SHEET:

1 OF 1

DATE:

20/05/2014

REV:

B

DRAWN: MC/JSB

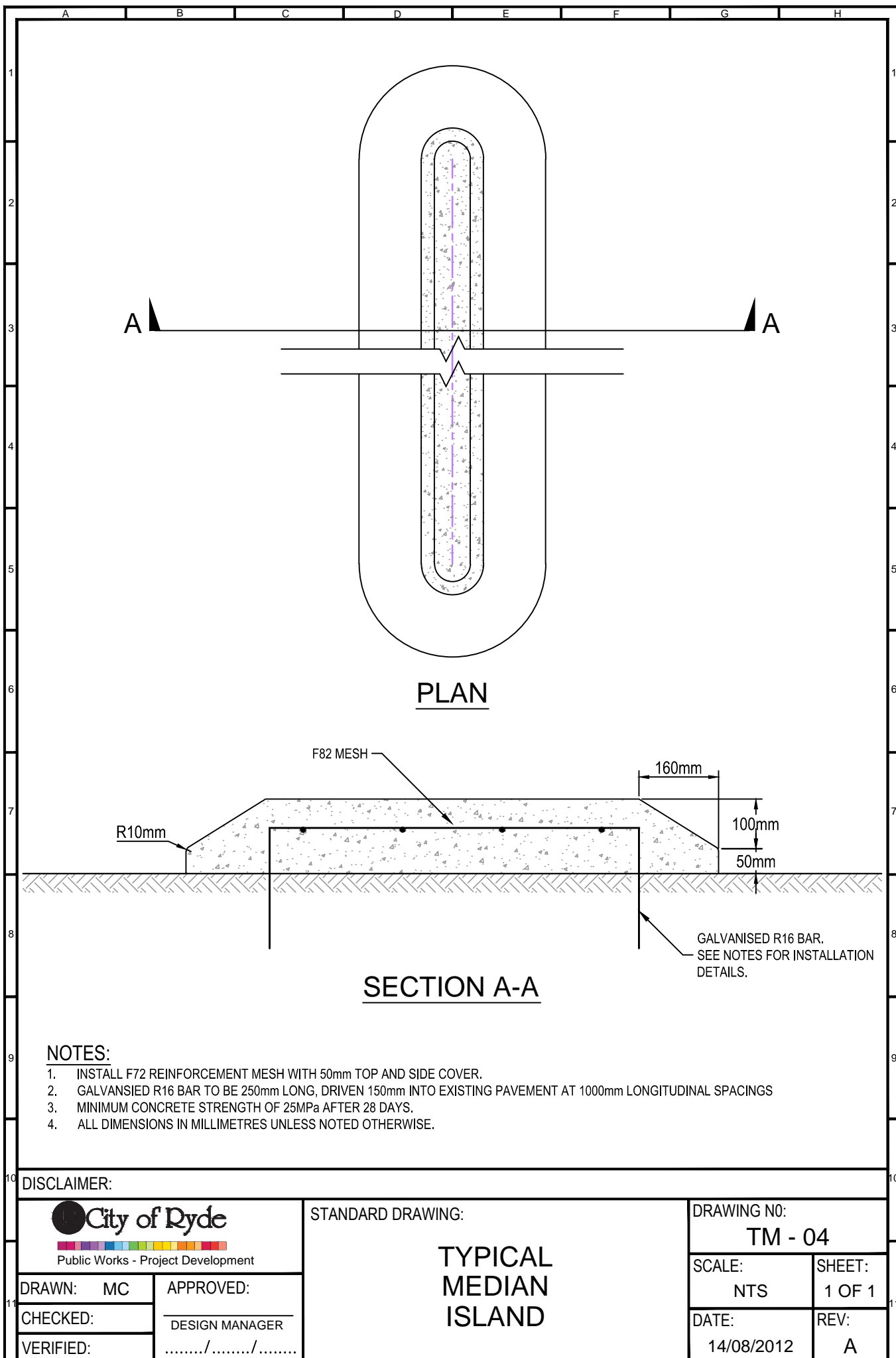
APPROVED:

CHECKED:

DESIGN MANAGER

VERIFIED: VP

...../...../.....



PAVEMENT TYPE: CONCRETE

CONCRETE SLAB:

PLACE 125mm THICK CONCRETE (25MPA) WITH SL72 MESH MINIMUM COVER 40mm.
PLACE CONCRETE BLINDING LAYER ON MINIMUM 50mm DEEP DGB20 TO 98% STANDARD DRY COMPACTION IN ACCORDANCE WITH AS1289.5.1.1. REFER TO DETAIL PV1.1 & PV1.2
ANY SOFT SPOTS IN SUB-GRADE TO BE REMOVED AND IDENTIFIED WITH CITY OF RYDE (CoR) PROJECT MANAGER.

SURFACE FINISH:

BROOM FINISH:

BROOM FINISHED STROKES TO BE IN ONE DIRECTION PERPENDICULAR TO LINE OF TRAVEL. ALL EDGES TO BE FINISHED WITH 20-40mm EDGING TOOL.

EXPOSED AGGREGATE:

AGGREGATE TO BE EXPOSED IN A UNIFORM MANNER TO PREVENT IRREGULAR OR SPLOTCHY FINISH. SURFACE RETARDANTS MAY BE USED TO INCREASE WORKABILITY. PREFERRED TECHNIQUE FOR EXPOSING IS ACID WASH OR ABRASIVE BLASTING.

PIGMENTED FINISH (CCS):

COLOURED PIGMENT AT THE SPECIFIED RATES TO BE MIXED THROUGHOUT CONCRETE BATCH TO MATCH CCS COLOURS. REFER LANDSCAPE PLANS FOR CCS COLOUR

COVING FINISH:

STROKES TO BE UNIFORM MANNER IN DIRECTION AS INDICATED BY LANDSCAPE PLANS.

SLAB JOINTS:

ISOLATION JOINTS:

10mm WIDE FULL DEPTH FLEXIBLE FOAM ISOLATION JOINT (CONNOLLY JOINT OR APPROVED EQUIVALENT) TO BE APPROVED BY CoR PROJECT MANAGER PRIOR TO CONSTRUCTION. PLACE BETWEEN CONCRETE SLAB AND BACK OF KERB; AND BUILDING LINE; AND EXISTING ITEMS IDENTIFIED IN JOINTING PLAN. ISOLATION JOINT FOAM TO FINISH 20mm BELOW FINISHED SURFACE TO ACCOMMODATE BACKING ROD AND APPROVED SEALANT. REFER TO DETAILS PV3.3, PV3.3a & PV3.6

EXPANSION JOINTS:

10mm WIDE FULL DEPTH FLEXIBLE FOAM EXPANSION JOINT (CONNOLLY JOINT OR APPROVED EQUIVALENT) TO BE APPROVED BY CoR PROJECT MANAGER PRIOR TO CONSTRUCTION. PLACE PERPENDICULAR TO KERB AND BUILDING LINE AT MAXIMUM 6.0m INTERVALS. WHERE WIDTH OF PAVEMENT (BETWEEN KERB AND BUILDING LINE) IS GREATER THAN 3m, PLACE EXPANSION JOINT CENTRALLY IN CONCRETE SLAB. REFER TO DETAILS PV3.1, PV3.1a & PV3.6

CONTROL JOINTS:

PLACE 3-5mm WIDE x 40mm DEEP SAW CUT CONTROL JOINT PERPENDICULAR TO KERB AND BUILDING LINE AS SHOWN ON JOINTING PLAN. ENSURE ALL CUTS ARE CONTINUOUS AND STRAIGHT. SAW CUT TO STOP 50mm SHORT OF ADJACENT JOINT OR OBJECT. REFER TO DETAIL PV3.4, PV3.4a & PV3.6

KEY JOINTS:

PLACE KEY JOINT PERPENDICULAR TO KERB AND BUILDING LINE AS REQUIRED IN ACCORDANCE WITH JOINTING SETOUT PLAN. REFER TO DETAILS PV3.2 & PV3.6

EDGING:

GENERAL EDGING TO CONCRETE SURFACE TO BE CARRIED OUT IN ACCORDANCE WITH SURFACE FINISH TREATMENT

BROOM FINISH - EDGING TOOL 20-40mm

EXPOSED AGGREGATE - EXPOSED FULLY TO EDGE

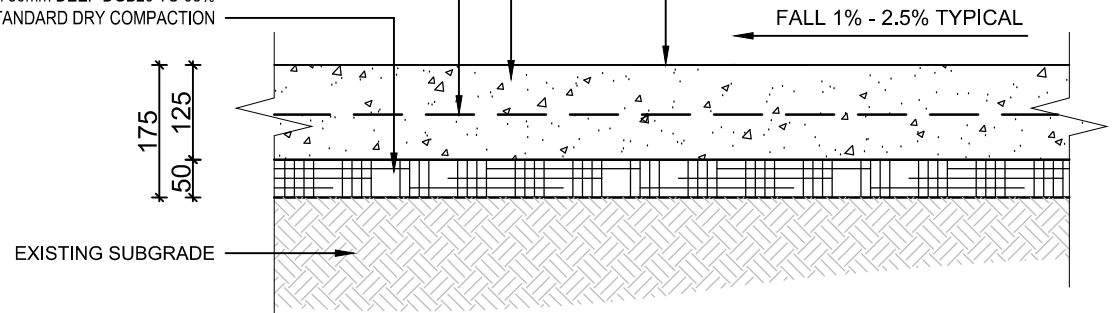
PIGMENT CCS - EDGING TOOL 20-40mm

FINISH: BROOM FINISH CONCRETE WITH 50mm COVING TOOL TO EDGE. REFER SPECIFICATION & FINISHES DRAWINGS FOR CCS COLOUR AND/OR AGGREGATE

CONCRETE: 25MPA & 80mm SLUMP
125mm DEEP. STANDARD AGGREGATE UNLESS OTHERWISE SPECIFIED. REFER FINISHES DRAWINGS

SL72 STEEL MESH WITH MIN 40mm COVER, 80mm CHAIRS & PLATES

MINIMUM 50mm DEEP DGB20 TO 98% STANDARD DRY COMPACTION



TOWN CENTRE PAVEMENT TYPE CONCRETE - TYPICAL
SCALE 1:10



PUBLIC WORKS
Project Development

ABN: 81 621 292 610

Civic Centre, 1 Devlin Street Ryde NSW 2112
Locked Bag 2069
NORTH RYDE NSW 1670

Email: cityofryde@ryde.nsw.gov.au
Web: www.ryde.nsw.gov.au

Tel: (02) 9952 8222
Fax: (02) 9952 8070

STANDARD DETAILS
PAVEMENT TYPE CONCRETE
TOWN CENTRE

APPROVED

IA

DESIGN MANAGER

DATE

20 / 05 / 14

DRAWN DS

DRAWING NUMBER

REVISION

SCALE
AS SHOWN @ A4

PV1.1

B

INSTALLATION OF GRANITE

CONCRETE BLINDING LAYER:

PLACE 125mm THICK CONCRETE (25MPA) WITH SL72 MESH MINIMUM COVER 40mm.
PLACE CONCRETE BLINDING LAYER ON MINIMUM 50mm DEEP DGB20 TO 98% STANDARD DRY COMPACTION IN ACCORDANCE WITH AS1289.5.1.1. REFER TO DETAIL PV1.1 & PV1.2
ANY SOFT SPOTS IN SUB-GRADE TO BE REMOVED AND IDENTIFIED WITH CITY OF RYDE (CoR) PROJECT MANAGER.

PAVER JOINTING:

BETWEEN INDIVIDUAL PAVERS - JOIN FLUSH TOGETHER LEAVING A 2mm GAP. FORM CONTINUOUS EVEN SURFACE TO AVOID TRIP HAZARDS. THE JOINTS BETWEEN PAVERS ARE TO BE FILLED WITH ULTRA FINE SILICA SAND CEMENT MIX AS SUPPLIED BY BENEDICTS SAND AND SOIL (PH.9986 3500) OR AN APPROVED EQUIVALENT.
AT ISOLATION AND EXPANSION JOINTS - FILL 5-10mm GAP WITH FOAM BACKING ROD AND APPROVED ONE COMPONENT, THIXOTROPIC, POLYURETHANE BASED JOINT SEALANT. SEALANT COLOUR TO BE BLACK UNLESS SPECIFIED OTHERWISE. REFER TO DETAILS PV3.1a - PV3.6

BLINDING SLAB JOINTS:

AS PER CONCRETE JOINTS WITH ADDITION OF ISOLATION JOINTS FOAM TO FINISH 20mm BELOW FINISHED PAVER LEVEL TO ACCOMMODATE BACKING ROD AND APPROVED JOINT SEALANT. REFER DETAILS PV3.1a - PV3.6

SETOUT - PAVERS:

PAVERS SHALL BE SETOUT AS PER DIMENSIONS AND LOCATIONS AS SHOWN IN TYPICAL DETAILS PV4.1 - PV4.9

LAYING - PAVERS:

LAYING OF PAVERS IS TO COMMENCE FROM PROPERTY BOUNDARY TOWARDS BACK OF KERB. REFER TO DETAIL PV4.1 - PV4.9 UNLESS OTHERWISE SPECIFIED.
ENSURE ALL PAVERS ARE FULLY BEDDED ON A 30mm THICK 8:1 SAND/CEMENT SCREED. SAND USED SHALL BE WHITE WELL GRADED WASHED SAND, PASSING A 4.75mm SIEVE. PAVERS ARE TO BE MANUALLY TAMPED WITH A RUBBER Mallet INTO THE WET MORTAR. THE USE OF VIBRATING COMPACTION EQUIPMENT EG. WAKA PLATE, IS STRICTLY PROHIBITED. WHERE PAVERS ARE TO BE LAID IN A RADIAL OR CURVE ALIGNMENT, PAVERS TO BE CUT RADIAL TO CENTRE. REFER TO DETAILS PV4.1 - PV4.9
ALL PAVERS TO BE LAID LEVEL TO THOSE ADJACENT TO AVOID TRIP HAZARDS.
MINIMUM CUT PAVER WIDTH SHOULD BE NO LESS THAN 100mm UNLESS APPROVED BY CoR PROJECT MANAGER.

KERB RAMP:

GENERALLY KERB RAMPS ARE TO BE SETOUT AS SHOWN IN DETAILS PV4.6, PV4.7 & PV4.8
WHERE ANY CHANGES ARE REQUIRED, CONFIRM WITH CoR PROJECT MANAGER.
MINIMUM CUT PAVER WIDTH IS TO BE 100mm UNLESS APPROVED BY CoR PROJECT MANAGER.

GRADE >1:8:

ALL PAVERS LAID ON A GRADE STEEPER THAN 1:8 (12.5%) ARE REQUIRED TO BE A 'V' RATED PAVER WITH A BUSH HAMMERED FINISH.

ROOF OUTLETS:

WHERE ROOF OUTLET CONNECTIONS ARE TO BE PROVIDED USE 150mm x 90mm GALVANISED STEEL RECTANGULAR HOLLOW SECTION. WHERE MORTAR COVER CANNOT

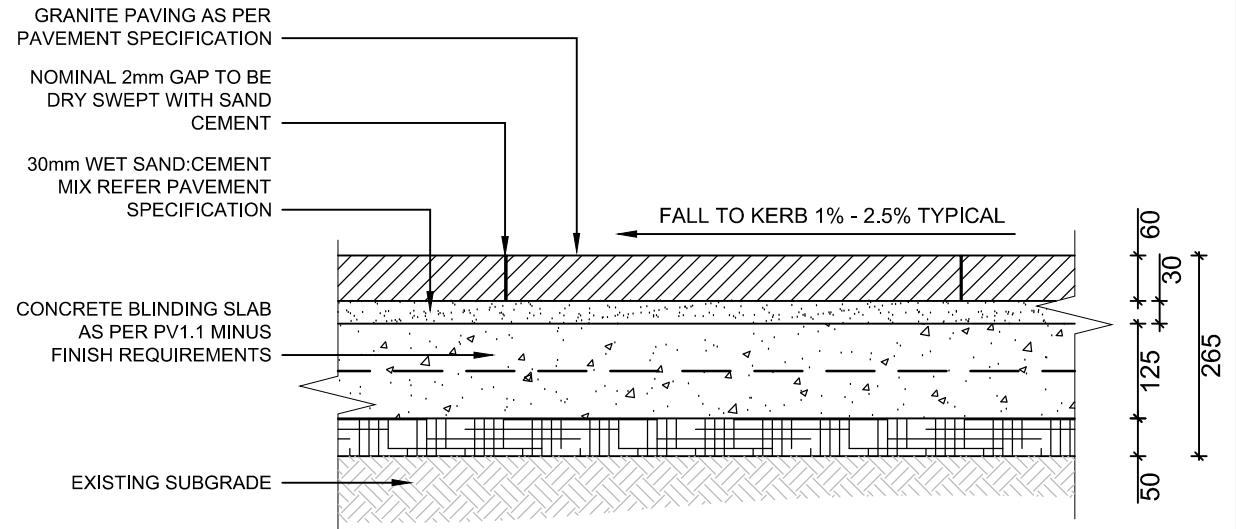
BE ACHIEVED PAVERS ARE TO BE GLUED TO STEEL SECTION AS REQUIRED WITH HIGH STRENGTH EPOXY ADHESIVE.

SERVICE LID TREATMENT:

REPLACE ALL EXISTING SERVICE LIDS WITH STAINLESS STEEL OR GALVANISED STEEL INFILL COVERS AND FRAMES.
NEW SERVICE LIDS ARE TO BE PRE APPROVED BY THE APPROPRIATE AUTHORITY.
ADJUST HEIGHT OF PIT FRAME/LID AS REQUIRED TO SUIT FINISH LEVEL OF NEW WORK.
PROVIDE 10mm WIDE SEALANT (COLOUR: BLACK) AROUND PERIMETER OF SERVICE PIT LID/FRAME.

CLEANING OF PAVERS:

ALL PAVERS LAID DURING THE COURSE OF ONE WORKING DAY MUST HAVE JOINTING SAND BROOMED IN AND BE CLEANED AT THE END OF THAT DAY BEFORE PROCEEDING WITH LAYING OF SUBSEQUENT PAVERS. THIS IS TO PREVENT RESIDUE BUILD UP ON PAVERS WHICH MAY BECOME DIFFICULT TO CLEAN IF LEFT OVERNIGHT OR FOR PROLONGED PERIODS.



PV
1.2
PAVEMENT TYPE GRANITE - TYPICAL
SCALE 1:10

STANDARD DETAILS PAVEMENT TYPE GRANITE



PUBLIC WORKS
Project Development

ABN: 81 621 292 610
Civic Centre, 1 Devlin Street Ryde NSW 2112
Locked Bag 2069
NORTH RYDE NSW 1670
Email: cityofryde@ryde.nsw.gov.au
Web: www.ryde.nsw.gov.au
Tel: (02) 9952 8222
Fax: (02) 9952 8070

APPROVED
IA

DESIGN MANAGER

DATE
20 / 05 / 14

DRAWN DS

DRAWING NUMBER

REVISION

SCALE
AS SHOWN @ A4

PV1.2

B

GRANITE PAVER SPECIFICATION	
Type:	General Paver - Select flame exfoliated granite Grade >1:8 Paver - Select bush hammered granite
Description:	Natural stone which is of uniform quality, sound, free from defects (such as vents, cracks, fissures, seams, porous inclusions, foreign material, loose surface material striations, stains, and discolouration) liable to affect its strength, appearance, durability, or proper functioning under the intended conditions of use.
Matching:	Select stone for the optimum matching of visual properties such as colour and pattern.
Finish:	General Paver, W rated - Sawn edges with exfoliated surface to provide a finish in accordance with AS/NZS 4586:2004. Grade >1:8 Paver, V rated - Sawn edges with bush hammered surface to provide a finish in accordance with AS/NZS 4586:2004.
Colour:	Raven Black or colour code G684
	Header paving and banding as per landscape drawings.
	For Top Ryde CBD, Rosa (matching existing material laid in Blaxland Rd, Ryde)
Size:	Footpaths 600 x 300 x 60 (Infill pavers); 300 x 300 x 60 (Header pavers)
	Driveways 600 x 300 x 60 mm (Infill pavers); 300 x 300 x 60 mm (Header pavers)
	Commercial Driveways: Transition pavers 600 x 150 x 60 mm ; Infill pavers 300 x 150 x 60 mm ; Header course (kerb and property boundary) 300 x 300 x 60 mm
Breaking Load:	Minimum 5Kn
Tolerance:	Plan area +/-1mm
	Thickness: +/- 2mm
Water Absorption:	Maximum 0.3% Moisture Content And Total Water Absorption in accordance with ASTM C97
Chamfers & Edges:	Stone edge is not to be chamfered unless specified. Finish to exposed edges to match surface finish - no sawn edges to be exposed



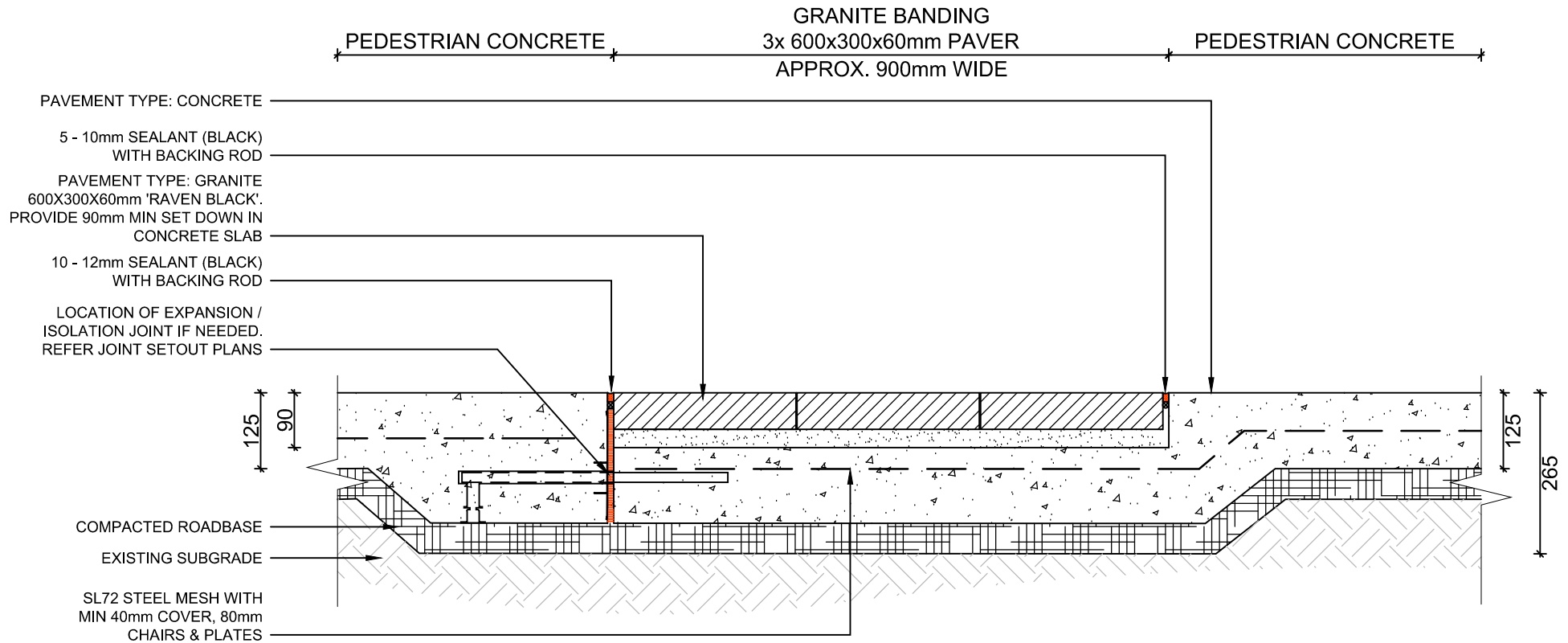
PUBLIC WORKS
Project Development

ABN: 81 621 292 610
Civic Centre, 1 Devlin Street Ryde NSW 2112
Locked Bag 2069
NORTH RYDE NSW 1670
Email: cityofryde@ryde.nsw.gov.au
Web: www.ryde.nsw.gov.au
Tel: (02) 9952 8222
Fax: (02) 9952 8070

STANDARD DETAILS
**PAVEMENT TYPE GRANITE
GRANITE SPECIFICATION**

APPROVED IA DESIGN MANAGER		DATE 19 / 06 / 14
DRAWN DS	DRAWING NUMBER	REVISION
SCALE AS SHOWN @ A4	PV.SPEC	B

COPYRIGHT © 2011 City of Ryde. ALL RIGHTS RESERVED. No part of this document shall be reproduced without written permission.



PV
1.2a GRANITE BANDING IN CONCRETE PAVEMENT
SCALE 1:10



PUBLIC WORKS
Project Development

ABN: 81 621 292 610
Civic Centre, 1 Devlin Street Ryde NSW 2112
Locked Bag 2069
NORTH RYDE NSW 1670
Email: cityofryde@ryde.nsw.gov.au
Web: www.ryde.nsw.gov.au
Tel: (02) 9952 8222
Fax: (02) 9952 8070

STANDARD DETAILS
PAVEMENT TYPE CONCRETE
WITH GRANITE BANDING

APPROVED
IA

DESIGN MANAGER

DATE
19 / 06 / 14

DRAWN DS
SCALE
AS SHOWN @ A4

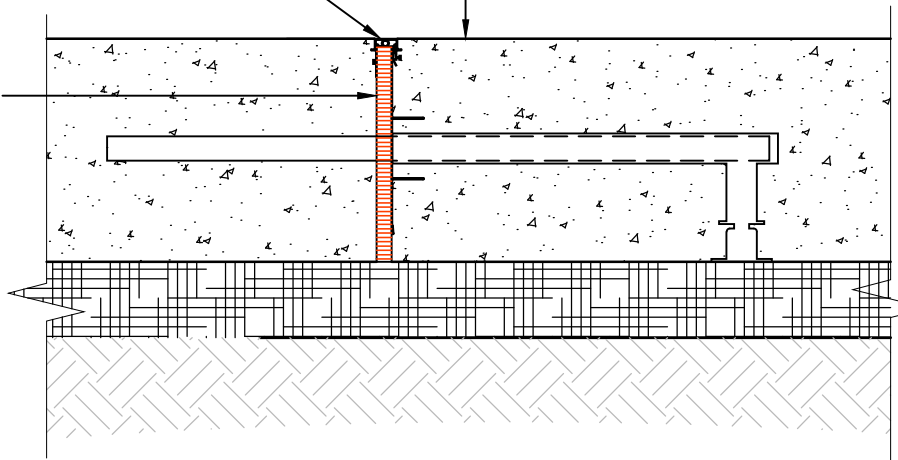
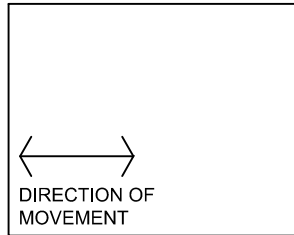
DRAWING NUMBER
PV1.2a

REVISION
B

PAVEMENT TYPE: CONCRETE
REFER PV1.1

PVC CAPPING FINISHED FLUSH WITH
SURFACE. REFER SPECIFICATION
FOR COLOUR

EXPANSION JOINT - CONNOLLY
JOINT OR APPROVED EQUIVALENT



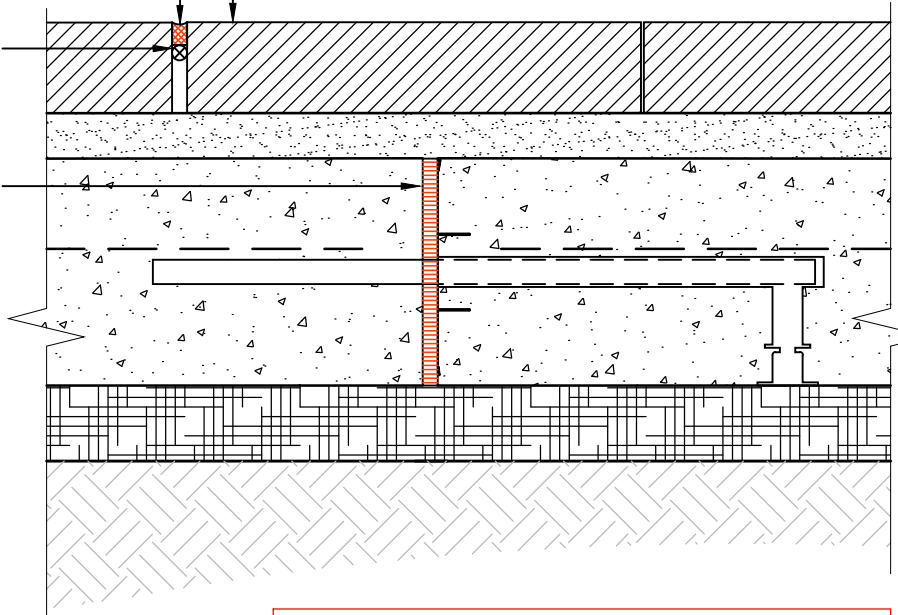
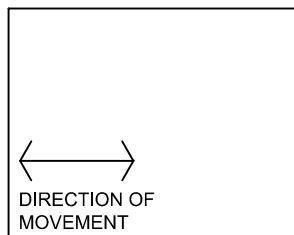
PV 3.1 CONCRETE EXPANSION JOINT (EJ) - TYPICAL
SCALE 1:5

PAVEMENT TYPE: GRANITE
REFER PV1.2

JOINT SEALANT (PJ). COLOUR BLACK

FOAM BACKING ROD TO CONTROL
JOINT DEPTH. ENSURE JOINTING SAND
IS CLEANED OUT PRIOR TO INSTALLING

EXPANSION JOINT - CONNOLLY
JOINT OR APPROVED EQUIVALENT



PV 3.1a GRANITE EXPANSION JOINT (EJ)
SCALE 1:5

NOTES:
REFER JOINTING PLAN FOR SETOUT & JOINT TYPE / LOCATION.
ALL SURFACE JOINTS AS INDICATED ON FINISHES PLANS.
SEEK CLARIFICATION IF REQUIRED



PUBLIC WORKS
Project Development

STANDARD DETAILS JOINT TYPES

APPROVED
IA

DESIGN MANAGER

DATE
20 / 05 / 14.

DRAWN DS

DRAWING NUMBER

REVISION

SCALE

AS SHOWN @ A4

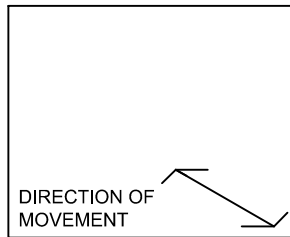
PV3.1 & PV3.1a

B

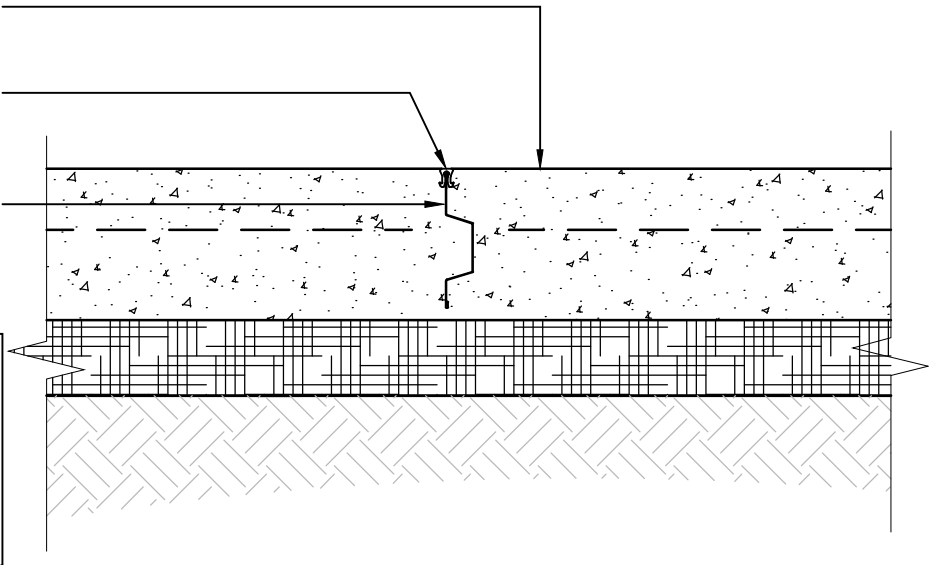
PAVEMENT TYPE: CONCRETE
REFER PV1.1

PVC CAPPING FINISHED FLUSH WITH
SURFACE. REFER SPECIFICATION FOR
COLOUR

KEY JOINT APPROVED BY
CoR PROJECT MANAGER



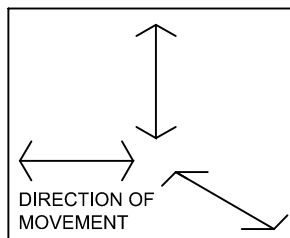
PV
3.2 CONCRETE KEY JOINT (KJ)
SCALE 1:5



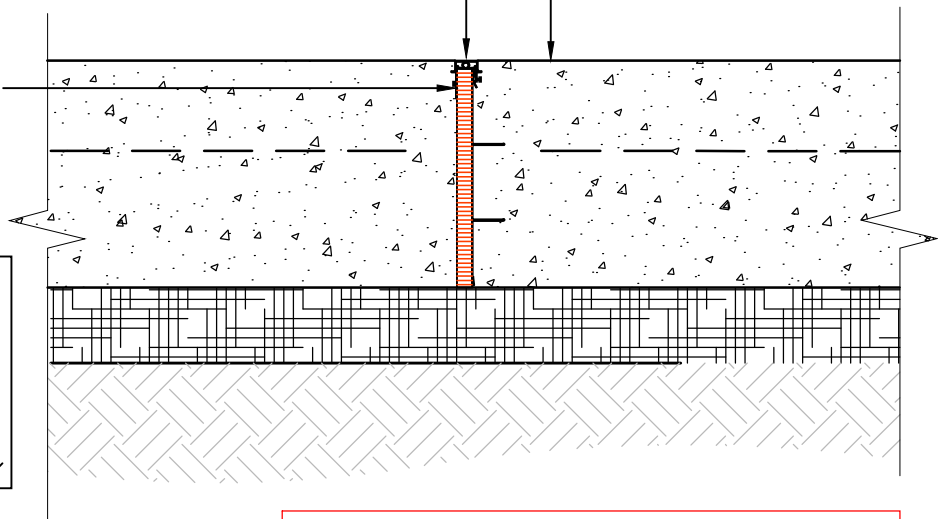
PAVEMENT TYPE: CONCRETE
REFER PV1.1

PVC CAPPING FINISHED FLUSH WITH
SURFACE. REFER SPECIFICATION FOR
COLOUR

ISOLATION JOINT - CONNOLLY
JOINT OR APPROVED EQUIVALENT



PV
3.3 CONCRETE ISOLATION JOINT (IJ)
SCALE 1:5



NOTES:
REFER JOINTING PLAN FOR SETOUT & JOINT TYPE / LOCATION.
ALL SURFACE JOINTS AS INDICATED ON FINISHES PLANS.
SEEK CLARIFICATION IF REQUIRED



PUBLIC WORKS
Project Development

STANDARD DETAILS
JOINT TYPES

APPROVED
IA

DESIGN MANAGER

DATE
20 / 05 / 14.

DRAWN DS

DRAWING NUMBER

REVISION

SCALE

AS SHOWN @ A4

PV3.2 & PV3.3

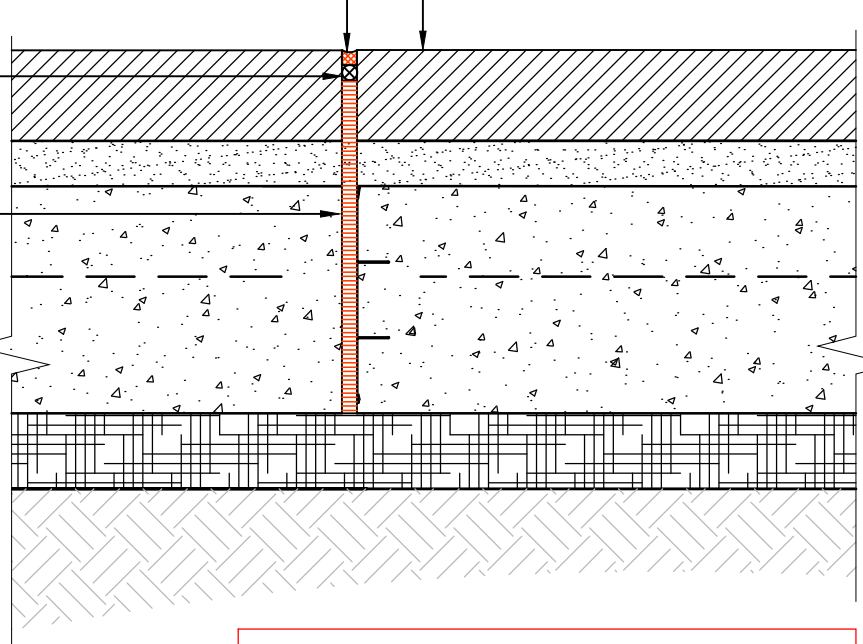
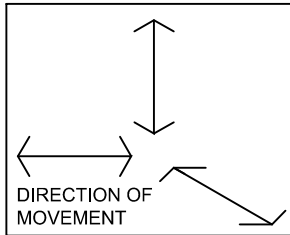
B

PAVEMENT TYPE: GRANITE
REFER PV1.2

JOINT SEALANT (PJ). COLOUR BLACK

FOAM BACKING ROD TO ISOLATION
JOINT DEPTH. GRANITE PAVING JOINT
TO ALIGN WITH LOCATION OF
ISOLATION JOINT (REFER JOINTING
PLANS). ENSURE JOINTING SAND IS
CLEANED OUT PRIOR TO INSTALLING

ISOLATION JOINT - CONNOLLY JOINT OR
APPROVED EQUIVALENT. EXTEND
ISOLATION JOINT 60-70mm ABOVE
SURFACE OF BLINDING SLAB TO ALIGN
JOINT IN GRANITE PAVERS



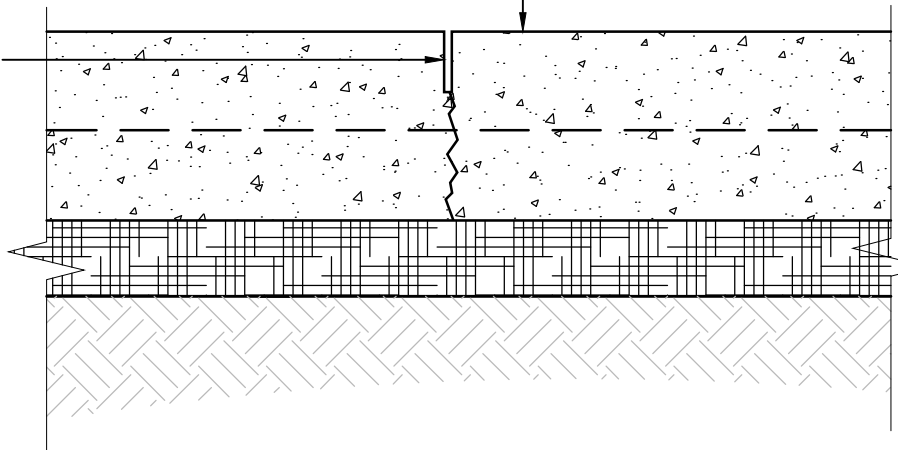
PV
3.3a **GRANITE ISOLATION JOINT (IJ)**
SCALE 1:5

NOTES:

REFER JOINTING PLAN FOR SETOUT & JOINT TYPE / LOCATION.
ALL SURFACE JOINTS AS INDICATED ON FINISHES PLANS. SEEK
CLARIFICATION IF REQUIRED

PAVEMENT TYPE: CONCRETE
REFER PV1.1

SAW CUT 3-5mm WIDE AND
MINIMUM 40mm DEEP



PV
3.4 **CONCRETE CONTROL JOINT (CJ)**
SCALE 1:5

NOTES:

REFER JOINTING PLAN FOR SETOUT & JOINT TYPE / LOCATION.
SAW CUTS TO BE STRAIGHT AND CONTINUOUS



PUBLIC WORKS
Project Development

STANDARD DETAILS
JOINT TYPES

APPROVED

IA

DESIGN MANAGER

DATE

20 / 05 / 14

DRAWN DS

DRAWING NUMBER

REVISION

SCALE

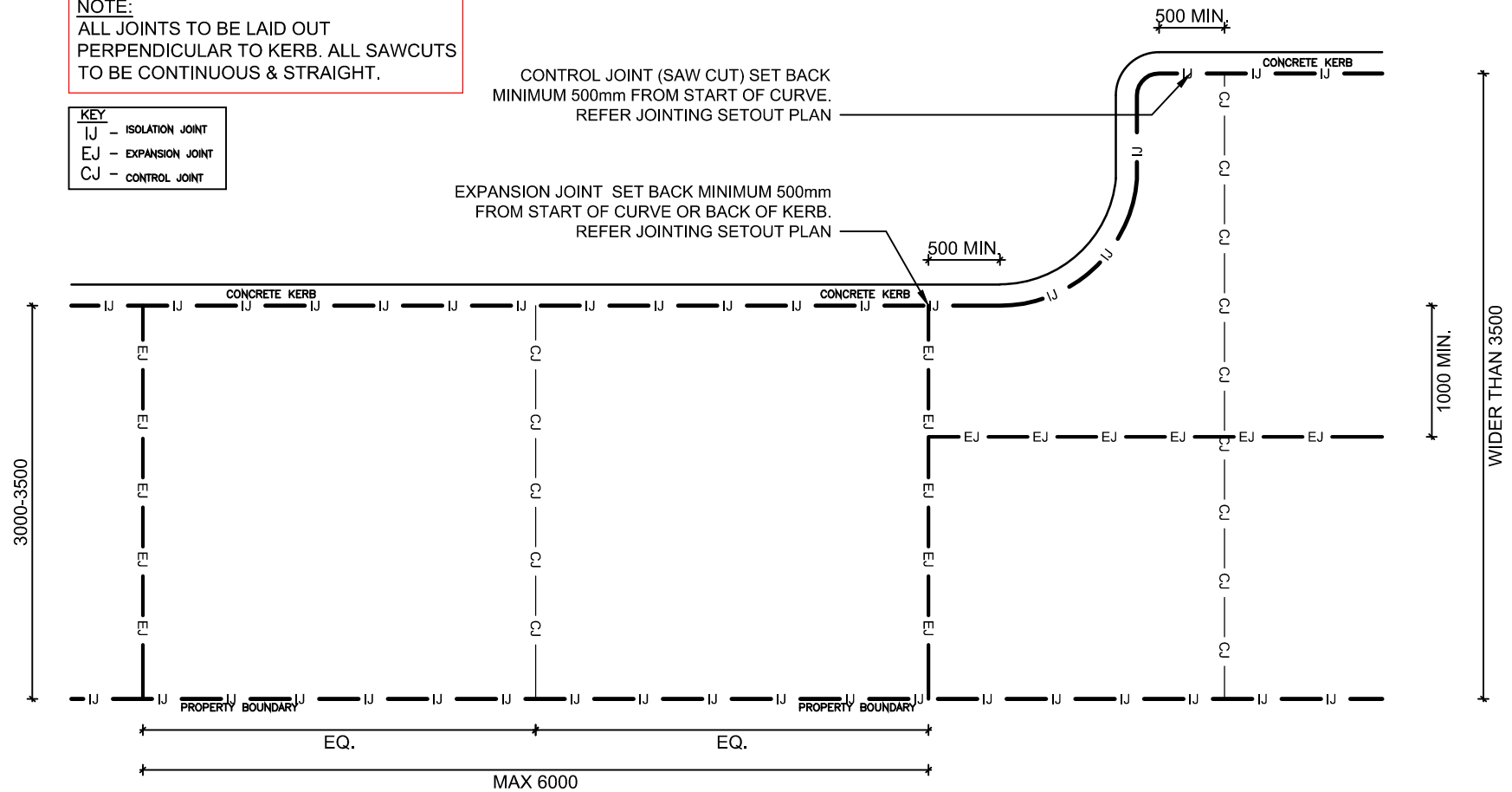
AS SHOWN @ A4

PV3.3a & PV3.4

B

NOTE:
ALL JOINTS TO BE LAID OUT
PERPENDICULAR TO KERB. ALL SAWCUTS
TO BE CONTINUOUS & STRAIGHT.

KEY
IJ - ISOLATION JOINT
EJ - EXPANSION JOINT
CJ - CONTROL JOINT



PV
3.6
CONCRETE SLAB JOINT SETOUT - TYPICAL
SCALE 1:50



PUBLIC WORKS
Project Development

ABN: 81 621 292 610
Civic Centre, 1 Devlin Street Ryde NSW 2112
Locked Bag 2069
NORTH RYDE NSW 1670
Email: cityofryde@ryde.nsw.gov.au
Web: www.ryde.nsw.gov.au
Tel: (02) 9952 8222
Fax: (02) 9952 8070

STANDARD DETAILS CONCRETE JOINT SETOUT

APPROVED
IA

DESIGN MANAGER

DATE
20 / 05 / 14

DRAWN DS
SCALE
AS SHOWN @ A4

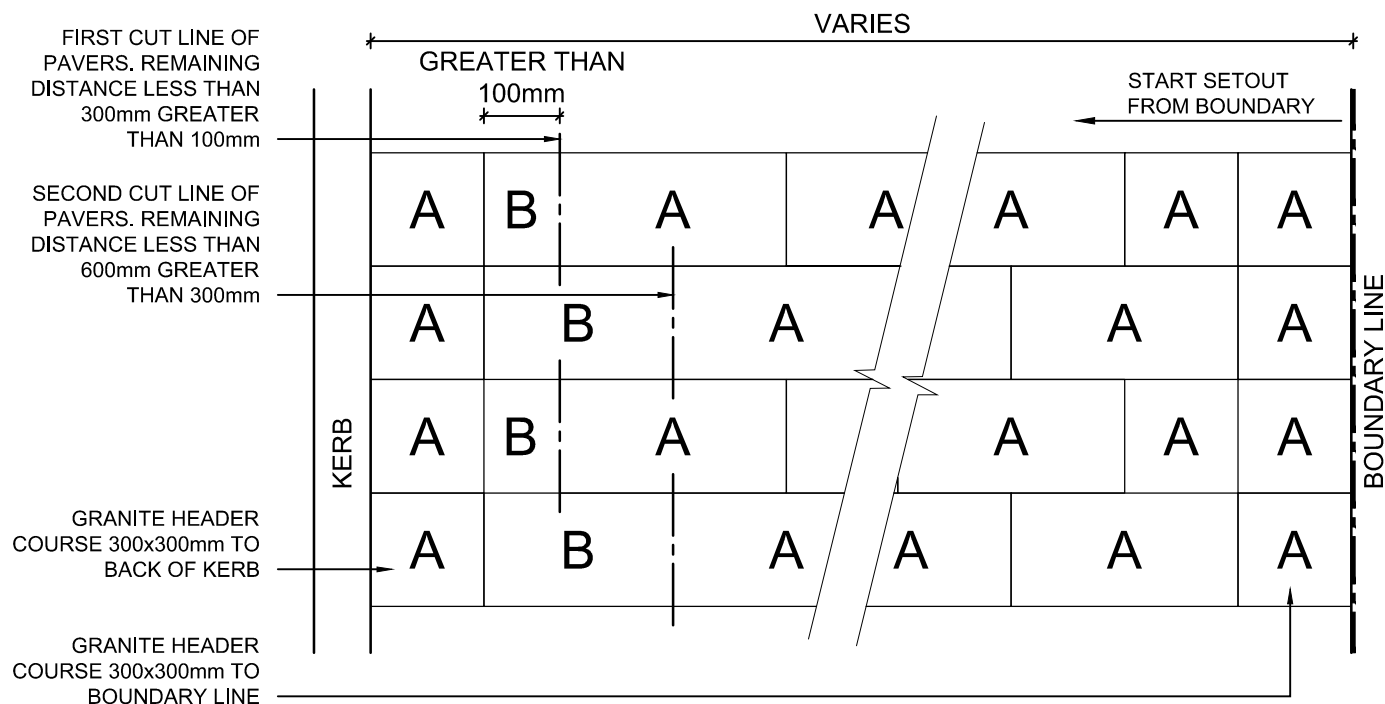
DRAWING NUMBER

PV3.6

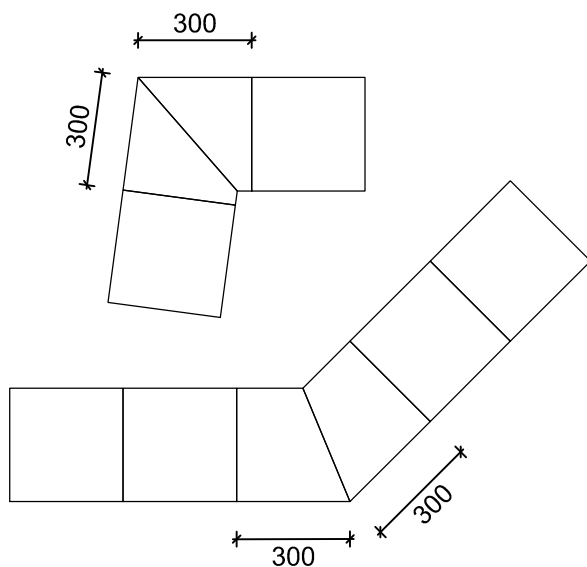
REVISION

B

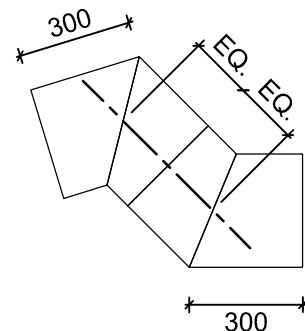
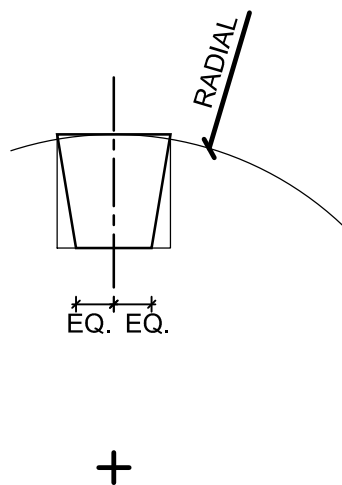
A = FULL OR HALF SIZE PAVER AS PER GRANITE PAVING SPECIFICATION.
 B = PAVER CUT TO FIT REMAINING DISTANCE
 NOTE: IF REMAINING DISTANCE IS LESS THAN 100mm THEN SETOUT MOVES ACROSS TO THE NEAREST UNIT LARGER THAN 100mm. SECOND CUT LINE IS THEN SET OFF MID POINT AND THIRD CUT LINE IS REQUIRED. REFER PV4.1a



PV 4.1 PAVING SETOUT - CoR PREFERENCE
 SCALE 1:20



PV 4.2 HEADER COURSE CUTTING EXAMPLES
 SCALE 1:20



NOTE:
 RETAIN LARGEST POSSIBLE PIECE OF PAVER AT CORNER/JUNCTION. ADD CUT PAVER ON MIDPOINT OF STRAIGHT TO ACCOMMODATE.



PUBLIC WORKS
 Project Development

STANDARD DETAILS
 PAVING SETOUT
 AND
 CUTTING EXAMPLES

APPROVED
 IA

DESIGN MANAGER

DATE
 20. / 05. / 14.

DRAWN DS

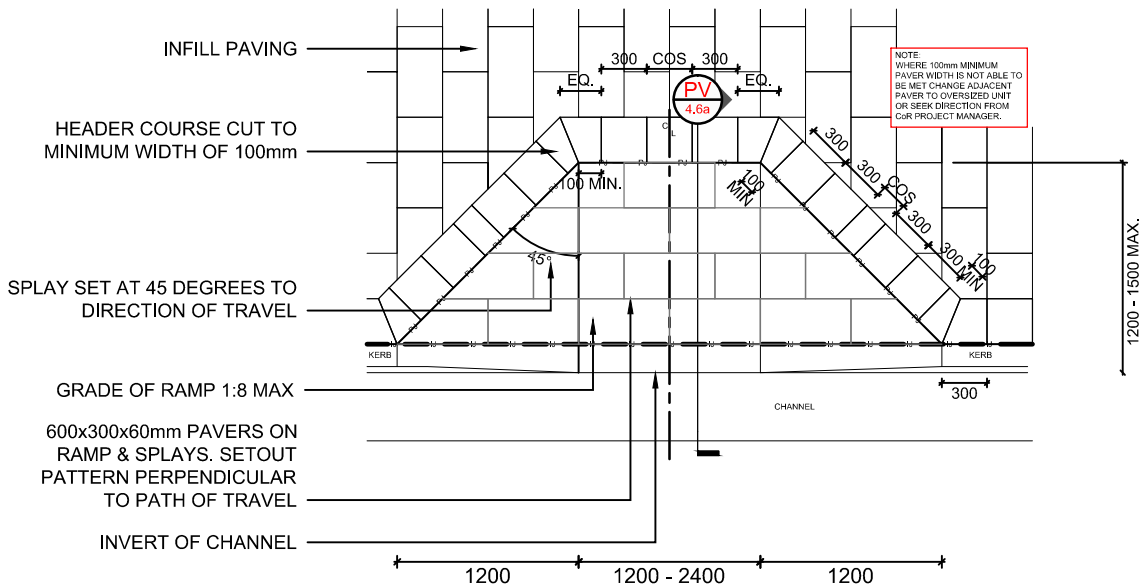
DRAWING NUMBER

REVISION

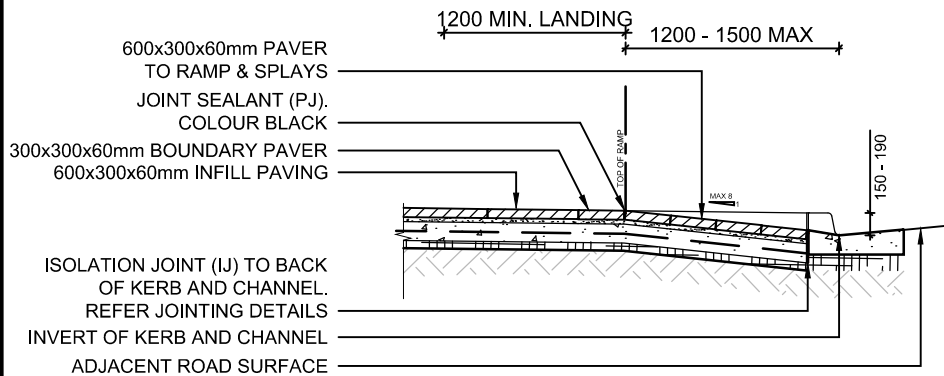
SCALE
 AS SHOWN @ A4

PV4.1 & PV4.2

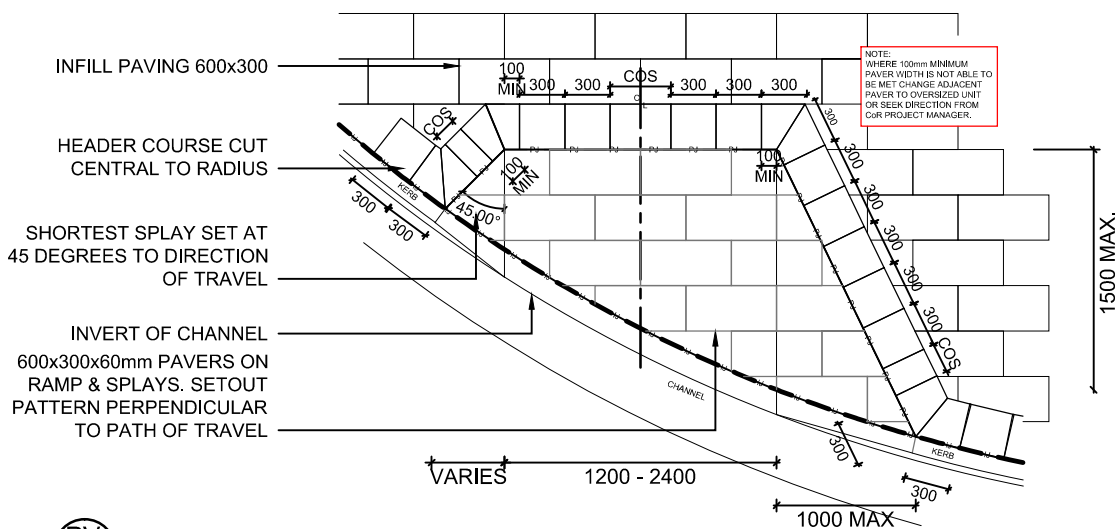
B



PV 4.6 KERB RAMP PLAN - TYPICAL
SCALE 1:50



PV 4.6a KERB RAMP - SECTION
SCALE 1:50



PV 4.7 KERB RAMP ON CURVE - TYPICAL PLAN
SCALE 1:50



PUBLIC WORKS
Project Development

STANDARD DETAILS
KERB RAMPS
600x300x60mm GRANITE
PAVER

APPROVED
IA

DESIGN MANAGER

DATE
20 / 05 / 14.

DRAWN DS

DRAWING NUMBER

REVISION

SCALE

AS SHOWN @ A4

PV4.6 & PV4.7

B

COPYRIGHT © 2011 City of Ryde. ALL RIGHTS RESERVED. No part of this document shall be reproduced without written permission.

AREA FOR TGSi's
WHEN REQUIRED.
REFER DRAWINGS FOR
LOCATIONS. CONFIRM
WITH CoR PROJECT
MANAGER

HEADER COURSE TO
PROPERTY BOUNDARY

300 x 150 INFILL PAVER
FOR BODY OF
DRIVEWAY

LAYBACK AS PER CoR
STANDARD DETAILS

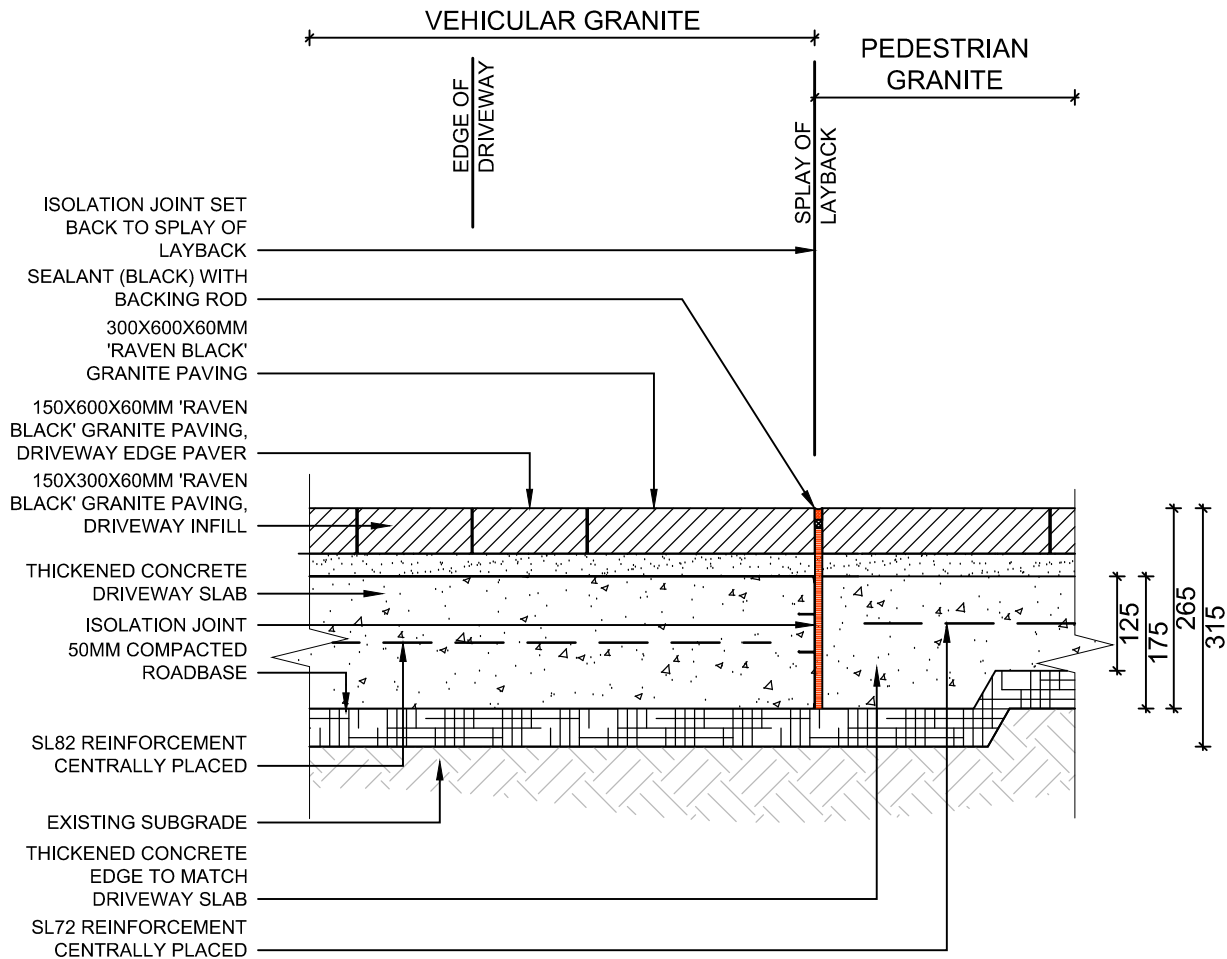
600 x 150 EDGE PAVER
TO LINE OF DRIVEWAY

HEADER COURSE
TO KERB

INFILL PAVING LAID
PERPENDICULAR
TO KERB



COMMERCIAL VEHICLE CROSSING SETOUT
SCALE 1:50



COMMERCIAL VEHICULAR GRANITE TO PEDESTRIAN GRANITE
SCALE 1:10

City of Ryde

PUBLIC WORKS
Project Development

ABN: 81 621 292 610
Civic Centre, 1 Devlin Street Ryde NSW 2112
Locked Bag 2069
NORTH RYDE NSW 1670
Email: cityofryde@ryde.nsw.gov.au
Web: www.ryde.nsw.gov.au
Tel: (02) 9952 8222
Fax: (02) 9952 8070

STANDARD DETAILS COMMERCIAL VEHICLE CROSSING

APPROVED
IA

DESIGN MANAGER

DATE
20 / 05 / 14

DRAWN DS
SCALE
AS SHOWN @ A4

DRAWING NUMBER

PV4.9 & PV4.9c

REVISION

B

ADJACENT SOFTSCAPE (GARDEN BED,
TREE PLANTING, TURF ETC)

90X90X6MM HOT DIPPED
GALVANISED STEEL ANGLE. FULL
WELD AT JOINTS, GRIND FLUSH
AND TREAT TO PREVENT RUST

COVER STEEL ANGLE WITH WET
SAND/CEMENT AND LAY PAVER ON TOP

GRANITE PAVING

FIX STEEL TO CONCRETE SLAB WITH
M10 THREADED ROD EPOXY FIXED
INTO SLAB AT 1.5M CENTRES. MAX
200mm DISTANCE FROM ENDS. ALL
FIXINGS TO BE HOT DIPPED GAL OR
STAINLESS STEEL

EXISTING SUBGRADE

90

PV
6.1 STEEL ANGLE TO STRAIGHT GARDEN BED EDGE - TYPICAL
SCALE 1:5

ADJACENT SOFTSCAPE (GARDEN BED,
TREE PLANTING, TURF ETC)

180X6MM HOT DIPPED GALVANISED
STEEL. FULL WELD AT JOINTS. GRIND
FLUSH AND TREAT TO PREVENT RUST

WET SAND/CEMENT WITH
PAVER ON TOP

GRANITE PAVING

FIX STEEL TO CONCRETE SLAB WITH
M10 THREADED ROD EPOXY FIXED
INTO SLAB AT 1M CENTRES. MIN 50MM
CONCRETE COVER. MAX 200MM
DISTANCE FROM ENDS. HOLES
DRILLED MIN 50MM CLEARANCE FROM
EDGE. ALL FIXINGS TO BE HOT DIPPED
GAL OR STAINLESS STEEL

EXISTING SUBGRADE

180

PV
6.2 STEEL FLAT TO CURVED GARDEN BED EDGE - TYPICAL
SCALE 1:5



PUBLIC WORKS
Project Development

STANDARD DETAILS STEEL EDGE TYPES

APPROVED
IA

DESIGN MANAGER

DATE
20/05/14

DRAWN DS

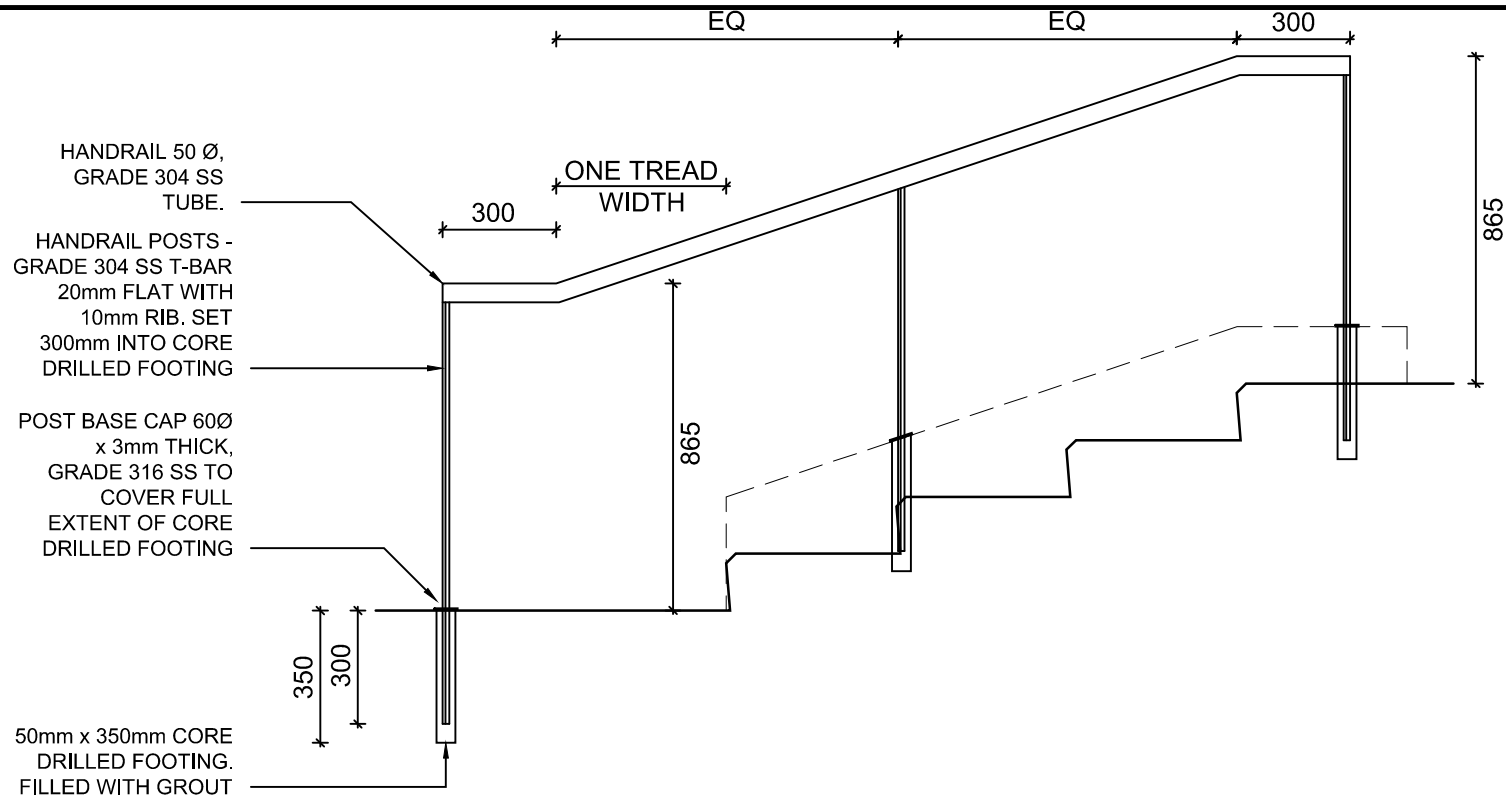
DRAWING NUMBER

REVISION

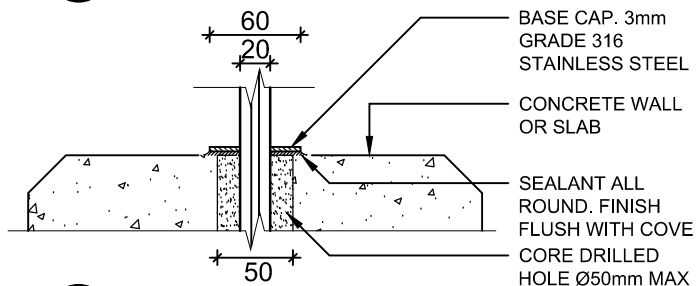
SCALE
AS SHOWN @ A4

PV6.1 & PV6.2

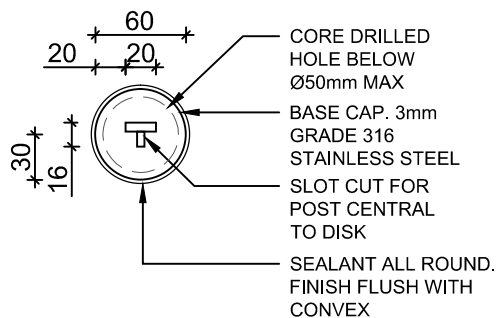
B



HR 1.1 TOWN CENTRE HAND RAIL - TYPICAL
SCALE 1:20



HR 1.2 POST BASE CAP - PLAN & SECTION
SCALE 1:5



HR 1.3 POST TO HANDRAIL - PLAN & SECTION
SCALE 1:5

City of Ryde

PUBLIC WORKS
Project Development

ABN: 81 621 292 610
Civic Centre, 1 Devlin Street Ryde NSW 2112
Locked Bag 2069
NORTH RYDE NSW 1670
Email: cityofryde@ryde.nsw.gov.au
Web: www.ryde.nsw.gov.au
Tel: (02) 9952 8222
Fax: (02) 9952 8070

STANDARD DETAILS HANDRAIL TOWN CENTRE

APPROVED
IA

DESIGN MANAGER

DATE
20 / 05 / 14

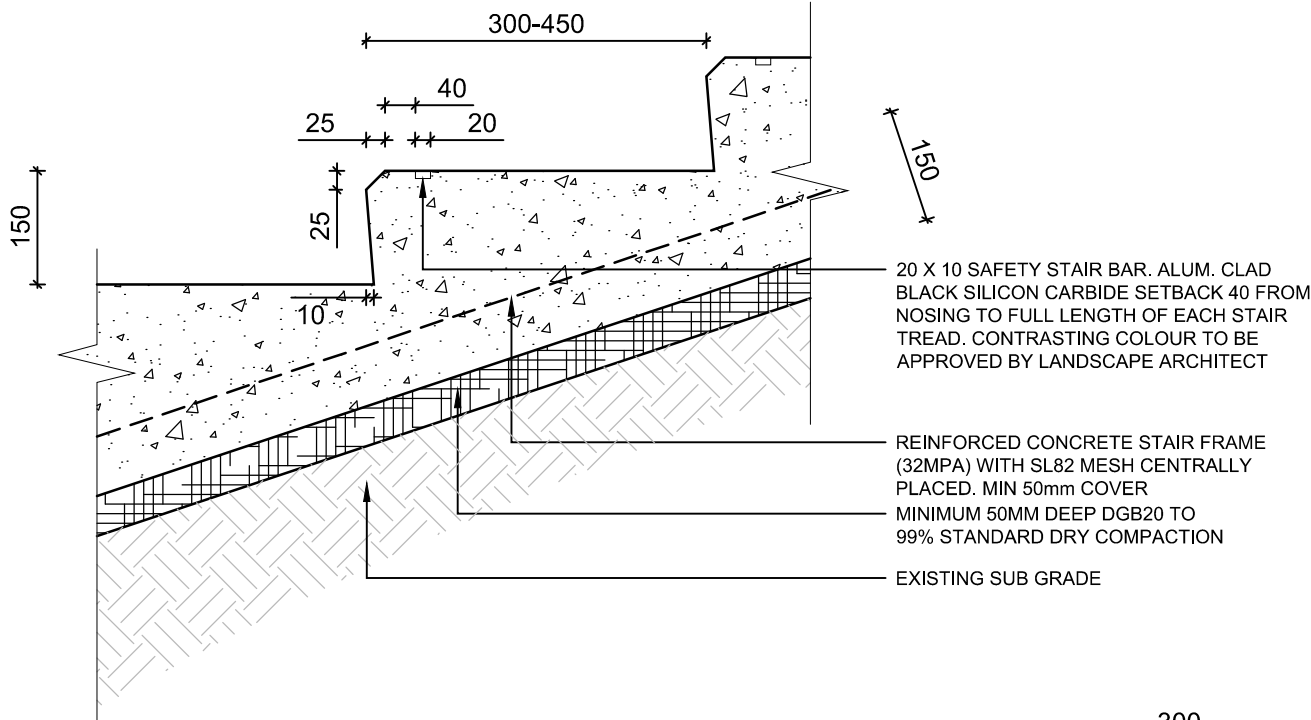
DRAWN DS
SCALE
AS SHOWN @ A4

DRAWING NUMBER

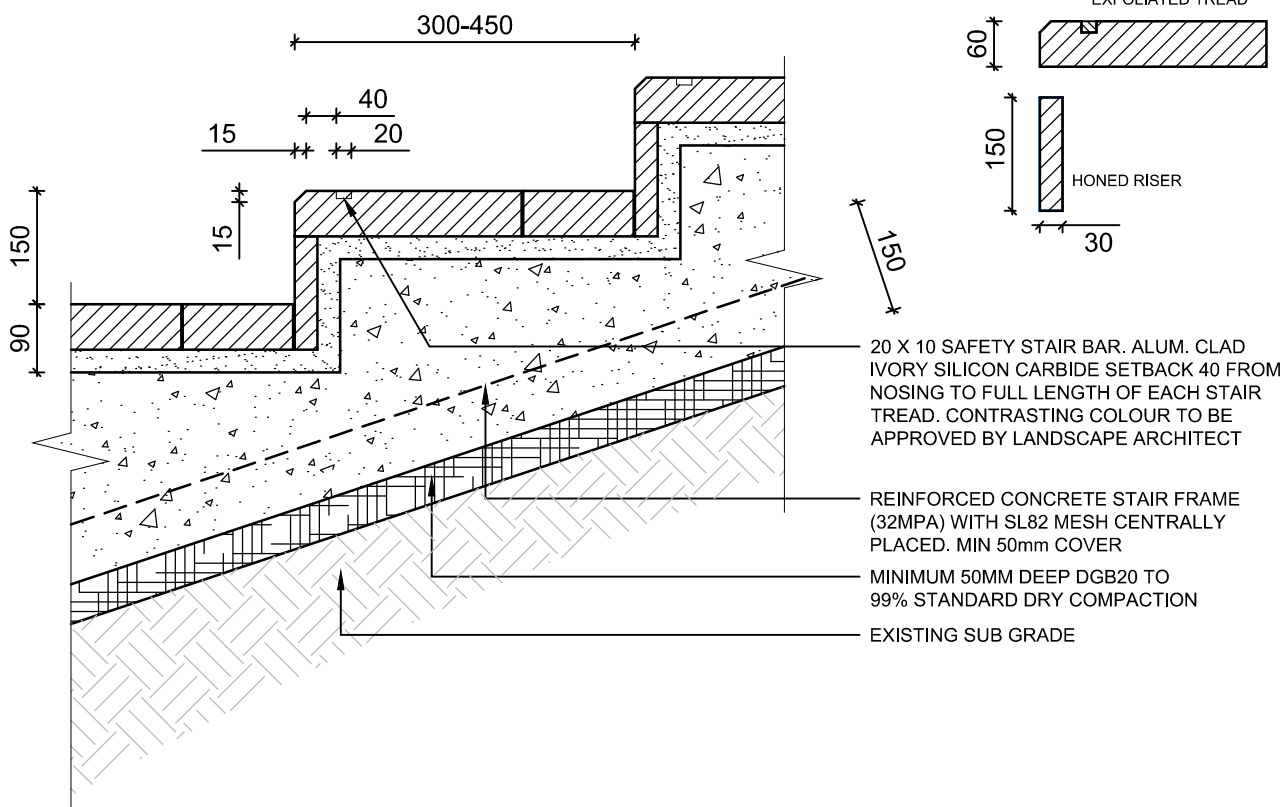
HR1.1 - HR1.3

REVISION

B



STR 1.1 STAIR TREAD - TYPICAL
SCALE 1:10



STR 2.1 GRANITE STAIR - TYPICAL
SCALE 1:10



PUBLIC WORKS
Project Development

STANDARD DETAILS
STAIR TYPES
TOWN CENTRES

APPROVED

IA

DESIGN MANAGER

DATE

20./05./14.

DRAWN DS

DRAWING NUMBER

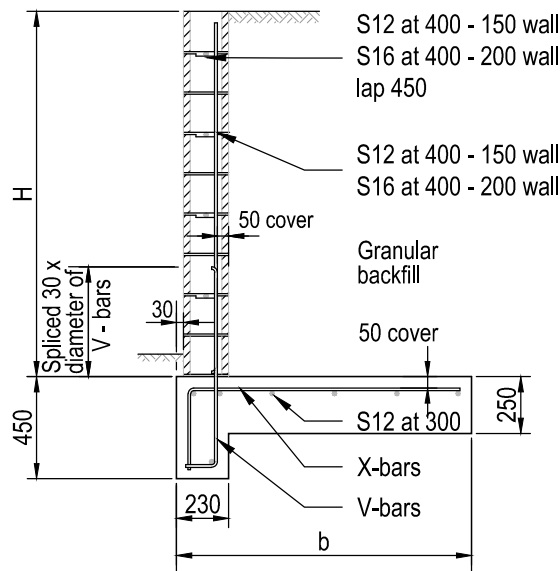
REVISION

SCALE

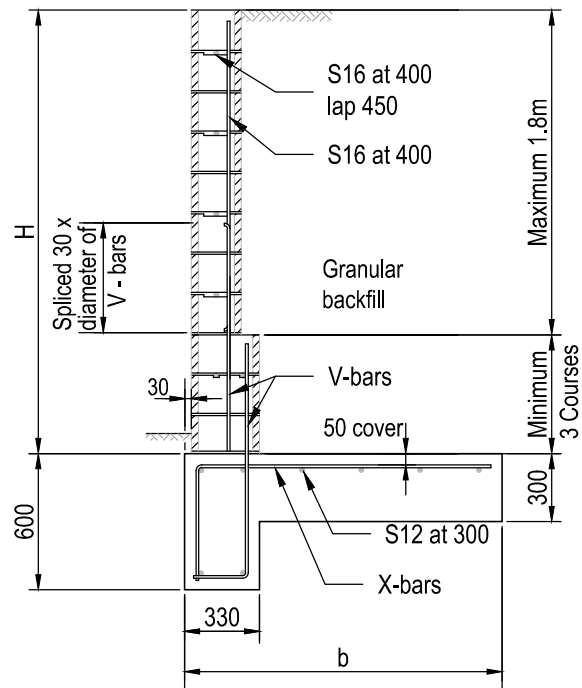
AS SHOWN @ A4

STR1.1 & STR2.1

B



150 & 200 WALLS
Not to Scale



200 & 300 WALLS
Not to Scale

CONCRETE BLOCK RETAINING WALLS

BACKFILL TYPE	HEIGHT "H"m	WALL TYPE	WITHOUT SURCHARGE			WITH 5.0 kPa SURCHARGE		
			"b"mm	V-BARS	X-BARS	"b"mm	V-BARS	X-BARS
1	1.0	150	900	S12 @ 400	S12 @ 400	1000	S12 @ 400	S12 @ 400
	1.4	200	1050	S16 @ 400	S16 @ 400	1150	S16 @ 400	S16 @ 400
	1.8		1300	S16 @ 400	S16 @ 400	1400	S20 @ 400	S16 @ 400
	2.2	200	1450	S16 @ 400	S16 @ 400	1600	S20 @ 400	S16 @ 400
	2.6	AND	1750	S20 @ 400	S20 @ 400	1850	S20 @ 400	S20 @ 400
	3.0	300	2050	S24 @ 400	S20 @ 400	2300	S24 @ 400	S24 @ 400
3	3.2		2200	S20 @ 200	S24 @ 400			
	1.0	150	1050	S12 @ 400	S12 @ 400	1150	S12 @ 400	S12 @ 400
	1.4	200	1200	S16 @ 400	S16 @ 400	1450	S16 @ 400	S16 @ 400
	1.8		1450	S20 @ 400	S16 @ 400	1750	S24 @ 400	S20 @ 400
	2.2	200	1700	S20 @ 400	S16 @ 400	2050	S20 @ 400	S20 @ 400
	2.6	AND	1900	S24 @ 400	S20 @ 400			
4	3.0	300	2450	S20 @ 400	S24 @ 400			
	1.0	200	1400	S16 @ 400	S16 @ 400	1550	S16 @ 400	S16 @ 400
	1.4	200	1750	S20 @ 400	S20 @ 400	2000	S20 @ 400	S20 @ 400
	1.8	AND 300	2150	S20 @ 400	S20 @ 400	2600	S24 @ 400	S24 @ 400

NOTES

1. A 400mm nominal wall may be used In lieu of 300mm wall using the reinforcement shown above.
2. Lightweight blocks may be used provided they have the minimum characteristic compressive strength specified.
3. Foundation to be approved for maximum allowable bearing pressure 125 kPa.
4. All dimensions in mm unless noted otherwise (U.N.O.)
5. Subject to review and certification by structural engineer.

DISCLAIMER:



Public Works - Project Development

STANDARD DRAWING:

CONCRETE BLOCK RETAINING WALL

DRAWING NO:

WT 1.0

SCALE:

NTS

SHEET:

1 OF 1

DATE:

20/05/2014

REV:

B

DRAWN: MC/ JSB

APPROVED: IA

CHECKED:

DESIGN MANAGER

VERIFIED: VP

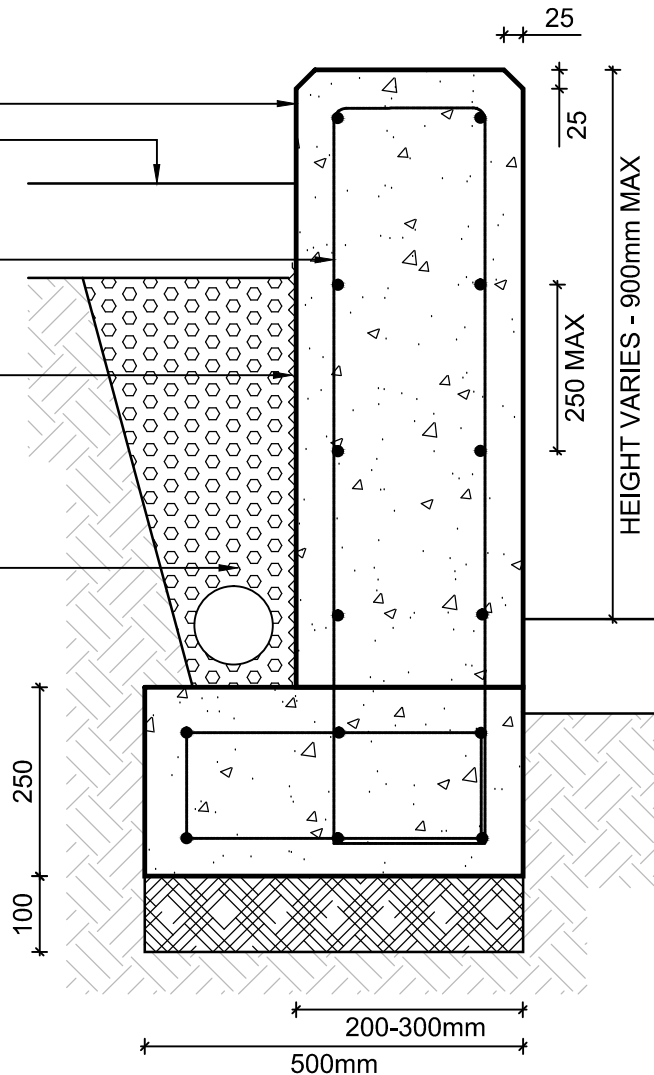
...../...../.....

CONCRETE RETAINING WALL
MAX. 900MM HIGH TO AREAS
SHOWN ON PLAN. 25mm
CHAMFER TO TOP EDGE ALL
ROUND. AERATE/VIBRATE
CONCRETE FORMWORK TO
REMOVE AIR BUBBLES AND
PREVENT HONEY COMBING.

ADJACENT SURFACE VARIES
R10 STIRRUPS AT 300MM
CENTRES WITH 50MM COVER.
3-4x N12 BARS SPACED
EVENLY TO EACH FACE. LAP
BARS MIN 420mm AT SPLICES

WATERPROOF MEMBRANE
AND PROTECTIVE SHEETING
TO BACK OF RETAINING WALL

10-20mm BLUE METAL BACK
FILL. 100MM SLOTTED PVC
AGRICULTURAL LINE. MINIMUM
FALL OF 1:100 TO NEAREST
DRAINAGE CONNECTION.
REFER DRAINAGE PLANS



WT 1.1 WALL TYPE 1 900mm MAX - TYPICAL
SCALE 1:10

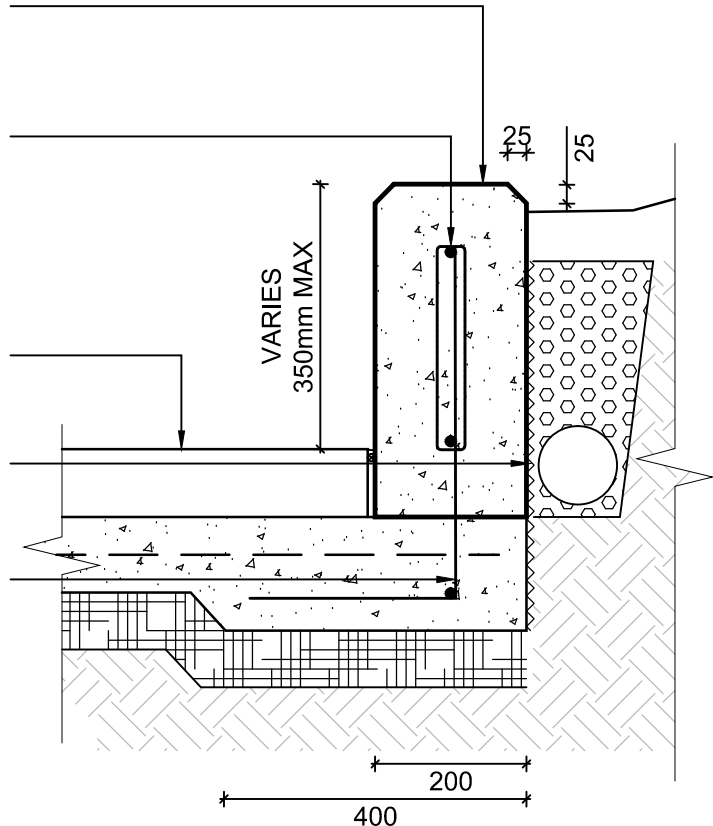
CONCRETE UPSTAND MAX.
350MM HIGH TO AREAS
SHOWN ON PLAN. 25mm
CHAMFER TO TOP EDGE ALL
ROUND. AERATE/VIBRATE
CONCRETE FORMWORK TO
REMOVE AIR BUBBLES AND
PREVENT HONEY COMBING.
WATERPROOFING TO
GARDEN BED SIDE OF WALL

R10 STIRRUPS AT 300MM
CENTRES WITH 50MM COVER.
2x N12 BARS SPACED EVENLY
TO EACH FACE. LAP BARS MIN
420mm AT SPLICES

ADJACENT SURFACE FINISH
150 BELOW TOP OF WALL.
REFER FINISHES DRAWINGS
FOR FINISH TYPE

WATERPROOF MEMBRANE
AND PROTECTIVE SHEETING
TO BACK OF WALL AND EDGE
OF SLAB TO FULL DEPTH.

STARTER BARS AT 300MM
CENTRES PROVIDED AS PART
OF SLAB WORKS



WT 2.1 WALL TYPE 2 ON SLAB UP TO 350mm - TYPICAL
SCALE 1:10

NOTES:

CONCRETE FINISH TO BE CLASS 2 AS3610
WHERE TIE RODS ARE USED AND SURFACE FINISH
IMPACTED - SPACING MUST BE UNIFORM.
VERTICAL EXPANSION JOINTS TO BE INSTALLED MINIMUM
EVERY 6M. CONFIRM EXPANSION JOINT TYPE WITH COR
PROJECT MANAGER. NOTIFY PROJECT MANAGER OF
SETOUT INTENTION FOR APPROVAL.

City of Ryde

PUBLIC WORKS
Project Development

ABN: 81 621 292 610
Civic Centre, 1 Devlin Street Ryde NSW 2112
Locked Bag 2069
NORTH RYDE NSW 1670
Email: cityofryde@ryde.nsw.gov.au
Web: www.ryde.nsw.gov.au
Tel: (02) 9952 8222
Fax: (02) 9952 8070

STANDARD DETAILS IN-SITU CONCRETE WALL

APPROVED
IA

DESIGN MANAGER

DATE
20 / 05 / 14

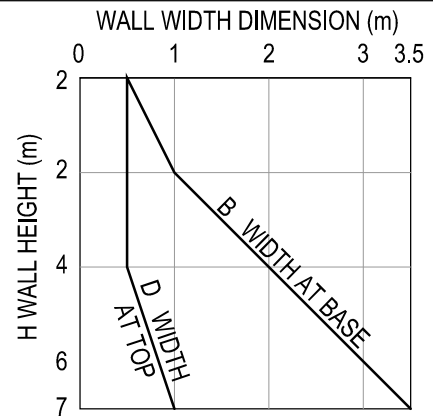
DRAWN DS
SCALE
AS SHOWN @ A4

DRAWING NUMBER

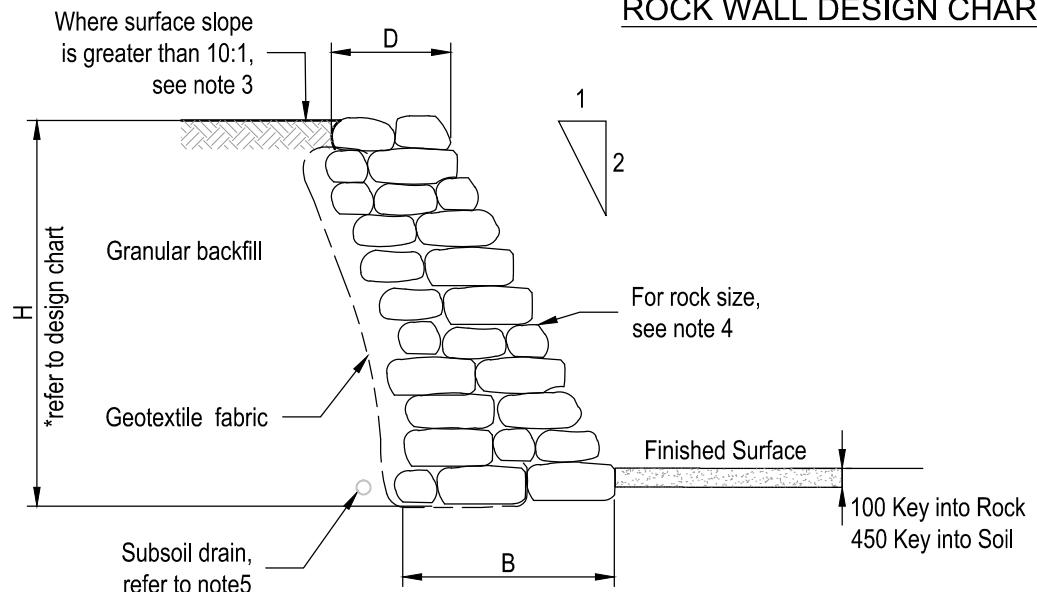
WT1.1 & WT2.1

REVISION

B



ROCK WALL DESIGN CHART



TYPICAL ROCK WALL GEOMETRY

Not to Scale

NOTES

1. Back fill to be granular, free draining and compacted.
2. Foundation to be approved for a safe bearing capacity of 200 KPa prior to construction.
3. Where the surface slope of retained material is between 10:1 and 4:1, the wall base dimension is to be increased by 0.5m.
4. Rock is to be sound durable sandstone or other approved material and at least 0.5 square meters plan area.
5. A continuous 100mm diameter subsoil drain is to be installed at the rear of the wall where the wall height exceeds 3.0m or where the wall foundation consists of materials other than rock.
6. Rocks shall be placed in such a manner that they are stable and interlocking and laid roughly coursed and bedded on their broadest base.
7. Subject to review by Structural Engineer.

DISCLAIMER:



Public Works - Project Development

STANDARD DRAWING:

ROCK RETAINING WALL

DRAWING NO:

WT3.1

SCALE:

NTS

SHEET:

1 OF 1

DATE:

20/05/2014

REV:

B

DRAWN: JSB

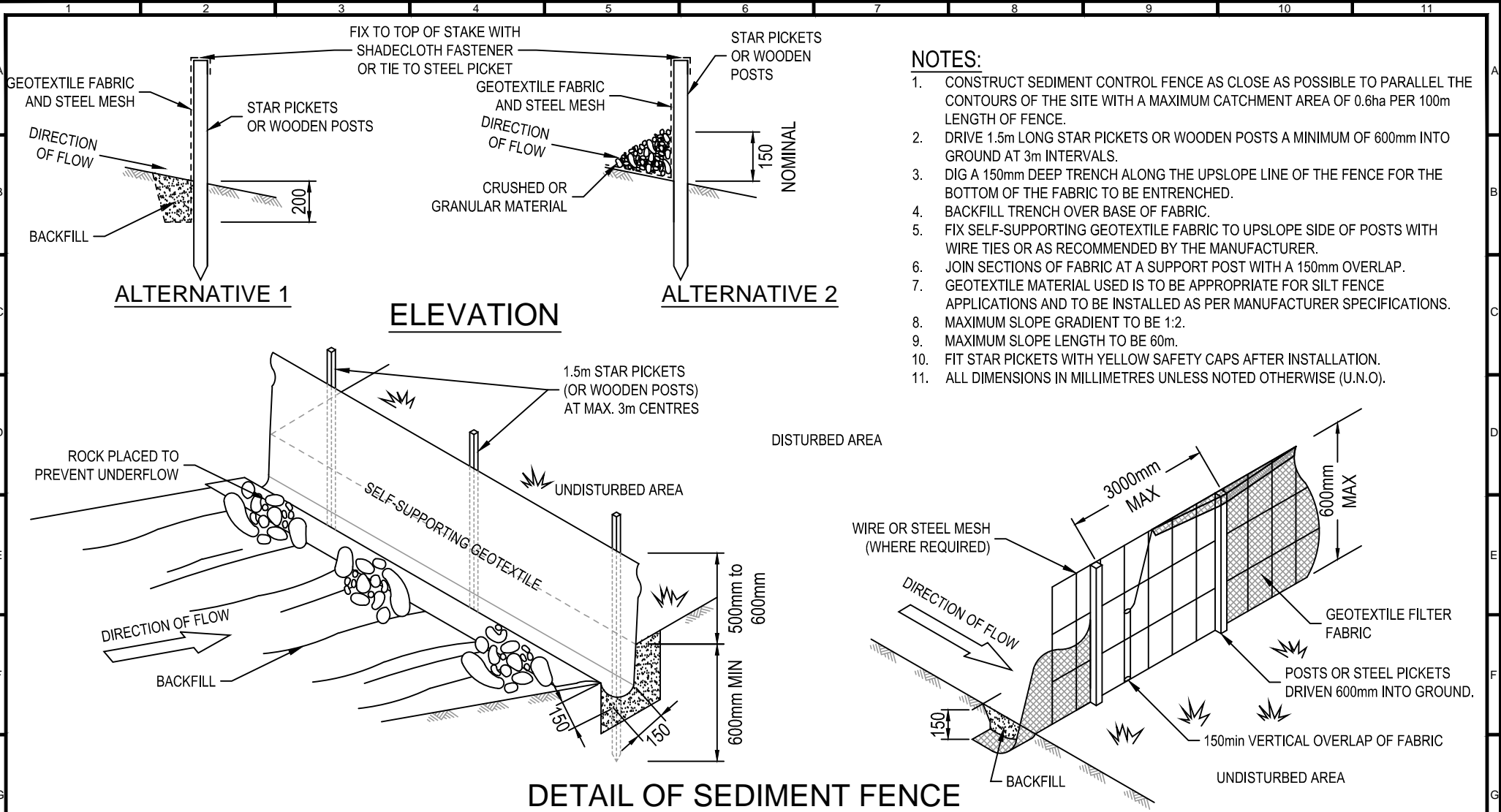
APPROVED: IA

CHECKED:

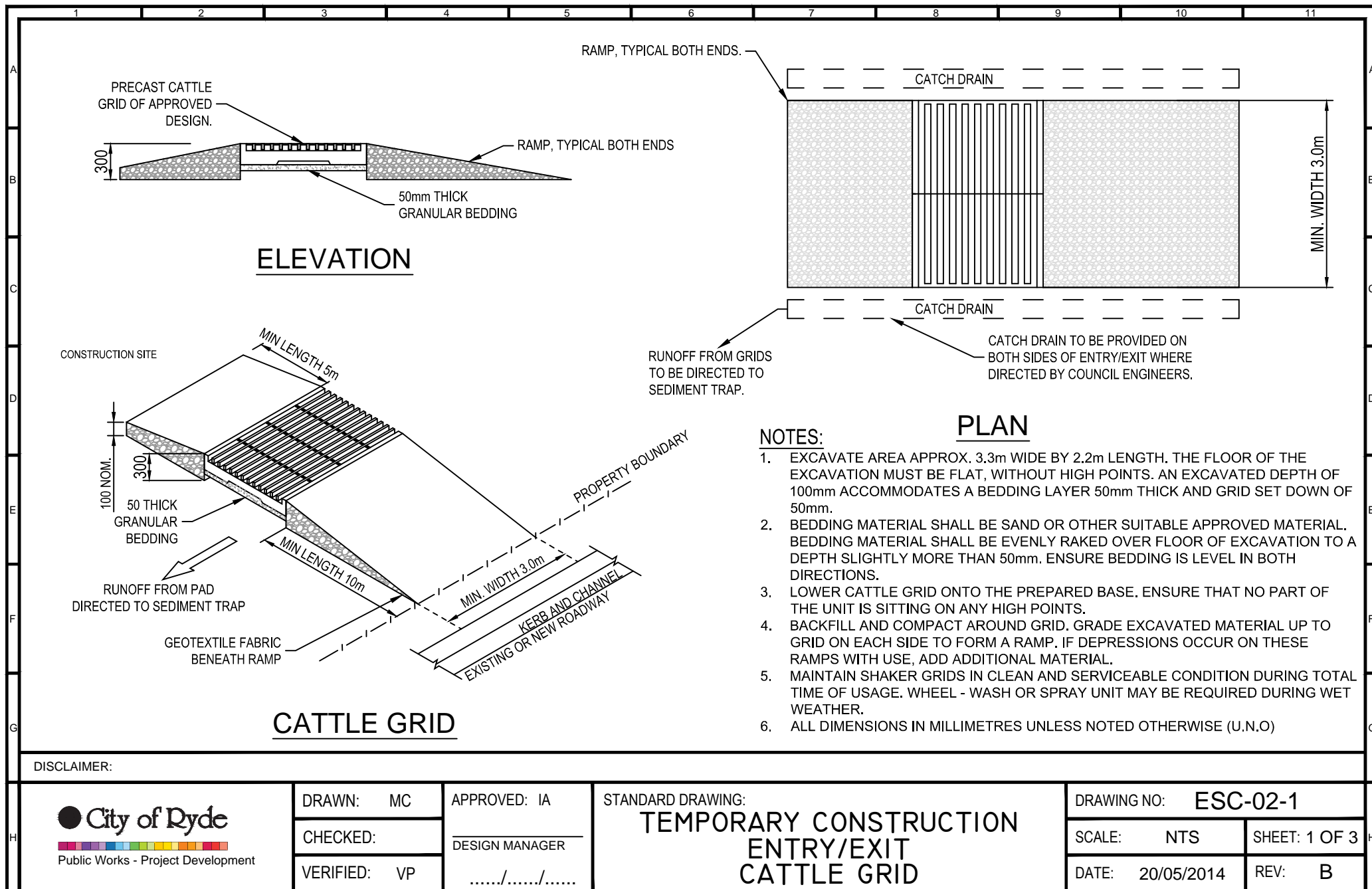
DESIGN MANAGER

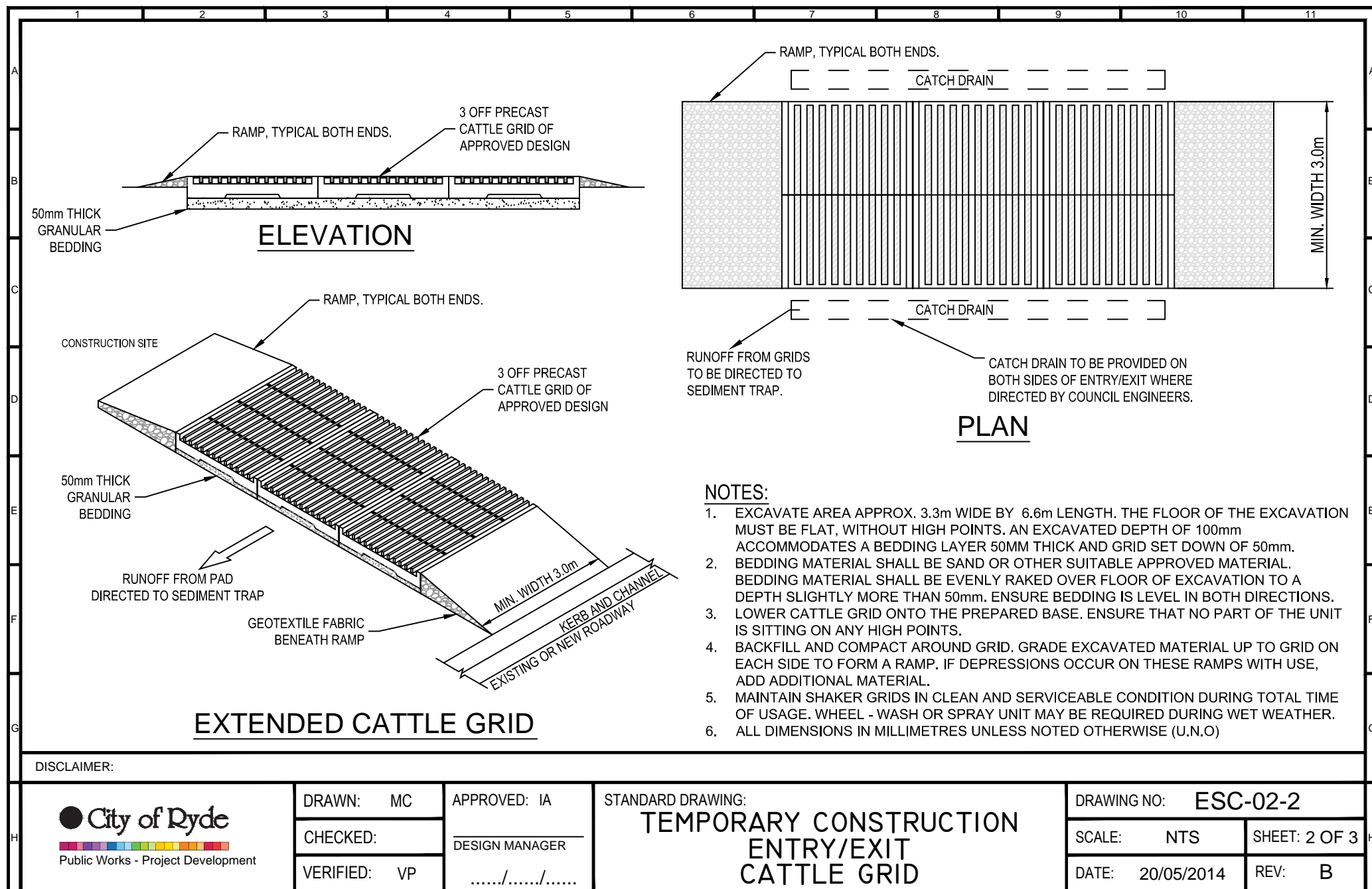
VERIFIED: VP

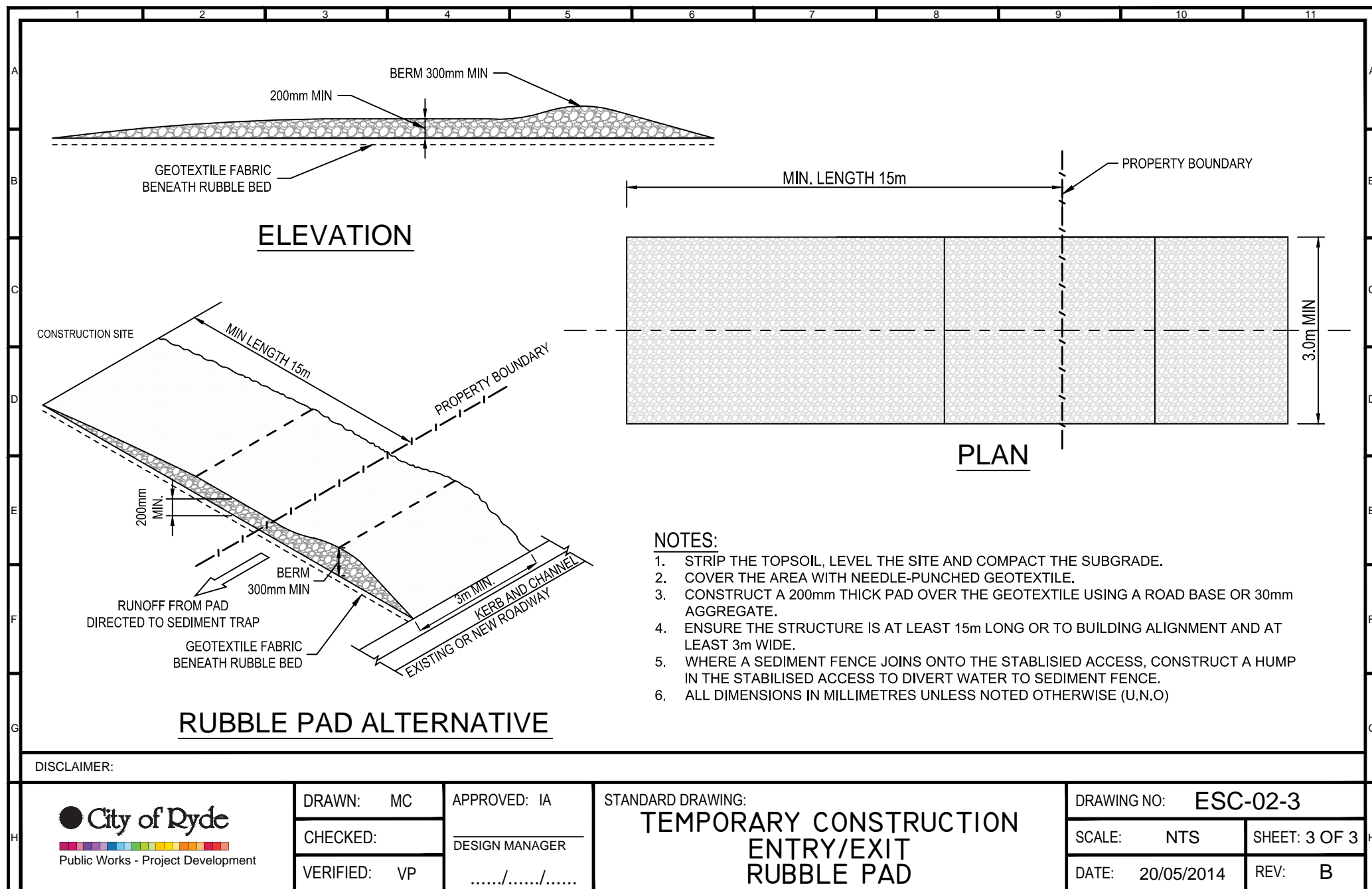
...../...../.....

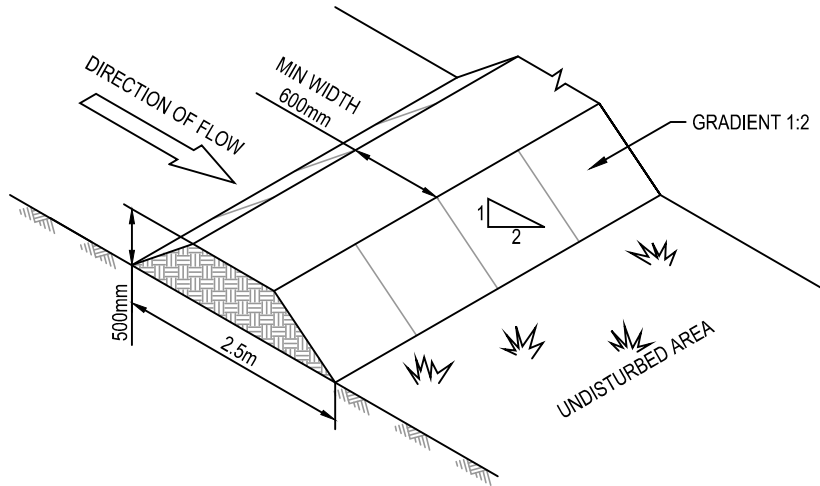


DISCLAIMER:

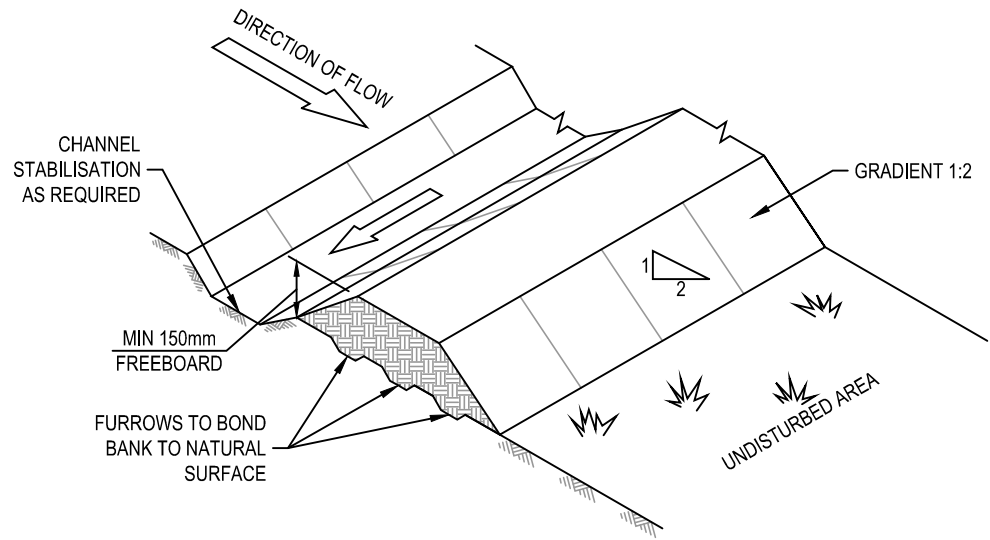








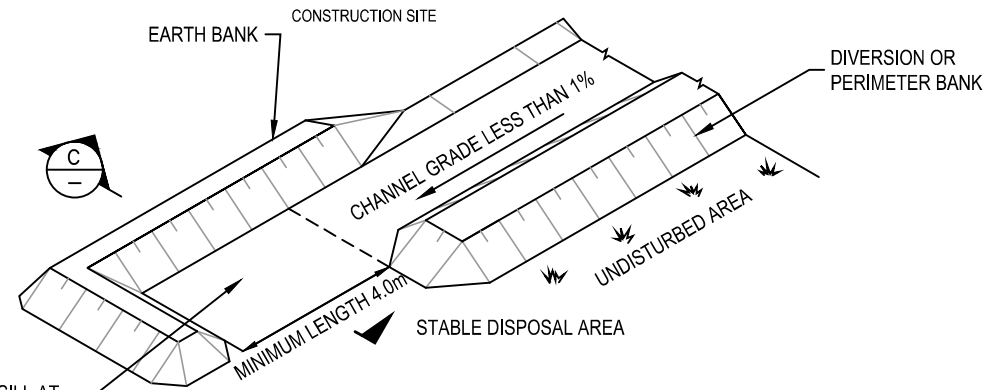
PERIMETER BANK (WITHOUT CHANNEL)
FOR 2ha CATCHMENT AREA OR LESS



DIVERSION BANK AND CHANNEL
FOR CATCHMENT AREA GREATER THAN 2ha

NOTES:

1. CONSTRUCT ALONG GRADIENT AS SPECIFIED.
2. AVOID REMOVAL OF TREES AND SHRUBS.
3. DRAINS TO BE OF PARABOLIC OR TRAPEZOIDAL CROSS SECTION AS OPPOSED TO V-SHAPED.
4. EARTH BANKS TO BE ADEQUATELY COMPACTED IN ORDER TO PREVENT FAILURE.
5. PERMANENT OR TEMPORARY STABILISATION OF THE EARTH BANK TO BE COMPLETED WITHIN 10 DAYS OF CONSTRUCTION.
6. ALL OUTLETS FROM DISTURBED LANDS ARE TO FEED INTO A SEDIMENT BASIN OR SIMILAR.
7. DISCHARGE RUNOFF COLLECTED FROM UNDISTURBED LANDS ONTO EITHER A STABILISED OR AN UNDISTURBED DISPOSAL SITE WITHIN THE SAME SUB-CATCHMENT AREA FROM WHICH THE WATER ORIGINATED.
8. COMPACT WITH A SUITABLE IMPLEMENT IN SITUATIONS WHERE THEY ARE REQUIRED TO FUNCTION FOR MORE THAN FIVE DAYS.
9. EARTH BANKS TO BE FREE OF PROJECTIONS OR OTHER IRREGULARITIES THAT WILL IMPEDE NORMAL FLOW.



LEVEL SPREADER (OR SILL)

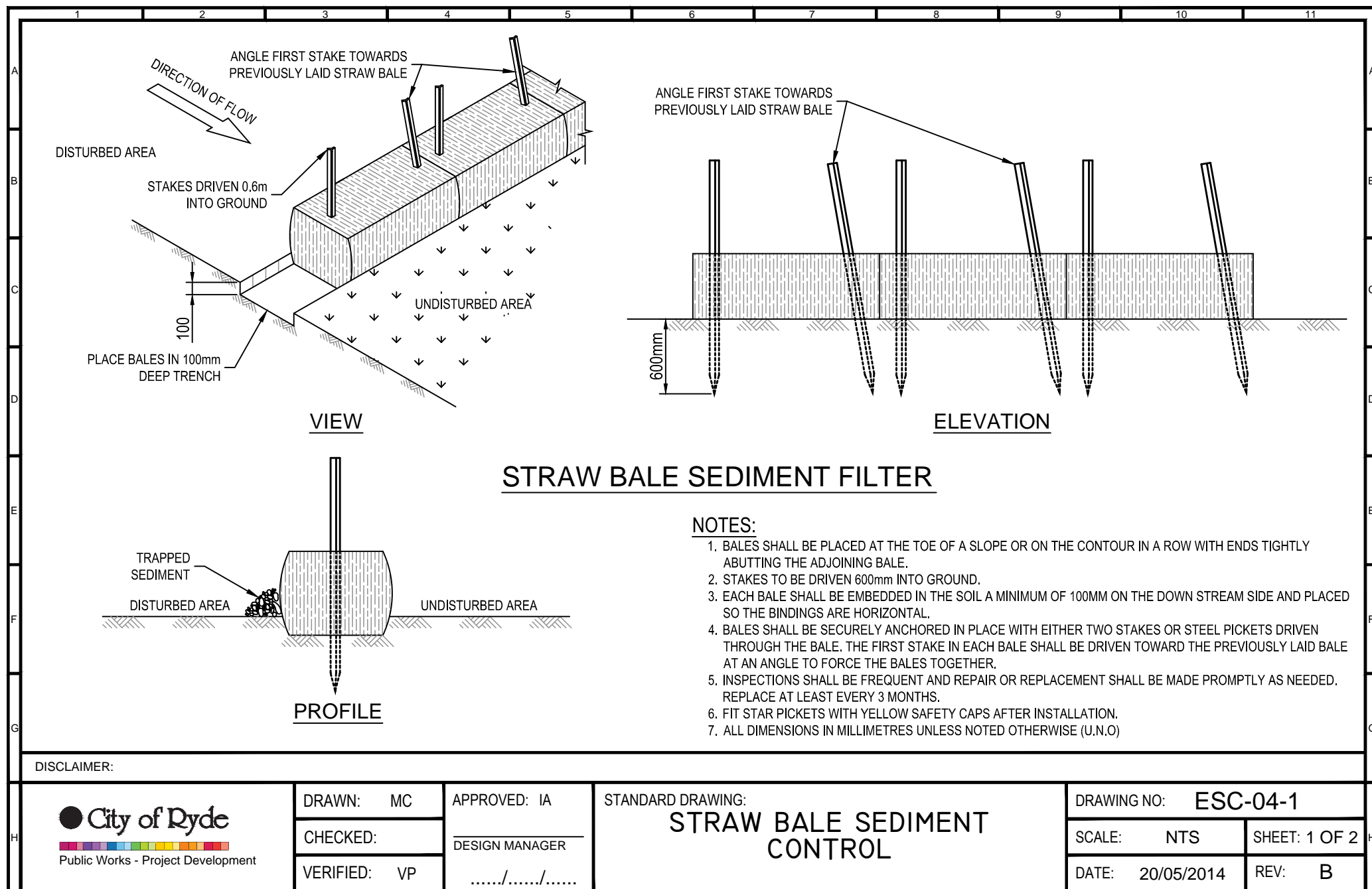
DISCLAIMER:

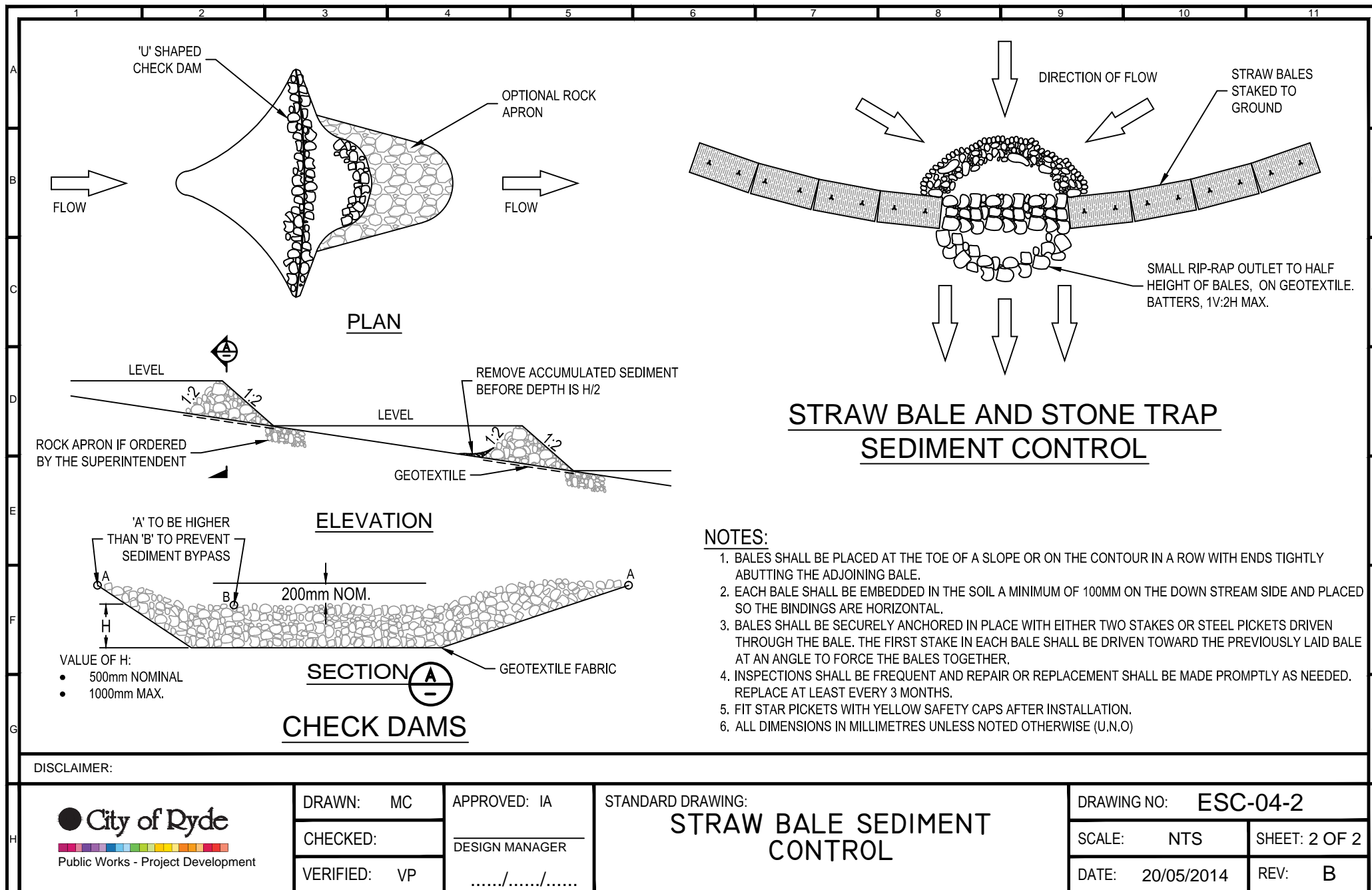


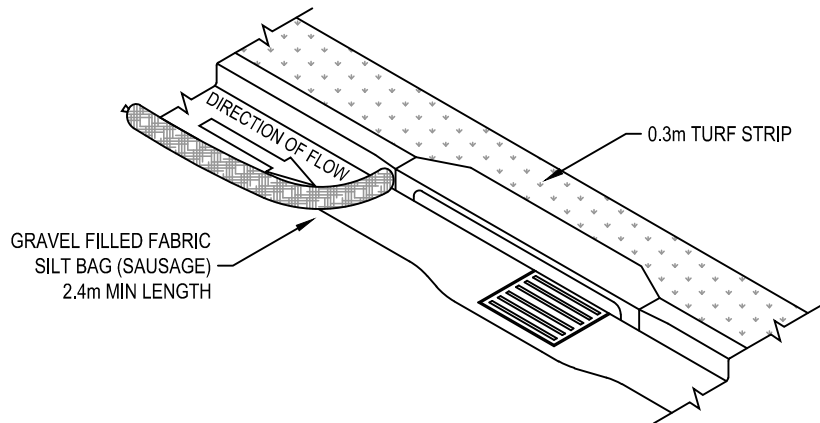
DRAWN: MC	APPROVED: IA
CHECKED:	DESIGN MANAGER
VERIFIED: VP/...../.....

STANDARD DRAWING:
**DIVERSION
BANKS AND CHANNELS**

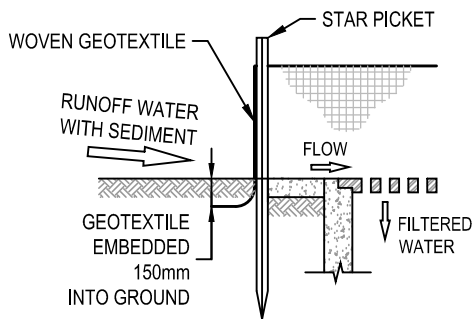
DRAWING NO: ESC-03
SCALE: NTS
DATE: 20/05/2014
SHEET: 1 OF 1
REV: B



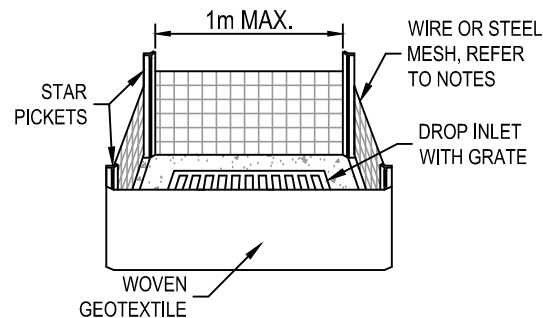




KERB INLET SEDIMENT TRAP

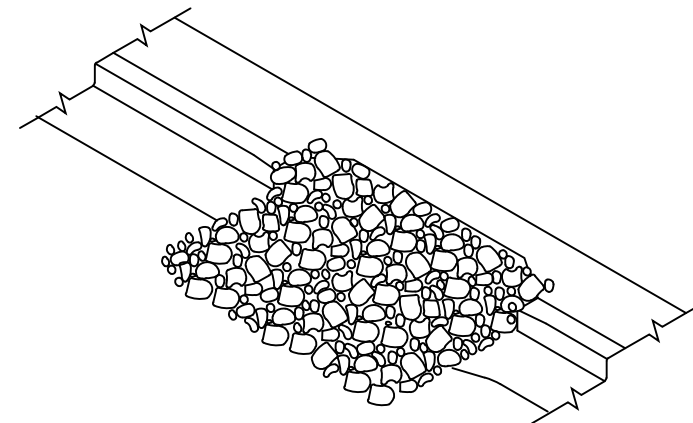


ELEVATION

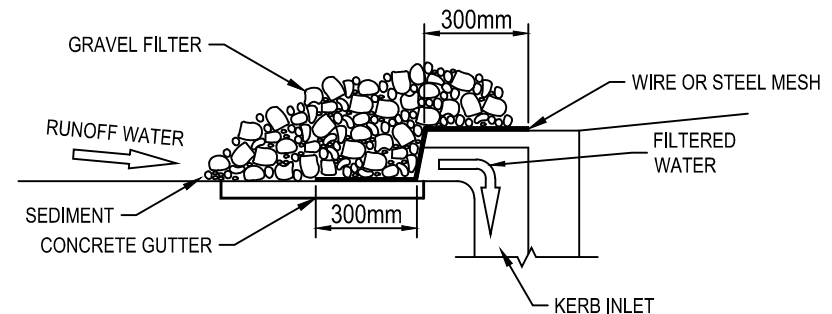


VIEW

GEOTEXTILE INLET FILTER



VIEW



ELEVATION

GRAVEL KERB INLET SEDIMENT TRAP

NOTES:

1. WHERE GEOTEXTILE IS NOT SELF-SUPPORTING, PROVIDE WIRE OR STEEL MESH (14 GAUGE X 150mm OPENINGS) TIED TO POSTS AT 1m CENTRES.
2. DO NOT COVER INLETS WITH GEOTEXTILE FABRIC.
3. FIT STAR PICKETS WITH YELLOW SAFETY CAPS AFTER INSTALLATION.
4. ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE (U.N.O)

DISCLAIMER:



DRAWN: MC

CHECKED:

VERIFIED: VP

APPROVED: IA

DESIGN MANAGER

...../...../.....

STANDARD DRAWING:

**KERB INLET
SEDIMENT TRAPS**

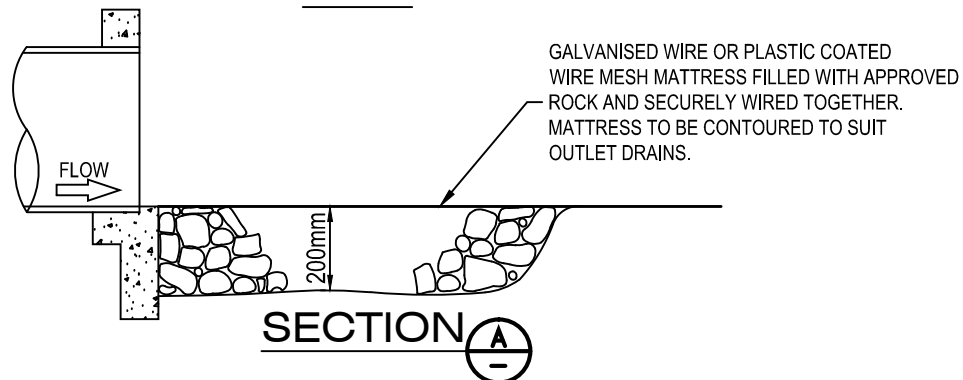
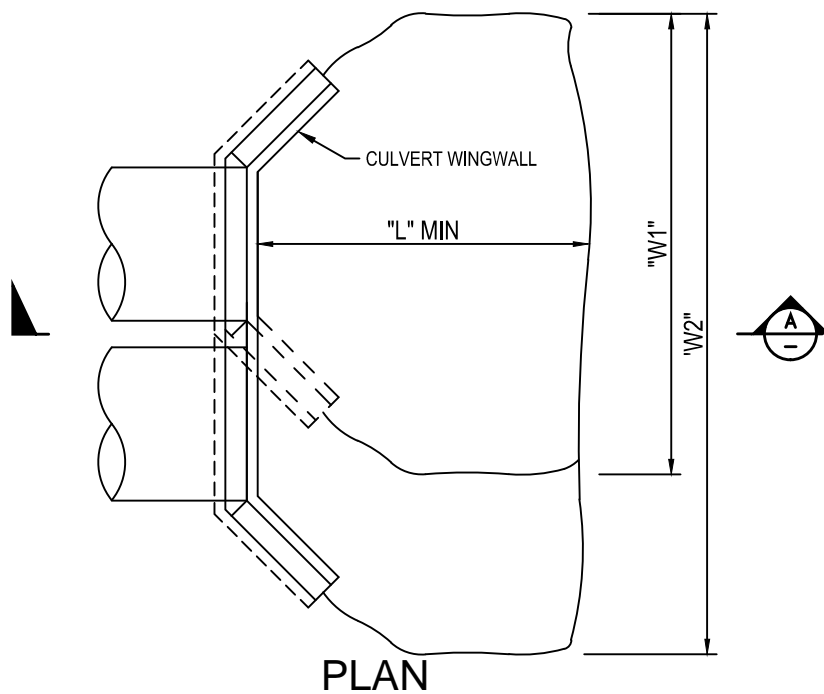
DRAWING NO: **ESC-05**

SCALE: NTS

DATE: 20/05/2014

SHEET: 1 OF 1

REV: B



PIPE DIAMETER	"W1"	"W2"	"L" MIN.
300	1450	2320	1200
375	1800	2750	1600
450	2100	3130	2400
525	2400	3520	3100
600	2750	4050	3600
750	3350	4810	4300
900	4000	5630	4800
1050	4600	6890	5500
1200	5200	7660	6100
1350	5650	8270	6700
1500	6100	8880	7300
1650	6700	9640	7900
1800	7300	10410	8500

NOTES:

1. "W1" MATTRESS WIDTH FOR SINGLE PIPE CULVERTS.
2. "W2" MATTRESS WIDTH FOR DOUBLE PIPE CULVERTS.
3. PROTECT FULL LENGTH OF EXCAVATED CHANNEL AS DIRECTED.
4. USE ROCK SIZES 80mm MINIMUM, 150mm MAXIMUM.
5. ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE (U.N.O.)

DISCLAIMER:

DRAWN: MC

CHECKED:

VERIFIED: VP

APPROVED: IA

DESIGN MANAGER

...../...../.....

STANDARD DRAWING:

ROCK MATTRESS OUTLET PROTECTION FOR PIPE CULVERTS

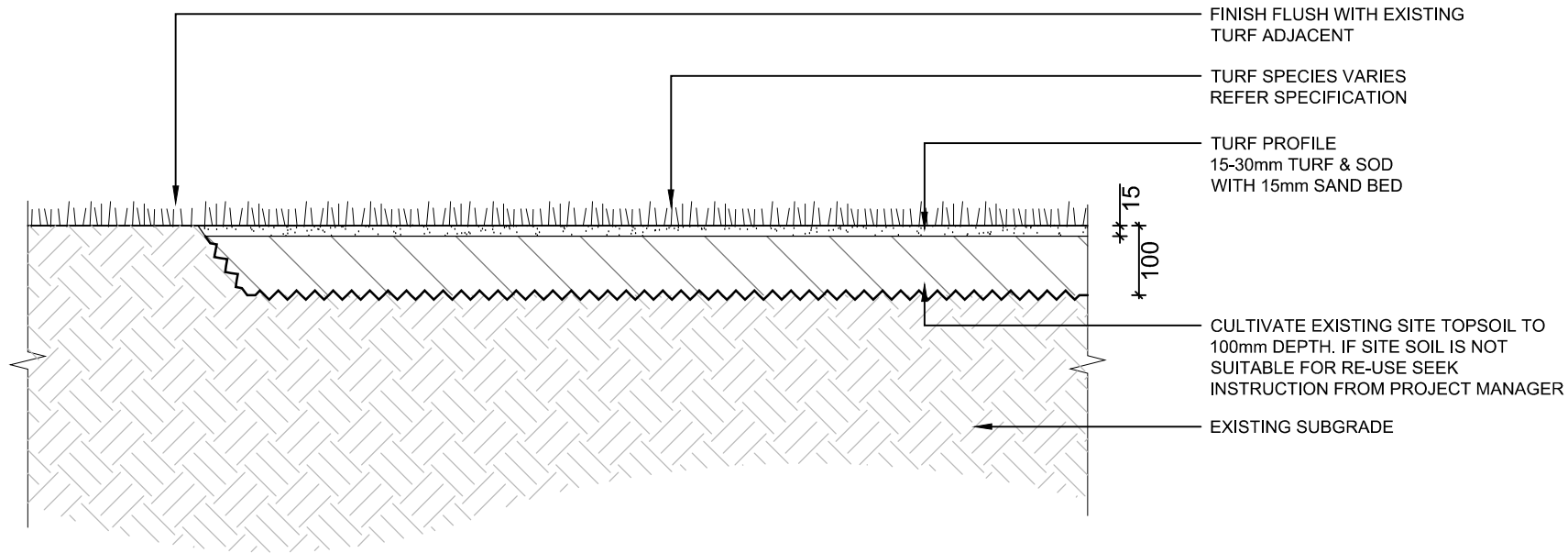
DRAWING NO: ESC-06

SCALE: NTS

DATE: 20/05/2014

SHEET: 1 OF 1

REV: B



PL 7.1 STANDARD TURF PROFILE - TYPICAL
SCALE 1:10



PUBLIC WORKS
Project Development

ABN: 81 621 292 610
Civic Centre, 1 Devlin Street Ryde NSW 2112
Locked Bag 2069
NORTH RYDE NSW 1670
E-Mail: cityofryde@ryde.nsw.gov.au
Web: www.ryde.nsw.gov.au
Tel: (02) 9952 8222
Fax: (02) 9952 8070

STANDARD DETAILS TURF

APPROVED
IA

DESIGN MANAGER

DATE
20 / 05 / 14

DRAWN DS
SCALE
AS SHOWN @ A4

DRAWING NUMBER

PL7.1

REVISION

B



City of Ryde
Civic Centre
1 Devlin Street
Ryde NSW 2112

www.ryde.nsw.gov.au

City of Ryde Development Control Plan 2014

Part: 7.1 Energy Smart, Water Wise

Translation

ENGLISH

If you do not understand this document please come to Ryde Civic Centre, 1 Devlin Street, Ryde Monday to Friday 8.30am to 4.30pm or telephone the Telephone and Interpreting Service on 131 450 and ask an interpreter to contact the City of Ryde for you on 9952 8222.

ARABIC

إننا نعتذر عليك فهم محتويات هذه الوثيقة، نرجو للحضور إلى مركز بلدية رايد Ryde Civic Centre على العنوان: 1 Devlin Street, Ryde من الاثنين إلى الجمعة بين الساعة 8.30 صباحاً والساعة 4.30 بعد الظهر أو الاتصال بمكتب خدمات الترجمة على الرقم 131 450 لكي تطلب من أحد المترجمين الاتصال بمجلس مدينة رايد، على الرقم 9952 8222، نيابة عنك.

ARMENIAN

Եթէ այս գրութիւնը չէք հասկնար, խնդրեմ եկէ՛ք Րայդ Սիվիկ Սենթըր, 1 Տելվին փողոց, Րայդ, (Ryde Civic Centre, 1 Devlin Street, Ryde) Երկուշաբթիէն Ուրբաթ կ.ա. ժամը 8.30 – կ.ե. ժամը 4.30, կամ հեռաձայնեցէ՛ք Հեռաձայնի եւ Թարգմանական Սպասարկութեան՝ 131 450, եւ խնդրեցէ՛ք որ թարգմանիչ մը Րայդ Քաղաքապետարանին հետ կապ հաստատուէ ձեզի համար, հեռաձայնելով՝ 9952 8222 թիվին:

CHINESE

如果您看不懂本文，請在周一至周五上午 8 時 30 分至下午 4 時 30 分前往 Ryde 市政中心詢問 (Ryde Civic Centre, 地址: 1 Devlin Street, Ryde)。你也可以打電話至電話傳譯服務中心，電話號碼是: 131 450。接通後你可以要求一位傳譯員為你打如下電話和 Ryde 市政廳聯繫，電話是: 9952 8222。

FARSI

اگر این مدرک را نمی فهمید لطفاً از 8.30 صبح تا 4.30 بعد از ظهر دوشنبه تا جمعه به مرکز شهرداری رايد، Ryde Civic Centre, 1 Devlin Street, Ryde مراجعه کنید یا به سرویس مترجم تلفنی، شماره 131 450 تلفن بزنید و از یک مترجم بخواهید که از طرف شما با شهرداری رايد شماره 9952 8222 تلفن بزند.

ITALIAN

Se non capite il presente documento, siete pregati di rivolgervi al Ryde Civic Centre al n. 1 di Devlin Street, Ryde, dalle 8.30 alle 16.30, dal lunedì al venerdì; oppure potete chiamare il Telephone Translating and Interpreting Service al 131 450 e chiedere all'interprete di contattare a vostro nome il Municipio di Ryde presso il 9952 8222.

KOREAN

이 문서가 무슨 의미인지 모르실 경우에는 1 Devlin Street, Ryde 에 있는 Ryde Civic Centre 로 오시거나 (월 – 금, 오전 8:30 – 오후 4:30), 전화 131 450 번으로 전화 통역 서비스에 연락하셔서 통역사에게 여러분 대신 Ryde 시청에 전화 9952 8222 번으로 연락을 부탁하십시오.

Amend. No.	Date approved	Effective date	Subject of amendment

Table of Contents

1.0 INTRODUCTION	5
1.1 Purpose of this Part	5
1.2 Objectives of this Part	5
1.3 Structure of this Part	5
2.0 DEVELOPMENT POLICIES	7
2.1 Alterations and Additions to a Dwelling	7
2.2 New Dwelling Houses, Dual occupancy (attached), Multi Dwelling Housing (attached) or Senior Housing Developments Alterations	8
2.3 Residential Flat Buildings (RFBs) including those contained in Mixed RFB/Commercial Developments Residential Conversion of Former Industrial Buildings	8
2.4 New Shops, Industrial and Commercial Premises (including those Contained in a Mixed-use Development).	10
2.5 New and Major Alterations to Motels, Hotels, Backpacker Accommodation and Boarding Houses	11
2.6 All Other Developments (School, Hospital, etc)	12
3.0 THE INFORMATION GUIDE	14
3.1 Pre-Application Consultation	14
3.2 Required Information	14
3.3 Other Matters for Consideration	15
3.4 Specialist Advice	15
3.5 Other Contacts	15
SCHEDULES	
Schedule 1 - Further Information	16

THIS PAGE HAS BEEN
INTENTIONALLY LEFT BLANK

1.0 INTRODUCTION

1.1 Purpose of this Part

The purpose of this Part is to provide a strategic framework for achieving sustainable development throughout the City of Ryde.

This Part has controls and design objectives for most new building works, including home renovations through to larger residential, commercial, retail and industrial developments. All new developments are required to comply with a minimum energy performance standard. The energy performance of a structure will be assessed with reliable and consistent energy rating tools as outlined in the Plan.

By carefully examining the existing site conditions at the beginning of the design stages, new developments and improvements to existing buildings can benefit from more comfortable and economic living and working environments. Environmental benefits, such as the reduction in the emission of greenhouse gases can also be achieved.

1.2 Objectives of this Part

Objectives

The primary objectives of the Part are:

1. To encourage the design of energy efficient buildings in the City of Ryde;
2. To ensure site planning and building design optimise solar access to land and buildings;
3. To decrease the total energy use in buildings through reductions in heat loss and energy consumption for the purposes of heating and cooling; and
4. To encourage the construction and use of buildings that reduce the current level of attributed greenhouse gas emissions and natural resource consumption.

1.3 Structure of this Part

This Part is divided into three sections.

Section 1 - introduction provides an overview of the aims, objectives and the relationship of this development control Plan with other Council planning instruments.

Section 2 - development Policies are divided into the following six categories:

- Alterations and Additions to a Dwelling;
- New Dwelling House, Dual Occupancy (attached), Multi dwelling housing (attached) or Senior housing developments;
- Residential Flat Buildings (RFB) including those contained in Mixed RFB/ commercial developments;
- Residential Conversion of Former Industrial Buildings;
- New Shops, Industrial and Commercial Premises;
- New and Major Alterations to Motels, Hotels, Backpacker Hostels and Boarding houses; and
- All Other Developments (Schools, Hospital, etc.).

For each development Policy category there are a number of 'objectives' that explain the specific aims of each category. The 'provisions' detail the requirements that are to be met to ensure compliance.

Section 3 - information guide summarises the key provisions of the Plan and provides an explanation of the information that you may be required to submit.

If you require further information on issues such as building materials and techniques, a list of useful references has been provided in Schedule 1.

It is strongly suggested that you consult with your architect, builder or adopted person on these requirements prior to lodging an application to Council; you should also seek advice from Council officers in the formative stages of your proposal.

2.0 DEVELOPMENT POLICIES

This section is divided into six categories. For each Development Policy category there are 'objectives' that explain what compliance with the development policy seeks to achieve. The 'Provisions' detail the requirements that are to be met to achieve compliance. 'Concessions' outline any circumstances in which Council may consider variations to those provisions.

Depending on the development Policy category, a development proposal will be required to meet differing levels of energy and water efficiency. Whilst the basic principles of energy and water efficiency can be applied to all development, the means by which it is implemented and monitored may differ.

2.1 Alterations and Additions to a Dwelling

Council has recognized that the densely built-up nature of Ryde's residential area makes it difficult for people undertaking smaller developments to satisfy the full range of energy and water efficiency principles. Therefore minor and major alterations and additions to dwelling houses (i.e. works affecting the existing floor area) will be required to meet the most basic and effective objectives.

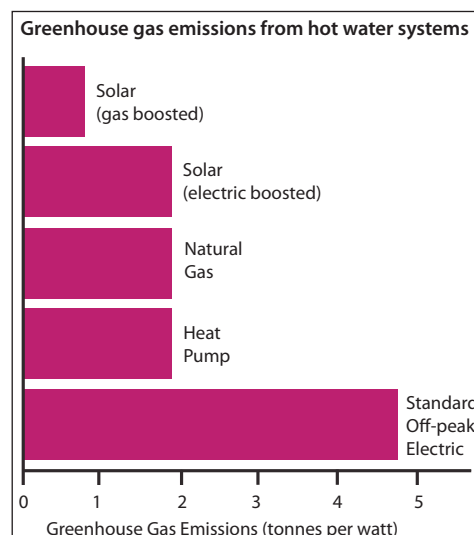
Objectives

1. Maximizing solar access to rooms and areas that are used most (living areas, family rooms and kitchens) through orientating rooms to the north, preferably within a range of 30° east and 20° west of true north.
Note: The 30° east and 20° west range for 'north-facing' elements represents the limits to energy efficient orientation. Any further variance to these angles will have a significant impact on energy consumption or the comfort levels of a dwelling.
2. Managing solar access to additional or replacement windows through the use of either vertical or horizontal shading devices such as pergolas, verandas, blinds or shutters to control the penetration of sunlight.
3. Preserving solar access to north facing windows, solar panels and clothes drying facilities in adjacent residential development.
4. Reducing household consumption of water, electricity and gas.

Controls

- a. Additional or replacement ceiling/roof and walls must be fitted with insulation. Ceiling/roof insulation must be rated R3.0 or equivalent and wall insulation must have an R1.5 or equivalent rating. Insulation of cavity brick walls is not required.
- b. Any hot water system(s) installed as part of a development or as a replacement must consider the most efficient option available to minimise greenhouse gas emissions (see diagram below as a guide).

Note: The Federal Governments Energy Rating website has a comprehensive list of efficient hot water systems rated through the Minimum Energy Performance Standard (MEPS) and is currently working on a rating scheme. The preferred system should be no worse than heat pump. <http://www.energyrating.gov.au>



- c. Water Efficient Fixtures: where new or replacement fittings are required shower heads shall be at least 3 star rated water efficient 4 star dual flush toilets and 4 star taps (for all taps other than bath outlets and garden taps), bathroom and kitchen taps shall be fitted with aerators; and water closets shall have a dual flush cistern.
- d. An external yard space or sheltered well-ventilated space for clothes drying must be provided and be suitably screened from view from any street, public space or adjoining property.
- e. Any products installed as part of a development or as a replacement that are regulated for water efficiency under Water Efficiency Labelling and Standards (WELS) Scheme must obtain a Minimum WELS rating of 4.5 stars. Products that carry a star water label and are regulated under WELS include clothes washing machines and dishwashers. The water star rating as well as date of purchase of the product should be visible on the product at all times. The Federal Governments WELS website has a comprehensive list of efficient appliances based on star ratings. <http://www.waterrating.gov.au>
- f. Wherever practicable, orient the development to reduce the need for artificial lighting by maximizing daylight in habitable areas, whilst minimizing heat and glare. Ways to achieve this includes skylights, atriums or light shafts and adjustable shading.

Information to be Submitted with Application

- Details of insulation on plan information.
- Details and location of hot water system on plan information.
- Details of outdoors clothes drying area on plan information.
- Details of water efficient appliances and water storage.
- BASIX certification from accredited assessor when applicable.

2.2 New Dwelling Houses, Dual occupancy (attached), Multi Dwelling Housing (attached) or Senior Housing Developments Alterations

The requirements of BASIX applies to these developments, see www.basix.nsw.gov.au for more information.

2.3 Residential Flat Buildings (RFBs) including those contained in Mixed RFB/Commercial Developments Residential Conversion of Former Industrial Buildings

Due to the advantage of economies of scale, residential flat buildings and the like can easily maximise the thermal performance, thermal comfort and energy efficiency of all dwellings.

Objectives

1. Maximizing solar access to rooms and areas that are used most (living areas, family rooms and kitchens) through orientating rooms to the north, preferably within a range of 30° east and 20° west of true north.

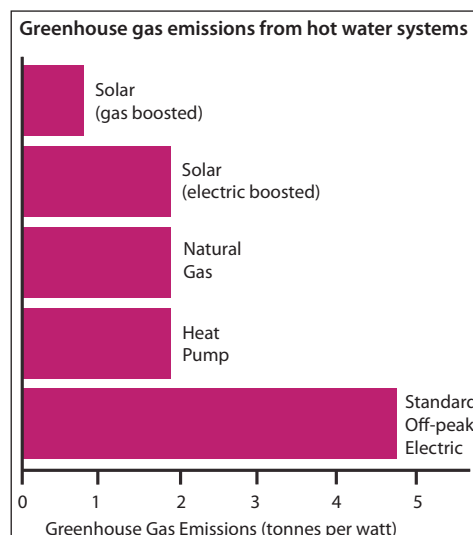
Note: The 30° east and 20° west range for 'north-facing' elements represents the limits to energy efficient orientation. Any further variance to these angles will have a significant impact on energy consumption or comfort levels.
2. Managing solar access to windows through the use of either vertical or horizontal shading devices such as pergolas, verandas, blinds or shutters to control the penetration of sunlight.

3. Preserving solar access to north facing windows, solar panels and clothes drying facilities in adjacent residential development.
4. Reducing household consumption of water, electricity and gas.

Controls

- a. Any hot water system(s) installed as part of a development or as a replacement must consider the most efficient option available to minimise greenhouse gas emissions (see diagram as a guide).

Note: The Federal Governments Energy Rating website has a comprehensive list of efficient hot water systems rated through the Minimum Energy Performance Standard (MEPS) and is currently working on a rating scheme. The preferred system should be no worse than heat pump. <http://www.energyrating.gov.au>



- b. Any products installed as part of a development or as a replacement that are regulated for energy efficiency under the Australian Standards for Products and/or Minimum Energy Performance Standards (MEPS) must achieve a Minimum energy rating of 4.5 stars.

Note: Products that carry an energy star label and are regulated under MEPS include refrigerators, freezers, clothes washers and dryers, dishwashers and air conditioners. The energy star rating as well as date of purchase of the product should be visible on the product at all times. The Federal Governments Energy Rating website has a comprehensive list of efficient appliances based on star ratings. <http://www.energyrating.gov.au>

- c. Ceiling/roof and walls must be fitted with insulation. Ceiling/roof insulation must be rated R3.0 or equivalent and wall insulation must have an R1.5 or equivalent rating. Insulation of cavity brick walls is not required,
- d. Water Efficient Fixtures: where new or replacement fittings are required shower heads shall be at least 3 star rated water efficient 4 star dual flush toilets and 4 star taps (for all taps other than bath outlets and garden taps), bathroom and kitchen taps shall be fitted with aerators; and water closets shall have a dual flush cistern.
- e. An external yard space or sheltered well-ventilated space for clothes drying must be provided and be suitably screened from view from any street, public place or adjoining property.
- f. Any products installed as part of a development or as a replacement that are regulated for water efficiency under Water Efficiency Labelling and Standards (WELS) Scheme must obtain a Minimum WELS rating of 4.5 stars. Products that carry a star water label and are regulated under WELS include clothes washing machines and dishwashers. The water star rating as well as date of purchase of the product should be visible on the product at all times. The Federal Governments WELS website has a comprehensive list of efficient appliances based on star ratings. <http://www.waterrating.gov.au>
- g. Wherever practicable, orient the development to reduce the need for artificial lighting by maximizing daylight in habitable areas, whilst minimizing heat and glare. Ways to achieve this includes skylights, atriums or light shafts and adjustable shading.

Information to be submitted with Application

- Energy Efficiency Performance Report (for proposals with 13 or more units).
- Details and location of hot water system on plan information.
- Details of insulation on plan information.
- Site Analysis (including placement of clothesline).
- BASIX certification from accredited assessor.
- Details of energy and water efficient appliances and water storage.

2.4 New Shops, Industrial and Commercial Premises (including those Contained in a Mixed-use Development).

The need to be resource efficient and environmentally friendly in the running of commercial, retail and industrial properties is increasingly recognised and prioritised, especially since adopting energy 'smart' measures can lead to a decrease in the operating costs of properties.

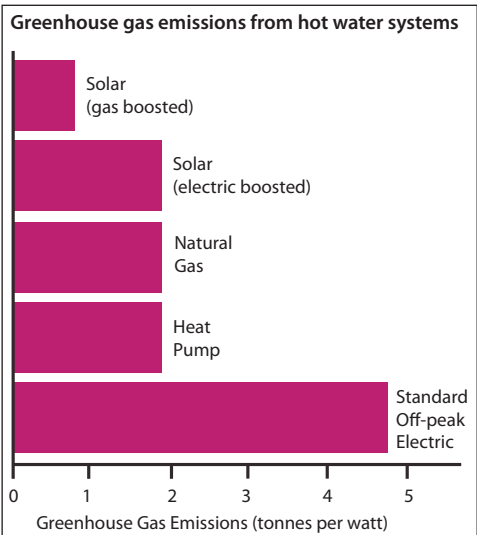
Objectives

1. A base building that incorporates appropriate energy conservation measures.
2. Reducing the consumption of water, electricity and gas for the purposes of lighting, heating and cooling.
3. Substantial reductions in water consumption through the use of water efficient fixtures and water efficient landscaping.

Controls

- a. The total anticipated energy consumption for the base building is no greater than 450 Mega Joules/ annum/ metre square [MJ/am²] (commercial) and 900 Mega Joules/ annum/ metre square [MJ/am²] (retail).
- b. Any hot water system/s installed as part of a development or as a replacement must consider the most efficient option available to minimise greenhouse gas emissions (see diagram below as a guide).

Note: The Federal Governments Energy Rating website has a comprehensive list of efficient hot water systems rated through the Minimum Energy Performance Standard (MEPS) and is currently working on a rating scheme. The preferred system should be no worse than heat pump. <http://www.energyrating.gov.au>



- c. Any products installed as part of a development or as a replacement that are regulated for energy efficiency under the Australian Standards for Products and/or Minimum Energy Performance Standards (MEPS) must achieve a Minimum energy rating of 4.5 stars.

Note: Products that carry an energy star label and are regulated under MEPS include refrigerators, freezers, clothes washers and dryers, dishwashers and air conditioners. The energy star rating as well as date of purchase of the product should be visible on the product at all times. The Federal Governments Energy Rating website has a comprehensive list of efficient appliances based on star ratings. <http://www.energyrating.gov.au>

- d. Water Efficient Fixtures: where new or replacement fittings are required, Shower heads shall be at least 3 star rated water efficient 4 star dual flush toilets, 4 star taps (for all taps other than bath outlets and garden taps) and 3 star urinals, bathroom and kitchen taps shall be fitted with aerators; and water closets shall have a dual flush cistern.
- e. The installation of energy efficient lighting, motion detectors and dimmers where appropriate are encouraged.
- f. Any products installed as part of a development or as a replacement that are regulated for water efficiency under Water Efficiency Labelling and Standards (WELS) Scheme must obtain a Minimum WELS rating of 4.5 stars. Products that carry a star water label and are regulated under WELS include clothes washing machines and dishwashers. The water star rating as well as date of purchase of the product should be visible on the product at all times. The Federal Governments WELS website has a comprehensive list of efficient appliances based on star ratings. <http://www.waterrating.gov.au>

Information to be submitted with Application

- Energy Efficiency Performance Report. This report shall include evidence from a suitably qualified consultant to confirm compliance with the total anticipated energy consumption.
- Details of complying water heater type and location on plan information.
- Site Analysis.
- Details of energy and water efficient appliances.

2.5 New and Major Alterations to Motels, Hotels, Backpacker Accommodation and Boarding Houses

Due to the advantage of economies of scale, larger developments can achieve a greater range of energy 'smart' measures. Careful consideration of simple and sensible objectives and design outcomes at an early stage of a development can create a comfortable environment whilst decreasing the operating costs of a building. (Major alterations is defined as works affecting more than 50% of the existing floor area.)

Objectives

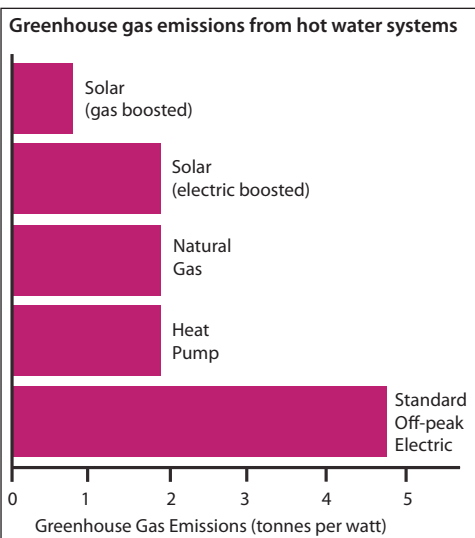
1. Maximizing solar access to rooms and areas that are used most (living areas, family rooms and kitchens) through orientating rooms to the north, preferably within a range of 30° east and 20° west of true north.
 Note: The 30° east and 20° west range for 'north-facing' elements represents the limits to energy efficient orientation. Any further variance to these angles will have a significant impact on energy consumption or comfort levels.
2. Managing solar access to windows through the use of either vertical or horizontal shading devices such as pergolas, verandas, blinds or shutters to control the penetration of sunlight, ensuring optimal access and use of renewable energy sources.
3. Substantial reductions in water consumption through the use of water efficient fixtures and water efficient landscaping.
4. Installation of energy efficient appliances and lighting that minimises green house gas generation.

Controls

- a. Ceiling/roof and walls must be fitted with insulation. Ceiling/roof insulation must be rated R3.0 or equivalent and wall insulation must have an R1.5 or equivalent rating. Insulation of cavity brick walls is not required.

- b. Any hot water system/s installed as part of a development or as a replacement must consider the most efficient option available to minimise greenhouse gas emissions (see diagram below as a guide).

Note: The Federal Governments Energy Rating website has a comprehensive list of efficient hot water systems rated through the Minimum Energy Performance Standard (MEPS) and is currently working on a rating scheme. The preferred system should be no worse than heat pump. <http://www.energyrating.gov.au>



- c. Any products installed as part of a development or as a replacement that are regulated for energy efficiency under the Australian Standards for Products and/or Minimum Energy Performance Standards (MEPS) must achieve a Minimum energy rating of 4.5 stars.

Note: Products that carry an energy star label and are regulated under MEPS include refrigerators, freezers, clothes washers and dryers, dishwashers and air conditioners. The energy star rating as well as date of purchase of the product should be visible on the product at all times. The Federal Governments Energy Rating website has a comprehensive list of efficient appliances based on star ratings. <http://www.energyrating.gov.au>

- d. Water Efficient Fixtures: where new or replacement fittings are required, Shower heads shall be at least 3 star rated water efficient 4 star dual flush toilets, 4 star taps (for all taps other than bath outlets and garden taps) and 3 star urinals, bathroom and kitchen taps shall be fitted with aerators; and water closets shall have a dual flush cistern.
- e. The installation of energy efficient lighting, motion detectors and dimmers where appropriate are encouraged.

Information to be submitted with Application

- Details of insulation on plan information.
- Details of water heater type and location on plan information.
- Site analysis.
- Details of energy and water efficient appliances.

2.6 All Other Developments (School, Hospital, etc)

All other development may include developments such as schools, hospitals and universities. Due to varying nature of such development the range of energy and water efficiency requirements for each of these uses are not listed in this Plan. The development are however required to meet the minimum elements of energy and water efficiency principles.

Objectives

1. Maximizing solar access to rooms and areas that are used most (living areas, family rooms and kitchens) through orientating rooms to the north, preferably within a range of 30° east and 20° west of true north.

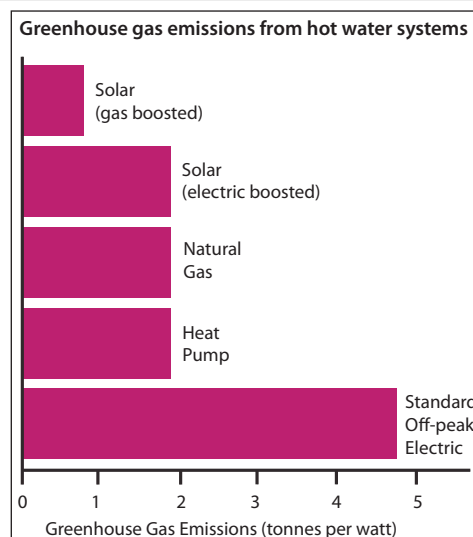
Note: The 30° east and 20° west range for 'north-facing' elements represents the limits to energy efficient orientation. Any further variance to these angles will have a significant impact on energy consumption or comfort levels.

2. Managing solar access to windows through the use of either vertical or horizontal shading devices such as pergolas, verandas, blinds or shutters to control the penetration of sunlight.
3. Preserving solar access to north facing windows, solar panels and clothes drying facilities in adjacent residential development.
4. Reducing the consumption of water, electricity and gas.

Controls

- a. Ceiling/roof and walls must be fitted with insulation. Ceiling/roof insulation must be rated R3.0 or equivalent and wall insulation must have an R1.5 or equivalent rating. Insulation of cavity brick walls is not required.
- b. Any hot water system/s installed as part of a development or as a replacement must consider the most efficient option available to minimise greenhouse gas emissions (see diagram below as a guide).

Note: The Federal Governments Energy Rating website has a comprehensive list of efficient hot water systems rated through the Minimum Energy Performance Standard (MEPS) and is currently working on a rating scheme. The preferred system should be no worse than heat pump. <http://www.energyrating.gov.au>



- c. Any products installed as part of a development or as a replacement that are regulated for energy efficiency under the Australian Standards for Products and/or Minimum Energy Performance Standards (MEPS) must achieve a Minimum energy rating of 4.5 stars.

Note: Products that carry an energy star label and are regulated under MEPS include refrigerators, freezers, clothes washers and dryers, dishwashers and air conditioners. The energy star rating as well as date of purchase of the product should be visible on the product at all times. The Federal Governments Energy Rating website has a comprehensive list of efficient appliances based on star ratings. <http://www.energyrating.gov.au>

- d. Any products installed as part of a development or as a replacement that are regulated for water efficiency under Water Efficiency Labelling and Standards (WELS) Scheme must obtain a Minimum WELS rating of 4.5 stars. Products that carry a star water label and are regulated under WELS include clothes washing machines and dishwashers. The water star rating as well as date of purchase of the product should be visible on the product at all times. The federal governments WELS website has a comprehensive list of efficient appliances based on star ratings. <http://www.waterrating.gov.au>
- e. Wherever practicable, orient the development to reduce the need for artificial lighting by maximizing daylight in habitable areas, whilst minimizing heat and glare. Ways to achieve this includes skylights, atriums or light shafts and adjustable shading.

3.0 THE INFORMATION GUIDE

The information guide provides both an overview of the type of information that is required to be submitted with a development application and a glossary of the terms used in the Plan. Applicants are encouraged to discuss development proposals with Council's staff at an early concept stage prior to lodgement of a development application. This prelodgement meeting will assist in identifying and addressing any matters that may otherwise increase processing time.

3.1 Pre-Application Consultation

Discussions with Council are encouraged at an early stage in the development application process to discuss and agree on the overall design approach before a detailed WSUD or Energy Management Plan is prepared.

The intent is to have the locality analysis available so that parameters can be agreed rather than providing the analysis only at the development application stage, thus saving time and costs associated with revisions and major modifications.

The aim of the consultation process is to provide direction and guidelines to you, the applicant, and to assist you with advice on Council's requirements. The level of consultation required will largely depend on the size and the complexity of the development. In some instances it will be mandatory to lodge a preliminary application with Council for developments of a certain level and/or scale.

3.2 Required Information

Energy Efficiency Performance Report

An Energy Efficiency Performance Report from an accredited consultant is required to demonstrate how the intent of the DCP has been met. Lists of accredited consultants are available from Nabers on www.nabers.com.au.

The report should evaluate the performance of the development in relation to (but not necessary limited to) the following issues:

1. The levels of solar access that have been achieved for north facing windows, solar hot water systems and clothes drying areas;
2. How energy efficiency influences the design in general;
3. Justification of hot water systems selection;
4. Justification of clothes dryer selection;
5. Overshadowing of adjoining properties;
6. Total anticipated energy consumption;
7. Water efficient fixtures;
8. How demand for water and discharge of wastewater will be minimised; and
9. Details of the potential for the treatment and re-use of effluent or stormwater.

Site Analysis

Site analysis involves consideration of a range of environmental factors that will influence the site and the building(s) to be developed on it. These factors may well be both internal and external to the site. The complexity of the site analysis will depend on the size and complexity of the project.

For small alterations and single residential infill projects, a simple annotated plan/ diagram showing key site characteristics including true solar north, and relationships to existing trees, buildings and streets may be all that is necessary. For larger sites a complete analysis including infrastructure will be required.

The following list gives an example of information that may be relevant to a site analysis:

1. Topographical characteristics and the direction of true north;
2. Site context, e.g. adjacent buildings or structures, relationship to the street or road;
3. Placement of clotheslines and drying equipment;
4. Existing causes of overshadowing, e.g. adjacent buildings or trees;
5. Views and any prevailing winds;
6. Shadow diagrams of the overshadowing of any adjacent properties solar hot water system created by the proposed development;
7. The arrangement of new lots, and the footprint of buildings for each lot (for major residential subdivision proposals); and
8. Details of existing natural features including waterways, views, vegetation or other important features on or affecting the site.

3.3 Other Matters for Consideration

The following matters are to be taken into consideration during the preparation of all DA's requiring water and energy efficient factors:

- Roads – consideration of the placement and incorporation of WSUD elements within and around roads, verges and footpaths;
- Safety – public safety and OHS considerations; and
- Maintenance and Monitoring – development of maintenance and monitoring regime for the management of WSUD and energy conservation elements.

3.4 Specialist Advice

- Applicants and developers are required to employ the services of appropriately qualified and experienced practitioners for the development of appropriate water and energy efficient factors, plans and strategies. The benefit of using consultants with demonstrated capacity to fulfil the requirements of this Part will generally reflect a smoother and more straightforward approval and construction process.
- Prior to commencing planning for water and energy efficient factors please contact Council.

3.5 Other Contacts

Duty officer – City of Ryde Customer Service, phone: 299528222.

Schedule 1 - Further Information

Legislation

- State Environmental Planning Policy (Building Sustainability Index: BASIX) 2006

General Sustainable Building Guides

- Your Home Your Future, www.yourhome.gov.au
- Mendler, S. and Odell, W. 2000 *The HOK Guidelines to Sustainable Design*. John Wiley & Sons.
- Mobbs, M. 1998 *Sustainable House – Living for Our Future*. Choice Books.

Sustainable Building Materials and Products

- Gertsakis, J (ed) 1999. *Ecospecifier – A guide to Sourcing Environmentally Preferable Materials*. A comprehensive database on sustainable building materials developed by Centre for Design at RMIT and Society for Responsible Design. See the website for a more up to date list <http://ecospecifier.rmit.edu.au>.
- *Builder Database on PVC Alternatives*. Greenpeace has launched a new international database that helps builders choose environmentally friendly alternatives to PVC products. The PVC Alternatives Database features more than 200 products from companies based in 17 countries that avoid the use of polyvinyl chlorides (PVCs), which have been linked to a range of health problems: <http://archive.greenpeace.org/toxics/pvcdatabase/>
- Environment Australia. 2001 *Shop Smart Buy Green – A consumer's guide to saving money and reducing environmental impacts*. Provides guidelines on how to make the environmental based purchasing decisions. Available at Council.
- NSW Waste Boards. *The Buy Recycled Guide*. 2nd Edition. Includes construction and building materials, household and industrial products and office supplies.

Energy

- Energy Star, www.energystar.gov.au – provides a comprehensive description of energy star, and how to activate energy star on computers.
- Energy ratings, www.energyrating.gov.au – includes a list of appliances, their star ratings and energy consumption.
- Live Energy Smart, www.energysmart.com.au
- Green Power, www.greenpower.com.au
- Hollo, N. *Warm House, Cool House*. Choice Publications
- Energy Smart Information Centre is available at www.energysmart.com.au

THIS PAGE HAS BEEN
INTENTIONALLY LEFT BLANK



City of Ryde
Civic Centre
1 Devlin Street
Ryde NSW 2112

www.ryde.nsw.gov.au

City of Ryde Development Control Plan 2014

Part: 7.2 Waste Minimisation and Management

Translation

ENGLISH

If you do not understand this document please come to Ryde Civic Centre, 1 Devlin Street, Ryde Monday to Friday 8.30am to 4.30pm or telephone the Telephone and Interpreting Service on 131 450 and ask an interpreter to contact the City of Ryde for you on 9952 8222.

ARABIC

إننا نعتذر عليك فهم محتويات هذه الوثيقة، نرجو للحضور إلى مركز بلدية رايد Ryde Civic Centre على العنوان: 1 Devlin Street, Ryde من الاثنين إلى الجمعة بين الساعة 8.30 صباحاً والساعة 4.30 بعد الظهر أو الاتصال بمكتب خدمات الترجمة على الرقم 131 450 لكي تطلب من أحد المترجمين الاتصال بمجلس مدينة رايد، على الرقم 9952 8222، نيابة عنك.

ARMENIAN

Եթէ այս գրութիւնը չէք հասկնար, խնդրեմ եկէ՛ք Րայդ Բիւրոյ Սիւվիլ Ենթոյր, 1 Տելվին փողոց, Րայդ, (Ryde Civic Centre, 1 Devlin Street, Ryde) Երկուշաբթիէն Ուրբաթ կ.ա. ժամը 8.30 – կ.ե. ժամը 4.30, կամ հեռաձայնեցէ՛ք Հեռաձայնի եւ Թարգմանութեան Սպասարկութեան՝ 131 450, եւ խնդրեցէ՛ք որ թարգմանիչ մը Րայդ Քաղաքապետարանին հետ կապ հաստատուէ ձեզի համար, հեռաձայնելով՝ 9952 8222 թիւին:

CHINESE

如果您看不懂本文，請在周一至周五上午 8 時 30 分至下午 4 時 30 分前往 Ryde 市政中心詢問 (Ryde Civic Centre, 地址: 1 Devlin Street, Ryde)。你也可以打電話至電話傳譯服務中心，電話號碼是: 131 450。接通後你可以要求一位傳譯員為你打如下電話和 Ryde 市政廳聯繫，電話是: 9952 8222。

FARSI

اگر این مدرک را نمی فهمید لطفاً از 8.30 صبح تا 4.30 بعد از ظهر دوشنبه تا جمعه به مرکز شهرداری رايد، Ryde Civic Centre, 1 Devlin Street, Ryde مراجعه کنید یا به سرویس مترجم تلفنی، شماره 131 450 تلفن بزنید و از یک مترجم بخواهید که از طرف شما با شهرداری رايد شماره 9952 8222 تلفن بزند.

ITALIAN

Se non capite il presente documento, siete pregati di rivolgervi al Ryde Civic Centre al n. 1 di Devlin Street, Ryde, dalle 8.30 alle 16.30, dal lunedì al venerdì; oppure potete chiamare il Telephone Translating and Interpreting Service al 131 450 e chiedere all'interprete di contattare a vostro nome il Municipio di Ryde presso il 9952 8222.

KOREAN

이 문서가 무슨 의미인지 모르실 경우에는 1 Devlin Street, Ryde 에 있는 Ryde Civic Centre 로 오시거나 (월 – 금, 오전 8:30 – 오후 4:30), 전화 131 450 번으로 전화 통역 서비스에 연락하셔서 통역사에게 여러분 대신 Ryde 시청에 전화 9952 8222 번으로 연락을 부탁하십시오.

Amend. No.	Date approved	Effective date	Subject of amendment

Table of Contents

1.0	INTRODUCTION	5
1.1	Site Waste Minimisation and Management	5
1.2	Development covered by this Part	5
1.3	Purpose	5
1.4	Objectives of this Part	6
1.5	Relationship of this Part to other Plans	6
1.6	Interpretation	7
1.7	Application Requirements	7
2.0	DEVELOPMENT CONTROLS	8
2.1	Introduction	8
2.2	Aims and Objectives for All Developments	8
2.3	All developments	8
2.4	Demolition and Construction	10
2.5	Residential Developments comprising 1 or 2 Dwellings	11
2.6	Multi Dwelling Housing developments (3 or more dwellings) and Residential Flat Buildings (up to 3 storeys)	11
2.7	Residential Flat Buildings of 4 storeys or more	13
2.8	Commercial and Retail	14
2.9	Mixed Use Developments	16
2.10	Industrial	16
SCHEDULES		18
Schedule 1	INDICATIVE BIN SIZES AND DIMENSIONS	18
Schedule 2	STANDARD WASTE AND RECYCLING BINS FOR RESIDENTIAL DEVELOPMENTS	19
Schedule 3	COMMERCIAL WASTE / RECYCLING GENERATION RATES	20
Schedule 4	DESIGN REQUIREMENTS	21

THIS PAGE HAS BEEN
INTENTIONALLY LEFT BLANK

1.0 INTRODUCTION

1.1 Site Waste Minimisation and Management

Waste and resource consumption is a major environmental issue and a priority for all levels of government within Australia. This is particularly the case as landfill sites become scarce and the environmental and economic costs of waste generation and disposal rise.

Sustainable resource management and waste minimisation has emerged as a priority action area and a key in the quest for Ecologically Sustainable Development (ESD). Critical actions in this regard include the following:

- avoiding unnecessary resource consumption
- recovering resources for reuse
- recovering resources for recycling or reprocessing
- disposing of residual waste.

The building and construction industry in particular is a major contributor to waste, much of which is still deposited to landfill. The implementation of effective waste minimisation strategies has the potential to significantly reduce these volumes.

Effective waste planning and management can also benefit the builder/developer. Some of the benefits of good waste planning and management include:

- reduced costs
- improved workplace safety
- enhanced public image
- compliance with legislation such as the Protection of the Environment Operation Act 1997 that requires waste to only be transported to a place that can lawfully accept it.

1.2 Development covered by this Part

This Part applies to all development that generates waste including:

- Demolition, earthworks and engineering works;
- Construction of buildings and structures (including alterations and additions);
- Use of premises and change in use in all residential development types, commercial, industrial and mixed developments.

1.3 Purpose

This Part aims to facilitate sustainable resource management and waste minimisation within the City of Ryde Local Government Area in a manner consistent with the principles of Ecologically Sustainable Development (ESD). In this regard, this Part encourages an increase in avoidance, reuse and recycling of waste and a consequential reduction in the demand for waste disposal from construction, demolition and ongoing development activities.

The criteria for the location and design of waste minimisation and management facilities within residential, commercial, retail, mixed and industrial developments are outlined in this Part. Best practice approaches to waste minimisation and management during building demolition and construction phases are also included in this Part.

This Part provides advice to intending applicants on:

- Matters to be considered when assessing the waste implications of development applications made under the *Environmental Planning and Assessment Act*;
- How to reduce and handle waste during the demolition and construction phase;
- How to provide for ongoing waste minimisation and management for particular types of development, including how to design and site waste storage areas and facilities.

1.4 Objectives of this Part

Objectives

The objectives of this part in pursuit of sustainable waste management are:

Waste minimisation:

1. To minimise resource requirements and construction waste through reuse and recycling and the efficient selection and use of resources.
2. To minimise demolition waste by promoting adaptability in building design and focussing upon end of life deconstruction.
3. To encourage building designs, construction and demolition techniques which minimise waste generation.
4. To maximise reuse and recycling of household waste and industrial/commercial waste.
5. To assist in achieving Federal and State Government waste minimisation targets in accordance with regional waste plans.
6. To minimise the overall environmental impacts of waste and foster the principles of ecologically sustainable development (ESD).

Waste management:

1. To assist applicants in planning for sustainable waste management, through the preparation of a site waste minimisation and management plan.
2. To assist applicants to develop systems for waste management that ensure waste is transported and disposed of in a lawful manner.
3. To require source separation, design and location standards which complement waste collection and management services offered by the relevant service providers.
4. To provide guidance in regards to space, storage, amenity and management of waste management facilities.
5. To ensure waste management systems are easy to use and access.
6. To minimise risks associated with waste management at all stages of development.

1.5 Relationship of this Part to other Plans

This Part has been prepared to meet the objectives of legislation including:

- *Environmental Planning and Assessment Act* 1979
- Waste Avoidance and Resource Recovery Act 2001
- Protection of the Environment Operations Act 1997

This Part is to be read in conjunction with *City of Ryde Local Environmental Plan 2014*, and City of Ryde Development Control Plan 2014, and any other relevant Council Policy. If there is an inconsistency between the requirements of this part and other parts of the City of Ryde DCP, Codes or Policies, this Part shall prevail.

Note: Where the proposed development involves the need to place a waste storage container (e.g. a skip) in a public place then a separate application needs to be made under Section 68 of the Local Government Act 1993. (Refer also Part 8.1 Construction Activities.)

1.6 Interpretation

In this Part, terms have the same meaning as in the *Environmental Planning and Assessment Act 1979* (as amended) and the Ryde LEP 2014.

A number of other terms related to waste minimisation and management techniques and storage facilities are used in this Part. The definitions for these terms are included in Part 10 Dictionary.

1.7 Application Requirements

All applications for development to which this Part applies must be accompanied by a Site Waste Minimisation and Management Plan (SWMMP).

Demonstration of compliance with the controls in this Part is required in the SWMMP, and the plans submitted with the development application. Application forms and information packages are available on Council's website at: www.ryde.nsw.gov.au and from Council's Customer Service Centre.

Further information to assist in the preparation of SWMMPs can be obtained via the NSW Office of Environment and Heritage (OEH), formerly known as The Department of Environment, Climate Change and Water, at www.environment.nsw.gov.au.

2.0 DEVELOPMENT CONTROLS

2.1 Introduction

This section contains matters for consideration in planning for waste minimisation and management with respect to all developments. Also provided are specific controls for demolition and construction activity and for the establishment and ongoing use of a range of development types such as residential, mixed use, commercial, retail and industrial types.

2.2 Aims and Objectives for All Developments

Objectives

1. To ensure new developments and changes to existing developments are designed to maximise resource recovery (through waste avoidance, source separation and recycling).
2. To encourage source separation of waste, reuse, and recycling by ensuring appropriate storage and collection facilities for waste, and quality design of waste facilities.
3. To encourage techniques in demolition and construction which minimise waste generation, and which maximise the reuse and recycling of materials.
4. To ensure appropriate, well-designed waste storage and collection facilities are provided and are accessible to occupants and service providers.
5. To ensure that wastes are handled and stored appropriately in order to minimise risk to health and safety associated with handling and disposal of waste and recycled material, and ensure optimum hygiene.
6. To minimise adverse environmental and amenity impacts associated with waste management (including odour from waste and noise from collection activity).
7. To discourage illegal dumping by providing on-site storage for waste awaiting collection by removal services.
8. To ensure waste and recycling storage areas and handling systems for residential properties are designed to meet minimum requirements for Council's domestic waste collection services.

2.3 All developments

The following controls apply to all developments.

Controls

General

- a. Developments must provide space on-site for the sorting and storage of waste in containers suitable for collection.
- b. The size of storage areas and number of storage containers required must be sufficient to handle and store the waste likely to be generated and stored on the premises between collections. The space is to be calculated using information in **Schedule 1 Indicative Bins Sizes, Schedule 2 Standard Waste and Recycling Bins for Residential Developments** and **Schedule 3 Commercial Waste/ Recycling Generation Rates** attached to this Part. The type and requirements of storage spaces may differ depending on development or land use type (refer Sections 2.4, 2.5, 2.6, 2.7, 2.8 and 2.9 in this Part.)

- c. Additional space must be provided for the storage of bulky wastes where appropriate.
- d. Allowance must be made for the storage of green waste where relevant.
- e. All waste containers must be stored within the boundaries of the site unless otherwise approved by Council under Section 68 of the **Local Government Act 1993**.
- f. All applications for development, including demolition, construction and the ongoing use of a site/premises, must be accompanied by:
 - i. a Site Waste Minimisation and Management Plan (SWMMP);
 - ii. location and design details of waste storage facilities on the site.

Relevant details of waste storage, waste facility design and access thereto proposed as part of the development must be clearly illustrated on the plans of the proposed development accompanying the development application. Details of waste storage rooms/areas should include floor plan, elevations and cross section drawings of the room, and details on materials and finishes. Drawings are to be submitted to scale clearly indicating the location of and provision for the storage and collection of waste and recyclables during:

- demolition
 - construction
 - ongoing operation.
- g. In all development, waste and recycling storage areas and facilities should be provided and be located in positions that:
 - i. provide easy, direct and convenient access for the users of the facility;
 - ii. permit easy transfer of bins to the collection point if relocation of bins is required;
 - iii. permit easy, direct and convenient access for collection service providers;
 - iv. do not intrude on car parking, landscaping, access and turning areas required for the type and scale of development;
 - v. do not reduce amenity (minimises the potential for noise, odour and other amenity and environmental impacts on residents and other occupants);
 - vi. maximize protection of trees and significant vegetation.
 - h. In cases where the waste storage areas and facilities are likely to be visible from the street, the design and location of waste storage areas/facilities should be such that they compliment the design of both the development and the surrounding streetscape. Design elements such as fencing, landscaping and roof treatments may be used.
 - i. No incineration devices are permitted.
 - j. A collection point for waste collection is to be identified on the plans submitted with the development application. The collection point must be conveniently located for users and services purposes and sited so that waste collection vehicles do not impede the access to the site or car parking facilities when servicing the bins so that waste can be safely and easily collected.
 - k. The path for wheeling bins between the waste and recycling storage room/area and the vehicle collection point must be free of steps and kerbs and, in the case of residential development, of a gradient of less than 14:1, and for all other development types, of a grade to the satisfaction of Council. The waste storage area must be as close as practicable to the collection point.
 - l. Access driveways and service areas for waste collection vehicles must be designed in accordance with Australian Standard AS 2890.2-2002 **Parking Facilities – Part 2: Off-street commercial vehicle facilities**.
 - m. All waste facilities must comply with the **Building Code of Australia** (BCA) and all relevant Australian Standards (AS).

- n. Heritage conservation considerations may alter requirements of this Part in the refurbishment of existing buildings. Designs should be discussed with Council's Heritage Advisor.
- o. Any equipment, such as volume reducing equipment, will be required to be installed in accordance with the manufacturer's instructions.
- p. Where commercial food preparation is carried out on the premises, the waste storage area is to be designed with a cover to exclude rainwater and a floor to be graded and drained to the sewerage system. The area is to be readily accessible for servicing and suitably screened from public view.

2.4 Demolition and Construction

Demolition and Earthworks

The demolition stage provides great scope for waste minimisation. Proponents are actively encouraged to consider possible adaptive reuse opportunities of existing buildings/structures, reuse of materials or parts thereof, and the destination of any excavated material.

Adaptive reuse opportunities should be achieved through planned work staging, use of the process of deconstruction where materials are carefully dismantled, sorted and stored separately on-site to allow for re-use of solid waste either on-site or off-site.

Construction

The objective of waste management at the construction stage is to minimize waste through utilising techniques such as the purchasing policy (ordering correct quantities of materials), use of prefabricated components, re-use of materials, use of recycled materials, co-ordination and sequencing of various trades and minimisation of excavation works.

A 'Rule of Thumb' for renovations and home building is that construction waste constitutes:

- Timber 5-7% of material ordered
- Plasterboard 5-20% of material ordered
- Concrete 3-5% of material ordered
- Bricks 5-10% of material ordered
- Tiles 2-5% of material ordered

Source: *Waste Planning Guide for Development Application*, Inner Sydney Waste Board, 1998

Where source separation is utilized, materials are to be kept uncontaminated to guarantee the highest possible re-use value.

Controls

In addition to the controls applying to all development (section 2.3) the following apply:

- a. Demolition activity must comply with relevant Australian Standards and WorkCover requirements.
- b. Demolition is to be carried out using the process of deconstruction where materials are carefully dismantled and sorted. A Demolition Work Plan is required to be submitted.
- c. A dedicated area is to be allocated on-site for the stockpile of materials for reuse, recycling or disposal and for site waste bins (for surplus and unwanted materials). The siting is to take into account environmental factors including slope, drainage, location of watercourses proximity to native vegetation and amenity impacts (including impacts of emissions from the waste, noise from collection activity) on occupants of neighbouring properties.

- d. Construction materials are to be stored away from the waste materials stored on-site for collection to enable easy access for waste collectors.

Note: The State Government's waste requirements requires on site retention of demolition and construction waste dockets to confirm which facility received the material for recycling or disposal. Inspections of these dockets may be required by authorised persons.

Note: The handling and disposal of materials containing asbestos is an issue in the City of Ryde and Council actively encourages the proper handling and disposal in accordance with relevant requirements including Australian Standards for removal of asbestos, WorkCover NSW and NSW Office of Environment and Heritage.

2.5 Residential Developments comprising 1 or 2 Dwellings

This section applies to low-rise residential developments of 1 or 2 dwellings only, including single dwellings, dual occupancy development, secondary dwellings, semi-detached dwellings. This section may also be applied to boarding houses (Class 1(b)).

The design of the waste and recyclables storage areas within the home and property affect the ease of use, amenity, the movement and handling of waste for the life of the development.

Composting areas are encouraged to be considered in the design of these types of residential developments.

Controls

In addition to the controls applying to all development (section 2.3) the following apply:

- a. Space must be provided inside each dwelling for receptacles to store garbage and recycling material. The area is to have the capacity to store two day's worth of materials.
- b. Space must be provided outside the dwelling/s to store the minimum number of Council's garbage, recycling and green waste bins required to meet Council's standard collection services applicable to the development. The space provided should be screened from the street with easy access for the householder to wheel the bins to the kerbside for servicing. Indicative dimensions of bins and numbers of bins are provided in Schedule 1 Indicative Bin Sizes and Dimensions and Schedule 2 Standard Waste and Recycling Bins for Residential Developments attached to this Part.

2.6 Multi Dwelling Housing developments (3 or more dwellings) and Residential Flat Buildings (up to 3 storeys)

This section applies to low rise and low-medium scale residential developments including:

- Multi Dwelling Housing development (3 or more dwellings) including villas and townhouses;
- Residential Flat Buildings up to 3 storeys in height (no lift access)

This section may also be applied to residential components of mixed developments including hotels, motels, serviced units, boarding houses (Class 1(b)), and backpacker accommodation.

The types of developments covered in this section may provide for individual or communal bin storage depending on considerations relating to the development site and its context. Factors determining this choice are contained in the controls.

Multiple households within the property increase challenges with regard to waste volumes, ease of access and operation of waste sorting and removal systems. Resources such as the Better Practice Guide for Waste Management in Multi-Unit Dwellings should be used to inform design of these multi-unit dwellings.

Composting areas are encouraged to be considered in the design of these types of residential developments.

Controls

In addition to the controls applying to all development (section 2.3) the following apply:

All developments

- a. Space must be provided inside each dwelling for receptacles to store garbage and recycling material. The area is to have the capacity to store two day's worth of materials.

Individual Bin Storage – smaller scale developments

- b. Multi-unit housing developments (including villas and townhouses, etc) with up to 6 dwellings, may provide individual bin storage provided that:
 - i. space is provided in each courtyard area for storing Council's garbage, recycling and green waste bins (refer **Schedule 1 Indicative Bin Sizes and Dimensions** and **Schedule 2 Standard Waste and Recycling Bins for Residential Developments** for space requirements);
 - ii. paved access is provided to the courtyard area from outside the building to enable the householder to wheel the bins to the kerbside for servicing;
 - iii. the maximum carting grade does not exceed 14:1 (i.e. not too steep for individuals to cart the bins to the street frontage);
 - iv. the maximum carting distance does not exceed 75 metres, or 50 metres for developments designed for aged or disabled people (i.e. not too far for individuals to move bins to the street frontage); and
 - v. the total number of bins awaiting collection will fit comfortably on the street frontage without encroaching adjoining street frontages, or detrimentally affecting residential amenity or road safety.

Communal Bin Storage – larger scale developments

- c. Multi Dwelling Housing developments that do not meet the requirements for individual bin storage, and Residential Flat Developments of up to 3 storeys, must have communal bin storage areas designed and constructed in accordance with **Schedule 4: S4.1. Residential Bin Storage Areas**.
- d. Communal bin storage areas are to be located so as they can be screened from the street and in a position which is convenient for users and waste collection staff.

Note: On difficult or steep sites or sites with particular natural features (such as watercourses) or with two street frontages it may be appropriate to have a number of waste storage and recycling areas to minimise distances, prevent site pollution and facilitate collection.

- e. To facilitate servicing by waste collection staff, communal bin storage areas must not be more than 15 metres from the street kerb.

Note: Council does not provide a drive-in on-site collection service, however Council provides a runner service to take bins from bin storage areas to the kerbside for collection by the collection vehicle where the bin storage area is no more than 15 metres from the kerbside.

- f. For developments where bulk bins are provided for waste (i.e. 660/1100 litre skip bins) the bulk bins should be contained within waste and recycling storage rooms designed and constructed in accordance with the requirements of **Schedule 4** (refer **S4.2 Waste and Recycling Storage Rooms**).
- g. For developments comprising 30 or more dwellings, a separate room or undercover caged area of a minimum 5 square metres, with instructive signage must be provided for the storage of bulky discarded items such as furniture and white goods, awaiting Council pickup, to prevent illegal dumping in the public domain. Bulky items storage areas should be located adjacent to waste storage areas.
- h. Where collection vehicles are required to drive into a property to collect waste and recycling, adequate access must be provided for the users, waste collection staff and collection vehicles, and:
 - i. the site must be designed to allow collection vehicles to enter and exit the property in a forward direction with minimal need for reversing and to be operated with adequate clearances; and
 - ii. the access and manoeuvring space are to be suitable for the collection vehicle in terms of pavement strength, spatial design, access width and clearances. *Appendix C Collection Vehicles* and *Appendix D Vehicle access/Turning Circles* under the *Better Practice Guide for Waste Management in Multi-Unit Dwellings*, DECC 2008 are to be used as a guide.

2.7 Residential Flat Buildings of 4 storeys or more

This section applies to residential flat buildings. These developments have differing requirements to residential developments covered in the previous section in particular as the developments usually have a greater number of dwellings and are four or more storeys in height providing lift service. Elements of this development type are also relevant to the residential component of hotels and serviced apartments.

This section may also be applied to residential components of mixed development including hotels, motels, serviced units, boarding houses (Class 3), and backpacker accommodation.

The design of the waste storage and handling facilities affects the ease with which they are used and the amenity of the development and the adjoining premises. Considerations in high-rise development include the opportunity to transfer waste from each and every dwelling on each and every floor.

Controls

In addition to the controls applying to all development (section 2.3) the following apply:

- a. Space must be provided inside each dwelling for a receptacle to store garbage and recycling material – the area is to have the capacity to store two day's worth of garbage and recyclables.
- b. A waste and recycling storage room (or rooms) must be provided for the storage of garbage, recyclable and green wastes, with a capacity to easily store the number of bins required to meet Council's standard collection services applicable to the development. The space is to be calculated using the **Schedule 1 Indicative Bins Sizes** and **Schedule 2 Standard Waste and Recycling Bins for Residential Developments** attached to this Part.
- c. All waste and recycling storage rooms must be designed and constructed in accordance with **Schedule 4: S4.2 Waste and Recycling Storage Rooms**.

- d. Consideration must be given to the convenient transportation of waste and recycling from the various floors to the central waste and recycling storage room/area. Such transportation system may include a passenger or goods lifts, or a garbage chute system.
- e. Where garbage chutes are proposed, service rooms/compartments for accessing the garbage chutes must be provided on each residential floor. All garbage chutes and service rooms/compartments must be designed and constructed in accordance with **Schedule 4: S4.3 Garbage Chutes** and **S4.4. Service Rooms (or Compartments)**.
- f. For developments comprising 30 or more dwellings, a separate room or undercover caged area of a minimum 5 square metres, with instructive signage must be provided for the storage of bulky discarded items such as furniture and white goods, awaiting Council pickup, to prevent illegal dumping in the public domain. Bulky items storage areas should be located adjacent to waste storage areas.
- g. Waste storage areas are to be designed to accommodate waste receptacles which can be managed by all types of domestic waste collection vehicles.
- h. Adequate access must be provided for the users, waste collection staff and collection vehicles. Where collection vehicles are required to drive into a property to collect waste and recycling:
 - i. the site must be designed to allow collection vehicles to enter and exit the property in a forward direction with minimal need for reversing and to be operated with adequate clearances; and
 - ii. The driveway and basement manoeuvring space are to be suitable for the collection vehicle in terms of pavement strength, spatial design, access width and clearances. *Appendix C Collection Vehicles* and *Appendix D Vehicle access/Turning Circles* under the *Better Practice Guide for Waste Management in Multi-Unit Dwellings*, DECC 2008 are to be used as a guide.

2.8 Commercial and Retail

Commercial developments include offices, shops, health care buildings, schools, child care centres, assembly buildings, entertainment and sporting venues.

The range of non-residential uses present an array of unique waste minimisation opportunities and management requirements. Flexibility in size and layout is often required to cater for the different needs of multiple tenants as well as future changes in use.

This section applies to:

- Hotels, motels, schools, child care centres, large boarding houses, class 3 buildings.
- Office premises, retail premises, shops, food and drink premises, class 5 & 6 buildings.
- Health care (e.g. public and private hospitals, nursing homes, class 9(a) buildings).
- Assembly buildings, theatres, cinemas, class 9(b) buildings.
- Entertainment and sporting facilities/events.

The garbage and recycling systems installed in commercial developments will vary according the types and quantities of waste and recyclables generated. **Schedule 1 Commercial Waste/ Recycling Generation Rates** provides some indicative commercial waste generation rates.

Controls

In addition to the controls applying to all development (section 2.3) the following apply:

- a. All commercial premises must have a dedicated waste and recycling storage room or area, which has adequate storage space to meet the needs of the land use activity. Indicative waste generation rates for various commercial developments are listed in **Schedule 3 Commercial Waste/Recycling Generation Rates** attached to this Part.

Note: Depending upon the size and type of the development, it may be necessary to include a separate waste/recycling storage room/area for each tenancy.

- b. All waste and recycling storage rooms and areas must be designed and constructed in accordance with the requirements of **Schedule 4** (refer **S4.2 Waste and Recycling Storage Rooms** and **S4.5. External Waste and Recycling Storage Areas**).
- c. The waste and recycling storage room or area must provide separate containers for the separation of recyclable materials from general waste. Standard and consistent signage on how to use the waste management facilities should be clearly displayed.
- d. Space must be provided in each occupancy for the temporary storage of garbage and recyclables generated in that area.
- e. Hazardous and special waste is to be stored in accordance with relevant occupational, health and safety and environmental protection legislation.
- f. In multi storey developments, consideration must be given to the convenient transportation of waste and recycling from the various floors to the central storage area. Such transportation system may include a passenger or goods lifts, or a garbage chute system.
- g. Separate space must be allocated for the storage of liquid wastes and oils etc. The liquid waste storage areas must be undercover and bunded to prevent the escape of spills or leaks.
- h. Space must be provided for the installation of grease traps or other wastewater pre-treatment equipment required by Sydney Water Corporation. Grease traps must be installed outside the building or in a dedicated grease trap room. Grease traps must not be accessed through food handling and storage areas.
- i. In premises where more than 50 litres of seafood, poultry or meat waste per day is generated, the waste must be stored in a refrigerated waste room until collected or have that waste collected daily.
- j. Space is to be provided for compactors and for any other equipment necessary to manage the waste and recycling likely to be generated on the premises. Sufficient space is also required for storage of the waste (such as cardboard boxes) prior to processing.
- k. Sufficient space in the development must be allocated to store bulky items such as used pallets and crates to prevent illegal dumping in the public domain.
- l. Adequate access must be provided for the users, waste collection staff and collection vehicles. Where collection vehicles are required to drive into a property to collect waste and recycling:
 - i. The site must be designed to allow collection vehicles to enter and exit the property in a forward direction with minimal need for reversing and to be operated with adequate clearances; and
 - ii. The driveway and any basement space needed are to be suitable for collection vehicles in terms of pavement strength, spatial design, access width, and height clearances. **Appendix C Collection Vehicles** and **Appendix D Vehicle access/Turning Circles under the Better Practice Guide for Waste Management in Multi-Unit Dwellings**, DECC 2008 are to be used as a guide.

2.9 Mixed Use Developments

Where two or more (e.g. residential and commercial) land uses occur within the one building or in the same development, waste management will necessitate variable demands are balanced, including that potential impacts of commercial operations on residential amenity are considered. These controls may apply to mixed use comprising:

- Office premises, retail premises, shops, food and drink premises, class 5 & 6 buildings
- Hotels, motels, schools, child care centres, large boarding houses, class 3 buildings.

Mixed use can vary in size from small shop top housing developments (two storey) to multi-storey complexes containing a mix of commercial, retail and residential developments. Better practice waste management in mixed use developments requires the complete separation of the residential from the commercial and retail waste storage areas and handling facilities.

Controls

In addition to the controls applying to all development (Section 2.3) the following apply:

- a. Waste and recycling storage, handling and collection system/s for the residential area/s of the building or development are to be provided separate from the waste and recycling storage, handling and collection systems for the commercial area/s
- b. The residential and commercial/retail waste management systems are to be designed so that they can efficiently operate without conflict between these systems within the proposed development and with the surrounding land uses.
- c. The residential and commercial/retail waste management systems must be in locations which are easily accessible to their respective users and waste collection staff.
- d. The residential and commercial/retail waste management systems, including access thereto, are to be designed to comply with the relevant requirements for those developments under this Part.
- e. Measures must be taken to ensure that noise from the operation of the commercial waste storage and handling system does not impact on residents. In this regard it should be noted that commercial activities most commonly require the daily collection of waste, which can contribute to noise impacts. Consideration must be given to appropriate siting of the waste commercial compaction equipment and waste collection area/a, and appropriate measures to mitigate potential daily noise impacts.
- f. Commercial tenants in a mixed development must be actively discouraged from using the residential waste facilities (e.g. via signage and through the use of separate keys and locking systems).
- g. Details about the separate storage areas, handling areas and collection points for the commercial and residential waste streams must be clearly identified in the site waste minimization and management plan, and in the plans submitted with the development application.

2.10 Industrial

Industrial developments typically produce a diverse range of waste products. Some of these waste products may be hazardous and require compliance with established laws and protocols that are additional to this Part. Other waste products are similar in nature to commercial and domestic waste streams. Mixing waste products limits potential reuse and recycling opportunities and may distribute toxic material through a larger volume of wastes.

Waste and recycling storage areas may be internal (rooms) or external (areas).

Controls

In addition to the controls applying to all development (Section 2.3) the following apply:

- a. All industrial developments must include a designated general waste and recycling storage area (either an external area, or an internal room or a combination of both) which has adequate storage space to meet the needs of the activity in terms of expected nature of the waste (type of waste stream) and expected volumes.
- b. Waste and recycling storage rooms and areas are to be capable of providing space sufficient for the opportunity for waste to be separated into at least 4 streams: paper/cardboard, recyclables, general waste, industrial process type waste.
- c. Hazardous and special waste is to be stored in accordance with relevant occupational, health and safety and environmental protection legislation.
- d. In premises where more than 50 litres of seafood, poultry or meat waste per day is generated, the waste must be stored in a refrigerated waste room until collected or have that waste collected daily.
- e. Waste and recycling storage rooms are to be designed and constructed in accordance with **Schedule 4: S4.2 Waste and Recycling Storage Rooms**.
- f. External waste and recycling storage areas must be designed and constructed in accordance with **Schedule 4: S4.5. External Waste and Recycling Storage Areas**.
- g. For multi-use industrial premises and industrial unit complexes, a waste storage and recycling area is to be provided per unit or in a communal space, which is designed to allow a range of uses. Space must be also provided in each occupancy for the temporary storage of wastes and recyclables generated in that area.
- h. Space is to be provided for compactors and for any other equipment necessary to manage the waste and recycling likely to be generated on the premises. Sufficient space is also required for storage of the waste (such as cardboard boxes) prior to processing.
- i. Space must be provided for the installation of grease traps or other wastewater pre-treatment equipment if required by Sydney Water Corporation. Grease traps must be installed outside the building or in a dedicated grease trap room. Grease traps must not be accessed through food handling and storage areas.
- j. Sufficient space in the development must be allocated to store bulky items such as used pallets and crates to prevent illegal dumping in the public domain.
- k. Separate space must be allocated for the storage of liquid wastes and oils etc. The liquid waste storage areas must be undercover and bunded to prevent the escape of spills or leaks.
- l. Where possible, access must be provided for waste collection vehicles to stand on the premises when collecting wastes, and leave the site in a forward direction.
- m. On industrial properties in close proximity to residential development, care must be taken in design and siting of the waste and recycling storage rooms/areas to ensure that amenity (such as odour from storage, noise impacts from collection activities) are kept to a minimum.
- n. Adequate access must be provided for the users, waste collection staff and collection vehicles. Where collection vehicles are required to drive into a property to collect waste and recycling
 - i. The site must be designed to allow collection vehicles to enter and exit the property in a forward direction with minimal need for reversing and to be operated with adequate clearances; and
 - ii. The driveway and any basement space needed are to be suitable for collection vehicles in terms of pavement strength, spatial design, access width and height clearances. Appendix C Collection Vehicles and Appendix D Vehicle access/Turning Circles under the Better Practice Guide for Waste Management in Multi-Unit Dwellings, DECC 2008 are to be used as a guide.

SCHEDULES

Schedule 1 INDICATIVE BIN SIZES AND DIMENSIONS

BIN TYPE	HEIGHT	DEPTH	WIDTH
80 Litre Bin	870mm	530mm	450mm
120 Litre Bin	940mm	560mm	485mm
140 Litre Bin	930mm	615mm	535mm
240 Litre Bin	1080mm	735mm	580mm
660 Litre Bin	1180mm	770mm	1360mm
1100 Litre Bin	1460mm	1230mm	1370mm
3000 Litre Bin	1450mm	1842mm	1995mm

Figure S.01 Indicative Dimensions for bins used in the City of Ryde

Note: These dimensions are only a guide. Dimensions can vary according to manufacturer, i.e. if bins have flat or dome lids and are used with different lifting devices.

Schedule 2 STANDARD WASTE AND RECYCLING BINS FOR RESIDENTIAL DEVELOPMENTS

This schedule identifies Council's standard bin requirements for a range of residential developments. It may be used in conjunction with Schedule 1 for the calculation of areas required for on-site storage.

DEVELOPMENT TYPE	CITY OF RYDE STANDARD WASTE AND RECYCLING BINS
<u>Single dwellings, dual-occupancies, secondary dwellings</u> (Low rise low scale residential of 1-2 dwellings only)	1 x 140 litre bin for garbage. 1 x 240 litre bin for recyclables. 1 x 240 litre bin for green waste.
<u>Multi-dwelling housing</u> (Small scale villa/townhouse developments) with individual bin storage	1 x 140 litre bin for garbage. 1 x 240 litre bin for recyclables. 1 x 240 litre bin for green waste.
Multi-dwelling housing and Residential Flat Buildings up to 3 storeys (low rise residential) with communal bin storage facilities	1 x 240 litre bin for garbage per two units (dwellings). 1 x 240 litre bin for recyclables per two units (dwellings). 1 x 240 litre bin for green waste (or as required). However, for large developments Council may provide bulk bins (i.e. 660/1100 litre skip bins) for garbage, based on the volumes per unit identified above.
<u>Residential flat buildings</u> of 4 or more storeys (high-rise residential)	Depending on proposed service frequency: 1 x 660 litre skip bin for garbage per 15 units OR 1 x 1100 litre skip bin for garbage per 25 units OR 1 x 240 litre bin for garbage per two units 1 x 240 litre bin for recyclables per two units 1 x 240 litre bin for green waste (or as required)

Schedule 3 COMMERCIAL WASTE / RECYCLING GENERATION RATES

This schedule contains information on commercial waste generation rates for various land use activity types, and indicative bin sizes and dimensions. The generation rates are to be used in association with indicative bin sizes (refer Schedule 2) for calculating the number of bins required and size of storage areas. Contact should also be made with Council's Waste Services Manager regarding waste service options to assist in this calculation.

PREMISES TYPE	WASTE GENERATION	RECYCLABLE MATERIAL GENERATION
Backpackers' Hostel	35L/occupant space/week	30L/occupant space/week
Boarding House, Guest House	40L/occupant space/week	35L/occupant space/week
Food premises: Butcher Delicatessen Fish Shop Greengrocer Restaurant, Café Supermarket Takeaway food shop	80L/100m ² floor area/day 80L/100m ² floor area/day 80L/100m ² floor area/day 240L/100m ² floor area/day 10L/1.5m ² floor area/day 240L/100m ² floor area/day 80L/100m ² floor area/day	Variable Variable Variable 120L/100m ² floor area/day 2L/1.5m ² floor area/day 240L/100m ² floor area/day Variable
Hairdresser Beauty Salon	60L/100m ² floor area/week	Variable
Hotel Licensed Club Motel	5L/bed space/day 50L/100m ² bar area/day 10L/1.5m ² dining area/day	1L/bed space/day 50L/100m ² bar area/day 50L/100m ² dining area/day
Offices	10L/100m ² floor area/day	10L/100m ² floor area/day
Shop less than 100m² floor area Shop greater than 100m² floor area	50L/100m ² floor area/day 50L/100m ² floor area/day	25L/100m ² floor area/day 50L/100m ² floor area/day
Showroom	40L/100m ² floor area/day	10L/100m ² floor area/day
Residential Developments where bin areas are shared	120L/unit/week	60L/unit/week

Figure S.02 Indicative Waste/Recycling Commercial generation rates for various land use activities

Note: Generation rates may change from time to time, contact should be made with Council current provisions and standard waste and recycling services to assist with calculation of areas required for waste storage in these types of developments.

Schedule 4 DESIGN REQUIREMENTS

This schedule contains design requirements referred to in the controls in this Part for:

- Residential Bin Storage Areas for communal bin storage in residential developments (S4.1);
- Waste and Recycling Storage Rooms suitable for use in residential, commercial/retail and industrial applications (S4.2);
- Garbage chutes for use in high rise residential buildings (S4.3);
- Service compartments/rooms for use in association with garbage chutes (S4.4), and
- External waste and recycling storage areas (S4.5) suitable for use in commercial/retail, and industrial applications in general, and including where garbage and/or putrescible waste is to be stored.

S4.1. Residential Bin Storage Areas

Residential bin storage areas (communal bin storage) must be designed and constructed in accordance with the following requirements:

- The bin storage area must be of adequate dimensions to comfortably accommodate the required number of bins.
- A space at least 700mm wide x 750mm deep must be provided for each bin.
- The layout of the bin storage area must allow easy unobstructed access to all bins (stacked bin arrangements are not acceptable) and allow the bins to be easily removed for servicing purposes.
- To permit easy access for servicing all passageways must be at least 1 metre wide.
- The floor of the bin storage area must be constructed of concrete.
- The walls of the bin storage area must be constructed of brickwork at least 1100mm high and be designed to screen the bins from the street.
- The entry to the bin storage area must not include any gates.
- Landscaping must be provided to minimise the impact of the bin storage area on the streetscape.

S4.2. Waste and Recycling Storage Rooms

Waste and recycling storage rooms must be designed and constructed in accordance with the following requirements:

- The waste and recycling storage room must be of adequate dimensions to comfortably accommodate the required number of waste and recycling bins.
- The layout of the waste and recycling storage room must allow easy unobstructed access to all bins (stacked bin arrangements are not acceptable) and allow the bins to be easily removed for servicing purposes.
- Where building occupants are required to take their waste to the waste and recycling storage room, the garbage bins should be located closest to the access door to minimise the risk of the recycling bins being contaminated.

*Note: **The Better Practice Guide for Waste Management in Multi-Unit Dwellings**, DECC 2008 provides information on suitable bin layouts for communal storage areas in larger developments.*

- The floor of the waste and recycling storage room must be constructed of concrete finished to a smooth even surface and coved at the intersections with the walls.
- Where garbage or putrescible waste is to be stored, the floor must be graded to a floor waste connected to the sewerage system. The floor waste must be fitted with an in-floor dry basket arrestor approved by Sydney Water Corporation.

- Where garbage or putrescible waste is to be stored, a tap with a hose connection must be provided in or adjacent to the waste and recycling storage area to facilitate cleaning.
- The walls of the waste and recycling storage room must be constructed of brickwork, concrete block work or similar solid material with the internal wall surfaces cement rendered to a smooth even surface.
- The ceiling of the waste and recycling storage room must be constructed of a rigid smooth faced non-absorbent material. The ceiling must be of a minimum height that enables access for cleaning and enables the lids of bins to be fully opened.
- The internal walls and ceiling of the waste and recycling storage room must be painted with a light coloured washable paint.
- The waste and recycling storage room must be provided with a close fitting self-closing door that is openable from inside the room without the use of a key.
- The doors of the waste and recycling storage room must be finished with a smooth faced impervious material that is capable of being easily cleaned.
- The waste and recycling storage room must be provided with permanent natural ventilation direct to the outside air or a system of mechanical exhaust ventilation.
- The waste and recycling storage room must be provided with artificial lighting controllable by switches outside and inside the room. Sensor lights may be used in this regard.
- Clear signage must be displayed in the waste and recycling storage room describing how to use the waste facilities correctly.

S4.3. Garbage Chutes

Garbage chutes are only suitable to transfer garbage, and not suitable to transfer recyclables for a range of safety reasons, including potential fire hazard. Garbage chutes must be designed and constructed in accordance with the following requirements:

- The chute must be cylindrical in shape with a diameter of at least 500mm;
- The chute must be constructed of non-corrosive metal or other suitable smooth impervious material;
- The chute must be vertical with no bends, off-sets or restrictions and all internal joints and seams finished to a smooth even surface to allow the free flow of garbage through the chute;
- Chutes should not open onto any habitable or public space. The service openings for depositing garbage into the chute must be located in a dedicated **service room/compartment** (refer guidelines below);
- The service openings must be fitted with a charging device between one (1) metre and one and a half (1.5) metres above floor level and have a cross-sectional area not more than half that of the garbage chute;
- The charging devices must be self-closing and designed to permit free flow of garbage into the chute;
- The chute branches from the charging devices must not exceed one (1) metre in length and must be angled to allow the free flow of garbage into the chute;
- The chute must terminate in the waste and recycling storage room and discharge the garbage directly into a waste container or garbage compactor in such a way that no spillage occurs;
- A suitable cut-off device must be provided at or near the base of the chute to effectively close off the chute while the waste containers are being serviced or the compaction equipment is being maintained;
- The chute, charging devices and service openings must be capable of being easily cleaned;
- The chute must be ventilated so that air does not flow from the chute through any service opening and the flow of air through the chute does not impede the downward movement of garbage; and

- The vent at the top of the chute must extend above the roof level and be fitted a weather-proof cowl and wire mesh screen to prevent the entry of rainwater and birds.

Note: As a guide, one garbage chute is generally suitable for servicing a minimum of 20 dwellings, and a maximum of around 28-30 dwellings.

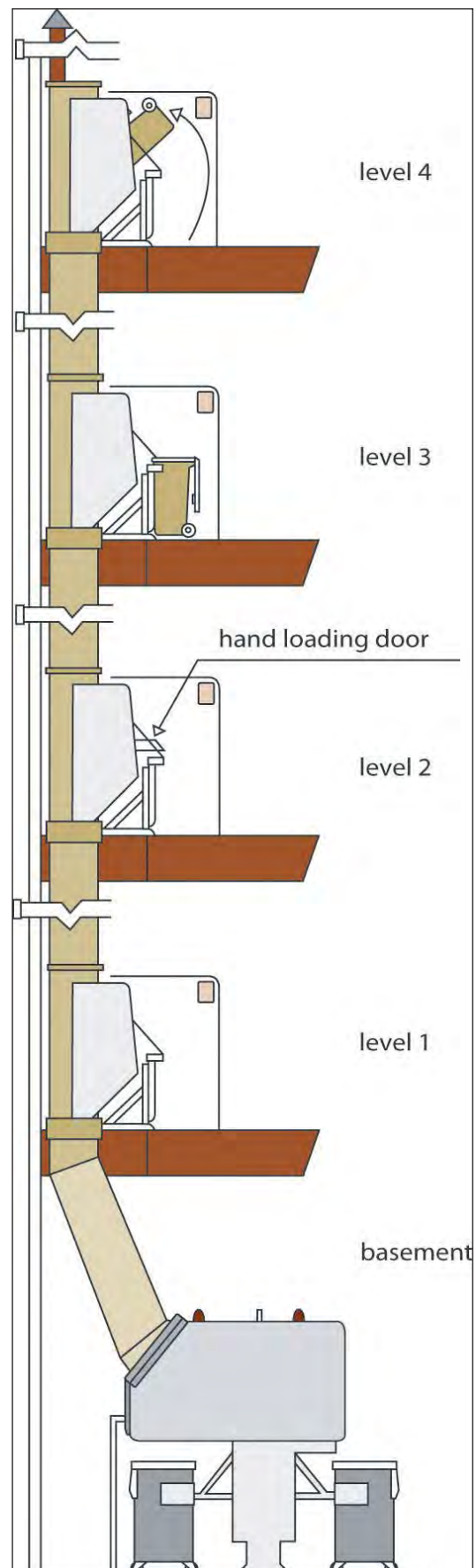


Figure S.01
Example of a garbage chute system

Source:
*Better Practice Guide for Waste Management in
Multi-Unit Dwellings*, DECC, 2008.

S4.4. Service Rooms (or Compartments)

Service rooms or compartments are located on each floor of a building to allow access to the garbage chute. Service rooms/compartments must be designed and constructed in accordance with the following requirements:

- Each service room/compartment must be located for convenient access by users and must be well ventilated and well lit.
- Each service room/compartment must include space for bins or crates for the reception of recyclable materials.
- The floors, walls and ceilings of the service rooms/compartments must be finished with smooth impervious materials that are capable of being easily cleaned.
- The service rooms/compartments must contain clear signage that describes the types of wastes that can be deposited into the garbage chute and the types of wastes which should be deposited into the recycling bins or crates.

S4.5. External Waste and Recycling Storage Areas

All **external waste and recycling storage areas** in commercial and industrial developments must be designed and constructed in accordance with the following requirements:

- The waste and recycling storage area must be of adequate dimensions to store all garbage and recyclable wastes generated on the premises between collections and allow easy access for users and servicing purposes.
- The waste and recycling storage area must be roofed to prevent the entry of rainwater. The ceiling must be of a minimum height to enable access for cleaning and the lids of bins to be fully opened.
- The floor of the waste and recycling storage area must be constructed of concrete finished to a smooth even surface.
- All uncontaminated stormwater from the roof and uncovered paved areas of the site must be directed away from the waste and recycling storage area and be drained to Council's stormwater drainage system.
- Where garbage or putrescible waste is to be stored, the floor must be graded to a floor waste connected to the sewerage system. The floor waste must be fitted with an in-floor dry basket arrestor approved by Sydney Water Corporation.
- Where garbage or putrescible waste is to be stored, a tap with a hose connection must be provided in or adjacent to the waste and recycling storage area to facilitate cleaning.
- The waste and recycling storage area must be adequately screened from the street to prevent the creation of unsightly conditions.

THIS PAGE HAS BEEN
INTENTIONALLY LEFT BLANK



City of Ryde
Civic Centre
1 Devlin Street
Ryde NSW 2112

www.ryde.nsw.gov.au

City of Ryde Development Control Plan 2014

Part: 8.1 Construction Activities

Translation

ENGLISH

If you do not understand this document please come to Ryde Civic Centre, 1 Devlin Street, Ryde Monday to Friday 8.30am to 4.30pm or telephone the Telephone and Interpreting Service on 131 450 and ask an interpreter to contact the City of Ryde for you on 9952 8222.

ARABIC

إننا نعتذر عليك فهم محتويات هذه الوثيقة، نرجو للحضور إلى مركز بلدية رايد Ryde Civic Centre على العنوان: 1 Devlin Street, Ryde من الاثنين إلى الجمعة بين الساعة 8.30 صباحاً والساعة 4.30 بعد الظهر أو الاتصال بمكتب خدمات الترجمة على الرقم 131 450 لكي تطلب من أحد المترجمين الاتصال بمجلس مدينة رايد، على الرقم 9952 8222، نيابةً عنك.

ARMENIAN

Եթէ այս գրութիւնը չէ՞ք հասկնար, խնդրեմ եկէ՛ք՝ Րայդ Սիվիկ Սենթըր, 1 Տելվին փողոց, Րայդ, (Ryde Civic Centre, 1 Devlin Street, Ryde) Երկուշաբթիէն Ուրբաթ կ.ա. ժամը 8.30 – կ.ե. ժամը 4.30, կամ հեռաձայնեցէ՛ք Հեռաձայնի եւ Թարգմանական Սպասարկութեան՝ 131 450, եւ խնդրեցէ՛ք որ թարգմանիչ մը Րայդ Քաղաքապետարանին հետ կապ հաստատուէ ձեզի համար, հեռաձայնելով՝ 9952 8222 թիվին:

CHINESE

如果您看不懂本文，請在周一至周五上午 8 時 30 分至下午 4 時 30 分前往 Ryde 市政中心詢問 (Ryde Civic Centre, 地址: 1 Devlin Street, Ryde)。你也可以打電話至電話傳譯服務中心，電話號碼是: 131 450。接通後你可以要求一位傳譯員為你打如下電話和 Ryde 市政廳聯繫，電話是: 9952 8222。

FARSI

اگر این مدرک را نمی فهمید لطفاً از 8.30 صبح تا 4.30 بعد از ظهر دوشنبه تا جمعه به مرکز شهرداری رايد، Ryde Civic Centre, 1 Devlin Street, Ryde مراجعه کنید یا به سرویس مترجم تلفنی، شماره 131 450 تلفن بزنید و از یک مترجم بخواهید که از طرف شما با شهرداری رايد شماره 9952 8222 تلفن بزند.

ITALIAN

Se non capite il presente documento, siete pregati di rivolgervi al Ryde Civic Centre al n. 1 di Devlin Street, Ryde, dalle 8.30 alle 16.30, dal lunedì al venerdì; oppure potete chiamare il Telephone Translating and Interpreting Service al 131 450 e chiedere all'interprete di contattare a vostro nome il Municipio di Ryde presso il 9952 8222.

KOREAN

이 문서가 무슨 의미인지 모르실 경우에는 1 Devlin Street, Ryde 에 있는 Ryde Civic Centre 로 오시거나 (월 – 금, 오전 8:30 – 오후 4:30), 전화 131 450 번으로 전화 통역 서비스에 연락하셔서 통역사에게 여러분 대신 Ryde 시청에 전화 9952 8222 번으로 연락을 부탁드립니다.

Amend. No.	Date approved	Effective date	Subject of amendment

Table of Contents

1.0	INTRODUCTION	7
1.1	The Objectives of this Part	7
1.2	When to use this Document	7
2.0	SITE WORK PRACTICES	8
2.1	Sediment & Other Pollution Controls	8
2.1.1	General	8
2.1.2	Erosion and Sediment Control Plan	8
2.1.3	ESCP Approval	9
2.1.4	Soil and Water Management Plans	12
2.2	Engineering Compliance Certificates	13
2.2.1	Compliance Certificates for Public Infrastructure	13
2.2.2	Compliance Certificates Required for Occupation Certificate	14
2.2.3	Compliance Certificate from Registered Surveyor	14
2.3	Limiting Erosion	14
2.3.1	Site Clearing	14
2.3.2	Diverting Water	15
2.3.3	Vehicle Access and Road Cleaning	15
2.4	TREATING SEDIMENT LADEN RUNOFF	17
2.4.1	Sediment Fences	17
2.4.2	Maintenance	19
2.4.3	Sediment Basins	19
2.4.4	Other Sediment Retention Devices	19
2.4.5	Pumping Water from Excavations	19
2.4.6	Reference	20
2.5	Tree Preservation and Protection Measures	20
2.6	Demolition	21
2.6.1	General	21
2.6.2	Public Safety	21
2.7	Builders Identification Signage	21
2.8	Site Toilets	21
3.0	DAMAGES IN THE ROAD AND FOOTWAY	22
3.1	Protecting the Road and Footway	22
3.2	Temporary Restoration of Damaged Areas	22

Table of Contents

3.3	Final Restoration of Damages	22
3.3.1	Re-instatement of Concrete Footpaving	23
3.3.2	Re-instatement of Footway Crossings	23
3.3.3	Re-instatement of Grassed Footway	24
3.3.4	Reinstatement of Kerb and Gutter	25
3.3.5	Reinstatement of Road Pavement	25
3.3.6	Reinstatement of Drainage Facilities	25
4.0	SAFETY AND AMENITY	26
4.1	Safety of Pedestrians and Traffic	26
4.1.1	Traffic Management	26
4.1.2	Provision for Pedestrians	26
4.2	Minimum road widths	26
4.2.1	Local Residential Streets	26
4.2.2	Other Streets	27
4.3	Public Liability	27
4.4	Security Fences	27
4.5	Overhead Protective Structures (Hoardings)	27
4.5.1	When they are Required	27
4.5.2	Siting	28
4.5.3	Design	28
4.5.4	Liability Insurance	28
4.5.5	Fees	28
4.6	Hours of Operation	28
4.7	Parking for Construction Vehicles	29
4.7.1	Construction Parking Zones	29
4.8	Trenches and other Excavations within Public Land	29
4.8.1	Road Opening Permit	29
4.8.2	Placement of Waste Containers (Skips)	30
4.8.3	Signs and Barricades	30
4.8.4	Backfilling and Temporary Restoration	30
4.8.5	Subsidence	30
4.8.6	Public Liability	30
4.8.7	WorkCover	30
4.8.8	Stockpiles	31
4.8.9	Loss of On-street Car Parking	31

Table of Contents

4.8.10 Restricting Access to Properties	31
4.9 Services in the Public Road	31
4.9.1 Prevention of Damage	31
4.9.2 Alterations	32
5.0 NOTIFICATION OF AFFECTED PROPERTY USERS	33
6.0 INSPECTIONS	34
6.1 Inspections During Construction	34
6.2 Final Inspection	34
6.3 Overland Flow Inspection by Consultant	35
7.0 WORKS AS EXECUTED DRAWINGS	36
8.0 STANDARDS NOT MET	37
8.1 Property Drainage System	37
8.2 Overland Flow	37
9.0 IMPORTANT COMMON LAW OBLIGATIONS	38
SCHEDULES	39
Schedule 1 - Temporary Placement of Waste Container or Skip on the Footpath	39
Schedule 2 - Certification form for installation of Sediment and Erosion Controls	41

THIS PAGE HAS BEEN
INTENTIONALLY LEFT BLANK

1.0 INTRODUCTION

1.1 The Objectives of this Part

The objectives of this Part are:

1. To encourage consideration of Ecologically Sustainable Development and Site Management when developing a site;
2. To ensure adequate controls are in place on or near a site to minimise the impact of construction activities on adjoining properties;
3. To provide requirements and advice to applicants in regard to site management;
4. To improve water quality of creeks and receiving waters (Lane Cove River & Parramatta River); and
5. To ensure public health and safety is maintained.

1.2 When to use this Document

This document is to be used when:

- Developing all new subdivisions;
- Developing new single or dual occupancy domestic buildings;
- Altering or adding to domestic buildings;
- Developing new commercial, institutional or multiple occupancy residential developments;
- Developing ancillary structures, such as tennis courts & swimming pools;
- Making alterations or connections to the street and trunk drainage throughout Ryde; and
- Carrying out alteration or additions to utilities or other services in public roads.

The Part applies to all lands within the Ryde City Council area.

Note: It is important that the requirements of Council's Development Engineers are obtained at the start of the design process of the proposed development.

2.0 SITE WORK PRACTICES

2.1 Sediment & Other Pollution Controls

2.1.1 General

- a. Appropriate site works practices are to be adopted during the construction phase of a development in order to:
 - i. Counter the effects of soil erosion and sedimentation. These effects include the filling of natural and artificial wetlands, smothering of natural vegetation, reduction of stormwater drainage capacity, damage to bushland and aquatic habitats, and degradation of receiving waters (Lane Cove and Parramatta Rivers);
 - ii. generally apply the principles of ecologically sustainable development (ESD); and
 - iii. employ best management practices (BMP) based on the best available technology in order to mitigate soil erosion and trap pollutants at the source.

2.1.2 Erosion and Sediment Control Plan

- a. For construction sites between 250 m² and 2500 m² (area of disturbed land) an *Erosion and Sediment Control Plan* (ESCP) must be prepared and approved prior to any **Construction Certificate** being issued to undertake development on a property involving the disturbance or placement of soil on the land.
- b. Erosion and Sediment Control Plans submitted are to be concept plans of sufficient detail to determine whether the site can be developed in the manner suggested whilst incorporating adequate erosion control.
- c. For those works not requiring the consent of council it remains the owner's/builder's responsibility to ensure that adequate erosion and sedimentation controls are provided on the site.
- d. Erosion and sedimentation control measures, once installed are to be maintained so as to ensure their continued proper operation until such time as development activities have been completed and the site fully stabilised. Failure to effectively maintain sedimentation controls may result in the responsible individual/corporation receiving an on-the-spot fine of up to \$1500 under the *Protection of the Environment Operations Act 1997*.
- e. All Erosion and Sedimentation Control Plans must include all aspects of pollution control including:
 - i. Physical constraints of the development site, including soil type, gradient of land, location of remnant vegetation that requires protection, location of natural watercourses and the potential for significant overland stormwater flow through the site;
 - ii. An accurate property description with allotment boundaries; a north point and scale;
 - iii. location of adjoining road(s) and all impervious surfaces; existing vegetation;
 - iv. existing site contours with approximate grades and indications of direction(s) of fall;
 - v. construction site/disturbed area boundary, outside of which no works, vehicle movements or stockpiling of materials are to occur;
 - vi. details of access points to the construction site;
 - vii. location, details and dimensions of all permanent and temporary sediment and erosion control structures;
 - viii. all existing watercourses and/or drainage structures;
 - ix. timing of site rehabilitation or the landscaping program;

- x. outline of the maintenance program for all erosion and sediment controls; be signed and dated by the person and/or organisation who adopted the plan;
 - xi. The name, address and contact phone number of the person ultimately responsible for ensuring implementation of the Site Work Plan;
 - xii. An identification of all potential pollution sources;
 - xiii. Any physical attributes of the site or development that may increase the risk of pollution from the property and therefore requires special attention;
 - xiv. All measures that will be employed to address pollution sources including control of access, soil erosion, sediment and general pollution; and
 - xv. Maintenance schedules and practices.
- f. The plan is to be of scale 1:500 or larger; and
 - g. A narrative should accompany the plan that describes how erosion control and soil and water management will be achieved on site, including on going maintenance of structures.

2.1.3 ESCP Approval

- a. After the Erosion and Sedimentation Control Plan has been approved, the requirements of that plan will be incorporated as a condition of consent. Depending on the nature and scale of the development, Council may impose additional conditions of consent to control erosion and sedimentation. The applicant and owner will be responsible for ensuring that the requirements of the Erosion and Sediment Control Plan are adhered to.
- b. The diagrams on the following pages (Figures 8.1.01 and 8.1.02) are designed to assist applicants in preparing an Erosion and Sediment Control Plan by giving examples of design details of erosion and sediment control structures. These diagrams are referenced from *"Managing Urban Stormwater- Soils and Construction, 1998, New South Wales Department of Housing"*. These are not an extensive list of erosion and sediment control structures and ESCPs should not be limited to those examples given in this Part.

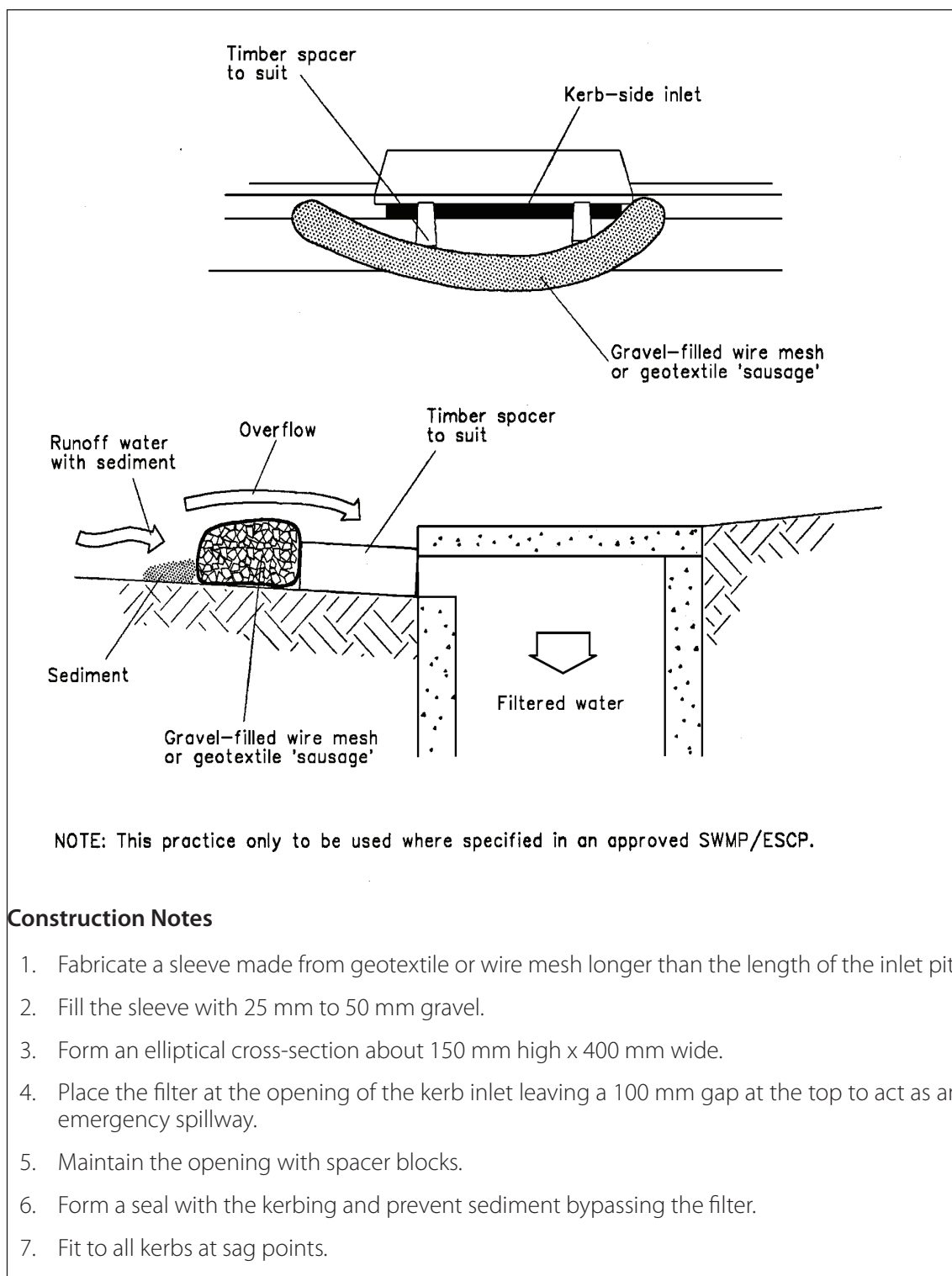


Figure 8.1.01 Mesh and gravel inlet filter

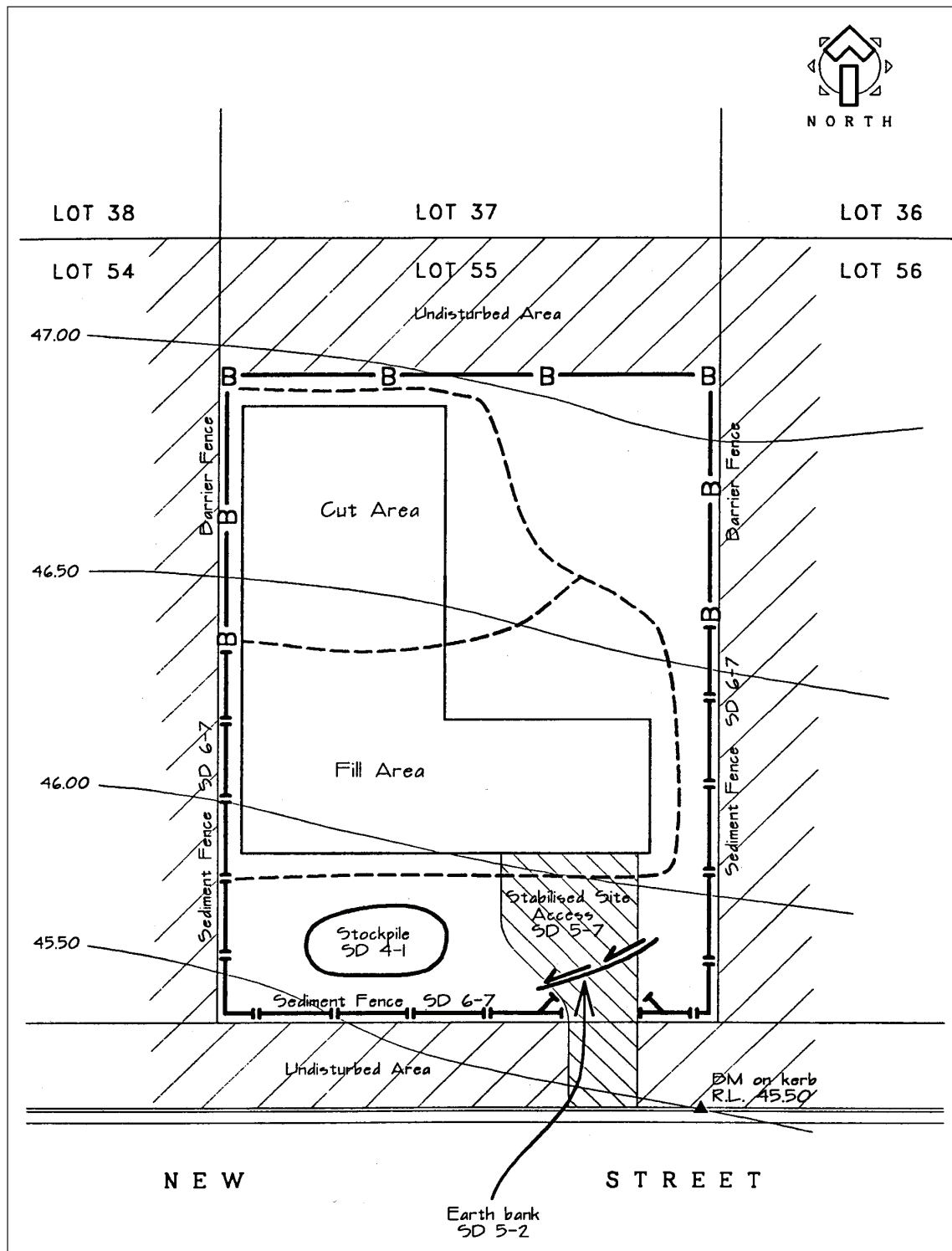


Figure 8.1.02 Typical detail for a residential erosion and sediment control plan (ESCP)

2.1.4 Soil and Water Management Plans

- a. For construction sites larger than 2 500 m² (area of disturbed land) or identified as being either in an extra sensitive location and/or an activity with a high level of risk of pollution of the receiving waters, a *Soil and Water Management Plan* (SWMP) must be prepared. The SWMP must be approved by the Consent Authority prior to any Construction Certificate being issued to undertake development on a property involving the disturbance or placement of soil on the land.
- b. The SWMP is to include all aspects of pollution control including:
 - i. Physical constraints of the development site, including soil type, gradient of land, location of remnant vegetation that requires protection, location of natural watercourses and the potential for significant overland stormwater flow through the site;
 - ii. Appropriate measures to overcome these physical constraints. This should include:
 - measures for management of soil erosion, including the use of a sediment retention basin;
 - management of overland stormwater flow through and off the subject site;
 - staging of site works;
 - maintenance and rehabilitation of the site works area; and
 - measures for the control of pollutants such as sediment, nutrients, litter, cement wastes, toxins and bacteria that are likely to be encountered during the construction phase.
- c. The plan is to be prepared in conjunction with the engineering design for all construction works and included as part of the final engineering plans. It should be prepared by a person with suitable qualifications, experience, ability and a demonstrated knowledge of soil and water management. Where works continue for an extended period, the Plan is to be revised at 2 yearly intervals from the date of the approval of the original plan and an Engineering Compliance Certificate is to be obtained declaring that the revised Plan complies with the requirements of this DCP. Suitably experienced people include those certified by:
 - i. The Institution of Engineers, Australia, for engineering and hydrology matters;
 - ii. The International Erosion Control Association for soil conservation matters; and
 - iii. The Australian Society of Soil Science for collection or analysis of soil data.
- d. The SWMP must include the following elements:
 - i. A 1:500 or larger scaled drawing of the site accompanied by detailed instructions describing how erosion control and soil and water management will be achieved, together with a maintenance program;
 - ii. The following information is to be contained on the scaled drawing:
 - location of site boundaries;
 - existing contours and approximate grades;
 - approximate location trees, clearly showing the trees that are to be retained;
 - location of environmentally sensitive areas e.g. wetlands and creeks;
 - location of vehicular access and proposed roads;
 - stormwater discharge points; and
 - North Point and scale.
- e. The detailed instructions of the erosion control and soil and water management shall include:
 - i. construction program;
 - ii. location of construction materials stockpiles;
 - iii. location and type of proposed erosion and sediment control measures site rehabilitation schedule;

- iv. maintenance program; and
- v. construction details, supporting information, calculations and notations.

Further details of requirements are found in the publication *Managing Urban (3rd Edition, Stormwater: Soils and Construction August 1 998)* prepared by the NSW Department of Housing.

2.2 Engineering Compliance Certificates

Controls

- a. Engineering Compliance Certificates must be obtained by the developer for certain works at the specified stage(s) and submitted to the Principal Certifying Authority (PCA). If Council is appointed the PCA then the appropriate fee is to be paid to Council. These certificates are to contain the following declarations:
 - i. *Name and address of person issuing certificate...*
 - ii. *Relevant qualification of person issuing certificate...*
 - iii. *This certificate is supplied in relation to...*
 - iv. *Property...*
 - v. *I have been responsible for the supervision of all work nominated in (c) above.*
 - vi. *I have carried out all tests and inspections necessary to declare the work nominated in (c) above has been carried out in accordance with the approved plans, specifications, and the conditions of the development consent.*
 - vii. *I have kept a signed record of all inspections and tests undertaken during the works, and can supply the Principal Certifying Authority with a copy of such records and test results if and when required.*

Signed _____ Date _____

2.2.1 Compliance Certificates for Public Infrastructure

- a. Compliance Certificates are normally required at the following stages of construction where public infrastructure (work related to trunk drainage & public road reserves) is involved:
 - i. Prior to the commencement of construction, confirming that the constructed erosion and sediment control measures comply with the approved Site Works Plan (where required as a condition of Development Consent) and other relevant requirements of the DCP;
 - ii. Prior to backfilling of pipelines in which Council has an interest;
 - iii. Prior to backfilling of drainage connections to pipelines, channels or pits in which Council has an interest;
 - iv. Prior to casting of pits and other concrete structures in which Council has an interest including kerb and gutter, accessways, aprons, pathways, vehicular footpath crossings, dish crossings and pathway steps;
 - v. Proof roller testing of subgrade of public roads;
 - vi. Proof roller testing of sub-base of public roads; and
 - vii. Roller test of completed pavement prior to placement of wearing course of public roads.

Note: Council has an interest in all pipelines draining public road reserves and public reserves, and in all structures located within public road reserves.

2.2.2 Compliance Certificates Required for Occupation Certificate

- a. Prior to the issue of the Occupation Certificate the following Engineering Compliance Certificates must be obtained (If Council is appointed the Principal Certifying Authority [PCA] then the appropriate fee must be paid to Council) and submitted to the PCA:
 - i. Confirming that all vehicular footway and gutter (layback) crossings are constructed in accordance with the construction plan requirements and Council's Development Engineers;
 - ii. Confirming that the constructed driveway is constructed in accordance with the construction plan requirements and Council's Development Engineers;
 - iii. Confirming that the constructed internal car park and associated drainage complies with the construction plan requirements and Council's Development Engineers;
 - iv. Confirming that the constructed interallotment drainage system complies with the construction plan requirements of Part 8.2;
 - v. Confirming that the on-site drainage system (including the on-site detention storage system) servicing the development complies with the construction plan requirements of Part 8.2;
 - vi. Confirming that the on-site detention system will function hydraulically in accordance with the approved design;
 - vii. Confirming that after completion of all construction work and landscaping, all areas adjacent the site, the site drainage system (including the on-site detention system), and the trunk drainage system immediately downstream of the subject site (next pit), have been cleaned of all sand, silt, old formwork, and other debris; and
 - viii. Confirming that the connection of the site drainage system to the trunk drainage system complies with Section 4.7 of AS 3500.3 - 1990 (*National Plumbing and Drainage Code*).

2.2.3 Compliance Certificate from Registered Surveyor

- a. Where pipelines have been constructed inside Drainage Easements, or Interallotment Drainage Easements, a Compliance Certificate from a Registered Surveyor must be submitted to the Principal Certifying Authority. The Compliance Certificate must clearly indicate that all pipelines and associated structures lie wholly within the relevant easement as required by the Development Consent.

2.3 Limiting Erosion

Controls

2.3.1 Site Clearing

- a. The area of exposed soil on the property shall be kept to a minimum by implementing the following work site practices:
 - i. Disturb only those lands necessary for effective completion of the work's program;
 - ii. Fence off areas remaining undisturbed;
 - iii. Define vehicle access and turning areas, eliminating any that are unnecessary. Fence off areas, which are to remain undisturbed; and
 - iv. Stage the work and re-stabilise at the completion of each stage to ensure the minimum amount of soil is exposed at any one time.

2.3.2 Diverting Water

- a. Where possible, runoff from undisturbed areas should be redirected so as not to pass over disturbed land and particularly areas of cut and fill. The runoff shall not, however, be redirected onto an adjoining property, or conveyed in a manner that may result in erosion.
- b. Long lengths of exposed slopes should be shortened by the use of drains for interception/diversion of surface flows, which should convey them to a stable outlet.
- c. In environmentally sensitive areas, channels/drains and associated inlet/outlet structures for the construction phase are to be designed for flows from large storm events – typically 20-year Average Recurrence Interval.

2.3.3 Vehicle Access and Road Cleaning

- a. All vehicular entrances to the construction site must be stabilised to prevent them becoming a source of sediment. Fences should be erected to ensure vehicles are unable to bypass the stabilised vehicular access unless coming from a stabilised area.
- b. In order to prevent hazard and nuisance for vehicles using the public road, public roads must be kept free of mud and dirt. Sediment tracked onto the public roadway by vehicles leaving the construction site is to be swept up immediately.

Council street cleaning

- c. Where the street has been left in an unsatisfactory manner, Council may arrange for its own staff to clean the street. All costs associated with this work will be deducted from the builders security deposit. Depending on the time Council's overseers can schedule the work, this may be charged at overtime or even call out rates.

2.4 TREATING SEDIMENT LADEN RUNOFF

2.4.1 Sediment Fences

Controls

- a. Sediment fences are useful for filtering sediment from sheet flow (i.e. the runoffs not concentrated to a single point). They must be constructed from a material that is properly supported and allows water to pass through, but not sediment. Hay bales are not a suitable alternative.
- b. Sediment fences work by causing sediment laden runoff to pond behind the sediment fence, giving time for sediment particles to settle out of the runoff. The fences must therefore be installed to ensure the following:
 - i. they do not collapse under the pressure of the water. The maximum flows behind the fence at any one point should not exceed 40 litres/second per metre width of overland flow for the 2-year ARI storm events (fences should not be installed across concentrated stormwater overland flowpaths because they will invariably fail under such conditions); and
 - ii. the water does not undermine the sediment fence and cannot flow around or over the fence before a sufficient ponding has occurred.
- c. To be effective, sediment fences must be located perpendicular to the flow of water. Fences that are not perpendicular to the flow will typically only redirect runoff to the low point.

The effectiveness of a sediment fence is dependant on:

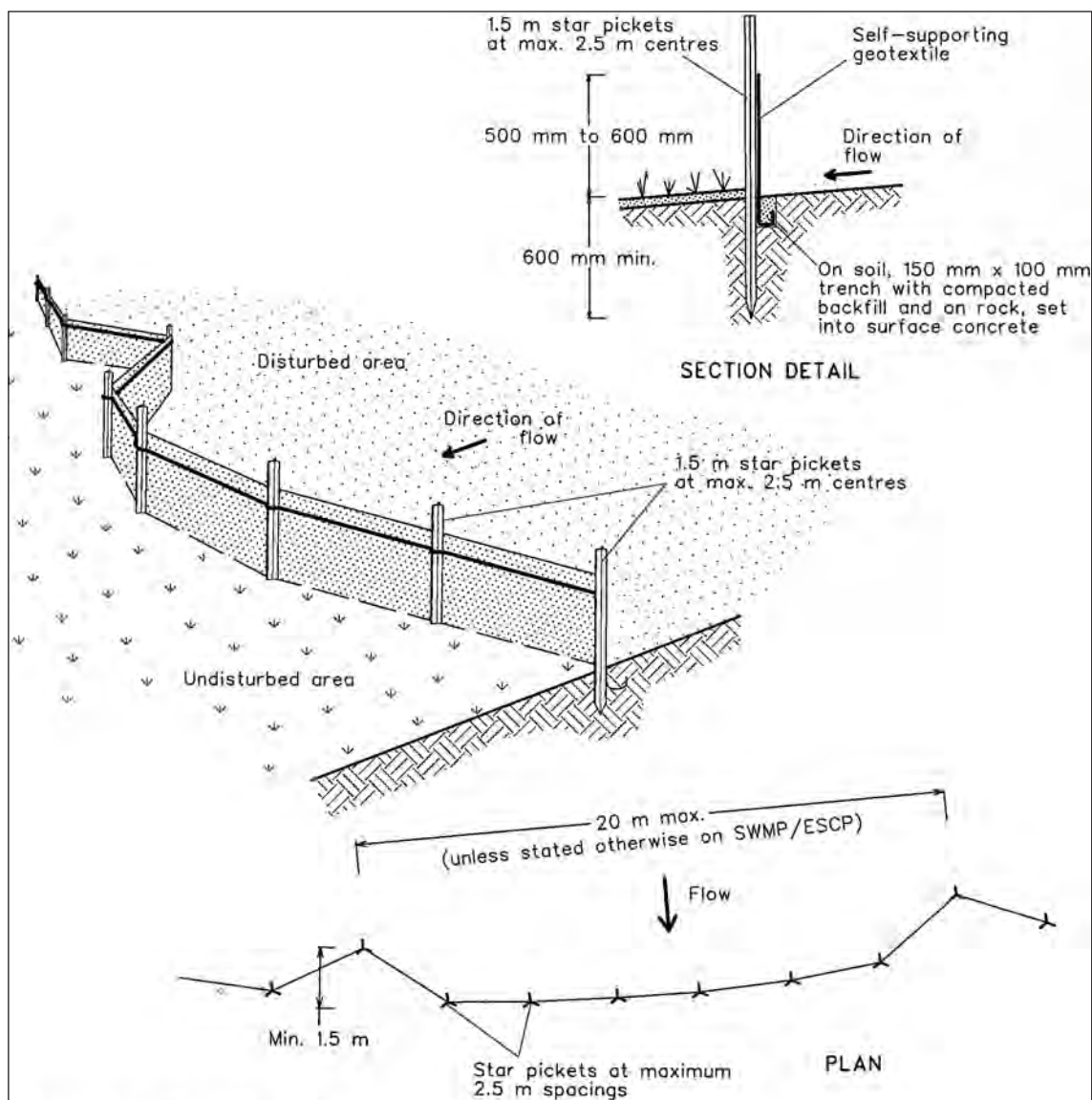
- i. correct installation;
- ii. appropriate positioning to ensure a sufficient volume of water can pond behind the fence; and
- iii. timely maintenance to ensure storage volume is not reduced by collected sediment.

The volume of water that may pond behind a sediment fence depends on the slope of the land immediately upstream of the fence.

- d. In the 2.5 metre zone behind the sediment fence, the land slope should be not greater than 1 in 10.
- e. The total disturbed catchment area draining to a sediment filter fence should not exceed 150 m² for every linear metre of the fence that will retain and filter runoff.

Installation of Sediment Fences

- f. Fences must be installed in accordance with the manufacturer's specifications. The base of the filter fence buried into the ground to a minimum depth of 150 mm and the soil holding it into the ground is to be heavily compacted.
- g. In areas where water may pond behind the sediment fence to a depth exceeding 300 mm, or in circumstances where the fence cannot be buried to a depth of 150 mm, sand bags should be placed at the base of the fence to prevent undermining. Refer to Figure 8.1.04.



Construction Notes

1. Construct sediment fences as close as possible to being parallel to the contours of the site, but with small returns as shown in the drawing to limit the catchment area of any one section. The catchment area should be small enough to limit water flow if concentrated at one point to 50 litres per second in the design storm event, usually the 10-year event.
2. Cut a 150-mm deep trench along the upslope line of the fence for the bottom of the fabric to be entrenched.
3. Drive 1.5 metre long star pickets into ground at 2.5 metre intervals (max) at the downslope edge of the trench. Ensure any star pickets are fitted with safety caps.
4. Fix self-supporting geotextile to the upslope side of the posts ensuring it goes to the base of the trench. Fix the geotextile with wire ties or as recommended by the manufacturer. Only use geotextile specifically produced for sediment fencing. The use of shade cloth for this purpose is not satisfactory.
5. Join sections of fabric at a support post with a 150-mm overlap.
6. Backfill the trench over the base of the fabric and compact it thoroughly over the geotextile.

Figure 8.1.04 Typical details of a sediment control fence

2.4.2 Maintenance

- a. All sediment fences are to be inspected weekly. Sediment that has settled at the base of the fence should be removed and any geofabric that has been clogged should be backwashed or replaced. Any evidence of sagging, overtopping, undermining or bypass of the structure should be addressed.

2.4.3 Sediment Basins

- a. Sediment basins shall be used on small building sites when the standards for use of sediment fences cannot be met, on all large construction sites and land subdivisions in excess of 5000 m² and on sites in environmentally sensitive locations. Sediment basins hold the sediment laden runoff on-site allowing time for the sediment particles to settle out. The 'clean' runoff is then pumped from the storage basin.
- b. Generally, a flocculent such as gypsum will need to be added to accelerate the time taken for the water to clear.
- c. Sediment basins are to be designed using the process outlined in Section 6.3 of *Managing Urban Stormwater: Soil and Construction* ("Blue Book" – Dept. of Housing)
- d. Sedimentation basins can be constructed from rock, earth or suitable crushed concrete products. Rock structures should be lined on the inside with a geotextile material to ensure removal of sediment particles from the system, or a suitable impermeable material for wet basins.
- e. Sedimentation basins and traps are not to be decommissioned until works for which they were designed are completed and the contributing catchment is stabilised.

2.4.4 Other Sediment Retention Devices

- a. It is essential to ensure that building materials, fill material and top soil is not washed into the trunk drainage system, and that storm water flow in gutters is not impeded. Measures that may need to be employed to prevent contaminated stormwater runoff entering the stormwater system may include:
 - i. Covering stockpiled materials with plastic sheeting;
 - ii. Downstream pit protection e.g. star picket geotextile fence (where geotextile is not self-supporting, steel mesh is to be used as a frame);
 - iii. Sand bags to be used to create artificial sag points; and
 - iv. Geo-textile "sausage" to be used to prevent contaminated water entering kerb and raised pit inlets.

2.4.5 Pumping Water from Excavations

- a. Typically, water pumped from an excavation will contain sediment and therefore cannot be directly pumped to the drainage system.

Sediment laden runoff from excavations must be first pumped to an adequately sized sediment basin (See Section 2.4.3 above) to allow settling of solids by natural deposition or assisted with a flocculating agent.

- b. Waste water cannot be discharged to the stormwater system unless it is visually free from grease, oil, solids and unnatural discolouration and free from settleable matter under the *Protection of the Environment Operations Act 1997*.
- c. Where water is to be pumped from a site that does not comply with this requirement a Trade Waterwaste Permit must be obtained from Sydney Water to allow the water to be disposed of in an acceptable manner.

2.4.6 Reference

A more comprehensive treatment of the techniques for managing stormwater from construction sites is given in the publication *Managing Urban Stormwater: Soil and Construction* ("Blue Book" – Dept. of Housing) and available from:

The Publication Officer – Resitech
Housing Production Division | NSW Dept. of Housing
Locked Bag 7466
Liverpool NSW 1871
Phone: 9821 6092

Information regarding Trade Waste Permits may be obtained from Sydney Water on 13 20 92, or at the following locations:

Head Office
1 Smith Street
Parramatta NSW 2150
Phone: 13 20 92

2.5 Tree Preservation and Protection Measures

Controls

- a. Trees that are to remain on the site are to be protected against damage during construction. All mature trees to remain shall be clearly marked and a 1.8 metre high chainwire fence attached to 50 mm steel posts erected around their dripline or a minimum of 4 metres from the trunk where a structure is to be constructed under the canopy. A qualified arborist shall inspect the tree protection measures and issue a Compliance Certificate to indicate that if maintained they will provide sufficient protection during normal construction activities.
- b. All reasonable efforts are to be taken to protect trees from damage during construction. Such measures should include:
 - i. clearly marking trees to remain;
 - ii. avoiding compaction of ground around these trees (generally caused by vehicles driving through these areas); and
 - iii. avoiding stockpiling of material within the dripline of these trees.
- c. Tree protection zones:
 - i. fencing off all areas which are not to be disturbed to prevent vehicles, building materials and refuse being placed in those locations. Fences are to be erected prior to any demolition or construction work being undertaken.

Areas on the building site that are affected by tree roots on an adjoining private or public property should be similarly fenced off.

- d. Installation of Services:

Trenches for services shall be located outside the dripline of all trees that must be retained on the property and all trees on adjoining public and private lands. If this is not possible, the services, including stormwater pipelines, shall be hand dug under the trees roots. At any time where a pipe is being laid within the dripline of a tree that is to be retained, or the dripline of a tree on an adjoining property, a qualified arborist must be on-site to oversee the operation.
- e. Cutting of Roots:

All roots in excess of 25 mm Ø that must be severed shall be cleanly cut (not with a backhoe bucket), and be kept moist at all times and not be left exposed to the air.

2.6 Demolition

Controls

2.6.1 General

- a. All work shall be carried out in accordance with the requirements of *AS 2601-1991 The demolition of structures*.

2.6.2 Public Safety

- a. Throughout the demolition operations, adequate safety shall be maintained in public places adjoining the site. In both the planning and execution of the demolition work, appropriate action shall be taken to prevent demolished materials from falling freely outside the boundaries of the demolition site.

Fencing, Hoardings and Warning Signs

- b. Security fencing shall be provided around the perimeter of the demolition site and any additional precautionary measures taken, as may be necessary to prevent unauthorised entry to the site at all times during the demolition period.
- c. Where the demolition site adjoins a public thoroughfare, the common boundary between them shall be fenced for its full length with a hoarding unless the least horizontal distance between the common boundary and the nearest parts of the structure is greater than twice the height of the structure. The hoarding shall comply with the minimum requirements for such a structure as outlined in the *WorkCover Code of Practice Overhead Protective Structures*.
- d. Notices lettered in accordance with AS 1319 and displaying the words 'DANGER! DEMOLITION IN PROGRESS', or a similar message, shall be fixed to the fencing at appropriate places to warn the public.

Hazardous Materials and Conditions

- e. Before the commencement of any stripping or demolition, the structure and all parts of the site shall be examined, by competent specialists, to determine, as far as is practicable, the presence of noxious, toxic or explosive materials or conditions which would be hazardous to the health of the public if disturbed by stripping or demolition.
- f. Where hazardous materials have been identified, including asbestos, no demolition shall proceed in the immediate vicinity of the hazard and removal of the hazard shall only be by competent persons and in accordance with the requirements of the NSW WorkCover Authority.

2.7 Builders Identification Signage

Controls

- a. Displayed at all construction sites shall be a sign indicating the builder's or contact person's name and contact phone number.

2.8 Site Toilets

Controls

- a. Site toilets shall be provided in accordance with the WorkCover Code of Practice entitled *Amenities for Construction Work*.

3.0 DAMAGES IN THE ROAD AND FOOTWAY

3.1 Protecting the Road and Footway

Controls

- a. All reasonable efforts shall be made to protect the grassed footway, any footpath paving, the kerb, gutter, road pavement and drainage facilities, including those beneath the surface from damage.
- b. Some drainage structures contain survey marks, care needs to be taken when working in close proximity to these marks to ensure they are not disturbed. In the event these marks are disturbed arrangements will need to be made at the applicants expense to replace the survey mark.

Record existing damages to road and footway

- c. Council officers will identify any existing damages in the public road prior to any work being undertaken on the property. It is strongly advised that the applicant inspect the public footway and road carriageway in front of the building site prior to any work being undertaken on the property and make a photographic record of any existing damages.
- d. The applicant will generally be required to lodge a security deposit with Council prior to any work being undertaken on the property. The amount to be lodged is dependent upon the type of work being undertaken and the length of property frontage to public land.

3.2 Temporary Restoration of Damaged Areas

Controls

- a. Any time damages in the public footway, road carriageway, public parks and the like occur, an assessment is to be undertaken of the likely impact on public safety. Where public safety will be compromised, sufficient temporary repairs shall be undertaken to ensure safety in the vicinity of the damages.
- b. Damages to footpaving shall be temporarily repaired with 25 mm of compacted coldmix. Damages in the road carriageway shall be backfilled with compacted dense graded base and topped with 25 mm coldmix.

Public liability claims

- c. Should any public liability claim be lodged with Council for damages caused by the condition of the roadway and/or footway, Council will not accept liability and any such claims will be forwarded to the applicant.

3.3 Final Restoration of Damages

Controls

- a. Any damages to the public road shall be made good by Council contractors at the completion of the work on the property unless this code provides that the work may be undertaken by the applicant's contractors.
- b. All costs incurred by Council as a result of undertaking the repairs will be deducted from the applicant's security deposit. The rates used when assessing the cost of repair are published in

Council's fees and charges schedule. If the security deposit is insufficient to cover the entire cost of repair any outstanding amount will need to be paid prior to finalisation of the application.

- c. The applicant shall be responsible for all damages resulting from the provision of services to the new work on the property such as telephone, gas, water and the like.

3.3.1 Re-instatement of Concrete Footpaving

Controls

- a. Reinstatement of slabs 1.2 metres in width or less - Where a portion of the footpaving slab is damaged or removed, the entire slab shall be replaced.
- b. Reinstatement of slabs wider than 1.2 metres - Where a portion of the footpath paving is damaged or removed, only the damaged portion need be replaced, provided the broken edge is trimmed parallel to the nearest unbroken edge of the slab and the minimum distance between parallel construction joint is 300 mm. Where any undamaged portion is 300 mm in width or less, such undamaged portion shall be included in the portion reinstated.

3.3.2 Re-instatement of Footway Crossings

- a. Damaged footway crossings into subject property that are to be retained shall be restored by the applicant's contractors. All broken edges shall be trimmed parallel to the nearest unbroken edge of the slab. The minimum distance between parallel construction joint is 1200 mm. Where any undamaged portion is 1200 mm in width or less, such undamaged portion shall be included in the portion reinstated.
- b. Footway crossings into adjoining properties damaged as a result of work undertaken on private properties shall be restored by Council. All efforts will be made to ensure materials and finish match the undamaged portion of the drive. The extent of footway crossing to be removed and replaced shall be determined in the following way (refer also Figure 8.1.05):
 - i. The creation of new construction joints in a footway crossing perpendicular to road alignment will not be permitted; and
 - ii. The section of footway crossing from the back of the gutter crossing to the line of the existing or future footpaving, and the section of footway crossing from the line of the existing or future footpaving to the property boundary.

Where the total width of the section is less than 2400 mm, then the entire section is to be removed and replaced. Where the section is 2400 mm wide or greater and it is possible to remove the damaged portion without leaving a slab less than 1200 mm wide, then a saw cut shall be made parallel with the road alignment and the damaged section of driveway removed and replaced. If it is not possible to prevent leaving an undamaged slab that is 1200 mm then that section of undamaged footway crossing shall be included in the portion reinstated.

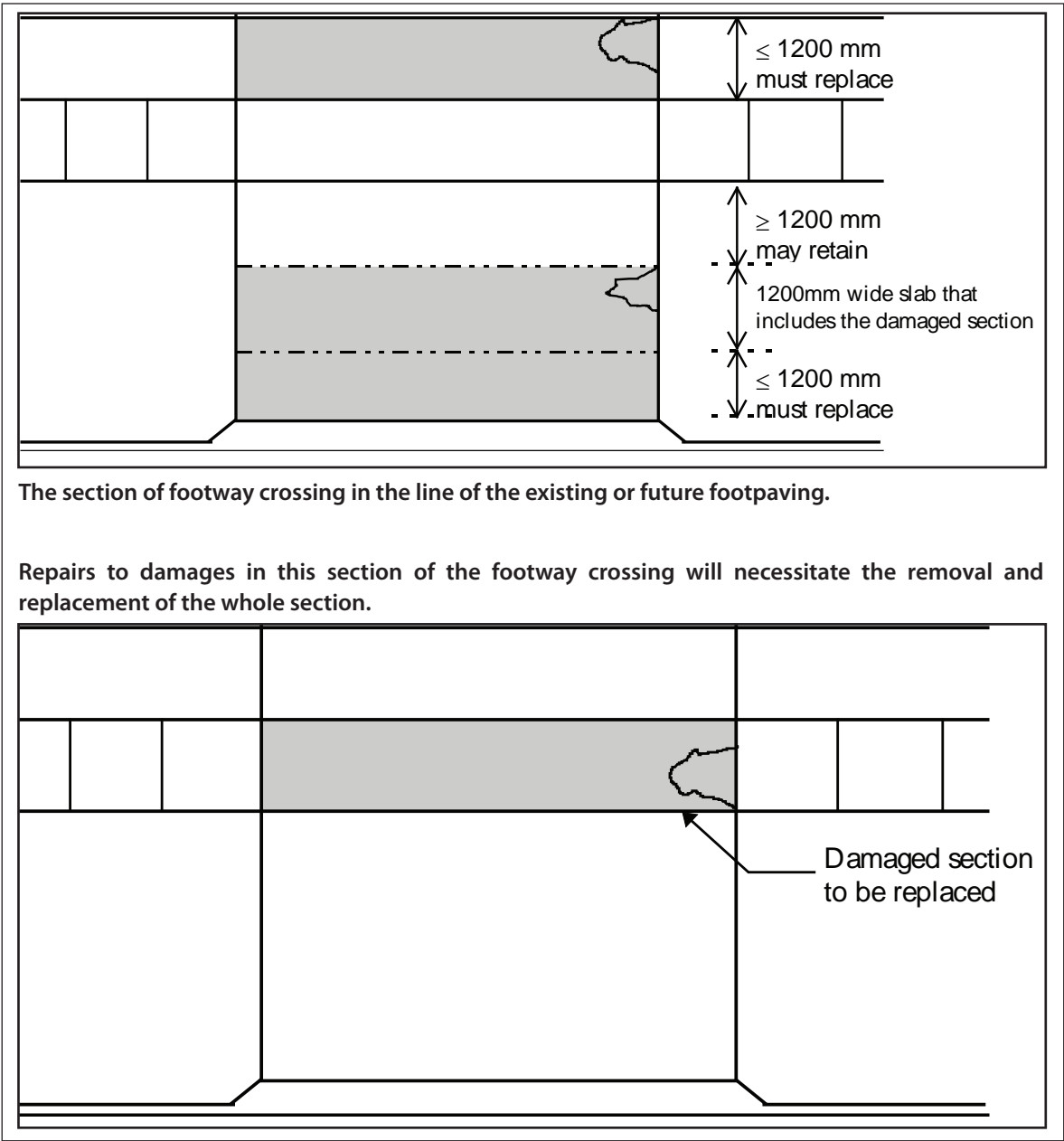


Figure 8.1.05 Requirements in the event of damages

3.3.3 Re-instatement of Grassed Footway

- a. All damaged sections of the grassed footway shall be fully restored by the applicant.

Filling Material

- b. Where filling is necessary, filling shall be clean fill consisting of not less than 70 % granular material and must be free from vegetation, stumps, roots, rubbish, and other deleterious material.

Topsoil

- c. A 75 mm layer of topsoil is to placed over the footway. The topsoil is to contain less than 40 % clay. Clods in the topsoil shall not be greater than 50 mm Ø. The minimum finished grade should be 1%. There should be no localised depressions which may pond, or concentrate rainwater.

Turfing

- d. Couch, Kikuyu and Buffalo turf to match pre-existing turf types at shall be laid over all exposed soil. The applicant shall maintain the turf for two (2) months after laying it. Following the maintenance period, approved topdressing shall be spread to fill minor depressions due to the thickness of turf. The tolerance shall be ± 25 mm provided that the variations in level are not local and are over 2m or more. The applicant shall be responsible at his expense for the replacement of dead turf.

The footway will not be considered satisfactory if:

- i. the finished level of the footway adjacent the kerb is below the top of kerb;
- ii. there is a step down from the any footpaving or driveway crossings to the finished level of the footway;
- iii. there are localised depressions where water may pond or flows may be concentrated; or
- iv. there exists areas of dead turf.

3.3.4 Reinstatement of Kerb and Gutter

- a. Cracks or chips in the kerb will be repaired by the removal and replacement of that section of kerb. The minimum width of kerb removed shall be 1000 mm. The minimum distance between construction joints in the kerb shall be 1000 mm. Where necessary, portions of undamaged kerb adjacent to the damaged section will need to be removed and replaced in order to satisfy these minima.

3.3.5 Reinstatement of Road Pavement

- a. Where the road pavement has been damaged, the minimum width and length of any road removal and restoration is 500 mm. Notwithstanding this, where damages in the public road occur, the applicant will be charged a minimum repair fee corresponding to the fee to restore 1.0 m² of road pavement.

3.3.6 Reinstatement of Drainage Facilities

- a. Where pit lintels, lids or grates are damaged, the complete section shall be replaced. Where drainage conduits are damaged, the complete component shall be replaced and joint reinstatement shall ensure restoration of system integrity.

4.0 SAFETY AND AMENITY

4.1 Safety of Pedestrians and Traffic

Controls

- a. At all times when work is being undertaken within the public road, adequate precautions must be taken to warn, instruct and guide road users safely around the work area.
- b. Traffic control devices shall satisfy the minimum standards outlined in *AS 1742.3-1996 Traffic Control Devices for Works on Roads*.
- c. Careful consideration must be given to the signage of the work site no matter how brief the occupation of the site may be. This should include:
 - i. provisions of adequate warning of changes in the road surface or in driving conditions and of personnel or plant engaged in work on the road;
 - ii. adequate instruction of road users, including pedestrians and cyclists, and their guidance safely through, around or past the work site; and
 - iii. protection of workers.

4.1.1 Traffic Management

- a. Only the minimum practicable length and width of a road shall be closed off at any time and work schedules shall be arranged to minimise:
 - i. disruption of established traffic movements and patterns;
 - ii. interference with traffic at peak movement periods and at night, weekends, holiday period or other special events; and
 - iii. interference with public transport services.
- b. Signs and devices shall not direct a motorist to disobey a law unless an authorised person is present to direct traffic.

4.1.2 Provision for Pedestrians

Minimum footpath widths

- a. At all stages, provision shall be made for pedestrians to pass the work site safely. A footpath width of 2.0 metres should be maintained with an absolute minimum width of 1.2 metres at local constrictions. Where it is necessary to direct pedestrians onto the road carriageway, adequate warning signs and barricades must be provided.

4.2 Minimum road widths

Controls

4.2.1 Local Residential Streets

- a. The minimum roadway width for two-way traffic in a local residential street is 5.5 metres. If this minimum cannot be maintained, the width should be reduced to a maximum of 3.5 metres to ensure vehicles operate in single file under shuttle working conditions.
- b. The need for traffic controllers or other traffic devices to direct traffic shall be determined in accordance within the provisions of *AS 1742.3-1996*.

4.2.2 Other Streets

- a. Safe traffic flow shall be maintained in accordance within the minimum requirements outlined in *AS 1742.3-1996 Traffic control devices for Road Works*.

4.3 Public Liability

Controls

- a. It is the responsibility of the contractor undertaking the work within the public land to ensure adequate signage and other provisions have been made to ensure adequate safety in the vicinity of the work site. Should any public liability claim be lodged with Council for damages caused by the condition of the roadway or footway, Council will not accept liability and any claims will be forwarded to the applicant.

4.4 Security Fences

Controls

- a. Adequate fencing shall be installed around all building sites to restrict unauthorised public access. Generally, this does not apply to building developments consisting of one or two dwellings unless Council assesses that the circumstances require the erection of security fencing.
- b. Council may relax the requirement to provide security fencing if evidence is submitted to support the case that restricting public access would not be of benefit in lessening risk to persons on the site.
- c. Details of the security fencing arrangement must be supplied and approved prior to release of the building application. The detail shall include the location, material and design of any fencing structures to be erected and the time they will be erected.
- d. Where a gate is required, it must not open onto the public road.
- e. Where security-fencing arrangements have been approved by Council, they must remain in place and be maintained through the progress of the work.

4.5 Overhead Protective Structures (Hoardings)

Controls

4.5.1 When they are Required

- a. A overhead protective structure (Hoarding) shall be erected where a building over 7.5 metres in height above the footpath level and within 3.5 metres of the street alignment is being erected or demolished or where the outer part of such a building adjoining a public way is being demolished.
- b. Overhead protective structures are also required when material is being hoisted over or across a public way.

4.5.2 Siting

- a. The structure should not adversely affect pedestrian traffic along existing footpaths and access to or from buildings. Consideration shall be given to ensure sight lines to vehicles entering a public road and using a public road are not unreasonably obstructed by the structure. The structure must not obstruct the view of traffic lights by motorists or pedestrians.

4.5.3 Design

- a. The structure must be designed to meet the standards of the WorkCover Authority as outlined in their publication *Code of Practice - Overhead protective structures*.
- b. The following minimum distances are required for safe access:
 - i. A minimum clear distance of 250 mm from the edge of the kerb to any part of the structure or any part attached to it. If this distance is greater than 400 mm, pedestrian access between the structure and the kerb is to be blocked off at each end;
 - ii. A minimum overhead clearance of 2.2 metres to any bracing, beams or any other part of the structure; and
 - iii. A minimum clear passage width of 2.0 metres along the entire length of the structure.
- c. Where pedestrians have access under the overhead protective structure, the deck is to be made waterproof. Rainfall falling on the structure should be directed to the site.
- d. Access to hydrants or other footpath pits or surface fittings must not be impeded. If the surface fitting or pit is affected, the appropriate service authority must be consulted and their requirements implemented.
- e. The structure must not obstruct pedestrian kerb ramps.

4.5.4 Liability Insurance

- a. Arrangements must be made for a minimum of \$10 million public and professional liability insurance.
- b. Where approval has been given to erect an overhead protective structure, the holder of this approval shall indemnify and keep indemnified the Council against all claims, demands, suits, actions, damages and costs incurred by or made against Council in respect of death or injury to any person or damage to any property of any person whatsoever in any way arising out of this approval.

4.5.5 Fees

- a. Council will charge a fee when the overhead protective structure is erected on public land. The fee shall be calculated on the basis of the length of the structure and the period of time the structure will be on the public footpath.

4.6 Hours of Operation

Controls

- a. All demolition and/or construction and associated work is to be restricted to between the hours of 7 am and 7 pm Mondays to Fridays and between 8 am and 4 pm on Saturday. No work is to be carried out on Sunday or public holidays.
- b. Council may vary these conditions if the applicant provides a formal submission demonstrating that due to the nature of the work being undertaken, or the location of the site, residents in the vicinity of the construction site will not be adversely affected.

4.7 Parking for Construction Vehicles

Controls

- a. Parking of vehicles on the public footpath is an offence under the *Roads Act, 1993*. Both Council rangers and the police are authorised to fine vehicles that contravene the provisions of this Act.
- b. Similarly, parking within a public park is also a finable offence

4.7.1 Construction Parking Zones

- a. Where any building work involving the erection of a building or significant additions to an existing building and restricted parking conditions apply in the public road adjacent the subject property, provision shall be made for the parking of construction vehicles on the property.

Application for construction parking zone

- b. Where it is impractical to provide such parking arrangements the applicant shall apply to Council for the creation of a Construction Vehicle Parking Zone in a suitable location to provide for the parking needs of the site.

Assessment by traffic committee

- c. Construction Vehicle Parking Zone applications are assessed by the Ryde Traffic Committee. The scheduled Traffic Committee meetings are held once every six weeks. It is therefore necessary to submit any application for the creation of a temporary Construction Vehicle Parking Zone well in advance of the desired date of commencement.

Fees for construction parking zone

- d. Where approval for the creation of such a zone is granted, all signs will be erected and removed by Council. A fee will be payable to Council for the creation of the zone calculated on the basis of the length of the parking zone and the period of time the zone will be required. A cash security deposit will need to be paid prior to Council establishing the construction zone. The amount will be based on the cost of the construction parking zone over the estimated time the zone is required plus a 50% contingency bond. At the completion of the job, the actual fee will be calculated and the required amount will be deducted from the deposit with all remaining money being returned to the applicant. If the security deposit is insufficient to cover the fee, the additional outstanding amount must be paid prior to Council finalising the application.

4.8 Trenches and other Excavations within Public Land

Controls

4.8.1 Road Opening Permit

- a. A road-opening permit must be obtained from Council before any trenching or other excavation work is undertaken within a public road, including the footway.
- b. It is the responsibility of each contractor and/or subcontractor wishing to excavate within the road reserve to obtain such a permit. The permit must be held onsite and produced when requested by a Council officer.

4.8.2 Placement of Waste Containers (Skips)

- a. All building waste containers or skips are to be located on private property at all times, wherever practical. The placement of such containers on the public footpath will only be permitted in exceptional circumstances where it is not possible to locate containers on private property. No permit will be issued for building waste containers to be located within the carriageway section of any public road or in any reserve. Application must be made to Council, the fee paid and written approval granted prior to any container or skip being placed on the footpath section of any public road.
- b. A form for "Application for Temporary Placement of Waste Container or Skip on Footpath" is contained in Schedule 1.

4.8.3 Signs and Barricades

- a. The permit holder is responsible for supplying warning signs and barricades for pedestrian vehicular traffic safety to AS 1742.3-1996.

4.8.4 Backfilling and Temporary Restoration

All trenches must be backfilled and compacted in accordance with the standard outlined below:

Roads

- a. The trench is to be backfilled with sand to 100 mm above the pipe/service, followed by dense graded base, compacted in layers of 150 mm thickness and topped with 25 mm coldmix.

Footways Areas

- b. In turfed footway areas the trench is to be backfilled with sand to 100 mm above the pipe/service and compacted. The remainder to be backfilled and compacted with excavated materials. The disturbed area is to be returfed.
- c. Where footpaving is damaged or removed, 25 mm of coldmix is to be placed over the area that is to be compacted in the same manner as the turfed areas.
- d. Council will undertake final restoration of road pavements kerb and gutter and footpaving.

4.8.5 Subsidence

- a. If subsidence occurs in a public area, Council will restore the damage and all costs incurred will be charged to the permit holder.

4.8.6 Public Liability

- a. The permit holder is responsible for maintaining the opening in a safe manner until Council commences permanent restoration works.
- b. Should any public liability claim be lodged with Council for damages caused by the condition of the roadway and/or footway, Council will not accept liability and any such claims will be forwarded to the applicant.

4.8.7 WorkCover

- a. WorkCover guidelines regarding appropriate trenching and excavation procedures shall be followed. Trenches in excess of 1.5 metres depth must be shored.

4.8.8 Stockpiles

- a. Spoil stockpiles and imported backfill materials shall not restrict pedestrian and vehicular movements and appropriate precautions shall be taken to minimise the potential for rainwater to wash soil into the drainage system. These measures shall include, but not be restricted to:
 - i. ensuring soil is not stockpiled within the gutter or other areas of concentrated water flow;
 - ii. sandbag are placed around the stockpile to delineate the extent of the stockpile and redirect water away from the stockpile; and
 - iii. the stockpile is covered to prevent rainwater dislodging sediment particles.

The stockpiling of materials on the public footway will only be permitted in exceptional circumstances and only for the minimum period practicable. The applicant must request in writing and receive prior approval from Council to stockpile material on the public footway, regardless of how long it is intended for the material to remain there.

4.8.9 Loss of On-street Car Parking

- a. Where the work will temporarily reduce the number of available on-street parking spaces on a street where timed parking restrictions apply, Council's traffic engineer must be consulted. Council may impose conditions aimed at minimising the disruption.

4.8.10 Restricting Access to Properties

- a. Whenever, access to a property is to be restricted or otherwise adversely affected, those property owners affected shall be given advanced written notification in accordance with Council's standards on notifications as outlined in this document.

Access to properties must be restored before the end of each working day.

- b. Steel plates must be available on-site during the course of the work to provide temporary vehicular access to affected properties. At all times through the course of the work, the contractor shall comply with all reasonable requests by affected parties to provide temporary vehicular access to a property.

4.9 Services in the Public Road

Controls

4.9.1 Prevention of Damage

- a. During the progress of the works care shall be taken to prevent damage to any public utility; e.g. gas, water, sewerage, electricity or telephone services, etc, and the applicant will be held responsible for any such damage caused by him or his agents, either directly or indirectly.
- b. BEFORE YOU DIG, applicants should telephone "Dial Before you Dig" 1100 to ascertain which utility services are underground in the proposed excavation area.

Enquiries should include details of:

- i. street number and street name
- ii. which side of street
- iii. distance from nearest cross street.

4.9.2 Alterations

- a. All mains, services, poles etc that require alteration shall be altered at the applicants expense to the satisfaction of Council and the authority concerned.

House Services

- b. Where the alteration of a house service is required, it is to be carried out by a suitably experienced trades-person. Twenty-four hours notice shall be to the affected property owner before their service is affected.

Service Mains

- c. In the case of public utility mains, if a main must be raised, lowered or relocated, then the applicant shall be required to liaise with the relevant Authority to organise the alteration and undertake all work to the satisfaction of that Authority.

Surface Fittings

- d. The applicant shall arrange with the relevant authority for the alteration of all surface fittings of all service authorities that are affected by the new finished surface levels.

5.0 NOTIFICATION OF AFFECTED PROPERTY USERS

- a. The applicant is responsible for notifying all property owners when access to their property will be necessarily restricted. A minimum of 48 hours notice shall be given and all endeavours shall be taken to ensure the period of disruption is kept to a minimum.
- b. Where the alteration of a house service is required a minimum of twenty-four (24) hours' notice shall be to the affected property owner before their service is affected.

Such notice must be in writing.

6.0 INSPECTIONS

6.1 Inspections During Construction

Controls

Lines Laid within the Property

- a. A Compliance Certificate for the property drainage system must be obtained following excavation and laying of the pipeline, but prior to backfilling. The accredited certifier shall check the following:
 - i. the size of pipes and pits, the general location of the pipes.

Connections to Council's System

- ii. a Compliance Certificate shall be obtained whenever a connection is made to a Council pipeline once the connection has been made and the pipe or pit grouted smooth but prior to backfilling.

The inspection schedule for drainage systems that will revert to Council ownership will be specified in any development consent associated with the work and will be carried out by a Council Drainage Engineer.

Pipes Within a Public Park

- b. Inspections of pipes laid through a public park must be undertaken:
 - i. immediately prior to any work being done, where the inspector will check the existing state of the park;
 - ii. following excavation and bedding of the pipe but prior to backfilling, where the inspector will check the bedding conditions, size, location and grade of the pipe; and
 - iii. following backfilling and restoration, where the inspector will check the quality of restoration.

6.2 Final Inspection

Controls

- a. Compliance Certificates must be obtained once the stormwater drainage system has been fully constructed and prior to refund of any security deposits confirming that:
 - i. the system complies with the approved plans and the requirements of Part 8.2;
 - ii. the on-site stormwater detention system (if required) will function hydraulically in accordance with the approved design;
 - iii. after completion of all construction and landscaping work, all pits, pipes and other drainage structures, as well as the trunk drainage system immediately down stream of the subject site, have been cleaned of any sand, sediment and debris and all formwork has been removed;
 - iv. the pits, pipes and any detention storage facility are free draining, i.e. they do not allow water to pond;
 - v. a correctly sized orifice has been securely installed in the detention tank/outflow control pit;
 - vi. a removal rust-proof debris screen or cage has been install within the detention tank/outflow control pit;

- vii. the kerb where a new pipe connection has been made has been adequately restored;
- viii. if the system has been directly connected to the trunk drainage system, that the connection complies with Section 4.7 of AS 3500.3 – 1990; and
- ix. where pipes were laid in the public footway footpath paving has been fully restored.

6.3 Overland Flow Inspection by Consultant

Controls

- a. In instances where a development was approved following the submission of a flood study, a suitably experienced and qualified hydraulics engineer must inspect the property following completion of all work and certify that the development has been completed in a manner that is fully consistent with the approved overland flow management strategy.

7.0 WORKS AS EXECUTED DRAWINGS

Controls

- a. **If an above ground storage basin is constructed, a works-as-executed survey of the detention basin will need to be prepared to demonstrate that adequate storage volume has been provided.** Further, a positive covenant will need to be executed and registered against the title of the of the lot containing the above ground basin to require maintenance of the basin in accordance with Council’s standard terms as outlined in Part 8.4 Title Encumbrances in this DCP. This positive covenant must be indicated on any linen plans for subdivision of the development. If no subdivision is proposed, the covenant shall be prepared and lodged with the Land Titles Office prior to finalisation of the development.
- b. Where the built system varies from the approved drainage plans, a Work-as-Executed plan must be prepared. A suitably qualified engineer, experienced in hydraulic design, will need to certify that the constructed system satisfies the requirements of Council as outlined in this standard and submit all calculations used to in leading to this assertion.

8.0 STANDARDS NOT MET

8.1 Property Drainage System

Controls

- a. Where Council standards as outlined in this document have not been met, the unsatisfactory components of the system shall be removed and reconstructed. Council officers will not approve a variation from the approved plan unless the proposed amendments have been shown on a plan submitted to Council and a suitably qualified hydraulics engineer has certified that the amended system satisfies the requirements of Council as outlined in this standard and submits all calculations that lead to this assertion.

8.2 Overland Flow

Controls

- a. Where Council officers do not consider the completed development to be fully consistent with the overland flow management strategy approved by Council, the applicant's consulting engineer will be required to prepare a further submission to Council. This submission shall outline all necessary additional work required on the property to ensure the appropriate management of stormwater through and around the subject property in accordance with the standards outlined in this document. Included with the submission shall be the plans and calculations used to confirm the work will satisfy Council's development standards. Following approval by Council, the work must be undertaken on the subject property prior to Council issuing any certificates or finalising the application. A further inspection of the property is then required in accordance with Section 6.3.

9.0 **IMPORTANT COMMON LAW OBLIGATIONS**

The applicant has obligations at common law not to do any work on their property that will create nuisance on other properties. Any work that involves redirecting, concentrating or increasing the quantity of stormwater runoff over an adjoining property has the potential to create nuisance on that property. This responsibility remains with the property owner and is not transferred to Council or any other party with the approval of stormwater plans for the property or by the undertaking of inspections on the property. The property owners must satisfy themselves that the property improvement will not result in adverse drainage conditions on other properties.

SCHEDULES

Schedule 1 - Temporary Placement of Waste Container or Skip on the Footpath

Applicant's Name:..... Phone:.....

Address:.....

I hereby make application for permission to place a Waste Container on the footpath at the following location:.....

The container will be supplied by -

Name:.....

Address:..... Phone:.....

N.B. If it is physically possible to place the container on private property it is unlikely approval will be granted.

I agree to comply with Council's conditions as set out on the back of this page.

I hereby accept responsibility for any damage caused to footpaths, kerbs and gutter, landscaping or services in the placement or removal of the container.

I hereby undertake to clean up any waste deposited around the container by any person and to dispose of it according to Council requirements.

I hereby provide evidence of Public Liability insurance.

Fee of \$ for a maximum of days is enclosed.

Signed: Date:

Draw a sketch of the property and show exactly where you wish to place the container:

Privacy Notification

In completing this form you will be prompted to supply information that is personal information for the purposes of the Privacy and Personal Information Act 1998. The supply of this information is voluntary. If you cannot provide, or do not wish to provide the information sought, the Council may be unable to process your request. Council is required under the Act to inform you about how your personal information is being collected and used. If you require further information please contact Council's Customer Service Centre on 9952-8222 and ask for an information sheet to be forwarded to you.

1. All building waste containers or skips are to be located on private property at all times, wherever practicable. The placement of such containers on the footpath section of any roadway will only be permitted in exceptional circumstances where it is not possible to locate containers on private property.
2. No permit will be issued for building waste containers or skips to be placed within the carriageway section of any public road or in any reserve at any time.
3. Application must be made to Council and the fee paid and approval in writing granted before any waste container or skip is placed on the footway section of any road.
4. All building waste containers or skips placed on the footway section of any road must have legibly displayed thereon the name, address and telephone number of the supplier and be provided with lights or reflective strips.
5. Containers or skips placed on the footway section of any road must be placed as directed by Council.
6. Companies or individuals supplying containers or skips or the hirers must accept liability for any damage caused to footpaths, kerbs and gutter, landscaping or services in the placement or removal of containers or skips.
7. The design, including the size, shape and colour of any waste container or skip shall be to Council's satisfaction.
8. Any application for placement of waste containers or skips on the footway section of any road shall be accompanied by evidence of a current Public Liability Insurance policy of a minimum of \$5 million.
9. Council reserves the right to order the removal of any building waste container or skip, despite any approval granted, if such container or any activity associated with it causes a nuisance.
10. Putrescible waste or dangerous or hazardous wastes shall not be placed in any building waste container or skip.
11. The supplier or hirer shall agree in writing on the application form that they will bear responsibility for the removal of any waste deposited in or around the building waste container or skip whether by himself or at his direction or by any other person.
12. The applicant for permission to place a waste container or skip on the footway section of a road shall lodge payment with Council at the time of application in accordance with Council's relevant fees and charges

N.B. Council has the power to prosecute persons placing building waste containers or skips in any part of a road (including footpaths/nature strips) or any reserve contrary to the above conditions or if placed without permission.

Council may remove any containers or skips which are placed in dangerous situations or which are a nuisance or impede traffic or pedestrians.

Application Approved by Authorised Ranger: Signed _____
Date _____

Schedule 2 - Certification form for installation of Sediment and Erosion Controls

City of Ryde

Certification for the Installation of Sediment & Erosion Controls

Property Address:

Development Application Number:

I hereby certify that I have inspected the subject property and to the best of my knowledge, appropriate erosion and sediment control measures have been correctly installed on the site in accordance with the approved Sediment Control Plan.

Applicants Name:

Signature: Date:

Phone Number: Mobile:

Should Council require any further information regarding the installation or maintenance of the controls, please contact:

Contact Name:
(Builder, Contractor, Owner etc)

Company Name:

Address:

Phone Number: Mobile:

Privacy Notification

In completing this form you will be prompted to supply information that is personal information for the purposes of the Privacy and Personal Information Act 1998. The supply of this information is voluntary. If you cannot provide, or do not wish to provide the information sought, the Council may be unable to process your request. Council is required under the Act to inform you about how your personal information is being collected and used. If you require further information please contact Council's Customer Service Centre on 9952-8222 and ask for an information sheet to be forwarded to you.



City of Ryde
Civic Centre
1 Devlin Street
Ryde NSW 2112

www.ryde.nsw.gov.au

City of Ryde Development Control Plan 2014

Part: 8.2 Stormwater and Floodplain Management

Translation

ENGLISH

If you do not understand this document please come to Ryde Civic Centre, 1 Devlin Street, Ryde Monday to Friday 8.30am to 4.30pm or telephone the Telephone and Interpreting Service on 131 450 and ask an interpreter to contact the City of Ryde for you on 9952 8222.

ARABIC

إذا لم تفهم هذا المستند، يرجى الحضور إلى مركز بلدية رايد Ryde Civic Centre، 1 Devlin Street، Ryde على العنوان: من الاثنين إلى الجمعة بين الساعة 8.30 صباحاً والساعة 4.30 بعد الظهر، أو الاتصال بمكتب خدمات الترجمة على الرقم 131 450 لكي يتصلب من أحد المترجمين الاتصال بمجلس مدينة رايد، على الرقم 9952 8222، نيابة عنك.

ARMENIAN

Եթե այս փաստաթուղթը չէք հասկանալ, խնդրեմ եկե՛ք՝ Բայքըր Սիվիկ Սենթրը, 1 Տեվլին փողոց, Բայքըր, (Ryde Civic Centre, 1 Devlin Street, Ryde) Երկուշաբթի՛ն և Երեքշաբթի՛ն կառ. ժամը 8.30 – 4.30, կամ հեռաձայնեցե՛ք Հեռաձայնի եւ Թարգմանության Ապաստանության՝ 131 450, եւ խնդրեցե՛ք որ թարգմանիչ մը Բայքըր Թաղապետարանին հետ կապ հաստատի ձեզի համար, հեռաձայնելով՝ 9952 8222 թիվին:

CHINESE

如果您看不懂本文，請在周一至周五上午 8 時 30 分至下午 4 時 30 分前往 Ryde 市政中心詢問 (Ryde Civic Centre, 地址: 1 Devlin Street, Ryde)。你也可以打電話至電話傳譯服務中心，電話號碼是: 131 450。接通後你可以要求一位傳譯員為你打下電話和 Ryde 市政廳聯繫，電話是: 9952 8222。

FARSI

اگر این مدرک را نمی فهمید لطفاً از 8.30 صبح تا 4.30 بعد از ظهر دوشنبه تا جمعه به مرکز شهرداری رايد، Ryde Civic Centre, 1 Devlin Street، Ryde مراجعه کنید یا به سرویس مترجم تلفنی شماره 131 450 تلفن کنید و از یک مترجم بخواهید که از طرف شما با شهرداری رايد شماره 9952 8222 تلفن یزند.

ITALIAN

Se non capite il presente documento, siete pregati di rivolgervi al Ryde Civic Centre al n. 1 di Devlin Street, Ryde, dalle 8.30 alle 16.30, dal lunedì al venerdì; oppure potete chiamare il Telephone Translating and Interpreting Service al 131 450 e chiedere all'interprete di contattare a vostro nome il Municipio di Ryde presso il 9952 8222.

KOREAN

이 문서가 무슨 의미인지 모르실 경우에는 1 Devlin Street, Ryde 에 있는 Ryde Civic Centre 로 오시거나 (월 – 금, 오전 8:30 – 오후 4:30), 전화 131 450 번으로 전화 통역 서비스에 연락하셔서 통역사에게 여러분 대신 Ryde 시청에 전화 9952 8222 번으로 연락을 부탁하십시오.

Amend. No.	Date approved	Effective date	Subject of amendment
1	26 May 2015	3 June 2015	Content of DCP revised and consolidation with 8.6 Floodplain Management

Contents

1.0	Introduction	4
1.1	Land to which this Part applies	4
1.2	Purpose	4
1.3	Objectives	4
1.4	Document Structure	4
1.5	Relationship with other Plans and Manuals/Guides	5
1.6	Dictionary	5
2.0	STORMWATER DRAINAGE	6
2.1	Drainage Principals	6
2.2	Property Drainage	6
2.3	Stormwater Discharge from Property	7
2.4	Community Stormwater Management	12
3.0	WATER SENSITIVE URBAN DESIGN	14
3.1	General	14
3.2	WSUD – Where does it apply	14
3.3	WSUD Controls	14
4.0	FLOODING AND OVERLAND FLOW	16
4.1	General	16
4.2	Flood Risk and Development	16
4.3	Terms and definitions	18
4.4	Flood Affected Objectives and Controls	18

1.0 Introduction

This Part shall be read in conjunction with Council's Stormwater and Floodplain Management Technical Manual and Water Sensitive Urban Design Guidelines. The Technical Manual and Guidelines have been created to provide additional detailed information to assist in the implementation of the objectives of City of Ryde Development Control Plan 2014 ("DCP") and must therefore be read in conjunction with the DCP. For the avoidance of doubt, the Technical Manual and Guidelines form part of the DCP.

1.1 Land to which this Part applies

This Part applies to all land within the City of Ryde. A section of the document has specific relevance to flood effected areas.

1.2 Purpose

The purpose of this Part is to guide development with respect to:-

- the management of stormwater runoff in terms of drainage and
- land susceptible to flooding or overland flow within the City of Ryde

1.3 Objectives

The overall objectives of this Part and associated Technical Manual are as follows;

- To ensure that the collection and conveyance of stormwater from development is undertaken in a safe manner without adverse impact to property or public safety and does not adversely impact downstream conditions.
- To minimise or prevent degradation of the environment from stormwater drainage systems, by implementing water sensitive urban design (WSUD) principals.
- To ensure that development is designed with consideration for overland flows and/or flooding that may potentially occur during large storm events, so as to minimising property damage and maintain public health and safety

1.4 Document Structure

This document has four sections which cover the components of managing stormwater drainage, flooding/overland flow when undertaking development in the City of Ryde.

An outline of these sections is as follows:

Section 1: Introduction	An introduction to the intent of the DCP, its structure and application to development proposals.
Section 2: Stormwater Drainage	Describes the requirements for stormwater drainage, in terms of collecting and controlling stormwater runoff to an approved point of discharge.
Section 3: Water Sensitive Urban Design	Describes requirements to ensure that the design of a stormwater drainage system integrates whole water cycle management considerations.
Section 4: Flooding and overland flow	Describes the requirements for development on land susceptible to significant overland flows or flooding during large storm events.

1.5 Relationship with other Plans and Manuals/Guides

This Part supplements and gives guidance to the objectives and controls of Ryde Local Environmental Plan 2014 (RLEP 2014).

This part is to be read in conjunction with:

- Stormwater and Floodplain Management Technical Manual
- Water Sensitive Urban Design Guidelines
- Eastwood and Terrys Creek Floodplain Risk Management Plan and Study (2009)
- Macquarie Park Floodplain Risk Management Plan and Study (2011)
- City of Ryde - Water Sensitive Urban Design Vegetation Selection Guide
- Floodplain Development Manual 2005

1.6 Dictionary

In regards to the definition of terms used in this Part refer to Councils DCP 2014 Part 10 Dictionary.

2.0 STORMWATER DRAINAGE

2.1 Drainage Principals

Development affects the natural drainage patterns of land. It is critical then that development affecting the existing stormwater runoff regime is undertaken in a manner that does not negatively impact on neighbouring properties, the public drainage network or increase the threat to public safety.

This section seeks to ensure that the management of stormwater from development is not detrimental to downstream areas and does not burden the public drainage network.

The following subsections address the principles of drainage system design associated with achieving Council's objectives for stormwater management. These are;

- Section 2.2 – Property Drainage i.e. Stormwater management on the property
- Section 2.3 – Stormwater Discharge from Property i.e. Means of stormwater discharge from the property.
- Section 2.4 – Community Stormwater Management i.e. Control of stormwater discharge to the public drainage system.

2.2 Property Drainage

OBJECTIVE

1. To ensure the collection and conveyance of stormwater runoff on property is undertaken in a manner to preserve the amenity of the land, prevent damage to property and without jeopardising public safety.

CONTROLS

Property drainage systems are to be designed to collect and convey stormwater runoff from the property so as to prevent damage to private property (the subject site as well as neighbouring property), reduce long term ponding and to improve the amenity of the site after storm events or during periods of rainfall. All of the following needs to be implemented:-

- a. Stormwater runoff draining from impervious/ hardstand areas must be collected and conveyed via pipe or an engineered open channel to a discharge point in accordance with this Part and the Stormwater and Floodplain Management Technical Manual
- b. Stormwater runoff from soft landscaping or turfed areas should be conveyed to a discharge point in accordance with this Part and the Councils *Stormwater and Floodplain Management Technical Manual* or otherwise dealt with in a manner to mimic state of nature conditions and avoid long-term ponding.
- c. The property drainage network must be designed with sufficient capacity to safely convey stormwater run-off generated from design storm events listed in the *Stormwater and Floodplain Management Technical Manual*.
- d. Stormwater runoff, including overland flows entering the site from upstream properties, must be managed to provide fail-safe protection to buildings, properties and persons either on private property or in the public domain.

- e. Where a multi dwelling housing development is proposed on a site that consolidates two or more lots and any adjoining upslope properties do not have the benefit of a drainage easement, the development must be designed to potentially accommodate a new drainage easement benefitting upstream properties.
- f. The design and location of all drainage components must be visually unobtrusive and integrated with site landscaping to ensure they do not detract from the streetscape appearance of the development.

NOTE: Information to be submitted with a Development Application

- All development which affects the impervious footprint of the site or changes to landform, must demonstrate by way of a conceptual plan prepared in accordance with Section 3 of the Stormwater and Floodplain Management Technical Manual, the proposed means of the collection and conveyance of stormwater from the site, so as to demonstrate that stormwater management satisfies this Part.
- Development which is intended to utilise the existing drainage system, must submit documentation prepared by a suitably qualified person, demonstrating that the existing system is compliant with the Ryde DCP controls or otherwise detail the means to rectify the system to make it comply.

2.3 Stormwater Discharge from Property

Property drainage systems should ideally implement a gravity fed stormwater management system, which will eventually direct stormwater runoff to the lowest point of the site. Ideally the property drainage system should then seek to discharge to the public drainage network, comprised of either public drainage infrastructure (kerb and gutter, stormwater channels) or natural watercourses (streams and creeks).

OBJECTIVE

1. To ensure that the discharge of a stormwater runoff from property is undertaken in a controlled and sustainable manner that is not detrimental to downstream areas.

NOTE: *Schedule 1 Overview of Discharge points* provides guidance as to selecting an appropriate stormwater discharge point.

2.3.1 Preferred Discharge Point – Public Drainage Network or Natural Watercourse

The following controls only apply to property drainage systems which are to discharge to the public drainage network or natural watercourse.

CONTROLS

- a. Stormwater runoff from property must be directed to either public drainage infrastructure, a natural watercourse or public reserve under gravity feed wherever possible, with the point of connection designed in accordance with Section 1.4.1 of the *Stormwater Technical Manual*.
- b. Stormwater discharge from multi-residential dwellings, commercial, retail and industrial development on sites greater than 1000m² and within 30 metres of in-ground public drainage infrastructure, must extend this drainage infrastructure to the site, so as to enable a direct connection be made to this infrastructure.

- c. For sites that fall to a public reserve and are within 30m. of public drainage infrastructure, a direct connection to this must be made and will require the extension of the infrastructure to the site, unless an exemption is granted by Council after consideration of the scope of development relative to the cost of the exercise as well as construction logistics and affectation to the reserve.

NOTE: If to achieve the above controls it is necessary for a property to drain over a neighbouring property, it will be necessary for a private drainage easement to be acquired (see 2.3.2 Private Drainage Easements)

2.3.2 Private Drainage Easements

The term “easement” refers to a portion of land on a property in which a separate person/ party (not the owner) has a right to utilise for a specific purpose, such as for the purpose of drainage. To obtain a drainage easement typically warrants an offer of compensation to the property owner burdened by the easement.

CONTROLS

- a. Where development is to utilise an existing private drainage easement to drain, proof of the right to drain through the easement and clarification of the infrastructure in the easement (or works required to accomplish this) must be presented prior to consent to ensure the means of drainage is viable.
- b. Where a new private drainage easement must be established to legally convey stormwater runoff through a downstream property to a preferred discharge point, a private drainage easement must be obtained. Refer to Section 1.6 of the *Stormwater Technical Manual* in relation to this process.

NOTE: Where the subject property falls towards private property, there is great potential for stormwater runoff to impact downstream lots. To safely convey stormwater runoff a drainage easement is required so as to enable the legal right to drain stormwater over the downstream property. Should exemption be granted for the need to acquire a new easement, the requirements of alternative discharge points are as specified in Section 2.3.3.

2.3.3 Alternative Discharge Points

It is acknowledged that the process of acquiring an easement can be costly in terms of time and money, and is an onerous exercise for minor development. For some types of minor development alternate discharge points maybe considered.

Table 2.3.below specifies the conditions of exemption from having to establish a private drainage easement for given development types.

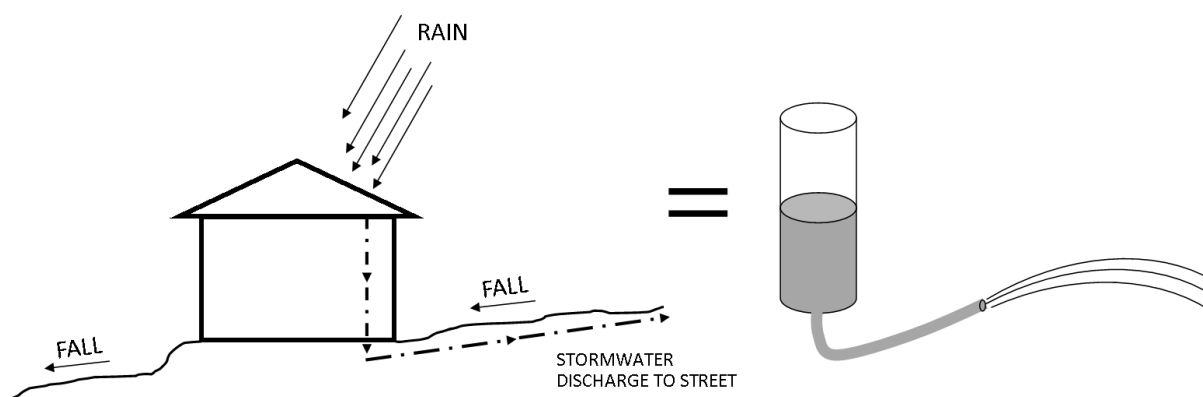
DEVELOPMENT TYPE	CONDITIONS OF EXEMPTION
Residential - Alterations and additions	<ul style="list-style-type: none"> Residential alterations and additions will not require the acquisition of a drainage easement unless 75% of the permissible building footprint is altered, in which case the development will be considered as a new dwelling.
Residential - New Dwellings/ Dual	<ul style="list-style-type: none"> An attempt must be made to acquire a drainage easement through the site. Evidence must be provided that a formal request, with

Occupancies	<p>monetary offer, has been undertaken to acquire an easement through the downstream property(ies).</p> <ul style="list-style-type: none"> • The request must include a reasonable monetary offer of compensation. • Exemption from having to acquire an easement and the utilisation of an alternative means of stormwater disposal will be considered provided that a written refusal from the downstream property owner(s) be provided OR evidence by way of a Statutory Declaration that more than 3 attempts has been made to contact the owner, yet they have not responded to the request. • This process is detailed in Section 1.6 of the <i>Stormwater Technical Manual</i>.
Institutional Development (Schools) AND landscaped/ rural lots	<ul style="list-style-type: none"> • Where the lowest portion of development is distanced more than 100m from the downstream property, alternative discharge points may be considered.
Commercial, Industrial AND Multi-residential development.	<ul style="list-style-type: none"> • None. The scope of development is such that a private drainage easement must be obtained.

TABLE 2.3 – Conditions of exemption from having to acquire a private drainage easement.

2.3.3.1 Alternative Discharge Points– Charged or siphonic systems Control

Charged or siphonic systems operate by the weight of water in the drainage system, pushing water against gravity to the point of discharge. A simplified view of a charged system is as below.



Use of a charged/ siphonic system for drainage of low level properties is not an ideal solution for the following reasons;

- The system is unable to drain areas below the point of discharge.
- Failure of the system (e.g. due to blockage, large storm events, etc) will result in stormwater runoff going downhill, away from the discharge point. This may be adverse for properties downstream.
- Piping of stormwater runoff against the natural fall of the land may redirect stormwater runoff outside the natural catchment area. This can exacerbate flooding impacts in the receiving catchment.
- The system has higher maintenance requirements in comparison to a typical drainage stormwater system.

CONTROLS

- a. The use of charged or siphonic system as a primary means to drain a development will not be permitted unless the development satisfies the conditions for exemption from having to acquire a private drainage easement in Table 2.3.

NOTE: The use of charged systems for directing stormwater runoff to onsite detention or rainwater storage tanks is acceptable provided the failure mode of the system is accounted for (e.g. any stormwater flows surcharging from the piped system can be directed to the discharge point by grading the land, structures or channels).

- b. All components of the charged/ siphonic systems must comply with the design requirements stated in Section 1.3.6 of the *Stormwater and Floodplain Management Technical Manual*.
- c. Charged drainage systems must be designed so as to not extend beyond the boundaries of the property.
- d. Titles of encumbrance must be placed on all charged/siphonic systems to ensure these drainage systems are maintained and will operate as designed.

2.3.3.2 Alternative Discharge Point – Absorption/ onsite disposal systems

The use of absorption /onsite disposal systems generally involve discharging stormwater runoff to a large trench/ pit below ground level, to facilitate stormwater flows to infiltrate into the soil or mimic natural stormwater runoff in locations where the system is intended to surcharge.

Absorption or infiltration pits are not an ideal solution for drainage as they can have the following impacts.

- A majority of the Ryde Council area have soil conditions unsuitable for this type of system in that they have low infiltration rates (meaning they are poor at absorbing stormwater) and areas at risk of slope instability.
- Absorption systems have limited ability to accommodate stormwater runoff from large storm events and will disperse these flows over the downstream area.
- Absorption systems alter groundwater conditions which can cause structural issues in adjoining buildings and result in nuisance seepage flows downstream, days after a storm event.

For these reasons, drainage to such systems should be used sparingly.

CONTROLS

- a. Absorption/ onsite disposal system will only be permitted as a primary means to drain development unless the development satisfies the conditions for exemption

from having to acquire a private drainage easement stated in the Table 2.3 OR where the development falls to a Park/ Reserve and discharge to public drainage infrastructure cannot be undertaken or an exemption from doing so has been granted by Council.

- b. The design of the absorption system must comply with the design requirements stated in Section 1.3.5 of the *Stormwater Technical Manual*.
- c. The use of absorption and onsite dispersal systems is not permitted in locations marked by Council as being classified as “High Risk” in terms of slope stability.
- d. The use of a absorption/ onsite disposal system on sites located in lower risk slope stability areas (classed as M1, M2 and M3a by Council) may be permitted, subject to the submission of a geotechnical report demonstrating that the proposed absorption system can be implemented without deleterious impacts.
- e. Absorption systems can be used where the impervious site coverage does not exceed 35% of the site. Site coverage ratios of up to 40% may be permitted provided an onsite detention system (OSD) is incorporated prior to the discharge point. For sites located in an OSD exempt area as marked on the “Ryde Catchment Map” – Appendix 4 of the Stormwater and Floodplain Management Technical Manual, an equivalent sized rainwater tank surplus to BASIX requirements will be required.
- f. Absorption systems must be located as far as practical from structures downstream, providing a minimum 5 m. clearance from downstream boundaries and 3 m. clearance from structures or hardstand areas. For onsite dispersal systems, this may be reduced to 2 m. clearance from a boundary which backs onto a public reserve.
- g. Titles of encumbrance must be placed on the absorption system to ensure it is maintained and will operate as designed.

2.3.3.3 Alternative Discharge Point – Pump / Sump systems

Pump/ sump systems are a mechanical means to convey stormwater runoff to a suitable discharge point. It is the least preferred of the alternative systems for the following reasons;

- Pumps are reliant on electrical power to operate, which typically fails during a storm event.
- As they rely on an external energy source, they are not an environmentally sustainable form of development.
- It has a finite and limited rate in the disposal of stormwater.
- Such systems are difficult to cater for failure of the system as sumps are usually located in the lowest point in the site, typically in a basement garage.
- Requires ongoing maintenance to function up to the design specifications.

Accordingly pumps are suitable only to drain seepage or minor amounts of stormwater runoff to basement parking areas.

CONTROLS

- a. Pump/ sump systems are permitted only for the disposal of stormwater runoff in basement level car parks and driveways leading to those areas.

- b. The design of pump/ sump systems must be in accordance with Section 1.3.7 of the *Stormwater Technical Manual*.
- c. Charged or rising mains from the pump system must not extend beyond the boundary of the site.
- d. Titles of encumbrance must be placed on the pump/ sump system to ensure it is maintained and will operate as designed.

2.4 Community Stormwater Management

Development in the City of Ryde Council area has experienced significant growth in the last half-century and correspondingly the volume and rate of stormwater runoff from developed areas to the public drainage network have escalated over this time. This has been exacerbated by flooding issues throughout the area and placed a greater burden on the public drainage network. The following aerial images demonstrate the scale of development the area has undergone.



Ryde 1943



Ryde 2012

To counter the effects of development, Council has adopted an onsite detention policy which seeks to reduce the *rate* of stormwater runoff discharged to the public drainage network from development, consistent with the pre-developed, state of nature conditions of the catchment area.

Onsite detention (OSD) is a component of the property drainage system which *restricts* the rate of runoff from the site, mimicking state-of-nature conditions. As the rate of water exiting the system is less than the rate of watering entering, OSD systems require rainwater storage to buffer rainwater flows.

OBJECTIVE

1. To ensure that the collective impact of stormwater runoff from development to the public drainage network and waterways, in terms of environmental impacts and capacity to convey stormwater, is minimised or prevented wherever possible.

CONTROLS

- a. Onsite stormwater detention must be incorporated in the property stormwater drainage system for all development unless the development can satisfy a condition of exemption as listed in Section 1.4.1 of the *Stormwater and Floodplain Management Technical Manual*.

- b. The design of the onsite detention component must comply with the requirements specified in Section 1.4 of the *Stormwater and Floodplain Management Technical Manual*.
- c. All stormwater runoff from impermeable areas must be routed through the onsite detention system where possible. Where this cannot be readily achieved, the design of the onsite detention must be revised to compensate for the uncontrolled discharge utilising the method stated in the *Stormwater Technical Manual*.
- d. Below ground onsite detention system storages located at the front of the site must be located under driveway and vehicle access ramps where possible.
- e. Titles of encumbrance must be placed on all on-site detention systems.

3.0 WATER SENSITIVE URBAN DESIGN

3.1 General

Water Sensitive Urban Design (WSUD) is an element of stormwater management which seeks to reduce the environmental impact of drainage systems and integrate water cycle management and promote onsite reuse to reduce development impacts.

Traditional stormwater drainage system design sought to dispose of stormwater from a property as efficiently, fast and as cost effective as possible. Such approaches can be detrimental to the receiving waterways. This practise was also contrary to sustainable development practises by not recognising water as a valuable resource.

3.2 WSUD – Where does it apply

It is acknowledged that the pro-active implementation of WSUD principals may not be practical or cost effective for smaller development. With this in mind, the following controls only apply to;

- Development on land located in a mixed use business zone or industrial zone if the development is greater than 1,500 m² in gross floor area. This will include residential flat buildings and mixed use developments
- Development on land for SP2 Infrastructure such as schools, hospitals and other institutions, greater than 1,500 m² floor area.
- Above-ground carparks accommodating more than 50 carspaces.
- Land subdivisions resulting in the creation of 5 or more lots.

OBJECTIVES

1. To ensure that the quality of stormwater discharged to the public drainage network as a result of development is such that it will not be detrimental to receiving waters.
2. To encourage stormwater treatment and water capture measures which can integrate into the landscape so as improve the visual amenity, aid the natural environment and enhance public space areas.
3. To reduce potable water demand via the reuse of stormwater runoff.

3.3 WSUD Controls

3.3.1 Stormwater Quality

CONTROLS

- a. All development applicable under this section must prepare a Water Sensitive Urban Design Strategy Plan (WSUD Strategy Plan) which is to contain, but is not limited to, the following items plus be in accordance with Council's document, *"Water Sensitive Urban Design Guidelines"*.

- Stormwater Management plan of the site and proposed development marked with constraints and opportunities.
 - Details of the treatment methodology for achieving the stormwater quality targets specified in control (b) with due consideration for the constraints and opportunities of the site noted above. All measures must be located on the property.
 - Describe how the treatment methodology will integrate with the urban design.
 - An analysis of non-potable water demand for the proposed development.
- b. WSUD measures incorporated into the development must satisfy the following pollutant target controls;

WSUD Stormwater Quality Performance Targets

Gross Pollutants	90%
Total Suspended Solids	85%
Total Phosphorus	60%
Total Nitrogen	45%

- c. All treatments are to be located inside the confines of the property.

3.3.2 Water harvesting and reuse

Water supply can vary with weather conditions and therefore can be considered a finite and valuable resource. Accordingly the ability to implement water reuse facilities should be sought wherever possible.

CONTROLS

- a. All development applicable under this section that does not require a BASIX certificate, must provide a rainwater tank to meet greater than the 50% of non-potable water demand.
- b. Water use within open space areas of the development (for uses such as irrigation, ponds and water features, etc) must be supplied from sources other than potable water. This may include rainwater storage tanks or treated grey-water, to meet 80% of the water use demand.

4.0 FLOODING AND OVERLAND FLOW

4.1 General

In accordance with the City of Ryde LEP 2014 and the NSW Floodplain Development Manual (2005), Council is required to consider the impacts of flooding and overland flow in the assessment of development in flood affected areas. The primary objective of State policy is:

“to reduce the impact of flooding and flood liability on individual owners and occupiers of flood prone property, and to reduce private and public losses resulting from floods, utilising ecologically positive methods wherever possible.”

The following section seeks to ensure development and future occupants are appropriately protected from the impacts of stormwater inundation on land identified as being **flood affected** as defined under LEP 2014 clause 6.3 *Flood planning*.

i.e.

- (a) land identified as “Flood Planning Area” on the Flood Planning Map, within Ryde LEP 2014 and
- (b) other land at or below the flood planning level.

4.2 Flood Risk and Development

Development requirements and controls under this section are based on:-

- the exposure to flood risk (i.e. type of development and land use) and
- the level of flood risk (flood hazard) within flood affected areas.

4.2.1 Development and Land Use Categories

Development types have been separated into the following categories based on the ramifications of such development to flood risk that a property is exposed to.

- Landform Development (retaining walls, fencing, swimming pools)
- Carparking Areas (Any development where parking is a component for consideration)
- Concessional Development (residential alterations and additions, minor works or change of use)
- Residential Development
- Retail, Commercial & Industrial Development
- Recreation & Non-urban Development
- Sensitive Uses & Facilities
- Critical Uses & Facilities

Criteria of development types are listed in Schedule 2 of this Part and the controls listed in Section 4.4 are to be applied relative to these categories.

4.2.2 Flood Risk (flood hazard) within flood affected areas

In accordance with the NSW Floodplain Development Manual, flood levels are determined from the 100yr ARI (Annual Recurrence Interval) storm event.

Council has identified locations subject to flooding and major overland flows, based on the catchment data and historical records and is in the process of mapping flood affectation

throughout the area. For areas where this has been completed, site specific flood information can be obtained and must be utilised when developing the property. It is advised to contact Council in regards to clarifying whether flood information is available.

In locations where flood level information is not available from Council, flood risk levels specific to the site will need to be estimated. For minor development, it is acknowledged the cost of obtaining this information is relatively high in comparison to the cost of works. As such, Council has implemented provisions to be undertaken in the design of the development and preparation of the Flood Impact Statement for concessional development.

The level of flood risk is basically a product of flood depth and the velocity of flow and can be categorised as follows.

High Flood Risk	Areas where there is a potentially catastrophic damage to property, risk to life, evacuation problems or where development would significantly or adversely alter flood behaviour. Most development is restricted in these locations.
Medium Flood Risk	Areas whereby there would be potential flood damage or public safety is a concern but could be addressed by the application using appropriate measures.
Low Flood Risk	Land within the floodplain (i.e. within the extent of the probable maximum flood) but not identified as either High Flood Risk, Medium Flood Risk Precinct or as an Overland Flow Precinct.
Overland Flow Precinct	Areas identified as Overland Flow Precincts are distant from watercourses where shallow inundation (relative to major flooding) occurs following heavy rain. Typically the depth of inundation will be less than 0.3 m to 0.5 m but more than 0.1 m to 0.2 m in a 100 year ARI event.

Localised overland flows attributed to stormwater runoff on the site itself must be taken into consideration. Minor overland flow depths may typically be around 50mm to 100mm and, whilst they do not present great risk to development, must meet the minimum development control requirements to ensure there is adequate protection from any stormwater inundation.

4.3 Terms and definitions

Terms and references used in this Section are defined as follows:-

freeboard – An additional level difference applied above the flood level, and is considered a factor of safety to account for any debris or unaccounted changes in the landform which may affect flood levels. For development which is suspended above flood waters and major overland flows, the freeboard is to be taken from the underside of the structure.

- *Habitable* – Floor areas which are furnished or provide dry storage of goods. Inundation of these areas would result in a great loss of amenity and property damage to the development.
- *Non-Habitable* – Enclosed or partially open floor area which is not the above.
- *ARI* – Average Recurrence Interval, represents flood magnitude and potential likelihood.
- *PMF* – Probable Maximum Flood, the largest flood that could conceivably occur at a particular location.

4.4 Flood Affected Objectives and Controls

OBJECTIVES

1. To ensure that development on land affected by flooding and overland flow is undertaken in a manner which provides for the safety of occupants of that development as well as minimise damage to private property, during such flooding events.
2. To ensure essential services and land uses are designed with respect to potential flooding and overland flow risks.
3. To ensure development does not exacerbate flooding on other properties.
4. To ensure flood protection measures are sympathetic to the streetscape and relationship of the building to the street, do not have other adverse environmental impacts

4.4.1 Development in the Flood Planning Area

CONTROLS

- a. For all development that is flood affected, a Flood Impact Statement must be submitted to Council. The Flood Impact Statement is to be prepared in accordance with Section 2.2 of the *Stormwater and Floodplain Management Technical Manual* and is required to address the various controls related to the following development types.

4.4.2 Carparking Areas

Carparking is typically located in areas either exposed to the weather or in below ground areas at risk of flooding. Accordingly the potential for property damage is great, not only to vehicles but also floating vehicles carried by overland flows, and jeopardise public safety.

CONTROLS

- a. To minimise property damage, the following finished surface levels must be attained for new parking areas;

- For open parking areas, no less than the 100yr ARI flood level.
 - For enclosed parking areas, the parking area must be no less than the 100yr ARI flood level plus 150mm freeboard.
 - Basement parking or parking at levels below the adjacent flood levels, a bunded crest at the estimated PMF (probable maximum flood) level prior to descent into the parking area, must be provided such that inundation of the area is prevented.
 - For new parking areas associated with concessional development, parking areas are to be elevated to habitable floor level.
- b. New parking areas must not divert overland flow or reduce flood storage such to adversely impact the surrounding area.
 - c. Large open parking areas (greater than 10 carspaces) must provide adequate restraints or barriers to prevent vehicles leaving the site up to the 100yr ARI flood event.
 - d. The utilisation of existing parking areas must not result in the increased risk to property damage or threat to public safety.

4.4.3 Landform Development

Alterations to the landform, which includes the addition of retaining walls and fences, in the regions of floodwaters and major overland flows can have adverse impacts for neighbouring properties in terms of higher floor levels or diverted flows.

CONTROLS

- a. For landform development exposed to Low Risk and above Flood Risk Category (or where this is not known, the indicative extent of inundation on Councils mapping system) the following must occur
 - i. Fences are permeable, open or otherwise a frangible structure, such to permit the conveyance of floodwaters below the 100yr ARI flood event. In the event the flood level is unknown, 200mm above ground level is to be adopted.
 - ii. The face of retaining walls, pools or garden beds aligned towards overland flows are no greater than 200mm in height, unless it can be demonstrated such a structure will not have an adverse impact to the surrounding area by way of a Flood Impact Statement.

4.4.4 Concessional Development

The scale of this type development is minor i.e. it does not greatly extend the life of the development or structure to be retained.

Development under this category includes;

- Alteration and additions to a single residential or dual occupancy dwelling. This does not apply to major alterations which would effectively result in a new dwelling.
- Change of use for an industrial/ commercial/ retail floor area which does not result in increased risk of property damage or jeopardise public safety.

- Construction of a non-habitable outbuilding associated with single residential or dual occupancy development.

CONTROLS

- Concessional development must not, jeopardise the degree of protection from inundation afforded by existing development on the site nor increase the risk to public safety.
- Floor levels of *habitable* and *non-habitable* areas must comply with the freeboard requirements as stated in Table 2.1 of the *Stormwater Technical Manual*. Where flood level information cannot be obtained from Council or otherwise, *habitable* floor levels must provide a freeboard above the natural ground level no less than the maximum pre-developed equivalent OR coinciding with the existing habitable floor level within the existing footprint, subject to consideration of the Flood Impact Statement under the concessional provisions for this component (Floor Levels).
- Extension of the existing building footprint which is exposed to flood waters, or if the extent of flooding is unknown, must be designed and constructed such to allow for the passage of overland flow underneath the structure.
- Development must not divert major overland flows or reduce flood storage such to adversely impact the neighbouring property or surrounding area. The submitted Flood Impact Statement must give consideration that the development does not;
 - Reduce the pre-developed level of flood storage.
 - Increase flood levels or velocities such to adversely impact adjoining dwellings.

4.4.5 Residential

The following controls relate to all new residential development (including secondary dwellings such as granny flats).

CONTROLS

- Residential development on land subject to flood risk categorised as high will not be permitted unless it can be clearly demonstrated that development under this section can be undertaken on the land without jeopardising public safety and access, property damage or adverse ramifications of the pre-developed flood regime by means of a Flood Impact Statement.

NOTE: The relevant environmental instrument LEP 2014 identifies development permissible with consent in various zones in the LGA. Notwithstanding, constraints specific to individual sites, may preclude Council granting consent for certain forms of development on all or part of a site.

- Floor levels of habitable and non-habitable areas must comply with the freeboard requirements as stated in Table 2.1 of the *Stormwater Technical Manual*.
- New structures subject to flooding and overland flow (excluding those sites located in Overland Flow Precincts) must be designed and constructed to withstand the anticipated hydrostatic forces. For all parts of the development potentially exposed to floodwater, below the minimum freeboard requirement, the development structure must:
 - be constructed of flood compatible building components in accordance with the *Stormwater and Floodplain Management Technical Manual*.

- ii. A structural engineer must certify that the completed works are designed and capable of withstanding forces subject to forces of floodwater, debris, buoyancy forces anticipated by the 100yr ARI flood event.
- d. Development must not divert major overland flows or reduce flood storage such to adversely impact the neighbouring property or surrounding area. It must be demonstrated the development does not;
 - i. Reduce the pre-developed level of flood storage.
 - ii. Increase flood levels or velocities such to adversely impact adjoining dwellings.
- e. If the development under this development type category involves subdivision of the land, it must be demonstrated that any potential development of this newly created allotment can comply with the controls under this section.
- f. A restrictive covenant must be placed on the title of the land to ensure there are no further significant works and alterations to the landform or development are undertaken without the approval of Council such to impact on flooding.

4.4.6 Commercial or Industrial

The following controls relate to all new commercial or industrial development.

CONTROLS

- a. Commercial development on land subject to flood risk categorised as high will not be permitted unless it can be clearly demonstrated that development under this section can be undertaken on the land without jeopardising public safety and access, property damage or adverse ramifications of the pre-developed flood regime by means of a Flood Impact Statement.

NOTE: The relevant environmental instrument LEP 2014 identifies development permissible with consent in various zones in the LGA. Notwithstanding, constraints specific to individual sites, may preclude Council granting consent for certain forms of development on all or part of a site.

- b. Floor levels of *habitable* and *non-habitable* areas must comply with the freeboard requirements as stated in Table 2.1 of the *Stormwater Technical Manual*. If these levels cannot be practically achieved for the entire floor area (E.g. for reasons of accessibility from a public space) then a lesser level may be considered subject to consideration of the extent or scale of property damage and risk to public safety.
- c. New structures subject to flood waters and major overland flows (excluding those sites located in Overland Flow Precincts) must be designed and constructed to withstand the anticipated hydrostatic forces. For all parts of the development potentially exposed to floodwater, below the minimum freeboard requirement, the development structure must:
 - i. be constructed of flood compatible building components in accordance with the Stormwater Technical Manual.
 - ii. A structural engineer must certify that the completed works are designed and capable of withstanding forces subject to forces of floodwater, debris, buoyancy forces anticipated by the 100yr ARI flood event.
- d. Development must not adversely impact the existing flood regime in terms of diverting major overland flows or reduce flood storage such to adversely impact

the surrounding area. The submitted Flood Impact Statement must demonstrate the development does not;

- i. Reduce the pre-developed level of flood storage.
 - ii. Increase flood levels or velocities such to adversely impact adjoining dwellings.
- e. All goods and materials must be stored at the minimum *habitable* floor level, complying with the freeboard requirements as stated in Table 2.1 of the *Stormwater Technical Manual*, unless the site is located in an Overland Flow Precinct in which case this may be reduced to 500mm above the adjoining ground level. Exemptions from this may be considered if it can be demonstrated in the Flood Impact Statement, that the materials will not adversely impact the surrounding environment or can be damaged if subject to stormwater inundation.
- f. If the development under this development type category involves subdivision of the land, it must be demonstrated that potential development of this newly created allotment can comply with controls under this section.
- g. A restrictive covenant must be placed on the title of the land to ensure there are no further significant works and alterations to the landform or development are undertaken without the approval of Council such to impact on floodwaters.

4.4.7 Recreation and Non-Urban

The following controls relate to development of land intended for recreational and non-urban purposes. Examples of this include sports fields, parks, etc.

CONTROLS

- a. Floor levels of *habitable* and *non-habitable* areas must comply with the freeboard requirements as stated in Table 2.1 of the *Stormwater Technical Manual*. If these levels cannot be practically achieved for the entire floor area (E.g. for reasons of accessibility from a public space) then a lesser level may be considered subject to consideration of the extent or scale of property damage and risk to public safety.
- b. New structures subject to flood waters and major overland flows (excluding those sites located in Overland Flow Precincts) must be designed and constructed to withstand the anticipated hydrostatic forces. For all parts of the development potentially exposed to floodwater, below the minimum freeboard requirement, the development structure must:
 - i. be constructed of flood compatible building components in accordance with the Stormwater and Floodplain Management Technical Manual.
 - ii. A structural engineer must certify that the completed works are designed and capable of withstanding forces subject to forces of floodwater, debris, buoyancy forces anticipated by the 100yr ARI flood event.
- c. Development must not adversely impact the existing flood regime in terms of diverting major overland flows or reduce flood storage such to adversely impact the surrounding area. The submitted Flood Impact Statement must give consideration that the development does not;
 - i. Reduce the pre-developed level of flood storage.
 - ii. Increase flood levels or velocities such to adversely impact adjoining dwellings.

- d. Development located on large lots subject to full inundation must demonstrate that adequate refuge is provided for all occupants above the PMF (probable maximum flood) event. This is to ensure that public safety is maintained.
- e. All goods and materials must be stored at the minimum *Habitable* floor level, complying with the freeboard requirements as stated in Table 2.1 of the *Stormwater Technical Manual*, unless the site is located in an Overland Flow Precinct in which case this may be reduced to 500mm above the adjoining ground level. Exemptions from this may be considered if it can be demonstrated in the Flood Impact Statement, that the materials will not adversely impact the surrounding environment or can be damaged if subject to stormwater inundation.

4.4.8 Sensitive Uses and Facilities

The following controls relate to development of land intended for use by the community and which, if it were to be disabled, would impose a great detriment to the community in returning to normal operations after a flood event. Examples of this include educational establishments, residential care facilities, fuel stations, public utility buildings, etc.

CONTROLS

- a. Development categorised as “Sensitive Uses and Facilities” as per Schedule 2 subject to flood risk categorised as MEDIUM or HIGH will not be permitted.

NOTE: The relevant environmental instrument LEP 2014 identifies development permissible with consent in various zones in the LGA. Notwithstanding, constraints specific to individual sites, may preclude Council granting consent for certain forms of development on all or part of a site.

- b. All floor levels must be no lower than the PMF level. Exemption from this may be considered, subject to consideration of the extent or scale of impact to the community that would occur in the event the structure is inundated.
- c. New structures subject to flood waters and major overland flows must be designed and constructed to withstand the anticipated hydrostatic forces. For all parts of the development potentially exposed to floodwater up to the PMF event, the development structure must:
 - i. be constructed of flood compatible building components in accordance with the Stormwater Technical Manual.
 - ii. A structural engineer must certify that the completed works are designed and capable of withstanding forces subject to forces of floodwater, debris, buoyancy forces anticipated by the PMF flood event.
- d. Development must not adversely impact the existing flood regime in terms of diverting major overland flows or reduce flood storage such to adversely impact the surrounding area. The submitted Flood Impact Statement must demonstrate the development does not;
 - i. Reduce the pre-developed level of flood storage.
 - ii. Increase flood levels or velocities such to adversely impact adjoining dwellings.




4.4.9 Critical Uses and Facilities



CONTROLS

- a. Development categorised as “Critical Uses and Facilities” as per Schedule 2 will not be permitted on land subject to major overland flows and floodwaters, excluding lots identified as Overland Flow Precincts.

NOTE: The relevant environmental instrument LEP 2014 identify development permissible with consent in various zones in the LGA. Notwithstanding, constraints specific to individual sites, may preclude Council granting consent for certain forms of development on all or part of a site.

Schedule 1 Overview of Preferred Discharge points

Downstream Area	Comment
<p>Street frontage (kerb and gutter)</p> 	<p>The discharge of stormwater to public drainage infrastructure in the roadway area (kerb & gutter, kerb inlet pit, Council drainage pipe) is ideal as this public asset is managed to safely direct stormwater from developed areas to receiving waters with minimal environmental impact.</p> <p>It is the preferred point of discharge and should be sought in all cases.</p> <p>Refer to Section 2.3.2 (Preferred Discharge Point – Public Drainage Network or Natural Waterway).</p>
<p>Council Drainage Pipe or Channel in lowest region of property.</p> 	<p>The discharge of stormwater to public drainage infrastructure (Council drainage pipe) located on the property is accepted as this public asset is managed to safely direct stormwater from developed areas to receiving waters with minimal environmental impact.</p> <p>The manner of connection warrants an inspection by Council however it is the preferred point of discharge and should be sought in all cases.</p> <p>Refer to Section 2.3.2 (Preferred Discharge Point – Public Drainage Network or Natural Waterway).</p>
<p>Natural Waterway</p> 	<p>Natural waterways are considered part of the public drainage network as they convey stormwater runoff from developed areas to receiving water.</p> <p>Discharging to a natural waterway is acceptable however needs to be undertaken with care to preserve the natural riparian environment of that</p>

	<p>waterway.</p> <p>Refer to Section 2.3.2 (Preferred Discharge Point – Public Drainage Network or Natural Waterway).</p>
<p>Public Nature Reserve or Park</p> 	<p>Where the property falls to a Park or Reserve, stormwater discharge should seek to connect to public drainage infrastructure if this is in proximity to the site. Otherwise the manner of discharge to a Park or Reserve, whilst presenting low potential for property damage, can have consequences for the environment of that area.</p> <p>Where there is public drainage infrastructure in the Reserve, Council is unable to grant a private drainage easement to discharge stormwater runoff over public reserves, due to the classification of the land. The applicant will be required to extend this infrastructure to the site in order to drain to it.</p> <p>If this does not exist or is onerous for the scope of works, alternative means of stormwater discharge may be considered.</p> <p>Refer to Section 2.3.2 (Preferred Discharge Point – Public Drainage Network or Natural Waterway) prior to considering alternative means of stormwater disposal.</p>
<p>Private Property</p> 	<p>Where the site falls towards private property, this obviously presents the greatest potential for adverse impacts to the neighbouring property.</p> <p>It is preferable that stormwater runoff from the upstream property be piped over the neighbouring property to a preferred discharge point. This will however require an easement.</p> <p>It is acknowledged that this exercise is onerous for small scale development and so an exemption from having to acquire a drainage easement may be applicable for certain situations.</p> <p>Refer to Section 2.3.1 (Private Drainage Easements) prior to considering alternative means of stormwater disposal.</p>

Schedule 2 – Flooding and Overland Flow Development Categories

Residential Development

Development which permits a place of residence or temporary occupation for the general public. A majority of this is represented by single residential properties and thereby there is potential that the stormwater inundation or flooding could pose a danger to public safety and property damage. In most cases, the lower scope of works presents less opportunity for flood protection and there is greater repercussion to occupants resulting from flood events.

Residential works involving alterations and additions to an existing dwelling, refer to “Concessional Development”.

Retail, Commercial & Industrial Development

Development which is typically providing goods for sale or supply and other services. For such development, there is typically low exposure to personal safety (staff and patrons per square metre of the site is low) however there is a greater proportion for damage to property in terms of materials and goods.

It is acknowledged that most development in this category would be more tolerant of inundation due to the nature of the business, particularly for industrial applications.

Recreation & Non-urban Development

This is comprised development normally exposed to the elements and is therefore present a considerably reduced potential for damage to private property.

Sensitive Uses & Facilities

Development accommodating services or facilities which are essential to evacuation during periods of flooding or if effected would unreasonable affect the ability of the community to return to normal activities after flood events.

Critical Uses & Facilities

Emergency services facilities, administration building or public administration building that may provide an important contribution to the notification or evacuation of the community during flood events.

Concessional Development

Concessional development refers to minor works or change of use that does not considerably extend the serviceable life of the structure on site any further than, say, 25 years.

- Additions to an existing dwelling (unless in Councils opinion the extent of alteration is such that the dwelling is effectively a new dwelling)
- The construction of a non-habitable outbuilding; or
- Rebuilt dwellings which substantially reduce the extent of flood risks compared with the existing situation.

Landform Development

Works not included in the above categories however involve minor alterations to the landform and have potential to affect the path of overland flow or conveyance of flood waters.

NOTE: Refer to table 1 overleaf for example types of development for each of the above categories.

CRITICAL USES AND FACILITIES	SENSITIVE USES AND FACILITIES	RESIDENTIAL
Emergency services facilities; administration building or public administration building that may provide an important contribution to the notification or evacuation of the community during flood events (e.g. SES headquarters and Police Stations); Hospitals.	Community facility; telecommunications facility; Institutions; Educational establishments; Liquid fuel depot; Public utility undertaking (including electricity generating works and utility installations) which are essential to evacuation during periods of flood or if affected would unreasonably affect the ability of the community to return to normal activities after flood events, residential care facility, school and seniors housing.	Attached dwelling, backpackers' accommodation; bed and breakfast accommodation; boarding house; caravan park (with permanent occupants); child care centre; dual occupancy; dwelling; dwelling house; exhibition home; group home; home-based child care centre; home business; home industry; home occupancy; home occupation (sex services); hostel; hotel or motel accommodation; moveable dwelling; multi dwelling housing; neighbourhood shop; permanent group home; residential accommodation; residential flat building; secondary dwelling; semi detached
CRITICAL USES AND FACILITIES	SENSITIVE USES AND FACILITIES	CONCESSIONAL
Air transport facility; airport; amusement centre; brothel; bulky goods premises; business premises; caravan park; community facility (other than critical and sensitive uses and facilities); correctional centre; crematorium; depot; entertainment facility; exhibition village; food and drink premises; freight transport facility; function centre; funeral chapel; funeral home; hazardous industry; hazardous storage establishment; health care professional; health consulting rooms; health services facility; heavy industry; heliport; highway service centre; industrial retail outlet; industry; liquid fuel depot;	Animal boarding or training establishment; biosolid waste application; biosolids treatment facility; boat launching ramp; boat repair facility; boat shed; caravan park (with non- permanent occupants); charter and tourism boating facility; environmental facility; environmental protection works; extensive agriculture; extractive industry; information and education facility; horticulture; kiosk; landscape and garden supplies; marina; mine; mining; moveable dwelling; port facilities; public utility undertaking (other than critical uses or facilities); recreation area; recreation	Alterations and additions to freestanding/ dual occupancy residential dwellings. Work sheds, non-habitable outbuildings, Change of use of office/ industrial space.

Table 1 - Example types of development under Flooding and Overland Flow Categories listed in this Section.

NOTE: Not all land uses listed are permitted in all land use zones within Ryde LEP 2014



City of Ryde
Civic Centre
1 Devlin Street
Ryde NSW 2112

www.ryde.nsw.gov.au

City of Ryde Development Control Plan 2014

Part: 8.2 Stormwater Management Technical Manual

Adopted 26 May 2015
Effective 3 June 2015

GLOSSARY

1:5 (V:H)	Slope of 1 vertical to 5 horizontal.
AC	Asphaltic Concrete.
ACRS	Australian Certification Authority for Reinforcing Steel.
Accredited Certifier	Person qualified to issue certificates and operate as a Principal Certifying Authority (PCA) under the Environmental Planning and Assessment Act 1979.
Applicant	Any person/s, company or entity representing the Applicant/Developer for the purpose of carrying out works in association with a Subdivision, Development, Building or Construction works. This may also include Council.
AEP	Annual Exceedance Probability
AR&R (1998)	Australian Rainfall and Run-off (1998).
ARI	Average Recurrence Interval.
AS	Australian Standards published by the Standards Association of Australia and being current at the time of application.
Council	Ryde City Council as represented by its employees.
Engineer or Registered Engineer (NPER)	Person who is a practising Engineer registered on the Institution of Engineers Australia, National Professional Engineers Register (NPER) Engineer in the relevant field of work.
EP&A Act	Environmental Planning and Assessment Act 1979, as amended.
EPA	Environmental Protection Authority.
FRC	Fibre Reinforced Cement
NATA	National Association of Testing Authorities, Australia.
NATA Laboratory	A laboratory accredited by NATA to undertake the specific test referred Registered to in the body of the text.
OH&S	Occupational Health & Safety.
OSD	On-site Stormwater Detention.
PSD	Permissible Site Discharge.
PMF	Probable Maximum Flood
RCP	Reinforced Concrete Pipe.
RHS	Rectangular Hollow Section.
RMS	Roads & Maritime Services, New South Wales (previously known as RTA).
Site	Area of land being developed under the Subdivision or Development Approval.
SQID	Stormwater Quality Improvement Device.
SSR	Site Storage Requirement.
Surveyor	Registered Surveyor.

UCS	Unconfined Compressive Strength.
UPVC	Unplasticised Polyvinyl Chloride compounds (referring to pipe).
VCP	Vitrified Clay Pipe.
WAE	Works as Executed Plan.
Works	The development of land as described by the Drawings and Specifications (the Documents) as proposed by the Applicant and as cited and approved by Council "For Construction" including all the area of the land being developed.
WSUD	Water Sensitive Urban Design.

Table of Contents

STORMWATER DRAINAGE.....	6
1.1 Scope.....	6
1.2 Property Drainage	6
1.3 Stormwater Discharge from Property.....	8
1.4 Onsite Stormwater Detention (OSD) Systems	21
1.5 Trunk Drainage Design.....	33
1.6 Drainage for low level properties	34
FLOODING AND OVERLAND FLOW.....	38
2.1 Freeboard requirements	38
2.2 Preparation of a Flood Impact Statement	41
2.3 Flood Analysis	45
2.4 Fencing and Landform.....	47
2.5 Piping overland flow	47
ENGINEERING DRAWING AND REPORT REQUIREMENTS	48
3.1 Stormwater Drainage Submissions	48
HYDROLOGY	54
4.1 General	54
4.2 Design Average Recurrence Intervals (ARI)	55
4.3 Rational Method	56
4.4 Time of Concentration	57
4.5 Rainfall Intensities	58
4.6 Run-off Coefficient.....	58
4.7 Catchment Area	61

HYDRAULICS	62
5.1 Aim	62
5.2 Minor System Criteria	62
5.3 Major System Criteria	62
5.4 Hydraulic Grade Line Analysis.....	64
5.5 Pit Requirements	66
5.6 Pipe and Culvert Requirements	69
5.7 Bridges and Culverts	71
5.8 Overland Flow	71
WATERWAYS.....	74
6.1 Scope	74
6.2 Aim	74
6.3 General	74
6.4 Stability and Runoff Frequency.....	74
6.5 Riparian Zone.....	74
6.6 Stream Rehabilitation	75
6.7 Riparian Vegetation Management	77
SOIL AND WATER MANAGEMENT.....	79
7.1 Scope	79
7.2 Aim	79
7.3 General	79
APPENDAGES	80

1 STORMWATER DRAINAGE

1.1 Scope

This section of the manual sets out Council's technical requirements in relation to Stormwater and Floodplain Management and is to be read in conjunction with the Council documents;

- DCP Part 7.3 - "*Stormwater and Floodplain Management*", (commonly referred to as "the DCP" in the following document)
- "*Water Sensitive Urban Design Guidelines*".

The following controls apply to the management of stormwater on sites, point of discharge and the manner of discharge particular for the Ryde Council area.

The design of stormwater drainage systems must be generally be undertaken in accordance with the following documents, which are referenced as the "*key documents*" throughout the following section:

- the current edition of Australian Rainfall and Run-off (AR&R), and;
- the latest edition of AS3500.3 National Plumbing and Drainage Code Part 3: Stormwater Drainage.

1.2 Property Drainage

Notwithstanding the minimum requirements of the key documents, the following controls apply to surface drainage systems.

1.2.1 Surface Runoff

Property drainage systems must be designed to reduce the extent and level of ponded water on property, prevent concentrated stormwater runoff entering neighbouring and reduce erosion.

- a) All surface drainage systems must be designed with respect to Section 2.1 of this Technical Manual in regards to overland flow.
- b) All runoff from impervious areas is to be collected,
- c) Runoff entering the site from upstream properties must not be obstructed, nor are they to be concentrated and diverted into neighbouring properties.
- d) Runoff from landscaped areas is to be collected and drained wherever works involve the regrading or alteration to the landform, such to concentrate stormwater runoff and where any long term ponding may occur.
- e) Stormwater runoff from swimming pools is to be taken as fully impervious. Timber decks and similar materials are to be taken as 25% impervious,

1.2.2 Roof Water Runoff

The following controls apply to roof drainage systems;

- a) Roof water drainage systems shall be designed with consideration to the full range of storm events up to the 100yr ARI storm event.
- b) The size of eaves gutters and number of downpipes for residential developments are to be designed to ensure no overflows for storms up to the 20yr ARI storm event. Figure 1-1 shows the maximum catchment area per downpipe required to ensure the gutter capacity is not exceeded (sourced from Australian Standards). Eaves gutters are to be provided with a minimum fall towards the outlet of 1 in 200.
- c) Box gutters are to be sized to ensure no overflows for storms up to the 100yr ARI storm event, in accordance with the key documents. The minimum slope on box gutters should be 1 in 200.

In situations where a building abuts a higher building and its roof is “flushed in” to the higher wall, for the purpose of determining the discharge from the lower roof – the contributing area shall be taken as: the projected roof area of the lower building, plus one half of the area of the vertical wall abutting.

- d) The minimum effective cross-section of a vertical downpipe, including the nozzle shall be not less than 50% of the effective cross sectional area of the gutter that it drains.

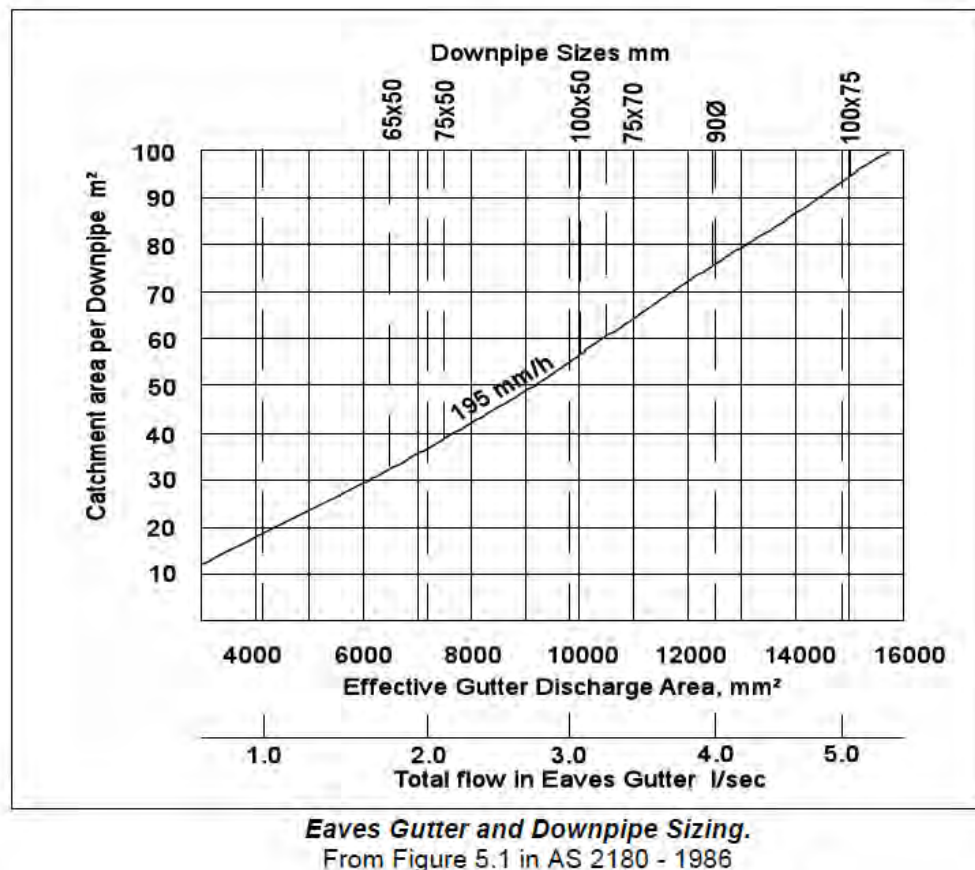


Figure 1-1 Eaves Gutter and Downpipe sizing for small developments

1.2.3 Subsoil Drainage

Subsoil drainage shall be provided as part of the stormwater management system to protect structures and mitigate long term surface water ponding. The following controls apply to subsurface drainage systems;

- Subsoil drains must discharge to a surface boundary pit prior to the discharge point so as to minimise the distribution or accrual of sediment in the receiving drainage system.
- In instances where subsoil drainage will affect the groundwater table, the level of drawdown must be contained within the site and not to influence neighbouring properties.
- The subsoil drainage system must be designed to prevent constant discharge of groundwater to the receiving drainage system so as to avoid nuisance surface seepage.

1.2.4 Rainwater Tanks

Rainwater tanks are to be installed in accordance with the manufacturer's specification and the latest edition of AS3500.3 National Plumbing and Drainage Code Part 3: Stormwater Drainage. Where rainwater tanks are proposed under Exempt and Complying Development the requirements under State Environment and Planning Policy (SEPP) shall apply.

The following requirements apply;

- a) If abutting a wall of the dwelling must be below the eaves line.
- b) Must not be visually obtrusive from the public domain and primary outlooks from adjoining property.
- c) Maximum height of the tank is 1.8 metres above the existing natural ground level where it is installed adjoining the rear or side boundary of a dwelling.
- d) Rainwater tanks must be sealed to prevent mosquitoes breeding in the reservoir.
- e) All tanks/tank stand installations shall be structurally sound and comply with the manufacturer's and/or designer's instructions.
- f) Must be a commercially manufactured tank designed for the use of water supply.
- g) Overflow from the tank must be piped directly to an approved stormwater system.
- h) The external finishes of the tanks shall be painted or coloured to be compatible with the surrounding environment. Alternatively the water tank may be screened behind a permanent physical barrier that serves that purpose.
- i) Taps associated with the tank shall be clearly marked indicating the source of the water and that it is not to be used for Drinking Water.
- j) The installation of the rainwater tank must be undertaken by a licensed plumber.

1.2.5 Regional retarding basins/wetlands

On-line retarding basins should be designed in accordance with Section 5.4 of Council's document "*Water Sensitive Urban Design Guidelines*". The following requirements apply;

- a) Retarding basins shall be designed to visually enhance the landscape form of the site and should incorporate a landscaped wetland. Grass lined, generally trapezoidal basins with low flow pipe systems and little landscaping will not be approved.
- b) Basins/wetlands should be designed as a community passive recreational facility as well as providing an essential flow retarding function.
- c) Where saline soils are identified as a development issue, strategies to minimise the impacts the wetland may have on water tables or movement of saline groundwater must be implemented. This may include, but not be limited to, lining of wetlands or restrictions on cut-fill of the proposed urbanised catchment.
- d) Spillways of basins shall be designed to safely pass extreme storm events without structural failure of the embankment.
- e) Landscape plans must not include placement of deep-rooted trees or shrubs where roots may promote piping or structural failure of engineered embankments, should they be uprooted during major storm events.
- f) The basin design must be subject to a detailed risk assessment, for all events up to and including the PMF, where the downstream floodplain is urbanised. The risk assessment must include an assumption of catastrophic structural failure; i.e. a dam break scenario. Large basins may need to be referred to the Dam Safety Committee for review.

1.3 Stormwater Discharge from Property

The following section defines the procedure in determination of an appropriate point of discharge and the requirements associated with the manner of discharge. The point of discharge from a property is an essential aspect of the drainage system with respect to potential impacts to adjoining property.

Generally there shall be only a single drainage discharge point from a site per allotment. The only exceptions to this are:

- a) When a property is across two sub-catchments (e.g. at the crest of a hill) and the drainage from the site is being directed towards two separate drainage systems and no water is being redirected from one sub-catchment to another.

- b) To disperse the discharge of stormwater from a large site to the public drainage network in order to mitigate or prevent localised flooding effects.
- c) When it is necessary to convey overland flow from other properties to the public road.
- d) The point of stormwater discharge will obviously depend on where the site falls to. To ensure there are no impacts to the downstream infrastructure, the property drainage system should seek to discharge to the public drainage network (whether infrastructure or natural watercourse) wherever possible.

The acceptable point of discharge is subject to where the property falls to and the scope of development proposed. Council's requirements with respect to approved stormwater discharge points are specified in Section 2.3 of the DCP Part 7.3 - "*Stormwater and Floodplain Management*".

The following subsections outline requirements relating to each point of stormwater discharge, where permitted under the DCP.

1.3.1 Discharge to Public Drainage Infrastructure

Public drainage infrastructure refers to engineered channels, gutters, pipes and surface inlets designed to convey stormwater runoff from the greater catchment, commonly referred to as the trunk drainage system.

Should the property under development have access to inground public drainage infrastructure (either inside the property or immediately fronting it) a direct connection to this must be made. As specified in the Council's DCP, larger development on sites located within 30m of inground public drainage infrastructure must extend the public drainage infrastructure to the site frontage, to enable a direct connection to be made.

In all cases other than discharge to the kerb, Council must approve the method of connection by the submission of detailed engineering plans and inspect the works prior to backfill. This is to ensure the works are not detrimental to the condition or operation of the infrastructure.

The following requirements relate to the respective point of discharge to this infrastructure.

Kerb and gutter

- a) To minimise the extent of overland flow in gutters, the maximum discharge to the kerb must not be greater than 30 L/s in the 100yr ARI storm event. This may be achieved by reducing the peak site discharge of the OSD system inside the site however will warrant additional storage.
- b) The peak velocity of water being discharged to the kerb must not exceed 2.0m/s.
- c) The alignment of drainage pipe must not cross the footway at an angle no less than 60° to the kerblines and should be located in front of the property.
- d) For sites having adverse levels or low level footpaths, the drainage line may be extended along the footpath or kerb (whichever has less imposition on services) to discharge for a maximum length of 20 metres beyond the site. The length of drainage line must be minimised where possible.
- e) At the point of connection into the kerb the invert of the pipe must match the invert of the kerb. The kerb is to be restored at the point of connection.
- f) Discharge points to the kerb must use the following galvanised steel box-section equivalent to pipe diameters as follows:
 - 100mm DIA outlet pipe – use 1 x 100mm x 100mm x 6mm thick (w x h x t)
 - 150mm DIA outlet pipe – use 1 x 200mm x 100mm x 6mm thick
 - 225mm DIA outlet pipe – use 2 x 200mm x 100mm x 6mm thick

Where the site discharge pipeline is to extend beyond the site frontage across neighbouring properties, the following requirements apply;

- g) Property drainage lines must not extend for more than 20 metres in the verge and are not permitted to be installed under the carriageway,
- h) The maximum depth from invert of gutter to invert of pipe in the verge area must be no greater than 1.2 metres,
- i) The pipe must cross the footway perpendicular to the street with two 45° bends used to turn the pipe parallel to the kerb line,
- j) An inspection eye should be installed on one of the bends,
- k) A sewer grade PVC pipeline may only be used across the footway where the cover is greater than 300 mm.
- l) The property owner benefitting from the drainage line must fund and restore any services affected by the works and fully reconstruct any driveway crossover that the works intersect.

Inground Drainage Infrastructure

Where the drainage system is able to discharge directly to the inground drainage public drainage network, connection to the system will be permissible by means of either connection to an existing kerb/ junction pit, constructing a new pit to Council's specifications or where a kerb inlet/ junction pit cannot be readily located, installing an appropriate slope junction.

Where the level of development is significant to warrant extension of the inground drainage infrastructure, Council's drainage system is to be extended using a minimum 375 mm RC pipe with a kerb inlet or junction pit to a point near the boundary of the subject property to allow a direct connection.

The following requirements apply pending on the type of connection outlined above.

Existing Kerb inlet pit

- m) Pipes connected to existing pits shall be cut flush with the internal wall of the pit.
- n) The pipe should enter the pit perpendicular to the pit wall and all damage to the internal wall of the pit around the pipe connection must be fully repaired to Council's satisfaction.

New Kerb Inlet Pit

- o) Where a new stormwater pit is to be constructed over an existing pipeline they shall be cast in-situ concrete,
- p) The works are to be undertaken in accordance with the standard detail Appendix 1 of this Manual.

Slope Junction

- q) The site discharge pipeline must be no greater than 225mm. If the property drainage pipeline is greater than 225 mm DIA the line must be connected to an access / junction pit.
- r) Only one slope connection is permissible from the development to Council's system unless the property straddles two sub-catchments each serviced by a different piped system.
- s) Where possible, only the top of the pipe is to be cut to facilitate water inflow and/or access for maintenance. The remainder of the pipe is to be left undisturbed. Any reinforcement exposed is to be treated to prevent concrete cancer to Council's satisfaction.
- t) A cleaning eye or pit must be installed immediately upstream of the connection point to facilitate cleaning in the event of a blockage.
- u) The connection must be made with a collar secured with epoxy adhesive to Council's pipeline to allow an inspection to be made of the interior of the main pipeline. See Appendage 1 in Section 8 for detail.

The design and construction of pits and pipes shall be in accordance with the hydraulic requirements listed in Section 5 - HYDRAULICS of this Manual.

1.3.2 Discharge to a Public Park or Reserve

The uncontrolled discharge of urban stormwater into public parks and reserves can cause significant bushland degradation. The increased volume of water and velocities of water entering these areas compared to natural conditions promotes the formation of unnatural drainage lines, weed invasion and accelerated erosion and sedimentation. It is therefore preferable that properties falling to a public reserve or park drain to public drainage infrastructure in the reserve where possible.

Unfortunately it is not possible to formalise a drainage easement across land zoned as public open space. In order to discharge to public drainage infrastructure in a public park or reserve, Council will be required to extend the infrastructure to the site, at the cost of the property owner. The infrastructure in the reserve/ public park will be retained under the care and ownership of Council.

An application may be made to Council to connect to a Council drainage system within the land. This application will be assessed by Councils Public Open Space and Works departments to determine the suitability of the proposal and the cost estimate for the extension of the public drainage infrastructure to the boundary of the property. An application form for this procedure is available from Council and must be accompanied by a non-refundable application fee, as detailed with Council's Management Plan.

A drainage analysis of the system being connected to must be undertaken to show that the downstream receiving system has sufficient capacity to cater for the additional flows generated by the proposed development. It will be at Council's discretion to determine the length, route and discharge point of any drainage system requested.

1.3.3 Discharge to a natural water course or channel

The uncontrolled discharge of urban stormwater into natural water courses and channels can cause a number of ecological and environmental issues, including reducing aquatic and riparian habitat, promoting the formation of unnatural drainage lines, weed invasion and accelerated erosion and sedimentation. Similarly any alterations of existing systems can also cause many ecological and environmental issues.

Conventional techniques such as concreting and piping of waterways impact on downstream watercourses by increasing the quantities and velocities of stormwater, resulting in creek bed and bank erosion, and flooding. When discharging stormwater to a channel or natural water course it is imperative that the existing system is maintained or restored to its natural state.

Discharge to a suitable natural watercourse, creek or channel may be allowed subject to approval by Council. The watercourse is to be protected against erosion at the point of discharge. In this regard an outfall apron or energy dissipation structure is to be provided in accordance with this Section. Stabilising a small length of the watercourse in the vicinity of the outlet is not appropriate as it can cause problems of erosion upstream and downstream of the stabilised section.

Only a single discharge point to the watercourse from the development will be permissible.

The piping, covering or alteration of a natural watercourse will not be approved by Council except in limited cases (see Section 2 - FLOODING AND OVERLAND FLOW). Instead, existing natural watercourses must be retained, along with any native vegetation within the riparian zone. In addition, the rehabilitation of degraded, piped or channelled watercourses to a more natural state will be encouraged and supported wherever possible.

Where stormwater flows into or through bushland reserves adjacent to natural watercourses/creeks forming unnatural drainage lines, it should be channelled, piped or consolidated into an existing watercourse to reduce the impacts on the surrounding bushland. Combinations of these systems may

also be acceptable. Open channels can be rock-lined with material similar to that found in the local area to reduce erosion and to mimic a natural system with riffle zones and stilling ponds.

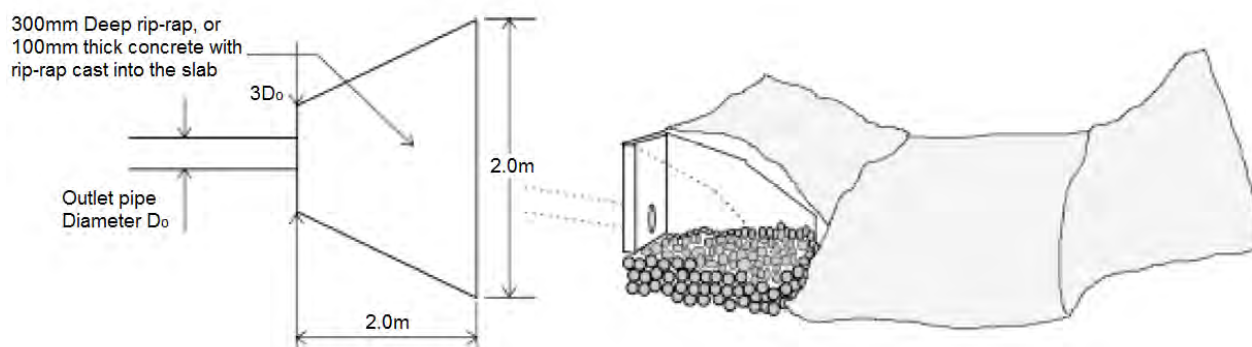
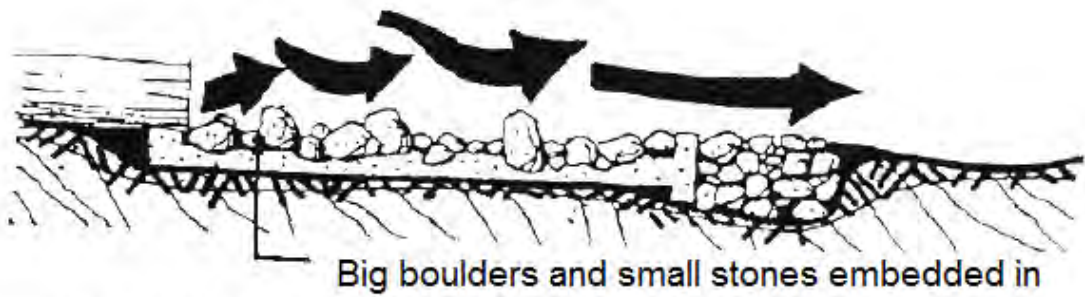


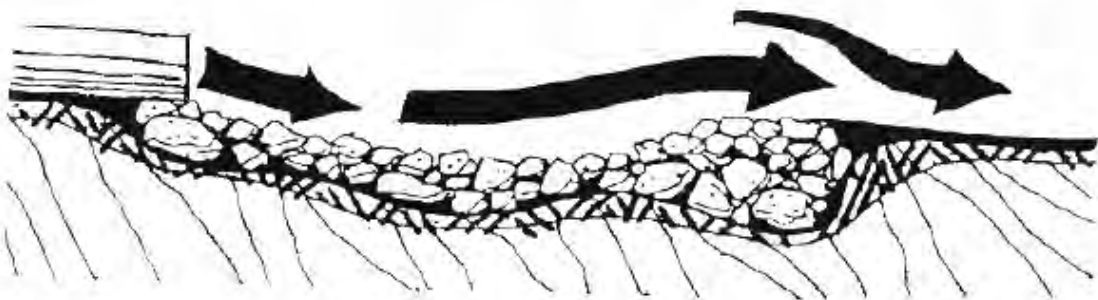
Figure 1-2 Outflow apron.

Channel Gradient (%)	Permissible Velocity (m/s)
1	2.1
2	1.9
3	1.8
4	1.7
5	1.6
6	1.6
8	1.5
10	1.5
15	1.4
20	1.3

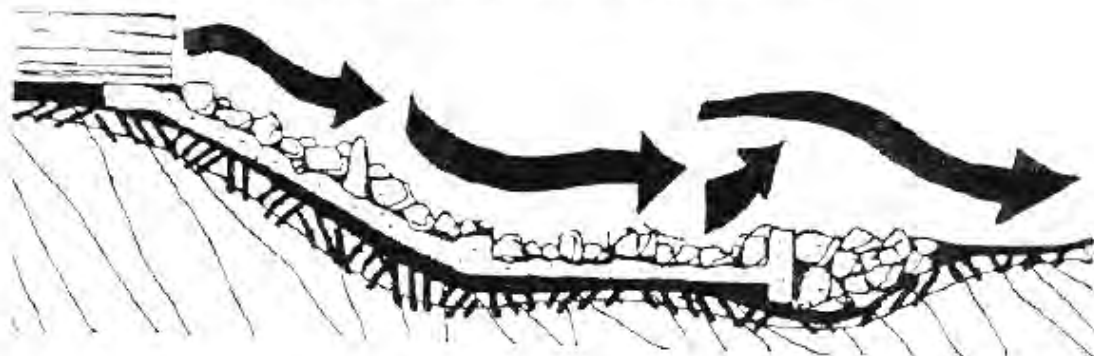
Table 1.1 Permissible velocities for vegetated channels.



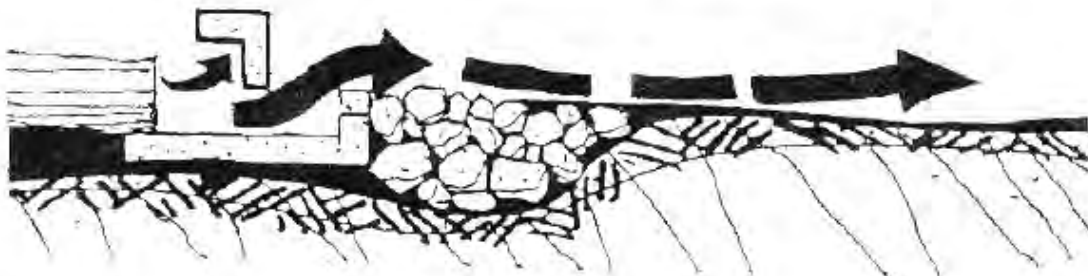
HORIZONTAL ROUGHNESS ENERGY DISSIPATORS



RIP-RAP ENERGY DISSIPATOR



FORCED JUMP ENERGY DISSIPATOR



IMPACT ENERGY DISSIPATOR

Figure 1-3: Energy dissipators

1.3.4 Discharge via a new or existing Drainage Easement/ Reserve

Where a property is to discharge via a new or established private drainage easement, the following requirements apply. Refer to Section 1.6 (Drainage for low level properties) regarding the acquisition of a drainage easement.

- a) Where the property drainage system will discharge via an existing drainage easement or inter-allotment drainage easement, evidence that the property benefits over the easement must be submitted with the application for the works.
- b) Where a new easement is to be created, Council may consider issuing a deferred consent after consideration of the feasibility of the easement, scope of works and point of discharge.
- c) Collected runoff from the development site shall be kept separate from the drainage system of the property through which the easement is passing. In some cases this may require the piped system to be of a capacity to accommodate stormwater runoff from the 100yr ARI storm event where a suitable overland flow route is not available.
- d) The design and construction of the drainage reserve or easement shall be in accordance with the hydraulic and discharge requirements listed in this document.
- e) The minimum width of new drainage easements should be in accordance with Table 1.2.

Drainage	Easement Width (m)
<u>Inter-allotment Drainage</u>	
Pipes < 150mm	1.0
Pipes up to 300mm	1.5
Pipes up to 900mm	2.5
Pipes > 900mm	Width required for maintenance, but not less than width of conduit + 1.5m and not less than 2.5m.
<u>Public Drainage Infrastructure</u>	
Pipes <=1350mm	3.0
Pipes > 1350mm	Width of the system plus 2.0m

Table 1.2: Minimum Width of Easements

- f) Where the pipeline serves more than three (3) lots, a hydraulic grade line analysis will be required with the design submission to ensure lots are not affected by surcharge.
- g) Minimum cover for pipelines within allotments shall be 300mm, apart from footway crossings to kerbs with galvanized steel Rectangular Hollow Sections (RHS) as specified in Section 1.3.1 (Discharge to Public Drainage Infrastructure).

- h) The desirable minimum pipe grade shall be 1.0% and pipes shall be designed to accept concentrated drainage from OSD systems or the concentrated drainage from buildings and paved areas.
- i) The minimum pipe sizes for inter-allotment drainage are as specified below in Table 1.3.

Number of Allotments	Minimum Pipe Size (mm)
1-4 lots	150
5-8 lots	225
9-15 lots	300
16-25 lots	375

Table 1.3 Minimum pipe sizes for inter-allotment drainage.

- j) Each allotment draining to the inter-allotment drainage line shall have direct access to the pipe line via a junction pit located on their lot.
- k) Inter-allotment drainage pits shall also be located at changes of grade, pipe size or direction and spaced no further than 75m apart.

1.3.5 Discharge to an On-site Dispersal/ Absorption System

Such systems involve the diversion of stormwater runoff to a pit or trench set below ground, to allow the stormwater runoff to permeate into the soil or, for an onsite dispersal system, percolate up and disperse as sheet flow downstream of the discharge point. Whilst these systems provide some water quality benefits and assist in recharging groundwater tables, they have limited capacity to dispose of large quantities of stormwater runoff. This is due to the typically low permeability of soils in the Ryde area. Figure 1-5 shows a typical absorption system layout.

On-site dispersal systems are designed to mimic natural stormwater runoff by dispersing stormwater runoff over wide areas. They are generally utilised where property falls to a natural reserve/ parkland and there is no risk of property damage due to stormwater inundation.

First flush infiltration systems are small gravel filled trenches wrapped in a geofabric membrane with a slotted pipe in the centre of the gravel bed that will disperse the first part of the runoff from a site into the ground. The “first flush” runoff from small catchment areas generally has the highest nutrient loading and this type of system will take this small volume off line and allow the main part of the storm flow to pass on to the downstream drainage system.

The following controls apply to the design of absorption/ onsite dispersal drainage systems where permitted under the DCP;

- a) The property must not be located within any areas identified by Council as containing soil types that are predominantly not conducive to the dispersion of stormwater, areas likely to induce landslip or areas where there is a clearly identified soil salinity problem. The applicant should liaise with Council as to whether their property is so affected before further proceeding with any detailed drainage design.

- b) The on-site absorption system will not have an adverse impact upon adjoining and/or downstream properties by the direction or concentration of stormwater on those properties.
- c) There is an area downslope of the dwelling at least equal to the impervious area draining to it which to construct the absorption trench.
- d) The infiltration trench/ pit is to be designed with a capacity in accordance to Council's absorption trench calculation sheet in Appendix 2.
- e) On-site absorption structures are to be located a minimum 5 metres from the downstream property boundary and a minimum of 3.0 metres from buildings. Where the property adjoins bushland the absorption trench may be constructed no less than 2 metres from the boundary adjoining the bushland and run parallel with the contours.
- f) The system should not be placed under any paved surfaces and must be at least 1.0 metre from pavements subject to vehicular traffic.
- g) A debris/silt collection pit shall be constructed immediately upstream of the underground system, a capped observation riser installed over the underground system and the area downstream is to be landscaped in a manner that will ensure a reduction of sub-soil flows into the adjoining property.
- h) The system should be designed to allow the majority of the sediment to be collected at the inlet to the system and have a cleaning eye at the opposite end to allow flushing of any sediment and or debris back to the cleaning sump if necessary.
- i) Where a high water table is encountered and a gravel filled trench design is proposed, the base of the trench should be at least 500mm above the water table to accommodate ground water table fluctuations.
- j) When an absorption/ onsite disposal system has been approved, no further development will be permitted on the site without a further stormwater management study demonstrating that the system is able to handle the additional runoff.
- k) A positive covenant is to be placed on the Property Title to ensure that the system is adequately maintained according to the approved maintenance schedule. A Restriction as to User is to be placed on the Property Title to ensure that no additional impervious areas are created on the property. The authority to vary the Restriction is to be City of Ryde.
- l) Where an absorption system is to be the primary means of stormwater discharge for a property or the absorption system is located on land identified being prone to slope instability or where the drainage design for an absorption system deviates from Council's design method, the stormwater management plan must include a report by an independent geotechnical engineer providing the following details:
 - An assessment of the infiltration soil profile,
 - Demonstrate that the proposal will not have an adverse impact on adjoining properties by the direction or concentration of stormwater on those properties,
 - Consider antecedent moisture conditions and performance over a variety of rainfall events,
 - Depth to rock strata,
 - Depth to the water table,
 - Measured infiltration rate (in litres/square metres/second),
 - Infiltration rate that can be maintained in the long term,
 - Minimum distance any infiltration system should be located clear of property boundaries,
 - Whether the use of infiltration is likely to cause seepage problems to the proposed structure or to any adjoining properties.

Figure 1-4 on the following page shows an example of a first flush infiltration system suitable for single residential developments.

Notwithstanding the above points, the following requirements apply to the design of onsite dispersal systems (level spreaders):

- m) The provision of an on-site stormwater detention system to limit discharge flow rates must be provided regardless of site coverage. The onsite detention system must comply with Council's simplified design requirements.

- n) The onsite dispersal system is to be located as far as possible from the downstream boundary.

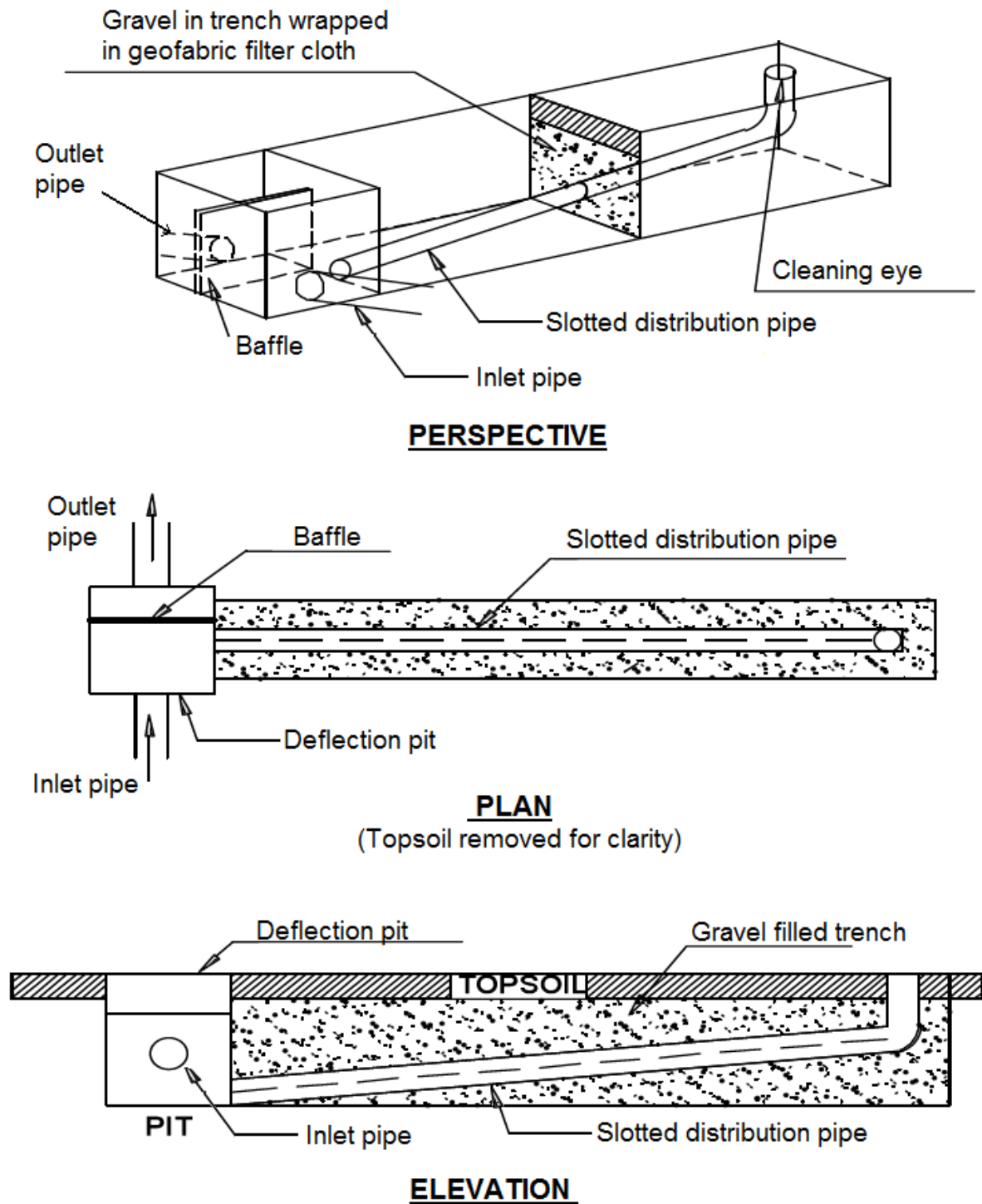


Figure 1-4: Detail of small first flush infiltration system suitable for single residential developments

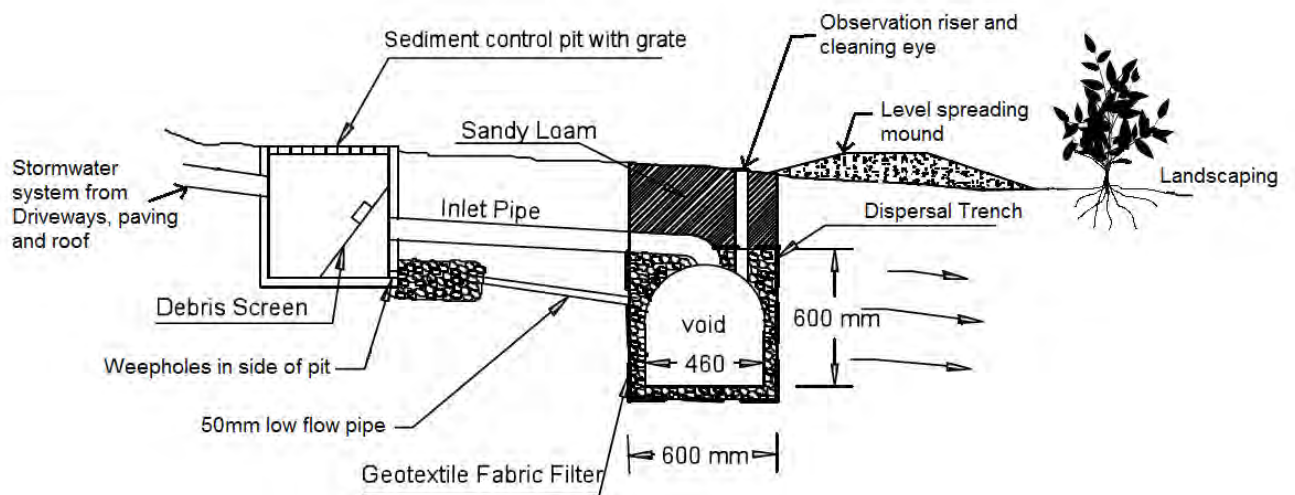
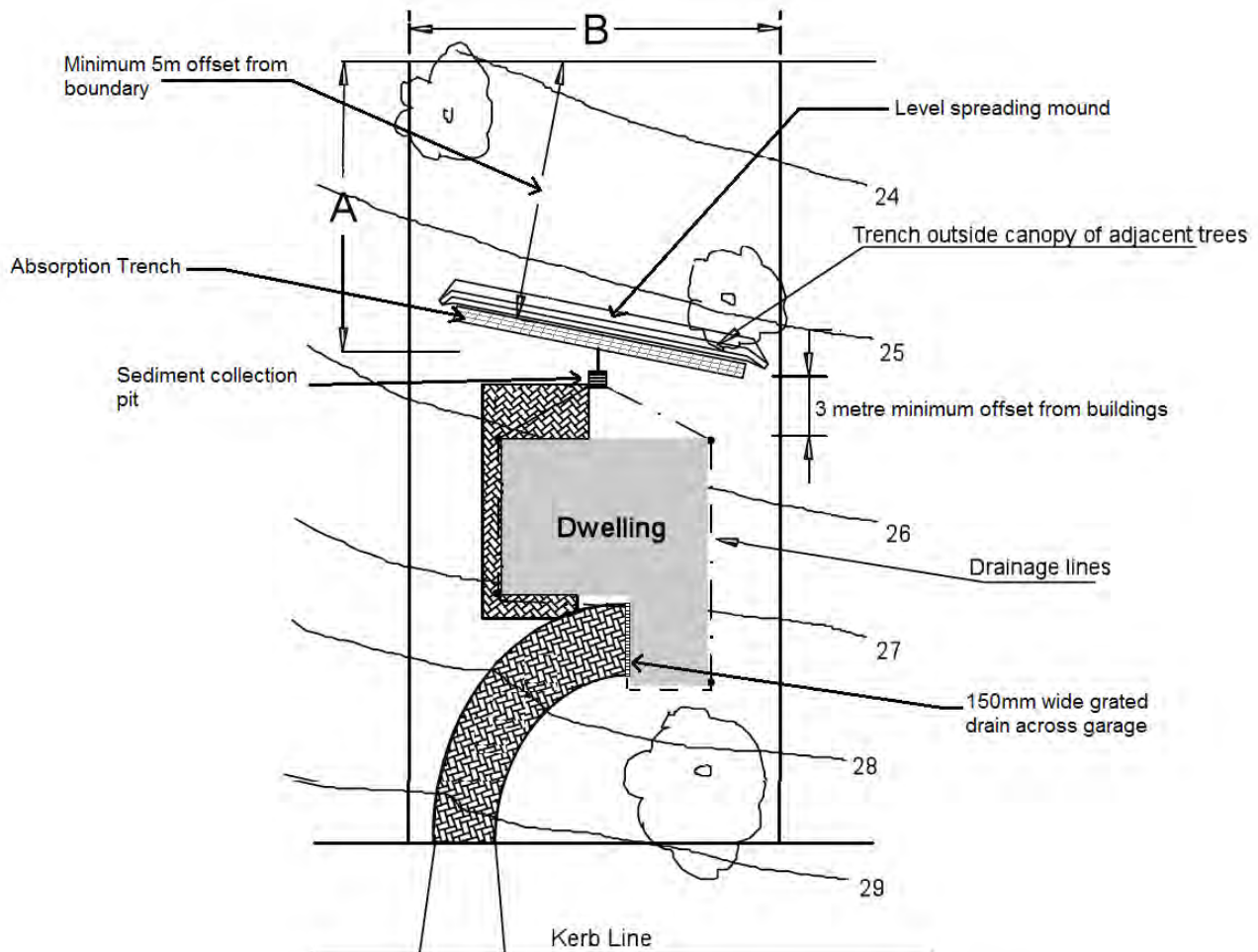


Figure 1-5: Typical Absorption System layout

1.3.6 Discharge to a Charged/ Siphonic System

The following controls apply to the design of charged/ siphonic systems where permitted under the DCP.

- a) All roof gutters and downpipes must be sized to accommodate stormwater runoff from roof areas resulting from the 100yr ARI storm event.
- b) The point of discharge must drain to the same catchment as the site and must not exacerbate flooding issues which would otherwise be unaffected had the site drained via an easement.
- c) There must be a minimum difference in height between the roof gutter and the discharge pit at the property boundary of 1.8 metres. This height may be reduced where a detailed HGL analysis is provided demonstrating the system can adequately operate.
- d) The system must discharge to a boundary junction pit, prior to discharge to the public drainage infrastructure.
- e) Charged lines are not permitted outside the property boundary.
- f) All charged lines must be of pressure grade and joints to be solvent welded.
- g) A clean out pit must be provided at the sump in the system.
- h) Gutter guards must be installed on all gutters to minimise debris entering the system.
- i) Normal On-site Stormwater Detention requirements will still apply.
- j) A Positive Covenant will be required to be placed on the title of the property to inform owners of their responsibility in maintaining the system.

1.3.7 Discharge to a Pump/ Sump System

The following controls apply to pump/ sump drainage systems where permitted under the DCP.

- a) Wet wells shall be designed and constructed in accordance with section 9.3 of AS 3500.3. with the exception that the well shall have the capacity to store the total runoff from the area draining to it during a 100yr - 3 hour ARI event.
- b) The pumps shall be dual submersible pumps and shall be sized and constructed in accordance with section 9.4 of AS 3500.3.
- c) Direct connection of a pump's rising main directly to the kerb is not permitted.
- d) The pumped water must be treated prior to discharge to remove any pollutants.
- e) A Positive Covenant will be required to be placed on the title of the property to inform owners of their responsibility in maintaining the system and to indemnify Council from any claims for damages arising from failure of the pump system.
- f) Full details of the holding tank capacity, pump type, pump curves detailing pump rate vs head, the discharge rate, the delivery line size and head against which the pump must operate must be submitted to Council for approval by Council.

1.3.8 Discharge to an Existing Property Drainage System

Notwithstanding Council's DCP requirements concerning the point of discharge which are to be held, the utilisation of an existing property drainage system must satisfy the following requirements.

- a) The proposed development will not impact on the operation of the existing system (i.e. remove a surface inlet pit or encroach into an OSD system reducing the volume provided),
- b) The hydraulic function of the existing system is unchanged (i.e. the head to discharge remains the same),
- c) The existing stormwater management system has sufficient capacity to cater for the additional runoff from the proposed development up to the 100 year ARI storm event, and
- d) The modifications to the existing system required do not consequently have adverse stormwater impacts upon adjacent or downstream properties.

This will generally require a report prepared by a suitably qualified and experienced engineer, of the existing stormwater management system and its capacity to handle the total (existing and proposed development) runoff from storm events up to the 100yr ARI storm event.

In the case of connecting to an existing on-site absorption system the design is to be accompanied with a report by a geotechnical engineer attesting to the absorption capacity of the system (including any necessary information such as an assessment of the infiltration of the soil profile, consideration of antecedent moisture conditions and performance over a variety of rainfall events) and demonstrating that the proposal will not have an adverse impact upon adjoining and/or downstream properties by the direction or concentration of stormwater on those properties.

The location of the existing stormwater drainage system must be shown on the drainage plans to be submitted in conjunction with the development application.

1.4 Onsite Stormwater Detention (OSD) Systems

An onsite detention (OSD) system seeks to mitigate the increasing rate of stormwater runoff generated by ongoing development in the City of Ryde catchment area.

OSD systems are designed to counteract the effect of each development within a catchment by restricting the rate of stormwater runoff discharged during large storm events. This restricted discharge rate requires a “buffer” storage tank/ basin to detain stormwater before slowly releasing it to the public drainage system. Typical OSD systems are shown in Figure 1-6 and Figure 1-7.

Refer to Section 2.4 (*Community Stormwater Management*) of the DCP - Part 7.3 (*Stormwater and Floodplain Management*) in relation as to when onsite detention is required in development.

1.4.1 Exemption from having to provide an OSD system.

Provision of an OSD system may be waived where:

- a) The proposal is for a single dwelling or dual-occupancy and less than 35% of the site will be covered by impervious / hardened surfaces
- b) The proposal is a one-off extension involving impervious surfaces (roof, driveway, paving, etc) totalling less than 80m².
- c) The site is within the designated **possible** exclusion zone (marked on Council's mapping system) along the Parramatta and Lane Cove River foreshore subject to there being no known drainage problems in downstream properties.
- d) The applicant can demonstrate to Council's satisfaction that if the total catchment containing the site were developed to its full potential, stormwater detention on the subject site would not be of benefit in reducing adverse flooding impacts on downstream roads, properties and open watercourses. This may be the case at the lower end of major catchments.
- e) The downstream public drainage network has been upgraded to cater for the storm flows up to 100yr ARI being directed to it.
- f) It is demonstrated that the property is subject to significant inundation (say over 50% inundation of the site due to a 100yr ARI storm event) or that it is impractical to provide an OSD storage facility out of or above this flow when the site is partially inundated OR OSD will not be required where the site of the development is located within a Council established 1 in 100 year ARI floodplain and that it can be demonstrated that lesser storm events will also flood the site. Otherwise it will be necessary to provide OSD to control the runoff for the minor storm events.
- g) The implementation of OSD on the site cannot be achieved without adverse outcomes, in terms of planning, impracticality and amenity to occupants, upon consideration of all feasible options. Exemption from OSD in cases is required to be confirmed by Council.

1.4.2 General OSD Design Requirements

The following general requirements apply in the design of OSD systems.

- a) The OSD system should be located prior to the point of discharge, generally in the lowest point of the site and located in a common area to facilitate access. This can possibly include a car park, open space area or even roof top areas where no underground storage is possible.
- b) As much as possible of the site area is to drain through to the OSD system(s). A portion of the impervious area may discharge directly to Council's system if it cannot be drained to the storage facility, provided the PSD is reduced and SRR increased to compensate for the smaller catchment.
- c) The maximum desirable extent of impervious surfaces bypassing the OSD system is 25% of the total impervious site area.
- d) Where it is proposed for the site to discharge to the kerb and gutter, the PSD shall be restricted to 30L/s.
- e) A positive covenant must be executed and registered against the title of the lots containing OSD systems to require maintenance of the system. This positive covenant must be on any linen plans for subdivision of the development. If no subdivision is proposed, the covenant shall be prepared prior to finalisation of the development.

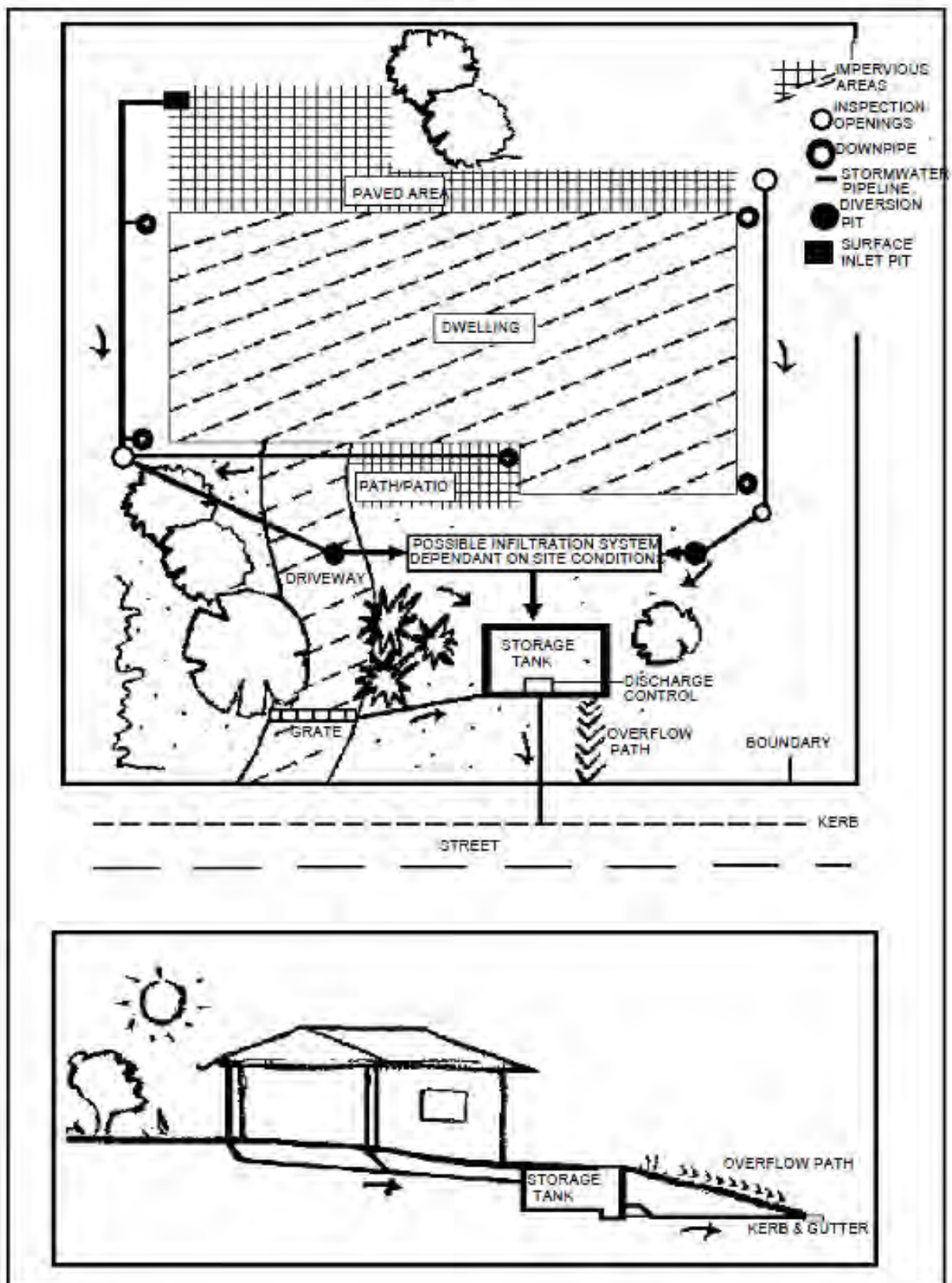


Figure 1-6 : Simplified Below Ground Storage System

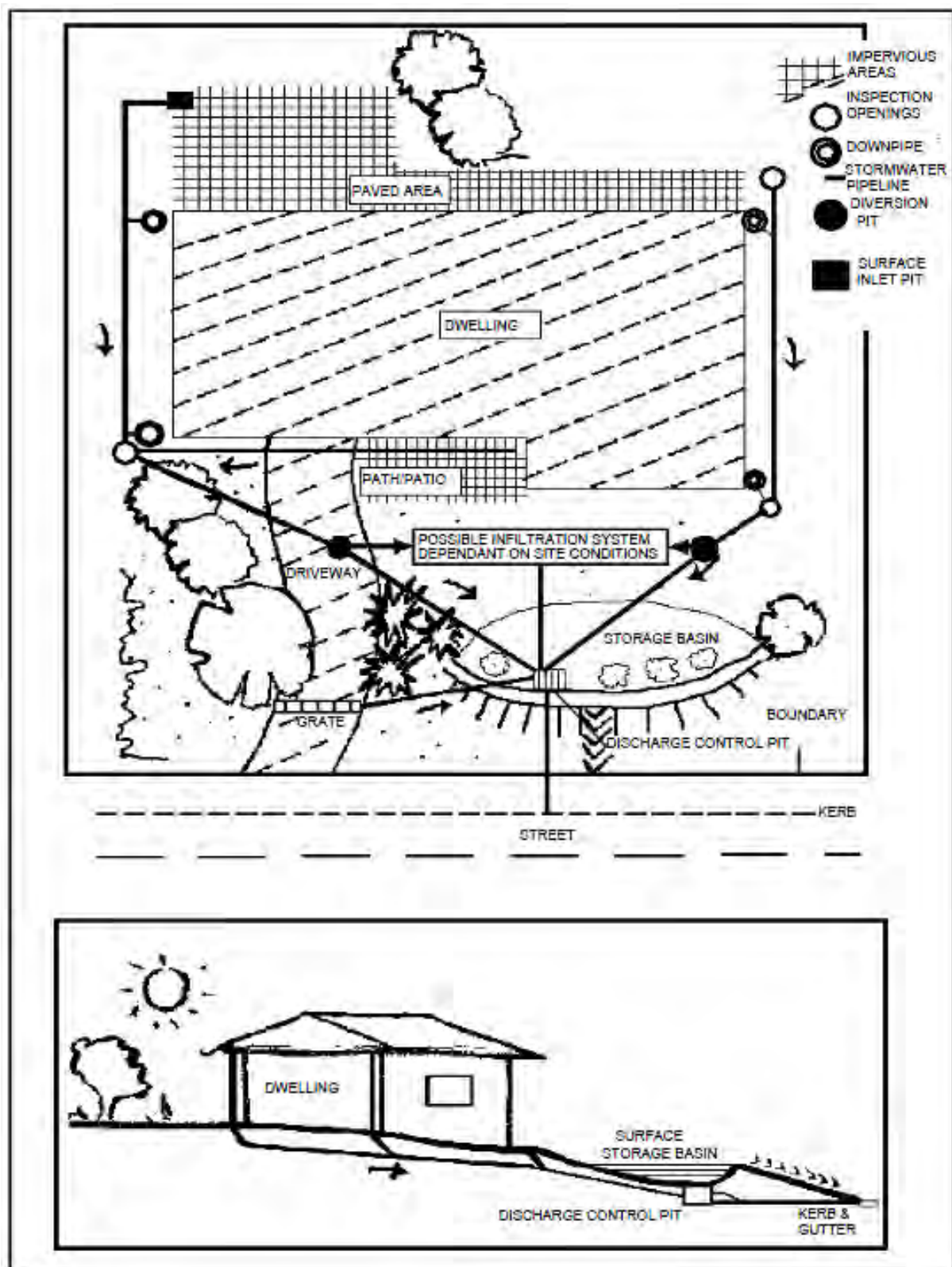


Figure 1-7 : Simplified Above Ground Storage System

1.4.3 OSD Design - Simplified Design Method

The simplified design method permits applicants to implement OSD systems without undergoing thorough or complex analysis. The approach is simply the application of Council's rates of permissible site discharge (PSD) and site storage requirement (SSR), based on the area draining to the OSD, to derive the require storage volume and permissible site discharge.

The simplified design method can only be used if the following site criteria are met;

- a) The type of development is single residential, dual occupancy or light industrial development,
- b) The total site area is less than or equal to 3000m²,
- c) A maximum of 25% of the impervious area bypasses the OSD system, and
- d) The discharge control must not be influenced by downstream water levels (i.e. must be able to freely discharge).
- e) The site is not located in a catchment draining to category 1 and 2 waterways.

The City of Ryde Council area drains to three main catchments labelled as Zone 1, Zone 2 and Eastwood Catchment as shown in the plan depicted in Appendix 4. Each catchment has separate permissible site discharge (PSD) rates and site storage requirements (SSR) suited for the characteristics of each catchment.

The catchment area used when determining the Permitted Site Discharge (PSD) rate and Site Storage Requirement (SSR) rate shall include the entire area that will contribute runoff to the detention storage facility during a 100 year ARI storm event.

The PSD and SSR provisions for each OSD catchment are given below in Table 1.4.

Catchment	Permissible Site Discharge (PSD) (L/sec/m ²)	Site Storage Requirement (SSR)(m ³ /m ²)
Zone 1	0.0265	0.0275
Zone 2	0.0265	0.0255
Eastwood	0.0210	0.0300

Table 1.4 Site discharge and storage coefficients.

Where 100% of the impervious area cannot drain to the OSD, the SSR and PSD shall be reduced to compensate for the smaller catchment draining to the OSD system. The modified PSD per square metre of catchment will be calculated using the following equation.

$$\text{Modified PSD} = \text{PSD} * ([A_t + A_b] / A_t)^{-1.37}$$

Where;

A_b = Impervious area bypassing the storage facility and

A_t = Total area draining to the storage facility

Wherever the PSD shall be reduced (say restricted to 30L/s if discharging to kerb and gutter) the SSR must be increased accordingly. The following formula may be used to calculate the adjusted storage volume:

$$ModSSR = 1.55I \times (PSD \text{ perm}^2 \times 10)^{-0.731} \times 1.2 \times 10^{-4}$$

Where;

I = Intensity of the 100yr – 2hr ARI storm event

= 56 mm/hr in Zone 1

= 51mm/hr in Zone 2 & Eastwood Catchment

Using the appropriate PSD rate and SSR rate based on the OSD catchment area, the OSD volume and orifice outlet size for the site can be determined by following the steps outlined in the On-site Detention Calculation Sheet contained in Appendix 3.

1.4.4 OSD Design - Detailed Method

The detailed method must be used in the following circumstances;

- Where the development does not satisfy the requirements for the simplified method above.
- Where Council considers the nature of the receiving system is too sensitive to warrant the simplified approach.
- Where the site conditions vary from those given in the simplified method.

The OSD must be designed to ensure the level of stormwater runoff discharged from the area of development must not to exceed the peak stormwater discharge arising from the post-developed works, during a 5 year ARI storm event.

To restrict post development flows to pre-development levels a detention basin for the design storms will be required to be modelled. Computational methods based on the approximate triangular method or the rational methods are not acceptable. It is recommended that a program in accordance with Section 3.1 is used.

In cases where the site proposes discharge to the kerb and gutter, the point of discharge is to be limited to 30L/s in accordance with Section 1.3.1.

If the rate of discharge from the outlet of the OSD system is affected by tail water conditions from the receiving system, for example where the invert level of the orifice is lower than the surface level at the point of connection into the existing drainage system, then full hydraulic calculations will be required in accordance with Section 5 of this Manual.

1.4.5 Rainwater Tank Offsets

Rainwater tanks do not generally substitute for the storage capacity required for on-site detention. However, where a rainwater storage tank for water efficiency is incorporated into a stormwater drainage system for a single occupancy development and the tank is connected to an internal re-use system, the volume of the required on-site detention may be reduced by an equal amount up to a volume of 5,000 litres for sites less than 3000m². This provision will be in addition to any BASIX requirements.

If a rainwater storage system is proposed for a larger development, some on-site stormwater detention offset may be given. The amount of offset shall be calculated from a water balance model

and consideration must be given to the maintenance of downstream open watercourse flows. This will apply on both public and private land as appropriate.

In some circumstances where it is difficult to provide OSD Council may consider waiving OSD requirements if the site proposes innovative stormwater management systems, including a large re-use rainwater tank and “rainsaver” system to compensate for inability to provide on-site detention. In such cases a detailed water balance model is required to show how many days the rainwater tank system is full and empty using a minimum of 10 years of rainfall data. Approval of such systems is at Council’s discretion only and will be assessed on its merit.

For rainwater reuse requirements for developments to size the rainwater tank please refer to Council’s manual “*Water Sustainable Urban Design Guidelines*”.

Rainwater tanks (above or below ground) can be designed to form part of an on-site stormwater detention system. A dual purpose OSD/rainwater re-use tank that collects only roof water from the roof may however allow the majority of stormwater runoff from the site to be uncontrolled. When using a dual purpose OSD/rainwater re-use tank the design must still ensure that the permissible site discharge for the whole site is still achieved. Storage tanks below ground will need appropriate pumps for their intended re-use purpose.

1.4.6 Orifices

The control outlet of an OSD system, the dimension and structural integrity of this component must be precisely detailed to ensure the system operates as intended. The following requirements apply to this component.

- a) Orifices are to be made of minimum 200 mm x 200 mm flat stainless steel, 3 mm thick.
- b) The orifice plate is to be tooled to the exact dimension as calculated.
- c) Orifice plates will need to be securely fastened in a central position over the outlet pipe using four (4) bolts and are to be flush with the wall to ensure that flow does not pass between the plate and the wall.
- d) Generally the minimum orifice size permissible is 40 mm ϕ to minimise blockages. Where the calculated orifice is less than 40mm ϕ the detention system should be redesigned to either reduce water depths in the storage facility or increase the catchment draining to the basin. The absolute minimum orifice diameter is 25 mm ϕ in accordance with Australian standards – however orifices this small will only be accepted at Council’s discretion where it is not possible or practical to reduce the water depth.
- e) The following formulas may be used to calculate the required orifice diameter.

$$Q = CA\sqrt{2gh} \quad (1)$$

$$d = \sqrt{(4A/\pi)} \times 10^3 \quad (2)$$

Where;

equation (1) is the orifice equation and equation (2) is the area of a circle equation.

Q is the flow rate in m³/s

C is the orifice coefficient which is 0.6 for a circular shaped square edge cut orifice

A is the cross sectional area of the orifice in m²

h is the pressure head at the middle of the orifice when the system is at its maximum storage capacity ie. the depth of ponding from the centreline of the orifice to the top water level in metres.

g is gravity being 9.81 m/s.

d is the diameter (mm)

π is pi = 3.1416

This formula assumes the water level immediately downstream of the orifice is not above its invert. Where a pipe with a small diameter is proposed for the outlet control (ie. for use with a rainwater tank OSD system) the orifice equation above may be used to calculate the discharge using an orifice coefficient of 0.8 for pipes.

1.4.7 Debris Screens

A Debris screen or trash screen is a mesh insert placed inside pits, generally used with OSD systems to prevent the orifice/outlet pipe from getting blocked. It may also be required on-site prior to stormwater discharging the site to prevent gross pollutants and sediment entering the downstream water system. The following requirements apply to these components;

- a) Trash screens shall be constructed of hot dipped galvanized mesh, "Lysaght Maxi mesh Rh3030" (or an approved equivalent), for orifices or outlet pipes (or equivalent steel sections) of less than 150mm diameter. For orifices or outlet pipes (or equivalent steel sections) greater than 150mm diameter "WELDLOK (F40/203)" type mesh (or approved equivalent) shall be used. The cross sectional area of the screen shall not be less than 50 times the orifice cross sectional area for the Maxi mesh or 20 times for "WELDLOK".
- b) The screen or cage should be a minimum of 100mm from the face of the orifice or outlet pipe and attached (generally on a sliding mechanism) to the wall, but should be removable (without the use of tools) to permit cleaning and easy inspection of the outlet control. The use of any equivalent must be approved by Council's Engineer prior to installation.
- c) Any gaps between the trash rack and the pit wall shall be no greater than 3mm.
- d) A typical installation of a debris control screen is shown in Figure 1-8 below.
- e) A lifting handle welded to the top of the mesh is also required to allow for easy removal of the screen for cleaning purposes.
- f) The screen must not be bolted securely to the wall but should also not be easily removed.

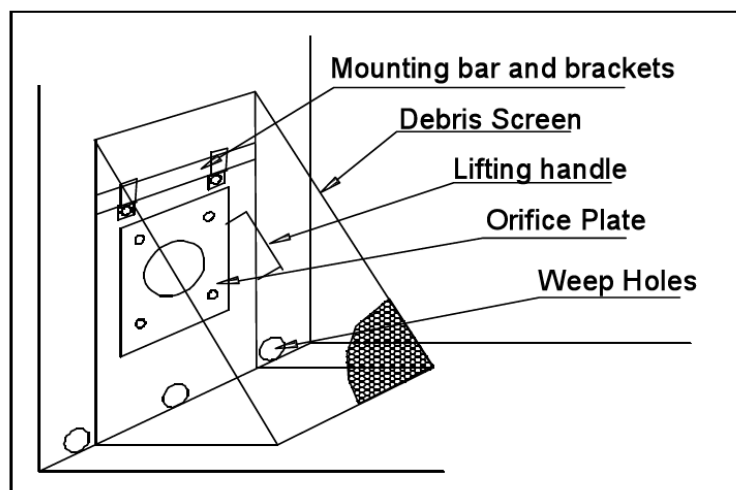


Figure 1-8 Debris screen.

1.4.8 High Early Discharge (HED) Systems

High early discharge (HED) systems work by routing stormwater runoff into a smaller secondary pit, located inside the OSD system at the location of the control outlet, allowing overflow to spill stormwater runoff to the main OSD storage. The stormwater runoff reaches its peak discharge rate faster as the water in the secondary pit fills up quicker due to the smaller area of the secondary pit. By allowing a greater rate of runoff at the commencement of the storm event the OSD volume to be provided to restrict post development flows back to pre-development levels may be reduced.

HED pits can only be used in OSD systems that have been modelled with the detailed computational method. Hydrograph output for the pre-developed case and post developed case is to be provided showing that the maximum PSD for the site is not exceeded for all ARI storm events.

The following general items shall be adhered to in the design of detention storages and HED systems:

- a) A minimum of 85% of the area draining to the OSD system must drain directly to the HED pit/chamber.
- b) High Early Discharge (HED) pits are to be constructed as concrete cast "in-situ" pits. Precast or masonry brick pits are not permitted for HED pits.
- c) High Early Discharge pits up to a depth of 1200mm shall have a minimum internal opening dimension of 900mm x 900mm. For deeper pits, the HED pit shall have a minimum internal opening of 1200mm x 1200mm.
- d) The flap valve on the "return" from the storage area into the HED pit shall be a "Nicholas Flexi Flap" or approved equivalent. If an equivalent is proposed this must be approved by Council's Engineer prior to installation.
- e) Fittings in the HED pit are to be secured with "Ramset Chemical anchors (type M 10)" available from Ramset Fastener Pty Ltd or an approved equivalent. Any proposed equivalent must be approved by Council's Engineer prior to installation.
- f) The HED system shall have a min. 200mm sump provided below the orifice outlet to collect sediment. This sump is to have a minimum depth of 200mm below the invert of the orifice and it to be connected to the outlet pipeline by means of 3x40 mm weep holes plugged with a geofabric filter cloth. Between the weep holes and the connection to the pipeline a further filter medium is to be provided consisting of 15mm gravel wrapped in geofabric with a minimum length of 600 mm between the wall of the pit and the connection to the outlet pipeline. Alternative methods for draining the sump may be considered by Council; however the system above is generally preferred.
- g) A debris (trash) screen shall be installed in the discharge control pit over the orifice in accordance with the design requirements listed in Section 1.4.7.
- h) Pits shall be designed so that the discharge of "inlet" pipes is directed across the trash rack.

1.4.9 Operation and Maintenance

OSD systems are intended to regulate flows over the entire life of the development. This cannot be achieved without some regular maintenance. Routine maintenance of the OSD system is essential to ensure the system operates as intended in the design and to avoid unpleasant odours and health risks. For this reason Council requires a Positive Covenant to be placed on the title of the subject land to emphasise the proprietor's maintenance responsibilities and the preparation of a plan of management for the OSD system.

As part of the detailed design submission, a plan of management report is required for the OSD system detailing the operation and maintenance of the OSD system. The maintenance schedule is a simple set of operating instructions for future property owners and occupiers that should clearly and simply set out maintenance actions and the frequency of such actions accompanied by a simplified plan showing the layout of the OSD system.

Maintenance is the responsibility of the owner of the property. For safety, all maintenance access to underground storage systems must have due regard for the entry and safe working requirements set out in AS 2865 *Safe Working In a Confined Space*.

The following items must be addressed in the plan of management:

- Where all the components of the OSD system are located (i.e. pits, orifice, sump, storage areas),
- Which parts of the system need to be inspected and accessed for cleaning and how access is to be obtained,

- A description of procedures to gain access and carry out cleaning (including any equipment required, lifting devices or keys), and
- The frequency of maintenance actions (for example every 6 months and after every major storm event).
- The report shall include an inspection checklist and maintenance report record sheet for ease of use.

The frequencies of both inspections and maintenance will be highly dependent on the nature of the development, amount of vegetation, location of the storage and the occurrence of major storms. Generally all on-site stormwater detention systems shall be cleared of debris and sediment at least once a year to ensure correct operation of the system.

The debris screen should be removed and the orifice plate checked for obstructions. If water is not drained from the sediment collection sump within 48 hours of a rainfall event the weep hole filter bed may need renewing. For residential developments the system is to be inspected every six months and after each heavy rainfall event. For commercial and industrial developments the system is to be inspected every three months and after each heavy rainfall event.

The majority of OSD systems, particularly those where a large proportion of the storage is located above ground, will be able to be maintained by property owners, residents or handymen. Larger underground systems, particularly those with limited access and/or substantial depth, will require the owner to engage commercial cleaning companies with specialised equipment. The person required to do the work should be specified in the plan of management.

1.4.10 Design Requirements – All Systems

The following general items shall be adhered to in the design of OSD systems:

- a) In all cases, safety issues shall be addressed with provision of warning signs (including Confined Space Entry signs), and if necessary, safety fencing.
- b) Freeboard for any building adjacent to the detention structure shall be in accordance with Section 2.1 of this Manual.
- c) The drainage concept plan (to be submitted by the Applicant with the Development Application) shall identify undrained areas and include SSR, PSD and High Early Discharge (HED) discharge (if used), control pit design parameters such as pit levels, orifice levels/diameters, weir levels/flow rates, etc.
- d) All pits associated with the on-site detention system, (except for a HED pit if used), shall have minimum internal opening dimensions of 600mm x 600mm for pits up to 600mm deep, 600 x 900 for pits up to 900mm deep, and 900mm x 900mm for deeper pits.
- e) When a dwelling wall is proposed to form part of the containment wall for a storage area, or is adjacent to the storage area, it must have an impervious waterproof type membrane to prevent water seeping/penetrating or rising into the dwelling. Care must be taken to ensure that brick wall ventilation holes are *not* below TWL of storage area.
- f) A debris (trash) screen shall be installed in the discharge control pit over the orifice in accordance with the design requirements listed in Section 1.4.7.
- g) A maintenance schedule is to be prepared in accordance with Section 1.4.9.
- h) Major retention structures should be checked for Half Probable Maximum Flood flows so that damage, resulting from failure of the structure, does not occur.
- i) An outlet structure or overflow weir shall be designed to safely convey the 100 year ARI storm event on the assumption that at commencement of the design storm the detention outlet is 100% blocked.
- j) Where overflow is through an adjoining property and a suitable overland flow path is not available, the overflow should be collected within a drainage pipeline with a design capacity equivalent to the 100 year ARI storm runoff from the site.

- k) Suitable scour protection in accordance with Landcom's "Managing Urban Stormwater – Soil and Conservation – Volume 1" 4th Edition 2004 (Blue Book) or similarly recognised publications shall be used over any spillway.
- l) Where plastic modules are proposed, a minimum of two cleaning eyes into the tank must be provided and all inlet pipes must be directed to an external control pit that has a screened connection to the tank with a surface area of at least 0.25m².
- m) All OSD storage must be located above the flood level or downstream water level to provide effective storage. Where there is a submerged outlet it shall be modelled with a computer program to ensure it functions hydraulically as intended to limit post development flows to pre-development levels. Submerged outlet will require HGL analysis.
- n) A sediment collection sump is to be provided below the orifice outlet to the stormwater detention system. This sump is to have a minimum depth of 200mm below the invert of the orifice and it to be connected to the outlet pipeline by means of 3x40 mm weep holes plugged with a geofabric filter cloth. Between the weep holes and the connection to the pipeline a further filter medium is to be provided consisting of 15mm gravel wrapped in geofabric with a minimum length of 600 mm between the wall of the pit and the connection to the outlet pipeline. A typical sediment collection sump with drainage filter is shown in Figure 1-9 - Typical sediment collection sump. Alternative methods for draining the sump may be considered by Council; however the system above is generally preferred.

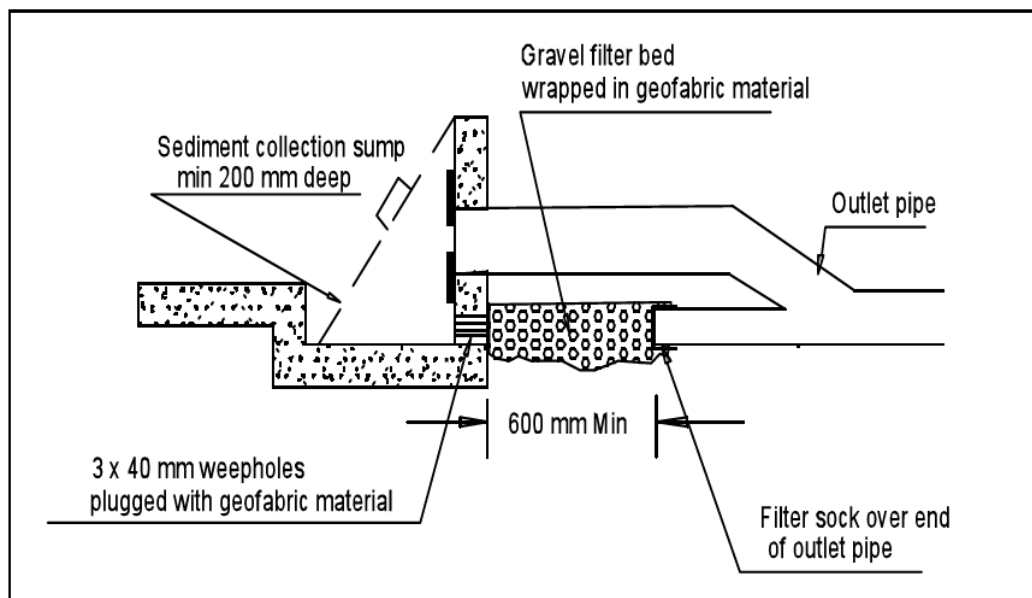


Figure 1-9 - Typical sediment collection sump.

- o) Each on-site stormwater detention system shall be indicated on the site by fixing a marker plate in a prominent position. This plate is to be of minimum size 150 mm x 100 mm and is to be made from non-corrosive metal or 4 mm thick laminated plastic. It is to be fixed to the nearest concrete or permanent surface in a prominent position. The wording on the marker plate is to be as per Figure 1-10 - Onsite detention system marker plate.

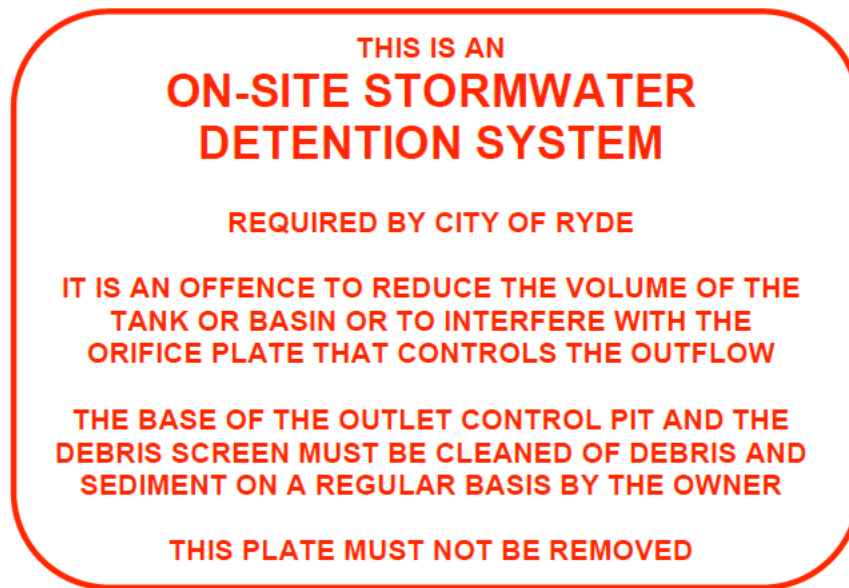


Figure 1-10 - Onsite detention system marker plate.

1.4.11 Design Requirements - Above ground systems

- a) When using rainwater tanks for OSD, consideration must be made to the appropriateness of using an orifice outlet as the discharge control as it may be difficult to construct as it is not a common rainwater tank fixture. It is therefore preferred when using a rainwater tank for OSD systems that the outlet control is an appropriately sized pipe. The use of an equivalent pipe diameter in place of an orifice is not acceptable as the discharge through a pipe is not the same as through an orifice of the same diameter. Please refer to Section 1.4.5 for the appropriate method of calculating discharge for OSD outlets.
- b) Minimum desirable slope of 1% in paved areas and absolute minimum of 1% in landscaped areas.
- c) The storage depth in car parking and driveway areas should generally not exceed 150mm, with an isolated maximum depth of 200mm being permissible at low points in the detention area.
- d) In large landscaping areas used for detention mulch is not to be used.
- e) Above ground storage areas shall generally incorporate "Walk in" and "walk out" batters with a maximum slope of 1 vertical to 5 horizontal (1V:5H). Where this cannot be achieved an absolute maximum slope of 1V:4H shall be used with consideration made to maintenance access.
- f) Where a 'walk in" and "walk out" batter of 1V:5H cannot be provided and/or the maximum storage depth is in excess of 600mm a risk assessment is required with documentation to determine whether a 1.2m high safety pool fence with child proof self closing gates or better is required to restrict access.
- g) Steps must be provided where the step down to storage invert exceeds 200 mm or for "fenced" storage areas where maximum allowable slope cannot be achieved.
- h) Above ground systems must be designed to not restrict pedestrian access from the public road to buildings.
- i) The storage volume must be increased by 20% in landscaped areas to allow for growth of vegetation and minor variations to the ground level that will occur as part of the general maintenance. The 20% additional volume is to be gained by increasing the surface area of the ponded surface. Increasing the depth of the basin to gain additional storage is not permitted as this will alter the designed stage-storage discharge relationship of the model.
- j) Have a volume of less than 10,000L where the basin is located within the front setback of a single occupancy development.

- k) Any above ground storage for medium density developments must be located in common areas (not in private courtyards etc) and not in the front setback of the development.
- l) If an earth mound is used to retain water the crest width (berm) is to be no less than 1.0m wide.
- m) Large systems may require approval of the Dam Safety Committee.

1.4.12 Design Requirements - Below ground systems.

- a) A minimum internal (head) height of 1.2m is to be provided. This may be reduced to 750mm for commercial/industrial development or 500mm for residential development, but only where all other practical alternatives have been exhausted and where it can be demonstrated that consideration has been made to allow easy access by the owner of the system to facilitate inspection and maintenance and having satisfied the requirements of Confined Spaces Act and Occupational Health & Safety Act 2000.
- b) Underground storage facilities shall be designed to adequately withstand all service loads and provide adequate service life of 50 years.
- c) Sufficient ventilation and access points (usually hinged grated lids) must be provided to the storage tank.
- d) All grates accessing the tank shall have industrial grates with a maximum lifting weight of 20 kg. The grate may need to have a double opening in order to achieve this requirement.
- e) Grates are to be placed in a manner to ensure that the maximum distance from any point in the tank to the edge of the nearest grate is not greater than 3m. This is to facilitate access and maintenance of the storage tank.
- f) The base of the tank shall be shaped with a min. 1% cross fall to a central "V" drain, and min 1% longitudinally slope along the "V" drain to ensure long term ponding of water will not occur over the floor of the basin.
- g) The designer shall avoid placing access points/grates in driveways to minimize danger to service personnel during maintenance works. Where this cannot be avoided, the grates must be designed to withstand vehicular loads.
- h) Suspended pipes through underground storage spaces shall be avoided wherever possible. Where they are unavoidable the following requirements shall apply:
 - i) Concrete pipes, in tanks, must be supported by concrete cradles with a minimum clearance of 50mm between under side of pipe and the tank floor.
 - j) PVC pipes must be secured to wall brackets or roof brackets. The resultant system shall be rigid in all directions.
- k) Vertical walls shall be finished smooth so that they cannot collect litter and debris. Walls will generally satisfy this requirement if they are:
 - l) Block walls with flush joints
 - m) Concrete wall with smooth surface
- n) Horizontal and near horizontal surfaces inside pits shall be finished with a wood float finish.
- o) Step irons shall be provided where pit and/or tank depths are in excess of 1.2m
- p) Below ground storage facilities shall be located outside the root zone of trees that must be retained.
- q) Below ground facilities shall have a minimum soil cover in landscaped areas of 300mm.
- r) Venting must be provided where gas build up is likely. A hydrostatic valve must be provided where necessary.

1.5 Trunk Drainage Design

Release areas or very large infill developments will require the design of trunk drainage infrastructure. Council's basic philosophy is that natural creek lines and watercourses must remain largely intact and continue to function as viable ecological systems. Where the existing riparian environments are largely degraded, Council expects that the trunk drainage design will address this issue and restore ecological and habitat systems to mimic the natural condition of Sydney creek lines as closely as is practicable.

Council recognises that urbanisation of natural or rural developed catchments will inevitably alter creek hydrologic and geomorphologic regimes. However, the design of any trunk drainage system must recognise and address these constraints whilst proposing solutions/designs that integrate with Water Sensitive Urban Design principles and mimic natural flow regimes and restore/enhance/maintain the existing riparian environment and floodplain.

Council is primarily interested in superior aesthetic, environmental and recreational outcomes for riparian corridors, which are a very valuable community resource. Leading edge or innovative trunk drainage design strategies will be assessed on their merits.

A low maintenance, naturalised, landscaped watercourse and floodplain is Council's preferred outcome. Hard engineering structures are to be avoided wherever possible in favour of more natural rock walls, riprap scour protection etc. However, rock outcrops are not common along Sydney creek lines and are only to be used where potential or existing scouring of creek beds and banks require such measures. Suitable select sandstone is preferred to igneous rock such as granite, basalt, dolerite etc. and interlocking loose packed rock walls and riprap is preferred over gabion or mattress type structures.

Bridges are preferred to Reinforced Concrete Box Culverts (RCBC's) at road crossings and must facilitate the movement of fauna and provide for fish passage where appropriate. Landscaping must reflect indigenous flora representative of the natural riparian environment of Sydney creek lines. The design should aim to achieve a slow moving, steady flow regime to minimise scouring potential and maximise safety outcomes. Rock drop structures, incorporating low flow riffle zones, and dense (increasing floodplain roughness) riparian plantings may help achieve these outcomes on steeper sections of some watercourses.

The design and construction of the trunk drainage shall be in accordance with the hydraulic requirements as per Section 5.

1.6 Drainage for low level properties

The following procedure describes the requirements for discharging water for single residential low level properties only. Multi-unit developments, industrial, commercial and subdivision developments that are low lying properties that cannot drain to a preferred discharge point must acquire or have access to an easement to drain via gravity feed system.

Generally, Council is to be satisfied that an honest attempt and reasonable attempt has been made to acquire an easement through any of the downstream properties or demonstrated that all avenues to establish an easement be impractical or unviable, prior to consideration of an alternative means of stormwater discharge from the site.

Applicants are to firstly approach all downstream property owners, wherever a drainage easement to drain the subject property could be established. Any request for a drainage easement must outline details of the proposed easement as well as present a monetary offer of compensation for the easement. The written request is to be generally in accordance with the proforma letter contained in Appendix 14. Council requires some written evidence to clarify that some negotiation has been undertaken with the property owner.

Where a neighbouring owner refuses to grant a drainage easement the applicant must provide documentary evidence of this outcome.

Section 88K of the *Conveyancing Act 1919* allows for the compulsory acquisition of an easement over land if the easement is reasonably necessary for the effective use or development of other land that will have the benefit of the easement. There are a number of criteria outlined in the Act that must first be satisfied.

If the property owner is unable to attain any written response from the adjacent downstream property owner, a Statutory Declaration stating the above must be submitted.

Council may, at its discretion consider other methods of stormwater disposal only if all of the above mentioned methods have been exhaustively investigated and were considered not appropriate for this development.

1.6.1 Section 88k of the conveyancing Act 1919 (NSW)

Where a drainage easement is not able to be obtained through a negotiation process with adjoining owners it is possible to have the matter dealt with by arbitration in the Supreme Court through the *Conveyancing Act 1919 (NSW)* (the Act), s 88k. The rationale behind the introduction of the section was expressed by the Attorney General in December 1995 where he pointed out that the introduction of s.88k:

“..reflect(s) .. a realisation that private developments may also be beneficial for the public, and that such development should not be unreasonable frustrated or held to ransom.”

Essentially to be successful under Section 88k, it is necessary to establish the following:

1. The easement is reasonably necessary for the effective use or development of the land that will have the benefit of the easement.
2. That the use of the land in accordance with the easement is not inconsistent with the public interest.
3. That the owners of the land to be burdened by the easement and each person having an estate or interest in that land can be adequately compensated for any loss or any other disadvantage that will arise from the imposition of an easement.
4. That all reasonable attempts have been made by the applicant to obtain the easement otherwise than approaching the court.

In making an order under Section 88k the court is to

- a) Specify in the order the nature and terms of the easement, and such particulars referred to in s 88 (1)(a)-(d) as are appropriate, and is to identify its site by reference to a plan that is , or is capable of being, registered or recorded as a Deposited Plan.
- b) Provide in the order for the payment by the applicant to specified persons of such compensation as the Court considers appropriate, unless the Court determines that

1.6.2 Building adjacent to Easements, Piped Drainage Systems or Natural Watercourses

No encroachments or low lying overhangs of developments are permitted over and/or within easements for stormwater drainage or over piped drainage systems or over natural watercourses. On a merit basis, Council may allow light, easily removable structures to be built over drainage easements, piped drainage systems or natural water courses, e.g. Carports or paved areas which can easily be removed and replaced.

An overhang, over and/or within an easement will be considered on merit. A minimum vertical clearance to allow appropriate machinery to allow easy access and ample clearances to undertake maintenance replacement operations is required. Alternative construction techniques to allow removal of sections of the building structure by the property owner will also be considered.

Demountable carports and other easily removable structures that do not involve usable floor space, have been approved over Council drainage easements. If approval for such a structure is granted, the owner would need to place a “Deed of Charge” on the title of the lot that is binding on successors in title, indicating that the property owner will remove the structure at their own expense if Council deems it necessary for the purposes of accessing the easement. Any such approvals will not extinguish or limit Council’s rights under the easement. Pedestrian and vehicular bridges may be permitted to encroach an easement provided they can be easily removed to facilitate access to the easement and suitable alternate vehicular and pedestrian access to the property exists if they were removed.

Structural support elements are not permitted within easements or within the cross sectional area of an open or natural watercourse. Structural support elements adjacent to an easement, piped drainage or natural water course located on the development site or on adjacent lands must be founded outside the zone of influence (or as directed by the structural engineer) to provide stability to both the structure and drainage system particularly during maintenance operations. Typically, where a drain is laid near to a footing the trench shall be located beyond a 45° angle from the base of the footing. Allowance needs be made for future upgrading of the pipeline to handle larger storm events. Figure 1-11 - Drainage easement adjacent to a building. ,shows an example of drainage easement adjacent to a building.

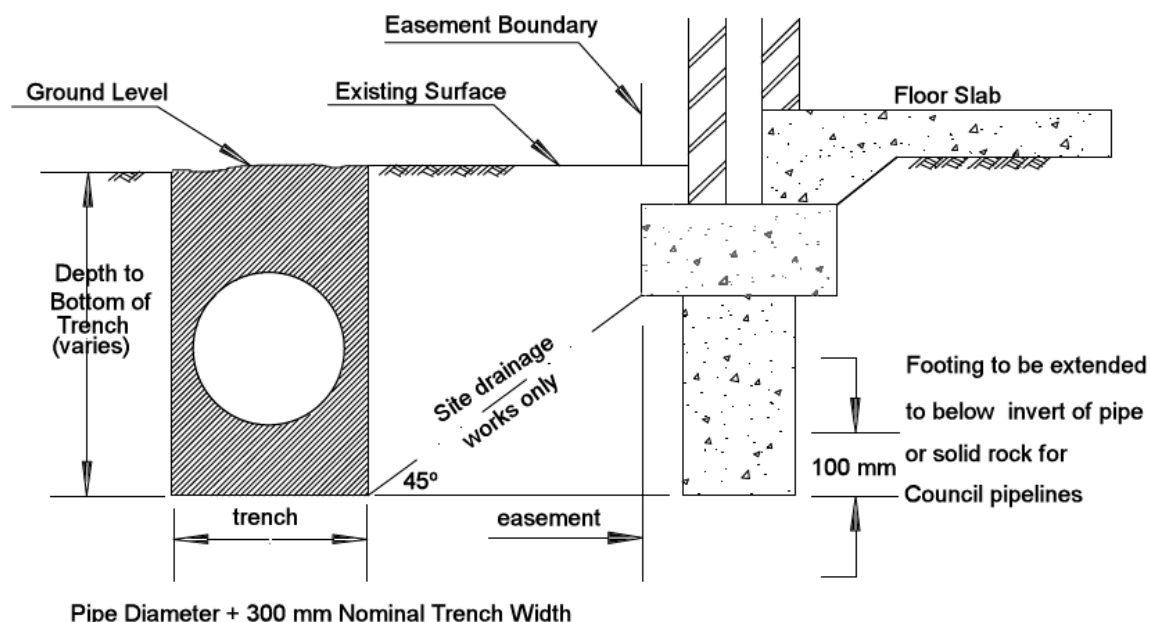


Figure 1-11 - Drainage easement adjacent to a building.

Where an easement across a property contains a pipeline conveying stormwater runoff from roads and parkland, the footing must be extended to a point a minimum of 100 mm below the invert of the pipe or to sound rock. The minimum width of this type of easement is 2.5 metres. If an existing easement is less than 2.5 metres, a setback from the easement boundary to allow for this width of access will be required.

Council will generally not approve the construction of any permanent structure or the placing of filling over a piped drainage system or easement that will prevent or hamper constructing, reconstructing, maintaining repairing, cleaning or gaining access to the pipelines or easement. Permanent structures include habitable dwellings, eaves & balconies, garages, impervious fences, swimming pools and retaining walls.

Consideration may be given in exceptional circumstances to permanent structures subject to an adequate and safe overland flow path being provided and a minimum of 8 metres clearance over the 1 in 100 year flood surface levels. This shall include eaves and balconies. On-ground vehicular driveways and landscaped areas will typically be permitted over an easement however the structural stability of any existing pipelines may need to be considered before consent is given to an application that proposes to introduce additional live loads to the pipeline. Similar considerations will be made when it is proposed to reduce cover over the pipe. Masonry walls constructed across an easement must cross the easement at an angle of not less than 60°. The section of wall spanning the easement shall be constructed to enable its easy removal without resulting in failure of the remainder of the structure. The footings must be constructed to prevent any loading imposed on the pipe.

2 FLOODING AND OVERLAND FLOW

It is essential that development be designed with consideration to flooding and overland flow due to stormwater runoff, from both minor and major storm events. Whilst the following section mostly addresses property affected by major flooding and overland flow, all property development must be mindful of the minimum freeboard requirements as specified following.

2.1 Freeboard requirements

The following table specifies minimum freeboard requirements based on type of overland flow and category of the development to ensure that such development is not subject to stormwater inundation or nuisance flooding.

Drainage System/ Overland Flow	Residential			Industrial/ Commercial	
	Land Level ^(b)	Habitable Floor Level	Non-Habitable Level ^(c)	Land Level ^(b)	Floor Level
Surface Drainage/ adjoining ground level ^(a)	-	.15m	-	-	.15m
Public drainage infrastructure, creeks and open channels	0.5m	0.5m	0.1m	0.3m	0.3m
Flooding and Overland Flow (Overland Flow Precincts and Low Risk)	N/A	0.3m	0.15m	N/A	0.3m
Flooding and Overland Flow (Medium Risk and greater)	N/A	0.5m	0.3m	N/A	-
Onsite Detention ^(d)	N/A	0.2m	0.1m	N/A	0.2m
Road Drainage Minor Systems (Gutter and pipe flow)		0.15m below top of grate			
Road Drainage		Refer to Figure 2-1.			
Detention Basins ⁽⁴⁾		The top water level shall be designed to be 0.5m below top of embankment (100yr ARI)			

Table 2.1 Freeboard requirements.

Notes:

- a. Reduced for site specific conditions (surface grades, extent of stormwater runoff, etc). Generally the intent is to prevent inundation by stormwater runoff on the site.
- b. Land level at subdivision stage.
- c. Non-habitable structures such as sheds etc.
- d. Refer to Section 1.4 for OSD design requirements.

It may be necessary for a structure to be checked against Probable Maximum Flood (PMF) event in areas where failure could significantly increase the danger to life and property. The freeboard may need to be increased where there are high flow rates, high flow depths, and/or potential damages in the event of stormwater inundation and/or low confidence in the accuracy of the prediction model. An adverse combination of factors may result in a freeboard of 500 mm or greater being required.

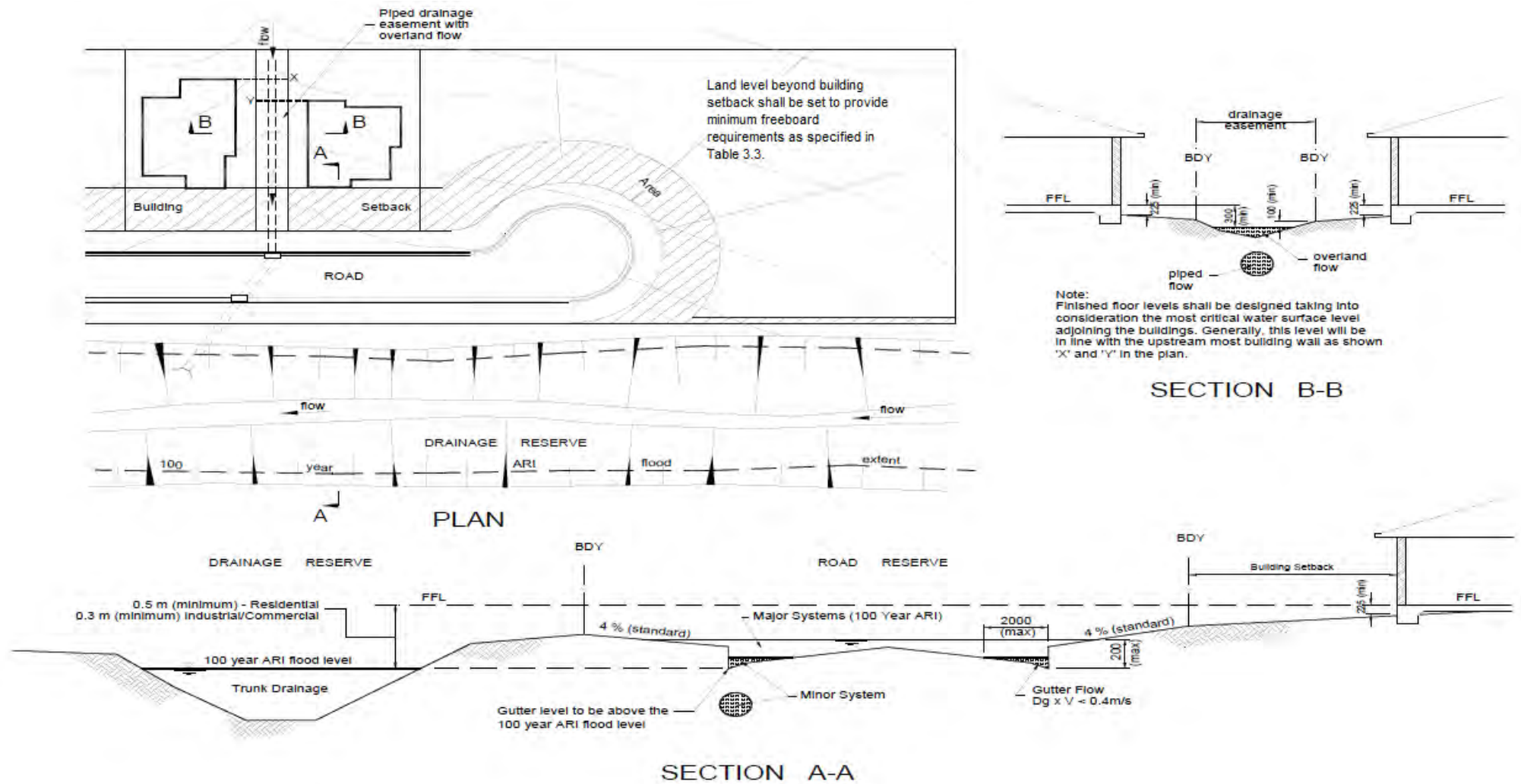


Figure 2-1 Typical freeboard requirements.

2.2 Preparation of a Flood Impact Statement

Certain areas within the City of Ryde are prone to major overland flows and flooding resulting from large storm events. Development works undertaken on land that is subject to these natural occurrences must therefore be designed to ensure the resulting development satisfies the Council's DCP objectives in relation to flooding and overland flows.

To assist in the assessment of development on land affected by flooding and major overland flows, a Flood Impact Statement must be prepared and submitted as part of any development application on land marked as subject to flood affectation unless the development is notably clear of any areas of flooding or overland flow path on the property. As a guide, this will be when the development works are founded (located on natural ground level) at least a metre above the marked extent of flood inundation on Council's mapping system. In some areas, Council's flood data is indicative only (based on the general topography, size of the upstream catchment and historical flood records) and does not take into account particular site characteristics or inground drainage infrastructure. As such, Council may request a Flood Impact Statement in situations where the specific site conditions and flood regime may present a risk to the development.

The intent of the Flood Impact Statement is to ensure that;

- site specific conditions are taken into consideration of the development with respect to flooding impacts,
- the objectives and controls of Councils DCP and Technical Manual are appropriately addressed.
- the statement is to provide recommendations to be implemented during the detailed design and construction phase, as well as during ongoing operation of the development.

The format of the Flood Impact Statement, outlined below, must address the planning considerations with respect to the estimated flood level and flows resulting from the 100yr ARI storm event, or the PMF for critical components where required.

The required level of detail of the supporting information may vary considerably from site to site, depending partly on how close the proposed development is to the criteria limits. The proposed location and shape of buildings and other structures will often have a large influence on overland flow characteristics. For this reason the early involvement of a qualified and experienced Drainage Engineer is recommended in the conceptual design phase.

The Flood Impact Statement must be prepared by a suitably qualified and practising Drainage Engineer, suiting the qualifications and skills listed in Section 3.1.2 (Drainage Consultant Qualifications).

2.2.1 Determining Flood Risk

Council has commenced and completed flood studies for several catchments in the Council area. Where this analysis has been completed, site specific flood information can be obtained from Council and must be utilised in the preparation of the Flood Impact Statement. Refer to Council's website or the DA Guideline for Flooding and Overland Flow in regards to obtaining this information.

In locations where site specific flood information is not available, the Flood Impact Statement will need to determine the level of flood risk, the scope of works proposed however will determine the appropriate level of detail for this to be determined.

For some development, The Flood Impact Statement may be required to undertake a catchment analysis in order to determine the flood levels resulting from the 100yr ARI storm event and in some cases the PMF for significant development.

Council acknowledges that for minor development, the cost of this exercise can be onerous relative to the cost of works. For this reason, several of the planning considerations to be addressed in the Flood Impact Statement contain concessional provisions, allowing the adoption of conservative assumptions and/ or measures to address the component.

2.2.2 Flood Impact Statement Structure - Planning Considerations

The requisite planning considerations to be considered in the Flood Impact Statement listed in the following section.

Several provisions may be applied for concessional development and are outlined under the term “*Concessional Provision*” below. These may only be utilised where permitted under Section 3 of the DCP Part 7.3 (*Stormwater and Floodplain Management*) (herein referred to as the “DCP”).

1. Description of the Flood Regime

To establish the applicant and consultant has a full understanding of the flood affectation and its relation to the development, the Flood Impact Statement must include a summary of the flood affectation and its relation to the proposed development which is site specific. This may be way of plan or description however should be site specific. Where detailed flood level information is not available, the report is to present an analysis of overland flow in accordance with Section 4 (HYDROLOGY).

Concessional Provision:

For development categorised as “Concessional” as per the DCP definitions, a general estimation of flood affectation may be presented. This may consist of (but not limited to) a simplified catchment analysis estimating overland flow and the depth of flow given the proposed flow path and site conditions. The intent of this is to ensure that the proponents of the development have a comprehension of the level of flood affectation over the site. The level of detail can be representative of the scope of development and conservative assumptions would be accepted.

2. Floor Levels

Development should provide a freeboard above flood levels resulting from the 100yr ARI storm event in order to protect it from inundation. Refer to Section 2.1 in regards to the freeboard requirements.

Concessional Provision:

Where permitted by Section 4 of the DCP, the floor level of new works must be no less than the existing maximum freeboard provided above natural ground level by the existing development.

3. Building Components

Any new development works subject to flooding and overland flows should be constructed of flood compatible materials to ensure the structural integrity of the works is maintained throughout and after a flood event. For a majority of development, this is not a crucial aspect to be addressed prior to development consent however will be enforced as a condition of consent. It is then warranted this aspect be considered in the design phase.

4. Structural Soundness

Proposed developments shall be designed to withstand damage due to scour, debris or buoyancy forces. Additional measures, including site drainage need to be considered with slab on ground construction. As per above, this is not a crucial aspect to be addressed prior to development consent

however will be addressed as a condition of consent. It is then warranted this aspect be considered in the design phase.

5. Flood Effects

Due regard is to be given to the location and shape of proposed buildings on the site with respect to the diversion of overland flow and flood depth, not only on the site but also to neighbouring properties.

Development must avoid;

- Concentrating overland flow through the property, increasing the risk to occupants and neighbouring properties.
- Promote the increased use of a property (or part of a property) that has an existing stormwater inundation safety hazard.
- Reducing flood storage.
- Diverting overland flow such to increase flood depth or affectation on neighbouring properties.

Assessment of this component will consider the degree of affectation, risk to occupants and neighbouring residents, the impact of potential development on the neighbouring sites and the level of measures the applicant has resorted to minimise these impacts.

In most cases, this component will require an analysis of the pre-developed and post-development conditions in the Flood Impact Statement to gauge these flood effects, using HEC-RAS or simplified open channel analysis if the site conditions (and the overland flowpath is uniform).

For sites where flood level information is available, the issued flood level information should be utilised to calibrate the model.

Concessional Provision:

To fully address this consideration requires the determination of flood levels and flows which can be a costly exercise for small scale development. Given concessional development typically presents minor alterations to building footprints, this component will not require further consideration if;

- The proposed works are designed to allow for the free passage of flows (eg the development is suspended above natural ground level).
- Where the above point cannot be achieved, the proposed works are designed to limit the level of exposure to overland flow such that, the extension of the footprint towards the centreline of the flow path, is no more than 15% than existing (at least 85% open space). The centreline of the flowpath is to be generally taken as the invert of a natural valley, depression or sag traversing the site (in other words, the path of which overland flow will follow) or where it is likely to be constricted by a neighbouring dwelling, midway to that dwelling. Refer to Figure 2.2 for examples.

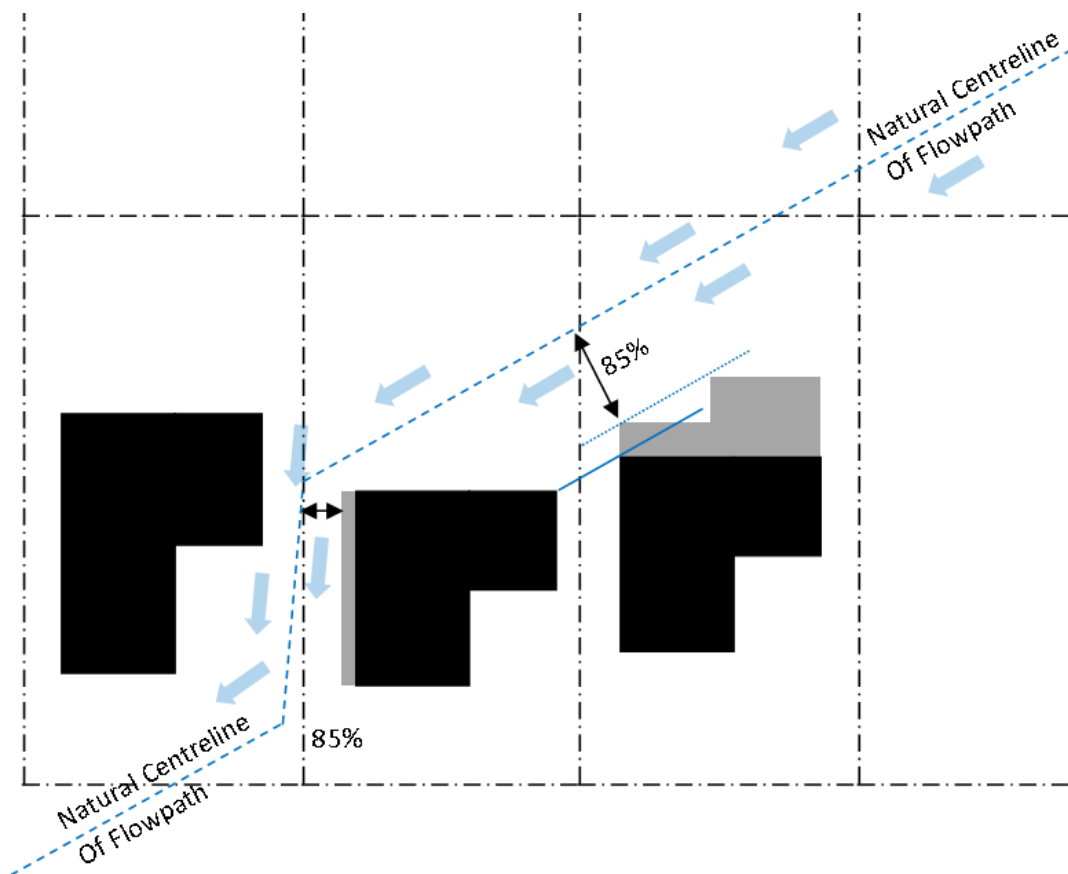


Figure 2-2 - Example of provisional flood effects consideration

Evacuation

Consideration for the escape from flood waters must be outlined in the flood impact statement, to ensure development does not jeopardise public safety. The site must have access to a safe refuge above the PMF event.

Management & Design

Access must be considered, especially with regard to occupants and vehicles leaving a site.

Proposed land subdivisions of lots affected by 'Local Drainage' will not be approved unless the applicant can demonstrate to Council that it is possible to provide a development on the newly created lot that realises the full floor space ratio (FSR) potential of the lot and provides suitable private open space while meeting the Local Drainage management criteria outlined in this document.

Suitable finished ground levels are often critical to ensure that overland flow is adequately conveyed through the property. Further, the inappropriate placement of landscaping features can seriously compromise or undo an otherwise sound overland flow management scheme.

All building plans must show sufficient finished levels to ensure builders will not inadvertently compromise the system for safely conveying overland flow through the property.

A suitably qualified hydraulics engineer must review the building plans, including the landscaping plans, and submit a Compliance Certificate confirming that the building and landscape plans are fully consistent with the approved overland flow management strategy. The engineer will also be required to inspect the completed development and certify that it is fully consistent with the approved overland flow management for this site.

1. A survey of the area affected by overland stormwater flow through the site, and adjoining properties where necessary, undertaken by a Registered Surveyor, showing all physical features which will affect the position and depth of floodwaters. This shall extend sufficiently upstream and downstream to ensure relevant hydraulic controls are contained within the survey.
2. A hydrological analysis of the upstream catchment and a hydraulic analysis of the relevant section of the piped drainage system, to determine overland flow rates through the site in accordance with Section 4, Section 5 and the design requirements in Section **Error! eference source not found..** Where known, these flow rates will be supplied by Council.
3. A hydraulic computer model to assess the pre-developed and post developed scenario flow regime.
4. A comparison of water levels, depths, velocities and hazard classifications across the site between the pre-developed and post developed scenarios.
5. An engineered post developed overland flow path(s) to safely convey waters.
6. Plans and calculations of the pre-developed and post-developed position, depth and velocity of the floodway through the site, and adjoining properties where relevant, prepared by a suitably experienced, qualified Civil Engineer.

All developments must not increase the quantity of flow, water levels or water depths through adjoining properties upstream, downstream or alongside of the site. Water depths within the development site may be increased where it can be shown that the design criteria listed below can be achieved. Regardless of what the pre-development velocities are through the site or adjoining properties where it is proposed to change the flow regime the Vd product must comply with the design requirements listed below.

2.3 Flood Analysis

Free surface hydraulic analysis of flow over properties in an urban environment is a complex process. Buildings and other obstructions can cause rapid variations in overland stormwater flows over a relatively short length. The direction of flow can change abruptly and the roughness of the surface can be highly variable. Engaging a suitably qualified engineer with experience in this field and an understanding of the complexities involved is essential. A poor choice of consultant can lead to significant delays and frustration.

When undertaking an analysis of an existing piped drainage system to determine peak overland flows careful consideration must be made to the blockage factors applied to the system and whether the system is governed by inlet control or outlet control.

Where the upstream catchment draining to the pipe system contains any open channels, headwalls or other open systems a 50% blockage factor is to be applied directly to the pipe running through/adjacent to the site where the overland flow analysis is being done, by modelling the pipe with an equivalent surface area equal to half the actual pipe size (i.e. a 750mm DIA pipe with 50% blockage is equivalent to a 525mm DIA pipe). Where the size and number of pit inlets in the catchment are unknown or it is impractical to gather the information for such a catchment a 50% blockage factor is also to be applied directly to the pipe.

In instances where the development is in a drainage sensitive area identified by Council where inadequate drainage has been provided it is possible that the pit inlets themselves are acting as the control governing what flows are actually contained within the pipe system. In such cases applying a

blockage factor to the pipe system is not acceptable; blockage factors listed in Section 5.5 shall be applied to the pit inlets to determine pipe flows and the resulting overland discharge.

Consideration must be made to adopting appropriate tail water levels.

2.3.1 Gauging Flood Hazard

To gauge the level of flood hazard a property is exposed to, both velocity x depth (Vd) limits and safe water depth limits should be observed. These limits must be strictly observed when designing flow paths on medium density residential property developments.

The depth x velocity product (Vd product) in the kerb and gutter should not exceed 0.6 m²/s (AR&R, 1998) to reduce hazard for pedestrians within the roadway. However, where there is an obvious danger of injury or loss of life, the Vd product shall be limited to 0.4 m²/s.

The Vd product of overland flows in all other cases (across the footpath, within the road reserve, through properties) shall be such that the safety of children and vehicles are considered and restricted to below 0.4 m²/s.

The peak Vd product of stormwater runoff through areas accessible to children or the elderly (such as schools, hospitals, community centres, libraries and other as specified by Council) shall be further limited to the stability values provided in **Error! Reference source not found.** Such areas include riveways, car parking spaces, pathways and courtyards.

Depth of Flow (m)	Limiting Stability Value of Depth x Velocity for 100 year ARI storm event
0.05 or less	0.15
0.1	0.22
0.2	0.29
0.3	0.33
0.4	0.35
0.5	0.33
0.6	0.31
0.7	0.26
0.8	0.16

Table 2.2 Maximum Vd products in areas accessible to children and the elderly.

2.4 Fencing and Landform

Changes to the landform and fencing are rarely considered in the context of flooding and overland flows however can have consequences in terms of diverting flows or reducing flood storage. The following requirements apply to such structures on flood affected lots.

- a) Safety fencing necessary to restrict access to area affected by hazardous flows shall meet the minimum standards outlined in *AS 1926.1-1993 Fencing for Swimming Pools*.
- b) Boundary and internal fences should not obstruct the natural path of overland flow.
- c) All fences located within an overland flow path shall be permeable in nature to at least 300 mm above the calculated top water level in order to allow water to freely pass through them. In most instances, only the lower portions of the fence will need to be permeable.
- d) All light structures such as garden sheds, fencing and above ground portable pools are likely to be removed due to major overland flows. Consideration should be given to the potential impacts of this debris.
- e) Consideration is to be given to potential for property erosion due to scour by overland flows. The potential for scour is a function of the velocity of the water and the type of surface over which the water is passing.

2.5 Piping overland flow

Proposals involving collecting and piping overland flow through the subject property or upgrading a section of Council's existing pipe infrastructure to address flooding will generally not be acceptable for the following reasons:

- a) The reliance of a drainage system in the absence of a defined overland flowpath is prone to failure.
- b) There is a substantial potential for system blockage due to the limited number of inlets available.
- c) The natural detention storage available within the catchment is reduced and flow velocities are increased.
- d) Due to the greater rates of flow, it may cause localised increase in flood hazard at the system outlet and greater scour of natural creeks and/or disturbance of the downstream river bed.

3 ENGINEERING DRAWING AND REPORT REQUIREMENTS

3.1 Stormwater Drainage Submissions

3.1.1 General Requirements

Stormwater documentation including concept stormwater plans, detailed stormwater engineering plans, supporting calculations and reports are required to enable Council to assess the proposed development.

Submissions light on detail that do not address the submission requirements listed in this Section will most likely be returned to the applicant with a notification for further information to be provided or in some cases will be rejected. With the view of having a smooth streamlined process for development applications and approvals without delays it is essential that the information requirements listed in these sections are addressed.

Stormwater concept drawings shall generally accompany the local development application (LDA). In certain circumstances where the site is in a drainage sensitive area detailed drawings may be required at DA stage. Detailed stormwater drainage drawings are required to be submitted with any construction certificate application.

Full stormwater engineering drawings with supporting calculations and reports shall generally accompany the Local Development Application. Concept stormwater drainage plans will only be permitted for small developments with minor drainage works, where the following criteria are met:

In general the level of information must be sufficient to demonstrate compliance with Council's controls which may require additional information for sensitive drainage/difficult sites.

3.1.2 Drainage Consultant Qualifications

Drainage plans and calculations must be prepared by persons having appropriate qualifications in the design and analysis of stormwater drainage and runoff. The following are considered to be acceptable accreditation for the purpose of stormwater drainage design and certification:

- NPER in Civil Engineering (Institution of Engineers, Australia),
- Surveyors certificate of Accreditation in Onsite Detention and Drainage Design (Institution of Surveyors NSW and Association of Consulting Surveyors NSW),
- Stormwater Register (Association of Hydraulic Services Consultants, Australia),
- Accreditation as a certifier under the Environmental Planning and Assessment Act, 1979 in the relevant discipline, or
- Other designers may be acceptable provided that they can satisfy Council that they have the relevant experience and competence in drainage design.

3.1.3 Stormwater Concept Plans

A concept drainage plan may be accepted for development works where it is clear the site discharges to a preferred drainage point and is generally compliant with Councils requirements.

The Stormwater Concept Plan should include the following:

- Site layout, dimensions and proposed finished floor levels,
- Existing and proposed design contours and/or spot levels,
- Overland flow paths through the site,
- The point of discharge of the drainage system,
- The location and approximate finished levels of drainage pits,

- The configuration of the proposed pipe network,
- The location and extent of any on-site detention storage,
- Cross-section through an OSD/ rainwater system with approximate levels and storage volume (where applicable),
- Any inter-allotment drainage line (where applicable).

The following information should also be included on the stormwater drainage concept plan to ascertain the appropriateness of the proposed system:

- Total site area (m²),
- Contributing and total impervious catchment areas (m²),
- Any contributing pervious catchment areas (m²), and
- A letter granting permission to discharge stormwater runoff into another authority's drainage system. This would include SRA, RMS and Sydney Water channels and various rivers and creeks. The letter should detail any conditions of the approval.

Where it is not clear that the site can be drained in a satisfactory manner to the point shown on the concept plan, the applicant may be required to submit a detailed drainage plan prior to completion of assessment of the Development Application.

Where the simplified method for OSD is used the OSD calculation sheet is to be provided to Council with the Local Development Application.

All development where the site is disturbed must provide Erosion and Sedimentation Control plans in accordance with the requirements of the Department of Water and Energy, the Environment Protection Authority and Council. Soil and Water Management plans shall be prepared in accordance with the Department of Environment and Conservation Guidelines, Landcom's "Managing Urban Stormwater – Soil and Conservation – Volume 1" 4th Edition 2004 (Blue Book) and form part of the engineering drawings.

3.1.4 Detailed Stormwater Plans

Detailed stormwater plans shall be prepared by a suitably qualified engineer and include all of the following additional items (on top of what is listed under concept drainage plans):

- The location of all buildings, driveways, and impervious surfaces,
- The location, trunk diameter and canopy size (drip line) of any significant trees that may have roots that will be affected by the drainage system, whether or not they are on the subject property,
- The location of all downpipes, surface channels, kerbs, pits, pipes, and sub-surface drainage,
- The size and class of all pipes and the size of all pits,
- The invert levels of all pipes and pits,
- The grades of all pipelines,
- Finished surface levels of all pits,
- Finished levels of any catch drains or swales,
- Finished surface levels of paved areas, unpaved areas, buildings and garages,
- Contours of the existing ground levels to Australian Height Datum (AHD),
- The path taken by overland flow during storm events where the capacity of the piped drainage system is exceeded or the system is blocked,
- Cross section details of any swales or catch drains proposed,
- A clear indication of the location of easements; the location, size and depth of any

Council street drainage or inter-allotment drainage pipelines; and the location of any watercourses passing through the property,

- Location of existing buildings or hard paving on the property not being removed as a consequence of the development, and the size and location of all drainage pipes and pits associated with the existing site improvements,
- Details of the connection to Council's drainage system, including a cross-section of the footpath area (where applicable) from where the pipeline leaves the subject site to the point of connection to the street system,
- Special drainage structures eg Headwalls, scour protection shall be detailed,

The detailed drainage plan is to be compatible with the landscape plan approved in conjunction with the development approval. To achieve compatibility the following matters need to be resolved:

- Conflict between the location of drainage pipelines and tree roots is to be minimised. This may be achieved by locating pipelines outside of the drip line of all significant trees,
- There should be no loose landscaping material (especially bark) within any on-site stormwater detention basin, and
- No trees should be planted within any detention basin that will significantly reduce the storage capacity of the basin when the tree grows to maturity.

3.1.5 On-Site Stormwater Detention Plans

Where detention storage is required, the detailed stormwater plans shall include:

- Details of the storage facility,
- The path taken by overland flow during storm events when the capacity of the system is exceeded or the system blocked,
- An elevation showing the outlet control pit including its invert level, surface level and the top water level,
- Details of the basin overflow provisions,
- Details of any orifice outflow control including the plate size, material and thickness, the orifice diameter, the exact location of the orifice on the plate, the exact position of the plate over the outlet pipe, the method for fixing the orifice over the outlet pipe,
- Details of any debris screens including their dimensions, the material used to make to screen, their location, the method for fixing the screen in place,
- The location, size and proposed construction materials and reticulation system of any rainwater tanks,
- Details of the sediment control sump and the means of allowing the sump to drain dry,
- The calculated permitted site discharge (PSD), the storage volume required and the storage volume proposed.
- Where the simplified method for OSD is used the Calculation form On-Site Detention Calculation Sheet in Appendage 12 Section 13 is to be completed and submitted with the application.
- Where the detailed OSD method is used full details of input variables and calculations used for the design of the on-site detention system including the selection of the permitted site discharge, the sizing of storage facility, and the design of the outlet is to be provided.

if below ground storage is proposed details shall also include:

- The location and size of the facility,
- Detailed information about the facility including the dimensions of the structure, the floor level, the slope on the floor, the level of the roof, the top water level, the surface level of any access man-holes, the invert level of all inlet pipes, the invert level and diameter of the outlet pipe,
- Full construction details of the tank or facility, certified by a practising structural engineer as being able to withstand all likely service loads. The details shall include wall, floor and roof slab thickness, reinforcement details, footing details and details of all pit openings.

If above ground storage is proposed details shall also include:

- Sufficient details of finished ground levels within the basin to enable an accurate check of the storage volume provided.

3.1.6 Hydraulic Grade Line Analysis

Where a hydraulic grade line analysis is required a detailed longitudinal section of every pipeline shall be prepared showing:

- The existing ground surface (dotted line),
- The final or proposed surface (full line),
- The pipe size, type, class, joint type and backfill type with a structure number to correspond with the plans and pipeline changes,
- Pipe inverts and grade,
- Flow rates and hydraulic grade lines,
- Pit types and pit 'k' values

3.1.7 Scales and Dimensions

The following scales shall be used for the following plans and sections, unless varied by Council:

- | | |
|---------------------------|--|
| • Engineering Detail Plan | 1:1000, 1:500 or 1:200, |
| • Longitudinal Sections | 1:100 (vertical) to 1:200 or 1:500 (horizontal), |
| • Cross Sections | 1:100 (vertical) to 1:200 or 1:500 (horizontal), |
| • Layout Plan | 1:500, 1:1000, 1:2000 or 1:4000, |
| • Catchment Plan | 1:500, 1:1000, 1:2000 or 1:4000 (for external |
| catchments) | |
| • Locality Plan | 1:500, 1:1000, 1:2000 or 1:4000, and |
| • Details | 1:10, 1:20, 1:50 or 1:100 as required. |

Linear dimensions on all engineering plans shall be in metres, with the exception of detail plans which may be in millimetres. Methods of dimensioning will be in accordance with the current Australian Standard.

Chainage shall be expressed to the nearest 0.01m, levels shall be reduced to Australian Height Datum (AHD) and expressed to the nearest 0.01m (except Bench Marks, PM's and SSM's which will be expressed to the nearest 0.001m).

3.1.8 Drainage Easements

Where it is proposed to discharge collected stormwater runoff to an existing inter-allotment drainage easement the applicant shall submit to Council information from the Land Titles Office that indicates the subject property has the right to use the inter-allotment drainage system. This information must be received before Council will issue a Local Development Consent for the proposed development. Hydraulic calculations must also be submitted to indicate the capacity of the pipeline and the ability to accept any additional flow. If the pipeline has insufficient capacity it will need to be upgraded.

Where an inter-allotment drainage easement is to be created and the applicant has come to an agreement with the effected property owner, the drainage easement should be registered prior to development consent. Should the negotiation for the easement be continuing or an applicant will pursue the matter through the courts, Council may consider granting development consent with a deferred commencement condition specifying the easement is to be registered prior to the activation of the consent.

3.1.9 Computer Models

Where computer modelling is used for either hydrological or hydraulic analysis, an electronic copy of the input and output files shall be submitted to Council in a form compatible with Council's computer software along with the plans and a hard copy of the input and output data.

Council encourages the use of computer models by Professional Civil Engineers for drainage design. Data input and output files of any program used shall be submitted in electronic format to Council. Council is familiar with the following commercially available programs and recommends their use subject to the comments below. Should Consultants wish to use a program not listed below, then all costs incurred by Council, associated with the independent assessment of the submitted drainage modelling, are to be borne by the applicant who is required to make satisfactory prior arrangements with Council for the payment of all expenses incurred by Council in its assessment of the drainage submission.

- ILSAX: Urban drainage catchment model. This model gives very good estimates of flow rates for urban catchments, and is preferred to the Rational Method. It cannot be used for hydraulic design of piped systems or OSD systems, but does give trial pipe sizes for a given gradient.
- DRAINS: Hydrologic and Hydraulic Urban Catchment model. This model gives very good estimates of flow rates for urban catchments, and is preferred to the Rational Method.
- XP-STORM: Hydrologic and hydraulic urban catchment model.
- RAFTS: Runoff routing model for trunk drainage and retention basin design. Flow rates should be checked against those calculated by other methods.
- TUFLOW: two dimensional hydrodynamic flood models
- HEC-RAS: 1-D Steady/unsteady flow calculations. To be used in open channel design and floodplain modelling.
- RORB: Runoff routing and stream flow routing program used to calculate flood hydrographs from rainfall and other channel inputs.
- WBNM: Watershed Bounded Network Model for flood estimation on natural and urban catchments.

3.1.10 Drainage Reports

Drainage Reports are required for significant development works which seek to utilise the existing drainage system on a property. It is critical the report and investigation address the key concern which is assurance that the existing drainage system is capable of accommodating stormwater runoff from the development in accordance with Council's requirements and that it has been constructed and maintained in a serviceable state.

The drainage report should present evidence that a site inspection of the drainage system was undertaken and should include information and calculations demonstrating compliance with Council's requirements.

3.1.11 Work-As-Executed Plans

In order to have a permanent record of construction which incorporates design details that have been varied prior to or during constructions Works-As-Executed Plans shall be lodged to Council following the completion of engineering works of a subdivision or development prepared by a Registered Surveyor or "Persons Qualified" in Section 3.1.2 (Drainage Consultant Qualifications).

Subdivision Certificates (Plan of Subdivision) will not be processed until the Works-As-Executed Plans have been received and verified. The Surveyor responsible for the Plan of Subdivision, or where easements are registered, covering the subdivision/development, shall supply a signed certificate stating that all pipes and associated structures are located wholly within the respective easements.

Where there is a variation from the design the variation shall be shown boxed, in red colour, on plan and longitudinal sections.

Work-As-Executed plans and documentation shall include:

- All works have been completed generally in accordance with the approved plans and specification,
- Any departure from the approved plans,
- Any additional/deleted work,
- The location of conduits, subsoil lines, stub mains and inter-allotment drainage lines,
- Pipeline long sections showing the constructed invert levels of each pipe at each pit/headwall and pipe dimensions at the entrance and exit of all pits (including any inter-allotment pits and pipes),
- Finished surface levels recorded by spot levels across the whole site.
- For minor regrading (i.e. cut or fill < 0.5m deep) spot levels observed and recorded on plans at allotment corners, centre of front and rear boundaries.
- For major site regrading (i.e. cut or fill over 0.5m in depth) recorded by new contours.
- If an above ground storage basin is constructed, a works-as-executed survey of the detention basin will need to be prepared to demonstrate that adequate storage volume has been provided.
- Where plastic drainage modules are used for an underground detention storage tank, photographic evidence of the installation and certification by an engineer or surveyor is required.
- Any part of a subdivision has had the surface level raised by the placement of any fill, other than nominal topsoiling, showing a minimum of that area of the subdivision that has been filled plus a reasonable surrounding area.
- Details of overland flow provisions.
- All other details which have a bearing on the extent of works and their acceptance by Council.

4 HYDROLOGY

4.1 General

A number of methods are available for determining flow rates, run-off volumes and catchment responses. The following commonly used hydrological methods are acceptable to Council:

- *The Rational Method* – This method has been the most commonly used method for drainage design. It provides simple means for the assessment of design peak flow rates (peak discharge). The rational method is not recommended for the design of detention basins or complex developments.
- *Time-Area Run-off Routing, eg. DRAINS* – DRAINS is a computer based model which involves the routing of the time-area relationship developed for the sub-catchments under consideration. It is suitable for use in urban catchments but requires suitably experienced designers to undertake the modelling and calibration with available flow data where possible.
- *RAFTS* – This is a proprietary computer model based upon the Regional Stormwater Model (RSWM). It includes separate routing of impervious and pervious areas; sophisticated loss models; urban run-off modelling and detention basin design; and provision for river basin analysis.

Council has modelled a number of catchments within the City of Ryde and will provide flow rates to consulting engineers where they are available. Where these flow rates have been provided, Council will not accept alternative flow rate values unless it can be demonstrated the modelling procedure used to determine the flow rate is more accurate than Council's model.

Flow hydrographs are to be generated by use of an appropriate runoff routing computer model such as RAFTS or DRAINS, or other approved equivalent models. Urbanised peak flow rates in particular and general shape, timing and volume of hydrographs are to match those for the undeveloped existing or natural catchment as closely as possible for all storm events.

Other hydrological models may be used as long as the requirements of AR&R are met. Council will require the submission of all calculations together with details of all program inputs and outputs.

Where catchments are large and/or higher confidence in the flow rate prediction is necessary, peak flow rates should be determined using one of the above runoff routing computational programs. For input parameters to be used with DRAINS, RAFTS and XPSTORM please refer to Appendix 4.

Please note when using the program DRAINS for modelling above ground detention basins it is preferred that a staged height vs volume is used to specify the detention storage over depth vs. surface area as drains is limited in its capacity to calculate storage volumes.

4.2 Design Average Recurrence Intervals (ARI)

Average Recurrence Interval (ARI) is the long term average number of years between the occurrence of a theoretical design flood as big as, or larger than, the selected storm. For example, storms with an average intensity greater than a 1 year ARI storm will occur on average once every year. A storm with a higher average intensity such as the 100 year ARI storm will occur on average once every 100 years. ARI is another way of expressing the likelihood of occurrence of a storm.

ARI is an alternative to AEP (Annual Exceedance Probability) to express the likelihood of occurrence of a flood event. For example a 1 in 100 year ARI storm event is the same as a 100yr ARI storm event (it has a 1 in 100 probable chance of occurring). Please note that design storms are based on statistical probability, for example even though a 1 in 100yr ARI storm event has a 1% chance of occurring it is possible that a storm event in the magnitude of a 1 in 100 year ARI event can occur more than once in one hundred years.

Design ARI storm events are used to quantify flow rates and volumes for use in the design of stormwater management of developments. The following Table 4.1 specifies design ARI storm events to be used in the design of stormwater systems for developments in the City of Ryde.

Drainage Item	Design ARI storm event
Piped Road drainage (minor system generally longitudinally):	
Urban Residential	20 year
Commercial	20 year
Industrial	20 year
Road drainage (major system) for all types of development:	100 year
Road Crossings (minor system with unobstructed floodway):	
Local/Collector	20 year
Sub-Arterial	20 year
Arterial	100 year
Access to Emergency Facilities	100 year
Road Crossings (major system) for all types of development:	100 year
Piped inter-allotment drainage (minor system):	
Urban Residential	20 year
Commercial	100 year
Industrial	100 year

Flows along an unstable watercourse	5 year
Outflows into unstable watercourse	20 year
Major system (overland flow paths) for all types of development	100 year
Onsite detention systems	5, 20 and 100 year

Table 4.1 Design ARI storm events.

Longer recurrence interval design storms than that specified in Table 4.1 above may need to be used in instances where the level of danger to persons or risk of significant property damage warrants such an approach. This would include most developments adjacent to major water courses (flow > 20m³/s for the 100 year ARI storm event). Under some circumstances the PMF will also need to be considered.

4.3 Rational Method

Use of the rational method for determining flow rates will be acceptable where the catchment is relatively small (less than 15,000m² or 1.5ha), has fairly common characteristics and the level of accuracy (sensitivity) of the results is not critical. Where the catchments are large (>15,000m²) and/or a reasonably accurate level of flow rate prediction is necessary, peak flow rates should be determined using a recognised runoff routing computer model such as; RAFTS, WBNM and DRAINS.

If the rational method is used, it is necessary to define the catchment area, sketching its boundaries on a plan and measuring the area in accordance with Section 4.7. The longest flow path to the catchment outlet is established to determine the time of concentration in accordance with Section 4.4. The rainfall intensity for a storm duration equal to the time of concentration (t_c) is selected for a duration equal to the time of concentration of the catchment.

Discharge rates (flow rates) may then be calculated using the Rational Method formula:

$$Q = C \times I \times A / 360 \quad (\text{m}^3/\text{s})$$

Where Q is the discharge flow rate in m³/s,

C is the runoff coefficient value calculated for each different land use type,

I is the rainfall intensity (mm/hr) for a given design ARI and total flow travel time, and

A is the catchment area in hectares (ha).

In urban catchments, it is probable that a greater flow rate may be obtained by applying the Rational Method to a lower part of the catchment with a time of concentration less than the full area travel time. These partial area effects and flows commonly occur when large paved areas are directly connected to the pipe inlet, and the sub catchment discharge is based on a larger pervious area. Similarly, partial area effects can also occur, where a large open space catchment contributes to an urban catchment, with a Time of Concentration substantially different to the urban catchment.

In areas where this may be critical, such as industrial, high density residential development or large scale developments, a partial area check, based on times of concentration of impervious areas directly connected to the pipe system, is necessary. However, for urban drainage design this may not

be appropriate and a computer based time-area run-off routing model eg. DRAINS is required. Technical Note 6 (page 24) of Book 8 of AR&R details a worked example for rationale method calculations.

4.4 Time of Concentration

The time of concentration (t_c) of a catchment is defined as the time required for the stormwater run-off to flow from the most remote part (relative to time) of the catchment to its outlet.

In determining the time of concentration for the post development scenario, the designer should assume that the catchments under construction are fully developed in accordance with the land use shown on the relevant Zoning Maps.

In a typical urban drainage system a designer will need to calculate the time of concentration for inlet location and pipe sizing. Regardless of the purpose of the time of concentration calculation, it will include one or a number of the following components:

- Overland or 'sheet' flow time.
- Roof to drainage system flow time.
- Gutter or channel flow time.
- Pipe flow time.

Where the flow path is through areas having different flow characteristics, the flow time of each portion of the flow path shall be calculated separately.

Time of concentration for small catchments under 1ha shall be determined using the Kinematic Wave Equation,

$$t = \frac{6.94(L \cdot n^*)^{0.6}}{I^{0.4} \cdot S^{0.3}}$$

Where t (t_c) is the time of concentration in minutes,

L is the flow path length in metres - being the longest flow path to the catchment outlet,

n^* is the surface roughness/retardance coefficient,

I is the rainfall intensity (mm/hr), and

S is the slope (m/m).

The Kinematic Wave equation is very sensitive to slope and the Retardance Coefficient " n^* ", these should be estimated carefully. Recommended Retardance Coefficients are listed in AR&R and in the following Table 4.2 below.

Surface Type	Roughness Coefficient n^*
Concrete or Asphalt	0.010 – 0.015
Bare Sand	0.01 – 0.016
Gravelled Surface	0.012 – 0.030

Bare Clay-Loam Soil (eroded)	0.012 – 0.033
Lawn	0.030 – 0.040
Sparse Vegetation	0.053 – 0.130
Short Grass Prairie	0.10 – 0.20
Bushland with light undergrowth	0.10 – 0.12
Bushland with heavy undergrowth	0.14 – 0.16

Table 4.2: Roughness Coefficient n^*

The minimum time of concentration should not be less than 5 minutes for the total flow travel time from any catchment to its point of entry into the drainage network. The maximum time of concentration in urban areas shall be 20 minutes unless sufficient evidence is provided to justify a greater time. For rural catchments and catchments over 1ha please refer to the procedures outlined in AR&R for time of concentration calculations.

Please note that engineering judgement is to be used when approximating time of concentration values to be used with computational programs such as DRAINS.

4.5 Rainfall Intensities

The Design Intensity-Frequency-Duration (IFD) Rainfall is required as input to the hydrological calculations used for the drainage design.

Appendix 7 provides a catchment map for the City of Ryde.

Alternatively, the IFD Rainfall for the catchment under consideration may be derived in accordance with the current edition of Australian Rainfall and Run-off (AR&R) using IFD program software with raw data from the Bureau of Meteorology. Where values outside of Council's IFD data is used calculations shall be submitted to Council.

4.6 Run-off Coefficient

The coefficient of run-off (C) is the coefficient used in the Rational Method and is the ratio of the peak rate of run-off to the average rainfall intensity during the critical rainfall period for the catchment area under consideration. The value of C is a statistical composite not only for the infiltration and other losses, but also the effects of channel storage and initial loss.

The coefficient of run-off adopted shall account for the future development of the catchment in accordance with the land use shown on the relevant Zoning Maps. Fraction impervious values shown in Table 4.3 are to be adopted for the various zoning areas in the City of Ryde LGA. Values outside of those specified in the table below can be used if justified with a detailed catchment plan clearly identifying pervious and impervious areas.

Zoning	Example of Land Use	Impervious Fraction (%)

General Residential (R1)	Attached dwellings, residential flat buildings, multi dwelling housing	65
Low Density residential (R2)	Low density housing	65
Medium Density Residential (R3)	Medium density housing	80
High Density Residential (R4)	High density housing	Site Specific (measure)
Neighbourhood centre (B1)	Child care centres, community facilities	70
Commercial Core (B3)	Commercial premises, Function centres, hotel or motel accommodation	100
Mixed Use (B4)	Educational establishments, registered clubs	Site Specific (measure)
Business Development (B5)	Bulky goods premises, industrial retail outlets	100
Business Park (B7)	Office premises, restaurants or cafes	90
Light Industrial (IN2)	Brothels, vehicle repair stations, warehouse centres	90
Special Activities (SP1)	Recreational facilities	Site Specific (measure)
Infrastructure (SP2)	Roads	90
Public Recreation (RE1)	Environmental facilities, kiosks	Site Specific (measure)
Private Recreation (RE2)	Roads, Water recycling facilities	Site Specific (measure)
National Parks and Nature Reserves (E1)	National Parks and reserves	5
Environmental Conservation (E2)	Environmental facilities	Site Specific (measure)

Table 4.3: Fraction Impervious Values

Runoff Coefficients "C" shall be determined in accordance with Section 1.5.5(iii) (pages 18-19) of Book 8 of AR&R. The following equations apply for City of Ryde:

$$C_Y = F_Y \times C_{10}$$

where: $C_{10} = 0.9 \times f + C_{10}^1 \times (1 - f)$ and

$$C_{10}^1 = 0.1 + 0.0133 \times (I_1 - 25)$$

Where C_Y is the Runoff Coefficient for recurrence interval "y" (years),

C_{10} is the 10 year ARI Runoff Coefficient,

C_{10}^1 is the pervious area runoff coefficient,

$^{10}I_1$ is the 10 year ARI, 1 hour duration rainfall intensity,

Fy is the Frequency Factor - See Table 4.4 below, and

f is the Fraction Impervious (i.e. 60% impervious is a fraction of 0.6)- See Table 4.3 for recommended values.

Recurrence Interval	Fy
1	0.8
2	0.85
5	0.95
10	1.00
20	1.05
50	1.15
100	1.20

Table 4.4: Frequency Factors for Runoff Coefficients

Runoff coefficients shall be estimated separately for each land use.

Alternatively runoff coefficients in Table 4.5 can be used for various impervious fractions.

ARI	Fraction Impervious										
	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
1	0.41	0.44	0.47	0.50	0.53	0.57	0.60	0.63	0.66	0.69	0.72
2	0.44	0.47	0.50	0.53	0.57	0.60	0.63	0.67	0.70	0.73	0.77
5	0.49	0.52	0.56	0.60	0.63	0.67	0.71	0.74	0.78	0.82	0.86
10	0.51	0.55	0.59	0.63	0.67	0.71	0.75	0.78	0.82	0.86	0.90

20	0.54	0.58	0.62	0.66	0.70	0.74	0.78	0.82	0.86	0.90	0.95
50	0.59	0.63	0.68	0.72	0.77	0.81	0.86	0.90	0.95	0.99	1.04
100	0.62	0.66	0.71	0.76	0.80	0.85	0.89	0.94	0.99	1.03	1.08

Table 4.5: Runoff Coefficients (from AR&R Figure 14.13 and Table 14.6)

NOTE : Typically, a minimum runoff coefficient of 0.7 should be adopted.

4.7 Catchment Area

Catchment areas may be determined from contour plans obtained from a detailed survey of the site. Where no detailed survey is available, 1:4000 orthophoto maps may be used to determine catchment boundaries and areas. Where orthophoto maps or survey information is not available Council may in some instances accept the use of other map imagery such as spatial information from NSW Department of Lands.

The determination of sub-catchments within urban subdivisions requires accurate contour information and a catchment plan shall be provided with the calculations.

The design should take into account realistic future road patterns where the contributing catchment includes areas subject to future development. Consideration must also be made to the existing drainage layout in the catchment to determine the outermost contributing catchment area.

Catchment areas to each pit shall be determined from contour information and proposed property boundaries. A site inspection shall always be made to check the contour information and assess the likelihood of any flow path deviations which may occur as a consequence of existing or proposed developments. Changes to flow paths can occur as a result of the construction of fences, retaining walls, buildings etc. after the construction phase of the subdivision. The impact of these changes shall be considered at the design stage when determining catchment areas.

5 HYDRAULICS

5.1 Aim

The design and construction of a drainage system that provides the following:

- a) A “major/minor” stormwater drainage system as set out in Chapter 14 of AR&R (1998),
- b) A “major” system to provide safe, well-defined overland flow paths for rare and extreme storm
- c) A “minor” system capable of carrying and controlling flows from frequent storm runoff events,
- d) A high level of safety for all users,
- e) Provide convenience and safety for pedestrians and traffic in frequent storms by controlling flows during those storms within defined limits,
- f) To ensure damage to private and public buildings located on land affected by stormwater inundation is minimised,
- g) Acceptable levels of amenity and protection from the impact of stormwater, and
- h) Economy of construction and maintenance.
- i) A system of overland flow paths to provide fail safe protection of buildings on the property and protection to adjoining and downstream properties in the event of pipe blockage or storm events that generate runoff greater than the pipe capacity.

5.2 Minor System Criteria

The minor drainage system shall be capable of controlling flows from frequent run-off events up to and including the ARI's as specified in this Section.

The following requirements shall be provided in the design of minor system drainage:

- a) The water surface level for inlet pits shall be 0.15 metres below the invert of gutter or 0.15 metres below the underside of the lid for junction pits.
- b) System blockages shall be assessed when designing for the minor event, as per Section 5.5.
- c) Kerb and gutter shall be provided on both sides of all roads except where the relevant Development Control Plan advises otherwise.
- d) Kerb inlets shall be provided at locations such that the flow in the gutter generally does not exceed 0.15m in any location.
- e) Inter-allotment drainage shall be provided at the lowest point of all allotments together with the creation of an easement over all downstream pipework to the legal point of discharge.
- f) Full piped drainage from all kerb inlets and other inlets shall be provided to the boundary of the subdivision, or approved point of discharge, unless otherwise approved by the Manager.
- g) Bypass from any pit on grade shall not exceed 15% of the total gutter flow at the pit (full capture desirable).

The widths mentioned above shall be measured from invert of the kerb and gutter.

5.3 Major System Criteria

Many of the flooding problems in older areas occur due to inadequate provision of overland flow paths. Thus, all urban drainage designs shall incorporate an assessment of major system flows.

The major drainage system in the form of overland flow paths shall be capable of controlling flows which exceed the capacity of the minor drainage system from run-off events up to and including the 100yr ARI storm event. In drainage sensitive areas identified by Council it may be necessary to provide adequate stormwater management controls for events larger than the 100yr ARI. An overland flow system shall be designed to convey waters through the subdivision or development clear of, and with the required freeboard to allotments and buildings.

Please note an overland flow path must be provided for drainage systems even where the 100 year ARI flows can be maintained within the pipe system. This is to ensure that a safe and adequate "Escape route" is achieved for storm events above that of the pipe system design and in case the minor system fails (i.e. if there is a 50% pipe blockage). This route should be a properly sized overland flow path preferably along a road and pathway system.

The Rational Method may be used to estimate major system flows for critical points in the drainage system. An ARI of 100 years shall be used for this and the difference between the minor system flow and the 100 year ARI flow shall be the basis upon which the major system flow path shall be designed.

Roads and pathways will generally form the flow path by which the major system flows are routed, either to the street drainage system or to a low point with sufficient hydraulic capacity to capture the flows. Special consideration shall be given to trapped low points where the overland flow path may divert surcharge into properties. This is especially important when designing "Downhill" cul-de-sac and kerb returns adjacent to a sag vertical curve. In the former case the overland flow path shall incorporate a depressed pathway with reverse crossfall in the footway. In the latter case consideration shall be given to grading the kerb return such that water flows around the return and away before it breaks over the top of kerb at the low point.

Where an overland flow path needs to be accurately determined, the flow path should be modelled using a computer program. The following requirements shall be provided in open channels, roadways, overland flow paths and stormwater surcharge paths:

Generally:

- a) Minor system blockages shall be assessed when designing for the major event, as per Section 5.5.
- b) The product of depth (d) and velocity (V_{ave}) (also known as Vd product) shall be limited to $0.4 \text{ m}^2/\text{s}$.

Roadways:

- c) Total flow shall be contained within the road reserve,
- d) Flow depths in roadways shall not exceed 100 mm on the high side of residential streets and 75mm on the low side of residential streets and 75mm in commercial areas,
- e) Flow widths shall not exceed 1.0 metres at bus stops, pedestrian ramps and kerb returns,
- f) Flow widths in any location shall not exceed 2.5m,
- g) The Vd product in the kerb and gutter should not exceed $0.6 \text{ m}^2/\text{s}$ (AR&R, 1998) to reduce hazard for pedestrians within the roadway. However, where there is an obvious danger of injury or loss of life, the Vd product shall be limited to $0.4 \text{ m}^2/\text{s}$.
- h) Where a road is in fill, a freeboard of 100 mm shall be provided between the 100 year flood level and the lowest point in the footpath.

The widths mentioned above shall be measured from invert of the kerb and gutter. Pit capacities shall be calculated using the appropriate blockage factors listed in Section 5.5, and pipe capacities estimated with trial diameters and head levels no greater than 150mm below the surface levels / invert of kerb (applicable up to the design ARI for the respective pipeline reach). Where the flow

widths above are exceeded these flows shall be intercepted with additional kerb inlets. Technical Note 4 (pages 16-17) of Book 8 of AR&R details a method for calculating gutter and road flows.

5.4 Hydraulic Grade Line Analysis

The Hydraulic Grade Line method shall be used for pipeline design for medium to large scale developments and shall generally be carried out in accordance with AR&R (1998). For pipeline design for small residential developments please refer to Section 0.

The detailed hydraulic grade line method is recommended for the analysis of stormwater pipe systems based on an analysis proceeding from downstream to upstream through the system. Calculations shall substantiate the hydraulic grade line adopted for the system and be shown on the drawings. It is not the purpose of this document to give a detailed explanation of the method, but important points are mentioned below. Pipes/culverts shall be determined using Colebrook-White formula with the recommended coefficients referred to in Table 5.1 below.

Pipe Material	Recommended K value (mm)
Unplasticised polyvinyl chloride (uPVC)	0.03
Vitrified clay pipe (VCP)	0.04
Rectangular hollow section (RHS)	0.046
Fibre reinforced concrete (FRC)	0.06
Reinforced concrete pipe (RCP)	0.3

Table 5.1: Roughness Coefficients (K)

Appendage 6 in Section 8 contains a discharge and velocity graph for circular pipes running full but not under head with Colebrook-White formula $k = 0.06$. The tail water level to be adopted in the hydraulic grade line analysis will depend on the outflow conditions. The following values listed in Table 5.2 may be used when conducting a hydraulic grade line analysis where the downstream starting water level (tail water level) is unknown.

Outfall/Outlet Condition	Tail water Level
Discharge to kerb and gutter	For 5yr ARI adopt 150mm below kerb invert, 20yr ARI adopt kerb invert and 100yr ARI adopt top of kerb level
Discharge to an existing pit in street	The inlet pipe obvert in the downstream pit

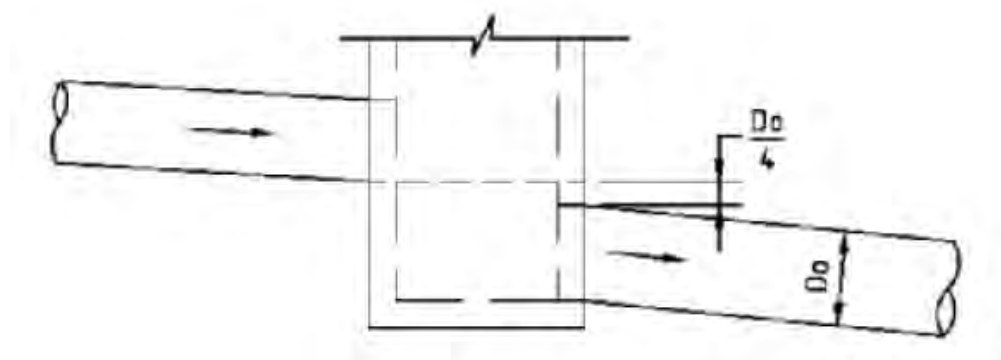
Free outfall	Adopt the pipe obvert
Discharge into receiving waters	Adopt tail water equivalent to the design ARI flood level of the system
Open Channel	The pipe obvert for the minor storm event and the top channel wall or embankment level for the major event where the flood level is unknown.
Surcharge point/pit	Adopt tail water level equivalent to the height of surcharge (ponded height)

Table 5.2: Tail water Level Conditions

Where determination of a tail water level is in doubt please consult with Council's Engineers before undertaking the design. Values outside that specified in the table above may only be used if sufficient justification is provided with accompanying detailed calculations.

Pit loss factors (k) for pits, slope junctions, bends, transition structures, inlets and outlets shall be calculated using Missouri Charts or Hare equations. Where these do not apply an appropriate value is to be selected. The top pit in the system must have sufficient depth to generate sufficient head to charge the pipe system. This can be calculated by using coefficients derived from the Missouri Charts. A k value of 3.5 - 4.5 should not automatically be assigned to all starter pits, each pit should be assessed on its merits. Computer program default pressure change coefficients shall not be acceptable unless they are consistent with those from the recommended charts. The chart used and relevant coefficient for determining k factors shall be noted on the hydraulic summary sheet or design report. An absolute minimum k factor of 0.3 is to be used for all pits.

Pit loss factors for drop pits shall be calculated in accordance with the charts previously mentioned. An allowance shall be made relative to the drop through the pit. When the obvert of the outlet pipe is at or greater than $D_o/4$ below the invert of the upstream pipe, the inflow shall be regarded as grate flow. That is, when the obvert of the outlet pipe is $1/4$ of its diameter or greater, below the invert of the upstream pipe then the pipe loss factor (k) shall be no less than 4.5. Intermediate cases may be determined by linear interpolation of pit loss factor (k) up to 4.5. Because of the high losses in these pits, it may be preferable to design a mitre bend or a steeper section of pipe.



An allowance of 150mm shall be adopted below the lowest point of the pit inlet/kerb invert, to allow such inlets to act efficiently. Where this cannot be achieved it will be necessary to obtain the concurrence of Council before proceeding. Where pipes are operating under head it is recommended that the procedures in Technical Note 9 Book 8 (pages 42-45) of AR&R detail are used.

Hydraulic losses for entry and exit of channel systems, culverts, headwalls and other structures shall be in accordance with the Australian standards or other similar recognised texts.

5.5 Pit Requirements

Once the sub catchment flows are known, pit inlets can be designed in accordance with the charts contained in Appendages 7 to 12 in Section 8. Inlet pits shall be installed at depressions and other locations to permit the entry of water to a stormwater drain and must have a flush fitting grate.

Surface inlet pits shall be sufficiently large to accept the predicted flow.

All new pit inlets shall be constructed using welded steel ("Weldlok") type or equivalent grates with appropriate skirts. On grade, percentage capture by grates is mainly dependent on lintel size, tests show that the two types of grates mentioned above have similar performance characteristics on grade when in combination with a lintel.

The charts for the sag inlets are based on tests conducted by the RTA N.S.W., Water Research Laboratory and the West Australian Institute of Technology and incorporate the following blockage factors:

- (a) 10% reduction in capacity for clogging of the kerb inlet.
- (b) 30% reduction in capacity for clogging of the grating.
- (c) 50% reduction in capacity for all sag pits.

Alternatively inlet capacities can be calculated from first principles using formulas as detailed in AR&R. If using these formulae the following blocking factors shall be applied,

Condition	Pit Type	Theoretical capacity allowed	i.e. % blocked
Continuous grade	Kerb inlet pit	90%	10%
Sag	Kerb sag pit	80%	20%
Surface inlet pit cover (grating)	Surface inlet pit	70%	30%
Surface inlet pit cover (grating) with legs (letterbox)	Surface inlet pit	50%	50%

Where it is proposed to use a grate not conforming to these requirements, it is necessary to submit a detailed investigation from an accredited laboratory establishing the performance of the grate prior to it being accepted or rejected by Council.

Computer analyses shall generally conform to the inlet capacities graphed on Appendages 7 to 11 in Section 8, unless prior approval has been received from Council.

Ponding depths can be calculated using design charts, Appendages 7 to 11 in Section 8. Lintel sizes shall be commensurate with inflow requirements.

A nominal internal lintel size of 0.9m shall be placed on junction pits along kerb and gutter in public roads. The minimum nominal internal lintel size for grated gully pits in public roads shall be 1.8m, unless the pit's main function is to facilitate a change in direction or grade of the stormwater pipe, in which case the nominal internal lintel size may be reduced to 1.2m. The minimum nominal internal lintel size for grated gully pits in "sags" shall be 2.4m.

An assessment of the topography will determine the location of proposed drainage paths. Once the location of a proposed network is defined, trial pit locations should be arranged. Generally, pits should be spaced with minimal bypass flows. An approximate procedure for locating pits is detailed in "Technical Note 2" in Book 8 (page 11) of AR&R. Pits should be located at junctions; kerb returns; sag points; and changes in grade, level, direction, pipe size or pipe class. Kerb inlet pits shall be located so that the gutter flow width is in accordance with the requirements of minor and major system criteria and at a maximum spacing of 60 metres where flow widths are not critical.

The following general items shall be adhered to in the design of pits:

- a) Non-standard drainage structures for pipes larger than 750mm diameter shall be designed and certified by a Competent Structural Engineer by way of an accompanying letter or by statement on the engineering plans.
- b) All drainage structures deeper than 1.8m shall be reinforced with appropriate Fabric to Engineer's (structural) requirement and pits deeper than 3.0m shall be structurally designed and certified.
- c) Drainage pits shall be designed wherever possible such that the inlet and outlet walls are perpendicular to the centreline of inlet and outlet pipes.
- d) Wherever possible, drainage pits shall be designed so that the pipe centrelines intersect on the downstream pit face.
- e) The base of the pit should be at the same level as the invert of the outlet pipe (unless a sump pit). Where this has not been achieved the pit floor is to be benched with concrete. Rainwater is not permitted to pond within the stormwater system.
- f) The grated covers of pits larger than 600 x 600mm are to be hinged to prevent the grate from falling into the pit.
- g) Drainage pits shall be designed and constructed in accordance with Section 8.5 (Public Civil Works).
- h) Provide step irons for all pits deeper than 1200mm. The step irons shall be staggered to give a 300mm spacing vertically and 220mm spacing horizontally. The type of step irons used must satisfy Council's requirements for durability and strength.
- i) A pit shall be provided at the road boundary at the lowest point of the system before the drainage line enters public roads and footways. These pits may be either "precast" or cast "in-situ" concrete pits, PVC or similar "precast" pits are not acceptable. Where there is an OSD system this pit shall be a minimum 450 x 450. In the case of drainage systems that do not have an on-site detention system, this pit must be a minimum of 600mm x 600mm and contain a debris screen. For details of the debris screen refer to Section 1.4.7.
- j) Pits shall be designed so that the discharge from inlet pipes is directed towards the outlet pipe.

- k) In medium density residential developments private courtyards must contain at least one pit not less than 300 x 300mm.
- l) All pit grates are to have the same clear opening as the internal plan dimension of the pit (for pits up to 1200 square).
- m) The maximum weight of each individual hinged grate shall be 20 kilograms.
- n) All grates are to be hinged and provided with an appropriate childproof lockdown system. Hinged grates are to be placed away from any wall or kerb, to ensure that the grates can be fully opened for safety reasons.
- o) Where precast pits are proposed in Council's road system, the pit shall be placed on a 75mm thick concrete base and backfilled with concrete to half way up the outside of the unit. *PVC type pits are not acceptable.*
- p) In-situ pits in Council's road system are to be constructed on a concrete bed of at least 150mm thick. The walls are to be designed to meet the minimum requirements of clause 4.6.3 of AS 3500.3 – 1990.
- q) Pits shall be located at least 1 metre away from driveway laybacks.
- r) The minimum pit size for any inlet, gully or junction pit on Council drainage systems is 900 x 900 mm clear internal.
- s) Continuous trench drains are to be of width no less than 150mm and depth not less than 100mm. The bars of the grating are to be parallel to the direction of the surface flow.
- t) PVC pits will only be permitted if they are not greater size than 450 x 450 mm (maximum depth 450mm) and are heavy duty.
- u) Stormwater pits or cleaning eyes shall be installed at each junction, change in gradient, and change in direction, at a maximum spacing of 30 metres, directly above any reflux valves, orifice plates and debris screens to facilitate maintenance of stormwater pipes.
- v) Minimum pit sizes for various depths (D) shall be in accordance with Table 5.3.

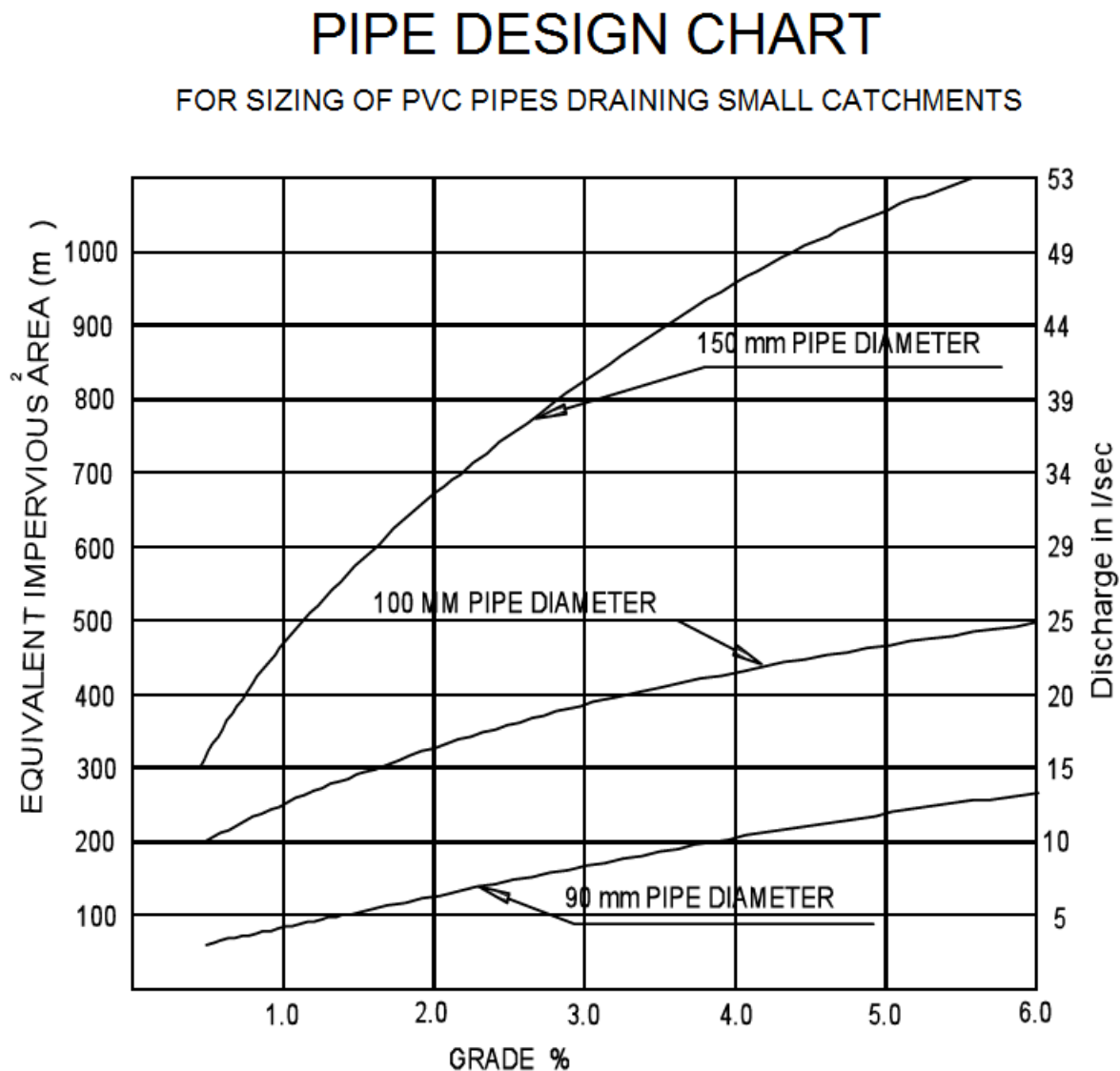
Depth (mm)	Minimum Pit Size (mm)
$300 \geq D$	300 x 300
$600 \geq D > 300$	450 x 450
$900 \geq D > 600$	600 x 600
$1200 \geq D > 900$	900x 900
$D > 1200$	900 x 900 (with step irons)

Table 5.3 :Minimum Pit Sizes

5.6 Pipe and Culvert Requirements

Pipes and culverts shall be designed overall as a gravity system with due regard to the upstream and downstream system to satisfy minor and major design criteria.

For small residential developments draining catchments up to 1000m² (0.1ha) only the following pipe design chart can be used. Figure 5-1 on the following page shows the pipe sizing chart for small residential developments.



This figure has been prepared using expected rainfall intensities from a 20 year ARI storm event of 5 minutes duration with an intensity of 195mm/hr. The Colebrook-White roughness coefficient is assumed to equal 0.03. The equivalent impervious area for grassed catchments is taken as 0.7 x area.

Figure 5-1 : Pipe Sizing Chart for Small Residential Developments

For larger scale developments with impervious areas larger than 0.1ha where the level of accuracy (sensitivity) is not critical Manning's equation can be used to calculate pipe capacities. For

Manning's equation please refer to Section 5.8.2. Piped road drainage systems must provide a HGL analysis as listed in Section 5.4.

Culverts shall be designed in accordance with culvert hydraulics theory i.e. the culvert capacity is determined by the flow conditions, depending on whether inlet control or outlet control governs. Recommended design procedures are contained in Section 3 of the Concrete Pipe Association of Australia's publication: "Hydraulics of Precast Concrete Conduits - Hydraulic Design Manual".

Pipes and culverts shall be designed in accordance with the following:

- a) The minimum pipe size shall be 375mm diameter (Class 4) in roadways.
- b) The backfill to pipes under roads shall be 5% cement stabilised sand.
- c) Minimum box culvert size in Council property of 600 mm wide by 300 mm high.
- d) In order to provide accessibility for maintenance and repair work, the location of pipes under building structures will only be permitted in exceptional circumstances where there is no other practical solution. Please refer to Section 1.6.
- e) A minimum desirable grade of 1.0 % shall be provided for self-cleansing purposes under low flow velocities for pipes less than 225mm and 0.5% for all larger pipes.
- f) Where pipe grades are in excess of 15%, Concrete Thrust Blocks/anchor blocks shall be placed at the top and bottom of the inclined section and at intervals not exceeding 3.0m. Anchor blocks are to be designed according to clause 3.5.3 of AS3500.3-1990.
- g) Pipe grades >20% are NOT permitted, except where approved by Council in special unavoidable circumstances.
- h) Connection to stormwater drains under buildings shall be carried out in accordance with section 3.10 of AS 3500.3 – 1990.
- i) Above ground pipe work shall be carried out in accordance with Section 6 of AS 3500.3 – 1990.
- j) Pipe velocities shall be between 0.5 m/s and 6.0 m/s and preferably between 1.0 m/s and 5.0 m/s during the design storm to ensure the flow is self-cleansing but not likely to cause scour.
- k) Minimum pipe size shall be 90mm where the line only receives roof water runoff or 100mm where the line receives runoff from paved or unpaved areas on the property.
- l) Minimum pipe cover shall be as follows in Table 5.4.

Pipe	Location	Minimum Cover
PVC and uPVC	Not subject to vehicle loading	100mm single residential
		300mm all other developments
	Subject to Vehicle loading	450mm where not in road
	Under a sealed road	600mm
	Unsealed road	750mm
	Paved Driveway	100mm plus depth of concrete
Concrete		450mm

Table 5.4: Minimum Pipe Cover Requirements

See AS 2032 Installation of UPVC pipes for further information.

Concrete pipe cover shall be in accordance with *AS 3725-1989 Loads on buried concrete pipes*, however a minimum cover of 450 mm will apply. Where insufficient cover is provided, the pipe shall be covered by at least 50 mm thick overlay and shall then be paved with at least:

- 150 mm reinforced concrete where subject to heavy vehicle loading,
- 75 mm thickness of brick or 100 mm of concrete paving where subject to light vehicle traffic, or
- 50 mm thick brick or concrete paving where not subject to vehicle traffic.

5.7 Bridges and Culverts

Bridges and major culverts shall be designed for the major storm event generally without afflux in urban areas. A minimum clearance of 0.3 metres should be provided between the major flow level and the underside of a major structure to allow for passage of storm debris.

5.8 Overland Flow

5.8.1 General

Overland flow paths shall be provided to convey flows in excess of the pipe system and convey flows in the major storm event from a development site to the receiving water body in accordance with the following generally in accordance with Chapter 14 of AR&R (1998) and the current version of *NSW State Government Floodplain Management Manual*.

Overland flow paths (open channels and free surface flow areas) associated with major system flows for OSD systems, road systems, and conveying local upstream catchments where the level of accuracy (sensitivity) is not critical and where uniform flows are occurring, i.e. the channel cross-section, roughness and slope are constant over a reasonable distance; Manning's equation can be used to approximate water depths and velocities.

In areas of shallow inundation (typically less than 0.1 to 0.2m in a 100 year flood) that are distant from major watercourses being impacted by the conveyance of overland flows classified as a 'Local Drainage' area under the Floodplain Development Manual OR where Council deems that there is potential risk of damage and/or injury to persons a computational model must be used to calculate water depths and velocities. Detailed analysis for such cases shall be in accordance with Section 4.

Council will also accept in some circumstances using Manning's equation to determine approximate pipe capacities.

When using Manning's equation to calculate water depths and velocities careful consideration must be made of the upstream and downstream influences. Where uniform flow is occurring, i.e. the channel cross-section, roughness and slope are constant over a reasonable distance; Manning's equation may be applied to the cross-section without consideration of upstream or downstream influences. For most overland flow analysis the assumption of uniform flow will not be appropriate and consideration must be given to upstream and downstream controls, losses for afflux and other hydraulic losses. It is recommended in these instances that a computational model is undertaken.

The depth x velocity product (Vd product) in the kerb and gutter should not exceed 0.6 m²/s (AR&R, 1998) to reduce hazard for pedestrians within the roadway. However, where there is an obvious danger of injury or loss of life, the Vd product shall be limited to 0.4 m²/s.

The Vd product of overland flows in all other cases (across the footpath, within the road reserve, through properties) shall be such that the safety of children and vehicles are considered and restricted to below 0.4 m²/s. In areas where there is heavy pedestrian traffic and children the maximum Vd product shall be in accordance with Table 2.2 Maximum Vd products in areas accessible to children and the elderly. in Section 2.3.1. In all other cases where there is overland flow through a property the Vd product shall be restricted to 0.4 m²/s.

For further information please refer to the current version of the NSW Floodplain Development Manual.

5.8.2 Manning's Equation

Manning's equation is:

$$Q = \frac{1}{n} (AR^{2/3}S^{1/2})$$

Where Q is the discharge flow rate in m³/s,

n is Manning's roughness coefficient,

A is the cross sectional flow area,

R is the hydraulic Radius (m) = A/P

P is the wetted perimeter (m) of the channel/pipe, and

S is the channel/pipe slope (m/m).

Table 5.5 below lists the Manning's roughness coefficient for different surface types to be used.

Surface Type	Mannings “n”
Concrete	0.013
Asphaltic Concrete	0.015
Flush Seal	0.014
Sprayed Seal	0.018
Rough texture surfaces (ie. pavers)	0.018
Gravel	0.02
Bare clay – loam earth	0.022
Lawns	0.05
Short grass	0.06
Long grass	0.1
Natural channel with earth bed	0.04
Natural channel with rock bed	0.045
Natural channel with coarse gravel bed	0.05

Table 5.5: Recommended Manning’s “n” values

Please note that Manning’s roughness coefficient “n” is not the same as the surface roughness/retardance coefficient “n*” used in the kinematic wave equation.

The major flows must have an overland flow path such that all floor levels have minimum freeboards in accordance with Section 0 of this Manual. The freeboard requirement may be varied on consideration of the sensitivity of the floodway parameters to the flows subject to approval by Council.

6 WATERWAYS

6.1 Scope

This section of the Manual sets out Council's requirements for the design and stormwater management of waterways. It is in no way a comprehensive design manual and it is intended to be read in conjunction with current best management practices.

6.2 Aim

The aim of this section is to provide detailed guidelines for managing stormwater flow in Council's waterways and provide guidance for protecting the waterways.

6.3 General

The trunk stormwater system, creeks and groundwater flow within the City of Ryde discharge into the Lane Cove and Parramatta Rivers. These waterways are currently used for recreation and transport, as well as providing flora and fauna habitats with a range of remnant natural ecosystems along their length that require protection. As stormwater flows through a catchment it collects many substances including litter, sediment, nutrients, chemicals, oil and grease, depositing them further downstream. A co-ordinated and integrated approach, including the management of stormwater discharging from specific sites, is required if the quality of stormwater discharging into these waterways is to be of a standard that will not have a detrimental impact upon these waterways as well as maintaining or improving the quality of the natural environment.

The philosophy of this section is to minimise the disturbance due to developments on waterways. In practice this generally involves the design and installation of appropriate devices to treat stormwater before it leaves the subject site where deemed feasible. For requirements pertaining to quality of stormwater at or near the source of potential pollutants please refer to Council's WSUD tools.

6.4 Stability and Runoff Frequency

Urban development increases the frequency, duration, peak flows and volume of stormwater runoff, due to the increase in impervious area in urban catchments. Pipe and constructed channel drainage systems deliver flows more rapidly to receiving waters and concentrate flows at a single point. An important consequence of these effects is the potential for increased erosion of natural waterways downstream of urbanising areas. Waterway stability objectives have been identified to minimise the impact of urban developments of urban development on stream morphology.

6.5 Riparian Zone

The riparian zone must not be subject to development (erection of structures or fill) without the specific consent of Council. The riparian zone consists of 5 metres either side from the top of the bank of a non-perennial watercourse, 20 metres either side from the top of the bank of a perennial watercourse and within the 100 year flood plain (whichever is greater). This must be calculated by a consultant engineer. During the rehabilitation of riparian vegetation, the planting of indigenous native plant species is required when adjacent to bush land. In other areas, locally native species are encouraged, taking into consideration the surrounding landscape and land use. Retaining and restoring natural watercourses achieves the following benefits:

- Stream stabilisation, by reducing the velocity of stormwater, stream bank erosion and sedimentation of waterways.
- Increased water infiltration and groundwater recharge, resulting in a reduction in the amount of stormwater and flooding incidence.
- Improved water quality, because vegetation acts as a filter, reducing pollutant and nutrient levels.

- Improved biological integrity of the watercourse through the provision of a variety of habitats for aquatic organisms and by providing a self-functioning and stable system.
- Provision of habitat and wildlife corridors which can assist in the conservation of biodiversity.
- Improved aesthetic and recreational values.

6.6 Stream Rehabilitation

As part of the site analysis required prior to development consideration must be given to the retention of any existing watercourses, and these should be built around (rather than over or through) as much as possible.

The rehabilitation of degraded watercourses may include removing pipes or concrete lining from channels (subject to DA approval) and replacing them with more 'natural' watercourses.

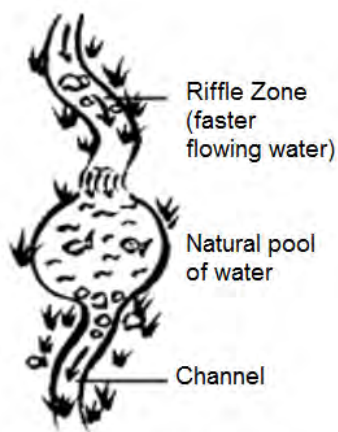
Many can be constructed to become an attractive natural feature of a property or park. A wide range of techniques can be used, including rock armouring/protection, gabions, rock lined channels creating a series of pools and riffle zones, stilling ponds, drop structures, and sandstone walling. There should not be more than a 3 metre drop between pools. Natural materials, similar to that found in the local area should be used and all gabion structures should be filled with sandstone cobbles rather than basalt. Revegetation of these areas shall be undertaken using local native species.

The methods listed above can be incorporated where new stormwater channels need to be constructed as part of a development, in lieu of the more conventional (and usually more expensive) methods.

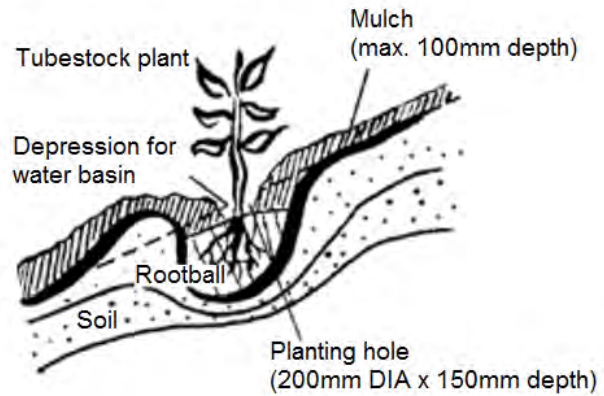
A detailed design produced by a qualified stormwater engineer must be completed for all open channel constructions and approved by Council before works are undertaken.

During construction, soil and vegetation disturbance should be minimised, by restricting machinery access, using experienced machine operators, and installing and maintaining effective sediment and erosion control measures in accordance with Section 7.

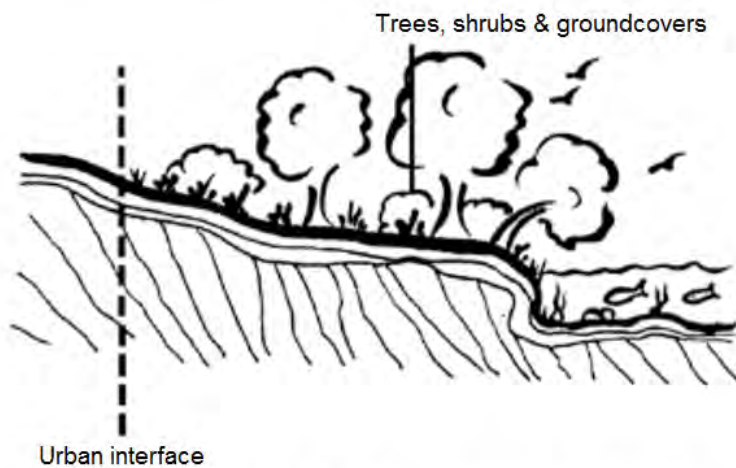
When a more natural stream environment is established and the diversity of aquatic organisms is high, the number of mosquitoes are kept to a minimum as they become part of the natural system and become the prey of aquatic fauna, such as frogs.



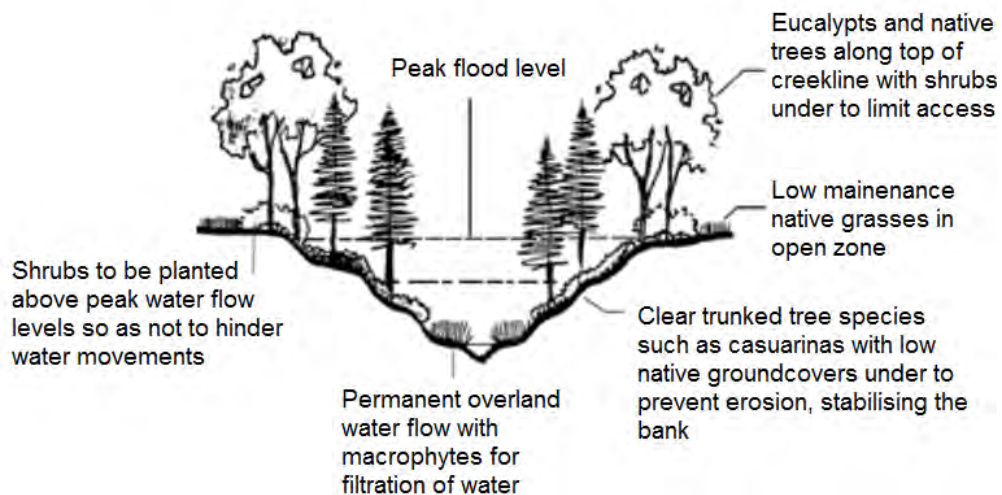
NATURAL WATERCOURSE
(RETAIN/REHABILITATE)



PLANTING FOR RIPARIAN VEGETATION



RIPARIAN VEGETATION (RETAIN/REPLANT)



RIPARIAN VEGETATION (RETAIN/REPLANT)

Figure 6-1: Examples of Riparian Systems

6.7 Riparian Vegetation Management

Any existing native vegetation along a natural watercourse should be retained within the riparian zone during the development of a site and should be considered in the initial design stages.

Riparian vegetation should be protected by fencing to avoid damage from machines during development. If any noxious, environmental and nuisance weeds are present these should also be removed.

If there is little or no riparian vegetation remaining it should be re-established within the riparian zone. This rehabilitation of riparian vegetation will involve one or more of the following activities:

- Weed removal;
- Soil stabilisation;
- Erosion and sediment control measures;
- Planting and mulching; and
- On-going maintenance.

Sufficient on-going weed management at the site will be required until the indigenous vegetation is established. This is usually required for a minimum of 3 years. This maintenance must be included in the overall costs of the project and be detailed in a plan of the proposed works that must be approved by Council prior to commencement.

If weeds are playing a significant role in bank stabilisation, gradual removal should be undertaken whilst the desired species regenerate, to limit soil loss and erosion. Herbicides and pesticides should not be sprayed within 20 metres of waterways.

Where native riparian vegetation is to be rehabilitated, professionals with qualifications and experience in bush regeneration techniques should be employed and local indigenous species planted. These plants should be propagated from local seed stock.

Existing sites with similar conditions nearby containing natural riparian vegetation can be studied to obtain a list of appropriate indigenous plant species. Typical native riparian tree species in Ryde include *Acmena smithii* (Lilly Pilly), *Callicoma serratifolia* (Blackwattle), *Pittosporum undulatum* (Sweet Pittosporum), *Ceratopetalum apetalum* (Coachwood) and *Tristania laurina* (Water Gum). The following section provides a more extensive list of the more common locally occurring riparian plant species in Ryde.

Shrubs

- *Lomatia myricoides* - Long-leaved Lomatia
- *Viminaria juncea* - Native Broom
- *Callistemon citrinus* - Red Bottlebrush
- *Callistemon linearis* - Narrow-leaved Bottlebrush
- *Melaleuca ericifolia* – Swamp Paperbark
- *Bauera rubioides* - Dog Rose
- *Austromyrtus tenuifolia* - Narrow-leaf Myrtle
- *Baeckia linifolia* - Swamp baechea
- *Tristania neriifolia* - Water Gum

Grasses and Groundcovers

- *Cyperus* spp.
- *Lomandra longifolia*

- *Adiantum aethiopicum*
- *Centella asiatica*
- *Commelina cyanea*
- *Baumea* spp
- *Dichondra repens*
- *Juncus kraussii*
- *Sarcocornia quinqueflora*
- *Hydrocotyle* spp.
- *Lepidosperma* spp.
- *Oplismenus imberllicus*
- *Restio fastigiatus*
- *Viola hederacea* – Native violet

Ferns

- *Blechnum cartilagineum*
- *Blechnum nudum*
- *Christella dentata*
- *Todea barbara*
- *Pennisetum alopecuroides*
- *Dnthonia linkii*
- *Poa labillardieri*

Aquatic Plants

- *Phragmites australis*
- *Gahnia melanocarpa*
- *Gahnia sieberiana*
- *Juncus usitatu*
- *Carex appressa*
- *Isolepis nodosa*
- *Triglochin procera*
- *Philydrum lanuginosum*
- *Eleocharis sphacelata*
- *Alisma plantago-aquatica*
- *Bolboschoenus fluviatis*
- *Schoenoplectus mucronatus*

7 SOIL AND WATER MANAGEMENT

7.1 Scope

This section of the Manual sets out Council's requirements for erosion and sediment control. It is in no way a comprehensive design manual and it is intended to be read in conjunction with the *Department of Environment and Conservation Guidelines, Landcom's "Managing Urban Stormwater – Soil and Conservation – Volume 1" 4th Edition 2004 (Blue Book)* and other similar recognised texts.

7.2 Aim

The aim of this section is to provide detailed guidelines for managing erosion and sediment control during the construction of developments in the City of Ryde.

7.3 General

All developments, where the site is disturbed, shall provide appropriate Erosion and Sedimentation Control measures to control runoff, mitigate soil erosion and trap pollutants before they can reach downslope lands and receiving watercourses. This is to ensure that downstream properties, Council's drainage system, natural watercourses and bushland area are protected from the adverse effects of sediment and other pollutants.

Where required, sediment ponds together with treatment trains are to be implemented on all relevant construction sites. For sites smaller than 250m² a small works sediment control plan is required to be submitted, while for sites with disturbances of between 250m² to 2500m² an Erosion Sediment Control Plan (ESCP) is required. For sites larger than 2500m² a Soil and Water Management Plan (SWMP) is required.

A small works sediment control plan will need to detail simple erosion and sediment control measures required such as silt fencing, hay bales and sand bags. Explanatory notes are to be included on the plans advising that sediment deposition on roads and into receiving waters is to be avoided.

ESCP's and SWMP's shall be designed and constructed in accordance with Landcom's "Managing Urban Stormwater – Soil and Conservation – Volume 1" 4th Edition 2004 (Blue Book).

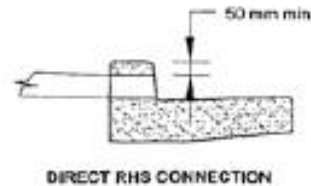
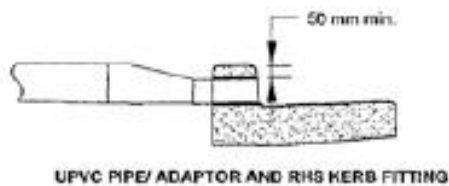
8 APPENDAGES

1. Council's Std. Drawing of connections to Kerb and R.C pipe
2. Absorption Calculation Sheet
3. On-Site Detention Calculation Sheet
4. Ryde Catchment Map
5. Orifice sized according to depth of ponding and PSD
6. DRAINS, RAFTS and XPSTORM Input Parameters
7. IFD Data
8. Discharge and Velocity Graph
9. Pit Inlet Design: Grated Kerb Inlet – Independent of grade
10. Pit Inlet Design: Kerb Inlets in Sags
11. Pit Inlet Design: Inlets Capacities for Gratings in Sags
12. Pit Inlet Design: Inlets Capacities for Kerb Inlets with Duram Type Grates in Sags
13. Pit Inlet Design: Inlets Capacities for Kerb Inlets with WELDLOC Type Grates in Sags
14. Example Easement Letter

8.1 Appendix 1: Council's Std. Drawing of connections to Kerb and R.C pipe

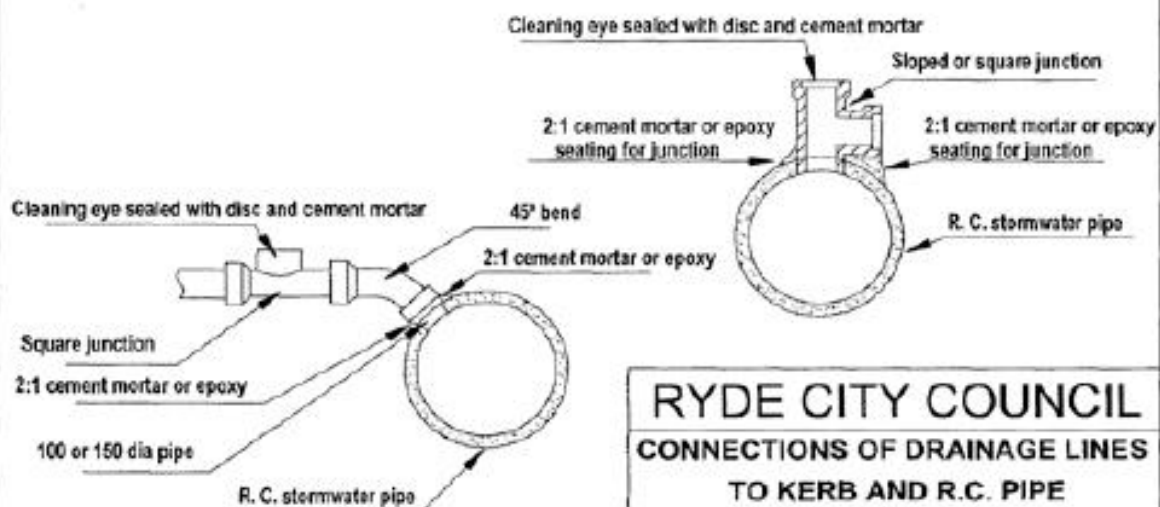
CONNECTION WITH 150 MM CONCRETE KERB

1. INTERNAL DIAMETER OF PIPES OR INTERNAL HEIGHT OF RECTANGULAR SECTION ACROSS THE FOOTPATH SHALL BE 100 MM MAXIMUM, 90 MM MINIMUM.
2. PIPES ACROSS FOOTPATH SHALL BE SEWER GRATE U.P.V.C.
3. RECTANGULAR SECTIONS ACROSS FOOTPATH SHALL BE CAST IRON OR HOT DIP GALVANISED R.H.S.
4. CONVERT 150 MM DIAMETER PIPES WITHIN THE PROPERTY TO A 200 X 100 X 6 MM GALVANISED R.H.S. ACROSS THE FOOTPATH, USING A 300 X 300 PIT WITH A REMOVABLE LID.
5. CONNECTIONS TO KERB ACROSS THE FOOTPATHS TO BE AT A MAXIMUM OF 60 DEGREES TO THE KERB LINE
6. A 127 X 64 X 4 MM R.H.S. HOT DIPPED GALVANISED (OR ALUMINIUM) KERB INSERT WITH AN ADAPTOR FOR 100 MM DIAMETER U.P.V.C. PIPES IS REQUIRED



CONNECTIONS OF DRAINAGE LINES TO R.C. PIPES

1. THE R.C. STORMWATER PIPE SHALL BE PIERCED BY A NEAT OPENING AS SHOWN TO ALLOW THE CONNECTION OF A SQUARE, SLOPED JUNCTION OR BEND WHICH SHALL NOT PROTRUDE BEYOND THE INNER SURFACE OF THE R.C. STORMWATER PIPE
2. THE INTERNAL JUNCTION SHALL BE SMOOTHLY FINISHED WITH 2:1 CEMENT MORTAR OR EPOXY CEMENT SO AS TO PRESENT NO OBSTRUCTION WITHIN THE INTERNAL SURFACE OF THE R.C. STORMWATER PIPE. THE LINE IS NOT TO EXTEND BEYOND POINT 1 UNTIL APPROVED BY COUNCIL
3. THE HOLE IN COUNCIL'S PIPE IS TO BE FORMED BY CAREFUL DRILLING TO NEATLY ACCEPT THE OUTSIDE DIAMETER OF THE PIPE
4. ANY DAMAGE TO THE STRUCTURE OF COUNCIL'S PIPE IS TO BE MADE GOOD TO THE SATISFACTION OF COUNCIL'S ENGINEER, IF NECESSARY BY THE REPLACEMENT OF THE PIPE.
5. PIPE FITTINGS ARE TO BE VITRIFIED CLAY OR SEWER QUALITY U.P.V.C.
6. COUNCIL PIPELINE IS TO BE LEFT FREE OF DROPPED CLAY, CONCRETE, MORTAR, etc.



RYDE CITY COUNCIL
CONNECTIONS OF DRAINAGE LINES
TO KERB AND R.C. PIPE

Not to Scale

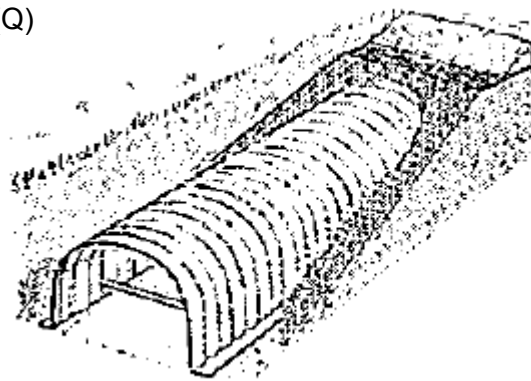
8.2 Appendix 2 - Absorption System Calculation Sheet

DEVELOPMENT TYPE:

ADDRESS:

Catchment Zone =	(Zone 1)	(Zone 2)	(Eastwood)		
1. Site Area =				m ²	(A)
2. Roof Area =				m ²	(B)
3. Driveway Area =				m ²	(C)
4. Other Paved Area =				m ²	(D)
5. Pervious Paving Area =	m ² x 0.25 =			m ²	(E)
6. Total Proposed Impervious Area (B + C + D + E) =				m ²	(F)
7. Total Impervious Area Draining to Absorption Trench =				m ²	(G)
(As much of the impervious areas possible are to drain to the absorption system, with 100% of the roof area and driveway area to connect to the system)					
8. Site impervious % = (F)/(A) x 100 =				%	(H)
(must be less than 40%)					
9. Area available for dispersal =				m ²	(K)
10. Rainfall Intensity (mm/hr)					
For a 1 in 5 year 20min Storm:					
	Zone 1 = 88.2				
	Zone 2 and Eastwood = 82.7			mm/hr (L)	
11. Volume of Runoff = (G) x (L) x (1/3) =				L	(M)
12. Storage Required = (M) /1000 =				m ³	(N)
13. Absorption Trench Type =					
14. Storage Capacity per lineal metre (from product guide) =				m ³ /m	(O)
15. Additional Storage Capacity in Gravel Trench with voids					
= (trench width (m) x trench height (m) – cross section area of absorption trench (m ²)) x void space					
				m ³ /m	(P)
16. Total Storage Capacity = (O) + (P) =				m ³ /m	(Q)
17. Length of Trench Required = (N)/(Q)					

Length = _____ m



8.3 Appendix 3 – Onsite Detention Calculation Sheet

RYDE CITY COUNCIL ON-SITE DETENTION CALCULATION SHEET

DEVELOPMENT TYPE: _____

ADDRESS: _____

Catchment Zone	(Zone 1)	(Zone 2)	(Eastwood)
Site Area		_____	m ² (A)
65% Site Area		_____	m ²
Total Proposed Impervious Area (roofs, driveways, hardstand etc)		_____	m ² (B)
% of site impervious		_____	%
Impervious area draining to the Storage Facility		_____	m ² (C)
Pervious area draining to the Storage Facility		_____	m ² (D)
Total area draining to the Storage Facility (impervious and pervious areas)		_____	m ² (E)
Pervious area bypassing the Storage Facility		_____	m ² (F)
Impervious area bypassing the Storage Facility		_____	m ² (G)
$\frac{(C)+(G)}{(C)}$		1. _____	(L)

must not be greater than 1.25.

Permitted Site Discharge (PSD) rate per m²

Catchments in Zones 1 & 2

If (G)=0 then PSD = 0.0265 l/sec/m²

If (G)≠0 then PSD = 0.0265x(L)^{-1.37} l/sec/m²

Eastwood Catchment

If (G)=0 then PSD = 0.0210 l/sec/m²

If (G)≠0 then PSD = 0.0210x(L)^{-1.37} l/sec/m²

_____ (J)

PERMITTED SITE DISCHARGE (E) x (J) _____ x _____

l/s

Storage Volume per m²

(K) = 0.0275 m³/m² for zone 1 or

(K) = 0.0255 m³/m² for zone 2 or

(K) = 0.0300 m³/m² for Eastwood Catchment

_____ (K)

SITE STORAGE REQUIREMENT ((E) + (G)) x (K)x(1.2)^v _____ + _____ x _____ (x1.2)

m³

NOTE ^v If OSD is provided in a landscaped surface basin the volume must be increased by 20%

OUTLET CONTROL - using a Sharp Edged Orifice Plate

Height Difference between top water level and Centre of Orifice (m) _____ (H)

$$\text{mm} = 21.9 \sqrt{\frac{PSD}{\sqrt{H}}}$$

ORIFICE DIAMETER (mm)

Should pipe and pit losses be used to control outflow, the calculations are to be attached.

8.4 Appendix 4: DRAINS, RAFTS and XPSTORM Input Parameters

Drains Model			
Parameter	Description	Value	Unit
Model	Rational Method Procedure	ARR 98	
	Soil Type - Normal	3.0	
	Paved (impervious) Area Depression Storage	1	mm
	Supplementary Area Depression Storage	1	mm
	Grassed (Pervious) Area Depression Storage	5	mm
AMC	Antecedent Moisture Condition	2.5	
	Minimum Pit freeboard	150	mm

RAFTS and XP STORM Models			
Parameter	Description	Value	Unit
CAPIMP	Capacity of Impervious Area Storage	1.5	mm
ISC	Interception Storage Capacity	1.5	mm
DSC	Depression Storage Capacity	5	mm
USC	Capacity – Upper Soil Zone Storage	25	mm
LSC	Capacity – Lower Soil Zone Storage	100	mm
UH	Maximum Potential Evapotranspiration from Upper Soil	10	mm/day
LH	Maximum Potential Evapotranspiration from Lower Soil	10	mm/day
ER	Proportion of Evapotranspiration from USC	0.7	
IDS	Initial Impervious Area Storage	0.5	mm

IS	Initial Interception Storage	0.5	mm
DS	Initial Depression Storage (pervious)	0	mm
US	Initial Upper Soil Zone Storage	20	mm
LS	Initial Lower Soil Zone Storage	80	mm
GS	Initial Groundwater Storage	0	mm
GN	Groundwater Recession Factor	1	mm
SO	Sorptivity of Dry Soil	3.0	mm/min-
Ko	Saturated hydraulic Conductivity	0.33	mm/min
LDF	Lower Soil Drainage Factor	0.05	
KG	Constant Rate Groundwater Recession Factor	0.94	
ECOR	Rate of Potential Evaporation from "A" Class Pan	0.70	
IAR	Proportion of Rainfall intercepted by Vegetation	0.7	

Appendage 5: Ryde Catchment Map

OSD Catchment Map for RCC



Catchment	Permissible Site Discharge (PSD) (l/sec/m ²)	Site Storage Requirement (SSR)(m ³ /m ²)
Zone 1	0.0265	0.0275
Zone 2	0.0265	0.0255
Eastwood	0.0210	0.0300

8.6 Appendix 6: IFD Data

Time	Intensity mm/hr for ARI						
(mins)	Zone 1 (NW): Buffalo, Gladesville, Industrial, Kittys, Lane Cove, Mars, Porters, Shrimptons, Terrys						
	1	2	5	10	20	50	100
5	97.3	123.7	154.5	171.7	194.9	224.9	247.4
6	91.2	116.0	144.9	161.1	182.9	211.1	232.3
7	86.1	109.6	137.0	152.3	173.1	199.9	220.0
8	81.8	104.1	130.3	145.0	164.8	190.4	209.7
9	78.0	99.4	124.5	138.6	157.6	182.2	200.7
10	74.7	95.2	119.4	133.0	151.3	175.0	192.8
11	71.7	91.5	114.8	128.0	145.7	168.6	185.8
12	69.1	88.2	110.7	123.5	140.6	162.8	179.4
13	66.7	85.2	107.0	119.4	136.0	157.5	173.7
14	64.6	82.4	103.7	115.7	131.8	152.7	168.4
15	62.6	79.9	100.6	112.2	127.9	148.3	163.6
16	60.7	77.6	97.7	109.1	124.4	144.2	159.1
17	59.1	75.4	95.1	106.2	121.1	140.4	154.9
18	57.5	73.5	92.6	103.4	118.0	136.9	151.1
19	56.0	71.6	90.3	100.9	115.1	133.6	147.5
20	54.7	69.9	88.2	98.5	112.4	130.5	144.1
21	53.4	68.2	86.1	96.3	109.9	127.6	140.9
22	52.2	66.7	84.2	94.2	107.5	124.8	137.9
23	51.0	65.2	82.4	92.2	105.3	122.3	135.1
24	49.9	63.9	80.7	90.3	103.2	119.8	132.4
25	48.9	62.6	79.1	88.6	101.2	117.5	129.8
26	48.0	61.4	77.6	86.9	99.2	115.3	127.4
27	47.0	60.2	76.2	85.3	97.4	113.2	125.1
28	46.2	59.1	74.8	83.7	95.7	111.2	122.9
29	45.3	58.0	73.5	82.3	94.0	109.3	120.8
30	44.5	57.0	72.2	80.9	92.4	107.5	118.8
31	43.8	56.0	71.0	79.5	90.9	105.7	116.9
32	43.0	55.1	69.8	78.3	89.5	104.1	115.1
33	42.3	54.2	68.7	77.0	88.1	102.5	113.3
34	41.7	53.4	67.7	75.8	86.8	100.9	111.6
35	41.0	52.5	66.7	74.7	85.5	99.5	110.0
36	40.4	51.7	65.7	73.6	84.2	98.0	108.4
37	39.8	51.0	64.7	72.6	83.1	96.7	106.9
38	39.2	50.2	63.8	71.6	81.9	95.3	105.5
39	38.7	49.5	62.9	70.6	80.8	94.1	104.1
40	38.1	48.9	62.1	69.7	79.7	92.8	102.8
41	37.6	48.2	61.3	68.7	78.7	91.7	101.4
42	37.1	47.6	60.5	67.9	77.7	90.5	100.2
43	36.6	46.9	59.7	67.0	76.7	89.4	99.0
44	36.1	46.3	59.0	66.2	75.8	88.3	97.8
45	35.7	45.8	58.2	65.4	74.9	87.3	96.6
50	33.6	43.1	55.0	61.8	70.8	82.5	91.4
55	31.8	40.8	52.1	58.6	67.2	78.4	86.9
60	30.2	38.8	49.6	55.8	64.1	74.8	82.9
70	27.6	35.4	45.4	51.2	58.8	68.7	76.2
80	25.4	32.7	42.0	47.4	54.5	63.8	70.8
90	23.6	30.5	39.2	44.3	51.0	59.7	66.4
100	22.1	28.5	36.8	41.6	48.0	56.3	62.6
110	20.9	26.9	34.8	39.4	45.4	53.3	59.3
120	19.7	25.5	33.0	37.4	43.2	50.7	56.5
150	17.1	22.1	28.8	32.8	37.9	44.6	49.8
180	15.2	19.7	25.8	29.4	34.0	40.2	44.9

North East Polynomial Coefficient:

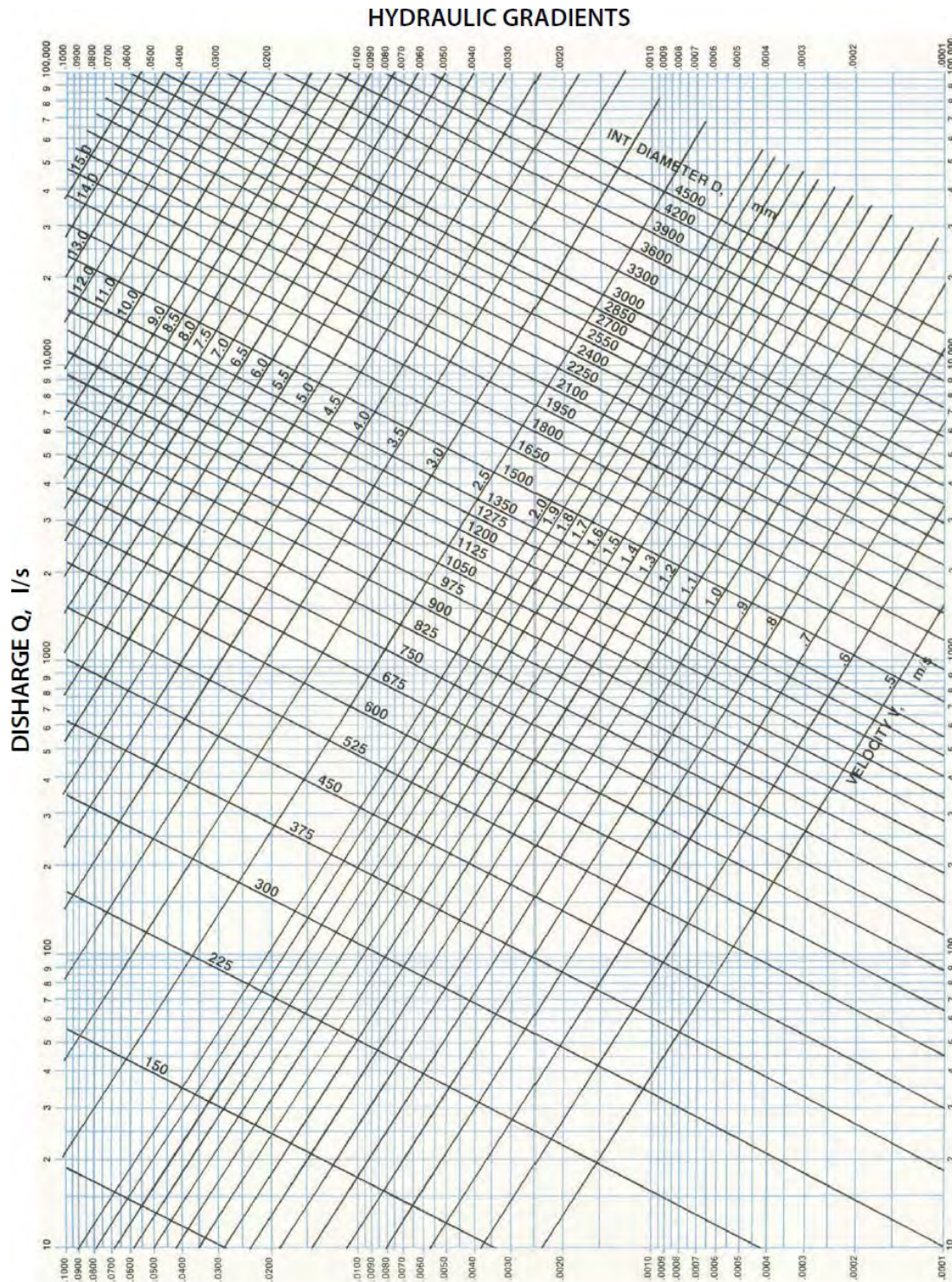
3.4086	-.58988	-.040977	.006755	0.0018839	-6.9872E-05	-7.6289E-05
3.6589	-.58398	-.039062	.0069866	0.0015993	-1.1613E-04	-6.0789E-05
3.9042	-.56826	-.033879	.0076074	8.3204E-04	-2.3972E-04	-1.9187E-05
4.0221	-.56005	-.031169	.0079322	4.3088E-04	-3.0432E-04	2.5585E-06
4.1597	-.55326	-.028933	.0082005	0.0000998	-3.5774E-04	2.052E-05
4.3146	-.54563	-.026414	.0085028	-0.0002732	-4.1779E-04	4.074E-05
4.4178	-.54054	-.024736	.0087022	-5.2147E-04	-4.5768E-04	5.4188E-05

Time (mins)	Intensity mm/hr for ARI Zone 2 (South-West Zone) : Archer, Charity, Denistone, Eastwood, River						
	1	2	5	10	20	50	100
5	91.1	116.2	146.2	163.1	185.9	215.4	237.55
6	85.3	108.9	137.1	153.1	174.5	202.3	223.18
7	80.5	102.8	129.6	144.7	165.0	191.4	211.21
8	76.4	97.6	123.1	137.6	157.0	182.1	200.99
9	72.9	93.2	117.6	131.4	149.9	174.0	192.10
10	69.8	89.2	112.7	125.9	143.8	166.8	184.25
11	67.0	85.7	108.3	121.1	138.2	160.5	177.26
12	64.6	82.6	104.4	116.7	133.3	154.8	170.96
13	62.3	79.7	100.8	112.8	128.8	149.6	165.25
14	60.3	77.2	97.6	109.2	124.7	144.8	160.04
15	58.4	74.8	94.6	105.9	120.9	140.5	155.26
16	56.7	72.6	91.9	102.8	117.5	136.5	150.85
17	55.1	70.6	89.3	100.0	114.3	132.8	146.77
18	53.7	68.7	87.0	97.4	111.3	129.3	142.97
19	52.3	66.9	84.8	94.9	108.5	126.1	139.43
20	51.0	65.3	82.7	92.6	105.9	123.1	136.12
21	49.8	63.8	80.8	90.5	103.5	120.3	133.01
22	48.7	62.3	79.0	88.5	101.2	117.6	130.09
23	47.6	60.9	77.3	86.6	99.0	115.1	127.33
24	46.6	59.7	75.7	84.8	97.0	112.8	124.73
25	45.6	58.4	74.1	83.1	95.0	110.5	122.26
26	44.7	57.3	72.7	81.5	93.2	108.4	119.92
27	43.9	56.2	71.3	79.9	91.4	106.4	117.70
28	43.0	55.1	70.0	78.5	89.8	104.5	115.58
29	42.2	54.1	68.7	77.1	88.2	102.6	113.56
30	41.5	53.2	67.5	75.7	86.7	100.9	111.63
31	40.8	52.3	66.4	74.5	85.2	99.2	109.79
32	40.1	51.4	65.3	73.3	83.8	97.6	108.03
33	39.4	50.6	64.3	72.1	82.5	96.1	106.34
34	38.8	49.8	63.3	71.0	81.2	94.6	104.72
35	38.2	49.0	62.3	69.9	80.0	93.2	103.17
36	37.6	48.3	61.4	68.9	78.9	91.8	101.67
37	37.1	47.5	60.5	67.9	77.7	90.5	100.23
38	36.5	46.9	59.6	66.9	76.6	89.3	98.85
39	36.0	46.2	58.8	66.0	75.6	88.1	97.51
40	35.5	45.6	58.0	65.1	74.6	86.9	96.22
41	35.0	44.9	57.2	64.2	73.6	85.8	94.98
42	34.6	44.3	56.5	63.4	72.7	84.7	93.77
43	34.1	43.8	55.7	62.6	71.7	83.6	92.61
44	33.7	43.2	55.1	61.8	70.9	82.6	91.49
45	33.3	42.7	54.4	61.1	70.0	81.6	90.40
50	31.3	40.2	51.3	57.6	66.1	77.1	85.43
55	29.7	38.1	48.6	54.7	62.7	73.2	81.12
60	28.2	36.2	46.3	52.1	59.8	69.8	77.35
70	25.8	33.2	42.4	47.8	55.0	64.0	71
80	23.8	30.6	39.2	44.2	51.0	59.0	66
90	22.1	28.5	36.6	41.3	47.5	56.0	62
100	20.8	26.7	34.4	38.8	44.7	52.0	58
110	19.6	25.2	32.5	26.7	42.3	49.6	55
120	18.6	23.9	30.9	34.9	40.2	47.2	52
150	16.1	20.8	27.0	30.6	35.3	41.5	46.2
180	14.4	18.6	24.2	27.4	31.7	37.3	41.6

South West Polynomial Coefficient:

3.3393	-.58392	-.033169	.0077673	7.1372E-04	-.0002336	1.7908E-05
3.5896	-.57971	-.031933	.0077639	5.8990E-04	-2.3827E-04	1.3537E-05
3.8349	-.56852	-.02862	.0077548	2.5919E-04	-2.5059E-04	-1.8835E-06
3.9527	-.56266	-.026887	.0077487	8.6322E-05	-2.5681E-04	4.1675E-06
4.0903	-.55783	-.025456	.0077458	-5.6644E-05	-2.6224E-04	9.2213E-06
4.2452	-.5524	-.023848	.0077412	-2.1702E-04	-2.6821E-04	1.4868E-05
4.3484	-.54877	-.022773	.0077379	-3.2437E-04	-2.7212E-04	1.8636E-05

8.7 Appendix 7 – Discharge – Velocity Graph



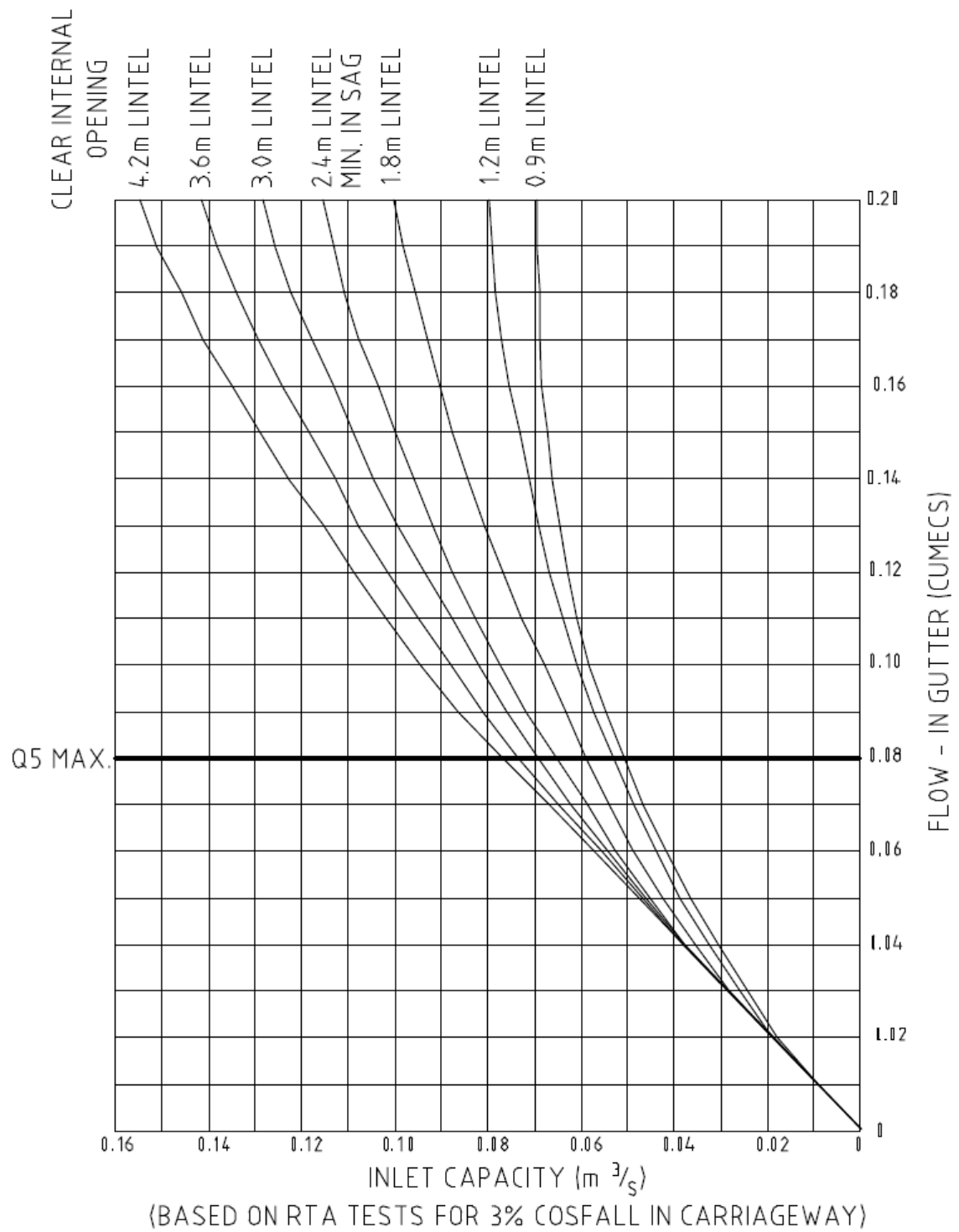
Discharge and velocity graph

Colebrook-White formula $k = 0.60\text{mm}$

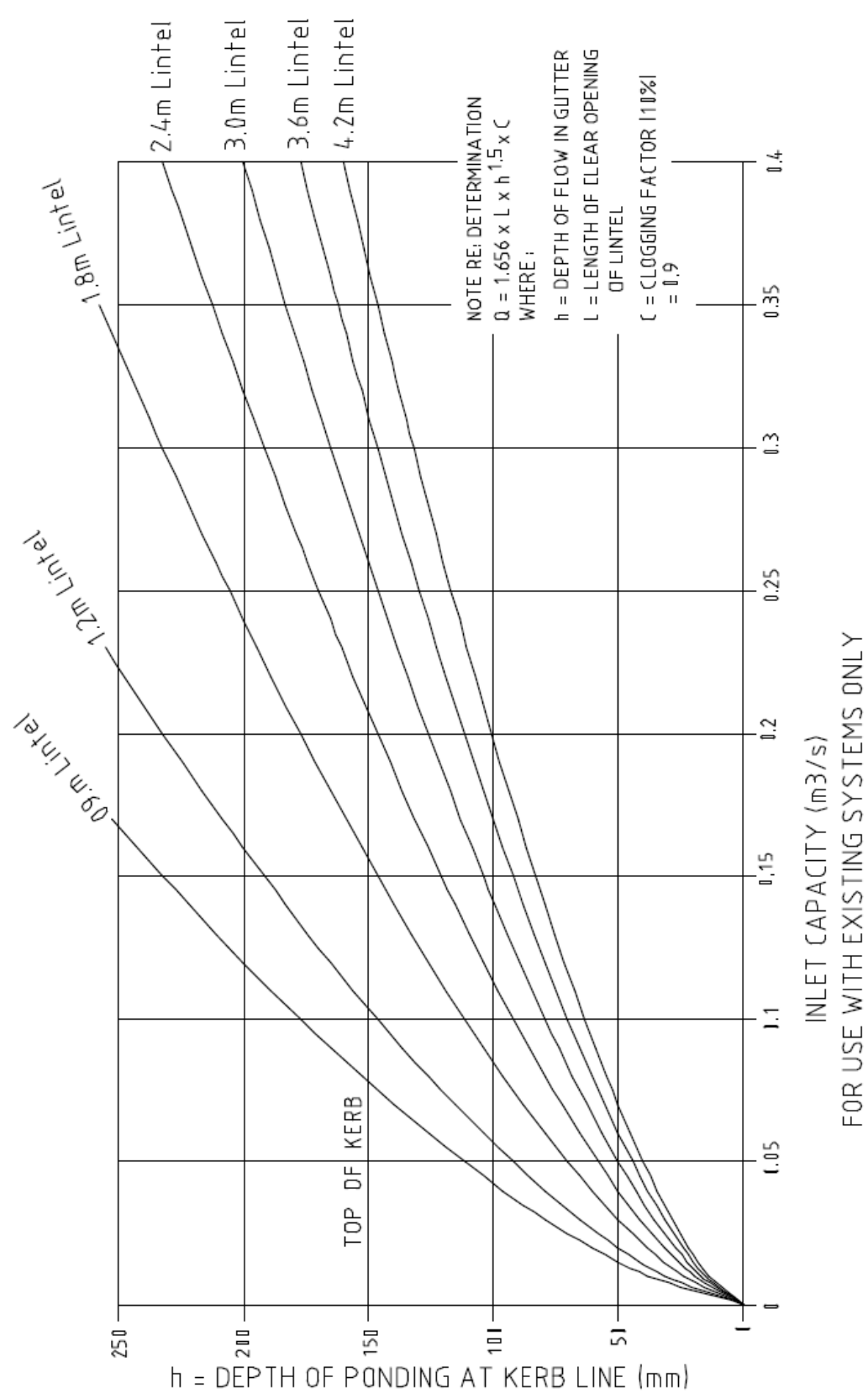
For circular pipes running full but not under head.

Computed by: $\frac{1}{\sqrt{f}} = -2\log_{10} \left(\frac{k}{3.7D} + \frac{k}{R_e\sqrt{f}} \right)$

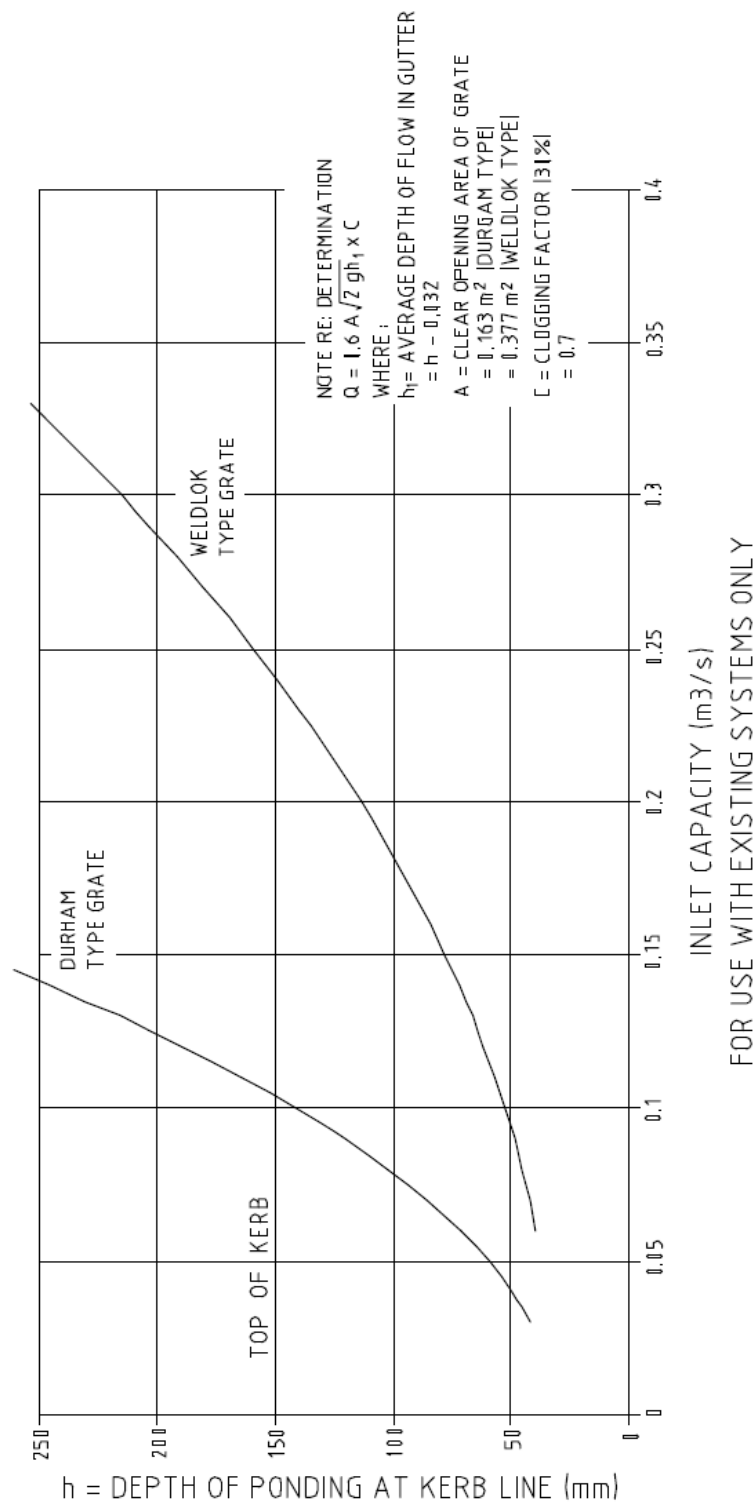
8.8 Appendix 8 - Pit Inlet Design Figure: Grated Kerb Inlet – Independent of grade



8.9 Appendix 9 - Pit Inlet Design Figure: Kerb Inlets in Sags

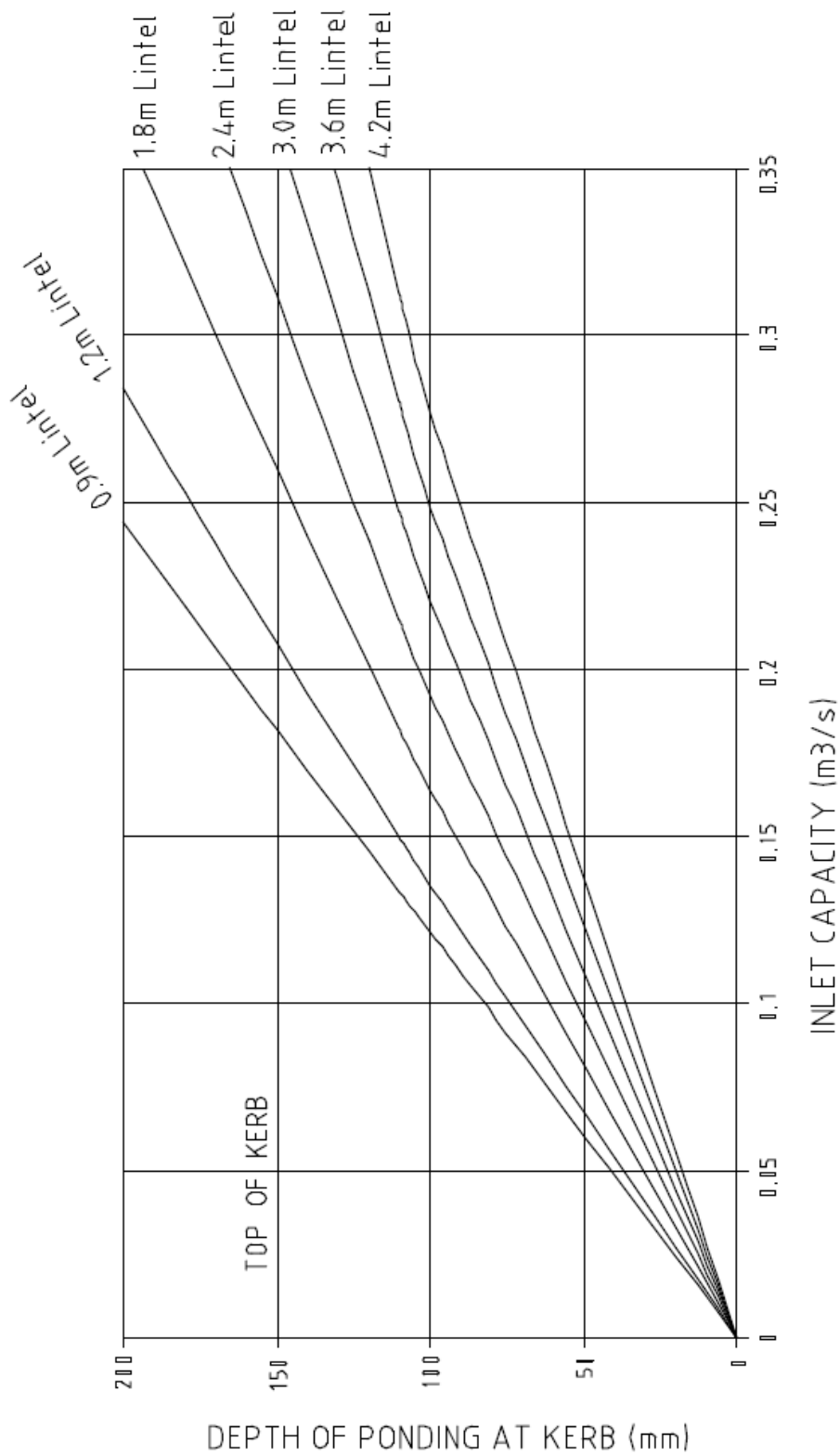


8.10 Appendix 10 - Pit Inlet Design Figure: Inlets Capacities for Gratings in Sags



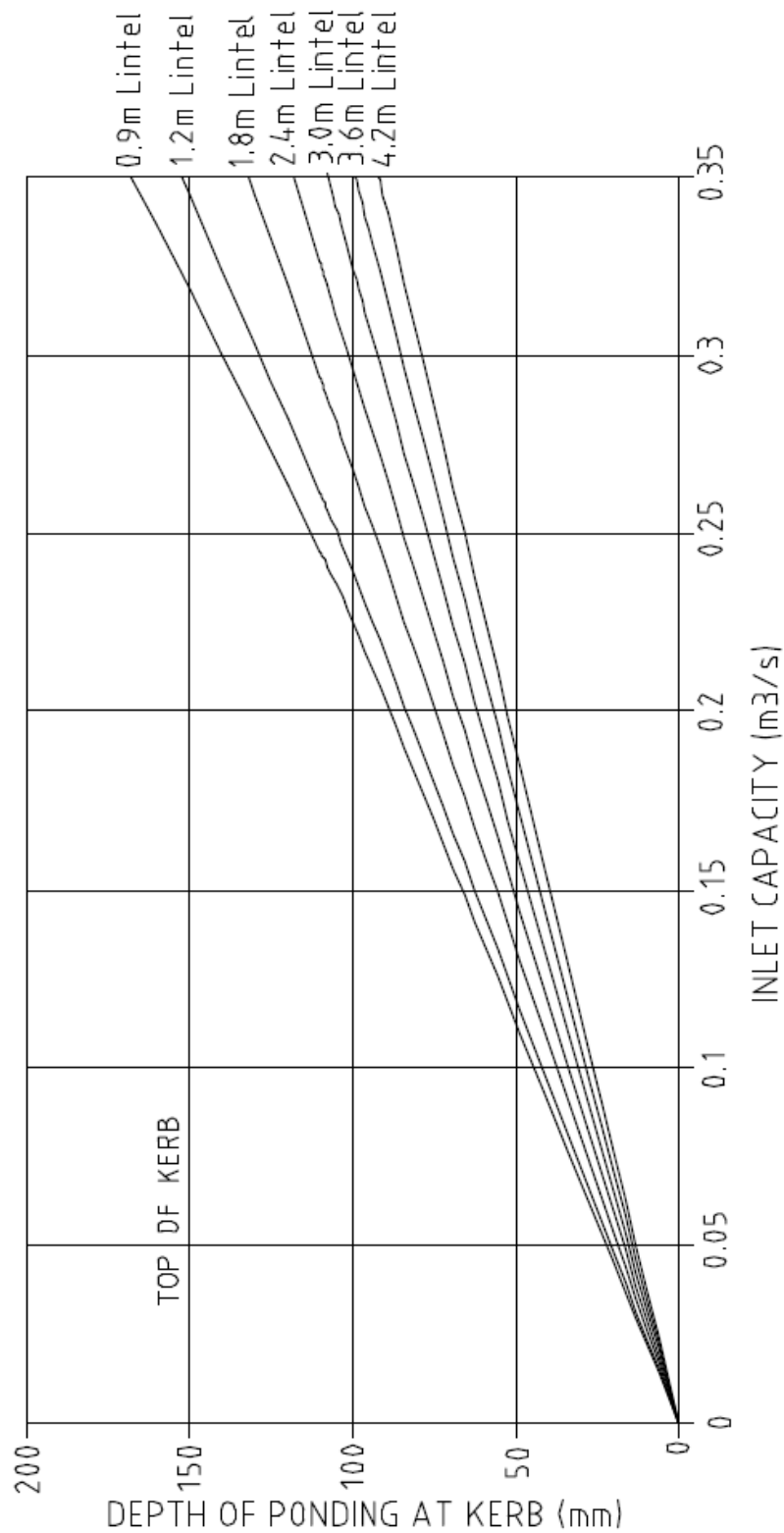
8.11 Appendix 11 - Pit Inlet Design Figure: Inlets Capacities for Kerb Inlets with Duram Type Grates in Sags

NOTE: This chart is based on the equations shown on Appendix 9 and 10.



8.12 Appendix 12 - Pit Inlet Design Figure: Inlets Capacities for Kerb Inlets with WELDLOC Type Grates in Sags

NOTE: This chart is based on the equations shown on Appendix 9 and 10.



8.13 Appendix 13: Orifice sized according to depth of ponding and PSD.

PSD l/s	Depth of tank above centreline of orifice																			
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
2	55	46	42	39	37	35	34	33	32	31	30	30	29	28	28	28	27	27	26	26
3	67	57	51	48	45	43	41	40	39	38	37	36	36	35	34	34	33	33	32	32
4	78	65	59	55	52	50	48	46	45	44	43	42	41	40	40	39	38	38	37	37
5	87	73	66	62	58	56	54	52	50	49	48	47	46	45	44	44	43	42	42	41
6	95	80	72	67	64	61	59	57	55	54	52	51	50	49	48	48	47	46	46	45
7	103	87	78	73	69	66	63	61	59	58	57	55	54	53	52	51	51	50	49	49
8	110	93	84	78	74	70	68	65	64	62	60	59	58	57	56	55	54	53	53	52
9	117	98	89	83	78	75	72	69	67	66	64	63	61	60	59	58	58	57	56	55
10	123	104	94	87	82	79	76	73	71	69	68	66	65	64	63	62	61	60	59	58
11	129	109	98	91	86	82	79	77	75	73	71	69	68	67	66	65	64	63	62	61
12	135	113	102	95	90	86	83	80	78	76	74	72	71	70	69	67	66	65	65	64
13	140	118	107	99	94	90	86	83	81	79	77	75	74	73	71	70	69	68	67	66
14	146	122	111	103	97	93	90	87	84	82	80	78	77	75	74	73	72	71	70	69
15	151	127	115	107	101	96	93	90	87	85	83	81	79	78	77	75	74	73	72	71
16	156	131	118	110	104	99	96	93	90	88	85	84	82	80	79	78	77	76	75	74
17	160	135	122	113	107	103	99	95	93	90	88	86	85	83	82	80	79	78	77	76
18	165	139	125	117	110	106	102	98	95	93	91	89	87	85	84	83	81	80	79	78
19	170	143	129	120	113	108	104	101	98	95	93	91	89	88	86	85	84	82	81	80
20	174	146	132	123	116	111	107	104	100	98	96	94	92	90	88	87	86	85	83	82
21	178	150	136	126	119	114	110	106	103	100	98	96	94	92	91	89	88	87	85	84
22	183	154	139	129	122	117	112	109	105	103	100	98	96	94	93	91	90	89	87	86
23	187	157	142	132	125	119	115	111	108	105	102	100	98	97	95	93	92	91	89	88
24	191	160	145	135	128	122	117	113	110	107	105	102	100	99	97	95	94	93	91	90
25	195	164	148	138	130	124	120	116	112	109	107	105	102	101	99	97	96	94	93	92
26	198	167	151	140	133	127	122	118	115	112	109	107	105	103	101	99	98	96	95	94
27	170	154	143	135	129	124	120	117	114	111	109	107	105	103	101	100	98	97	96	96
28	173	156	146	138	132	127	122	119	116	113	111	108	106	105	103	101	100	99	97	97
29	176	159	148	140	134	129	125	121	118	115	113	110	108	107	105	103	102	100	99	99
30	179	162	151	143	136	131	127	123	120	117	115	112	110	108	107	105	104	102	101	101
31	182	165	153	145	138	133	129	125	122	119	116	114	112	110	108	107	105	104	102	102
32	185	167	156	147	141	135	131	127	124	121	118	116	114	112	110	108	107	105	104	104
33	188	170	158	150	143	137	133	129	126	123	120	118	116	114	112	110	109	107	106	106
34	191	172	160	152	145	140	135	131	128	125	122	120	117	115	113	112	110	109	107	107
35	194	175	163	154	147	142	137	133	129	126	124	121	119	117	115	113	112	110	109	109
36	196	177	165	156	149	144	139	135	131	128	125	123	121	119	117	115	113	112	110	110
37	199	180	167	158	151	146	141	137	133	130	127	125	122	120	118	117	115	113	112	112
38	202	182	170	160	153	148	143	139	135	132	129	126	124	122	120	118	116	115	113	113
39	204	185	172	163	155	149	145	140	137	133	131	128	126	124	122	120	118	116	115	115
40	207	187	174	165	157	151	146	142	138	135	132	130	127	125	123	121	120	118	116	116
41	210	189	176	167	159	153	148	144	140	137	134	131	129	127	125	123	121	119	118	118
42	212	192	178	169	161	155	150	146	142	139	136	133	130	128	126	124	122	121	119	119
43	215	194	180	171	163	157	152	147	144	140	137	134	132	130	128	126	124	122	121	121
44	217	196	183	173	165	159	154	149	145	142	139	136	133	131	129	127	125	124	122	122
45	220	198	185	175	167	161	155	151	147	143	140	138	135	133	131	129	127	125	123	123
46	222	201	187	177	169	162	157	152	148	145	142	139	136	134	132	130	128	126	125	125
47	224	203	189	178	170	164	159	154	150	147	143	141	138	136	133	131	130	128	126	126
48	227	205	191	180	172	166	160	156	152	148	145	142	139	137	135	133	131	129	128	128
49	229	207	193	182	174	168	162	157	153	150	146	143	141	138	136	134	132	131	129	129
50	231	209	195	184	176	169	164	159	155	151	148	145	142	140	138	136	134	132	130	130

Min. 375 mm diameter outlet pipe

Min. 300 mm diameter outlet pipe

The values calculated above are for a circular, square cut edge orifice only.

8.14 Appendix 14: Example Easement Letter

Dear

I/we

are proposing to redevelop our property at

Before we can proceed with this proposal Council has advised us that we have two options for the drainage of stormwater, the first, which is Council's preferred method, is to obtain a drainage easement to convey the stormwater runoff from our property to the nearest public stormwater drainage infrastructure or Council approved discharge point, being
.....

This will require you to grant me/us a drainage easement through your property with all legal and survey costs for the creation of the easement being borne by us, together with any consideration for the use of your property as determined by an independent valuation or agreement. (Attach independent valuation or agreement to this form).

The other alternative is to install an underground absorption system or level spreader (if appropriate for this site) to spread and disperse the stormwater flow. As the runoff and seepage from this system may flow towards your property because of the slope of the land, the best solution would be to have a drainage system that will convey our stormwater via an interallotment drainage pipe to
.....

You are advised that if Council determines that the only way for the drainage of stormwater is via an easement through your property, I/we may have to use Section 88K of the Conveyancing Act 1919 to request the Supreme Court to grant me/us the drainage easement. This will probably result in legal expenses and time spent for both you and I/us.

Could you please indicate your position regarding this matter so that we can advise Council to enable our application to progress.

YES I/we are willing to grant you a drainage easement.

.....

Name

Address

NO I/we are not willing to grant you a drainage easement.

.....

Name

Address

City of Ryde

Water Sensitive Urban Design Guidelines

**Adopted 26 May 2015
Effective 3 June 2015**

Table of Contents

1	INTRODUCTION.....	3
2	PREPARATION OF A WSUD STRATEGY.....	4
3	SITE ASSESSMENT.....	7
4	INITIATIVES FOR POTABLE WATER CONSERVATION.....	9
4.1	WATER EFFICIENT FITTINGS AND APPLIANCES	9
4.2	WATER EFFICIENT LANDSCAPING.....	9
4.3	RAINWATER TANKS.....	10
4.4	STORMWATER HARVESTING AND WASTEWATER RECYCLING	13
5	INITIATIVES FOR STORMWATER QUALITY MANAGEMENT	19
5.1	GROSS POLLUTANT TRAPS.....	21
5.2	VEGETATED SWALES AND BUFFER STRIPS.....	23
5.3	BIORETENTION SYSTEMS	29
5.4	WETLANDS	34
6	VEGETATION GUIDE.....	39
6.1	SWALES AND BUFFER STRIPS.....	39
6.2	TREES AND SHRUBS.....	41
6.3	WETLANDS	41
6.4	BATTERS.....	42
6.5	EPHEMERAL ZONE	44
6.6	SHALLOW MARSH.....	45
6.7	MARSH.....	45
6.8	DEEP MARSH.....	45
6.9	DEEP WATER - POOLS	45
6.10	BIORETENTION SYSTEMS	45
7	REFERENCES	49

1 INTRODUCTION

Water Sensitive Urban Design (WSUD) aims to manage the effects of urban development on the urban water cycle by considering the management of potable water, wastewater and stormwater elements in an integrated manner.

The main elements of the urban water cycle are:

- The natural water cycle of a catchment, including rainfall, runoff (stormwater), surface water and groundwater
- Potable water treated to drinking water standard, usually imported from external catchments, before being piped to households, businesses and industry
- Wastewater generated by households, businesses and industry and transported to regional treatment plants for basic treatment and disposal to waterways and water bodies

Urban water cycle management is based on these three elements of the urban water cycle, i.e. stormwater, potable water and wastewater. The management objectives of water sensitive urban design for the City of Ryde are:

- Protection and enhancement of natural water systems (creeks and rivers etc.)
- Treatment of urban stormwater to meet water quality objectives for reuse and/or discharge to receiving waters
- Matching the natural water runoff regime as closely as possible (where appropriate)
- Reducing potable water demand through water efficient fittings and appliances, rainwater harvesting and wastewater reuse
- Minimising wastewater generation and maximising treatment to a standard suitable for effluent reuse opportunities and/or to release to receiving waters
- Integrating stormwater management into the landscape, creating multiple use corridors that maximise the visual and recreational amenity of urban development

Management of the urban water cycle must still consider traditional management issues with stormwater, potable water and wastewater such as: stormwater systems providing flood protection and flow attenuation, and wastewater and potable water supplies ensuring an acceptable standard of public health.

The objectives of WSUD are integrated with the management of the urban water cycle. That is, the objectives aim to conserve potable water, ensure stormwater quality and minimise wastewater. Additional information outlining how the WSUD objectives can be met through urban water management is provided in the following sections.

The overall aim of this document is to provide the relevant parties with the necessary detail to design a WSUD solution that meets the objectives of the City of Ryde's DCP 2014 - Part 8.2 *Stormwater and Floodplain Management* (herein referred to as, the "DCP").

2 PREPARATION OF A WSUD STRATEGY

The WSUD provisions within the DCP require that a WSUD Strategy be submitted for development applications lodged within City of Ryde, for the following development types:

- Development of land located in a mixed use business zone or industrial zone if the development is 1, 500sqm or greater. This will include residential flat buildings and mixed use developments.
- Development on land for SP2 Infrastructure e.g. schools , hospitals and other institutions
- Above ground parking areas accommodating more than 50 carspaces.
- Land subdivisions that result in 5 or more allotments.

A WSUD Strategy is a written report detailing potable water savings, stormwater quality controls and waterway stability management measures that are to be implemented on the site to meet the WSUD targets. The main elements of a Strategy are shown in Table 1. Table 1 provides detail on the information required as well as links to supporting information and key resources and tools available to assist in the preparation of the WSUD Strategy. Preparation of a WSUD Strategy will involve tasks including:

- Site assessment – both desktop and field assessment.
- Evaluation of site constraints and opportunities.
- Quantification of water conservation strategy.
- Computer modelling and concept design of stormwater quality, hydrology and waterway stability measures.
- Co-ordination with urban designers and landscape architects to integrate WSUD elements into the development master plan.

Table 1 identifies where further information is available in meeting the WSUD Targets identified in the DCP.

Table 1 – Contents of a WSUD Strategy (Tools and Resources)

Outline contents	Details	Key tools and resources
Background information	Summarise any background information available, including previous studies, concurrent studies.	
Constraints and opportunities Identify the key constraints and opportunities for water management on the site.	<ul style="list-style-type: none"> • Identify receiving environments. • Map general drainage patterns, natural water courses and flow paths on site, as well as the location of all points/areas of discharge from the site. • Identify riparian corridors and EEC's on site and liaise with the relevant government departments as required. 	<i>Section 3</i> <i>(Site Assessment)</i>
WSUD objectives Identify which WSUD objectives apply to the proposed development.	This section should demonstrate that all the objectives have been considered in determining which apply: <ul style="list-style-type: none"> • The appropriate set of water conservation targets should be selected according to the development type. • Stormwater quality objectives apply consistently in all cases. • Waterway stability targets 	<i>DCP</i>
Water conservation Demonstrate how the water conservation targets are met.	Plan for integrated water cycle management through the site by conducting a water balance. The water balance for the development should determine baseline potable mains water consumption and stormwater flows and seek to optimise the three urban water streams.	<i>Section 4.</i> <i>(Potable Water Conservation)</i>

Outline contents	Details	Key tools and resources
<p>Stormwater quality</p> <p>This section should demonstrate how the stormwater quality targets will be met. It should include stormwater quality modelling results and identify the location, size and configuration of stormwater treatment measures proposed for the development.</p>	<p>Establish a stormwater quality model for the development to predict expected stormwater quality pollutant loads generated from development and to develop a strategy to achieve Council's</p> <p>Stormwater Quality Targets. This section of the WSUD Strategy should include:</p> <ul style="list-style-type: none"> • Location, size and configuration of stormwater treatment elements to meet the targets. • Summary of MUSIC results demonstrating compliance with the targets • Details of MUSIC modelling of those elements, with the MUSIC parameters and assumptions outlined in an appendix to the WSUD Strategy. Parameters are required for rainfall (rain station, time step and years of rainfall), source nodes (catchment areas, impervious fractions, soil parameters and pollutant mean and standard deviation values), and treatment nodes (including k_c^* values for all pollutants and rationale for non standard pollutants). For treatment nodes the following parameters also need to be supplied: 	<p><i>Section 5</i></p> <p><i>(Initiatives for Stormwater Quality Control)</i></p> <p><i>MUSIC Modelling guidelines</i></p>
<p>Integration with the urban design</p> <p>The WSUD Strategy should outline how WSUD elements will integrate with other elements of the urban design.</p>	<p>This may include:</p> <ul style="list-style-type: none"> • Site plans (and cross-sections, where relevant) including WSUD elements • List of plant species to be used in vegetated stormwater treatment measures • Drawings to illustrate conceptual layout of WSUD elements within the context of other site features 	<p><i>Vegetation Selection Guide</i></p>
<p>Costs and Maintenance</p> <p>Prepare capital and operation and maintenance cost estimates of proposed water cycle management measures.</p>	<ul style="list-style-type: none"> • Both typical annual maintenance costs and corrective maintenance or renewal/adaptation costs should be included. • Develop a maintenance plan. 	

3 SITE ASSESSMENT

In the development of a WSUD Strategy it is necessary to undertake a site assessment. The site assessment is required to:

- Determine what site-specific objectives apply (e.g. the objectives for stream-forming flows depend on the presence and nature of streams downstream of the development)
- Provide information on physical constraints that will guide the concept and detailed design of
- WSUD measures such as stormwater treatment devices and storage systems.
- Site assessment will involve some fieldwork and desktop investigation. Important considerations to be addressed in a site assessment are outlined in Table 2 below.

Main considerations	Specific issues	Further information, potential additional investigations
Receiving waterways	<ul style="list-style-type: none"> • Streams requiring stream stability controls • Potential for stream rehabilitation 	Geomorphologist and ecologist input
Vegetation	<ul style="list-style-type: none"> • Endangered Ecological Communities • Weeds 	State Government and Council information
Existing development	<ul style="list-style-type: none"> • Previous development on the site to be retained or removed • Underground and overhead services • Evidence of impacts from existing development on receiving waterways 	Services search
Landform	<ul style="list-style-type: none"> • Catchments and drainage • Slope • Shallow bedrock • Proposed cut and fill 	Detailed survey
Soils and groundwater	<ul style="list-style-type: none"> • Soil permeability • Acid sulphate soils • Salinity • Shallow groundwater 	Geotechnical assessment

Table 2: Site assessment checklist

All stormwater treatment devices can be subject to site-specific constraints. Stormwater treatment devices should be first selected based on matching the pollutant removal capability of a device with target pollutants in the stormwater. The physical constraints of the site (e.g. slope, soils, groundwater, etc) then need to be incorporated into the design of the selected device.

Table 3 has been reproduced from the *WSUD Technical Design Guidelines for South East Queensland* (Moreton Bay Waterways and Catchments Partnership, 2006), summarising key physical constraints that may affect the use of specific WSUD measures. It provides a useful summary, however it needs to be supplemented by site-specific investigation and technical design information for a more complete feasibility assessment in each case.

WSUD Measure	Steep site	Shallow bedrock	Acid Sulfate Soils	Low permeability soil (eg. Clay)	High permeability soil (eg. sand)	High water table	High sediment input	Land availability
Swales and buffer strips	C	D	D	✓	✓	D	D	C
Bioretention Swales	C	C	C	✓	✓	C	D	C
Sedimentation basins	C	✓	✓	✓	✓	D	✓	C
Bioretention basins	C	D	D	✓	✓	C	C	C
Constructed wetlands	C	D	C	✓	D	D	D	C
Infiltration measures	C	C	C	C	✓	C	C	C
Sand filters	D	✓	✓	✓	✓	D	C	✓
Aquifer storage and recovery	C	C	C	C	✓	C	C	C

C – Constraint may preclude use; D – Constraint may be overcome through appropriate design;

✓ - Generally not a constraint

Table 3: Summary of physical constraints affecting WSUD measures

4 INITIATIVES FOR POTABLE WATER CONSERVATION

Potable water conservation contributes to reducing demand on water resources and wastewater discharges to the environment. To reduce the demand on potable water it is important to identify current sources and uses of potable water, and the quantity and potential reuse of wastewater generated.

Potable water conservation applies to all types and scales of development and the DCP includes the performance targets listed in Section 3.3.2 of the DCP (Part 8.2).

Approaches to conserve potable water include:

- Water efficient fittings and appliances
- Water efficient landscaping
- Rainwater tanks
- Potable water substitution with treated stormwater or recycled wastewater

These are discussed further in the following sections.

4.1 WATER EFFICIENT FITTINGS AND APPLIANCES

Within buildings, the key water conservation opportunity is the use of water-efficient fittings and appliances. The Water Efficiency Labelling and Standards Scheme (WELS, <http://www.waterrating.gov.au/>) provides a good guide to the availability and water use of fittings and appliances. Water efficient fittings and appliances include:

- Tap fittings
- Toilets and urinals
- Shower heads
- Washing machines and dishwashers

New fittings and appliances are labelled with their water star rating, making it easy to select fittings that meet the minimum star ratings set out in the DCP.

4.2 WATER EFFICIENT LANDSCAPING

Water efficient landscaping can assist in meeting BASIX water conservation targets in residential development, and is also applicable to commercial and industrial development and in public open space. Currently there are no accepted best practice guidelines for xeriscaping (landscaping for minimal water use) or urban irrigation; however it is known that irrigation water demands are affected by a large number of factors, and the following measures can be taken to reduce water demands:

- Locate and design landscaping for interception and retention of flows from runoff (passive irrigation)
- Use good quality, well-structured topsoils and increase depth of soil to increase water storage in soil
- Initially use deep mulch in landscaped areas to reduce evaporation from the soil and increase soil organic matter over time as plantings fill out
- Increase planting density (both single level and stacked plantings) to maximise soil shading in time
- Choose native (or other) species suitable to the climate and situation and prioritise deep rooted perennials
- Where turf is required, use warm season grasses and increase height at mowing

- Where deemed necessary, use subsurface or drip irrigation for more efficient water application and soil moisture sensors (can be electronic or manual assessment) for irrigation scheduling

Landscape and water features should be located and designed at initiation so that they are integrated into the water cycle of a site and are not dependent on potable water for irrigation or top-up.

A plant selection guide has been developed for the City of Ryde which is comprised mostly of Australian natives or naturalised species that are typical of the Sydney 'Turpentine Ironbark' Forest and more the Ryde LGA. Incorporating these plants into urban areas will add considerable biodiversity and ecological habitat value to urban areas of Ryde LGA. Vegetation in urban areas also serves several important functions such as: soil stabilisation, modulation of microclimates, filtration of particulate air pollution, water pollution filtration as well as providing faunal habitat, natural borders, and visual amenity.

4.3 RAINWATER TANKS

Rainwater is runoff from roofs, which can be captured and used without treatment for toilet flushing, irrigation, washing machines and hot water systems. Rainwater may also be used in cooling towers.

Rainwater tanks can be incorporated into building design so they do not impact on the aesthetics of a development or the surrounding environment. Tanks can be selected to suit heritage areas, be located underground and some newer, slim line designs utilise tanks as sections of fencing or walls. An example of a rainwater tank installation suitable for domestic uses, in commercial or (smaller) industrial settings is given in Figure 2.

4.3.1 Design Considerations

Tanks should be sized for the associated roof area, water demand and climate. Rainwater tanks are most effective when they are sized efficiently, that is- tank size is matched to demand and available runoff from the roof area. A desired level of reliability can be achieved with the selection of an appropriate sized tank.

Roof area and construction

The roof area available for rainwater harvesting is determined by the roof configuration and the number of downpipes connected to the rainwater tank.

Roofs constructed of cement or terracotta tiles, Colorbond®, galvanised steel, Zincolume®, fibrous cement, polycarbonate, fibreglass or slate should be suitable for the collection of rainwater for drinking water. Steel claddings should be free of corrosion. Lead flashing should be restricted to parts of the roof not used for drinking water.



Figure 2 - Rainwater tank in residential property

Water Demand

Average water demand in the 2006/07 period was ~237 kL/yea for single dwellings, ~1275 kL/year for commercial properties, ~1860 kL/yr for industrial properties, ~190 kL/yr for units/flats and ~1300 kL/yr for other property types (SoER 2007). Water metering and water bills from similar types of business can also provide an estimate of the water demand.

Even though average water consumptions per property are summarised above, the actual water demand for commercial and industrial developments in particular is considerably varied. For example, a warehouse with a roof area of 500m² may only have domestic water demands of 20 L/ day, however, a commercial laundry service with a similar roof area may have a water demand in the order of 200 kL/day.

Reliability of Potable Water Supply and Quality

All rainwater tanks should be fitted with 'first flush diverters'. These are simple mechanical devices that divert the first portion of runoff volume (that typically carries more debris and contaminants) away from the tank. After the first flush diversion, water passes directly into the tank.

Tanks can also be fitted with potable water top-up devices, to ensure there will always be some water in the tank, even in periods of no or little rainfall. This is important if rainwater is used for indoor demands such as toilet flushing. Potable water top-up is achieved by plumbing potable water into the tank with an air gap, having a float activated switch as well as ensuring no cross contamination can occur by using appropriate valves. Where there is potable water top-up, a backflow prevention device is required to prevent rainwater from entering the potable supply system.

Applications for rainwater

Collected roof runoff water is suitable for direct use for outdoor irrigation or toilet flushing with no additional treatment. Tank water can also be used in hot water systems, where a storage temperature of 60°C will effectively destroy most pathogens in a short amount of time. The relevant Australian Standard (AS/NZS 3500 Part 4.2) requires hot water to be stored at a minimum of 60°C and then mixed with cold water to be delivered at 50°C. Following these standards should ensure effective pathogen removal for hot water use. If pathogens are a particular concern, then additional chemical or UV disinfection can be used.

A typical set-up for a domestic application is given in Figure 3.

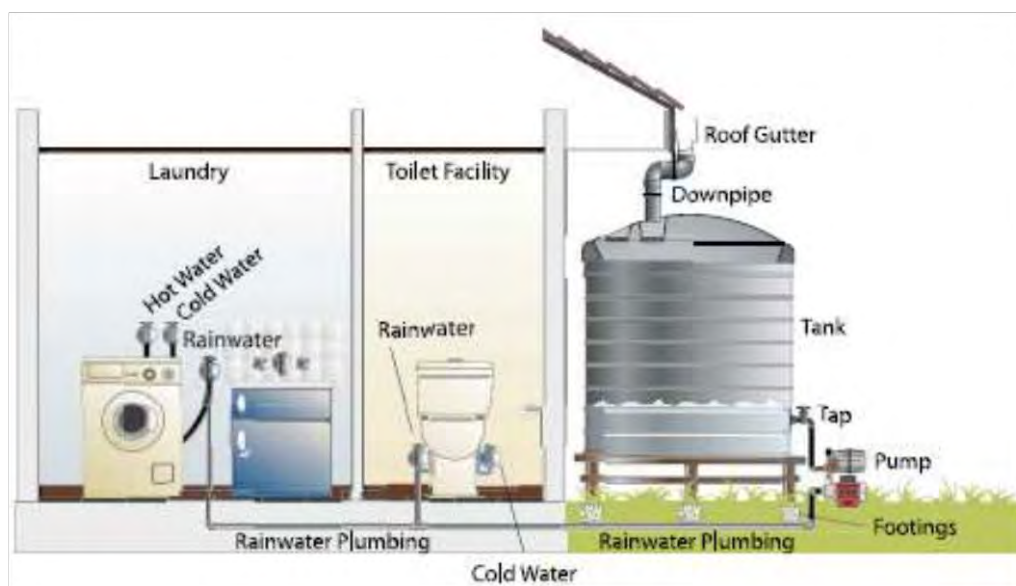


Figure 3: Typical configuration of a rainwater tank used to meet / supplement laundry and toilet water demands (ACT Government, 2006)

Installation

A licensed plumber is required to install the rainwater tank with all installations conforming to Australian standards (AS3500.1.2 Water Supply: Acceptable Solutions).

4.3.2 Sizing Curves

For residential development, the BASIX online tool allows a rainwater tank to be sized to meet the water conservation target. Sizing curves suitable for industrial and commercial developments within the Ryde LGA have been developed. The water demands modelled ranged from 25 L/day to 1500 L/day. The upper limit was selected based on a commercial building with a roof area of 3000 m², a net lettable area (NLA) of 16 500m² and a water demand of 1.01kL/ yr per NLA.

The rainwater tank sizing curve has been derived using Epping Chester Street daily rainfall in conjunction with daily evapotranspiration sourced from the Sydney Airport AMO weather station (refer to MUSIC Modelling Guidelines for more information). Stormwater quality parameters for storm flow conditions have been adjusted within MUSIC as per the NSW DECC recommendation (refer to MUSIC Modelling Guidelines for more information).

The sizing curves have been developed for a roof area of 100m². For roof areas outside this range, the roof area should be scaled to give a roof area of 100m² (for example, the scale factor for a 400m² roof area is 4). If the roof area needs to be scaled, the water demand must also be scaled. An appropriate tank size (to achieve a given demand efficiency) can be read from the sizing curves. The tank size is then multiplied by the scale factor to give the real tank size required. It should be noted that the optimal rainwater tank size does not attempt to meet 100% of demand, but should aim for the point of diminishing returns.

Figure 4 shows that an appropriate rainwater tank size in Ryde is approximately 1-2 kL for every 100 m² of roof that drains to the tank, regardless of the demand.

4.3.3 Maintenance

Rainwater tanks involve regular preventative maintenance in order to avoid the need for corrective action. Recommended maintenance includes:

- 6-monthly inspections of roof areas and gutters to ensure they are relatively free of leaves and debris.
- Vegetation and trees that overhang the roof may need to be pruned.
- First flush devices should be checked and cleaned out once every 3-6 months.
- Bypass screens at inlet and overflow points should be inspected each 6 months to check for fouling and clean them.
- Each 2-3 years, tanks should be checked for accumulation of sludge. Sludge may become a problem if it is deep enough to reach the level of the out take pipe and so produce discoloured or sediment-laden water, or when it affects storage capacity. When necessary, sludge can be removed by vacuum, by siphon, by suspending the sludge and washing it through, or by completely emptying the tank.
- If a pump system is used, the pump manufacturer should be consulted for advice on necessary maintenance.

4.3.4 Further Information

Information on modelling rainwater tanks in MUSIC is included in the MUSIC Modelling Guidelines.

The enHealth document “Guidance on Use of Rainwater Tanks” (Australian Government, 2004) provides information on health-related issues associated with rainwater tanks.

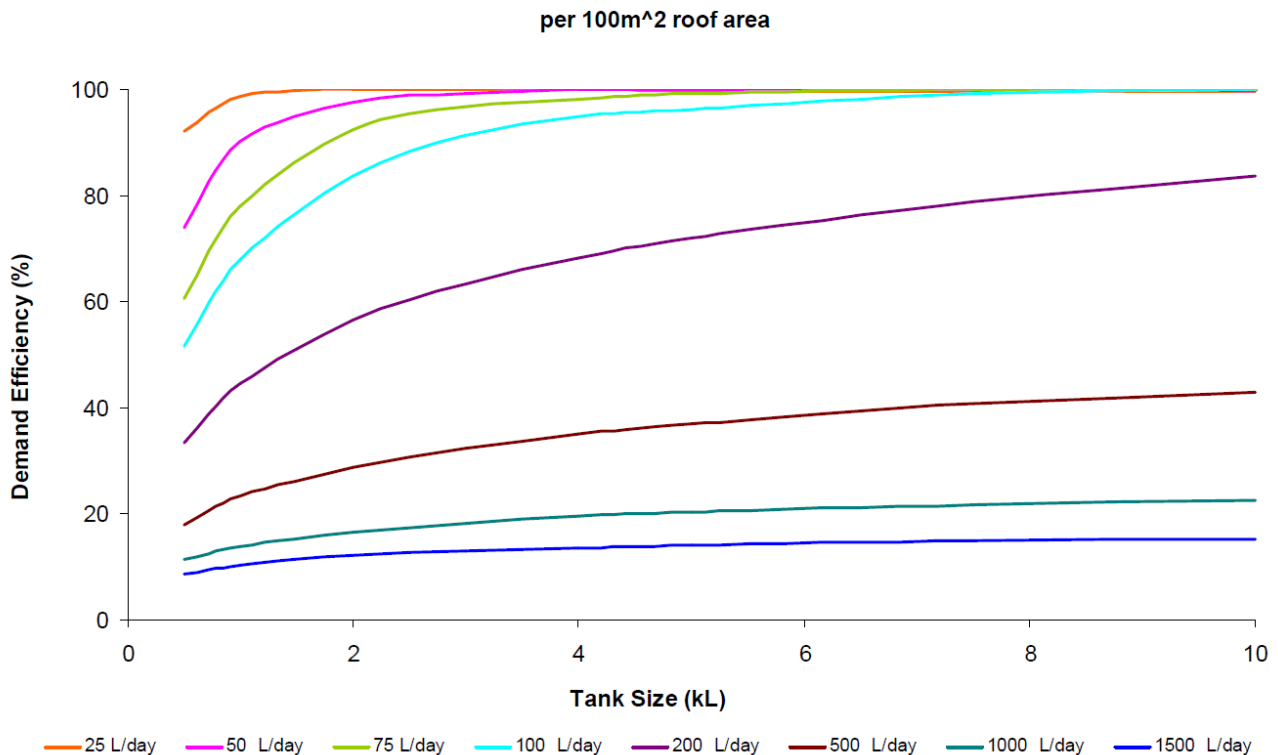


Figure 4: Rainwater tank Sizing Curves for the Ryde LGA.

4.4 STORMWATER HARVESTING AND WASTEWATER RECYCLING

Stormwater harvesting and wastewater recycling can be undertaken at a range of scales and the design of harvesting and reuse systems varies greatly depending on the scale of the project, the water source and the intended reuse. The following sections of this document provide some high-level guidance to assist in planning for a stormwater harvesting and/or wastewater reuse scheme.

In designing a stormwater harvesting or wastewater reuse scheme, some of the key considerations are:

- The source of water, including volumes, timing and proximity to reuse opportunities
- Matching supply with demand, and deciding how to make up any shortfall in dry periods.
- Stormwater can provide significant volumes of water for reuse, but supply is variable and a large storage is often required to meet demands in times of low rainfall.
- The source, type and concentration of contaminants including physical characteristics such as temperature
- Water quality requirements of the intended application.

- Possibility to meet multiple objectives; e.g. stormwater harvesting can achieve reduced stormwater quantity and improved stormwater quality discharging from the catchment.
- Space available for treatment and storage. Large above-ground storages may require special safety considerations, such as dam safety. Underground storage may be expensive and difficult to construct, depending on the soil conditions.
- Pumping requirements.
- Potential health risks from pathogens.
- Costs of stormwater harvesting/wastewater recycling, relative to other options.

4.4.1 Water Sources

Stormwater can be harvested from a pipe, culvert or open channel. Normally stormwater should be harvested from urban drainage systems. Where stormwater is harvested from a creek, impacts on geomorphology and aquatic habitat should be minimised. If stormwater is harvested from a river, a water access licence would be required.

Wastewater can be reused on an individual allotment (e.g. within an industrial site) or can be harvested from a sewer for treatment, distribution and reuse. Different types of wastewater have different quality and quantity characteristics. In general most wastewater is poorer quality than urban stormwater, but wastewater flows are more consistent, which can make it equally attractive as an alternative water supply.

4.4.2 Treatment Requirements

Water quality criteria for typical reuse applications are shown in Table 5 which has been reproduced from DEC (2006). In order to meet these criteria, wastewater and stormwater both need to be treated. General treatment requirements for different water sources are given in Table 6.

Level	Criteria ¹	Applications
Level 1	<i>E. coli</i> <1 cfu/100 mL Turbidity ≤ 2 NTU ² pH 6.5–8.5 1 mg/L Cl ₂ residual after 30 minutes or equivalent level of pathogen reduction	Reticulated non-potable residential uses (e.g. garden watering, toilet flushing, car washing)
Level 2	<i>E. coli</i> <10 cfu/100 mL Turbidity ≤ 2 NTU ² pH 6.5–8.5 1 mg/L Cl ₂ residual after 30 minutes or equivalent level of pathogen reduction	Spray or drip irrigation of open spaces, parks and sportsgrounds (no access controls) Industrial uses – dust suppression, construction site use (human exposure possible) Ornamental waterbodies (no access controls) Fire-fighting
Level 3	<i>E. coli</i> <1000 cfu/100 mL pH 6.5–8.5	Spray or drip irrigation (controlled access) or subsurface irrigation of open spaces, parks and sportsgrounds Industrial uses – dust suppression, construction site use, process water (no human exposure) Ornamental waterbodies (access controls)

¹ values are median for *E. coli*, 24-hour median for turbidity and 90th percentile for pH

² maximum is 5 NTU

Source: derived from NSW RWCC (1993), DEC (2004), ANZECC & ARMCANZ (2000)

Table 5: Water quality criteria for typical stormwater reuse applications

Water Type	Source	Quality	Treatment Required
Potable Mains Water	Reticulated (piped) water distribution	High Quality	None
Rainwater	From roof during rain, generally stored in rainwater tanks	Reasonable quality	Low. Sedimentation can occur inside rainwater tanks
Stormwater	Catchment runoff, including roads and pavements.	Moderate quality	Reasonable treatment needed to remove litter and reduce sediment and nutrient backlog.

"Light" Grey water	Catchment runoff, Including impervious areas like roads and pavements	Moderate quality	Moderate treatment required to reduce pathogens and organic content.
Grey water	"Light greywater", plus laundry water, including basin and washing machine.	Low quality – high organic loading and highly variable depending on how it was used.	High level of treatment required to reduce pathogens and organic content
Black water	Greywater, plus kitchen, and toilet water. Can also be sourced from sewers	Lowest quality wastewater – high levels of pathogens and organics	Advanced treatment and disinfection required

Table 6 – Summary of water quality in the urban water cycle.

Wastewater treatment is generally provided by specialist suppliers of wastewater treatment solutions. Landcom's "Wastewater reuse in the Urban Environment: selection of technologies" report (February 2006) provides guidance as to appropriate treatment systems for projects of different scales.

Stormwater can be treated for reuse using the same kind of treatment measures as outlined in Section 5. Depending on the reuse application, disinfection may also be required. Stormwater treatment for storage and reuse should aim to remove gross pollutants and suspended solids as a minimum, so that these do not accumulate in the storage or interfere with the operation of pumps and the stormwater distribution system. Where stormwater is to be stored above-ground, nutrient removal would also be important to minimise the risk of eutrophication and algal growth. Depending on the application for treated stormwater, it may also be necessary to remove other pollutants such as salts, heavy metals and pesticides. Generally, where there is a possibility of public contact with treated stormwater (for example, in a sprinkler irrigation system at a sports field), disinfection is required. Disinfection may be undertaken by chlorination, ozone or UV.

The quality of water and pollutants generated from an industrial process vary between industries. For example, the wastewater generated from a warehouse will be similar to that of a commercial / office application, while wastewater collected from a mechanic could be contaminated with oils, greases and PAHs (polyaromatic hydrocarbons). Generally, most harvesting opportunities in an industrial setting will be from industrial processes, cooling systems and firewater.

4.4.3 Storage

Water balance modelling should be used to size an appropriate storage for reuse, based on supply and demand characteristics.

The sizing curves for rainwater tanks can be used to make an initial estimate of a suitable stormwater storage volume – the roof area should be substituted with the impervious catchment area. However this may give an optimistic estimate of the reliability, as usually only treated stormwater is directed to the stormwater storage. In general, untreated flows should bypass the storage system to achieve the best possible reuse water quality.

As for rainwater harvesting, stormwater harvesting is better able to meet demands that are spread evenly throughout the year, rather than irrigation demands which are seasonally dependent.

Storage facilities can take the form of underground tanks or natural ponds above ground (Figure 5).



Figure 5: Stormwater storage being installed at the South Australian Museum (left), and stormwater harvesting pond at Barra Brui oval, St Ives (right).

4.4.4 Reuse Options

A matrix of water sources and potential reuse opportunities is given in Table 7. The table has been adapted from the *Australian guidelines on water reuse* (2006) and the BASIX assessment tool.

Source	Reuse Options							
	Garden and Lawn	All toilets	Laundry	All hot water	Cold water in showers, baths, hand basins, etc	Cooling towers	Ornamental water features	Public open space ¹
Potable	✓	✓	✓	✓	✓	✓	✓	✓
Rainwater	✓	✓	✓	✓		✓	✓	✓
Treated stormwater	✓	✓	✓			✓	✓	✓
Treated greywater ²	✓	✓	✓					✓
Untreated greywater ³	✓							
Reticulated recycled water	✓	✓	✓			✓	✓	✓

Note 1: Water uses in public open space may include irrigation and street cleaning.

Note 2: Advanced treatment of greywater is required before reuse in toilet flushing, laundry and surface irrigation. Treatment needs to include filtration and disinfection.

Note 3: Untreated greywater can be used for subsurface irrigation; further guidance is given by DEUS (2007)

Table 7 – Water reuse applications in commercial and residential development.

Table 7 does not include industrial reuse applications. Indicative reuse applications for industrial water reuse are not easily definable. Industrial uses generally include cooling water, process water, washdown water and supplementary emergency water supply. Industry-based water quality guidelines will need to be consulted.

4.4.5 Risk Management

Potable water substitution with stormwater or wastewater needs to consider public health as a key design requirement. A preventative risk management process is recommended (NRMMC 2006) to ensure that alternative water sources do not pose a health risk. The draft guidelines for water recycling advocate a risk management framework in assessing a reuse water scheme. The risk management framework is effective in:

- Identifying the source of hazards (for example, sewer overflow)
- Identifying the people at risk from the hazard and how they would be exposed
- Identifying the health effects resulting from the hazard
- Identifying measures that prevent the hazard from occurring (for example, first flush systems on rainwater tanks)
- Identifying appropriate indicators of unsatisfactory water
- Linking the hazards and preventative measures into a management procedure.

The preventative management procedure should outline an adequate:

- Water quality monitoring program and
- Maintenance procedure to ensure critical control points are operating effectively and the likelihood of them failing due to neglect is low.
-

4.4.6 Further Information

Information on modelling stormwater harvesting, storage and reuse systems is included in the MUSIC Modelling Guidance document.

The NSW Department of Environment and Climate Change has published Managing Urban Stormwater: Harvesting and Reuse (2006), which includes useful details on statutory considerations and health and environmental risks related to stormwater harvesting, as well as planning, design and operation considerations. The document also presents several case studies of successful stormwater harvesting projects in NSW.

NSW Department of Energy, Utilities and Sustainability (DEUS) 2007 NSW Guidelines for Greywater Reuse in Sewered, Single Household Residential Premises.

Landcom (2006) "Wastewater reuse in the Urban Environment: selection of technologies" prepared by Ecological Engineering, February 2006.

Sydney Water has published Best Practice Guidelines for cooling towers. These are available online:

<http://www.sydneywater.com.au/Publications/FactSheets/SavingWaterBestPracticeGuidelinesCoolingTowers.pdf>

5 INITIATIVES FOR STORMWATER QUALITY MANAGEMENT

Stormwater is runoff from ground surfaces such as roads, carpark and pedestrian areas and can contain gross pollutants, sediments, nutrients, heavy metals, hydrocarbons and faecal contamination. Development of a WSUD strategy must meet the stormwater quality objectives set in the DCP. The stormwater quality objectives are given in terms of annual gross pollutants, TSS, TP and TN load reductions of 90%, 85%, 65% and 45%, respectively.

No single treatment measure can effectively treat this full range of pollutants. In practice, the application of WSUD for stormwater treatment rarely involves a single type of treatment device and generally a 'treatment train' is proposed. A treatment train is a series of treatment measures that collectively address a range of stormwater pollutants. This is intended to balance the need to meet relevant treatment objectives with the flexibility required for WSUD to be feasible across a wide variety of sites.

The particle size of stormwater pollutants varies from gross solids, litter, coarse to medium size particulates (fine litter, sediment and suspended solids) to fine colloidal and dissolved particulates (soluble nutrients, metals etc). The variation of type and particle size distribution of stormwater pollutants is shown in Figure 6. Coarser pollutants generally require removal early in the treatment train, so that the operation of treatment elements targeting finer pollutants is optimised.

Particle classification and size (µm)	Common stormwater pollutant types				
	Visual	Sediment	Organics	Nutrients	Metals
Gross solids >5000 µm	Litter	Gravel	Plant debris		
Coarse to medium 5000 – 125 µm					
Fine particulates 125 – 10 µm		Silt		Particulate	Particulate
Very fine/colloidal 10 – 0.45 µm	Turbidity		Natural & anthropogenic materials		Colloidal
Dissolved particulates <0.45 µm				Soluble	

Figure 6 – Size range of typical stormwater pollutants (after Ecological Engineering 2003)

Figure 7 shows which pollutants are targeted by different types of stormwater treatment measures. The treatment systems discussed in this guide are GPTs (Gross Pollutant Traps), grass swales and buffer strips, bioretention systems and wetlands. These systems have been selected as they are effective in removing the target pollutants (gross pollutants, TSS, TP and TN).

Planning and design of stormwater treatment elements needs to consider site conditions including:

- The nature of the proposed development
- Natural assets to be preserved on site
- Physical infrastructure existing on the site
- Landscape attributes of the site
- Topography, geology, soils and groundwater
- Ecology of the site and receiving environments
- Catchment areas and impervious areas
- The distribution of treatment systems throughout a catchment.

Particle classification and size (μm)	Treatment Measures				
	Gross pollutant traps	Sediment basins (wet and dry)	Grass swales and buffer strips	Wetlands	Filtration systems (e.g. bioretention)
Gross solids >5000 μm					
Coarse to medium 5000 – 125 μm					
Fine particulates 125 – 10 μm					
Very fine/colloidal 10 – 0.45 μm					
Dissolved particulates <0.45 μm					

Figure 7: Treatment options for different size ranges (after Ecological Engineering 2003)

Design of WSUD elements needs to consider the full range of conditions under which WSUD elements must operate. The performance of an urban stormwater quality improvement strategy is measured through the impact of a continuous period of typical climatic conditions. Computer modelling with software packages such as MUSIC is used to predict system performance in terms of mean annual pollutant loads captured and to assess the most effective design specifications. The following sections provide information useful at the device selection and preliminary sizing stage, including:

- The purpose of each element and how it works
- Where it would be most appropriately located in the urban landscape
- Important design considerations, including soil and vegetation selection for vegetated stormwater treatment measures. The design considerations point to the advantages and disadvantages, benefits and risks of each WSUD element
- Basic sizing curves for stormwater quality treatment devices. Sizing curves can provide a useful first estimate of treatment measure performance before detailed modelling is undertaken. Detailed modelling will be necessary on all projects to predict treatment performance more reliably. The sizing curves can then also be used to check that model results are within the expected range.
- Maintenance requirements
- References to more detailed information are provided where relevant.

MUSIC modelling is required to demonstrate compliance with the load-based targets for TSS, TP and TN.

5.1 GROSS POLLUTANT TRAPS

Gross pollutants include litter, leaves and other vegetative matter. Many gross pollutant traps (GPTs) will also capture significant loads of coarse suspended solids.

5.1.1 Location

Gross pollutant traps (GPTs) are often the first treatment measure in a treatment train, for example they can be used upstream of wetlands and other water bodies to protect them from gross pollutants. Gross pollutant capture efficiency varies between different types of GPTs, as does coarse sediment removal. Most GPTs cannot remove fine sediments, nutrients or other pollutants to any significant degree. GPTs are available in a range of different types and sizes, suitable for a wide range of applications. Figure 8 shows a range of GPTs.

5.1.2 Design Considerations

Key design considerations include:

- The size of the catchment to be treated, and the flow rate that must pass through the GPT. GPTs are normally sized to treat the 3-month to 1-year ARI flow.
- The type of waterway on which the GPT is to be installed (pipe/culvert/open channel).
- Pollutant types and loads in the catchment – for example, commercial areas are likely to generate higher loads of litter than residential areas.
- Target pollutants. For example as pre-treatment to a wetland, it is important to remove coarse sediments. However at other locations, it may be undesirable to trap sediment, in case it reduces natural sediment deposition downstream.
- The GPT's efficiency in trapping pollutants will affect the frequency and magnitude of cleanouts, and the volume of waste material that must be disposed of.
- Some GPTs store captured pollutants in a drained state, while others hold them in stagnant water.
- Anaerobic conditions in wet sumps can lead to odours, and wet pollutants may be more difficult to clean out than dry pollutants.
- Access and equipment requirements for cleanouts. Small pit insert GPTs may be cleaned out by hand, while larger GPTs may require a bobcat, excavator or crane to remove the pollutants and/or basket.
- Upstream flooding. GPT designs should ensure that there is no risk of increased flooding upstream of the GPT.
- Costs. It is important to consider the life cycle costs of GPTs, as operation and maintenance costs over the lifetime of a GPT can far outweigh the design and installation costs.

5.1.3 Maintenance

Regular maintenance is essential to ensure the performance of GPTs. Normally cleanouts are required around once every 3 months, however each trap should be monitored during the first few years of operation to determine the required cleanout frequency. Poorly maintained GPTs can:

- Fail to trap pollutants.
- Release contaminants by leaching from the collected pollutants.
- Reduce the capacity of the drainage system and potentially lead to upstream flooding.
- Lead to unpleasant odours and reduced visual amenity.
- The nature of maintenance activities depends to a large extent on the type of trap installed; this should be considered during the design stage. GPT suppliers can provide information on maintenance methods.

- Development integrating such systems will warrant a Positive Covenant to be registered on the title of the property, to ensure future owners/ occupants are aware of the system and maintenance requirements.

5.1.4 Further Information

Information on modelling GPTs in MUSIC is included in the MUSIC Modelling Guidance document. There are several different manufacturers of GPTs in Australia and each of them can provide detailed information on their products. Manufacturers include Baramy, Ecosol, Nettech, Rocla, and others.



Figure 8: Typical range of gross pollutant traps

5.2 VEGETATED SWALES AND BUFFER STRIPS

Vegetated swales are both a stormwater conveyance and treatment mechanism. They are effective for removal of suspended solids, particularly coarse sediments, and will also reduce some phosphorus and nitrogen loads. A typical swale configuration is shown in Figure 9.

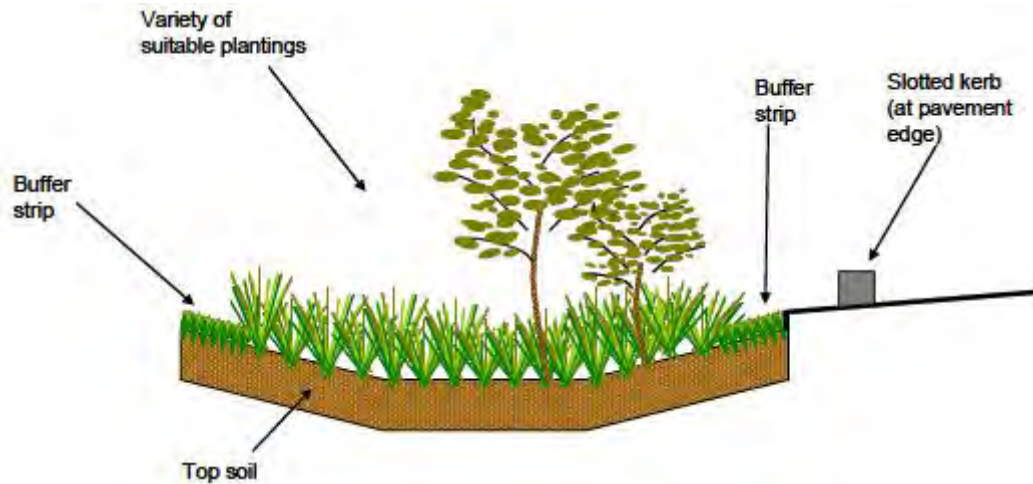


Figure 9 – Typical swale arrangement.

5.2.1 Location

Vegetated swales can be used instead of pipes to convey stormwater and provide a 'buffer' between the receiving water and the impervious areas of a catchment. They can be integrated with landscape features in parks and gardens as well as incorporated in street designs, adding to the aesthetic character of an area.

Buffer strips are intended to slow and filter flow from impervious surfaces to the drainage system. The key to their operation, like swales, is an even shallow flow over a wide vegetated area. The vegetation facilitates an even distribution and slowing of flow thus encouraging pollutant settling as well as incorporating some of the nutrients. Buffers are commonly used as a pre-treatment for other stormwater measures. They may be located at the edge of a road, carpark or pedestrian area. Buffer strips are also often incorporated on the outer edges of a swale, as in Figure 10.



Figure 10: Typical swale and buffer strip configuration

5.2.2 Design considerations

Swales are normally sized to convey low flows, for example the 3 month ARI peak flow, however they can also be sized for conveyance of higher flows where required. Typical widths range from 0.1 to 2.0 m at the base and side slopes are normally 1 in 3 to 1 in 6. Swales operate best with slopes from 2% to 4%. Slopes milder than this can tend to become waterlogged and have stagnant ponding, although the use of underdrains can alleviate this problem. For slopes steeper than 4%, check banks along swales, dense vegetation and/or drop structures can help to distribute flows evenly across the swales as well as slow velocities. Driveway crossovers can provide an opportunity for check dams (to provide temporary ponding) or can be constructed at grade and act like a ford during high flows (see Figure 11).

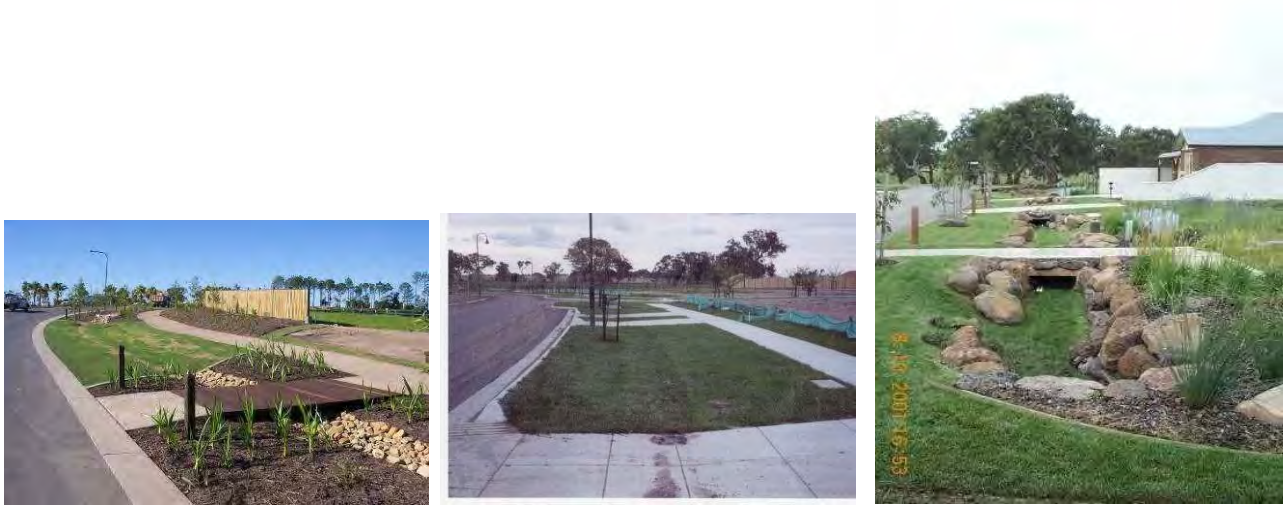


Figure 11 - Examples of different types of swale crossings

Buffer strips should be set down from the paved surface to account for sediment accumulation and plant growth over time (see Figure 12). Generally between 40 and 50 mm set down from the paved surface will be adequate with a pavement surface that is tapered down towards the buffer strip (as illustrated in the diagram below).

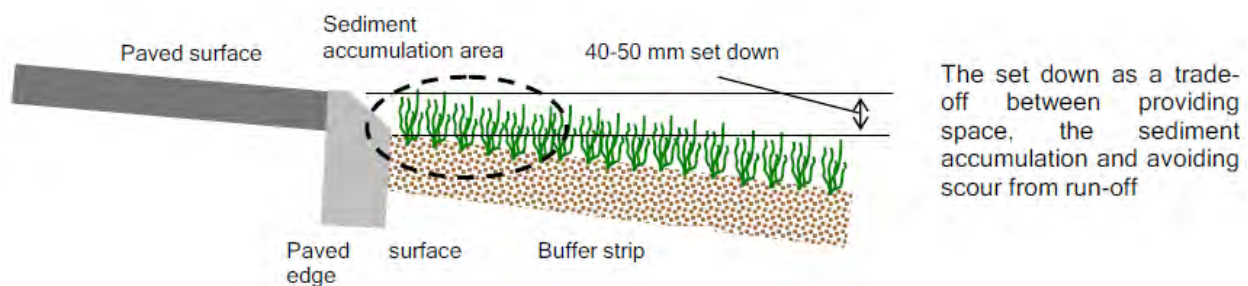


Figure 12: Typical buffer strip arrangement

Vegetation should cover the whole width of the swale, be capable of withstanding design flows and be of sufficient density to provide good filtration. It should also be selected to be compatible with the landscape of the area and maintenance capabilities. For best performance, vegetation height should be above the water level for the design flow.

Edge treatment should prevent vehicular access to roadside swales, and allow flows into the swale. Some examples of different arrangements for delivering water to a swale while restricting vehicular access are shown in Figure 13.



Figure 13: Different arrangements for delivering water to a swale and preventing vehicular access

5.2.3 Soil and vegetation

Swales should include enough good quality topsoil to support the chosen vegetation. The topsoil depth depends on the vegetation to be planted in the swale.

Vegetation in swales is important to ensure the pollution reduction performance of the system. The planting densities should be high to provide maximum contact with stormwater (6 to 10 plants per square meter, depending on the species mix). A range of species has been selected according to their hydrologic requirements, drought tolerance and growth form. A detailed species list is presented in Section 6 (VEGETATION).

5.2.4 Sizing

A sizing curve for swales is shown in Figure 14 and variations in performance are plotted for different catchment impervious fractions according to their length per unit area. The sizing curves assume that the swale has set dimensions and other parameters, equal to:

- Longitudinal slope = 3%.
- Base width = 1 m.
- Side slopes = 1 in 4.
- Vegetation height = 0.4 m.

The sizing curves show that swales are not suitable at meeting the pollutant load reduction targets on their own. Swales are most effective at suspended solids removal and for this reason are useful as a pre- treatment measure upstream of devices such as bioretention systems and wetlands.

5.2.5 Maintenance

Maintenance is typical of open landscaped gardens, with vegetative growth the key objective. This is because the vegetation in swales provides the majority of the pollutant removal- making it a key maintenance objective. Typical maintenance requirements, the swales include:

- Monitoring for scour and erosion, and sediment or litter build-up
- Weed removal and plant re-establishment
- Monitoring overflow pits for structural integrity and blockage

5.2.6 Further Information

Section 6 (VEGETATION) details appropriate vegetation types both for swales as well as the local flora of the Ryde LGA.

For more information on swales and buffer strips refer to the Western Sydney Technical Guidelines (UPRCT 2004) or “Managing Urban Stormwater: Treatment Techniques” (DECC 2007).

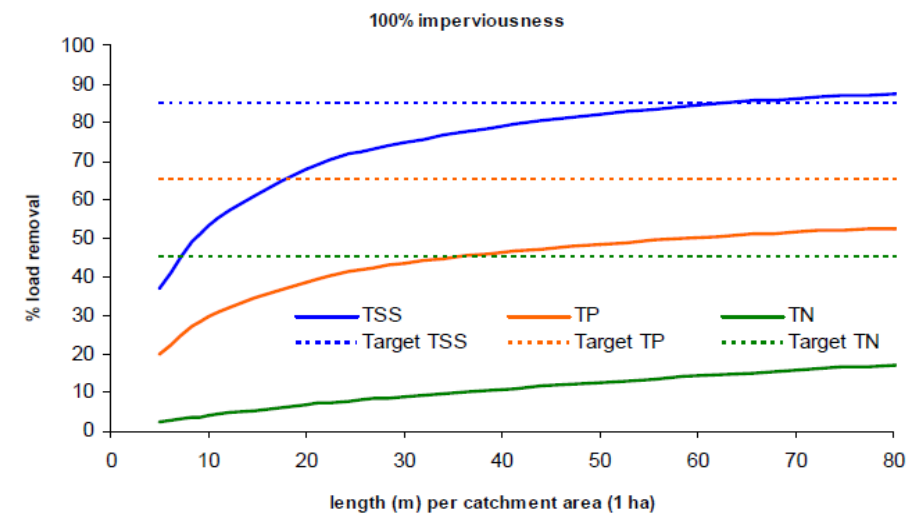
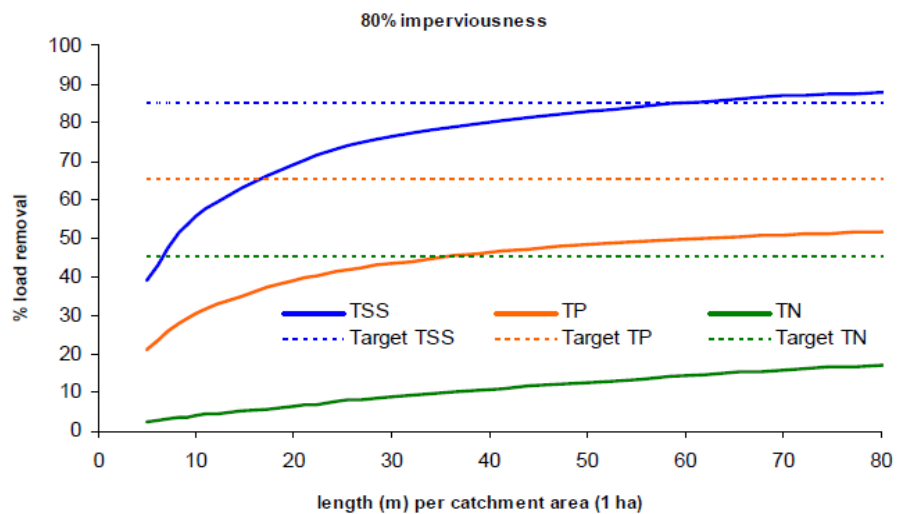
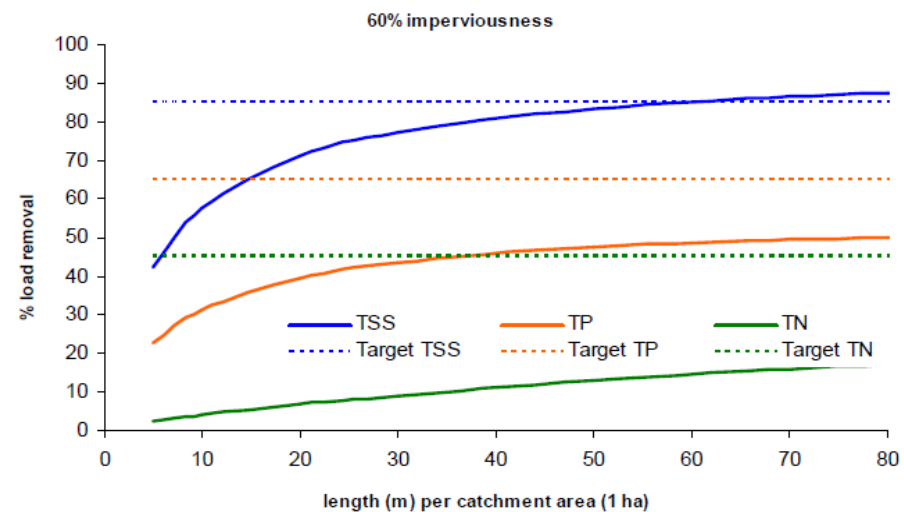
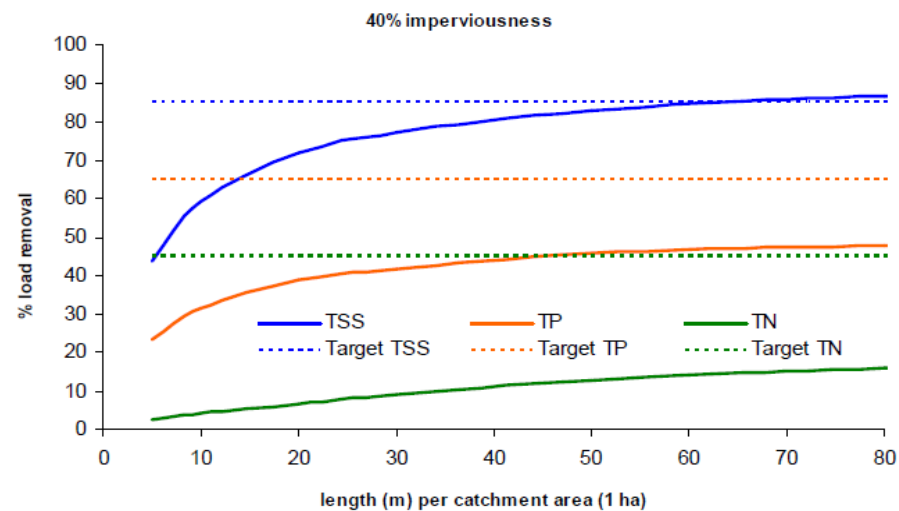


Figure 14: Sizing curves for swales in Ryde LGA.

5.3 BIORETENTION SYSTEMS

Bioretention systems are vegetated soil media filters, which treat stormwater by allowing it to pond on the vegetated surface, then slowly infiltrate through the soil media. Treated water is captured at the base of the system and discharged via outlet pipes. A typical bioretention system is shown in Figure 15.

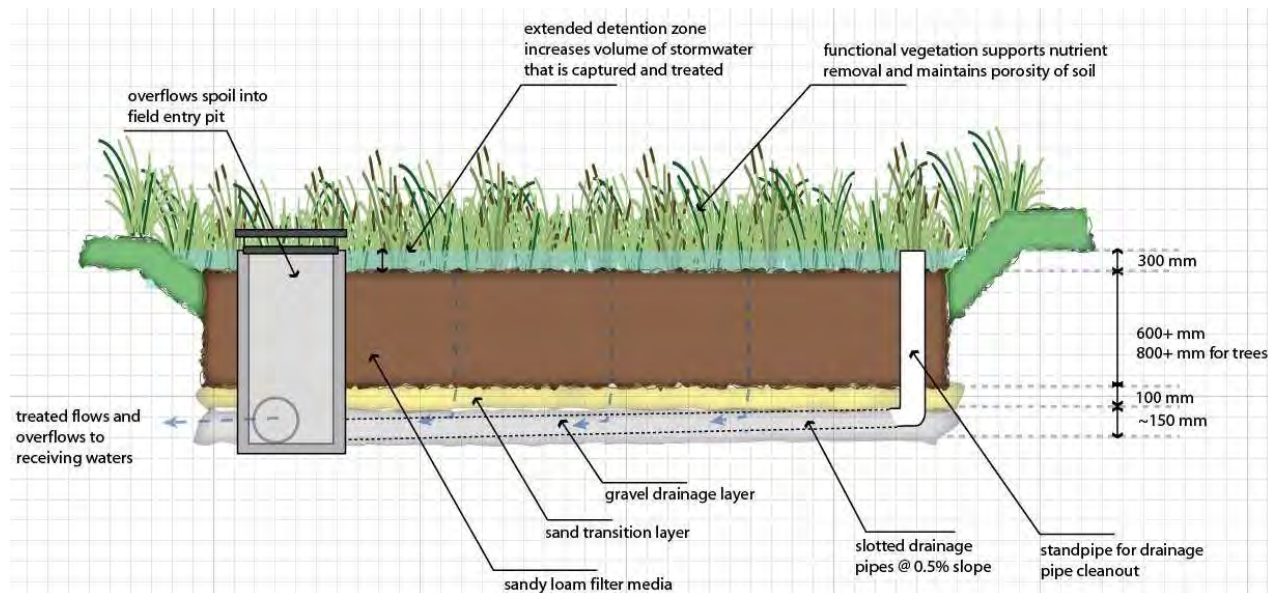


Figure 15: Bioretention system typical arrangement

5.3.1 Location

Bioretention systems can be implemented in several sizes/shapes in many different locations. For example, in planter boxes, parks or in streetscapes integrated with traffic calming measures. It is important to have sufficient depth (normally at least 0.8 m) between the inlet and outlet, therefore they may not be suitable at sites with shallow bedrock or other depth constraints, however they are otherwise a very flexible and effective treatment measure for dissolved nutrients.

5.3.2 Design considerations

In bioretention systems stormwater runoff is filtered through a vegetated soil media layer and is then collected via perforated pipes and routed to downstream waterways or storages for reuse. Temporary ponding above the soil media provides additional treatment. Bioretention systems are not intended for exfiltration and discharge to groundwater. Vegetation that grows in the filter media enhances its function by preventing erosion of the filter medium, continuously breaking up the soil through plant growth to prevent clogging of the system and providing biofilms on plant roots that pollutants can adsorb to.

Selection of an appropriate filtration media is a key issue that involves a trade-off between providing sufficiently high hydraulic conductivity to treat as much stormwater as possible, while retaining sufficient water to support vegetation growth. A sandy loam or fine sand is suitable, with a hydraulic conductivity of 50-180 mm/hr. Typically flood flows bypass the device thereby preventing high flow velocities that can dislodge collected pollutants or scour vegetation.



Figure 16 - Examples of bioretention systems in planter boxes, in the streetscape, and in parks

Bioretention systems must be protected from clogging by pretreating stormwater to remove coarse to medium sediments. Pre-treatment by sedimentation basin or swale is appropriate prior to directing stormwater to a bioretention system. A sediment forebay can also be included at the inlet to the bioretention system. If the filter media clogs, it will need to be replaced.

Streettrees

Street tree bioretention systems are small systems that are incorporated at street tree locations. These systems can be integrated into high-density urban environments and can take on a variety of forms. The filter media should be at least 0.8 m deep to allow for root growth of the tree, therefore substantial depth is required between the inlet and outlet. Some examples of street tree bioretention systems are shown in Figure 17.

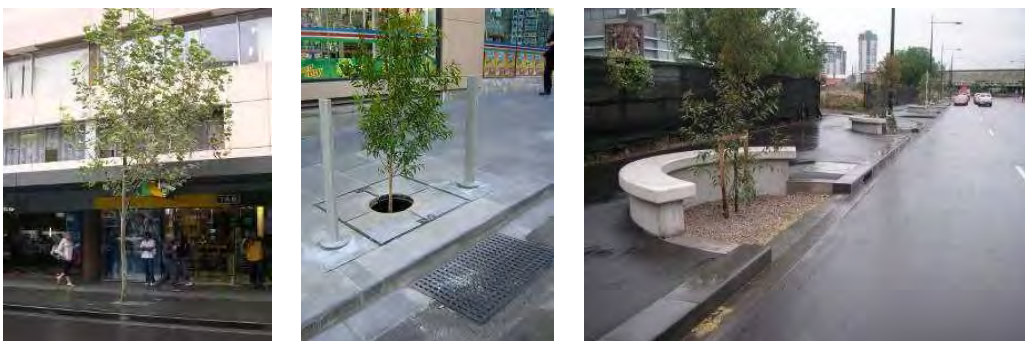


Figure 17 - Example street tree bioretention systems

Raingardens

Raingardens can be incorporated in a range of locations, as they can be any shape and size. They are essentially bioretention systems however tend to incorporate a greater number of plant species. Typical locations include pocket parks, traffic calming measures and between parking bays. Examples of raingardens are given in Figure 18.



Figure 18: Examples of bioretention raingardens

Bio retention Swales

Swale bioretention systems provide both stormwater treatment and conveyance functions. A bioretention system is installed in the base of a swale. The swale component provides stormwater pre-treatment to remove coarse to medium sediments while the bioretention system removes finer particulates and dissolved pollutants. A bioretention system can be installed in part of a swale, or along the full length of a swale, depending on treatment requirements. Typically, these systems should be installed with slopes of between 1 and 4 %. In steeper areas, check dams are required to reduce flow velocities. For milder slopes, it is important to ensure adequate drainage is provided to avoid nuisance ponding (a bioretention system along the full length of the swale will provide this drainage). Runoff can be directed into conveyance bioretention systems either through direct surface runoff (eg. with flush kerbs) or from an outlet of a pipe system. Figure 19 shows some examples of bioretention swales.



Figure 19: Example bioretention swales

5.3.3 Soil and vegetation

Soil for a bioretention system needs to be highly permeable and free-draining. Normally sandy loam is recommended with a saturated hydraulic conductivity in the range of 80-300 mm/hr. Some organic matter is beneficial; however labile organic carbon content should be kept to a low percentage to avoid leaching nutrients from the system. Amendments such as activated charcoal (biochar/agrichar etc) can be used as a substitute for organic matter in these soils as it is highly resistant to degradation whilst conferring growth benefits.

A detailed soil specification for bioretention systems is available from the Facility for Advancing Water Biofiltration (FAWB) at Monash University: <http://www.monash.edu.au/fawb>. Only soils that meet this specification should be used for these systems.

Plants used in bioretention should be suited to sandy, free-draining soils, and tolerant of drought. Bioretention systems should be planted densely to maximise the biological processing of nutrients. Planting can incorporate several growth forms – shrubs, tufted plants and groundcover species, to ensure that the plant roots occupy all parts of the media. Using several species reduces the risk that insect attack, disease or adverse weather will harm all of the plants at once creating a more robust treatment system. A detailed species list is presented in Section 6 (VEGETATION). The final compilation of species needs to be determined by Council so as to be consistent with the landscaping of the area.

5.3.4 Sizing

Sizing curves for bioretention systems are shown in Figure 19. Variations in performance are plotted for differing catchment imperviousness values and assume that the bioretention systems have a filter depth of

0.5 m, a sandy-loam filter material (saturated hydraulic conductivity of 100mm/hr), extended detention of 0.2 m and an average particle size of 0.45 mm.

5.3.5 Maintenance

Bio retention systems require regular maintenance, similar to swales.

Maintenance requirements of Bioretention systems include:

- Monitoring for scour and erosion, and sediment or litter build-up
- Weed removal and plant re-establishment
- Monitoring overflow pits for structural integrity and blockage

5.3.6 Further Information

Section 6 (VEGETATION) details appropriate vegetation types both for bioretention systems as well as the local flora of the Ryde LGA.

For more detailed information on bioretention systems refer to the Western Sydney Technical Guidelines (UPRCT

2004) or “Managing Urban Stormwater: Treatment Techniques” (DECC 2007).

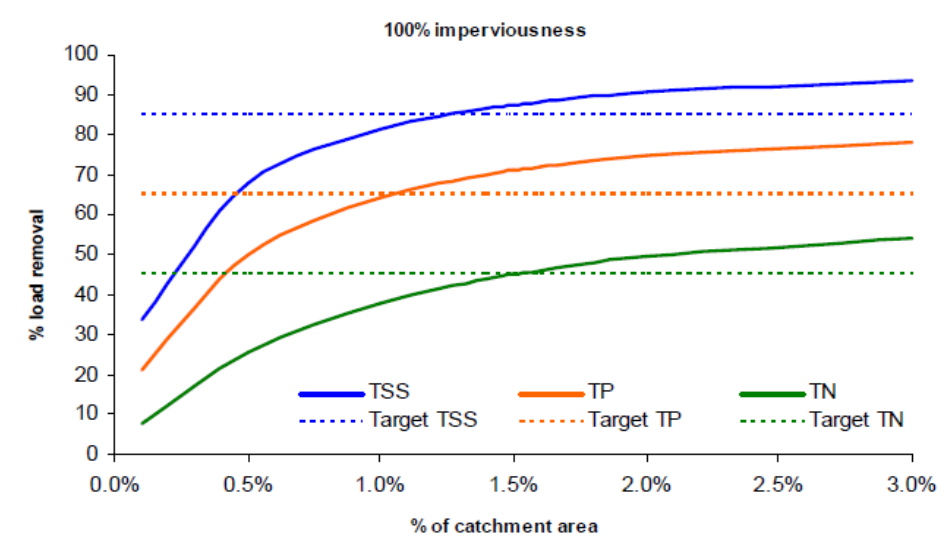
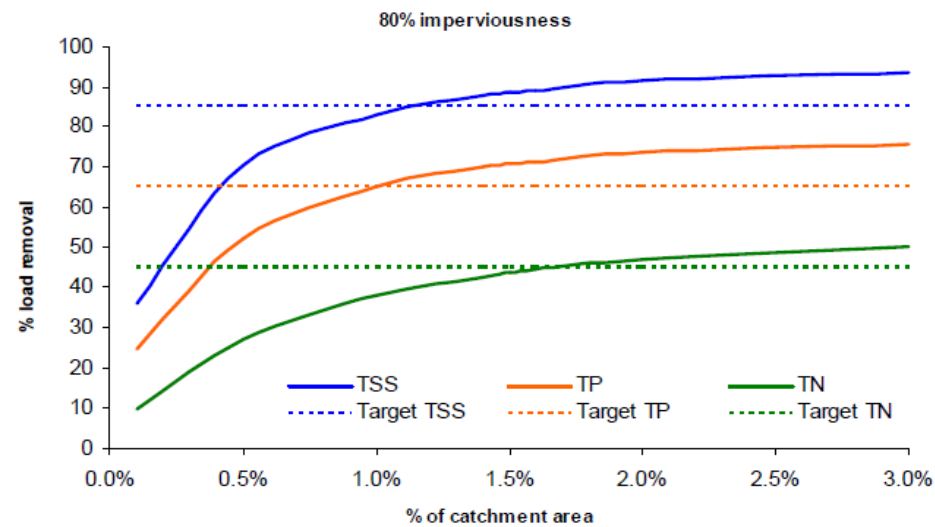
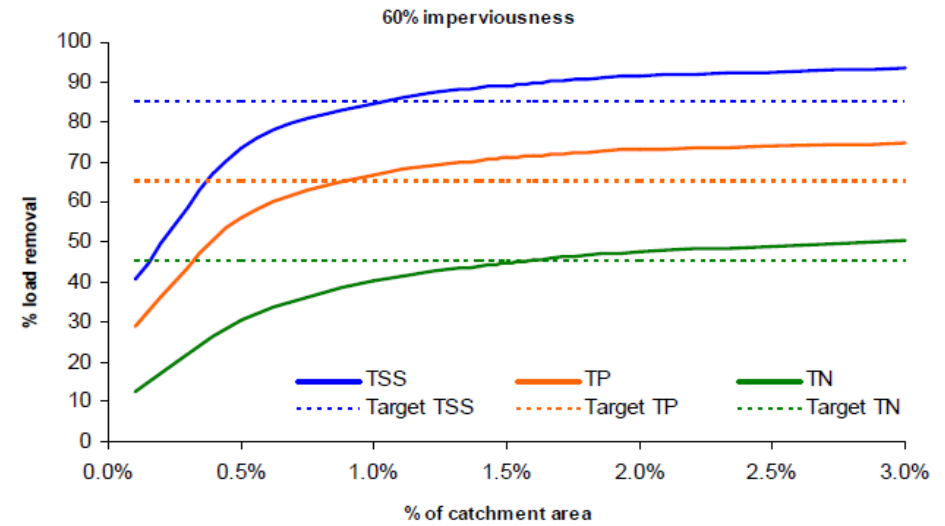
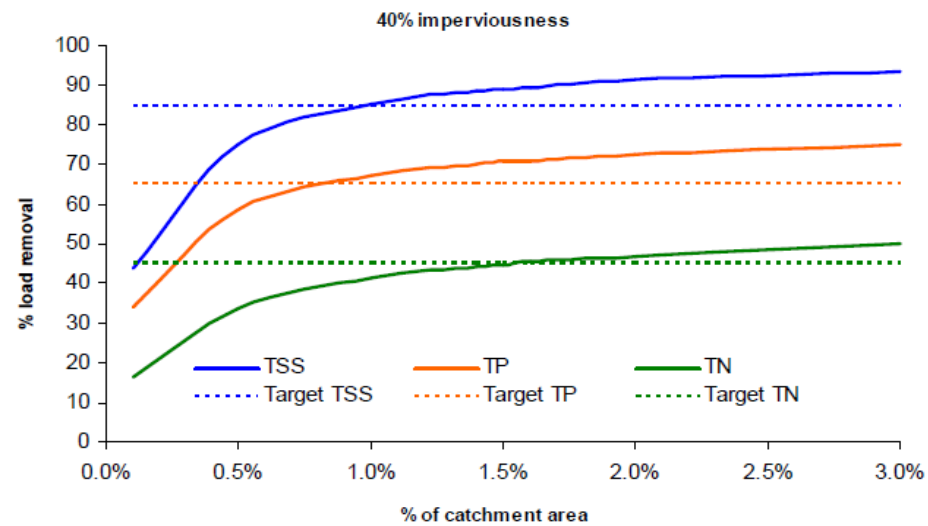


Figure 20 – Sizing curves for biorention elements in the City of Ryde LGA.

5.4 WETLANDS

Constructed surface flow wetland systems use enhanced sedimentation, fine filtration and biological uptake processes to remove pollutants from stormwater. They generally consist of:

- An inlet zone (essentially a sediment basin)
- A macrophyte zone (a shallow heavily vegetated area to remove fine particulates and take up soluble pollutants), and
- A high-flow bypass channel (to protect the macrophyte zone).

Wetland systems can also incorporate open water areas. Wetland processes are engaged by slowly passing runoff through heavily vegetated areas where plants filter sediments and pollutants from the water. Biofilms that grow on the plants absorb nutrients and other associated contaminants. While wetlands can play an important role in stormwater treatment, they can also have significant community benefits. They provide habitat for wildlife and a focus for recreation, such as walking paths and resting areas. They can also improve the aesthetics of new developments and can be a central landscape feature.

5.4.1 Location

Wetland systems can be combined with flood protection measures when incorporated into retarding basins. An open water body or pond at the downstream end of a wetland can provide water storage for reuse purposes, such as irrigation. Wetlands can be constructed on many scales, from small devices to large regional systems. In highly urban areas they can have a hard-edged form and be part of a streetscape or building forecourt. In regional settings they can be over 10 hectares in size and provide significant habitat for wildlife.



Figure 21 - Small and large-scale wetlands (Docklands and Lynbrook in Melbourne)

5.4.2 Design considerations

Effective pollutant removal in wetlands depends largely on the macrophyte zone. Vegetation in the macrophyte zone plays a key role in pollutant removal, and it is therefore important to protect vegetation from high flows, debris and high sediment loads. Open water zones can provide a polishing step, as UV light provides a level of human pathogen removal dependant on

several factors. Some of these considerations are illustrated in Figure 22 and are expanded in the following sections on each element of the wetland.



Figure 22 - Key wetland design considerations

Pre-treatment of stormwater is necessary to protect wetland function. Gross pollutants and coarse to medium sediments should be removed before runoff reaches the wetland. A sediment basin is recommended upstream of a wetland.

Wetlands should be designed with a detention time of 72 hours to ensure sufficient contact time for biological processes. The macrophyte zone outlet orifice must be sized accordingly. Multiple level orifice riser outlets are considered to give the most uniform detention times for wetlands.

Wetlands can be designed to minimise mosquito habitat and to encourage mosquito predators. “Managing Urban Stormwater: Treatment Techniques” (DECC 2007) has more information on designing to minimise the risk of mosquito breeding.

Inlet zone and bypass structure

The inlet zone or sediment basin reduces flow velocities and encourages settling of sediments from the water column. The inlet zone can drain during periods without rainfall and then fill during runoff events. The inlet zone is sized according to the design storm discharge and the target particle size for trapping. Typically it is about 10% of the total wetland area and around 2 m deep.

Macrophyte zone

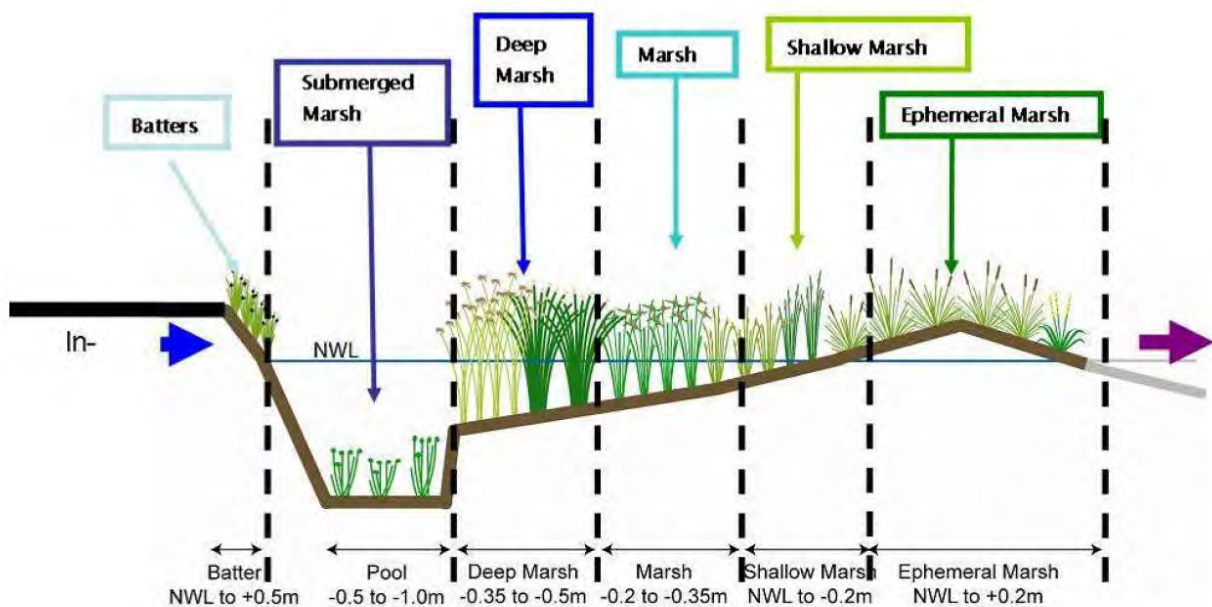
For macrophyte zones to function efficiently, flows that pass through the vegetation must be evenly distributed. Dense vegetation growth is required to dissipate flows and to support

efficient filtration. Flow and water level variations and maximum velocities are important considerations and can be controlled with an appropriate outlet structure.

Different zones in a macrophyte system perform different functions. Figure 23 shows a typical zonation including submerged marsh, deep and shallow emergent marsh and ephemeral marsh zones. Ephemeral areas are organic matter traps. These areas wet and dry regularly and thus enhance the breakdown process of organic vegetation. Marsh areas promote epiphyte (biofilms) growth on the plant surfaces. Epiphytes promote adhesion of fine colloidal particulates to wetland vegetation and uptake of nutrients. The marsh plants remove nutrients and promote microbial activity and pollution degradation.

Openwaterzone

Sometimes, there are areas of open water surrounding the outlet of wetlands. These can increase UV disinfection and provide habitat for fish and other aquatic species, as well as perform an aesthetic and passive recreation function.



Wetland Long Section (indicative only)

Figure 23: Wetland indicative long section

5.4.3 Soil and vegetation

Wetlands need to be lined with an impermeable liner, which can either be a layer of compacted clay or a strong plastic liner. Wetlands should include at least 200-300 mm good quality topsoil to support the vegetation.

Vegetation for wetlands is important to ensure the pollution reduction performance of the system. A range of species has been selected according to their hydrologic requirements and growth form. A detailed species list is presented in Section 6 (VEGETATION).

5.4.4 Sizing

A sizing curve for constructed wetlands is shown in Figure 24. The sizing curve plots the total wetland area (including the macrophyte zone and the inlet pond) as a percentage of the catchment area. The sizing curves assume the following:

- The surface area of the inlet pond is 10% that of the macrophyte zone
- The inlet pond has a permanent pool depth of 2 m
- The average water depth in the macrophyte zone is 0.4 m.
- The outlet configuration provides 72 hr detention.

5.4.5 Maintenance

Wetlands require the following routine maintenance activities:

- Checking the wetland after storms for scour and erosion
- Removing debris, particularly around inlets and outlets
- Regularly removing sediment from the sediment basin
- Weeding and replanting

It can be useful to design wetlands to allow them to be completely drained. This can assist in occasional corrective maintenance actions such as extensive weeding and replanting. This would also assist in the control of pests such as *Gambusia*, which can be removed from a waterbody by drying it out extensively, then refilling.

5.4.6 Further Information

Section 6 (VEGETATION) details appropriate vegetation types both for wetlands as well as the local flora of the Ryde LGA. In addition, the *WSUD MUSIC Modelling Guidance* provides further detail as to technical design and assessment of WSUD treatment elements for the City of Ryde.

For more detailed information on wetlands, refer to the Western Sydney Technical Guidelines (UPRCT 2004) or “Managing Urban Stormwater: Treatment Techniques” (DECC 2007). Information is also available in:

- the DLWC Constructed Wetlands Manual, 1998.
- The CRC for Catchment Hydrology Managing Urban Stormwater Using Constructed Wetlands 1999.
- The Institute of Engineers Australian Runoff Quality 2006.

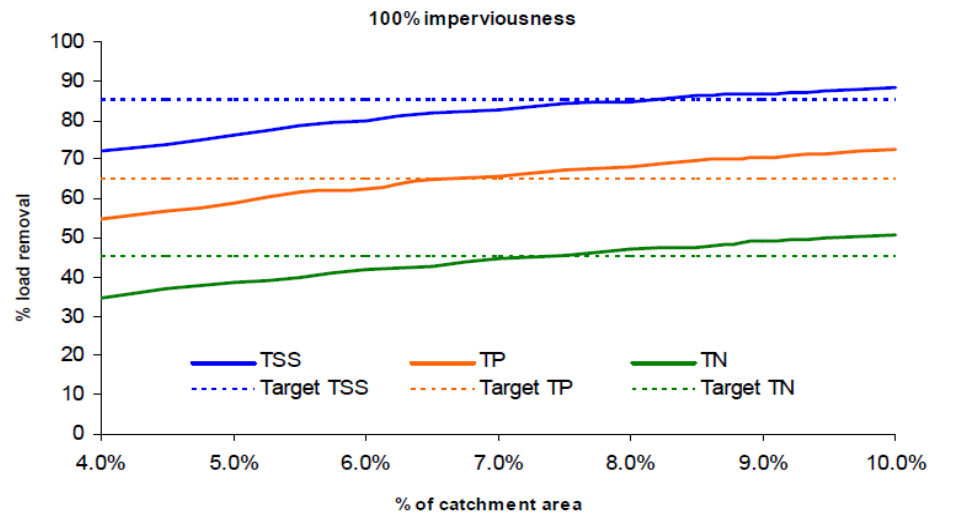
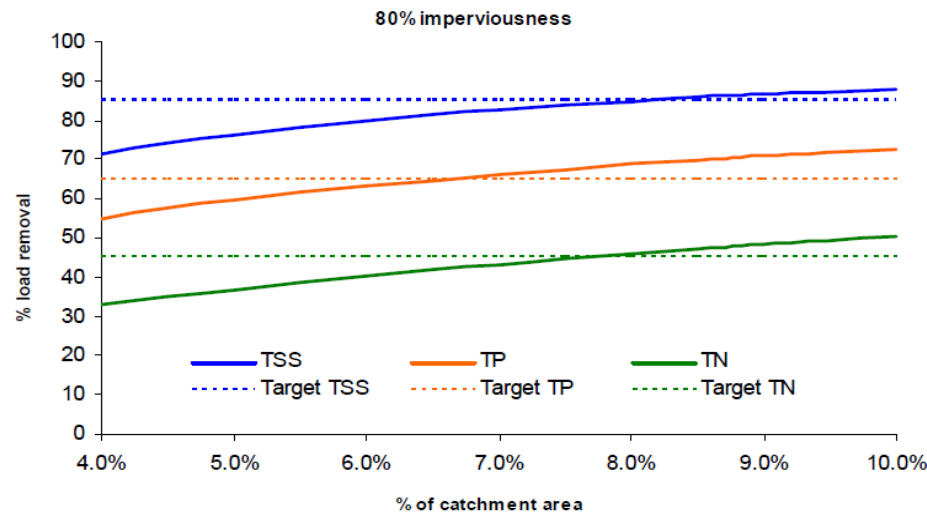
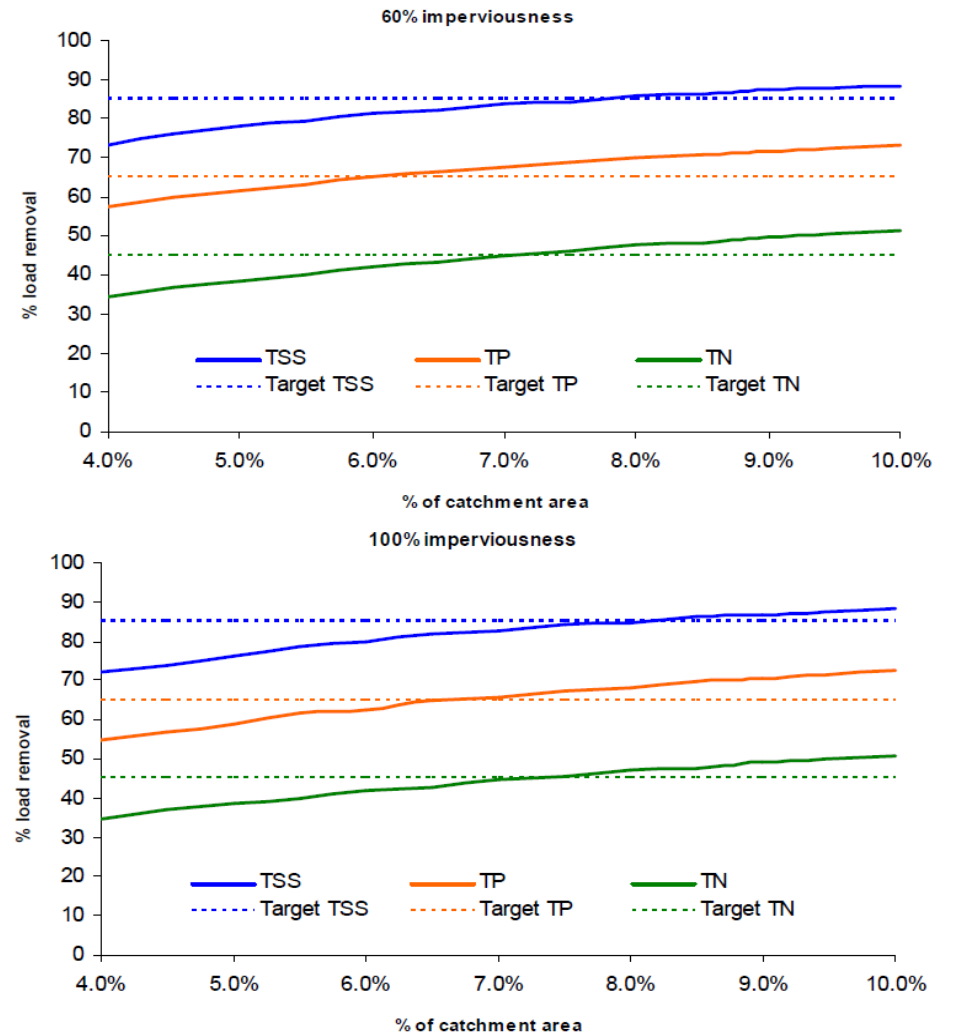
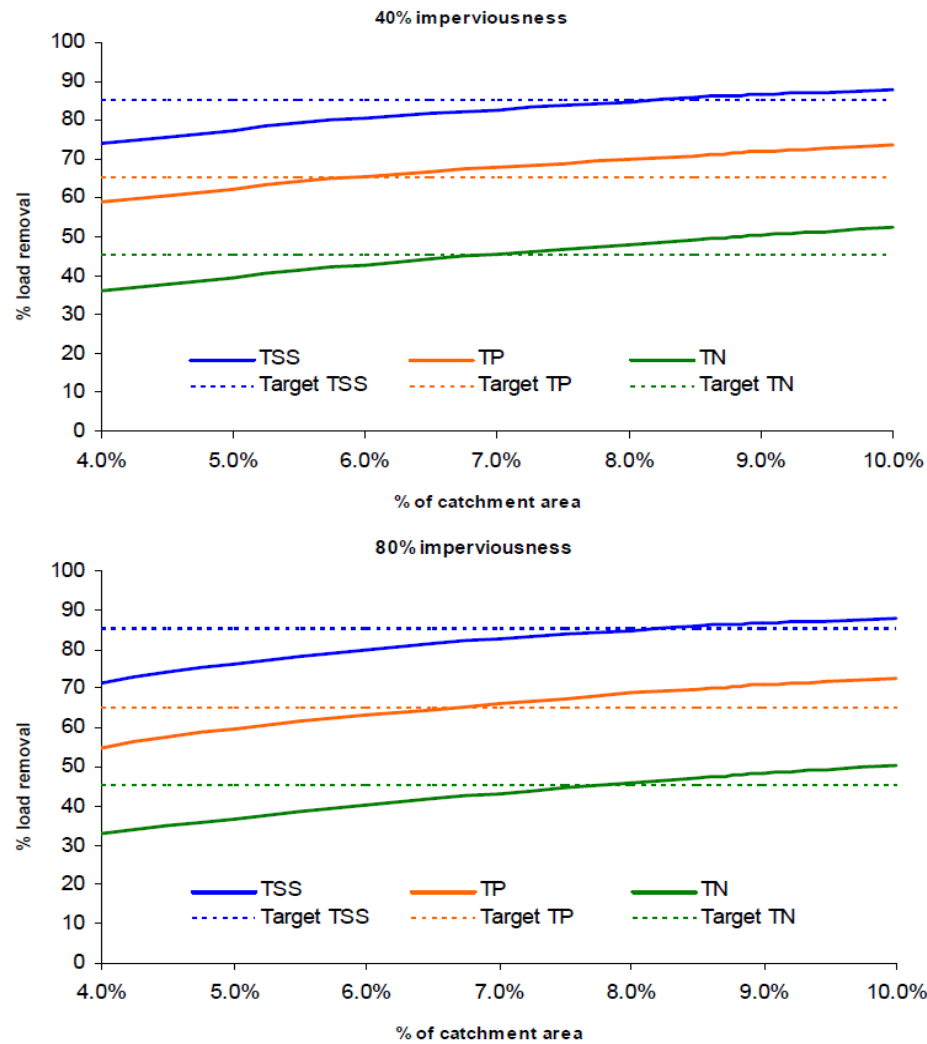


Figure 24 - Sizing curves for wetlands in the Ryde LG

6 VEGETATION GUIDE

This section provides an indicative plant species list for vegetated WSUD elements such as;

- Swales and buffer strips
- Wetlands
- Bioretention systems

Most of the plants selected are Australian natives or naturalised ground covers that occur naturally in Ryde City LGA as documented by the National Herbarium of NSW.

The majority of the plant species listed are known to occur naturally in the Ryde City LGA. Incorporating these plants into urban areas will add considerable biodiversity and ecological habitat value to urban areas. Vegetation can perform many important functions in urban areas, such as visual amenity, soil stabilisation, microclimate control, fauna habitat, natural borders, and water pollution filtration and uptake. Advice from land managers and landscape architects should be sought to determine that the plants used in each specific situation meet the needs of all the other site users.

These lists were guided by:

- Botanic Gardens Trust (July 2005). PlantNET - The Plant Information Network System of Botanic Gardens Trust, Sydney, Australia (version 2.0.). <http://plantnet.rbgsyd.nsw.gov.au> (Species for Ryde City LGA region)
- Department of Land and Water Conservation (1998) – The Constructed Wetlands Manual. - Volume 1.
- New South Wales National Parks and Wildlife Service (2002) Interpretation Guidelines for the Native Vegetation Maps of the Cumberland Plain, Western Sydney, Final Edition NSW NPWS, Hurstville.

6.1 SWALES AND BUFFER STRIPS

This is an indicative species list for planting in swales and buffer strips. During the detailed design of a swale or buffer strip the advice of a WSUD professional should be sought to guide the exact location, species mix and planting densities to ensure optimal treatment performance based on the detailed specifications of each treatment measure.

A key consideration in selecting vegetation for swales is the need for flow conveyance. Vegetation selection needs to be considered in the hydraulic modeling of the swale. If an open conveyance channel is required, then dense vegetation should be avoided. Turf species and trees may be appropriate. The use of tufted species in swales creates better fauna habitat and a more natural appearance than turf. Tufted species also create a low maintenance landscape once established – requiring very little weeding or mowing. However, tufted species can present an erosion risk if they are not appropriately planted. Vegetation should be densely planted (at least 8 plants per m²) in an offset pattern because sparse planting or planting in rows can lead to the formation of preferential flow paths. Swale design that incorporates tufted species should give

consideration to the use of appropriate design flow velocities and appropriate roughness values for vegetated conditions as opposed to turf.

Dense shrubs and/or trees can be used effectively to limit vehicular or pedestrian access to the swale surface if desired. However, since the purpose of swales is the conveyance and filtration of water, vigorous plant growth along the water's flow path is desired. For this reason care should be taken not to plant shrubs and trees too densely along the swale so as not to shade out the vegetation that interacts with the water.

Swales should be constructed with a layer of good quality topsoil to support vegetation. Swale plants should be those species suited to growth in the native soils of the area.

6.1.1 Turf

Species selected for turf need to be tolerant of mowing and some traffic. The turf grasses listed are naturalised ground covers that do not have weedy tendencies and have been used successfully as turf grasses in other areas. Where local specialists are available their advice should be sought regarding the performance of these species under local conditions.

- *Cynodon dactylon* (Couch, Bermudagrass)
- *Microlaena stipoides* (Weeping Grass)
- *Paspalum distichum* (Water Couch)
- *Paspalum vaginatum* (Salt Water Couch)
- *Sporobolus virginicus* (Sand Couch, Nioaka)
- *Zoysia macrantha* (Prickly Couch)
- *Digitaria didactyla* (Blue Couch)
- *Stenotaphrum secundatum* (Buffalo grass)

6.1.2 Tufted Species

Tufted grasses

- *Aristida ramosa* (Purple Wiregrass)
- *Bothriochloa macra* (Red Grass)
- *Danthonia pilosa* (Smooth Flower Wallaby Grass)
- *Danthonia semiannularis* (Wallaby Grass)
- *Danthonia tenuior* (Wallaby Grass)
- *Deyeuxia quadriseta* (Reed Bent Grass)
- *Dichelachne micrantha* (Shorthair Plumegrass)
- *Dichelachne sieberiana* (Plumegrass)
- *Elymus scaber* (Common Wheat Grass)
- *Imperata cylindrica* (Blady Grass)
- *Poa sieberiana* (Grey Tussock Grass)
- *Stipa rudis* (Speargrass)
- *Stipa scabra* (Speargrass)
- *Themeda australis* (Kangaroo Grass)

Tufted sedges or rushes

- *Baumea juncea* (Bare Twig-rush)
- *Cyperus polystachyos* (Umbrella Grass)
- *Cyperus sanguinolentus* (Umbrella Grass)
- *Fimbristylis dichotoma* (Common Fringe-sedge)
- *Ficinia nodosa* (Knobbly Club-rush)
- *Gahnia aspera* (Rough Saw-sedge)
- *Gahnia melanocarpa* (Black Fruit Saw-sedge)
- *Lepidosperma elatius* (Tall Sword-sedge)
- *Lepidosperma laterale* (Sword-sedge)
- *Juncus bufonius* (Toad Rush)
- *Juncus usitatus* (Common Rush)
- *Lomandra filiformis* (Wattle Mat-Rush)
- *Lomandra longifolia* (Spiny Mat-Rush)

6.2 TREES AND SHRUBS

The selection of trees for swales and buffer strips is often based on criteria set by landscape architect designs, bush fire hazard concerns, habitat values or street tree plans. Where these criteria are important, specialist advice should be sought regarding the appropriate species selection. Some species grow best in certain light and soil moisture conditions and these attributes should be considered when choosing plants. This information is available in guides to the native plants of the Sydney region.

A list of indigenous, low-water use trees and shrubs appropriate for use in the Ryde City LGA is available from the BASIX website.

Most of these species will be appropriate for use as accent planting in swales, or to form the basis of vegetated buffer strips http://www.basix.nsw.gov.au/help/Water/Common_areas_and_Central_systems/Landscape/List_of_indigenous_species.htm)

6.3 WETLANDS

Plant species used in wetlands play specific roles depending on their location. The species included in this list have been specifically chosen for their suitability to specific water depths, their growth form, hardiness and proven performance in treatment wetlands. Many of the species recommended for wetlands would also be suitable for planting around the edges of ponds or sediment basins. Water depth should be used as a guide to suitable plants for these situations.

Those species used on the batters should be terrestrial vegetation adapted to growing in moist areas - often plants that might normally grow alongside waterways. Within the wetland itself, there are five different zones identified in Figure 25, all with specific vegetation requirements depending on the range of water depths:

- The ephemeral marsh is periodically inundated and vegetation selected needs to be able to tolerate short-term flooding

- The shallow marsh is normally inundated, however water depths would be shallow (less than 0.2 m) and during dry times, the shallow marsh may occasionally be dry
- The marsh is permanently inundated with water depths of 0.2-0.35 m
- The deep marsh is permanently inundated, with water depths up to 0.5 m
- Open water pools are too deep to support emergent vegetation, however can be planted with submerged species

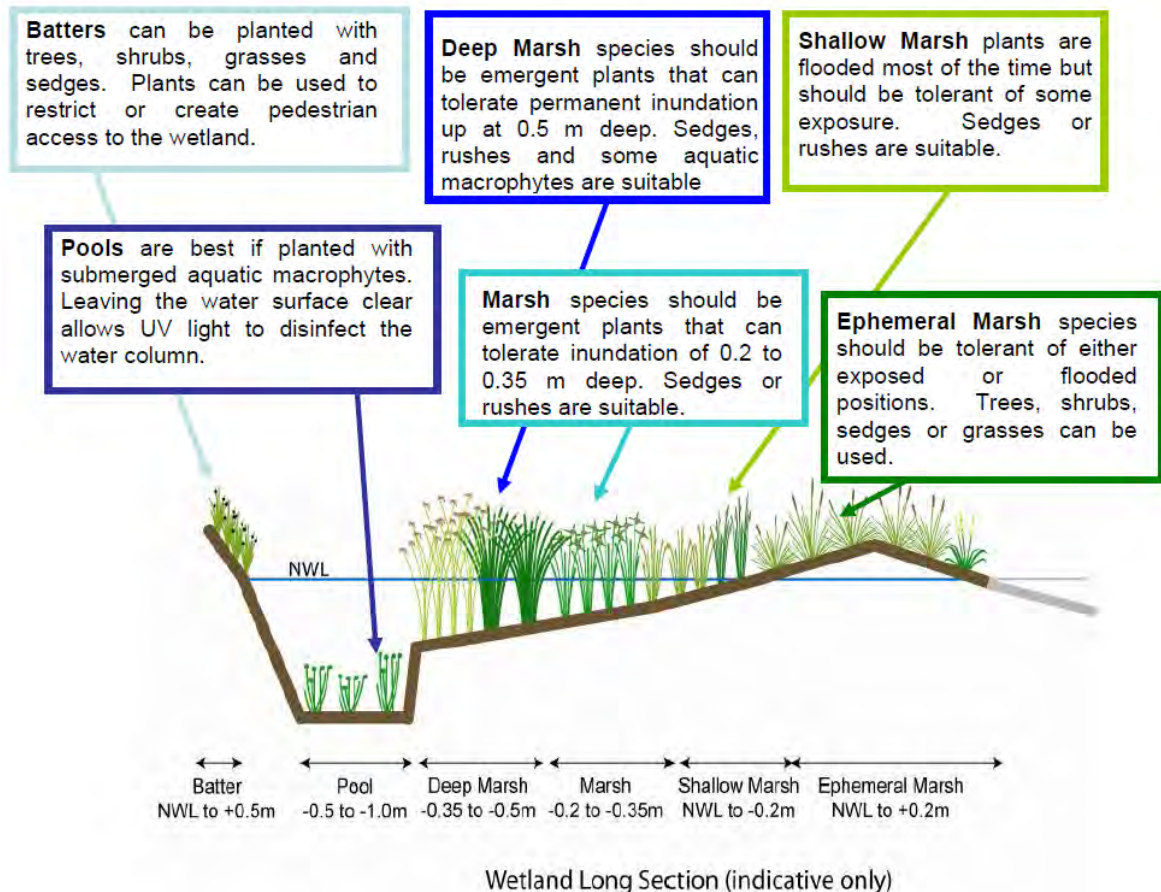


Figure 25 – Indicative wetland long section showing plant zones.

The following list of species is indicative only, the guidance of a WSUD professional should be sought to guide the exact location, species mixes and planting densities (generally 6 to 8 plants per m²) to ensure optimal treatment performance based on the detailed specifications of each treatment measure.

The species selected for a wetland should reflect the landscape form designed by landscape architects working on the site, or the type of habitat desired.

6.4 BATTERS

Lower batter (species preferring moist soils)

- *Carex appressa* (Tall Sedge)
- *Cyperus gracilis* (Slender Flat-Sedge)

- *Cyperus polystachyos* (Umbrella Grass)
- *Cyperus sanguinolentus* (Umbrella Grass)
- *Eleocharis gracilis* (Spike Rush)
- *Fimbristylis dichotoma* (Common Fringe-sedge)
- *Gahnia clarkei* (Tall Saw-Sedge)
- *Hypolepis muelleri* (Harsh Ground Fern)
- *Isolepis cernua* (Nodding Club-rush)
- *Isolepis inundata* (Swamp Club-sedge)
- *Ficinia nodosa* (Knobby Club-rush)
- *Juncus usitatus* (Common Rush)

Upper batter (species preferring drier soils) Tussocky grasses and sedges

- *Aristida ramosa* (Purple Wiregrass)
- *Bothriochloa macra* (Red Grass)
- *Cyperus caudata* (Sedge)
- *Danthonia pilosa* (Velvet Wallaby Grass)
- *Danthonia semiannularis* (Wallaby Grass)
- *Danthonia tenuior* (Wallaby Grass)
- *Deyeuxia quadriseta* (Reed Bent Grass)
- *Dichelachne micrantha* (Shorthair Plumegrass)
- *Dichelachne sieberiana* (Plumegrass)
- *Elymus scaber* (Common Wheat Grass)
- *Imperata cylindrica* (Blady Grass)
- *Lomandra filiformis* (Wattle Mat Rush)
- *Lomandra longifolia* (Spiny Mat Rush)
- *Poa sieberiana* (Grey Tussock Grass)
- *Stipa rudis* subsp. *rudis* (Speargrass)
- *Stipa scabra* subsp. *scabra* (Speargrass)
- *Themeda australis* (Kangaroo Grass)

Herbs

- *Adiantum aethiopicum* (Common Maidenhair)
- *Adiantum hispidulum* var. *hispidulum* (Rough Maidenhair fern)
- *Arthropodium minus* (Small Vanilla Lily)
- *Asplenium flabellifolium* (Necklace fern)
- *Cassinia aureonitens* (Yellow Cassinia)
- *Doodia aspera* (Prickly Rasp Fern)
- *Helichrysum scorpioides* (Button Everlasting)
- *Ozothamnus diosmifolius* (Rice Flower)
- *Pellaea falcata* (Sickle Fern)
- *Viola banksii* (Native Violet)
- *Viola betonicifolia* (Native Violet)
- *Viola hederacea* (Native Violet)
- *Xanthosia pilosa* (Woolly Xanthosia)

Trees and shrubs may be planted amongst the vegetation of the batters, but should be planted in such a way so as not to shade the aquatic macrophytes. It is

recommended that trees and shrubs be planted in the upper batter only, and that consideration is given to the aspect of the site in relation to incident sunlight.

Shrubs

- *Boronia polygalifolia* (Dwarf Boronia)
- *Callitris citrinus*
- *Callitris linearifolius*
- *Callitris linearis*
- *Grevillea buxifolia* subsp. *buxifolia* (Spider Flower Grevillea)
- *Grevillea linearifolia* (Linear Leaf Grevillea)
- *Grevillea sericea* subsp. *sericea* (Pink Spider Flower, Silky Grevillea)
- *Grevillea speciosa* (Red Spider Flower Grevillea)
- *Grevillea sphacelata* (Grey Spider Flower)
- *Hakea dactyloides* (Finger Hakea, Broad-leaved Hakea)
- *Hakea salicifolia* subsp. *salicifolia* (Willow-leaved Hakea)
- *Hakea sericea* (Needlebush)
- *Isopogon anemonifolius* (Broad-leaf Drumsticks)
- *Melaleuca decora* (White Feather Honey Myrtle, Paperbark)
- *Melaleuca linariifolia* (Flax-leaved Paperbark)
- *Persoonia lanceolata* (Lance Leaf Geebung)

Trees

A list of indigenous, low-water use trees appropriate for use in the Ryde City local government area is available from the BASIX website. Most of these species will be appropriate for planting on the upper batter. http://www.basix.nsw.gov.au/help/Water/Common_areas_and_Central_systems/Landscape/List_of_indigenous_species.htm.

6.5 EPHEMERAL ZONE

- *Carex apressa* (Tall Sedge)
- *Cyperus gracilis* (Slender Flat-Sedge)
- *Cyperus imbecillis* (Sedge)
- *Cyperus polystachyos* (Umbrella Grass)
- *Cyperus sanguinolentus* (Umbrella Grass)
- *Cyperus tetraphyllus* (Sedge)
- *Eleocharis gracilis* (Spike Rush)
- *Ficinia nodosa* (Knobbly Club-rush)
- *Fimbristylis dichotoma* (Common Fringe-sedge)
- *Isolepis inundata* (Swamp Club-sedge)
- *Juncus bufonius* (Toad Rush)
- *Juncus striata*
- *Juncus usitatus* (Common Rush)
- *Lepidosperma laterale* (Variable Sword Sedge)
- *Lepyrodia scariosa* (Scale Rush)
- *Ptilothrix deusta*

6.6 SHALLOW MARSH

- *Carex fascicularis* (Tassel Sedge)
- *Cyperus sanguinolentus* (Umbrella Grass)
- *Eleocharis acuta* (Rush)
- *Eleocharis cylindrostachys* (Rush)
- *Ficinia nodosa* (Knobbly Club-rush)
- *Isolepis hookeriana* (Bristel Club Rush)
- *Isolepis inundata* (Swamp Club-sedge)
- *Juncus continuus* (Pithy Rush)
- *Juncus usitatus* (Common Rush)
- *Myriophyllum crispatum* *Persicaria* spp. *Triglochin striatum* (Streaked Arrowgrass)

6.7 MARSH

- *Bolboschoenus caldwellii* (Sea Club Rush)
- *Bolboschoenus fluviatilis* (Rush)
- *Myriophyllum crispatum* *Schoenoplectus mucronatus* (Star Club Rush)
- *Schoenoplectus validus* (River Club Rush)

6.8 DEEP MARSH

- *Baumea articulate* (Jointed Twig Rush)
- *Bolboschoenus fluviatilis* (Rush)
- *Eleocharis sphacelata* (Giant Spike Rush)
- *Schoenoplectus littoralis* *Schoenoplectus validus* (River Club Rush)

6.9 DEEP WATER - POOLS

- *Chara* spp. (Muskgrass)
- *Myriophyllum caput-medusae*
- *Myriophyllum verrucosum*
- *Potamogeton crispatus* (Floating Pondweed)
- *Potamogeton ochreatus* (Blunt Pondweed)
- *Potamogeton pectinatus* (Fennel-leaved Pondweed)
- *Potamogeton tricarinatus* (Floating-leafed Pondweed)
- *Vallisneria spiralis* (Tape Grass)

6.10 BIORETENTION SYSTEMS

The soils used in bioretention systems are highly permeable, free-draining and hold very little water. Consequently, the plants used in these systems should be suited to sandy, free-draining soils, and tolerant of drought as well as periodic inundation. Bioretention systems should be planted densely to maximise the biological processing of nutrients. Planting should incorporate several growth forms – shrubs, tufted plants and groundcover species, to ensure that the plant roots occupy all parts of the media. Using several species reduces the risk that insect attack, disease or adverse weather will harm all of the plants at once.

This list of species is indicative only, the advice of a WSUD professional should be sought to guide the exact location, species mixes and planting densities (generally 8 plants per m²) to ensure optimal treatment performance based on the detailed specifications of each treatment measure. Bioretention systems will commonly comprise five to ten species, depending on the size and hydrologic conditions within individual systems.

6.10.1 Groundcover Plants

- *Actinotus helianthi* (Flannel Flower)
- *Cassinia aureonitens* (Yellow Cassinia)
- *Helichrysum scorpioides* (Buttons Everlasting)
- *Ozothamnus diosmifolius* (Rice Flower)
- *Prostanthera howelliae* (Mint Bush)
- *Senecio lautus* (Variable Groundsel)

6.10.2 Tufted Species

Grasses

- *Bothriochloa macra* (Red grass)
- *Danthonia tenuior* (Smooth Flower Wallaby Grass)
- *Eragrostis brownii* (Brown's Lovegrass)
- *Imperata cylindrica* (Blady grass)
- *Poa sieberiana* (Grey Tussock Grass)
- *Sporobolus virginicus* (Sand Couch, Nioaka)
- *Stipa pubescens*
- *Stipa scabra* (Speargrass)
- *Themeda australis* (Kangaroo Grass)
- *Zoysia macrantha* (Prickly Couch) Sedges
- *Baumea juncea* (Bare Twig-Rush)
- *Cyperus gracilis* (Slender Flat-Sedge)
- *Juncus bufonius* (Toad Rush)
- *Lepidosperma laterale* (Sword-Sedge)
- *Lomandra longifolia* (Spiny Mat-rush)
- *Lomandra filiformis* subsp. *filiformis* (Wattle Mat-rush)
- *Lomandra gracilis*

6.10.3 Shrubs

- *Amperea xiphoclada* var. *xiphoclada* (Broom Spurge)
- *Astroloma pinifolium* (Pine Heath)
- *Banksia ericifolia* (Heath-leaved Banksia)
- *Banksia integrifolia* (Coastal Banksia)
- *Banksia marginata* (Silver Banksia)
- *Billardiera scandens* (Appleberry)
- *Boronia rigens* (Stiff Boronia)
- *Bossiaea heterophylla* (Variable Bossiaea)
- *Bossiaea obcordata* (Spiny Bossiaea)
- *Bossiaea scolopendria*
- *Brachyloma daphnoides* (Daphne Heath)

- *Bursaria spinosa* (Blackthorn, Boxthorn, Sweet Bursaria)
- *Callistemon citrinus* (Common Red Bottlebrush)
- *Callistemon linearifolius* (Nettle Bottlebrush)
- *Callistemon linearis* (Narrow leaved Bottlebrush)
- *Callistemon rigidus* (Stiff Bottlebrush)
- *Calytrix tetragona* (Fringe Myrtle)
- *Correa reflexa* (Native Fuchsia)
- *Crocea saligna* (Willow-leaved Crocea)
- *Daviesia acicularis*
- *Dillwynia retorta* (Eggs and Bacon)
- *Epacris microphylla* (Coral Heath)
- *Eriostemon australasius* (Wax Flower)
- *Gompholobium glabratum* (Wedge Pea)
- *Gompholobium grandiflorum* (Large Wedge Pea)
- *Gompholobium minus* (Dwart Wedge Pea)
- *Gompholobium pinnatum* (Pinnate Wedge Pea)
- *Hakea dactyloides* (Finger Hakea, Broad-leaved Hakea)
- *Hakea sericea* (Needlebush)
- *Hovea linearis* (Narrow Leaf Hovea)
- *Isopogon anemonifolius* (Broad-leaf Drumsticks)
- *Leptospermum trinervium* (Slender Tea-Tree)
- *Leucopogon appressus* (Heath)
- *Leucopogon ericoides* (Pink Beard-heath)
- *Leucopogon juniperinus* (Prickly Beard-heath)
- *Leucopogon lanceolatus* (Lance Beard-heath)
- *Leucopogon microphyllus*
- *Leucopogon setiger*
- *Melaleuca erubescens* (White Flowering Melaleuca)
- *Melaleuca linariifolia* (Flax-leaved Paperbark)
- *Melaleuca nodosa*
- *Melaleuca thymifolia* (Thyme Honey-Myrtle)
- *Melichrus procumbens*
- *Monotoca elliptica*
- *Phyllota grandiflora*
- *Phyllota phyllicoides*
- *Pimelea curviflora*
- *Pimelea linifolia* (Rice Flower)
- *Pultenaea linophylla* (Small-leaved Bush Pea)
- *Styphelia longifolia* (Five Corners)
- *Styphelia triflora* (Pink Five Corners)
- *Woollsia pungens*
- *Zieria pilosa*

6.10.4 Trees

- *Allocasuarina distyla* (Scrub She Oak)
- *Allocasuarina littoralis* (She Oak)
- *Angophora bakeri* (Narrow-leaved apple)
- *Angophora costata* (Smooth Barked Apple)
- *Casuarina glauca* (Swamp Oak)

- *Eucalyptus haemastoma* (Scribbly Gum)
- *Eucalyptus piperita* (Sydney Peppermint)
- *Eucalyptus punctata* subsp. *wianamattica* (Grey Gum)
- *Eucalyptus sieberi* (Silver top)

7 REFERENCES

CRC for Catchment Hydrology 1999 Managing Urban Stormwater Using Constructed Wetlands.

CRC for Freshwater Ecology 1998 Design Guidelines: Stormwater Pollution Control Ponds and Wetlands.

engineers Australia 2001 Australian Rainfall and Runoff.

enHealth 2004 Guidance on Use of Rainwater Tanks (Australian Government, Canberra).

Landcom 2006 Wastewater reuse in the Urban Environment: selection of technologies, available online:
<http://www.landcom.com.au/Wastewaterreuse.aspx>.

Moreton Bay Waterways and Catchments Partnership 2006 WSUD Technical Design Guidelines for South East Queensland.

Natural Resource Ministerial Council and Environment Protection and Heritage Council 2006

Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (Phase 1).

NSW Department of Energy, Utilities and Sustainability (DEUS) 2007 NSW Guidelines for Greywater Reuse in Sewered, Single Household Residential Premises.

NSW Department of Environment and Climate Change (DECC) 2003 Use of effluent by irrigation (consultation draft).

NSW Department of Environment and Climate Change (DECC) 2006 Managing Urban Stormwater: Harvesting and Reuse.

NSW Department of Environment and Climate Change (DECC) 2007 Managing Urban Stormwater: Harvesting and Reuse.

NSW Department of Health 2004 Greywater and Sewage Recycling in Multi-Unit Dwellings and Commercial Premises - Interim Guidance.

NSW Department of Land and Water Conservation (DLWC) 1998 Constructed Wetlands Manual. NSW Government 1993 NSW guidelines for urban and residential use of reclaimed water.

NSW Government 2004 Managing Urban Stormwater: Soils and Construction (the "Blue Book") Fourth edition, reprinted 2006. Available from Landcom.

NSW National Parks and Wildlife Service (2002) Interpretation Guidelines for the Native Vegetation Maps of the Cumberland Plain, Western Sydney, Final Edition NSW NPWS, available online at
http://www.basix.nsw.gov.au/help_detached/water/landscape/list_of_indigenous_species.htm

Rutherford, I.D., Jerie, K. and Marsh, N 2000 A Rehabilitation Manual for Australian Streams CRC for Catchment Hydrology and the Land and Water Resources Research and Development Corporation.

SoER (2007) Northern Sydney Regional Organisation of Councils- State of the Environment Report- City of Ryde Edition

Upper Parramatta River Catchment Trust 2004, Water Sensitive Urban Design Technical Guidelines for Western Sydney.

Wong, T.H.F. (Ed) 2006 Australian Runoff Quality Engineers Australia, Sydney.

City of Ryde Development Control Plan 2014

Part: 8.3 Driveways

Translation

ENGLISH

If you do not understand this document please come to Ryde Civic Centre, 1 Devlin Street, Ryde Monday to Friday 8.30am to 4.30pm or telephone the Telephone and Interpreting Service on 131 450 and ask an interpreter to contact the City of Ryde for you on 9952 8222.

ARABIC

إننا نعتذر عليك فهم محتويات هذه الوثيقة، نرجو للحضور إلى مركز بلدية رايد Ryde Civic Centre على العنوان: 1 Devlin Street, Ryde من الاثنين إلى الجمعة بين الساعة 8.30 صباحاً والساعة 4.30 بعد الظهر أو الاتصال بمكتب خدمات الترجمة على الرقم 131 450 لكي تطلب من أحد المترجمين الاتصال بمجلس مدينة رايد، على الرقم 9952 8222، نيابة عنك.

ARMENIAN

Եթէ այս գրութիւնը չէք հասկնար, խնդրեմ եկէ՛ք Րայդ Բիւրօ Սիւիլիք Սենթըր, 1 Տելվին փողոց, Րայդ, (Ryde Civic Centre, 1 Devlin Street, Ryde) Երկուշաբթիէն Ուրբաթ կ.ա. ժամը 8.30 – կ.ե. ժամը 4.30, կամ հեռաձայնեցէ՛ք Հեռաձայնի եւ Թարգմանութեան Սպասարկութեան՝ 131 450, եւ խնդրեցէ՛ք որ թարգմանիչ մը Րայդ Քաղաքապետարանին հետ կապ հաստատուէ ձեզի համար, հեռաձայնելով՝ 9952 8222 թիւին:

CHINESE

如果您看不懂本文，請在周一至周五上午 8 時 30 分至下午 4 時 30 分前往 Ryde 市政中心詢問 (Ryde Civic Centre, 地址: 1 Devlin Street, Ryde)。你也可以打電話至電話傳譯服務中心，電話號碼是: 131 450。接通後你可以要求一位傳譯員為你打如下電話和 Ryde 市政廳聯繫，電話是: 9952 8222。

FARSI

اگر این مدرک را نمی فهمید لطفاً از 8.30 صبح تا 4.30 بعد از ظهر دوشنبه تا جمعه به مرکز شهرداری رايد، Ryde Civic Centre, 1 Devlin Street, Ryde مراجعه کنید یا به سرویس مترجم تلفنی، شماره 131 450 تلفن بزنید و از یک مترجم بخواهید که از طرف شما با شهرداری رايد شماره 9952 8222 تلفن بزند.

ITALIAN

Se non capite il presente documento, siete pregati di rivolgervi al Ryde Civic Centre al n. 1 di Devlin Street, Ryde, dalle 8.30 alle 16.30, dal lunedì al venerdì; oppure potete chiamare il Telephone Translating and Interpreting Service al 131 450 e chiedere all'interprete di contattare a vostro nome il Municipio di Ryde presso il 9952 8222.

KOREAN

이 문서가 무슨 의미인지 모르실 경우에는 1 Devlin Street, Ryde 에 있는 Ryde Civic Centre 로 오시거나 (월 – 금, 오전 8:30 – 오후 4:30), 전화 131 450 번으로 전화 통역 서비스에 연락하셔서 통역사에게 여러분 대신 Ryde 시청에 전화 9952 8222 번으로 연락을 부탁드립니다.

Amend. No.	Date approved	Effective date	Subject of amendment

Table of Contents

1.0 INTRODUCTION	5
1.1 Objectives	5
1.2 Application	5
2.0 DESIGN STANDARDS	6
3.0 EXISTING FOOTWAY CROSSINGS	7
3.1 Using an Existing Footway Crossing	7
3.2 Disused Footway crossings	7
4.0 DESIGNING INTERNAL ACCESS ROADS AND PARKING SPACES	8
4.1 General	8
4.2 Design of Parking Spaces	8
4.3 Gradients for Cars and Small Rigid Trucks.	8
5.0 CONSTRUCTION STANDARDS	9
6.0 STANDARDS ENFORCEMENT	10
SCHEDULE: DRIVEWAY AND CARPARKING TECHNICAL MATERIAL	11
S1.0 Objectives	11
S2.0 Design Standards	11
S2.1 Design Considerations	11
S2.2 Vehicular crossing Widths	11
S2.3 Layout	12
S2.4 Vehicular Crossing Location	13
S2.5 Sight Distances for Traffic and Pedestrians	14
S2.6 Conflicts with Existing Structures or Obstructions	15
S2.7 Other Traffic Measures	15
S3.0 Existing Footway Crossings	15
S3.1 Using an Existing Footway Crossing	15
S3.2 Disused Footway crossings	15
S4.0 Designing Internal Access Roads and Parking Spaces.	16
S4.1 General	16
S4.2 Design of Parking Spaces	16
S4.2 Construction Standards	20
S4.4 Standards Enforcement	25
APPENDICES	27

THIS PAGE HAS BEEN
INTENTIONALLY LEFT BLANK

1.0 INTRODUCTION

This section shall be read in conjunction with the City of Ryde Car Parking and Driveways Technical Material (refer Schedule attached to this Part).

1.1 Objectives

Objectives

1. To set standards and minimum requirements for vehicular access/ egress to and from off street parking areas in domestic, residential and commercial areas within the City of Ryde.
2. To ensure that parking areas are readily accessible useable and adequately provide for circulation and manoeuvring of vehicles.
3. To ensure smooth transition between the public road and the access driveway and parking areas to prevent scraping of vehicles using the driveways.
4. To encourage the efficient flow of traffic through carparks to minimise the potential for pedestrian and vehicular conflict.
5. To ensure that off-street parking facilities do not interfere with traffic flow and safety in adjacent streets or endanger pedestrian traffic on or off the site.
6. To ensure that parking areas and associated facilities are of an acceptable appearance by imposing construction standards and landscaping requirements.

1.2 Application

This Part applies to:

1. New buildings;
2. Alterations and additions to any existing building, whether or not such additions or alterations involve any change in the purpose for which such buildings are used; and
3. A change of use which under this part, would require the provision of a realigned or configured driveway or car-parking facilities.

2.0 DESIGN STANDARDS

Layout and design of the driveway and/or parking facility shall take into account the following:

- Frontage access, including sight distance and minimum disturbance to through traffic and pedestrian safety;
- Ensure minimum conflicts within the car park area and the provision for circulating capacity during peak periods;
- Ensure pedestrian and road user safety at points of conflict;
- Ensure no scraping of vehicles will occur;
- A maximum of two crossings will be permitted to any public road and the crossing widths of crossings shall be in accordance with details in the technical section;
- The footway crossing should be located so as not to be influenced by any existing obstruction that may adversely affect sight lines ingress and egress and vehicular and pedestrian safety;
- The required width of any footway crossing across the public footway shall be sized based on the location of the crossing, the traffic volume using the crossing and the type of road. Full details of these are set out in the technical section;
- All traffic management measures deemed necessary by Council's traffic engineer and/or the traffic committee are to be provided by the developer to Council's satisfaction; and
- Vehicle Turning Templates according to AS290.1:2004 and AS2890.2-2002.

3.0 EXISTING FOOTWAY CROSSINGS

Controls

3.1 Using an Existing Footway Crossing

- a. Existing footway crossings slabs and laybacks may only be used:
 - i. When they provide access to a maximum of two dwellings;
 - ii. The existing crossing is in the correct location, at the right level, has adequate width and in good condition to enable safe access to and from the site; and
 - iii. The existing crossing is not a bridge or piped crossing.

Otherwise, the crossing may have to be removed and a new crossing constructed.

3.2 Disused Footway crossings

- a. Footway crossings slabs, or parts of footway crossings slabs, that become redundant are to be removed and the footway area restored to Council requirement. Disused gutter crossings are to be removed and the kerb reinstated.
- b. Any existing unused gutter crossings and footway crossing slab will also need to be removed, irrespective of the fact that it may have not become redundant as a consequence of the current application.
- c. Removing a disused gutter crossing is generally completed by Council. The applicant may organise for their contractors to do this work only if the total amount of internal concrete driveways and parking areas being constructed exceeds 150 m².
- d. Details for kerb and gutter construction are given in the City of Ryde Car Parking and Driveways Technical Material (refer schedule attached to this Part).

4.0 DESIGNING INTERNAL ACCESS ROADS AND PARKING SPACES

Controls

4.1 General

- a. Where the development must provide on-site parking facilities, the design of all parking spaces, circulation roads and manoeuvring areas on the property must conform to the minimum requirements outlined below and the design criteria in *AS 2890.1-2004 Parking Facilities, Part 1 Offstreet Parking* and *AS 2890.2 –2002, Part 2, Commercial Vehicle Facilities Part 3 Bicycle parking Facilities* and *City of Ryde Car Parking and Driveways Technical Material* (refer Schedule attached to this Part). In so far as any inconsistency exists between criteria outlined below and the Australian Standards, the criteria in this document shall apply.

4.2 Design of Parking Spaces

- a. Parking spaces and driveway widths for all vehicles shall comply with A.S.2890 except where modified by the City of Ryde Car Parking and Driveways Technical Material (refer Schedule attached to this Part).
- b. Provision must be available within the property to enable vehicles (85th percentile vehicle) to enter and leave the designated parking space in a single 3 point turn manoeuvre. A 99th percentile vehicle shall be used for disabled vehicles.
- c. All vehicles must be able to enter and leave in a forward direction. This provision may be waived where the garage is located at the front of a dwelling and there is insufficient space within the front setback to provide a turning area. Turning templates are supplied in the appendix. A clearance of 300 mm should be added to both sides of the turning path.
- d. Concrete wheel strips may be used along straight sections of the driveway. However a transition pavement must be constructed at both the ends of the strips to facilitate access into the parking area and onto the strips. Wheel strips are inappropriate for use in areas where vehicles are turning. Wheel strips dimensions are to suit the largest type of vehicles using the access way and shall be in accordance with details specify in the technical section.
- e. Where the access road circulates, the dimensions shall comply with Section 2.5 of *AS2890.1:2004, Design of Circulating Roadways and Ramps*.

4.3 Gradients for Cars and Small Rigid Trucks.

- a. The access driveway from the centreline of the public road to the parking space is to be designed to minimise entry hazards from the road, account for pedestrian safety and prevent scraping of vehicles using the access.
- b. Driveway profiles for maximum rise and fall are shown in *City of Ryde Car Parking and Driveways Technical Material* (refer Schedule attached to this Part). Council is to be consulted and a vehicular crossing application made to obtain driveway levels.

5.0 CONSTRUCTION STANDARDS

- a. Construction standards are set out in the City of Ryde Car Parking and Driveways Technical Material (refer Schedule attached to this Part).
- b. Generally, gutter crossings may only be constructed or extended by Council. The applicant may organise for their contractors to do this work only if the total amount of internal concrete driveways and parking areas being constructed exceeds 150 m².
- c. Bridge crossings will no longer be permitted; except in cases where the Council considers that it is not practical to construct a standard layback.
- d. Gravel driveways are inappropriate for use in the Ryde area due to the low permeability of the underlying soils. Gravel may be used as a finish treatment over a concrete driveway provided the driveway grade does not exceed 5% and edge restraints are provided to ensure the gravel is not washed from the drive.

6.0 STANDARDS ENFORCEMENT

Plans submitted to the Principle Certifying Authority should show:

- The location of all driveways and car parking spaces;
- Existing gutter levels at either side of the footway crossing;
- The level of all proposed car parking spaces;
- A longitudinal section of the driveway access from the centreline of the public road to the parking area; and
- Construction details of the crossover.

The certifier will check:

- The location to ensure compliance with the development standards;
- Levels of the garage against the property alignment levels to ensure access can be achieved without exceeding maximum permissible grades or grade changes; and
- Safe pedestrian and traffic sight distance have been achieved.

If the development standard is not met, the unsatisfactory components of the driveway will need to be removed and reconstructed. Unsatisfactory sections of regarded footway will need to be repaired. If turf is dead, it will need to be replaced and maintained by the applicant for a further two month period after which, a further compliance certificate is required.

SCHEDULE - DRIVEWAY AND CARPARKING TECHNICAL MATERIAL

S1.0 Objectives

- To set standards and minimum requirements for vehicular access/ egress to and from off street parking areas in domestic, residential and commercial areas within the City of Ryde.
- To ensure that parking areas are readily accessible useable and adequately provide for circulation and manoeuvring of vehicles.
- To encourage the efficient flow of traffic through carparks to minimise the potential for pedestrian and vehicular conflict.
- To ensure that off-street parking facilities do not interfere with traffic flow and safety in adjacent streets or endanger pedestrian traffic on or off the site.
- To ensure that parking areas and associated facilities are of an acceptable appearance by imposing construction standards and landscaping requirements.

S2.0 Design Standards

S2.1 Design Considerations

Layout and design of the driveway and/or parking facility shall take into account the following:

- Frontage access, including sight distance and minimum disturbance to through traffic and pedestrian safety;
- Ensure minimum conflicts within the car park area and the provision for circulating capacity during peak periods; and
- Ensure pedestrian and road user safety at points of conflict.

S2.2 Vehicular crossing Widths

The width of any footway crossing to a residential property with less than 10 parking spaces is to be a minimum of 3.0 metres and a maximum of 5.0 metres. Wheel strips are not suitable across the public footway.

Footway crossings with a maximum width of six (6) metres will be permitted to facilitate access to two adjacent garages or carports if the distance between the parking space and the street frontage is less than 5.0 metres.

Footway crossings with a maximum width of six (6) metres may be permitted into residential properties containing three or more dwellings where they obtain access from a collector, sub-arterial or arterial road to minimise disruption to traffic vehicles wishing to enter the property.

Footway crossings into non-residential properties and residential properties with ____ or more parking spaces shall be designed in accordance with the following tables:

Road Frontage	Number of Car Parking Spaces Served by the Driveway					
	Less than 25	25-100	101-300	301-600	More Than 600	Heavy Vehicles
Major	1-2	2-3	3-4	4	5	7
Minor	1	1-2	2-3	3-4	4	6

Table 1 Driveway Types

Type	Entry Width (metres) W	Exit Width (metres) W	Minimum Separation of Driveways (metres)	Splay at Kerbline (metres) R
1	3-6	Combined	NA	0.45
2	6-9	Combined	NA	0.45
3	6	4-6	1-3	0.45
4	6-8	8-10	1-3	0.45
5	Direct feed from a controlled intersection via a dedicated public roadway			
6	8-10	8-10	3	0.45
7	10-12	10-12	3	0.45

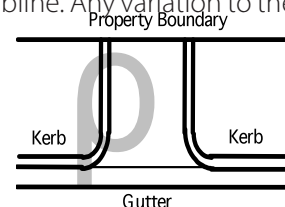
Table 2 Driveway Widths

S2.3 Layout

Vehicular crossings are to be placed to keep conflicts between frontage road traffic and car park traffic to an acceptable minimum. The following points specify some of the design criteria for vehicular crossings.

1. A maximum of two vehicle crossings are permitted to any public road provided the minimum separation between footway crossings is 1 m and the sum of the widths of all access footway crossings to any street frontage does not represent more than 30% of the total width of the total width of the property frontage to that street.

2. Dual Occupancy (attached) may be permitted to have two footway crossovers where the location of the garages on the property do not permit the use of a shared crossover. The crossover width may exceed 30% of the property frontage for a dual occupancy (attached) development.
3. All footway crossovers are to be constructed perpendicular to the kerblines. Any variation to the perpendicular angle is to be approved by Council's traffic engineer.
4. Generally, kerbs are not to be returned to the property boundary.
5. Kerb returns to the property alignment may be permissible if:
 - a. the access is to an arterial or sub-arterial road;
 - b. the development generates a large amount of traffic;
 - c. the drive is used by heavy vehicles; and
 - d. If kerb returns are permitted/required, kerb ramps will need to be provided to facilitate pram and wheelchair movements.
6. Auxiliary Lanes and Turning Bays will not be permitted unless they are considered necessary by the Local or Area Traffic Committee.
7. In certain circumstances, the Traffic Committee may restrict property access to left in - left out movements only. It will be necessary to erect appropriate signs and may be necessary to construct a median island within the road reserve to ensure compliance.
8. If separate footway crossings are provided for entering and exiting traffic they shall be signposted with "in" or "entrance" or "out" or "exit" as appropriate.



S2.4 Vehicular Crossing Location

Properties fronting onto major or arterial roads are to gain access from a residential road frontage if available.

For residential and long term parking areas at signalised intersections, the minimum distance is to be beyond the influence of the queue lengths at the intersection. If this cannot be achieved then

1. an arrangement may be made to confine access to left only when either entering or leaving the car park; and
2. or a signalised driveway or other approved means to provide safe site access may be considered.

For residential and long term parking areas at non signalised intersections the driveways are to be located in accordance with the requirements of section 3.2.3 of AS2890.1 :2004. Generally a driveway is to be located not less than 6 m from the kerb tangent point measured along the front property boundary and/or 6 m from the end of a median strip at the intersection measured along the front property boundary. Exceptions to this rule include driveways at or near signalised intersections and properties that would otherwise be denied access due to physical constraints.

Driveways for access to short term high turn over parking at shopping centres and parking for disable people shall comply with section 3.2.3 of AS2890. 1:2004.

Vehicular crossings should be located so minimum sight distances are provided to traffic and pedestrians. Minimum traffic sight distances are outlined in the desirable sight distance (DSD) column of table 3 below.

Sight distances as low as those given in the approach sight distance (ASD) column may be acceptable provided no reasonable alternative exists for improving sight distances. Sight distance to pedestrians shall be met by providing clear sight lines in the areas indicated by Figure 1.

S2.5 Sight Distances for Traffic and Pedestrians

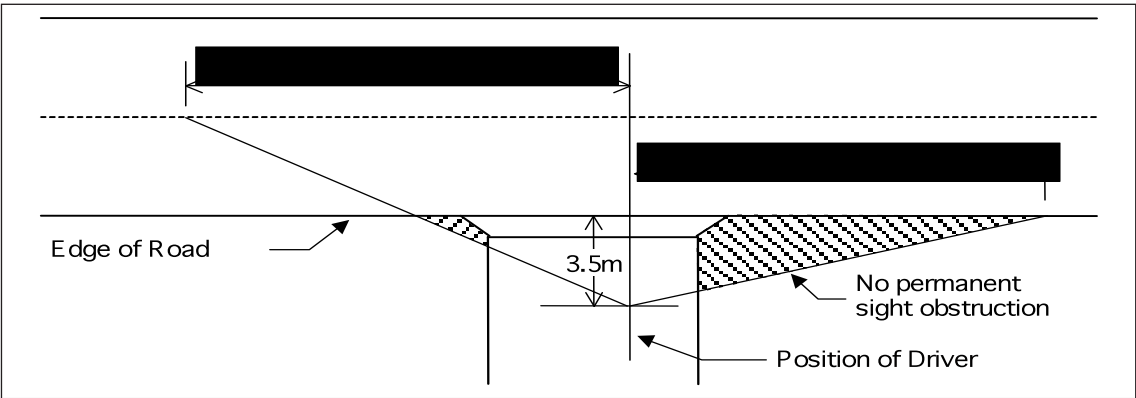


Figure 1 Traffic Sight Distance

Approach Speed of through road (km/hr)	ASD (m) (5 s reaction time)	DSD (m)
40	55	30
50	69	40
60	83	55
70	97	70
80	111	95

Table 3 Traffic Sight Distance

These figures do not include cumulative specific allowance for gradients, variations in road surface, quality of street lighting and similar factors all of which, from a safety point of view must be taken into consideration. Where there are variations to ideal conditions, the applicant must demonstrate that there is sufficient sight distance to enable the driver of a vehicle waiting to exit a property via a footway crossing to select a gap in the through traffic and join the traffic flow without causing a major disruption or conducting an unsafe or illegal manoeuvre. The above table may be used in residential and commercial areas. This is normally the desirable sight distance (DSD). The notes in figure 3.2 of AS2890.1:2004 are to be consulted to determine the sources of the above numbers for residential areas and section 3.4.5 of AS2890.2-2002 for commercial areas.

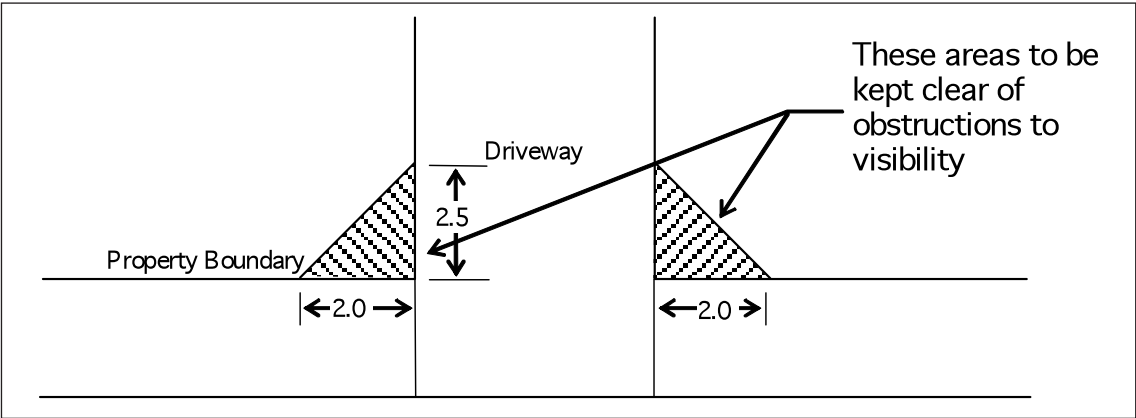


Figure 2 Minimum Sight Lines for Pedestrian Safety

S2.6 Conflicts with Existing Structures or Obstructions

The following points are to be observed with regard to footway crossings and existing structures and/or obstructions.

1. The footway crossing should be located so as not to be influenced by any existing obstruction that may adversely affect sight lines ingress and egress and vehicular and pedestrian safety. Typical obstructions include but are not limited to street trees, earth mounds, bus shelters and overland flow paths.
2. Council may give consideration to moving an existing bus shelter to another location in front of the property, or constructing a new bus shelter in another location, where it will adversely impact on the sight lines of vehicles using the proposed footway crossing. All costs associated with such work will be borne by the applicant.
3. The footway crossing shall be located clear of existing kerb inlet pits. Removing or reducing the length of a pit lintel is not permitted.
4. Provided the pit is not a sag pit, Council may give consideration to moving a kerb inlet pit and lintel to another location in front of the property, in order to facilitate construction of the footway crossover. All costs associated with such work will be borne by the applicant.
5. The footway crossing is not to disturb existing services without permission from the relevant service authority. All costs associated with the services are to be borne by the applicant.

S2.7 Other Traffic Measures

All traffic management measures deemed necessary by Council's traffic engineer and/or the traffic committee are to be provided by the developer to Council's satisfaction.

S3.0 Existing Footway Crossings

S3.1 Using an Existing Footway Crossing

Existing footway crossings slabs and laybacks may only be used:

1. When they provide access to a maximum of two dwellings;
2. The existing crossing is in the correct location, at the correct level and in good condition; and
3. The existing crossing is not a bridge or piped crossing.

Otherwise, the crossing may have to be removed and a new crossing constructed.

S3.2 Disused Footway crossings

Footway crossings slabs, or parts of footway crossings slabs, that become redundant are to be removed and the footway area restored. Disused gutter crossings are to be removed and the kerb reinstated.

Any existing unused gutter crossings and footway crossing slab will also need to be removed, irrespective of the fact that it may have not become redundant as a consequence of the current application.

Removing a disused gutter crossing is generally completed by Council. The applicant may organise for their contractors to do this work only if the total amount of internal concrete driveways and parking areas being constructed exceeds 150 m².

Details for kerb and gutter construction are given in Appendices.

S4.0 Designing Internal Access Roads and Parking Spaces.

S4.1 General

Where the development must provide on-site parking facilities, the design of all parking spaces, circulation roads and manoeuvring areas on the property must conform to the minimum requirements outlined below and the design criteria in AS 2890.1-2004 Parking Facilities, Part1 Offstreet Parking and AS 2890.2 –1989, Part 2, Commercial Vehicle Facilities Part 3 Bicycle parking Facilities. In so far as any inconsistency exists between criteria outlined below and the Australian Standards, the criteria in this document shall apply.

S4.2 Design of Parking Spaces

Parking Spaces for Commercial Vehicle facilities

Parking spaces for commercial vehicles shall comply with AS2890.2-2002.

Parking Spaces in Non Residential Development for Cars and Small Vehicles

The depth of a parking space shall not be less than 5.5 m except in the following cases.

- a. where a vehicle may overhang the end of a space; or
- b. where a space is provided for a small car.

Details of the above exceptions can be found in section 2.4.1 Angle parking spaces of AS2890.1-2004.

The width of a parking space is dependent on the width of the manoeuvring lane and will be in accordance with the following minimum standards for 90 degree angle parking. Parking spaces at other angles may be designed in accordance with AS2890.1-2004 section 2.4 – Design of Parking Modules.

CLEAR WIDTH OF SPACE	CLEAR WIDTH OF MANOEUVRING LANE
2.5 m	7.0 m
2.6 m	6.7 m
2.7 m	6.4 m
2.8 m	6.1 m
more than 2.8 m	6.0 m

Table 4

These widths do not apply for disabled parking spaces, where more stringent criteria are to be applied. Disabled car spaces are to comply with AS2890.6.

The absolute clear width of a parking space shall be 2.4 m and the abs minimum width of a manoeuvring lane shall be 5.8 metres for 90 degree parkin

Where the parking is provided as an undercover space, Council may per reduction of the clear width of parking spaces in accordance with the diagram if columns are setback from the front of the space.

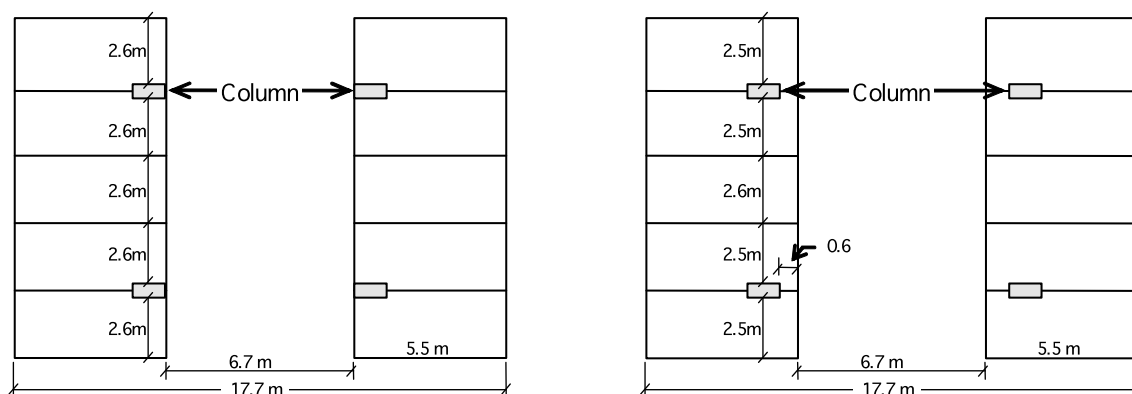


Figure 3

Blind Aisles

Provision shall be made for the sweep of the front of the vehicle where a parking space is perpendicular to the access driveway and has a wall or kerb greater than 150 mm high immediately adjacent the space.

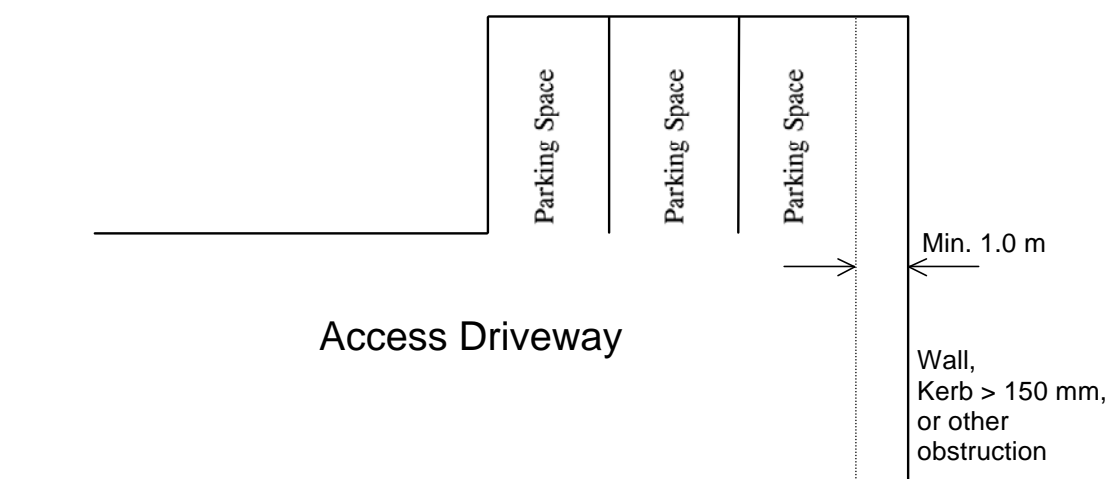


Figure 4

Domestic and Residential Development

- The depth of a parking space shall not be less than 5.5 m.
- The minimum clear width of an enclosed single vehicle garage or undercover parking space shall be 3.0 metres and 2.5 metres for uncovered parking spaces.
- Garage doorway shall have a minimum width of 2.5 metres. A wider doorway be required if there is not sufficient maneuvering space in front of the garage enable a straight entry. Garage widths and turning paths are to comply with t below.
- The absolute minimum width of a maneuvering lane shall be 6.5 metres for 90 degree parking although the lane width will need to increase where the parking space width is less than 2.6 metres in accordance with Figure 5.

OFFSET FROM EDGE OF DRIVEWAY	SINGLE OPENING "X"		DOUBLE OPENING	
	FORWARD	REVERSE	FORWARD	REVERSE
	ENTRY	ENTRY	ENTRY	ENTRY
4.5	4.4	3.6	7.5	6.1
5.0	4.4	3.0	7.5	5.5
5.5	4.4	2.7	7.5	5.2
6.0	4.2	2.4	7.4	5.0
6.5	4.1	2.4	7.2	4.8
7.0	3.8	2.4	7.0	4.8
7.5	3.5	2.4	6.6	4.8
8.0	3.0	2.4	6.1	4.8
8.5	2.5	2.4	5.3	4.5
9.0	2.4	2.4	5.3	4.8
Straight Approach	2.4	2.4	4.8	4.8

Table 5 Garage Opening Widths to Comply with AS2890.1 Section 5.4

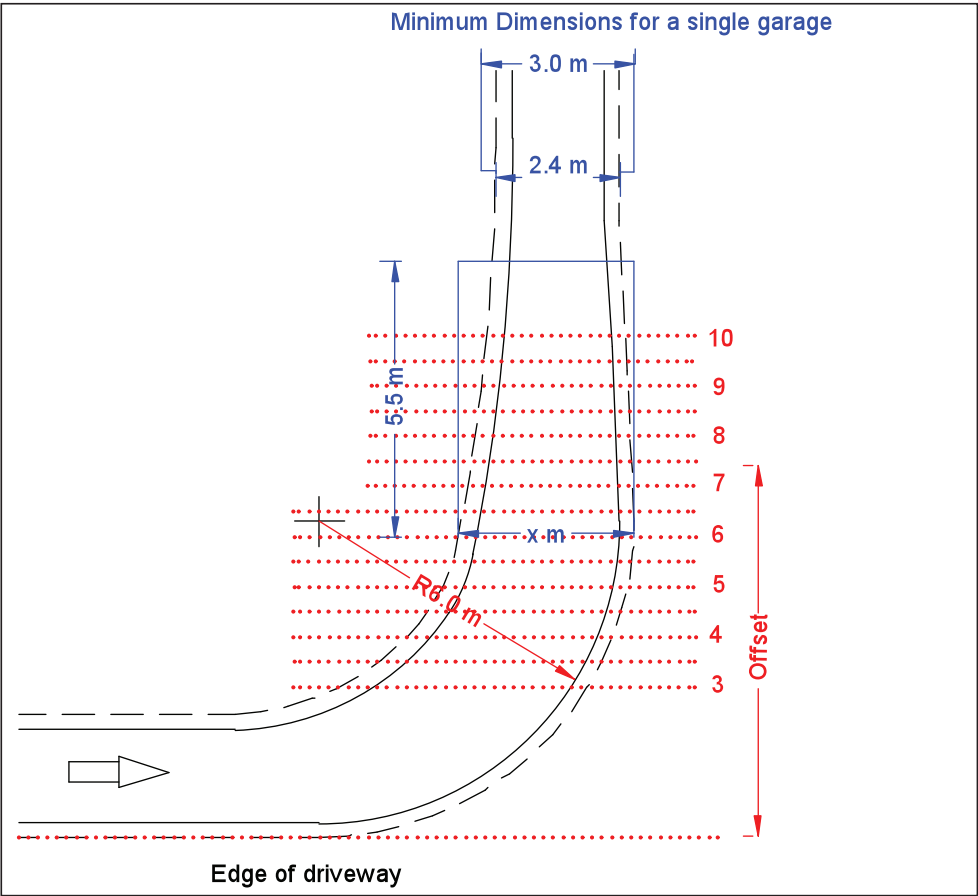


Figure 5

Note: This table of garage opening widths is meant for a general guide only as individual circumstances will vary. The table can also be used to check the opening for recessed garages and carports

Internal Access Road Widths

Provision must be available within the property to enable vehicles (85th percentile vehicle) to enter and leave the designated parking space in a single 3 point turn manouvre.

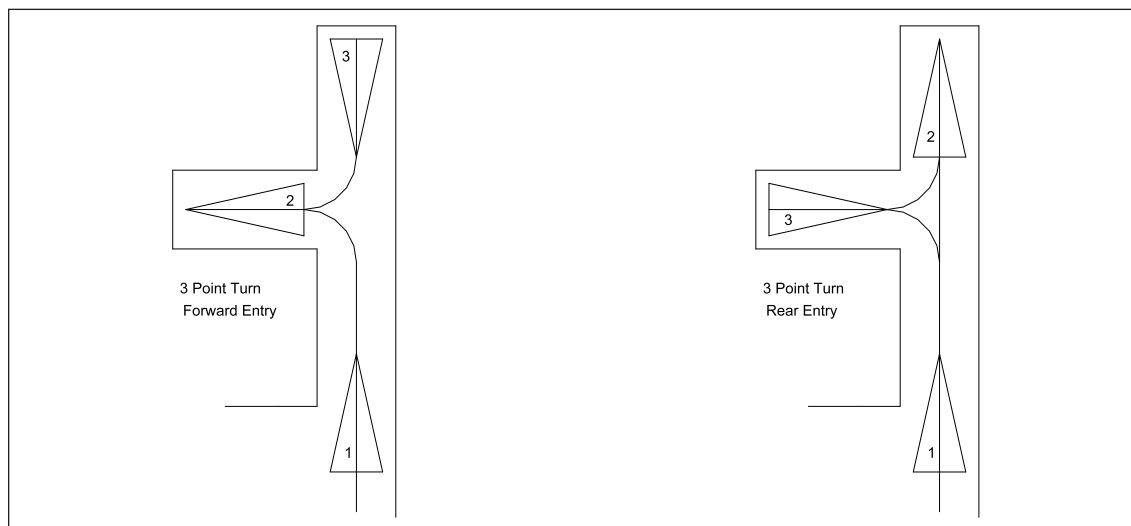


Figure 6 Three Point turns

A 99th percentile vehicle shall be used as disabled vehicle. Vehicles must be able to enter and leave in a forward direction. This provision may be waived where the garage is located at the front of a dwelling and there is insufficient space within the front setback to provide a turning area. Turning templates are supplied in the appendix. A clearance of 300 mm should be added to both sides of the turning path.

In non-residential properties, the minimum carriageway width for one-way roadways or ramps is 2.9 metres and 5.5 metres for two-way roadways or ramps. Where there is to be a kerb or barrier higher than 150 mm and closer than 300 mm from one edge of the roadway, the roadway shall be widened to provide a minimum of 300 mm clearance to the obstruction. If there is to be a high kerb or barrier on both sides, the width increase shall be sufficient to provide 300 mm on both sides.

Residential properties containing more than ten (10) parking spaces shall have lane widths of the same size as non-residential developments.

Residential properties containing 10 vehicle parking spaces or less, shall provide a minimum carriageway width of 3.0 metres however there must be provision for vehicle passing at least every 30 m by way of a passing bay with a minimum carriageway width of 5.5 metres and minimum length of 5.5 metres and suitable transitions.

Concrete wheel strips may be used along straight sections of drive. Wheel strips are inappropriate for use in areas where vehicles are turning. Wheel strips sh 600 mm wide with a 1200 mm separation.

Where the access road circulates, the dimensions shall comply with section AS2890.1 :2004, Design of Circulating Roadways and Ramps.

Gradients for Cars and Small Rigid Trucks

At entry and exit points including along the access driveway are to be designed to minimise entry hazards from the road, account for pedestrian safety and prevent scraping of vehicles.

Parking Spaces

The maximum grade for parking bays shall be:

- measured parallel with the angle of parking - 1 in 20 -5% (1 in 40 = 2.5% for disabled vehicles); and
- measured at 90° to the angle of parking - 1 in 20 (5%).

Access Roads

The minimum grade shall be 1 in 100 (1.0%).

The maximum grade shall be:

- a. Straight ramps:
 - i. 20 m long or more - 1 in 6 (16.7%) if pedestrian access is not obtained at the driveway; and
 - ii. less than 20 m long - 1 in 4 (25%) where pedestrian access is not obtained at the driveway.
- b. Curved ramps - as for straight ramps, except the grade shall be measured along the inside edge of the carriageway; and
- c. Changes of Grade- 1 in 8 (12.5%). Where this change is exceeded, transition sections will be required. These are to be a minimum length of 2.0 metres. On complex transitions the ground clearance templates in the appendix may be used to check access.

The maximum cross-fall on an internal roadway shall be 5%.

Pedestrians

Where the driveway is the sole pedestrian access to a building, the following maximum grades shall apply:

- a. 20 m long or more - 1 in 8 (12.5%); and
- b. less than 20 m long - 1 in 6 (16.7%).

The above standard does not apply to buildings with high public usage and and disabled housing developments. These developments must provide pedestr access in accordance with the requirements of AS 1428.1 – 1998.

Driveway profiles for maximum rise and fall are shown in the appendix. Council is to be consulted and a vehicular crossing application made to obtain driveway levels.

Headroom

For car and light van access into dwellings the height between the floor and an overhead obstruction shall be a minimum of 2200 mm. Headroom at a driveway change is grade at the garage entry shall be measured as shown in figure 5.3 of AS2890. 1:2004.

Applicants should ensure that provision for pipes, ducts and sprinkler systems within the car park does not compromise minimum clearances.

S4.2 Construction Standards

Construction Standard for Crossover Slabs

Suitable Materials

Vehicle footway crossing slabs are to be constructed of:

- plain concrete with a 28 day compressive strength of 25 mpa;
- coloured or patterned concrete with a 28 day compressive strength of 25 mpa; or
- concrete pavers.

The applicant is to be aware that any future restoration of the footway crossing carried out by Council or another service authority will be in plain concrete. The extent of restoration will be limited to the area damaged. Generally it will not extend to replacing the entire footway crossing slab.

Thickness

Concrete slabs shall be constructed in accordance with the following thicknesses:

Up to two dwellings	125 mm thick, unreinforced
more than two dwellings, Commercial, Light Industrial	150 mm thick + 1 layer of F62 fabric
Major Commercial / Heavy Industrial	175 mm thick + 1 layer F72 fabric

Reinforcing shall have approximately 40 mm top cover and should be supported during construction by bar chairs at 1-metre centres. The reinforcement should not be continuous through a control joint.

A 50 mm thick granular su-base shall be provided under all footway crossings.

Mastic joints 5 mm thick are to be provided at the property boundary and at the rear of the gutter crossing (layback). Dummy joints shall be provided at either side of the footway where applicable.

Pavers shall be a minimum 75 mm thick laid on a 100 mm unreinforced concrete base with a 30 mm layer of sand between the pavers and the concrete. A hard wood or concrete edge restraint is to be provided.

Pervious pavers will not be permitted on driveways unless they are laid strictly in accordance with specifications approved by Council. This generally requires a selected subgrade material up to 500 mm deep to permit satisfactory subsurface drainage.

Finish

Concrete crossovers should usually have a broom finish unless it has a gradient steeper than 1 (vertical) to 5 (horizontal) when it should be finished with a wooden float. The finish is to be a uniform, non-slip surface. All edges are to be rounded with a 75 mm edging tool.

Any damaged, defaced or otherwise unsatisfactory section shall be removed and replaced.

All footway crossings should have slip resistance appropriate for the pavement slopes as required by AS3661 .1. The relative level of adjacent pavers should not be greater than 5 mm, and gaps between pavers or in patterned concrete slabs, no greater than 3 mm. The finish is not to constitute a hazard to pedestrians.

Levels

The levels of the footway crossing must be in accordance with property alignment levels issued by Council. No internal driveways adjacent the proposed footway crossing should be constructed prior to issuing of alignment levels. If the proposed driveway levels on any approved building plans do not conform to the levels prepared by Council, the property alignment levels prepared by Council shall apply.

Altering Public Footway Levels

Where the property alignment levels issued by Council differ from the existing footway levels, the surrounding footway area must be regraded to satisfactorily marry into the new footway crossing. The minimum extent of footway which must be regraded is determined using the design constraints outlined below:

1. the maximum change of grade along the footway is to be 1 in 10 with a minimum segment length of 4.0 metres;
2. the maximum longitudinal grade of the footway is to be 1 in 6;
3. if it is impractical to achieve the above maximum grade, consideration will be given to permit installation of stairs within the footway;
4. if it was necessary to increase the footpath grade, and the longitudinal grade of the footpath exceeds 1 in 8, then concrete footpaving will need to be constructed over the regraded section of footway;
5. if access to adjoining private properties is affected by the footway regrading, all work necessary shall be done within those properties to ensure satisfactory pedestrian and vehicular access is restored. If work is to be undertaken within an adjoining property it will be necessary to obtain written consent from the adjoining property owner/s that they will permit the applicant (or applicant's agents) to enter their property in order to undertake all work necessary to ensure vehicles and pedestrians have satisfactory access to the property following regrading of footpath. The letter of consent must be submitted to the Principal Certifying Authority (PCA) prior to issuing of the Construction Certificate for the building works;
6. all mains, services, poles, footpath paving etc that require alteration shall be altered at the applicant's expense to the satisfaction of Council and the relevant authority;
7. where the alteration of a house service is required, it is to be carried out by a suitably experienced tradesperson. Twenty-four (24) hours notice shall be given to the affected property owner before their service is affected;
8. in the case of public utility mains, if a main must be raised, lowered, or relocated, the applicant shall liaise with the relevant Authority to organise the alteration and undertake all work to the satisfaction of that Authority; and
9. the applicant shall arrange with the relevant authority for the alteration of all surface fittings of all services that are affected by the new finished surface levels.

If the ground level of the property adjacent the footpath is above or below the finished level of the footway then adequate measures must be taken to support the land by constructing either earth batters or retaining structures. These are to be fully contained within the property and are not to encroach onto the public footway.

Where retaining of an adjoining property is necessary as a consequence of regrading the footway, written permission from the affected property owner(s) to enter their property and undertake such work must be submitted to the Principle Certifying Authority (PCA) prior to issuing of the Construction Certificate for the building works.

Construction Standard for Footways

Material for filling shall be clean fill consisting of not less than 70 per cent granular material and must be free from vegetation, stumps, roots, rubbish, and other deleterious material. Where excavation in rock is necessary, the rock shall be removed to a depth of 100 mm below finished surface level.

A 75 mm layer of topsoil is to be placed over the footway. The topsoil is to contain less than 40% clay. Clods in the topsoil shall not be greater than 50 mm Φ . The minimum finished grade should be 1%. There should be no localised depressions that may pond, or concentrate rainwater.

Couch, kikuyu and Buffalo turf to match pre-existing grass types, is to be laid over all areas of exposed soil.

Construction Standard for Gutter Crossings

Generally, gutter crossings may only be constructed or extended by Council. The applicant may organise for their contractors to do this work only if the total amount of internal concrete driveways and parking areas being constructed exceeds 150 m².

Gutter crossings (laybacks) shall be constructed in plain concrete in accordance with the design shown on plan M 421 in the appendix. Finish shall be wood float or broom with a 75 mm edging. Detailed construction standards are outlined in Part 8.4 Public Civil Works of this DCP.

Bridge crossings will no longer be permitted; except in cases where the Council considers that it is not practical to construct a standard layback.

Construction of Internal Access Roads

General

Internal pavements for residential developments consisting of single dwellings or multiple dwellings shall be in accordance AS 3727-1993 Guide to Residential Pavement. Extracts from this standard are provided below. Pavements that will carry heavy vehicles or significant traffic volumes shall be designed in accordance with the AustRoads "Pavement Design" manual (AustRoads 1992) or the Clay Brick & Paver Institute publication "Specifying and Laying Clay Pavers".

Concrete Pavements

Typical slab thickness, concrete grade, joint spacing and reinforcement should be in accordance with the table below.

Traffic	Min Slab Thickness	Min Concrete Grade	Alternative 1 Max. Control Joint Spacing	Min Reo Fabric	Alternative 2 Max. Control joint Spacing	Min Reo Fabric	Alternative 3 Max. Control joint Spacing	Min Reo Fabric
Light Traffic - Use by no more than two Dwellings	100	N20	2	-	3	F52	6	F62
Medium Residential Traffic Light/Industrial Commercial	150	N25	2	-	4	F72	6	F82
Heavy Industrial/Commercial	See AustRoad Manual							

Table 6 Concrete Pavements

Note: Slab thickness is measured from the underside of the slab to the bottom of any top surface patterning.

Reinforcing shall have approximately 40 mm top cover and should be supported during construction by bar chairs at 1 metre centres. The reinforcement should not be continuous through a control joint. Where the slab surrounds another structure such as a drainage pit, trimming reinforcement should be used. Trimming reinforcement should be not less than one Y12 bar of minimum length 600 mm.

Control joints shall have spacings no greater than shown in the table above. They shall be constructed by formwork between concrete pours, or creating a place of weakness to a depth of one third to one quarter of the pavement thickness. Mastic isolation joints should be provided where a pavement adjoins a building or other rigid structure such as a drainage pit.

Segmental Pavements

Typical thickness of base-courses and required breaking load for paver units shall be as follows:

Traffic	Compacted Base-course Thickness	Min. Breaking load of paving units
Light Traffic - Use by no more than two Dwellings	75	3
Medium Residential Traffic	150	5
Other	See "Specifying and	Laying Clay Pavers"

Table 7 Segmental Pavements

The sand bedding course shall be of roughly uniform thickness and not exceed 30 mm after compaction.

Pavers should have a nominal 3 mm joints between the units. Joints should be filled with an appropriate sand.

The entire perimeter of segmental pavements should be provided with lateral edge restraints.

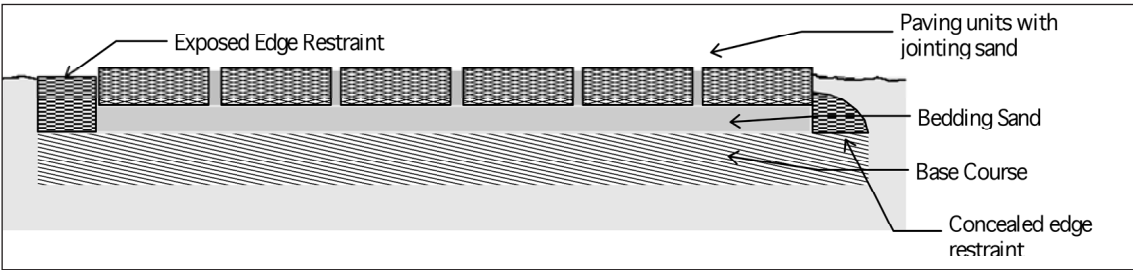


Figure 7 Segmental Pavements

Gravel Pavement

Gravel driveways are inappropriate for use in the Ryde area due to the low permeability of the underlying soils. Gravel may be used as a finish treatment over a concrete driveway provided the driveway grade does not exceed 5% and edge restraints are provided to ensure the gravel is not washed from the drive.

External Appearance

The external appearance of any car parking structure or area shall be of an acceptable standard and finish when viewed from the street. Setbacks from the front facade and landscaping should be used to soften the impact of such areas. Unpaved car parking will not be permitted.

Landscaping

A landscaped strip of between 1.5 metres and 3.0 metres along the frontage to a street or other public property will be required. A greater landscaped strip may be required to screen multi level carparks.

In order to reduce the amount of hardstanding areas within an open carpark and provide shade to vehicles. A landscaping strip having a minimum area of 6 m² (minimum 1.5 metre width and 3 metres long) is to be established for every ten (10) car parking spaces.

Such landscaping strips are to be established and maintained with appropriate planting of shrubs and shade trees.

A detailed landscaping plan shall be submitted as part of the Development Application for Council's consideration and approval. The landscape plan shall:

- a. Be prepared by a suitably qualified person and be of a minimum scale of 1:100;
- b. Ensure that trees and shrubs will have an informal and softening effect on buildings and the overall environment. Trees should be planted in sufficient numbers to achieve this aim;
- c. Ensure that any on-site stormwater detention system is complementary to and corresponds with the proposed landscape treatment;
- d. Screen and shade private open spaces;
- e. Provide privacy to occupants of neighbouring properties;
- f. Screen poor views;
- g. Be easily maintained;
- h. Where possible, use Australian native plants, particularly material indigenous to the area; and
- i. Provide for street trees consistent with, and complementary to existing trees at 6 metre centres within the footpath area at the front of the property.

S4.4 Standards Enforcement

Checking Design

Plans submitted to the principle certifying authority should show;

- the location of all driveways and carparking spaces;
- existing gutter levels at either side of the footway crossing;
- the level of all proposed carparking spaces; and
- construction details of the crossover.

The certifier will check:

- the location to ensure compliance with the development standards; and
- levels of the garage against the property alignment levels to ensure access can be achieved without exceeding maximum permissible grades or grade changes.

Inspections

A compliance certificate must be obtained following placement of formwork and re-inforcement, if applicable, but prior to pouring of concrete. The certifier will check:

- thickness and layout of formwork;
- suitability of subgrade treatment;
- crossover location and width; and
- crossover levels.

A compliance certificate must be obtained upon completion of the driveway. The certifier will check:

- quality of the finish;
- all disused driveways have been removed. If footway regrading was undertaken the certifier will check;
- the levels of the footway; and
- suitability of the transitions to the existing footway levels.

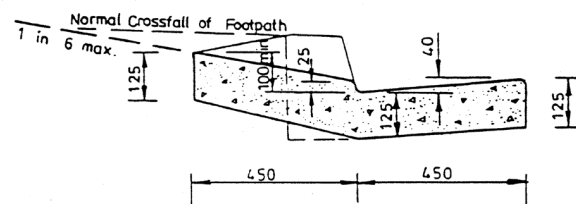
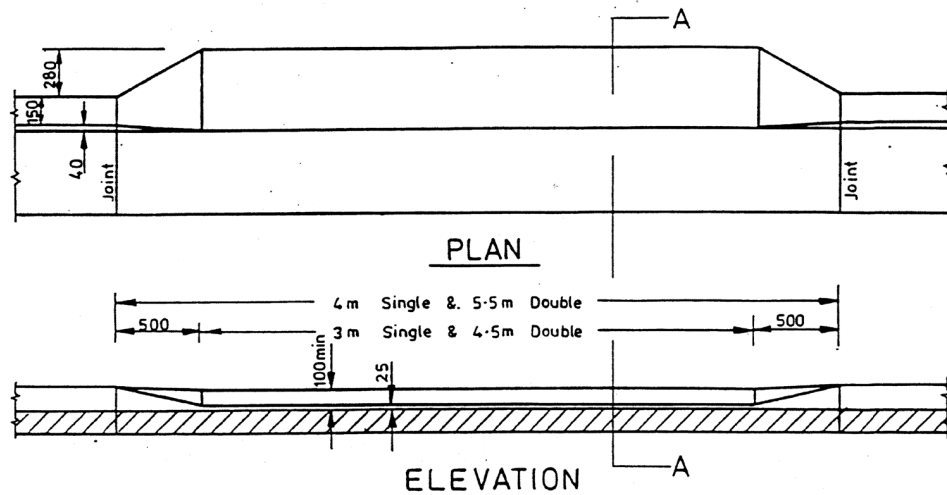
Where new turf has been laid, a further compliance certificate will be necessary two (2) months after the turf has been laid on the public footpath. The certifier will check:

- the finished level of the footway adjacent the kerb is not below the top of kerb;
- there is no step down from any footpaving or driveway crossings to the finished level of the footway;
- there are no localised depressions where water may pond or flows may be concentrated; and
- there are no areas of dead turf.

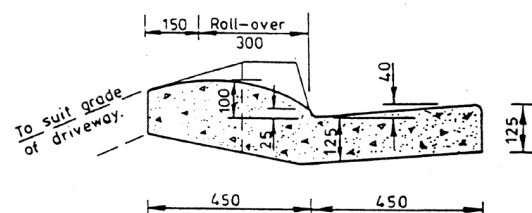
The building security deposit will not be refunded until this compliance certificate is obtained.

If the development standard is not met, the unsatisfactory components of the driveway will need to be removed and reconstructed. Unsatisfactory sections of regarded footway will need to be repaired. If turf is dead, it will need to be replaced and maintained by the applicant for a further two month period after which, a further compliance certificate is required.

APPENDICES

STANDARD VEHICULAR CROSSING

SECTION A-A
STANDARD GUTTER CROSSING
(LAYBACK)

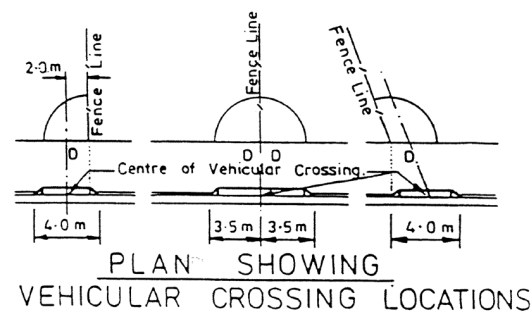


ROLL OVER GUTTER CROSSING

For Low Level Footpaths.

NOTES:

1. All corners to have 25 radius
2. Kerb on returns, Circles and Cul-de-Sacs to have vertical faces.
3. Heavy duty gutter crossing to be 150 thick and reinforced with one layer F 62 Fabric.
4. Gutter Crossing in roads carrying industrial traffic to be 150 thick at the outer edge.
5. Compression strength of concrete to be not less than 25 mpa. at 28 days.
6. The road base course is to be extended beneath the kerb and gutter.
7. Mastic expansion joints to be placed at no more than 6m and not less than 4m intervals.
8. For complete details see Councils full specification N° 4.
9. This plan replaces Councils previous standards plan Nos. M85, M185, M224, and M405
10. See plan N° for grades of footpath crossings.
11. Under exceptional circumstances the roll over gutter crossing may be reduced to 75mm above gutter invert.

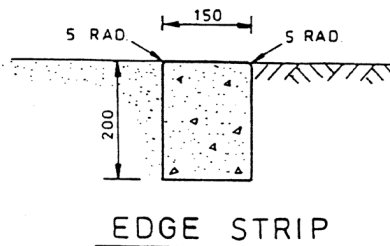
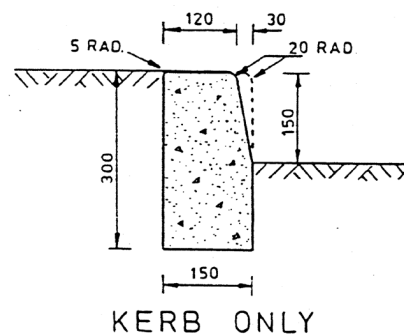
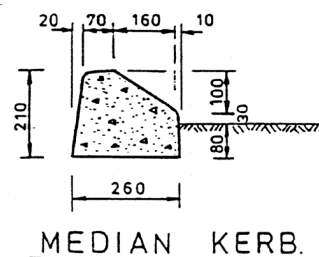
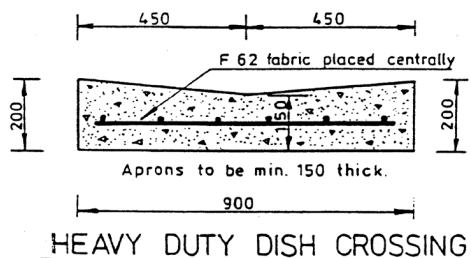
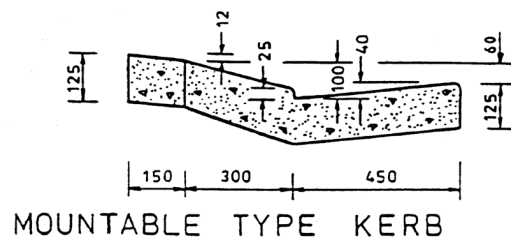
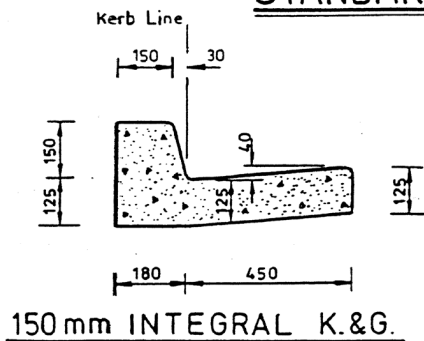


PLAN SHOWING
VEHICULAR CROSSING LOCATIONS

M. 421

Plan M.421 Standard Vehicle Crossing

STANDARD KERBS & GUTTERS



NOTES:

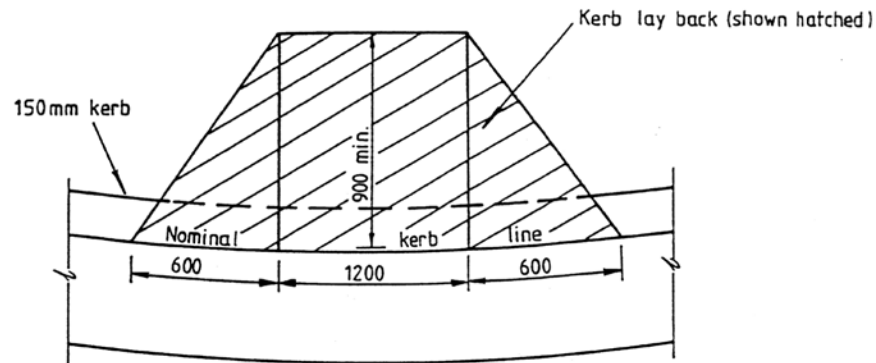
1. All corners to have 25 radius.
2. Kerb on returns, Circles and Cul-de-Sacs to have vertical faces.
3. Heavy duty gutter crossings to be 150 thick and reinforced with one layer F 62 Fabric.
4. Gutter Crossings in roads carrying industrial traffic to be 150 thick at the outer edge.
5. Compression strength of concrete to be not less than 25mpa. at 28 days.
6. The road base course is to be extended beneath the kerb and gutter.
7. Mastic expansion joints to be placed at no more than 6m and not less than 4m intervals.
8. For complete details see Councils full specification N° 4.
9. This plan replaces Councils previous standards plan Nos. M85, M185, M224 and M405.

10. Where conduits are placed prior to kerb construction the face of kerb shall be marked as required in specification N° 3.

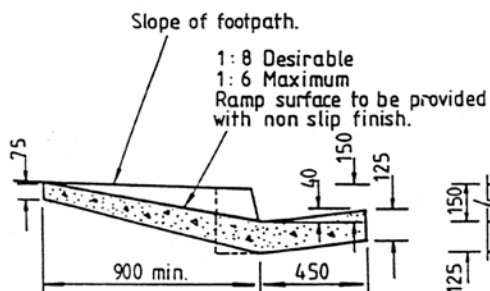
M. 422

Plan M.422 Standard Kerb and Gutters

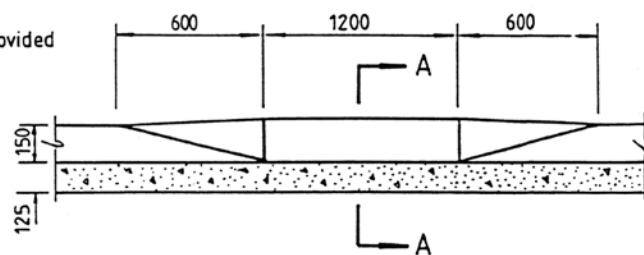
STANDARD KERB RAMP



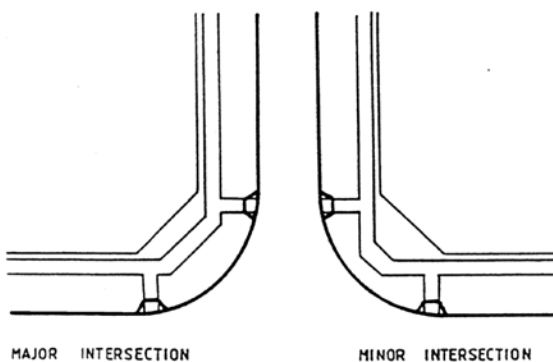
PLAN



CROSS SECTION A-A



ELEVATION



MAJOR INTERSECTION

MINOR INTERSECTION

PLAN SHOWING KERB
RAMP CROSSING
(DIAGRAMMATIC ONLY)

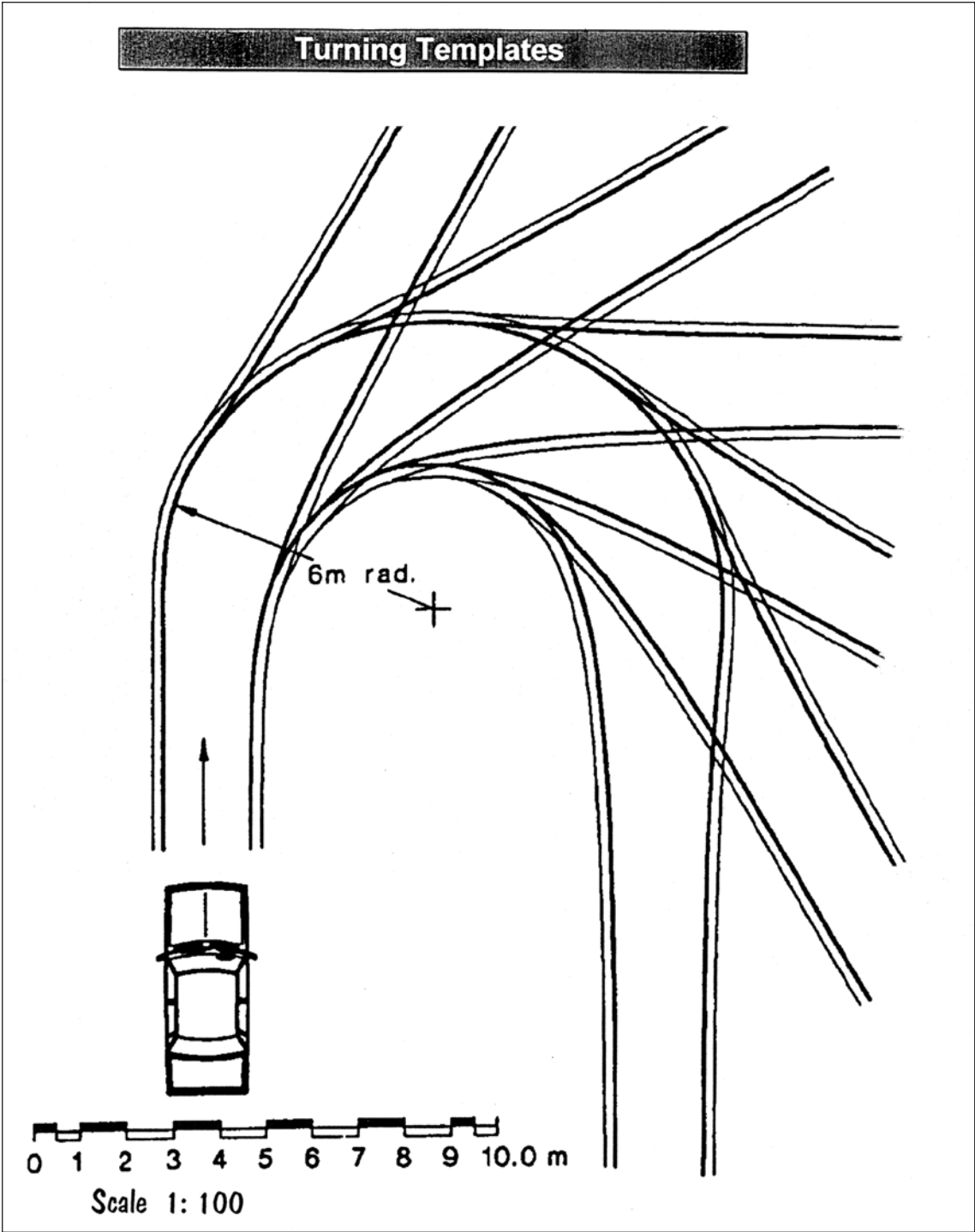
NOTES:

1. Kerb ramps shall be constructed at all road intersections and in front of pathways. Where the specified construction of the road kerb height varies from the 150 mm dimension shown on this drawing the depth of the kerb ramp into the footpath shall be adjusted from the 900 mm minimum to a minimum depth of six (6) times the specified kerb height.
2. Kerb ramps to be laid on a well compacted fine crushed rock base minimum thickness 50 mm.
3. Concrete to be of 25 MPa compressive strength (F_c) at 28 days.

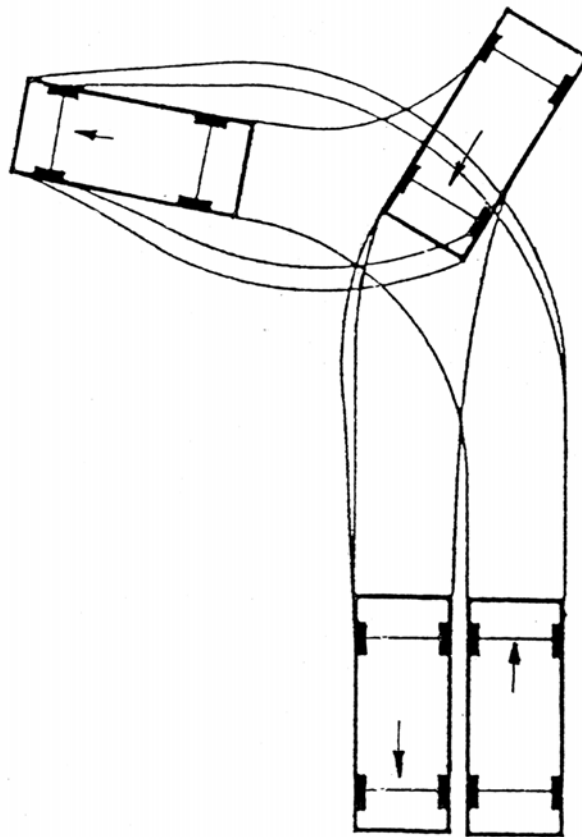
PLAN N°

M 388 c

Plan M.388c Standard Kerb Ramp



Vehicle Turning Templates according to AS290.1:2004 and AS2890.2-2002

Turning Templates**Three Point Turn****Scale 1: 100**

Vehicle Turning Templates according to AS290.1:2004 and AS2890.2-2002



City of Ryde
Civic Centre
1 Devlin Street
Ryde NSW 2112

www.ryde.nsw.gov.au

City of Ryde Development Control Plan 2014

Part: 8.4 Title Encumbrances

SCHEDULE 1 TITLE ENCUMBRANCES TECHNICAL MATERIAL – is currently under review by Council. A webpage providing information on matters relating Schedule 1 i.e. information sheets and examples will soon be available.

Please contact Council's Building and Development Advisory Service on 9952 8222 with respect to all matters contained within the Schedule.

Translation

ENGLISH

If you do not understand this document please come to Ryde Civic Centre, 1 Devlin Street, Ryde Monday to Friday 8.30am to 4.30pm or telephone the Telephone and Interpreting Service on 131 450 and ask an interpreter to contact the City of Ryde for you on 9952 8222.

ARABIC

إننا نعتذر عليك فهم محتويات هذه الوثيقة، نرجو للحضور إلى مركز بلدية رايد Ryde Civic Centre على العنوان: 1 Devlin Street, Ryde من الاثنين إلى الجمعة بين الساعة 8.30 صباحاً والساعة 4.30 بعد الظهر أو الاتصال بمكتب خدمات الترجمة على الرقم 131 450 لكي تطلب من أحد المترجمين الاتصال بمجلس مدينة رايد، على الرقم 9952 8222، نيابة عنك.

ARMENIAN

Եթէ այս գրութիւնը չէք հասկնար, խնդրեմ եկէք՝ Բայր Սիվիլ Ենթըր, 1 Տելվին փողոց, Բայր, (Ryde Civic Centre, 1 Devlin Street, Ryde) Երկուշաբթիէն Ուրբաթ կ.ա. ժամը 8.30 – կ.ե. ժամը 4.30, կամ հեռաձայնեցէք Հեռաձայնի եւ Թարգմանական Սպասարկութեան՝ 131 450, եւ խնդրեցէք որ թարգմանիչ մը Բայր Քաղաքապետարանին հետ կապ հաստատուէ ձեզի համար, հեռաձայնելով՝ 9952 8222 թիվի:

CHINESE

如果您看不懂本文，請在周一至周五上午 8 時 30 分至下午 4 時 30 分前往 Ryde 市政中心詢問 (Ryde Civic Centre, 地址: 1 Devlin Street, Ryde)。你也可以打電話至電話傳譯服務中心，電話號碼是: 131 450。接通後你可以要求一位傳譯員為你打如下電話和 Ryde 市政廳聯繫，電話是: 9952 8222。

FARSI

اگر این مدرک را نمی فهمید لطفاً از 8.30 صبح تا 4.30 بعد از ظهر دوشنبه تا جمعه به مرکز شهرداری رايد، Ryde Civic Centre, 1 Devlin Street, Ryde مراجعه کنید یا به سرویس مترجم تلفنی، شماره 131 450 تلفن بزنید و از یک مترجم بخواهید که از طرف شما با شهرداری رايد، شماره 9952 8222 تلفن بزند.

ITALIAN

Se non capite il presente documento, siete pregati di rivolgervi al Ryde Civic Centre al n. 1 di Devlin Street, Ryde, dalle 8.30 alle 16.30, dal lunedì al venerdì; oppure potete chiamare il Telephone Translating and Interpreting Service al 131 450 e chiedere all'interprete di contattare a vostro nome il Municipio di Ryde presso il 9952 8222.

KOREAN

이 문서가 무슨 의미인지 모르실 경우에는 1 Devlin Street, Ryde 에 있는 Ryde Civic Centre 로 오시거나 (월 – 금, 오전 8:30 – 오후 4:30), 전화 131 450 번으로 전화 통역 서비스에 연락하셔서 통역사에게 여러분 대신 Ryde 시청에 전화 9952 8222 번으로 연락을 부탁드립니다.

Amend. No.	Date approved	Effective date	Subject of amendment

Table of Contents

1.0	GENERAL INFORMATION	5
1.1	Objectives	5
1.2	Application	5
2.0	STORMWATER DRAINAGE	6
2.1	Easements in Gross	6
2.1.1	Easements to Drain Private Property	6
2.1.2	Council Drainage Easements	7
2.1.3	Building near or over a Drainage Easement	8
2.1.4	Existing Encroachments onto an Easement	8
3.0	RESTRICTIONS ON USE OF LAND	9
3.1	Provision for Overland Flow	9
3.1.1	When such a restriction will be imposed	9
3.1.2	Land Affected by the Restriction	9
3.2	Limitation of Site Cover	9
3.2.1	When such a restriction will be imposed	9
3.3	Creating the Restriction on use of Land	9
3.4	Releasing or Modifying the Restriction	9
4.0	POSITIVE COVENANTS	10
4.1	Maintenance of On-Site Stormwater Detention Systems	10
4.2	Maintenance of Charged Stormwater Drainage Systems	10
4.3	Maintenance of Pump out Systems	10
4.4	Maintenance of On-site Dispersal Systems	10
4.5	Creating a Positive Covenant	10
4.6	Rights and Obligations	10
4.7	Certificate of Amount Due	11
5.0	SERVICES	12
6.0	ACCESS	13
6.1	Right of Carriageway	13

Table of Contents

7.0	LAND DEDICATIONS	14
7.1	General	14
7.2	Splay Corners	14
7.3	Road Widening	14
7.4	Footway Widening	14
7.5	New Public Road Dedications	14
7.6	Public Open Space Dedications	14
SCHEDULE 1:	TITLE ENCUMBRANCES TECHNICAL MATERIAL	15
S1.0	General Information	15
S1.1	Objectives	15
S2.0	Stormwater Drainage	15
S2.1	Easements in Gross	15
S3.0	Restrictions on Use of Land	19
S3.1	Provision for Overland Flow	19
S3.2	Limitation of Site Cover	19
S3.3	Creating the Restriction on use of Land	19
S3.4	Releasing or Modifying the Restriction	19
S4.0	Positive Covenants	19
S4.1	Maintenance of On-Site Stormwater Detention Systems	19
S4.2	Maintenance of Charged Stormwater Drainage Systems	20
S4.3	Maintenance of Pump out Systems	20
S4.4	Maintenance of On-site Dispersal Systems	21
S4.5	Creating a Positive Covenant	21
S4.6	Rights and Obligations	22
S5.0	Services	22
S6.0	Access	23
S6.1	Right of Carriageway or Footway	23
S7.0	Land Dedications	23
S7.1	General	23
S7.2	Splay Corners	23
S7.3	Road Widening	24
S7.4	Footway Widening	24
S7.5	New Public Road Dedications	24
S7.6	Public Open Space Dedications	24
APPENDICES		25

1.0 GENERAL INFORMATION

This part shall be read in conjunction with the Title Encumbrance Technical Material (refer Schedule attached to this Part) which provides detailed text of the encumbrances to be applied.

1.1 Objectives

Objectives

1. To provide guidelines for the preparation of legal documentation to be attached to property titles.
2. To ensure consistency in the application of the title encumbrances.

1.2 Application

This Part applies to:

- a. New buildings and subdivisions; and
- b. Alterations and additions to any existing building, whether or not such additions or alterations involve any change in the purpose for which such buildings are used.

2.0 STORMWATER DRAINAGE

2.1 Easements in Gross

2.1.1 Easements to Drain Private Property

Common law obligations require that nothing be done on one property that would cause nuisance on another. Changing the natural pattern of stormwater runoff by increasing the amount or rate of runoff, or redirecting the runoff, has the potential to create this nuisance. Practically all property improvements will affect stormwater runoff to some extent and therefore provision must be made to ensure these site modifications do not adversely affect surrounding properties.

Minimum standards regarding the treatment of stormwater runoff from properties improvements are outlined in Part 8.2 Stormwater Management under this DCP.

Where it is necessary to convey collected stormwater runoff from one lot through another, an easement must exist on the downstream lot that confers rights to the upstream lot to drain water through it.

The standard easement used for this purpose is an Easement for drainage of water. The rights and obligations associated with an easement of this type are provided in the technical manual.

Interallotment drainage easements should be described as an Easement for drainage of water. Describing an easement in this way on the instrument has the same affect as inserting the words given above.

This form of easement replaces the earlier Easement to drain water.

Interallotment drainage easements shall benefit individual lots only and not list Council as a beneficiary.

Creation of Private Drainage Easements

Where an interallotment drainage easement must be created to facilitate a development, it is the responsibility of the applicant to negotiate with affected property owners to secure an easement.

Property owners are under no legal obligation to burden their lots with an easement for interallotment drainage unless they have been required to do so by the Supreme Court exercising the powers available to it under Section 88K of the *Conveyancing Act 1919* as amended, or required to do so by way of a condition of development consent.

Where an easement is required to allow suitable disposal of collected stormwater runoff from the property, a letter of agreement from the affected property owner(s) shall support the Local Development Application to demonstrate to Council that a suitable easement can be obtained. The Construction Certificate cannot be issued until the easement has been prepared by a registered surveyor and has been lodged with the Land Titles Office for registration.

Using an Existing Private Drainage Easement

Where it is proposed to discharge collected runoff to an existing pipeline that passes through an adjoining lot or to lay a new pipe within an existing easement interallotment drainage easement, the applicant shall submit to Council information from the Land Titles Office to indicate the subject property enjoys rights to use the interallotment drainage system. This information must be received before Council will issue a Local Development Consent on the lot.

Width of Private Drainage Easements

The width of an easement for an interallotment drainage line shall be in accordance with Part 8.2 Section 4 of this DCP.

2.1.2 Council Drainage Easements

Council has rights under Section 186 of the *Local Government Act 1993* to require the creation of an easement in its favour for the purpose of undertaking any of its functions as defined in the *Local Government Act*.

Council drainage easements will be required over all pipes or channels that convey runoff from a public park, road reserve or other public owned land.

Where a drainage easement is to be created as a condition of development consent, all costs associated with the creation of that easement shall be borne by the applicant.

Standard words for use in describing a Council drainage easement in the relevant instrument are provided in the technical manual.

Widths and location of a Council Drainage Easement

The required width of an easement shall be in accordance with details in Council's Title Encumbrances Technical Material (refer Schedule attached to this Part).

Existing easements that do not comply with this minimum standard will be required to modify the existing easement so as to comply with these minima.

The easement is to be positioned to ensure the pipe is centrally located within the easement. This standard may be modified at Council's discretion if the edge of the easement is in the same alignment as a property boundary and the pipeline is wholly contained within the easement.

Locating pipes

The exact location of a Council pipeline upon the lot should be confirmed by a registered surveyor. It should not be assumed that the pipe will be wholly located within the easement.

If buildings or footings are to be constructed within 2.0 metres of the edge of a Council drainage easement, the location and depth of the pipe must be ascertained by a registered surveyor and the information submitted to the Principle Certifying Authority along with the building plans for the work.

Relocating Pipes and Drainage Easements

Council may consent to the relocation of an existing Council pipeline through a property. Issues that will be considered will include, but not be limited to:

- the hydraulic efficiency of the re-routed system;
- the potential for blockages within the system;
- the management of overland flow; and
- costs associated with ongoing maintenance of the stormwater asset.

Should Council consent to a relocation of the pipeline, all associated design, relocation and legal costs shall be borne by the applicant.

A Council drainage easement shall be created over the new line of the pipe and any redundant easements shall be extinguished.

Release of Easements

Council will consent to releasing or extinguishing a drainage easement if it can be demonstrated that it is redundant to existing or future stormwater management needs. Any requests of this nature must be in writing and all costs associated with the extinguishment shall be borne by the applicant.

2.1.3 Building near or over a Drainage Easement

Council will not consent to permit any construction over a council drainage easement that will prevent or hamper constructing, reconstructing, maintaining, repairing, cleansing or gaining access to the pipes or easement. In this regard, no encroachments will be permitted within an 8.0m zone measured from the finished ground level over the pipeline. This shall include eaves and balconies.

The clear height restriction of 8.0 metres may need to be increased to account for issues such as very large pipes or restricted working spaces.

On-ground vehicular driveways and landscaped areas will typically be permitted over an easement however the structural stability of any existing pipelines may be considered before consent is given to an application that proposes to introduce additional live loads to the Council pipeline. Similar considerations will be made when it is proposed to reduce cover over the pipe.

Demountable carports and other easily removal structures that do not involve usable floor space, have been approved over Council drainage easements. If approval for such a structure is granted, the owner would need place a "Public Positive Covenant" on the title of the lot indicating that the property owner will remove the structure at their own expense if Council deems it necessary for the purposes of accessing the easement. Any such approvals will not extinguish or limit Council's rights under the easement. Pedestrian and vehicular bridges may be permitted to encroach an easement provided they can be easily removed to facilitate access to the easement and suitable alternate vehicular and pedestrian access to the property exists if they were removed.

Masonry walls constructed across an easement must cross the easement at an angle of not less than 60°. The section of wall spanning the easement shall be constructed to enable its easy removal without resulting in failure of the remainder of the structure.

All footings for buildings and other structures shall be taken a minimum of 1.0 times the pipe diameter below the load bearing zone of the existing pipe. This condition shall apply even when the pipe is location upon an adjoining property.

2.1.4 Existing Encroachments onto an Easement

Any time there is an existing, unsuitable encroachment onto a drainage easement, Council will take the opportunity to have that encroachment removed if and when it is presented.

Where an existing building encroaches onto an easement or Council drainage line, Council will not issue a Local Development Approval on the property where it involves significant capital expenditure to that building or any other application on that property that may reduce or delay the opportunity being presented for Council to have the encroachment removed.

3.0 RESTRICTIONS ON USE OF LAND

3.1 Provision for Overland Flow

3.1.1 When such a restriction will be imposed

If the property is subjected to overland flow associated with Council's 'major drainage system' (ie the path taken by stormwater when the capacity of Council's piped drainage system is exceeded), this flow path will generally need to be protected against blockage by the creation of a "restriction as to use". Such a restriction will be required as a condition of Local Development Consent when the proposed development is considered to be of such a nature that the potential for blockage is increased, or there is a need to highlight the site constraints to future property owners.

3.1.2 Land Affected by the Restriction

Council officers to determine extent of property affected by Restriction.

The path and characteristics of the overland flow through the property shall be determined by the applicant's consulting hydraulic engineer. The area of land affected by the restriction will be determined by Council having regard to existing flow paths, flow depths and velocities.

3.2 Limitation of Site Cover

3.2.1 When such a restriction will be imposed

Where a property is unable to drain stormwater to a Council drainage system and an on-site stormwater dispersal system is approved by Council. The built upon area of the site shall be limited to an amount determined by the circumstances of the site and the development and will be specified by Council officers.

3.3 Creating the Restriction on use of Land

The restriction shall be created under Section 88B of the *Conveyancing Act 1919* and all associated cost shall be borne by the applicant. Wording for the restriction is provided in the Technical Material (refer Schedule attached to this Part).

3.4 Releasing or Modifying the Restriction

Application to release or modify the restriction shall be made in writing. If such leave is granted all associated cost shall be borne by the applicant.

4.0 POSITIVE COVENANTS

4.1 Maintenance of On-Site Stormwater Detention Systems

A positive covenant shall be created on the title of all lots affected by an on-site stormwater detention system to protect the integrity of and ensure the ongoing maintenance of the system.

4.2 Maintenance of Charged Stormwater Drainage Systems

A positive covenant shall be created on the title of all lots affected by a charged drainage system to protect the integrity of and ensure the ongoing maintenance and effective operation of the system.

This restriction will only apply where a charged system is directed to a street gutter and not where the system feeds into a rainwater tank.

4.3 Maintenance of Pump out Systems

In the event that a pump out system has been approved by Council for disposal of stormwater and/or seepage from the property, a public positive covenant will need to be executed and registered against the title of the lot requiring ongoing maintenance and repair of the pump.

4.4 Maintenance of On-site Dispersal Systems

A positive covenant shall be created on the title of all lots affected by an on-site stormwater disposal system to protect the integrity of and ensure the ongoing maintenance of the system. This is essential to protect the amenity of any down slope properties that may be impacted by overland and subsoil flows.

4.5 Creating a Positive Covenant

The positive covenant shall be created under Section 88E of the *Conveyancing Act 1919*, using the wording provided in the technical manual for the relevant situation. Proof of registration of positive covenants will be required prior to issue of certificates of classification and/or Building Certificates under Section 172 of the *Local Government Act 1993*, and the release of any linen plan.

4.6 Rights and Obligations

Section 88F of the *Conveyancing Act 1919* confers the following powers to Council in respect of ensuring observance of the public positive covenant:

- a. for the purpose of ensuring observance of the covenant, the authority may, by its servants or agents, twice in every year at a reasonable time of the day and upon giving to the person against whom the covenant is enforceable not less than 2 days' notice, enter the land and view the condition of the land and the state of construction or repair of any structure or work on the land, except to the extent that the authority and that person may otherwise agree;
- b. where the covenant requires the carrying out of development of any nature by that person, the authority may carry out development of that nature on the failure of that person to comply with the covenant; and

- c. the authority may recover from that person, in a court of competent jurisdiction, any expense reasonably incurred by it in exercising its powers under paragraph (b) or (c).

4.7 Certificate of Amount Due

Section 88G Certificates

A certificate may be obtained from Council:

- a. stating the amount (if any) payable to the authority because of a failure to comply with a public positive covenant imposed on the land and particulars of how the amount is comprised or that no such amount is payable; or
- b. stating particulars of the work (if any) carried out by the authority the cost or part of the cost of which may be recovered by the authority under the covenant.

Plans submitted to the Principle Certifying Authority should show:

- the location of all driveways and car parking spaces;
- existing gutter levels at either side of the footway crossing;
- the level of all proposed car parking spaces;
- A longitudinal section of the driveway access from the centreline of the public road to the parking area; and
- Construction details of the crossover.

The certifier will check:

- The location to ensure compliance with the development standards;
- Levels of the garage against the property alignment levels to ensure access can be achieved without exceeding maximum permissible grades or grade changes; and
- Safe pedestrian and traffic sight distance have been achieved.

If the development standard is not met, the unsatisfactory components of the driveway will need to be removed and reconstructed. Unsatisfactory sections of regarded footway will need to be repaired. If turf is dead, it will need to be replaced and maintained by the applicant for a further two month period after which, a further compliance certificate is required.

5.0 SERVICES

Council does not specifically require easements over property services such as sewer, water and other utility lines where the service for one property crosses another. Where this does occur however the matter should be clarified with the particular authority providing the service.

6.0 ACCESS

6.1 Right of Carriageway

Where access either by vehicle or on foot to one property is required across an adjoining property a right of carriageway shall be created under Section 181A of the *Conveyancing Act 1919* and registered on the title of both properties involved. Details of the text to be included on the 88b documentation is provided in the Technical Material (refer Schedule attached to this Part).

7.0 LAND DEDICATIONS

7.1 General

Details of dedication procedures are provided in the Title Encumbrances Technical Material (refer Schedule attached to this Part).

7.2 Splay Corners

A corner cut-off or splay shall be provided at the intersection of a new road and an existing street. The dimensions of the splay shall comply with the requirements of AS 2890 for sight distance.

Council may also require the creation of a splay corner on an existing lot where a new boundary fence in excess of 1 metre in height is proposed.

7.3 Road Widening

Council may from time to time require a local road to be widened to provide improved vehicular movement. All procedures required for this are detailed in the *Roads Act 1993* and will be subject to full public consultation.

7.4 Footway Widening

Council may from time to time require a local road to be widened to provide improved pedestrian movement. All procedures required for this are detailed in the *Roads Act 1993* and will be subject to full public consultation.

7.5 New Public Road Dedications

New public roads will generally only be required where the subdivision of an existing parcel of land is undertaken that will create new lots that require access to a public road.

7.6 Public Open Space Dedications

Public open space may be required as part of the redevelopment of specific areas within the city to provide public amenity and in other location as opportunities may arise to add space to exiting open space areas.

SCHEDULE 1 TITLE ENCUMBRANCES TECHNICAL MATERIAL

S1.0 General Information

This manual shall be read in conjunction with the Part 8.4 Title Encumbrances and provides detailed text of the encumbrances to be applied.

S1.1 Objectives

- To provide guidelines for the preparation of legal documentation to be attached to property titles.
- To ensure consistency in the application of the title encumbrances.

S2.0 Stormwater Drainage

S2.1 Easements in Gross

Easements to Drain Private Property

Common law obligations require that nothing be done on one property that would cause nuisance on another. Changing the natural pattern of stormwater runoff by increasing the amount or rate of runoff, or redirecting the runoff, has the potential to create this nuisance. Practically all property improvements will affect stormwater runoff to some extent and therefore provision must be made to ensure these site modifications do not adversely affect surrounding properties.

Interallotment drainage easements should be described as an Easement for drainage of water. The rights and obligations associated with an easement of this type are outlined below.

The body having the benefit of this easement may:

1. drain water from any natural source through each lot burdened, but only within the site of this easement; and
2. do anything reasonably necessary for that purpose, including:
 - a. entering the lot burdened;
 - b. taking anything on to the lot burdened;
 - c. using any existing line of pipes; and
 - d. carrying out work, such as constructing, placing, repairing or maintaining pipes, channels, ditches and equipment.

Interallotment drainage easements shall benefit individual lots only and not list Council as a beneficiary.

Creation of Private Drainage Easements

Where an interallotment drainage easement must be created to facilitate a development, it is the responsibility of the applicant to negotiate with affected property owners to secure an easement.

Property owners are under no legal obligation to burden their lots with an easement for interallotment drainage unless they have been required to do so by the Supreme Court exercising the powers available to it under Section 88K of the *Conveyancing Act 1919* as amended, or required to do so by way of a condition of development consent.

Where an easement is required to allow suitable disposal of collected stormwater runoff from the property, a letter of agreement from the affected property owner(s) shall support the Local Development Application to demonstrate to Council that a suitable easement can be obtained. The Construction Certificate cannot be issued until the easement has been prepared by a registered surveyor and has been lodged with the Land Titles Office for registration.

Example of text used for the annexure to the TRANSFER GRANTING EASEMENT document (form 01TG) from Department of Lands.

Council Drainage Easements

Council has rights under Section 186 of the *Local Government Act 1993* to require the creation of an easement in its favour for the purpose of undertaking any of its functions as defined in the *Local Government Act*.

Council drainage easements will be required over all pipes or channels that convey runoff from a public park, road reserve or other public owned land.

Where a drainage easement is to be created as a condition of development consent, all costs associated with the creation of that easement shall be borne by the applicant.

Standard words for use in describing a Council drainage easement in the relevant instrument shall be as follows:

An easement to drain water within the meaning given to that expression by Part II Schedule IVA to the Conveyancing Act 1919 TOGETHER WITH the following addition thereto:-

“TOGETHER WITH the right for the body in whose favour this easement is to be created (herein referred to as “ the Body”) any every person authorised by it to make all necessary excavations and sink and make shafts and cuttings and lay down pipes in or on or under the servient tenement AND the owner of the servient tenement for the time being for them and their successors in title covenant with the Body that they will not do or allow to be done any act deed matter or thing which may injure damage or interfere with or impede the free and passage of water so and air through the same AND will not erect or permit to be erected over the servient tenement any building or structure except with the written permission of the Body and then only in accordance with all the conditions imposed by the Body in granting such permission AND will not do permit or suffer to be done any act deed matter or thing whereby the Body shall be prevented or hampered in constructing reconstructing maintaining repairing cleansing or gaining access to the pipes or easement or any part thereof AND if any such damage or injury be done or interference be made they will forthwith at their own expense properly and substantially repair and make good all such injury and damage and restore the free flow and passage of water and soil through the same and do all things necessary for the purpose aforesaid AND will and do hereby indemnify and keep indemnified the Body from and against all demands actions suits causes of and expenses or other claims which they or any other person may have against the Body arising out of any injury damage or interference by the owner of the servient tenement with or to such pipes or easement. THE NAME of the person empowered to release vary or modify the easement referred to herein is The Council of the City of Ryde”.

Widths and location of a Council Drainage Easement

The required width of an easement shall be the pipe diameter plus 1.5 m rounded up to the next highest 0.5 m with 2.5 metres as a minimum.

Existing easements that do not comply with this minimum standard will be required to modify the existing easement so as to comply with these minima.

The easement is to be positioned to ensure the pipe is centrally located within the easement. This standard may be modified at Council's discretion if the edge of the easement is in the same alignment as a property boundary and the pipeline is wholly contained within the easement.

Locating pipes

The exact location of a Council pipeline upon the lot should be confirmed by a registered surveyor. It should not be assumed that the pipe will be wholly located with the easement.

If buildings or footings are to be constructed within 2.0 metres of the edge of a Council drainage easement, the location and depth of the pipe must be ascertained by a registered surveyor and the information submitted to the Principle Certifying Authority along with the building plans for the work.

Relocating Pipes and Drainage Easements

Council may consent to the relocation of an existing Council pipeline through a property. Issues that will be considered will include, but not be limited to;

- the hydraulic efficiency of the re-routed system;
- the potential for blockages within the system;
- the management of overland flow; and
- costs associated with ongoing maintenance of the stormwater asset.

Should Council consent to a relocation, all associated design, relocation and legal costs shall be borne by the applicant.

A Council drainage easement shall be created over the new line of the pipe and any redundant easements shall be extinguished.

Release of Easements

Council will consent to releasing or extinguishing a drainage easement if it can be demonstrated that it is redundant to existing or future stormwater management needs. Any requests of this nature must be in writing and all costs associated with the extinguishment shall be borne by the applicant.

Building near or over a Drainage Easement

Council will not consent to permit any construction over a council drainage easement that will prevent or hamper constructing, reconstructing, maintaining, repairing, cleansing or gaining access to the pipes or easement. In this regard, no encroachments will be permitted within an 8.0m zone measured from the finished ground level over the pipeline. This shall include eaves and balconies.

The clear height restriction of 8.0 metres may need to be increased to account for issues such as very large pipes or restricted working spaces.

On-ground vehicular driveways and landscaped areas will typically be permitted over an easement however the structural stability of any existing pipelines may be considered before consent is given to an application that proposes to introduce additional live loads to the Council pipeline. Similar considerations will be made when it is proposed to reduce cover over the pipe.

Demountable carports and other easily removal structures that do not involve usable floor space, have been approved over Council drainage easements. If approval for such a structure is granted, the owner would need place a “Public Positive Covenant” on the title of the lot indicating that the property owner will remove the structure at their own expense if Council deems it necessary for the purposes of accessing the easement. Any such approvals will not extinguish or limit Council’s rights under the easement. Pedestrian and vehicular bridges may be permitted to encroach an easement provided they can be easily removed to facilitate access to the easement and suitable alternate vehicular and pedestrian access to the property exists if they were removed.

Masonry walls constructed across an easement must cross the easement at an angle of not less than 60°. The section of wall spanning the easement shall be constructed to enable its easy removal without resulting in failure of the remainder of the structure.

All footings for buildings and other structures shall be taken a minimum of 1.0 times the pipe diameter below the load bearing zone of the existing pipe. This condition shall apply even when the pipe is location upon an adjoining property.

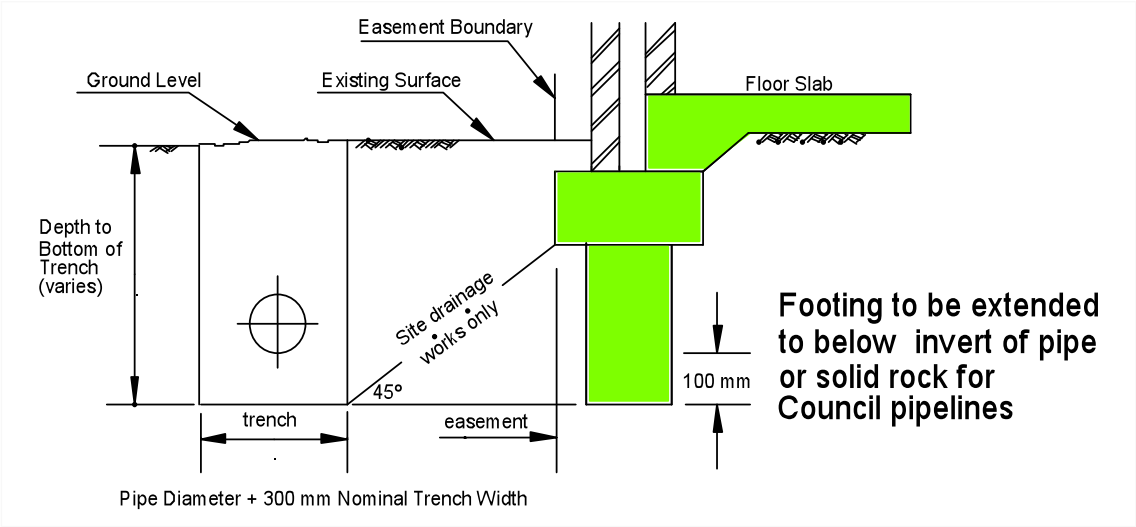


Figure 1

Existing Encroachments onto an Easement

Any time there is an existing, unsuitable encroachment onto a drainage easement, Council will take the opportunity to have that encroachment removed if and when it is presented.

Where an existing building encroaches onto an easement or Council drainage line, Council will not issue a Local Development Approval on the property where it involves significant capital expenditure to that building or any other application on that property that may reduce or delay the opportunity being presented for Council to have the encroachment removed.

S3.0 Restrictions on Use of Land

S3.1 Provision for Overland Flow

Terms of the Restriction on the Use of Land

Full and free right for the Council of the City of Ryde to convey stormwater in any quantity across the surface of the land being the site of the restriction hereby created (hereinafter called "the said land") and the registered proprietor from time to time of the lot herein burdened (hereinafter referred to as "the proprietor" which expression where herein used shall be deemed to include the successors and assigns of the proprietor) WILL NOT:

- a. erect, construct or place upon the said land any fence except a fence of a permeable nature without the prior consent in writing of the Council of the City of Ryde;
- b. erect, construct or place upon the said land or permit or suffer to be erected constructed or placed upon the said land any building, structure, retaining wall or rockery nature without the prior consent in writing of the Council of the City of Ryde; nor
- c. otherwise alter or permit or suffer any alteration to the surface level of the said land nature without the prior consent in writing of the Council of the City of Ryde.

Name of the body empowered to release, vary or modify the restriction referred to City of Ryde.

S3.2 Limitation of Site Cover

Terms of the Restriction on the Use of Land

The Registered Proprietor of the burdened lot shall not erect or suffer to permit any additional impervious surfaces on the whole of the land identified except in accordance with written approval from Council.

Name of the body empowered to release, vary or modify the restriction referred to; City of Ryde.

S3.3 Creating the Restriction on use of Land

The restriction shall be created under Section 88B of the *Conveyancing Act 1919* and all associated cost shall be borne by the applicant.

S3.4 Releasing or Modifying the Restriction

Application to release or modify the restriction shall be made in writing. If such leave is granted all associated cost shall be borne by the applicant.

S4.0 Positive Covenants

S4.1 Maintenance of On-Site Stormwater Detention Systems

Terms of Positive Covenant

The Registered Proprietor will at his own expense well and sufficiently maintain and keep in good and substantial repair and working order in accordance with dimensions approved by City of Ryde any on-site detention system (which expression shall include all ancillary gutters, pipes, drains,

walls, kerbs, pits, grates, fittings, tanks, chambers, basins and surfaces designed to temporarily detain water) (herein after called “the system”) which exists from time to time on the land.

Where the Registered Proprietor of the burdened lot fails to maintain the system in accordance with the above and fails to comply with any written request of the City of Ryde within such reasonable time as nominated in said request, the Registered Proprietor shall meet any reasonable costs incurred by the City of Ryde in carrying out works necessary to reinstate satisfactory performance of the system.

The term “Registered Proprietor” shall include the Registered Proprietor of the land from time to time, and all his heirs, executors, assigns and successors in title to the land and where there are two or more registered proprietors of the land the terms of this covenant shall bind all those registered proprietors jointly and severally.

Name of the body empowered to release, vary or modify the terms of positive covenant referred to; City of Ryde.

S4.2 Maintenance of Charged Stormwater Drainage Systems

Terms of Positive Covenant

The Registered Proprietor will at his own expense well and sufficiently maintain and keep in good and substantial repair and working order in accordance with dimensions approved by City of Ryde any charged drainage system (which expression shall include all ancillary gutters, pipes, drains, walls, kerbs, pits, grates, fittings, tanks, chambers, basins and surfaces designed to detain water under pressure) (herein after called “the system”) which exists from time to time on the land.

Where the Registered Proprietor of the burdened lot fails to maintain the system in accordance with the above and fails to comply with any written request of the City of Ryde within such reasonable time as nominated in said request, the Registered Proprietor shall meet any reasonable costs incurred by the City of Ryde in carrying out works necessary to reinstate satisfactory performance of the system.

The term “Registered Proprietor” shall include the Registered Proprietor of the land from time to time, and all his heirs, executors, assigns and successors in title to the land and where there are two or more registered proprietors of the land the terms of this covenant shall bind all those registered proprietors jointly and severally.

Name of the body empowered to release, vary or modify the terms of positive covenant referred to, City of Ryde.

Note: This restriction will only apply where a charged system is directed to a street gutter and not where the system feeds into a rainwater tank.

S4.3 Maintenance of Pump out Systems

Terms of Positive Covenant

The Registered Proprietor will at his own expense well and sufficiently maintain and keep in good and substantial repair and working order in accordance with dimensions approved by the City of Ryde any pump out drainage system (which expression shall include all ancillary gutters, pipes, drains, walls, kerbs, pits, grates, fittings, tanks, chambers and pumps designed to control water) (herein after called “the system”) which exists from time to time on the land.

The maintenance shall include the checking of the condition of the pumps by pumping water for at least 5 minutes every 6 months and maintaining a log book of these periodic checks. Permit officers of the City of Ryde to enter the land to view the log book and the condition of the pumps twice a year following two days notice. Where the Registered Proprietor of the burdened lot fails to maintain the system in accordance with the above and fails to comply with any written request of the City of Ryde within such reasonable time as nominated in said request, the Registered Proprietor shall meet any reasonable costs incurred by the City of Ryde in carrying out works necessary to reinstate satisfactory performance of the system. The term "Registered Proprietor" shall include the Registered Proprietor of the land from time to time, and all his heirs, executors, assigns and successors in title to the land and where there are two or more registered proprietors of the land the terms of this covenant shall bind all those registered proprietors jointly and severally.

Name of the body empowered to release, vary or modify the terms of positive covenant referred to, City of Ryde.

S4.4 Maintenance of On-site Dispersal Systems

Terms of Positive Covenant

The Registered Proprietor will at his own expense well and sufficiently maintain and keep in good and substantial repair and working order in accordance with dimensions approved by the City of Ryde any on-site storm water disposal system (which expression shall include all ancillary gutters, pipes, drains, walls, kerbs, pits, grates, fittings, tanks, chambers and pumps designed to drain and spread water) (herein after called "the system") which exists from time to time on the land.

Where the Registered Proprietor of the burdened lot fails to maintain the system in accordance with the above and fails to comply with any written request of the City of Ryde within such reasonable time as nominated in said request, the Registered Proprietor shall meet any reasonable costs incurred by the City of Ryde in carrying out works necessary to reinstate satisfactory performance of the system.

The term "Registered Proprietor" shall include the Registered Proprietor of the land from time to time, and all his heirs, executors, assigns and successors in title to the land and where there are two or more registered proprietors of the land the terms of this covenant shall bind all those registered proprietors jointly and severally.

Name of the body empowered to release, vary or modify the terms of positive covenant referred to, City of Ryde.

S4.5 Creating a Positive Covenant

The positive covenant shall be created under Section 88E of the *Conveyancing Act 1919*, using the wording provided in the technical manual for the relevant situation. Proof of registration of positive covenants will be required prior to issue of certificates of classification and/or Building Certificates under Section 172 of the *Local Government Act 1993* and the release of any linen plan.

Note: Council can prepare this documentation subject to the payment of the fees set out in the plan of management. See application form at the end of this document.

S4.6 Rights and Obligations

Section 88F of the *Conveyancing Act 1919* confers the following powers to Council in respect of ensuring observance of the public positive covenant:

- a. for the purpose of ensuring observance of the covenant, the authority may, by its servants or agents, twice in every year at a reasonable time of the day and upon giving to the person against whom the covenant is enforceable not less than 2 days' notice, enter the land and view the condition of the land and the state of construction or repair of any structure or work on the land, except to the extent that the authority and that person may otherwise agree;
- b. where the covenant requires the carrying out of development of any nature by that person, the authority may carry out development of that nature on the failure of that person to comply with the covenant; and
- c. the authority may recover from that person, in a court of competent jurisdiction, any expense reasonably incurred by it in exercising its powers under paragraph (b) or (c).

S4.7 Certificate of Amount Due

Section 88G Certificates

- Under the terms of the *Conveyancing Act 1919* No 6 any person may apply to a prescribed authority for a certificate (Council) under this section as to the amount (if any) payable to it because of a failure to comply with a public positive covenant imposed on the land under Section 88D or 88E.
- The application for the certificate shall be made in writing and shall state the name and address of the applicant and particulars of the land in respect of which the information is required. A copy of the application form is attached at the end of this document.
- On receipt of the application and after payment of the prescribed fee, Council will immediately give or post to the applicant a certificate in writing:
 - stating the amount (if any) payable to the authority because of a failure to comply with a public positive covenant imposed on the land and particulars of how the amount is comprised or that no such amount is payable; or
 - stating particulars of the work (if any) carried out by the authority the cost or part of the cost of which may be recovered by the authority under the covenant or that no such work has been carried out.
- Production of the certificate shall for all purposes be conclusive proof in favour of a purchaser in good faith and for valuation of the land that, at the time at which the certificate is issued:
 - no amount other than that stated in the certificate was due or payable to the prescribed authority in respect of the land because of any such failure; and
 - no work the cost or part of the cost of which may be recovered by the authority under the covenant other than that the particulars of which are stated in the certificate has been carried out by the authority.

S5.0 Services

Council does not specifically require easements over property services such as sewer, water and other utility lines where the service for one property crosses another. Where this does occur however the matter should be clarified with the particular authority providing the service.

S6.0 Access

S6.1 Right of Carriageway or Footway

Where access either by vehicle or on foot to one property is required across an adjoining property a right of carriageway shall be created under Section 181A of the *Conveyancing Act 1919* and registered on the title of both properties involved.

The general terms for the right of carriageway are:

Full and free right for every person who is at any time entitled to an estate or interest in possession in the land herein indicated as the dominant tenement or any part thereof with which the right shall be capable of enjoyment, and every person authorised by that person, to go, pass and repass at all times and for all purposes with or without animals or vehicles or both to and from the said dominant tenement or any such part thereof.

The general terms of a right of footway are:

Full and free right for every person who is at any time entitled to an estate or interest in possession in the land herein indicated as the dominant tenement or any part thereof with which the right shall be capable of enjoyment, and every person authorised by that person, to go, pass and repass on foot at all times and for all purposes without animals or vehicles to and from the said dominant tenement or any such part thereof.

S7.0 Land Dedications

S7.1 General

Land dedications to Council may be undertaken by several means:

- By negotiation with the owner of the land to determine appropriate compensation for the land to be dedicated;
- By compulsory acquisition under the *Just Terms Compensation Act*; and
- Wait until the land can be acquired at the time of Development Approval.

In all cases a survey plan of the site shall be prepared for lodgment with the Department of Lands.

Where appropriate an independent valuation of the site will be prepared as part of the process.

The transfer of the land must be approved by Council and the Common Seal of Council affixed to the transfer documents.

All dedications will be advertised in local papers and notified in the government Gazette.

S7.2 Splay Corners

A corner cut-off or splay shall be provided at the intersection of a new road and an existing street. The dimensions of the splay shall comply with the requirements of AS 2890 for sight distance.

Council may also require the creation of a splay corner on an existing lot where a new boundary fence in excess of 1 metre in height is proposed.

S7.3 Road Widening

Council may from time to time require a local road to be widened to provide improved vehicular movement. All procedures required for this are detailed in the *Roads Act 1993* and will be subject to full public consultation.

S7.4 Footway Widening

Council may from time to time require a local road to be widened to provide improved pedestrian movement. All procedures required for this are detailed in the *Roads Act 1993* and will be subject to full public consultation.

S7.5 New Public Road Dedications

New public roads will generally only be required where the subdivision of an existing parcel of land is undertaken that will create new lots that require access to a public road.

S7.6 Public Open Space Dedications

Public open space may be required as part of the redevelopment of specific areas within the city to provide public amenity and in other location as opportunities may arise to add space to exiting open space areas.

APPENDICES

DRAFT EXAMPLE OF ANNEXURE FOR RESTRICTION FOR OVERLAND FLOW

This is Annexure A to the Restriction on the use of land by a Proscribed Authority under section 88E(3) of the *Conveyancing Act 1919*

Dated the _____ of _____, 200__

Land being Lot _ in DP _____

TERMS OF THE RESTRICTION ON THE USE OF LAND

Full and free right for the Council of the City of Ryde to convey stormwater in any quantity across the surface of the land being the site of the restriction hereby created (hereinafter called "the said land") and the registered proprietor from time to time of the lot herein burdened (hereinafter referred to as "the proprietor" which expression where herein used shall be deemed to include the successors and assigns of the proprietor) WILL NOT:

- (d) erect, construct or place upon the said land any fence except a fence of a permeable nature without the prior consent in writing of the Council of the City of Ryde; nor
- (e) erect, construct or place upon the said land or permit or suffer to be erected constructed or placed upon the said land any building, structure, retaining wall or rockery nature without the prior consent in writing of the Council of the City of Ryde; nor
- (f) otherwise alter or permit or suffer any alteration to the surface level of the said land nature without the prior consent in writing of the Council of the City of Ryde.

Name of the body empowered to release, vary or modify the restriction referred to; City of Ryde.

Execution by the prescribed authority

.....
Signature of Witness

.....
Signature of Authorised officer

.....
Name of Witness

.....
Name of Authorised Officer
General Manager

Execution by the registered proprietor

.....
Signature of Witness

.....
Signature of Registered Proprietor

.....
Name of Witness

Consent of the lessee/mortgagee/chargee

.....
Signature of Witness

.....
Signature of Mortgagee

.....
Name of Witness

DRAFT EXAMPLE OF ANNEXURE FOR RESTRICTION FOR SITE COVER

This is Annexure A to the Restriction on the use of land by a Proscribed Authority under section 88E(3) of the Conveyancing Act 1919

Dated the of , 200_

Land being Lot _ in DP _____

TERMS OF THE RESTRICTION ON THE USE OF LAND

The Registered Proprietor of the burdened lot shall not erect or suffer to permit any additional impervious surfaces on the whole of the land identified except in accordance with written approval from Council.

Name of the body empowered to release, vary or modify the restriction referred to; City of Ryde.

Execution by the prescribed authority

.....
Signature of Witness

.....
Signature of Authorised officer

.....
Name of Witness

.....
Name of Authorised Officer

Execution by the registered proprietor

.....
Signature of Witness

.....
Signature of Registered Proprietor

.....
Name of Witness

Consent of the lessee/mortgagee/chargee

.....
Signature of Witness

.....
Signature of Mortgagee

.....
Name of Witness

DRAFT EXAMPLE OF ANNEXURE FOR POSITIVE COVENANT FOR ON-SITE STORMWATER DETENTION

This is Annexure A to the Positive Covenant PC13 under section 88E(3) of
the *Conveyancing Act 1919*

Dated the _____ of _____, 200_

Land being Lot _ in DP _____

TERMS OF POSITIVE COVENANT

The Registered Proprietor will at his own expense well and sufficiently maintain and keep in good and substantial repair and working order in accordance with dimensions approved by City of Ryde any on-site detention system (which expression shall include all ancillary gutters, pipes, drains, walls, kerbs, pits, grates, fittings, tanks, chambers, basins and surfaces designed to temporarily detain water) (herein after called "the system") which exists from time to time on the land

Where the Registered Proprietor of the burdened lot fails to maintain the system in accordance with the above and fails to comply with any written request of the City of Ryde within such reasonable time as nominated in said request, the Registered Proprietor shall meet any reasonable costs incurred by the City of Ryde in carrying out works necessary to reinstate satisfactory performance of the system.

The term "Registered Proprietor" shall include the Registered Proprietor of the land from time to time, and all his heirs, executors, assigns and successors in title to the land and where there are two or more registered proprietors of the land the terms of this covenant shall bind all those registered proprietors jointly and severally.

Name of the body empowered to release, vary or modify the terms of positive covenant referred to, City of Ryde.

Execution by the prescribed authority

.....
Signature of Witness

.....
Signature of Authorised officer

.....
Name of Witness

.....
Name of Authorised Officer
General Manager

Execution by the registered proprietor

.....
Signature of Witness

.....
Signature of Registered Proprietor

.....
Name of Witness

Consent of the lessee/mortgagee/chargee

.....
Signature of Witness

.....
Signature of Mortgagee

.....
Name of Witness

DRAFT EXAMPLE OF ANNEXURE FOR POSITIVE COVENANT FOR CHARGED STORMWATER SYSTEM

This is Annexure A to the Positive Covenant under section 88E(3) of the Conveyancing Act 1919

Dated the of , 200_

Land being Lot _ in DP _____

TERMS OF POSITIVE COVENANT

The Registered Proprietor will at his own expense well and sufficiently maintain and keep in good and substantial repair and working order in accordance with dimensions approved by City of Ryde any charged drainage system (which expression shall include all ancillary gutters, pipes, drains, walls, kerbs, pits, grates, fittings, tanks, chambers, basins and surfaces designed to detain water under pressure) (herein after called “the system”) which exists from time to time on the land

Where the Registered Proprietor of the burdened lot fails to maintain the system in accordance with the above and fails to comply with any written request of the City of Ryde within such reasonable time as nominated in said request, the Registered Proprietor shall meet any reasonable costs incurred by the City of Ryde in carrying out works necessary to reinstate satisfactory performance of the system.

The term "Registered Proprietor" shall include the Registered Proprietor of the land from time to time, and all his heirs, executors, assigns and successors in title to the land and where there are two or more registered proprietors of the land the terms of this covenant shall bind all those registered proprietors jointly and severally.

Name of the body empowered to release, vary or modify the terms of positive covenant referred to, City of Ryde.

Execution by the prescribed authority

.....
Signature of Witness

.....
Signature of Authorised officer

.....
Name of Witness

.....
Name of Authorised Officer
General Manager

Execution by the registered proprietor

.....
Signature of Witness

.....
Signature of Registered Proprietor

.....
Name of Witness

Consent of the lessee/mortgagee/chargee

.....
Signature of Witness

.....
Signature of Mortgagee

.....
Name of Witness

DRAFT EXAMPLE OF ANNEXURE FOR POSITIVE COVENANT FOR PUMPED DRAINAGE SYSTEM

This is Annexure A to the Positive Covenant PC13 under Section 88E(3) of the Conveyancing Act 1919

Dated the _____ of _____, 200__

Land being Lot _ in DP _____

TERMS OF POSITIVE COVENANT

The Registered Proprietor will at his own expense well and sufficiently maintain and keep in good and substantial repair and working order in accordance with dimensions approved by the City of Ryde any pump out drainage system (which expression shall include all ancillary gutters, pipes, drains, walls, kerbs, pits, grates, fittings, tanks, chambers and pumps designed to control water) (herein after called "the system") which exists from time to time on the land.

The maintenance shall include the checking of the condition of the pumps by pumping water for at least 5 minutes every 6 months and maintaining a log book of these periodic checks.

Permit officers of the City of Ryde to enter the land to view the log book and the condition of the pumps twice a year following two days notice.

Where the Registered Proprietor of the burdened lot fails to maintain the system in accordance with the above and fails to comply with any written request of the City of Ryde within such reasonable time as nominated in said request, the Registered Proprietor shall meet any reasonable costs incurred by the City of Ryde in carrying out works necessary to reinstate satisfactory performance of the system.

The term "Registered Proprietor" shall include the Registered Proprietor of the land from time to time, and all his heirs, executors, assigns and successors in title to the land and where there are two or more registered proprietors of the land the terms of this covenant shall bind all those registered proprietors jointly and severally.

Name of the body empowered to release, vary or modify the terms of positive covenant referred to, City of Ryde.

Execution by the prescribed authority

.....
Signature of Witness

.....
Signature of Authorised officer

.....
Name of Witness

.....
Name of Authorised Officer
General Manager

Execution by the registered proprietor

.....
Signature of Witness

.....
Signature of Registered Proprietor

.....
Name of Witness

Consent of the lessee/mortgagee/chargee

.....
Signature of Witness

.....
Signature of Mortgagee

.....
Name of Witness

City of Ryde

Section 88G Certificate Application

APPLICANT'S NAME:

POSTAL ADDRESS:

SUBURB: POST CODE:.....

PHONE NO: (W) (H)..... M)

(Please tick)

- | | | |
|--------------------------|--|-----------------------------------|
| <input type="checkbox"/> | Section 88G Certificate | \$35.00 (2009 |
| <input type="checkbox"/> | Expedite fee
(certificate required within 24 hours) | \$130.00 (includes GST)
(2009) |

PROPERTY ADDRESS:

ALLOTMENT DESCRIPTION: LOT DP /

OWNER'S NAME:

POSITIVE COVENANT NO.

Application is hereby made for a certificate under Section 88G of the Conveyancing Act 1919.

Signature.....

Privacy Notification

In completing this form you will be prompted to supply information that is personal information for the purposes of the Privacy and Personal Information Act 1998. The supply of this information is voluntary. If you cannot provide, or do not wish to provide the information sought, the Council may be unable to process your request. Council is required under the Act to inform you about how your personal information is being collected and used. If you require further information please contact Council's Customer Service Centre on 9952-8222 and ask for an information sheet to be forwarded to you.

City of Ryde

Application for the Preparation and Endorsement of Positive Covenant (88E) or Restriction as to User

Applicant Details

Name _____

Postal Address _____

Suburb _____ Postcode _____

Contact No. (H) _____ (W) _____

(M) _____ (Fax) _____

Property Details

Address _____

Lot No. _____ DP / SP No. _____

Consent Details

LDA No: _____ CC No: _____ CDA No: _____

Required Information

Registered Proprietor's full name(s) _____

(correct spelling as per registered title)

Name of Mortgagee (if applicable) _____

Mortgage Number: _____

How do you wish to receive the prepared and signed documentation?

1. Collect documentation ☐ (please indicate choice)

2. Post documentation ☐

Signature of Applicant _____ Date _____

Privacy Notification

In completing this form you will be prompted to supply information that is personal information for the purposes of the Privacy and Personal Information Act 1998. The supply of this information is voluntary. If you cannot provide, or do not wish to provide the information sought, the Council may be unable to process your request. Council is required under the Act to inform you about how your personal information is being collected and used. If you require further information please contact Council's Customer Service Centre on 9952-8222 and ask for an information sheet to be forwarded to you.



City of Ryde
Civic Centre
1 Devlin Street
Ryde NSW 2112

www.ryde.nsw.gov.au

City of Ryde Development Control Plan 2014

Part: 8.5 Public Civil Works

Translation

ENGLISH

If you do not understand this document please come to Ryde Civic Centre, 1 Devlin Street, Ryde Monday to Friday 8.30am to 4.30pm or telephone the Telephone and Interpreting Service on 131 450 and ask an interpreter to contact the City of Ryde for you on 9952 8222.

ARABIC

إننا نعتذر عليك فهم محتويات هذه الوثيقة، نرجو للحضور إلى مركز بلدية رايد Ryde Civic Centre على العنوان: 1 Devlin Street, Ryde 1 من الاثنين إلى الجمعة بين الساعة 8.30 صباحاً والساعة 4.30 بعد الظهر أو الاتصال بمكتب خدمات الترجمة على الرقم 131 450 لكي تطلب من أحد المترجمين الاتصال بمجلس مدينة رايد، على الرقم 9952 8222، نيابة عنك.

ARMENIAN

Եթէ այս գրութիւնը չէք հասկնար, խնդրեմ եկէք՝ Րայդ Բիւրոյ Սիւվիլ Ենթոքը, 1 Տելվին փողոց, Րայդ, (Ryde Civic Centre, 1 Devlin Street, Ryde) Երկուշաբթիէն Ուրբաթ կ.ա. ժամը 8.30 – կ.ե. ժամը 4.30, կամ հեռաձայնեցէք Հեռաձայնի եւ Թարգմանութեան Սպասարկութեան՝ 131 450, եւ խնդրեցէք որ թարգմանիչ մը Րայդ Քաղաքապետարանին հետ կապ հաստատուէ ձեզի համար, հեռաձայնելով՝ 9952 8222 թիւին:

CHINESE

如果您看不懂本文，請在周一至周五上午 8 時 30 分至下午 4 時 30 分前往 Ryde 市政中心詢問 (Ryde Civic Centre, 地址: 1 Devlin Street, Ryde)。你也可以打電話至電話傳譯服務中心，電話號碼是: 131 450。接通後你可以要求一位傳譯員為你打如下電話和 Ryde 市政廳聯繫，電話是: 9952 8222。

FARSI

اگر این مدرک را نمی فهمید لطفاً از 8.30 صبح تا 4.30 بعد از ظهر دوشنبه تا جمعه به مرکز شهرداری رايد، Ryde Civic Centre, 1 Devlin Street, Ryde مراجعه کنید یا به سرویس مترجم تلفنی، شماره 131 450 تلفن بزنید و از یک مترجم بخواهید که از طرف شما با شهرداری رايد شماره 9952 8222 تلفن بزند.

ITALIAN

Se non capite il presente documento, siete pregati di rivolgervi al Ryde Civic Centre al n. 1 di Devlin Street, Ryde, dalle 8.30 alle 16.30, dal lunedì al venerdì; oppure potete chiamare il Telephone Translating and Interpreting Service al 131 450 e chiedere all'interprete di contattare a vostro nome il Municipio di Ryde presso il 9952 8222.

KOREAN

이 문서가 무슨 의미인지 모르실 경우에는 1 Devlin Street, Ryde 에 있는 Ryde Civic Centre 로 오시거나 (월 – 금, 오전 8:30 – 오후 4:30), 전화 131 450 번으로 전화 통역 서비스에 연락하셔서 통역사에게 여러분 대신 Ryde 시청에 전화 9952 8222 번으로 연락을 부탁드립니다.

Amend. No.	Date approved	Effective date	Subject of amendment

Table of Contents

CONTENTS

1.0 INTRODUCTION	6
1.1 When is Construction Required	6
1.1.1 Footways	6
1.1.2 Footpath Paving	6
1.1.3 Kerb & Gutter	6
1.1.4 Road Pavement	7
1.1.5 Ancillary Roadworks Items	8
1.2 Alteration to Services	8
1.2.1 Prevention of Damage	8
1.2.2 Alterations	8
1.3 Notification	9
2.0 DESIGN & CONSTRUCTION STANDARDS	10
2.1 Design of Public Roads	10
2.1.1 Width & Alignment	10
2.1.2 Geometry	10
2.1.3 Design Speeds	10
2.1.4 Longitudinal Grades	10
2.1.5 Crossfalls	10
2.1.6 Matching Existing Road Pavement	11
2.1.7 Road Components	11
2.1.8 Levels	11
2.1.9 Retaining Along the Property Frontage	12
2.2 Construction Standard for Footways	12
2.3 Design of Footpath Paving	12
2.3.1 Concrete Footpaving	13
2.3.2 Footpaving Using Segmental Pavements	13
2.4 Design of Kerb & Gutter	14
2.4.1 Kerb & Gutter Detail	14
2.4.2 Levels	14
2.4.3 Matching Existing Kerb and Gutter	14
2.4.4 Kerb Ramps	14
2.4.5 Excavation	14
2.4.6 Form Work	15

Table of Contents

2.4.7	Material	15
2.4.8	Joints	15
2.4.9	Placing Concrete	15
2.4.10	Machine Placed Kerb and Gutter	15
2.4.11	Transition at Pits	16
2.4.12	Finish	16
2.4.13	Curing and Protection	16
2.4.14	Backfilling	16
2.4.15	Pavement Thickness	17
2.4.16	Formation	17
2.4.17	Compaction of Sub Grade	18
2.4.18	Materials	18
2.4.19	Spreading	19
2.4.20	Compacting and Trimming	19
2.4.21	Compaction Equipment	19
2.4.22	Surfacing Procedures Course	20
2.4.23	Subsoil and Subgrade Drains	20
2.4.24	Service Conduits	20
2.5	Construction Standard for Hot Bituminous Mixtures	21
2.5.1	Supply of Mixtures	21
2.5.2	Transport	21
2.5.3	Preparation of Pavement	21
2.5.4	Spreading	22
2.5.5	Joints	23
2.5.6	Compaction	23
2.5.7	Finished Surface	24
2.5.8	Provision for Traffic	24
3.0	ANCILLARY ITEMS	25
3.1	Roundabouts	25
3.2	Traffic Calming Devices	25
3.3	Provision of Services	25
3.4	Street Name Signs	25
3.5	Street Trees	25
3.6	Street Furniture	25

Table of Contents

4.0	STORMWATER DRAINAGE	26
4.1	Design of Drainage System	26
4.1.1	Storm Water Pipes	26
4.1.2	Pit Locations	26
4.1.3	Safety	26
4.2	Materials	26
4.2.1	Pipes	26
4.2.2	Pits	27
4.2.3	Concrete Works	27
4.2.4	Bedding & Backfill Material	27
4.3	Construction of Drainage System	27
4.3.1	Excavation	27
4.3.2	Bedding	28
4.3.3	Laying	28
4.3.4	Jointing	28
4.3.5	Junctions	28
4.3.6	Backfilling	28
4.3.7	Concrete Drainage Structures	28
4.3.8	Cast Iron and Galvanised Steel Fittings	29
4.3.9	Step Irons	29
4.3.10	Channelisation of Pits	29
5.0	STANDARDS ENFORCEMENT	30
5.1	Plan Submissions	30
5.1.1	Presentation of Plans	30
5.1.2	Plan Requirements - Roads	31
5.1.3	Plan Requirements – Drainage	31
5.2	Inspections	32
5.2.1	Footways	32
5.2.2	Footpath Paving	32
5.2.5	Drainage Works	33
5.3	Works as Executed Plans	33
5.4	Maintenance Period	33
5.4.1	Footways	33
5.4.2	New Public Roads	33

1.0 INTRODUCTION

1.1 When is Construction Required

1.1.1 Footways

The footway area is to be re-graded when:

- there is an unacceptably steep crossfall on the footway;
- the footway is rough and difficult to negotiate;
- vehicular footpath crossings into the site would result in unreasonable undulations along the footway; and
- construction of footpath paving and/or realignment of the road at a future time requires the footway to be raised or lowered. Regrading the footway at the time of undertaking the development will ensure that difficulties for vehicular and pedestrian access into the property do not arise in the future and ensure any walls or fencing constructed on the property boundary matches the future footway level.

1.1.2 Footpath Paving

Footpath paving shall be constructed across the entire property frontage when:

- the development is a residential development upon land zoned other than Residential Low Density and the completed development contains two (2) or more dwellings;
- the property is a residential development and has frontage to an arterial, sub-arterial road, or collector and the completed development contains two (2) or more dwellings;
- there is an existing footpath which is in poor condition or is constructed of bitumen and the completed development contains two (2) or more dwellings;
- the development is for a commercial, industrial or other non-residential use and existing footpaving does not exist or is unsatisfactory and the cost of providing concrete footpaving would not represent more than 1% of the development costs; or
- In special circumstances, such as where unusual topographical conditions exist, or where there is no pedestrian demand for use of the footway, Council may waive the requirement to provide footpaving.

Who can Construct Footpaving

The applicant will generally be required to engage their own contractor to construct the footpaving.

1.1.3 Kerb & Gutter

Kerb, gutter and paved road shoulder shall be constructed when:

- kerb, gutter and paved road shoulder does not exist, or is in an unsatisfactory condition or at an unsuitable level;
- the development will result in an increase in the number dwellings on the subject lot, or involves an increase in floor space associated with a commercial or industrial development;
- the development will have a presentation to the street in which the work is to be undertaken:
 - the work is necessary to protect the property from the flow of stormwater off a public road;
 - the work is necessary to ensure erosion of the road shoulder does not adversely affect access to the property; or
 - the work is necessary to ensure compatibility with new footway levels.

Who can Construct Kerb and Gutter

Where the length of kerb and gutter to be constructed exceeds 30 metres the work is to be constructed by the applicants contractors unless otherwise specified by Council.

Where the total length is less than 30 metres, then the work will be undertaken by Council at the applicants expense. If the work will be an extension of an existing kerb or road pavement, or replacement of a damaged kerb or road pavement, Council will undertake the work as soon as practicable after receiving the payment from the applicant. If the work will be an isolated section, Council will delay its construction until such a time as further contributions have been received, or Council allocates funds towards constructing larger sections of road pavement in the locality.

1.1.4 Road Pavement

Public Roads as part of a Subdivision

Where new public roads are required to service a land subdivision, the Subdivider shall, at no cost to Council, provide road pavement, kerb and gutter, footpath and all other associated works associated with providing a public road where there will be newly created lots within the proposed subdivision that will require access to a public road. These works are to meet the requirements of Council. Council will not accept ownership of a road where it is not constructed to the appropriate standard as outlined in this Part.

Constructing Half Road

The applicant shall provide half road pavement, along with all necessary kerb and gutter works, where the same does not exist or the existing pavement is unsatisfactory, across the entire frontage of the land adjacent the to the development site

Why: To enhance streetscape presentation.

To provide a suitable road pavement for the traffic generated by the development.

Where there is no pavement, or the existing pavement is in an unsatisfactory condition, the developer shall provide half-road pavement and kerb and gutter across the entire public road frontage of the allotment containing the development site where:

- the development will result in an increase in the number of dwellings on the subject lot, or involves an increase in floor space associated with a commercial or industrial development; and
- traffic generated by the development would increase the loads on the pavement thereby significantly reducing pavement life.

Increasing Road Width

Where a development would increase traffic movements in a public road necessitating road widening to increase the road's traffic carrying capacity, the developer shall increase the road pavement width and provide all necessary kerb, gutter and footway works across the frontage of the subject site.

Other Road Works

Further road construction paid for by the developer may be required where:

- Council has agreed to permit recessed parking bays within the public road; and
- Auxiliary lanes within the public roadway are required to permit safe vehicular access/egress for the property.

Who will Construct the Road

Where the length of road to be constructed exceeds 30 metres the work is to be constructed by the applicant's contractor/s prior to finalisation of the application unless otherwise specified by Council.

Where the total length is less than 30 metres, Council will undertake the work at the applicant's expense. If the work is an extension of an existing kerb or road pavement, or replacement of a damaged kerb or road pavement, Council will undertake the work as soon as is practicable after receiving the payment from the applicant. If the proposed work is an isolated section, Council will delay construction until such a time as further contributions have been received, or Council allocates funds towards constructing larger sections of road pavement in the locality.

1.1.5 Ancillary Roadworks Items

Council may require the construction of roundabouts, median islands, entrance thresholds and/or other traffic calming devices, depending on the needs generated by the proposed development.

1.2 Alteration to Services

1.2.1 Prevention of Damage

During the progress of the works care shall be taken to prevent damage to any public utility eg. gas, water, sewerage, electricity or telephone services, etc. The applicant will be responsible for any damage caused by themselves or their agents, either directly or indirectly.

1.2.2 Alterations

All mains, services, poles etc that require alteration shall be altered at the applicant's expense to the satisfaction of Council and the authority concerned.

House Services

Where the alteration of a house service is required, it is to be carried out by a suitably experienced tradesperson. Twenty-four House Services (24) hours notice shall be given to the affected property owner/s before their service is to be affected.

Service Mains

In the case of public utility mains, if a main must be raised, altered, lowered or relocated, then the applicant shall be required to liaise with the relevant Authority to organise the alteration and they shall undertake all work to the satisfaction of that Authority.

Surface Fittings

The applicant shall arrange with the relevant authority for the alteration of all surface fittings of all service authorities that are Surface Fittings affected by altered finished surface levels.

1.3 Notification

Notification of entry for data Collection

Prior to entering a property for the purpose of collecting survey information, the applicant shall advise the relevant property owners of their intention to do so. Such notice must be in writing prior to the day of entry and must specify the day on which entry is intended.

The initial notification will also request property owners/residents to indicate specific problems relating to their properties or specific problems that may be considered during the preparation of the detailed engineering design.

Attention is specifically drawn to Section 166 of the *Roads Act 1993*, relating to the consultation with and obtaining approval from property owners relating to property adjustments. It should be noted that Registered Surveyors and their assistants in accordance with *Survey Practise Regulations*, may enter a property after giving the notice prescribed in the regulations.

Should a property be entered for the above purposes, after giving the notice required a note shall be left for each property owner/resident indicating the situation should no one be at home on the particular day.

Notification of Affectation by Construction Activities

The applicant is responsible for notifying all property owners when access to their property will be necessarily restricted. A minimum of 48 hours notice shall be given and all endeavours shall be taken to ensure the period of disruption is kept to a minimum.

Where the alteration of a house service is required, a minimum of twenty-four (24) hours' notice shall be to the affected property owner before their service is affected.

Such notice must be in writing.

2.0 DESIGN & CONSTRUCTION STANDARDS

2.1 Design of Public Roads

2.1.1 Width & Alignment

The minimum width and alignment of roads that will become public roads shall be as follows:

CLASS OF ROAD	WIDTH	ALIGNMENT
Residential cul-de-sacs serving 30 lots or less.	17m	4.5 - 8.0 - 4.5
Local access roads between 30 and 100 lots	18m	4.5 - 9.0 - 4.5
Collector & Sub-arterial Roads Bus Routes	20m	4.5 – 11 .0 - 4.5
Commercial & Industrial Roads	22m	4.5 – 13.0 - 4.5

The radius of a cul-de-sac bulb shall be:

- Residential areas
 - 8.5 metres to face of kerb
 - 13 metres at the property line
- Residential Flat, Commercial and Industrial areas
 - 11.5 metres to face of kerb
 - 16 metres at the property line.

2.1.2 Geometry

Geometric Design of roads, particularly in relation to horizontal and vertical curves, sight distances, intersections, etc shall be in accordance with the relevant *RTA Road Design Guide 1988*, the NAASRA publication *Guide to the Geometric Design of Rural Roads*, the principles laid down in the *AUSTROADS - Policies and Publications* and general good engineering practise

2.1.3 Design Speeds

The minimum design speed for all roads shall be 50km/hr.

2.1.4 Longitudinal Grades

The general minimum grade shall be 1% but in specific circumstances a minimum gradient of 0.5% will be permitted.

The general maximum grade shall be 12.5% for residential roads and 8.5% for distributor roads. In specific circumstances gradients up to 17% will be permitted. Special additional requirements will them apply, particularly as regards the sight distance of vertical curves.

2.1.5 Crossfalls

Normal crossfalls shall be as follows:

- Road Pavement - Asphaltic Concrete 2.5%
- Footways including concrete footpaving 3.0%
- Public Pathway 3.0%

The maximum permissible super-elevation on bends will be 6%.

2.1.6 Matching Existing Road Pavement

All work necessary to match the new road pavement with the existing road pavement shall be undertaken at the applicant's expense. Council will determine the extent of work required.

2.1.7 Road Components

Design and construction requirements for each of the components that make up the road, being the:

- footway;
- footpath paving;
- kerb & gutter;
- road pavement; and
- ancillary items.

These are dealt with in the following sections of this standard.

2.1.8 Levels

A suitable design of the footway depends on numerous factors including the levels of adjoining properties, degree of pedestrian usage, preservation of existing street trees and future realignment of the road.

Generally, a 3% crossfall should be provided from the property boundary down to the top of kerb. Where this design cannot be accommodated Council will specify the necessary footway levels.

The levels along the footway will need to meet the following criteria:

- the maximum longitudinal grade of the footpath is to be 1 in 6;
- the maximum change of grade along the footway is to be 1 in 10 with a minimum segment length of 4.0 metres;
- if it was necessary to increase the footpath grade, and the longitudinal grade of the footpath exceeds 1 in 8, then concrete footpaving will need to be constructed over the regraded section of footpath, if it did not previously exist; and
- consideration will be given to permit installation of stairs where the total area to be regraded is very large. Approval of stairs in the public footway will be at the discretion of Council's Development Engineer.

Where it is necessary to raise or lower the footway in front of a property, the adjoining sections of footway must be regraded to provide a smooth transition to the new level. The minimum extent of footway that must be regraded is to be determined by Council using the design constraints above.

If access to adjoining private properties is affected by footway egrading, all work necessary shall be done within those properties to ensure satisfactory pedestrian and vehicular access is restored.

If work is to be undertaken within an adjoining property written consent must be obtained from the affected property owner(s) that they will permit the applicant's contractors to enter their property and undertake all work necessary to ensure vehicles and pedestrians have satisfactory access to the property following regrading of the footpath.

2.1.9 Retaining Along the Property Frontage

If the ground level of the property adjacent the footpath is above or below the finished level of the footway then adequate measures must be taken to support the land by constructing either earth batters or retaining structures. These are to be fully contained within the property and are not to encroach onto the public footway.

2.2 Construction Standard for Footways

Material for filling shall be clean fill consisting of not less than 70 per cent granular material and must be free from vegetation, stumps, roots, rubbish and other deleterious material. Where excavation in rock is necessary, the rock shall be removed to a depth of 100mm below finished surface level.

A 75mm layer of topsoil is to be placed over the footway. The topsoil is to contain less than 40% clay. Clods in the topsoil shall not be greater than 50 mm ϕ . The minimum finished grade should be 1%. There should be no localised depressions that may pond or concentrate rainwater.

Couch, kikuyu and buffalo turf to match pre-existing turf types at each property should be supplied and laid over all areas of cut or fill to the finished surface levels. The Contractor will maintain the turf for two (2) months after laying it. Following the maintenance period, approved topdressing shall be spread to fill minor depressions due to the thickness of turf. The tolerance shall be ± 25 mm provided that the variations in level are not local and are over 2 m or more. The Contractor shall be responsible at his/her expense for the replacement of dead turf.

The footway will not be considered satisfactory if:

- the finished level of the footway adjacent the kerb is below the top of kerb;
- there is a step down from the any footpaving or driveway crossings to the finished level of the footway;
- there are localised depressions where water may pond or flows may be concentrated; or
- there are areas of dead turf.

2.3 Design of Footpath Paving

Footpath paving must provide safe and convenient passage for pedestrians.

The surface should have slip resistance appropriate for the pavement slopes as required by AS3661.1. The surface should be even. Any gaps in the pavement should be no greater than 5 mm. Abrupt level changes exceeding 5 mm will not be acceptable. The maximum crossfall at any point shall not exceed 6%.

The footpath paving should have an average 3% crossfall towards the kerblines.

The footpaving will normally be 1200 mm wide and constructed 600 mm from the property line but shall match any existing pavement if of greater width than the above.

The level of ground adjacent the path should be no greater than 10 mm below the path level.

Splays shall be constructed at the junction of all footpaths.

Shared use paths for bicycles and pedestrians must be safe and convenient. The design of shared use paths must be in accordance with mid block engineering treatment specified in Bicycle Strategy and Masterplan 2007.

2.3.1 Concrete Footpaving

The subgrade shall be excavated to 125 mm and all soft and other unsuitable material shall be removed and replaced with roadbase material and the subgrade shall be thoroughly compacted and finished to a firm, smooth surface.

A minimum 50 mm thick sub-base of roadbase material shall be provided. Sand shall not be used except for minor levelling work.

The footpaving shall generally be 75 mm thick and increased at vehicular crossings to the crossing thickness.

The forms shall be true to grade and line and adequately braced and without local irregularities. The tolerance shall be ± 15 mm provided that variations in level are not local and are over lengths of 3m or more. Forms shall not be removed sooner than 24 hours after the placing of the last concrete in that section.

Ready mixed concrete shall conform to the provisions of Australian Standards *AS 1379 - Ready Mixed Concrete*.

The minimum compressive strength F_{cp} of the concrete shall be 25 MPa at 28 days in accordance with Australian Standards *AS 1480 - SAA Concrete Structures Code*.

Concrete may be mixed on the job for minor works and shall consist of Portland cement and fine and coarse aggregates mixed in a rotating drum mixer in the proportions of 1:2:3 parts by volume.

The subgrade shall be checked for uniformity and all irregularities made good prior to pouring of concrete and shall be sprinkled with as much water as it will readily absorb.

Concrete shall be placed so as to avoid segregation and shall be adequately compacted. Care shall be taken to fill the edges of the forms and to work the courser aggregate back from the face.

The concrete shall be finished with a broom finish or wooden float. All edges to be rounded with a 75 mm edging tool. The concrete shall not be disturbed after it has been in the forms for twenty (20) minutes.

Full depth contraction joints composed of nominal 6 mm thick approved bituminous mastic jointing material shall be constructed every 3.6 m and dummy joints shall be struck at intervals of 1.2 m.

Bituminous joints shall also be provided at each side of a vehicular crossing footway slab and against all existing concrete structures. The bituminous mastic joints shall be struck to the level of the adjoining concrete surfaces.

Paving shall be kept damp for a period of three (3) days and shall be protected from damage. Any damaged, defaced or otherwise unsatisfactory section shall be removed and replaced.

2.3.2 Footpaving Using Segmental Pavements

1. Pavers will generally only be approved in commercial areas.
2. Pavers shall be a minimum 75 mm thick laid on a 100 mm unreinforced concrete base with a 30 mm layer of sand between the pavers and the concrete.
3. The sand bedding course shall be of roughly uniform thickness and not exceed 30mm after compaction.
4. Pavers should have a nominal 3mm joint between the units. Joints should be filled with appropriate sand.

5. The entire perimeter of segmental pavements should be provided with lateral edge restraints.
6. Concrete aprons (100mm wide) are to be constructed around all pits and other existing structures in the footpath as a lateral restraint for the pavers. Using the existing structure as a lateral restraint is not acceptable.

Footpath Paving

Asphaltic concrete footpath paving or bituminous spray-sealed pavements are no longer permitted.

2.4 Design of Kerb & Gutter

2.4.1 Kerb & Gutter Detail

Kerb and gutter shall be integral construction in accordance with council requirements.

2.4.2 Levels

Design plans, if available, will be issued by Council. If design plans do not exist, they will need to be prepared by the applicant and approved by Council prior to construction.

Generally the following criteria should be met when designing levels for the kerb, gutter and road shoulder:

- there should be a minimum longitudinal grade of 1% and a maximum of 12%;
- the crossfall to the centreline of the road should be 3%; and
- the designer should consider how the proposed section of kerb and gutter will match into any existing kerb and gutter in the vicinity.

2.4.3 Matching Existing Kerb and Gutter

Where necessary, the applicant shall reconstructing existing kerb, gutter and road pavement to ensure appropriate integration with the new section. Council will determine the extent of reconstruction.

Any existing laybacks or roofwater drainage lines discharging into the kerb that will be affected by the reconstruction are to be replaced.

2.4.4 Kerb Ramps

Kerb ramps shall be constructed at each kerb return opposite the extension of the main footpath and in the kerb opposite the extension of a public pathway. Kerb ramps shall be in accordance with plan M388c in the appendix.

2.4.5 Excavation

The sub-grade shall be excavated to the pavement boxing level. All soft, yielding and other unsuitable material shall be removed and shall be replaced with crushed rock material and the sub-grade shall be thoroughly compacted and finished to a smooth surface of uniform bearing value.

The above backfilling procedure shall also be adopted in cases where over excavation of the sub-grade has occurred. At filled locations a crushed rock sub-base minimum 100 mm thick shall be provided.

2.4.6 Form Work

The forms shall be aligned true to grade and line and without local irregularities. The tolerance shall be ± 15 mm provided that variations in level are not local and are over lengths of 3 m or more.

Forms shall be constructed so that they can be removed without damaging the concrete and shall be adequately braced. The interior surface shall, if necessary, be oiled to ensure the non-adhesion of the concrete. The material used for forms for the exposed faces shall be sized dressed soft wood timber. Undressed timber may be used for backing to unexposed surfaces.

2.4.7 Material

Ready Mixed Concrete

Ready mixed concrete shall conform with the provisions of Australian Standards AS 1379 - *Ready Mixed Concrete*.

The minimum compressive strength f_{cp} of the concrete shall be 25 MPa at 28 days in accordance with Australian Standards AS 1480 - *SAA Concrete Structures Code*.

Job Mixed Concrete

Concrete may be mixed on the job for minor works and shall consist of Portland cement and fine and coarse aggregates mixed in a rotating drum mixer in the proportions of 1:2:3 parts by volume.

2.4.8 Joints

For hand placed kerb and gutter 6 mm thick approved bituminous mastic jointing material shall be provided at intervals not exceeding 6 m. For machine placed kerb and gutter, 6 mm thick approved bituminous mastic jointing material shall be provided at intervals not exceeding 6 m and full depth guillotined dummy grooved joints shall be provided midway between mastic joints. Joints are also required at each end of gutter crossing and gully pits. Joints shall be set vertical and square to the kerb.

2.4.9 Placing Concrete

Prior to placing the concrete the foundation shall be sprinkled with as much water as it will readily absorb and the surface shall be checked for uniformity and all irregularities made good.

The concrete shall be placed so as to avoid segregation and shall be adequately compacted. Care shall be taken to fill every part of the forms and to work the coarser aggregate back from the face. Exposed surfaces of concrete shall be struck off and finished with a steel float, and corners and edges so shown shall be left neatly rounded with an approved nosing tool. Concrete shall not be disturbed after it has been in the forms twenty (20) minutes.

2.4.10 Machine Placed Kerb and Gutter

Approval will be given for the use of a kerb moulding machine for the placing of integral kerb and gutter and semi-mountable kerbs, subject to the Contractor demonstrating to the satisfaction of the Director of Engineering Services, that the proposed machine and operators are able to produce a kerb and gutter or semi-mountable kerb to a standard at least equal to that obtained by the conventional formwork method.

2.4.11 Transition at Pits

At gully pits, attention is drawn to the requirement that an additional 50mm cross-fall be provided in the gutter invert adjacent to the kerb opening.

2.4.12 Finish

After removal of the forms, minor or porous sections or holes shall be repaired with a three to one (3 to 1) cement mortar. The exposed surfaces shall then be rubbed with a wooden float and clean water to leave the surfaces smooth and uniform in colour and appearance.

Any major rough or porous sections shall be removed between the construction joints. Such sections are to be removed and replaced at the applicant's cost.

2.4.13 Curing and Protection

Completed works shall be kept damp for a period of three (3) days and shall be protected from damage. Any damaged section shall be removed and replaced as directed at the applicant's cost.

After the concrete has set sufficiently (and not sooner than three [3] days after placing), the foot-way behind the kerb shall be neatly trimmed or filled with clay/loan soil to within 100 mm of the finished surface level and then filled to 25 mm below the finished surface level with topsoil.

2.4.14 Backfilling

After the concrete has set sufficiently (and not sooner than three [3] days after placing), the foot-way behind the kerb shall be neatly trimmed or filled with clay/loan soil to within 100 mm of the finished surface level and then filled to 25 mm below the finished surface level with topsoil.

2.4.15 Pavement Thickness

All road pavements to be constructed must be designed by a geotechnical engineer in accordance with the AUSTROADS Pavement Design Manual *A Guide to the Structural Design of Road Pavements (1992)*.

A full design is to be submitted to Council for approval in conjunction with the Development Application, and the final design should be tabled as follows:

PAVEMENT DETAILS	COMPACTED LAYER THICKNESS
TYPE OF PUBLIC ROAD	
Sub Grade Minimum subgrade CBR 8 otherwise lime stabilised to a depth of 150mm to achieve a CBR of greater than 8. Compacted to 100% Standard to AS1289.	Minimum = 150 mm
Sub-Base Course Dense Graded Road Base of nominal size 40mm (DGB40) or 75mm nominal size Crushed Sandstone with CBR greater than 30. Compacted to 98% Modified to AS1289.	Minimum = 150 mm
Base Course Fine Crushed Rock of nominal size 20mm (FCR20) with CBR greater than 80. Compacted to 98% Modified to AS1289.	Minimum = 150 mm
Wearing Course AC14 or SBS AC14 (binder A15E) at intersections and curves.	Minimum = 50mm
TOTAL THICKNESS	Minimum = 350mm

NOTE: The above pavement thickness is intended for Residential Roads and ideal sub-grade conditions. A sub-grade course is generally required where poor sub-grade conditions exist.

2.4.16 Formation

Scrub, stumps, boulders and the like shall be cleared to the full width of the road reserve, and grubbed to a depth below subgrade level. All existing trees are to be retained.

The finished roadway shall be graded in accordance with the longitudinal section and crossfalls shall be as shown on the appropriate cross sections with footways and side slopes neatly trimmed.

Topsoil shall not be used as filling.

Material for filling shall be approved clean filling consisting of not less than 70 per cent (70%) of granular material and be free from vegetation, stumps, roots, rubbish, iron, etc.

Embankments shall be carried up on full width layers of not greater than 300 mm thickness, loose measurement. Each layer shall be well compacted during construction by the use of approved rubber-tyre or sheep-foot rollers.

No filling shall be placed against any part of a concrete structure within 28 days of the concrete being placed unless the structure is adequately strutted and approved by the Supervising Engineer. Filling adjacent to weep holes shall be of clean broken stone for at least 300 mm in all directions from the weepholes and approved geotextile is to separate this material from surrounding backfill material.

The minimum batter slope in fill shall be 1(V):3(H).

In cuttings, the formation shall be finished with a boxing for the pavement. The boxing shall be formed by excavating to the sub- base level except in rock cuttings. In rock cuttings, the rock shall be loosened to a depth of 300 mm below subgrade level and if deemed suitable by Council, shall be re-compacted. If considered unsuitable, the material shall be treated as unsuitable subgrade, removed from the site and replaced with approved crushed sandstone.

The minimum batter in cut shall be 1(V): 2(H) or 1(V): ¼H) in rock.

Subsoil drains shall then be installed through the cutting as specified in Clause 2.4.23. Following installation of the subsoil drains placing of the first layer of the base course may proceed.

If the subgrade consists of organic material, soft and yielding clay or other unsound material it shall be removed for a depth as directed by the Supervising Engineer and replaced by approved crushed sandstone.

2.4.17 Compaction of Sub Grade

The subgrade shall be thoroughly trimmed and compacted by rolling with a roller weighing not less than 8 tonnes until it conforms to the required profile and exhibits a degree of compaction.

Any soft yielding or unstable patches that become apparent shall be removed and replaced with sound material as specified in Clause 2.4.16 and rammed or rolled until thoroughly compacted.

Any wet areas where the subgrade would be suitable if maintained in a dry state, shall be dried by tyning, wind rowing, re-levelling and compaction.

The degree of compaction required is that when tested with an approved 8 tonne three point roller, there should be negligible movement of the subgrade or be not less than 100% of the standard density obtained when tested in accordance with RMS Test Method T.111.

2.4.18 Materials

The road pavement shall consist of layers, as specified in the General Specification or as shown on the drawings, and as follows:

- | | |
|---------------------------------|--|
| a. Sub-base | To be crushed rock material in accordance with RMS Form 744 for crushed rock. This material shall be spread, compacted, trimmed and maintained as specified below. |
| b. Base Course | To be in accordance with Construction Standard for Hot Bituminous Mixtures page 26. |
| c. Intermediate or Upper Course | To be approved by Council based on site conditions. Residential Streets with low traffic volumes to use a residential mix AC. |
| d. Corrective or Binder Course | Areas subject to heavy breaking or tight turning traffic will generally be SBS modified AC. |
| e. Wearing Course | All other streets will generally require AC 10. |

2.4.19 Spreading

Pavement material shall be spread without segregation in uniform layers that will provide the compacted thickness' as specified.

When spread, the moisture content shall be adjusted so that it does not exceed the optimum percentage or be less than 97% of the optimum moisture content. Water shall be added using an approved watering machine. Excess moisture shall be removed to the specified content by loosening.

Pavement material shall not be spread on a waterlogged base. If at any time the subgrade or sub-base material should become rutted, or mixed with the pavement material, the applicant shall at his own expense remove the material, reshape and compact the subgrade material, and replace the pavement material with fresh material.

2.4.20 Compacting and Trimming

The road pavement shall be compacted by suitable means to meet the following requirements:

DESCRIPTION	MINIMUM DENSITY RATIO
Footpath Areas	95% (STD)
Subgrade	100% (STD)
Base course	98% (MOD)
Asphaltic Concrete	See Section 4.50

The top of each course shall be graded and trimmed, and material shall be added where necessary to produce a surface parallel to the finished surface of the roadway.

Variations in the compacted thickness of each course shall not exceed +25 mm or -15 mm. The finished surface level shall not vary more than 15 mm from the planned grade at any point, and in the case of upper courses the finished surface shall not deviate more than 6 mm in 3 m in any direction.

Any irregularities in excess of the tolerances stated above shall be corrected by loosening the surfaces, removing or adding pavement material as required, and compacting the area to a uniform surface conforming to the designed cross section and grade. In no case shall quarry dust or other fine material be used to build up depressions.

Traffic shall not use the pavement until it is fully compacted. Where it is not practicable to provide side-tracks or detours, the pavement may be constructed part width at a time so that traffic may use the remaining width not under construction. This procedure shall be subject to Council's prior approval of the methods of construction and the means of traffic management.

After the pavement is fully compacted it may be opened to traffic provided that, in the opinion of the Director of Engineering Services, it will not suffer damage. Notwithstanding such approval, any damage that may occur shall be made good by the Contractor at his/her own expense in the manner described in Clause 2.4.22.

2.4.21 Compaction Equipment

Vibrating compaction equipment cannot be used in streets where Federation Style or other older houses are located. At these locations Static Compaction equipment shall be used.

2.4.22 Surfacing Procedures Course

The pavement should be provided with the first layer of hot bituminous mixture as soon as possible after compaction of the base course is complete.

The final wearing course is laid after all other works are completed on the work site or as otherwise approved by the Certifier.

2.4.23 Subsoil and Subgrade Drains

Subsoil and subgrade drains shall be located as required by this clause or as shown on the Approved Drawings, or as directed by the Certifier.

Subsoil drains may be required at the property line of a footway formed in a cutting to prevent seepage of water onto the footpath. All locations will be treated on their merits and the construction of the necessary subsoil drains shall be undertaken as directed by Council.

The trench shall be 200 mm wider than the nominal pipeline size. If not indicated on the drawings the depth shall be a minimum of 400 mm below the road subgrade level or in the case of footpath drainage 600 mm below the finished footway level.

Subsoil drains shall be perforated plastic piping contained in a geotextile sock. The pipe size shall be 100 mm diameter.

Subgrade drainage lines located under the pavement shall be laid on a 50 mm thick bed of 5 mm crushed metal. The drainage line shall be backfilled to within 300 mm of subgrade level with 5 mm crushed metal and then covered with a geotextile (Bidim A14 or equivalent).

Subsoil drainage lines other than under the pavement as above to within 100mm of the finished surface and covered with geotextile (Bidim A14 or equivalent). The remainder of trench to be backfilled with approved top soil.

If shown on the Drawings, sumps for inspection and cleaning purposes shall be provided in subsoil or subgrade drainage lines at the locations and to the dimension shown.

2.4.24 Service Conduits

Service conduits are to be supplied and laid to the size and location as shown on the Drawings. In the absence of a specified size a minimum of a 100 mm diameter shall be used.

Conduits shall be laid with a minimum 100 mm cover below the subgrade level or deeper if required by the service authority and the trench backfilled and compacted with fine crushed rock or road base.

Conduits may be rubber ringed concrete pipes, cast iron (medium grade) pipe or rigid PVC tube. The conduits shall extend 300 mm behind the back of kerb on both sides.

The kerb face is to be clearly marked with a letter "C" 75 mm high recessed or cut 4 mm into the concrete kerb directly above the conduit on both sides of the road, then finished with red paint.

2.5 Construction Standard for Hot Bituminous Mixtures

2.5.1 Supply of Mixtures

All aspects of the supply of hot bituminous mixtures including aggregates, binder, proportioning of mixes, stability of mixes, voids in compacted mixes, voids filled by the binder and mixing procedure shall be in accordance with the relevant Roads and

Traffic Authority Specification and requirements.

The mixture must be supplied from an approved supplier or the applicant must undertake, at his/her own cost, to have the mix tested by an approved testing laboratory.

Mixes not complying with this specification will be rejected.

2.5.2 Transport

The mixed material shall be discharged into motor trucks, the bodies of which have been lightly smeared with oil, or lightly coated with lime-water or soap solution, to facilitate discharge. The complete load shall be covered with heavy canvas (or equivalent) to minimise loss of heat during transit.

Where mixed material is to be transported over long distances, or in cold conditions, the bodies of all trucks should be suitably insulated.

Except as agreed otherwise, all motor trucks shall carry not less than 6 tonnes of mixed material. Each truck shall be fitted with an approved type of adjustable tail gate to allow proper control of the mix during discharge into the spreading device.

When backing trucks against the spreader, care shall be taken not to jar the spreader out of its proper alignment. Delivery of the mix shall be at a uniform rate within the capacity of the spreading and compacting equipment. Transport shall be as expeditious as possible to minimise cooling of the mixture.

For contract works, if the contract is on the basis of a schedule of rate, then all truck loads of mix shall be weighed upon a weighbridge certified by the Department of Weights and Measures.

2.5.3 Preparation of Pavement

The pavement shall be dry and shall be thoroughly broomed before other works are undertaken. Any foreign matter adhering to the pavement and not swept off by the broom shall be removed by other means. Any deep depressions or uneven areas are to be tack-coated and brought up to the general level of the pavement with mixed material before the main course is laid. Such preliminary treatment shall be thoroughly rolled.

The whole of the area to be sheeted with mixed material shall be lightly and evenly tack-coated with a fine spray of rapid-setting bitumen emulsion, which shall be not less than 0.28 - 0.56 litre/metre squared. Warming of the bitumen emulsion to about 43°C and/or dilution with water may be required to facilitate spraying and permit uniform application. The tack coat shall be allowed to "break" (water separating from the bitumen) before the mix is spread.

2.5.4 Spreading

Spreading, except as agreed otherwise, shall be by an approved self-propelled machine having an effective spreading capacity of not less than 250 tonnes of mix per 8-hour day. It should include the following features:

- a. Means of pushing each motor truck during spreading, with a rapid acting device to engage and release trucks;
- b. A receiving hopper into which motor trucks can discharge the mixed material;
- c. Distributing screws to place the material evenly in front of screed plate, without segregation;
- d. Automatic tamping devices;
- e. An adjustable screed capable of providing a smooth even surface free from tears or other blemishes, to a width of not less than 3m. Provision shall be made for easy adjustment to permit lesser widths of spread;
- f. Heating device to control the temperature of the screed;
- g. Effective steering such that the mix can be laid to a true line;
- h. Means of adjusting depth of spread between 12 mm and 100mm compacted thickness; and
- i. Automatic screed control operated from joint matching shoe, fixed line, travelling straight edge or levelling beam.

The machine shall be so operated that material does not accumulate along the sides of the receiving hopper. Any mix in or under the machine which has become cold due to delay in the transport of mix, or for any other reason, shall be removed.

Where the end of the spread material has cooled due to delay in the delivery of mix, or when resuming work on the next day, a transverse joint shall be formed by cutting the spread material to a vertical face before any fresh mix is spread.

In the event of faulty operation of the mechanical spreader causing irregularities in the spread material, work shall be suspended until the fault is rectified. If the irregularities are of a minor nature, and the surface has not cooled appreciably, it will be permissible to spread a thin layer of fresh mix by hand, level it with broad rakes, and roll quickly. Should this treatment fail to produce a surface of acceptable texture and regularity, or if the faults left by the spreader are of appreciable depth, or if the faults left by the spreader are of appreciable depth, then the defective surface shall be removed, and fresh material shall be laid as previously described.

Mixing and placing asphaltic concrete will not be permitted when the surface of the road is wet, or is at a temperature less than 10°C or cold winds chill the mix to an extent that spreading and compaction are adversely affected.

The temperature of the mix when it is tipped into the spreader shall not be less than 130°C. Spreading shall proceed without undue delay, and initial rolling of the mix shall commence at a temperature of not less than 115°C.

The minimum compacted thickness of mix shall be as required by the approved Drawings.

2.5.5 Joints

Work is to be so arranged as to keep the number of joints, both longitudinal and transverse to a minimum and the daily laying pattern shall be subject to approval by Council before work commences.

Care shall be taken to provide positive bond between adjoining runs. The density of material at joints and the surface finish at joints are to be equal in all respects with those of the remainder of the course. Hot joints will be preferred. Whenever practicable the levels of adjacent runs shall be matched by the use of automatically controlled joint matching devices. Work is to be arranged so as to avoid longitudinal joint faces other than those at the extreme edge of the pavement being left exposed overnight.

Joints shall be carefully constructed and thoroughly compacted to provide a smooth riding surface, care being taken to ensure that exactly the required depth of loose materials provided at joints before rolling commences. Cold transverse joints shall be cut to a neat vertical face before work continues adjacent to them.

2.5.6 Compaction

Initial rolling shall be undertaken immediately behind the spreader, using a steel wheeled roller, having a minimum weight of 8 tonnes and a minimum unit load on the road roll(s) equivalent to 55 kg per cm width of roll. Steel-wheeled rollers shall be provided with adjustable scrapers to keep the rolls clean, also effective means of keeping the rolls moist with water, just sufficient to prevent the mix from sticking to the rolls. Excessive amounts of water, which may collect on the road's surface will not be permitted.

Unless otherwise approved, intermediate rolling shall be undertaken by a self-propelled pneumatic-tyred machine having a total weight of at least 10 tonnes, having minimum tyre pressure of 550 kPa and a minimum total load of 1 tonne on each tyre. Where practicable, the load should be increased to 2 tonnes per tyre. The tyres shall have smooth rolling surfaces and shall be maintained at pressures within 5% of the nominated figure. Final rolling should be undertaken by a steel-wheeled roller of the type described above. In the event of excessive displacement of the mix occurring at any time during rolling, further rolling shall be deferred, but only until such time as the mix has cooled sufficiently to permit proper compaction.

The transverse and longitudinal joints and edges shall be compacted first and rolling shall then proceed longitudinally at the sides and gradually progress towards the centre of the pavement, except on super-elevated curves where the rolling should begin on the low side and progress to the high side. Each transverse shall substantially overlap the previous transverse.

The rollers shall move at a steady uniform speed not exceeding 5 km/hr. Care shall be taken to avoid abrupt stops and starts that may displace the mix.

Where the edge of the spread mix is not supported laterally, it shall first be subjected to side tamping with hand tampers which should also slightly raise the level of the mix so as to secure maximum edge compaction from the subsequent rolling.

Rolling of the mix shall proceed until such time as the compaction is at least 97% of that of a laboratory specimen of the same mix, compacted by the modified Hubbard-Field method.

2.5.7 Finished Surface

The finished surfaces shall be smooth, dense and true to shape, shall not vary more than 12 mm from the planned grade at any point, and shall not deviate from the bottom of a 3 m straight edge, laid in any direction, be more than 12 mm for base courses or corrective courses, 6 mm for the intermediate courses and 3 mm for the surface course. Sufficient measurements of thickness shall be taken before and after compacting to establish the relationship between the thickness of the uncompacted material and the completed work. The thickness shall then be controlled by measurements taken of the uncompacted material immediately behind the paver. When the measurements indicate that an area will not be within the allowable tolerances for the completed work, the uncompacted area shall be corrected while the material is still in a workable condition by adding or loosening and removing material. Otherwise the defective area shall be removed and replaced with fresh material. Irregularities exceeding the tolerance given above in a particular course shall be corrected before a subsequent course is placed.

Where necessary, the finished surface shall be lightly sprinkled with limestone dust, or other approved filler, in quantity only sufficient to ensure that the mix will not be tacky under traffic.

2.5.8 Provision for Traffic

Care shall be taken to ensure that vehicles and pedestrians are not sprayed with bitumen emulsion during tack-coating and that entry to areas treated with tack coat or hot paving mixture is prevented.

Any damage or injury occasioned to vehicles or pedestrians shall be rectified at the applicant's expense.

3.0 ANCILLARY ITEMS

3.1 Roundabouts

Roundabouts should generally be designed in accordance with the requirements of the publication *AUSTROADS - Guide to Traffic Engineering Practice Part 6, Roundabouts*.

Roundabout designs should generally comply with the following:

- entry width to provide adequate capacity;
- adequate circulation width, compatible with entry width and design vehicles;
- central islands of diameter sufficient only to give guidance on the manoeuvres expected;
- adequate deflection of crossing movements to ensure low traffic speeds;
- a simple, clear and conspicuous layout; and
- a design to ensure the speed of all vehicles approaching the roundabout is less than 50 km/hr.

3.2 Traffic Calming Devices

Calming devices such as thresholds, slow points, speed humps, chicanes should be designed in accordance with requirements of the publication *AUSTROADS - Guide to Traffic Engineering Practice Part 10, Local Area Traffic Management*.

3.3 Provision of Services

Where a new public roadworks are being constructed, the applicant shall arrange and pay all costs and fees associate with providing street lighting, underground electrical power and telephone services. Council will bear the additional street lighting electricity charges.

3.4 Street Name Signs

If a new road is being provided, street name signs will be supplied and erected by Council at the applicant's expense.

3.5 Street Trees

Generally, street tree planting will be required along all newly constructed roads. There must be at least one tree on each side of the road for each 20 linear metres of road. The exact location of the tree will be determined having regard to the location of services, driveways and the like.

A tree schedule that nominates appropriate street trees for use in the Ryde local government area may be obtained from the Council.

3.6 Street Furniture

All proposed street furniture should comply with the relevant Council Masterplan in respect of its material, colour, size, shape and location. This is subject to aspects of safety and compatibility with the development and adjacent development being considered.

Where there is no masterplan, Council's use of a particular style of street furniture as a signature of the Council area or suburb must be respected.

4.0 STORMWATER DRAINAGE

4.1 Design of Drainage System

Stormwater systems are to be designed in accordance with Part 8.2 Stormwater of this DCP. In this section are additional guidelines that are to be used when designing drainage that will become public losses.

4.1.1 Storm Water Pipes

Pipe Size

Pipes shall be sized to adequately convey runoff from the relevant design storm. In some circumstances pipes may need to be sized larger to accommodate a greater quantity of runoff in order to ensure proper management of overland flow during extreme storm events.

The minimum pipe size shall be 375 mm diameter.

Pipe velocities shall be between 0.5 m/s and 7.0 m/s and preferably between 1.0 m/s and 5.0 m/s during the design storm.

Pipe Grade

The minimum pipe grade shall be 0.5%. The maximum pipe grade shall be selected so as to comply with the desirable and maximum velocities as given above.

4.1.2 Pit Locations

Kerb inlet pits shall be located and provided with inlets of adequate size to relieve the flow in gutters, such that the depth does not exceed 100mm on the high side of residential streets and 75 mm on the low side of residential streets and 75 mm in commercial areas.

The location of the gully pits on curves, kerb returns and in line with normal pedestrian traffic flows is to be avoided.

4.1.3 Safety

The Depth x Velocity product of stormwater flow across the footpath and within the road reserve shall be such that the safety of children and vehicles are considered. The limiting depth velocity product shall be as set out in the report by the University of NSW Water Research Laboratory, *Car Stability on Road Floodways: Technical report No 73/12*. further, the depth velocity should not exceed 0.4 m²/s.

4.2 Materials

4.2.1 Pipes

Pipes are to conform with the test requirements of Australian Standards *AS 4058-1992 Precast Concrete Pipes (Pressure and non-Pressure)*.

Typically, Council pipes shall be RCP class 2. PVC and FRC pipes will generally not be accepted as Council pipelines.

4.2.2 Pits

Pit Chamber

Precast pit chambers will not be acceptable for use as kerb inlet pits.

Lintels

Precast concrete lintels shall be at least equivalent to those supplied by CSR Humes.

Precast combined units will not be accepted.

Grates

Gully pits shall consist of Weldlock GG 78/51 Galvanised steel grates at most locations. In Commercial and Industrial Areas or along State and Regional Roads the Weldlock GG78-42A grate shall be used.

4.2.3 Concrete Works

Ready Mixed Concrete

Ready mixed concrete shall conform to the provisions of Australian Standards *AS 1379-1997 Specification and Supply of Concrete*.

The minimum compressive strength F_c of the concrete shall be 25 MPa at 28 days in accordance with AS 3600 - 1994 and have a minimum cement content of 240 kgs/m³. Details of the supplier and the mix shall be submitted to and approved by the Superintendent prior to the construction of gully pits.

Job Mixed Concrete

Concrete may be mixed on the job for minor works and shall consist of portland cement and fine and coarse aggregates mixed in an approved rotating drum mixer in the proportions of 1:2:3 parts by volume.

Reinforcement

Steel reinforcement shall be to the size, type, shape and positioned as shown on the drawings. It shall be free from mud, oil, grease or other non-metallic coating or loose rust that would reduce the bond between the concrete and the reinforcement and shall be adequately fixed and tied.

4.2.4 Bedding & Backfill Material

Bedding material for reinforced concrete pipes shall be as specified in Australian Standards *AS 3725-1989 Loads on Buried Concrete Pipes*. Backfill material shall be excavated from the trench or imported provided that the material is free from builders waste, bricks, pieces of concrete, roads or similar retained on a 75 mm sieve.

4.3 Construction of Drainage System

4.3.1 Excavation

Trenches shall be excavated to the grade line and shown on the Drawings and below the bedding. All soft, yielding and other unsuitable material shall be removed and the trench shall be thoroughly compacted and finished to a firm smooth surface of uniform bearing value. Excavation shall include all classes material including muck, shale or rock.

The minimum width of the trench shall be the nominal pipe diameter plus 400 mm (with local widening at pipe collars to ensure proper compaction of backfill). The Contractor's attention is drawn to the requirements of the NSW Department of Industrial Relations regarding the supporting of the sides of trenches deeper than 1.5m.

4.3.2 Bedding

Unless a higher standard of bedding is shown on the Drawings, type H1 support comprising a continuous cushion of 5 mm crushed blue metal shall be provided to a depth of 75 mm or 200mm in rock.

4.3.3 Laying

Pipes shall be laid top up as marked by the manufacturer. The space between abutting end of pipes shall not exceed ½% of the diameter of the pipe. Where socket joints are used, recesses shall be left under pipe joints to permit jointing, and to avoid bearing of the socket. Each length of pipeline shall be uniformly supported on the bedding throughout its length.

Pipelines shall be true to grade and line. Where multiple lines of pipes are to be laid side by side, the space between the lines of pipes shall be of the diameter of pipe with a minimum clearance of 300mm.

4.3.4 Jointing

All pipes concrete pipes of less than 600 mm diameter are to have rubber ring joints.

4.3.5 Junctions

Junctions shall be made by the use of pits or by direct connection to the main pipe in accordance with the pipe manufacturer's recommendations. Where a direct connection is made to the main pipeline, a short length of pipeline is to be connected to the pit and a joint used to join any full length of pipeline.

Every effort shall be made to streamline junction pits to reduce hydraulic losses. This includes benching of pit floors, alignment of inlet and outlet pipes to direct the inlet jet directly into the outlet pipe.

A 3 m long length of 100 mm diameter perforated plastic corrugated pipe shall be provided at the downstream end of every drainage trench and connected to each drainage pit. The drain shall be carried through the wall of the pit. The upstream end of the drain shall be blanked off with a plug of cement mortar or wrapped in geotextile.

4.3.6 Backfilling

All pipelines shall be surrounded and backfilled with 5 mm blue metal to 100 mm above the crown of the pipes. The blue metal shall then be covered/compacted with Geotextile - Bidim A14 or equivalent.

Pipelines located within existing or proposed carriageways shall then be further backfilled with either crushed rock or road base material to subgrade level.

At other locations, any of the above backfill materials shall be permitted in addition to approved excavated material free from excessively large pieces of material or other deleterious matter.

All backfilling shall be compacted in layers not exceeding 200 mm loose thickness.

4.3.7 Concrete Drainage Structures

The foundation shall be excavated to neat lines and formed at the required depth in accordance with the Approved Drawings. All unsuitable material shall be removed and the base shall be thoroughly compacted.

The Contractor shall furnish all necessary sheeting supports and brackets to support the excavations together with all formwork and supports to mould the concrete and shall keep the excavation free from water.

Forms shall be so designed and constructed that they can be removed without damaging the concrete, and shall be mortar-tight and adequately braced. The interior surface shall, if necessary, be oiled to prevent adhesion of the concrete.

Prior to placing concrete, the subgrade shall be sprinkled with as much water as it will readily absorb.

The concrete shall then be placed so as to avoid segregation and shall be adequately compacted. If a mechanical vibrator is used to compact the concrete, care should be taken to ensure that no segregation of the aggregate is caused by over vibration.

The exposed surfaces shall be struck off with a wooden float and neatly finished. Concrete shall not be disturbed after it has been in the forms 20 minutes.

Forms to concrete faces shall not be removed until at least 48 hours after concrete has been placed. At locations where the concrete will be under load and unsupported, a period of 28 days will be required.

After removal of forms, any rough or porous surfaces or holes shall be thoroughly scabbled and dressed and rubbed up with a 3 to 1 cement mortar. Faulty and honey-combed portions shall be taken down and rebuilt if directed by the certifying authority.

Concrete work shall be completed to the dimensions shown on the drawing with a tolerance of ± 2 mm unless otherwise approved.

Concrete work shall be kept damp for a period of three (3) days.

Inlet or outlet pipes shall be neatly rounded off with the interior surfaces of the pits and junction boxes.

4.3.8 Cast Iron and Galvanised Steel Fittings

Grates shall seat squarely within and be pinned to the frame, without rocking or other movement. Grates shall be firmly and evenly bedded. All pits located in the carriageway shall have cast iron covers.

4.3.9 Step Irons

All pits deeper than 1 m shall have step irons installed in accordance with Australian Standards *AS 1657 – 1992 Fixed Platforms Walkways Stairways and Ladders*.

4.3.10 Channelisation of Pits

The invert of all change of direction pits shall be shaped in such a manner as to minimise water turbulence.

5.0 STANDARDS ENFORCEMENT

5.1 Plan Submissions

5.1.1 Presentation of Plans

Two copies of engineering plans are required to be submitted at the draft design, draft final and approved final stages.

One set of Original Approved and Certified Plans printed on drafting film shall be placed in a sealed cardboard tube and delivered to Council.

Copies of the Approved and Certified Plans shall be provided to Council on computer files in AutoCAD with the extension ".dwg" and supplied on a CD.

Unless otherwise agreed to, all drawings shall be prepared on A1 sheets (841mm x 594mm) and generally in accordance with standard drawing practise.

The standard "Ryde City Council - Engineering Service" Title block shall be used on all drawings. As well details of Council font style shall be provided prior to the commencement of design.

Scales shall be clearly indicated on all sheets and the following scales shall normally be used:

- Plans Generally 1:250 horizontal
- Long Sections Generally vertical 1:250 horizontal 1:100
- Cross Section 1:100 natural
- Special Structures or Details 1:20
- for other scale drawings, only standard engineering scales shall be used (See Australian Standard 1100.7)

Plans shall include a schedule of set out points listing:

- Point number;
- Easting;
- Northing;
- Reg Level; and
- Finished surface level.

Australian Height Datum shall be used for all levels and a permanent bench mark shall be provided by the consultant for each project.

All surveys shall be co-ordinated to a minimum of three Integrated Survey Grid (I.S.G.) marks.

5.1.2 Plan Requirements - Roads

The Plan shall show all relevant and useful information consistent with current Engineering Practise and include:

- a. the position of each road, and its relation to other roads; road centreline with the bearings of straight sections and the radius of curves; all recovery pegs and bench marks with the reduced levels thereof and include a schedule of set out listing Point Number, Easting, Northing Peg level and finished surface level the road chainage and details of pits and pipes; horizontal curve information including intersection angle; arc length; tangent length and secant; property boundaries; the provision made for drainage (with levels, gradients and dimensions of proposed drains, if any) and any drainage reserves and easements.
- b. longitudinal section with levels at intervals not exceeding those for cross-sections in (iii) showing the road alignment; the existing natural surface levels, the proposed levels, grades, vertical curves. RI*'s of grade intersection points any alignments; TP SC SS locations, chainages and levels of intersecting roads. A separate row marked "WAE LEVELS" shall be included above the design levels.
- c. Cross-section and typical cross-sections showing the proposed width and convexity of carriageway, width and slope of footway, details of the proposed construction of kerbing, gutter and footway, and any proposed arrangement of tree planting, spacing shall be 10m on straight sections, curves and on transitions ie between SS and SC points.
- d. Kerb returns shall be designed using scales of 1:100 horizontal and 1:10 vertical or similar and shall indicate a longitudinal profile of kerb levels over the length of the return are between respective tangent points. Longitudinal profiles shall be included. The pit lintels at low points are to be plotted on the profile.

Sufficient survey and level information shall be obtained from the intersecting street ie for a minimum distance of 20m, to permit the design of the kerb return.

5.1.3 Plan Requirements – Drainage

A plan of the catchment area shall be included at a scale not less than 1:2000. All existing stormwater drainage works shall be shown.

Plan submitted shall include full details of run-off calculations entered on a flow schedule laid out in accordance with Council's standard drawing M252b.

The proposed pipelines shall be shown in heavy broken chain lines on the road plans together with the location and type of all pits, including the length of precast lintels where applicable.

A detailed longitudinal section of every pipeline shall be prepared showing:

- the existing ground surface (dotted line);
- the final or proposed surface (full line);
- the pipe size, type, class, joint type and backfill type structure number to correspond with plans and pipeline changes;
- pipe inverts and grade;
- flowrates and hydraulic grade lines; and
- pit types and pit 'k' values.

Special drainage structures eg Headwalls, scour protection shall be detailed.

5.2 Inspections

5.2.1 Footways

An Engineering Compliance Certificate (see Section 5.4) will need to be obtained after footway works have been completed.

- the levels of the footway;
- suitability of the transitions to the existing footway levels; and
- the alterations to any services within the footway.

A further Engineering Compliance Certificate must be obtained two (2) months after the turf has been laid on the public footpath. The Certifier must confirm:

- the finished level of the footway adjacent the kerb is not below the top of kerb;
- there is no step down from any footpaving or driveway crossings to the finished level of the footway;
- there are no localised depressions where water may pond or flows may be concentrated; and
- there are no areas of dead turf.

The building security deposit will not be refunded until this inspection is undertaken and the footway assessed as satisfactory.

Standard not met

If the development standard is not met, the sections of unsatisfactory footway will need to be repaired. If turf is dead, it will need to be replaced and maintained by the applicant for a further period of two months.

5.2.2 Footpath Paving

A Compliance Certificate must be obtained following placement of formwork and reinforcement, but prior to pouring of concrete.

The Certifier must check:

- thickness and alignment of the formwork;
- suitability of subgrade treatment; and
- the levels of the formwork.

Roller Testing

To ensure adequate compaction of the course under construction, the applicant shall make available a steel wheeled roller having a minimum weight of eight (8) tonnes and a minimum unit load on the rear roll equivalent to 5500kg per metre width of roll, and an operator.

Under the rolling test, the subgrade or pavement layer being tested shall not show any localised deflection under the roller wheel or wider scale movement, creep ahead of the roller or cracking. If the area being tested shows compaction under the test roller itself, as indicated by the roller permanently compressing the pass being tested in relation to the surrounding material further water and rolling of that layer shall take place.

Under no circumstances is any succeeding work to proceed until the compliance certificate has been obtained.

5.2.5 Drainage Works

Compliance certificates must be obtained at the following stages of construction;

- following excavation and bedding of the pipe but prior to backfilling, and
- following backfilling and restoration.

Inspections of any concrete structures will be required following erection of formwork and placement of reinforcement but prior to pouring.

Standard Not Met

Any sections of the drainage system that do not meet Council's standards must be removed and replaced.

5.3 Works as Executed Plans

Following satisfactory completion of the roadworks, a "works-as-executed" plan shall be prepared by a licensed surveyor and forwarded to Council prior to finalisation of the application.

On a copy of the approved road plans, the surveyor shall confirm the "as-executed" levels at each point on the plan where a level has been nominated. The plans shall show any additional work that has been carried out such as subsoil drains, service conduits, etc.

5.4 Maintenance Period

5.4.1 Footways

A maintenance period of two (2) months shall apply to the public footway. The building security deposit will not be released until this maintenance period is completed and a compliance certificate obtained to demonstrate the footway has been assessed as satisfactory.

5.4.2 New Public Roads

The applicant shall maintain all the works to the satisfaction of Council for a period of six (6) months after the date of final satisfactory inspection.

Prior to finalisation of the building works the applicant shall lodge with Council a cash deposit or bank guarantee which shall be refunded at the end of the maintenance period provided the work shows no defects.

The security deposit shall be calculated at 5% of the construction costs as estimated by Council.



City of Ryde
Civic Centre
1 Devlin Street
Ryde NSW 2112

www.ryde.nsw.gov.au

City of Ryde Development Control Plan 2014

Part: 9.1 Signage

Translation

ENGLISH

If you do not understand this document please come to Ryde Civic Centre, 1 Devlin Street, Ryde Monday to Friday 8.30am to 4.30pm or telephone the Telephone and Interpreting Service on 131 450 and ask an interpreter to contact the City of Ryde for you on 9952 8222.

ARABIC

إننا نعتذر عليك فهم محتويات هذه الوثيقة، نرجو للحضور إلى مركز بلدية رايد Ryde Civic Centre على العنوان: 1 Devlin Street, Ryde 1 من الاثنين إلى الجمعة بين الساعة 8.30 صباحاً والساعة 4.30 بعد الظهر أو الاتصال بمكتب خدمات الترجمة على الرقم 131 450 لكي تطلب من أحد المترجمين الاتصال بمجلس مدينة رايد، على الرقم 9952 8222، نيابة عنك.

ARMENIAN

Եթէ այս գրութիւնը չէք հասկնար, խնդրեմ եկէ՛ք Րայդ Բիւրոյ Սիւվիլ Սենթըր, 1 Տելվին փողոց, Րայդ, (Ryde Civic Centre, 1 Devlin Street, Ryde) Երկուշաբթիէն Ուրբաթ կ.ա. ժամը 8.30 – կ.ե. ժամը 4.30, կամ հեռաձայնեցէ՛ք Հեռաձայնի եւ Թարգմանական Սպասարկութեան՝ 131 450, եւ խնդրեցէ՛ք որ թարգմանիչ մը Րայդ Քաղաքապետարանին հետ կապ հաստատուէ ձեզի համար, հեռաձայնելով՝ 9952 8222 թիւին:

CHINESE

如果您看不懂本文，請在周一至周五上午 8 時 30 分至下午 4 時 30 分前往 Ryde 市政中心詢問 (Ryde Civic Centre, 地址: 1 Devlin Street, Ryde)。你也可以打電話至電話傳譯服務中心，電話號碼是: 131 450。接通後你可以要求一位傳譯員為你打如下電話和 Ryde 市政廳聯繫，電話是: 9952 8222。

FARSI

اگر این مدرک را نمی فهمید لطفاً از 8.30 صبح تا 4.30 بعد از ظهر دوشنبه تا جمعه به مرکز شهرداری رايد، Ryde Civic Centre, 1 Devlin Street, Ryde مراجعه کنید یا به سرویس مترجم تلفنی، شماره 131 450 تلفن بزنید و از یک مترجم بخواهید که از طرف شما با شهرداری رايد شماره 9952 8222 تلفن بزند.

ITALIAN

Se non capite il presente documento, siete pregati di rivolgervi al Ryde Civic Centre al n. 1 di Devlin Street, Ryde, dalle 8.30 alle 16.30, dal lunedì al venerdì; oppure potete chiamare il Telephone Translating and Interpreting Service al 131 450 e chiedere all'interprete di contattare a vostro nome il Municipio di Ryde presso il 9952 8222.

KOREAN

이 문서가 무슨 의미인지 모르실 경우에는 1 Devlin Street, Ryde 에 있는 Ryde Civic Centre 로 오시거나 (월 – 금, 오전 8:30 – 오후 4:30), 전화 131 450 번으로 전화 통역 서비스에 연락하셔서 통역사에게 여러분 대신 Ryde 시청에 전화 9952 8222 번으로 연락을 부탁드립니다.

Amend. No.	Date approved	Effective date	Subject of amendment

Table of Contents

CONTENTS

1.0	GENERAL INFORMATION	5
1.1	Objectives of this Part	5
1.2	Application of this Part	5
1.3	Applications and Approval Process	5
1.4	Structure of this Part	5
2.0	GENERAL REQUIREMENTS FOR ALL SIGNAGE	6
2.1	Signage Content	6
2.2	Language	6
2.3	Number of Signs	6
2.4	Design, Safety and Maintenance	6
2.5	Illuminated Signs	7
2.6	New Buildings and Multi - Tenant Buildings	7
2.7	Corporate Branding	8
2.8	Other Prohibited Signage	8
3.0	SIGNAGE REQUIREMENTS BY TYPE OF ZONE AND LOCATION	9
3.1	Residential Zones	9
3.1.1	Extent of Signage	9
3.1.2	Sign Options	9
3.1.3	Illumination	9
3.2	Business Zones	9
3.2.1	Sign options for Office and Retail Shop - Fronts within Shopping Precincts or Areas	9
3.2.2	Extent of Signage Permitted	10
3.2.3	Signs for Colonnades	11
3.2.4	Pole and Pylon Signs	12
3.2.5	Signs for Regional Shopping and Commercial Centres	12
3.3	Macquarie Park Corridor	12
3.3.1	Extent of Signage	12
3.3.2	Permitted Signs	13
3.4	Industrial and Special Purpose Zones	13
3.4.1	Extent of Signage Permitted	13
3.4.2	Permitted Signs	13
3.5	Heritage Conservation Areas and Heritage Items	13

Table of Contents

4.0

DEFINITIONS AND REQUIREMENTS FOR DIFFERENT TYPES OF SIGNAGE

14

5.0

ASSESSMENT CRITERIA

23

5.1

Character of the Area

23

5.2

Special Areas

23

5.3

Views and Vistas

23

5.4

Streetscape, Setting or Landscape

23

5.5

Site and Building

23

5.6

Associated Devices and Logos with Signage and Advertising Structures

24

5.7

Illumination

24

1.0 GENERAL INFORMATION

1.1 Objectives of this Part

Objectives

1. To provide guidelines for the erection and display of signage and advertising structures.
2. To maintain a balance between the established built form and character of the streetscape and commercial need to advertise goods and services.
3. To ensure that signage and advertising structures erected or displayed do not intrude into and detrimentally affect the visual amenity of the area.
4. To ensure that signage and advertising structures erected or displayed are compatible with the architectural style and size of the building and are compatible with the adjoining built environment.
5. To prevent visual clutter through the proliferation of signage and advertising structures by encouraging fewer more effective signs.
6. To ensure that signage does not disrupt vehicular or pedestrian flows.
7. To ensure the distinctive urban character and amenity of the City of Ryde is maintained.

1.2 Application of this Part

- 1.2.1** The land use table within Ryde Local Environmental Plan 2014 identifies the signs that are permitted within each zone with Council consent. General advertising is prohibited in all zones.
- 1.2.2** This Part will be considered by Council in assessing all applications for consent to erect or display any signage or advertising structure.

1.3 Applications and Approval Process

- 1.3.1** All signage, with the exception of signs which satisfy the requirements of SEPP (Exempt and Complying Development Codes) 2008 and signage set out in Schedule 2 Exempt Development of Ryde Local Environment Plan 2014, require a Local Development Application.
- 1.3.2** Section 4 of this part provides the definition requirements and controls for different types of signage within the City.
- 1.3.3** Section 5 of this Part provides information on the assessment criteria and issues that an applicant should consider in the preparation and submission of any development application to Council.

1.4 Structure of this Part

- Section 2** General Requirements for all Signage
- Section 3** Signage Requirements by Type of Zone and Location
- Section 4** Definitions and Requirements for Different Types of Signage.
- Section 5** Assessment Criteria

The City of Ryde acknowledges the use of some illustrations from Hurstville City Council in this

Part.

2.0 GENERAL REQUIREMENTS FOR ALL SIGNAGE

2.1 Signage Content

Controls

- a. A sign must be either:
 - i. A business identification sign or a building identification sign as defined in Ryde Local Environmental Plan 2014; or
 - ii. A directional sign, that is a sign that directs persons to development on the land to which it is displayed.

Billboard Type Signage and Advertising Structures are prohibited.

2.2 Language

Controls

- a. All advertising signs are to be displayed in the English language but may include a translation into another language using letters or characters that are no larger than the English language letters or characters.
- b. Any translated message must be accurate and complete.

2.3 Number of Signs

Controls

- a. Visual clutter through the proliferation of signage and advertising structures is not permitted.

Note: Excessive signage usually has an opposite effect to its original intention. The cluttering causes visual pollution and confusion to the observer. Having fewer, but clearer advertising assists not only the advertiser, but also the appearance of the building and the overall streetscape.

Excessive signage tends to have a “domino effect”, by competing with neighbouring premises in order to gain the advantage in exposure.

2.4 Design, Safety and Maintenance

Controls

- a. All signs must be sympathetic to, and compatible with the architectural style and finishes of the building to which they are attached, so as to look an integral part of the building rather than a “tack-on” appearance. They should not obscure existing architectural features such as windows.
- b. Signs are to be unobtrusive in design, colour, height and scale, so as not to impact adversely on the streetscape.
- c. Signs must be attractive and professionally written as well as being simple, clear and efficient.

Note: A well-designed sign inspires and promotes confidence in the business or product

advertised.

- d. Signs should be located at a height which avoids impact from footpath maintenance vehicles and discourages vandalism.
- e. Signs facing roads with high traffic volumes, traffic lights or major intersections may be referred to other relevant authorities such as the Roads and Maritime Services for comment.
- f. Signs that are prone to deterioration in appearance and condition, and may order removal of objectionable or unsightly advertisements, pursuant to the provisions of Section 124 of the Local Government Act 1993.

Note: Council will give due attention to all applications with respect to possible distraction of motorists due to illumination, position, colours, design and proximity to traffic lights.

2.5 Illuminated Signs

Controls

- a. The lighting intensity and hours of illumination must not unreasonably impact on any residential properties adjoining the sign or that is within its locality.
- b. The lighting intensity of a sign must be capable of modification or control after installation.
- c. Illuminated signs must minimise the spill effects or escape of light beyond the subject sign and must not compromise safety for pedestrians, vehicles or aircraft.
- d. Illumination of a sign (with the exception of floodlit signs) must not be external to the sign i.e. surrounding a sign. Illumination must be part of the advertisement.
- e. Electric wiring to illuminated signs is to be concealed.
- f. Depending on its location and its relationship to residential properties, Council may require that illumination be controlled by automatic time clocks extinguishing illumination between 11 pm and 6 am, or as is considered reasonable in the circumstances.

2.6 New Buildings and Multi - Tenant Buildings

Controls

- a. Applicants designing new buildings or alterations and refurbishing of existing buildings are strongly encouraged to take into account signage. Signage is to be considered as an integral part of the overall building.
- b. A "tack-on" approach to signage on buildings is to be avoided.

Note: An overall co-ordinated concept plan for advertising on the building at the original Local Development Application stage is recommended. If the concept plan is not supplied, then subsequent applications for signage may be refused by Council.

2.7 Corporate Branding

Corporate Branding is the identification of the owner of a site and includes any associated logo.

Controls

With respect to Corporate Branding:

- a. it is permitted only in business and industrial zones;
- b. it must be part of a sign that provides information about a business, industry or profession on the land where it is displayed . That is, corporate branding and the address of the site cannot be the only information provided on a sign;
- c. it is permitted only on one sign per site;
- d. it is permitted only on a business directory board or pylon sign;
- e. it is to occupy a maximum area of 0.6 m² ;
- f. it is to consist of words, symbols and shapes;
- g. the use of corporate colours is restricted to permitted signage only and the use of corporate colours in the external finishes of a building is prohibited.

2.8 Other Prohibited Signage

Controls

- a. Development for the purpose of erecting or displaying any of the following types of advertisements and signs is prohibited
 - i. General advertising;
 - ii. Signs not defined as a temporary sign made of canvas, fabric, similar sheet material or any type of airborne sign;
 - iii. Signs affixed to the surface of a public footway or public roadway;
 - iv. Signs that obscure obstruct or interfere with any road traffic signs or motorists vision or otherwise adversely affecting road safety; and
 - v. Signs prohibited under the Tobacco Advertising Prohibition Act, 1991 or any other Act.

3.0 SIGNAGE REQUIREMENTS BY TYPE OF ZONE AND LOCATION

3.1 Residential Zones

Controls

3.1.1 Extent of Signage

- a. Maximum of 1 sign will be permitted per site.

3.1.2 Sign Options

- b. Sign options in residential zones are:
 - i. Business signs;
 - ii. Real estate signs;
 - iii. Home occupation signs; and
 - iv. Temporary signs.

3.1.3 Illumination

- c. Illumination of signs is prohibited.

3.2 Business Zones

Controls

3.2.1 Sign options for Office and Retail Shop - Fronts within Shopping Precincts or Areas

- a. Sign options in business zones are:
 - i. An Illuminated Under Awning Sign (one per site);
 - ii. Fascia Sign;
 - iii. Top Hamper Sign;
 - iv. Window Sign;
 - v. Drop Awning Sign;
 - vi. Under Awning Bracket Sign;
 - vii. Real Estate Sign;
 - viii. Temporary Sign;
 - ix. Flush Wall Sign (Only if it relates to activity at that level); and
 - x. Internally Illuminated Sign.

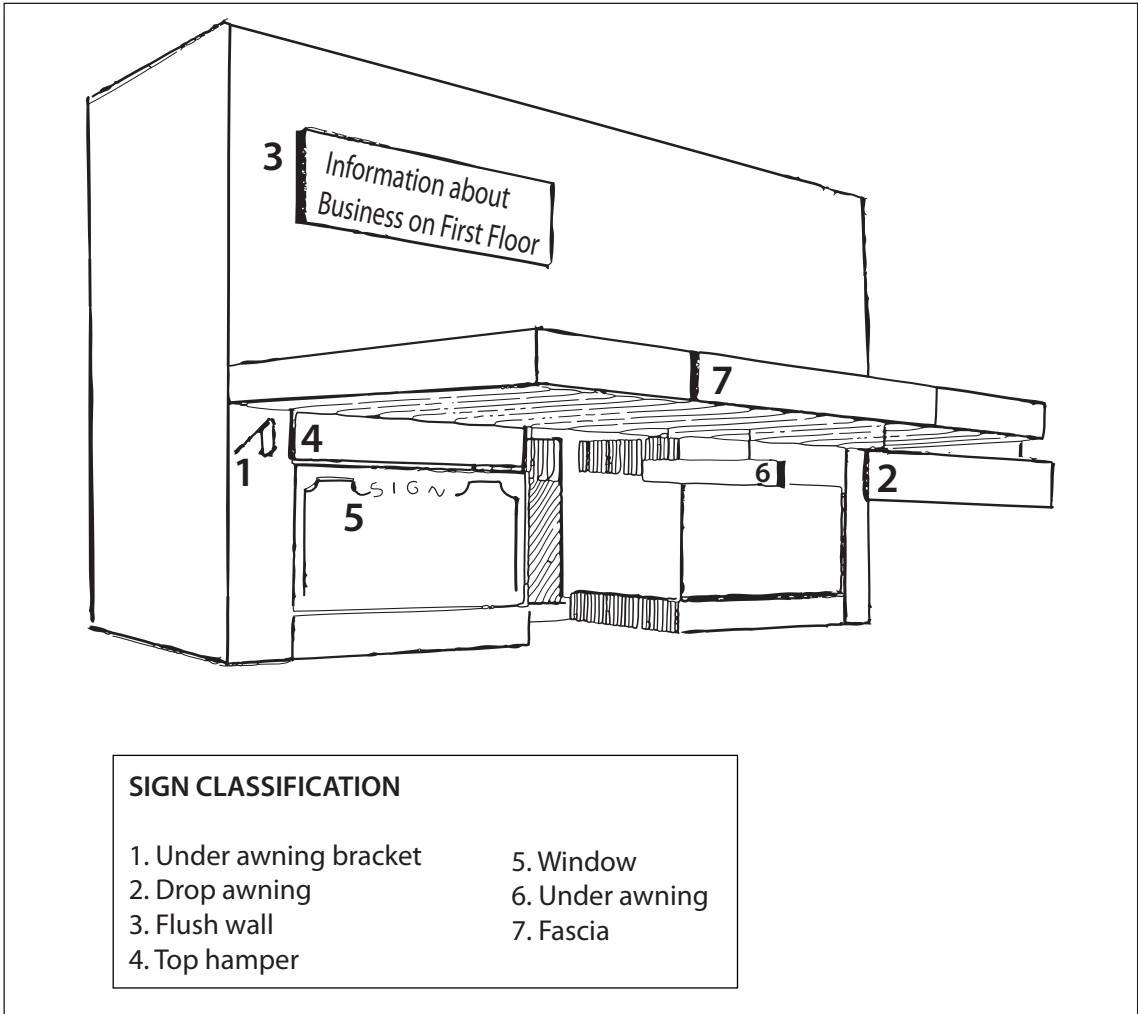


Figure 9.1.01 Sign Classifications (Business Zones)

Under awning signs are limited to one per shop-front, and should be positioned to provide reasonable spacing between other under awning signs to allow for fair exposure and usability. Where a shop front has exceptionally wide frontage more than one under awning sign may be permitted. The signs must be a minimum of 10 metres apart.

3.2.2 Extent of Signage Permitted

Controls

For Three or more Storey Buildings

- Maximum Sign Area – The total area of signs to be erected on a building (this includes all elevations) should not exceed 1.5 m² per 1 metre of frontage of the property to the street.
- All signage is restricted to the ground floor level and the transom area of the building i.e. the area above the doorway on the ground floor level to the floor level above. Council will only consider any additional signage after the submission of a signage plan for the total development.

For Two or More Storey Buildings

- Maximum Sign Area – The total area of signs to be erected on a building (this includes all elevations) should not exceed 1.5 m² per 1 metre of frontage of the property to the street.

- b. Front Elevation – All signage above the ground floor or awning level of a building must relate to the activity or use of the building at the first floor level.

The maximum area of signs above the ground floor or awning level on the front elevation should not exceed 15% of the area of the elevation situated at that level.

- c. Side and Rear Elevations – The maximum area of signs on side or rear walls should not exceed 15% of the area of each elevation visible from a public place. Where there is a break in any elevation the maximum coverage should apply to each part of that elevation.

For Single Storey Buildings

- a. Maximum Sign Area – The total area of signs to be erected on a building (this includes all elevations) should not exceed 1 m² per 1 metre of frontage of the property to the street;
- b. Side and Rear Elevations – The maximum area of signs on side or rear walls should not exceed 15% of the area of each elevation visible from a public place. Where there is a break in any elevation the maximum coverage should apply to each part of that elevation.

3.2.3 Signs for Colonnades

Controls

- a. Maximum Sign Area – The total area of signs to be erected at ground floor level (this includes all elevations) should not exceed 1 m² per 1 metre of frontage of the property to the street.
- b. Signs permitted on shopfronts in colonnades include:
 - i. window signs;
 - ii. top hamper; and
 - iii. under awning bracket signs.
- c. Flush wall signs on the external wall of the colonnade that have a maximum dimensions of 1.2 m x 0.5 m are permitted where the signs are located on that part of the external wall of the colonnade that is adjacent to the business the sign relates to and the sign only identifies the name of that business.
- d. All signs which must be sympathetic in colour and design to the building.



Figure 9.1.02 Colonnades (refer Clause 3.2.3)

3.2.4 Pole and Pylon Signs

Controls

- a. Pole and Pylon signs are only permitted on sites with large street or road frontages that are occupied by uses such as service stations, large take-away food outlets and large retail outlets.

3.2.5 Signs for Regional Shopping and Commercial Centres

Controls

- a. All signs visible from a public place will be considered on their merits relative to the general aims and objectives and provisions of Sections 1, 2, 4 and 5 of this Part.

3.3 Macquarie Park Corridor

3.3.1 Extent of Signage

Controls

- a. The total area of signs on a site (excluding the area of a business directory board or pylon sign) must not exceed 1 square metre of signage per 1 metre of building frontage for the first 10 metres then 0.3 square metres of signage for each 1 metre of building frontage after that.

Note: Building frontage is a straight line measurement of the length of a building as it presents to the street. The measurement should represent the length of the building that is clearly visible to a street (refer to Figure 9.1.03). Where a site has two street frontages the length of the building as it presents to the longest street frontage may be used to calculate the total area of signs permitted on the site. This is subject to the principal sign for the site being placed on the elevation containing the longest building frontage.

- b. Where more than one building is located on the site the building frontage of each building as it presents to the street may be used in the calculation of the total signage for a site. Where only part of a building frontage is visible to the street (i.e. where part of the building frontage of one building is hidden behind another building) only that part that is visible to the street is to be used in the calculation of signage.

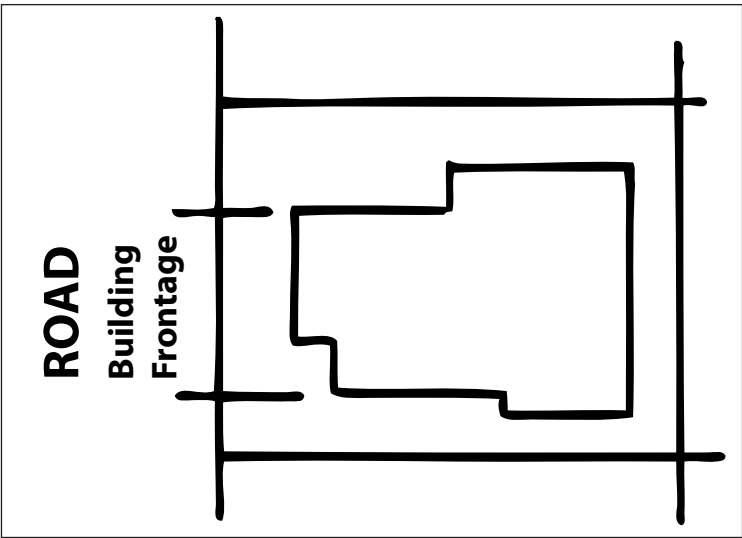


Figure 9.1.03 Building Frontage for Calculation of Extent of Signage

3.3.2 Permitted Signs

Controls

a. Sign options in Macquarie Park Corridor are:

- | | |
|---|-----------------------------|
| i. Pylon Sign (One Only Per Site); | v. Panel Sign; |
| ii. Business Directory Board Sign
(One Only Per Site); | vi. Plinth Sign; |
| iii. Directional Sign; | vii. Real Estate Signs; and |
| iv. Flush Wall Sign; | viii. Temporary Signs. |

3.4 Industrial and Special Purpose Zones

3.4.1 Extent of Signage Permitted

Controls

The total area of signs on a site cannot exceed one (1) square metre of signage per one (1) square metre of building frontage for the first 10 metres then 0.3 square metres of signage for each metre of building frontage after that.

Variation to the extent of signage permitted i.e. exclusion of the pylon sign and business directory board sign from area calculations may be considered by Council if the site upon which the signs are to be erected upon is large and contains more than one occupant such as in an industrial park.

Building frontage is a straight line measurement from each end of the building as it presents to the street. Where a site has two street frontages the length of the building as it presents to the longest street frontage is used.

3.4.2 Permitted Signs

Controls

a. Sign options in Industrial and SP1 Special Activities & SP2 Infrastructure zones are:

- | | |
|---|--|
| i. Pylon Sign (One Only Per Site); | vi. Plinth Sign; |
| ii. Business Directory Board Sign
(One Only Per Site); | vii. Real Estate Signs |
| iii. Directional Sign; | viii. Temporary Signs; and |
| iv. Flush Wall Sign; | ix. Pole Sign (Only One Per Site and Not
Permitted with any other Free Standing
Sign). |
| v. Panel Sign; | |

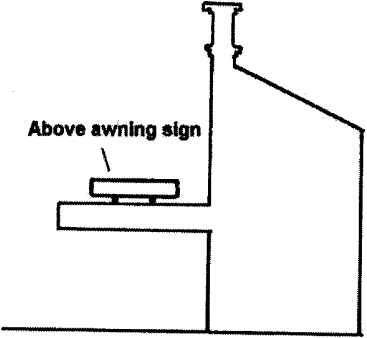

3.5 Heritage Conservation Areas and Heritage Items

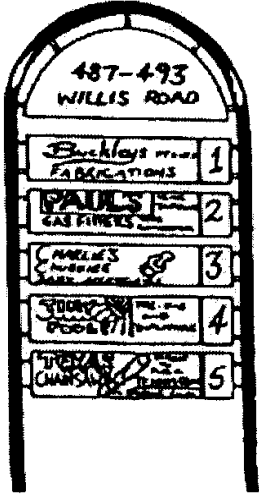
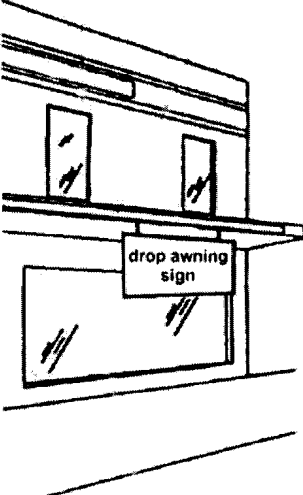
Controls

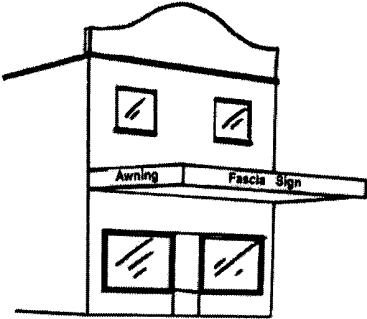
a. All signs in heritage conservation areas or on heritage items requires a heritage impact statement as set out by the NSW Heritage Division.

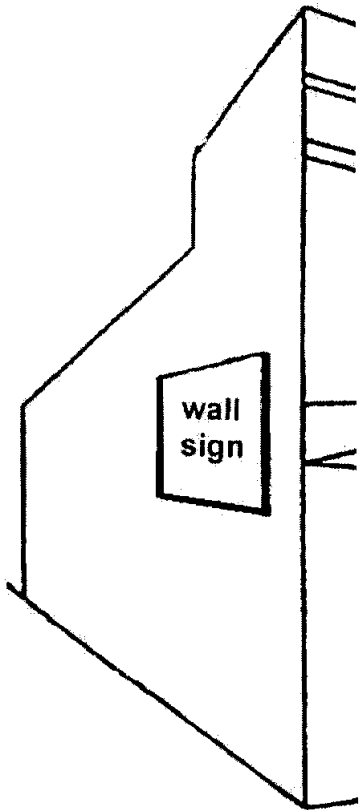
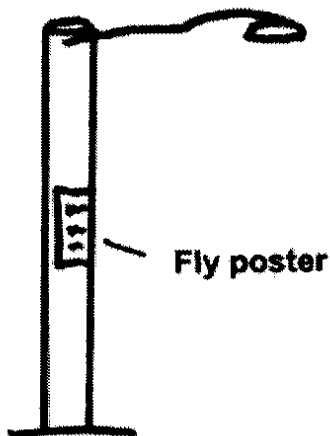
4.0 DEFINITIONS AND REQUIREMENTS FOR DIFFERENT TYPES OF SIGNAGE

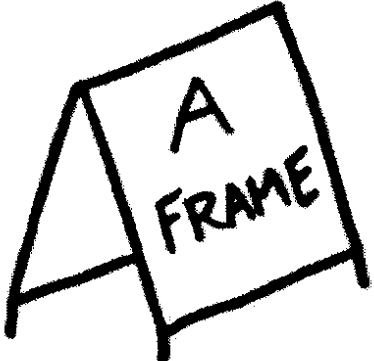
The following pages include illustrations (where possible), definitions and controls with respect to all types of signage referred to in this Part.



SIGN OPTIONS	DEFINITIONS / REQUIREMENTS AND CONTROLS
Above Awning / Verandah Sign 	<p>A sign above a verandah or awning or if there is no verandah or awning a sign that is more than 3.7 m above pavement level and which projects more than 300 mm from the wall of the building.</p> <p>Prohibited throughout the City of Ryde</p>
Billboard Sign (Free Standing or Attached to a Building Structure e.g.. Fence) 	<p>A sign used for the display of general advertising material not necessarily related to the place or premises on which it is located.</p> <p>Prohibited throughout the City of Ryde</p>
Bunting Sign	<p>An advertisement that consists of bunting streamers, flags, windvanes and the like. A single flag is not a bunting sign.</p> <p>Prohibited throughout the City of Ryde</p>

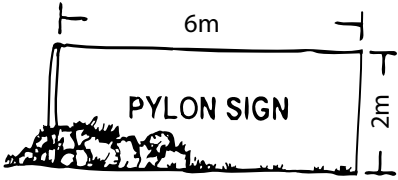
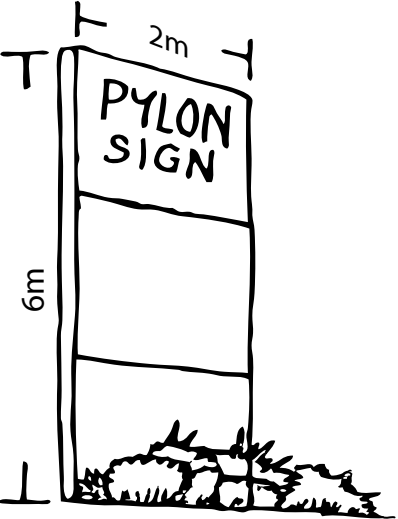
SIGN OPTIONS	DEFINITIONS / REQUIREMENTS AND CONTROLS
<p>Business Directory Board</p> 	<p>Free standing advertising structure that is located within the property boundary of a multiple occupancy premises and which identifies the names and activities of the occupants of the premises. This sign may be permitted on sites that have a single occupancy that comprises a number of activities.</p> <p>Controls</p> <ol style="list-style-type: none"> a maximum area does not exceed 6.2 m² ; maximum height of 3.5 m above ground level; illumination of sign will be considered by Council on a merit basis taking into account location of sign, proximity to main road, hours of operation. Up lighting is the preferred form of illumination; only one per premises; must be located within a landscaped setting.
<p>Business Sign</p>	<p>A sign that provides information about a business, industry or profession on the land where it is displayed. The information may include the use of the land or a building, goods manufactured or offered for sale, services offered and the name of any business or product.</p> <p>Controls</p> <ol style="list-style-type: none"> maximum area 0.75 m² ; maximum height and/or width of 1500 mm
<p>Directional Sign</p>	<p>A sign not exceeding 0.3 m² that directs vehicle or pedestrian traffic within the property the sign relates to.</p>
<p>Drop Awning Sign (Weather Protection Sign / Canvas Blind)</p> 	<p>A sign displayed on a roll down blind, retractable sun/ weather protection awning or the like that is attached to the under side or outer edge of the awning and is parallel to the kerb.</p> <p>Controls</p> <ol style="list-style-type: none"> the advertisement does not exceed a maximum coverage of 40% of the surface area of the blind. the blind or awning is attached behind the fascia; the blind or awning is setback a minimum of 0.6 m from the kerb; only one sign per premises; non illuminated.

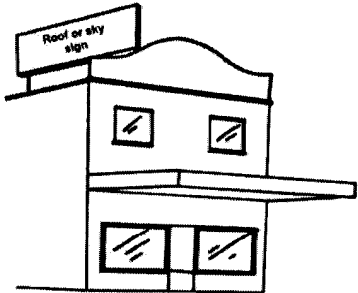
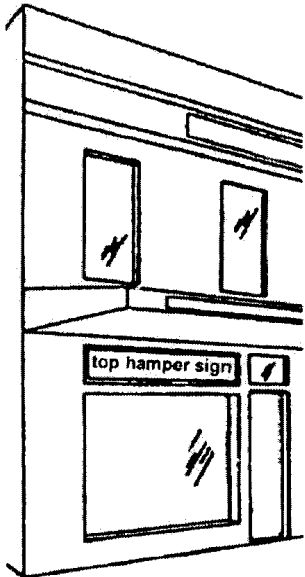
SIGN OPTIONS	DEFINITIONS / REQUIREMENTS AND CONTROLS
Fascia Signs 	<p>A sign on the fascia or return end of an awning.</p> <p>Controls</p> <p>a. A fascia sign shall not project above, below or beyond the fascia or return end of the awning to which it is attached.</p>
Fin Sign	<p>Erected on or above the canopy of a building such as a service station canopy.</p> <p>Prohibited throughout the City of Ryde</p>
Flashing Sign	<p>A sign illuminated (as to any part of the advertising area) at frequent intervals by;</p> <p>1. an internal source of artificial light; or</p> <p>2. any light source indirectly illuminating the sign.</p> <p>Prohibited throughout the City of Ryde</p>
Floodlit Sign	<p>A sign illuminated by external lighting.</p> <p>Controls</p> <p>a. lighting shall not cause distraction or nuisance to neighbouring properties or traffic.</p>

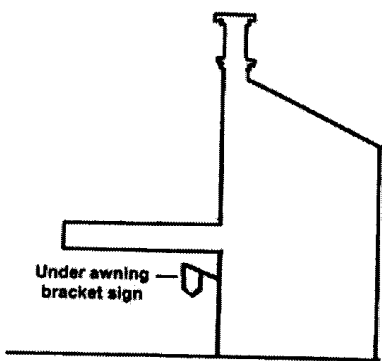
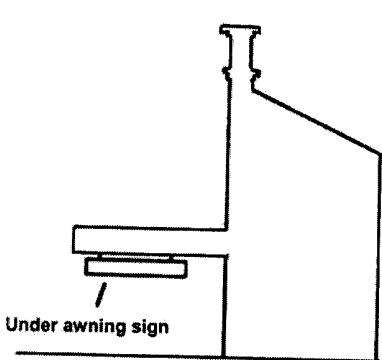

SIGN OPTIONS	DEFINITIONS / REQUIREMENTS AND CONTROLS
<p>Flush Wall Sign</p> 	<p>A sign attached or painted on the wall of a building and projecting horizontally no more than 300 mm from the wall.</p> <p>Controls</p> <ul style="list-style-type: none"> a. Only one sign per building elevation. b. Where it is illuminated shall not be less than 2.6 metres above the ground. c. shall not exceed a maximum area of five (5) square metres. d. shall not extend laterally beyond the wall of the building to which it is attached. e. shall not project above the top of the wall to which it is attached. f. shall not be located on a building wall if there is an existing building or business identification sign. g. shall not extend over a window or other opening or architectural feature. h. shall not project horizontally more than 300 mm from the wall. i. consideration must be given to design and aesthetics, so as to harmonise with the nature of the streetscape and townscape. j. flush wall sign advertising on end walls adjoining residential properties are prohibited. However, Council may permit advertising on end walls adjoining a public place.
<p>Fly Poster (Bill Poster)</p> 	<p>A poster type or hand written advertisement promoting any event, activity, product or service fixed to power poles, bus shelters or other public property, fences, buildings shop fronts, shop front windows or hoarding.</p> <p>Prohibited throughout the City of Ryde</p>

SIGN OPTIONS	DEFINITIONS / REQUIREMENTS AND CONTROLS
<p>Free Standing Signboard (A Frame / Sandwich Board)</p> 	<p>A moveable freestanding sign displayed at ground level.</p> <p>Controls</p> <ul style="list-style-type: none"> a. Only permitted in arcades etc. where they do not obstruct path of travel. b. Maximum width 0.6 m. c. Maximum height 1.1 m. d. Stabilized through weighting system. <p>Prohibited on Footpath Areas throughout the City of Ryde</p>
<p>Home Occupation Sign</p>	<p>A sign at a dwelling that advertises a home occupation in the dwelling.</p> <p>Controls</p> <ul style="list-style-type: none"> a. must not exceed 0.3 square metres. b. must not be illuminated.
<p>Internally Illuminated Sign</p>	<p>A sign illuminated by internal lighting or which contains lights or illuminated tubes arranged as advertising.</p>
<p>Moving Sign</p>	<p>Attached to a building and capable (as to any part of the advertisement or advertising structure) of movement by any source of power (whether or not included in any other class of advertising structure). Includes electronic message boards.</p> <p>Prohibited throughout the City of Ryde</p>
<p>Panel Sign</p>	<p>A sign with an advertisement area that is greater than 5 m² but no more than 12 m².</p> <p>Controls</p> <ul style="list-style-type: none"> a. only permitted in business and industrial zones. b. shall not extend laterally beyond the wall of the building to which it is attached. c. shall not project above the top of the wall to which it is attached. d. shall not project horizontally more than 300 mm from the wall.

SIGN OPTIONS	DEFINITIONS / REQUIREMENTS AND CONTROLS
Plaque or Plinth Sign	<p>A sign located at ground level as an ornament or memorial.</p> <p>Controls</p> <ul style="list-style-type: none"> a. maximum height of 900 mm. b. maximum area of 1.2 m.
Pole Sign 	<p>A sign displayed on a pole independent of any building or other structure.</p> <p>Controls</p> <ul style="list-style-type: none"> a. shall not be more than six (6) metres in height. b. have a maximum area of 3.3 square metres. c. to be contained wholly within the site. A sign is not to overhang any public space, e.g. footpath. d. However Council will give consideration to a pylon sign being constructed to a maximum height of eight (8) metres where it can be clearly demonstrated that the overall approved signage on the site will be reduced by at least 50%. e. Signs should generally be placed on buildings. Therefore Pole signs will not be permitted where signs are capable of being placed on a building and buildings are within 5 metres of the road frontage.
Projecting Wall Sign 	<p>A sign attached either vertically or horizontally to the wall of a building (other than the transom of a doorway or display window) and projecting not more than 300 mm from the wall.</p> <p>Controls</p> <ul style="list-style-type: none"> a. Vertical <ul style="list-style-type: none"> i. shall not project more than 300 mm; and ii. the bottom of the sign shall be no less than 2.6 m above the ground with the top of the sign being no more than 3.7 metres above the ground. b. Horizontal <p>Prohibited throughout the City of Ryde</p>

SIGN OPTIONS	DEFINITIONS / REQUIREMENTS AND CONTROLS
<p>Promotion Sign</p> 	<p>A sign on land or a building that advertises:</p> <ol style="list-style-type: none"> 1. goods or services of a class not provided, produced or sold on the land or in the building; and 2. events or competitions not conducted on the land or in the building. <p>Prohibited throughout the City of Ryde</p>
<p>Pylon Sign</p> 	<p>A sign located at ground level independent of any building and structure.</p> <p>Controls</p> <ol style="list-style-type: none"> a. Maximum height 6 m. b. Maximum area of structure 12 m. c. One per site. d. A pylon sign and a business directory board sign are not to be located at the same entrance way or access way. Such signs must be physically separated from each other. e. Must be provided within a landscaped setting. f. illumination of sign will be considered by Council on a merit basis i.e. location of sign, proximity to main road, hours of operation. Up lighting is the preferred form of illumination. g. Signs should generally be placed on buildings. Therefore Pylon signs will not be permitted where signs are capable of being placed on a building and buildings are within 5 metres of the road frontage.
<p>Real Estate Sign</p>	<p>An advertisement in respect of a place or premises to which it is affixed which contains only a notice that the place or premises is for sale or letting together with particulars of the sale or letting.</p> <p>Controls</p> <ol style="list-style-type: none"> a. For Residential sites <ol style="list-style-type: none"> i. one per site; and ii. the sign has a maximum area of 2.5 m². b. For Commercial or Industrial Sites <ol style="list-style-type: none"> i. one per site; ii. the sign has a maximum area of 4.5 m²; and iii. maximum display time - 6 months. c. Such signs are not to be displayed for more than seven (7) days after letting or completion of the sale of the premises or place to which the sign relates. <p>Exempt Development except where the above Conditions cannot be Satisfied</p>
<p>Reflective Sign</p>	<p>A sign finished with materials specifically made to reflect external light</p>

SIGN OPTIONS	DEFINITIONS / REQUIREMENTS AND CONTROLS
<p>Roof or Sky Sign</p> 	<p>An advertising sign which is:</p> <ol style="list-style-type: none"> on or above the roof of a building but not a verandah; fixed to the wall of the building and part of the sign projects vertically above the wall; and fixed to a structure (not a building) and part of the sign is more than 7 metres from the ground. <p>Prohibited throughout the City of Ryde</p>
<p>Temporary Sign (Special Event)</p>	<p>An advertisement of a temporary nature which announces a local event of a religious, educational, cultural or recreational character or relates to any temporary matter in connection with such an event.</p> <p>Controls</p> <ol style="list-style-type: none"> displayed on the property where the special event is to be held except if erected by or on behalf of Council or a public authority. not illuminated. sponsors name or logo is subsidiary to message. not containing a political message or image relating to political elections. no general advertising of a commercial nature except for the name of the event sponsor. has a maximum area of 3 m². displayed no longer than 14 days before the event and removed within 7 days after the event.
<p>Top Hamper Sign</p> 	<p>A sign painted on or attached to the transom of a doorway or display window at ground floor level of a building.</p> <p>Controls</p> <ol style="list-style-type: none"> shall not extend beyond any wall. shall not extend below the level of the head of the doorway or window above which it is attached.

SIGN OPTIONS	DEFINITIONS / REQUIREMENTS AND CONTROLS
<p>Under Awning Bracket Sign</p>  <p>Under awning bracket sign</p>	<p>A sign suspended from a wall-mounted bracket or pole under awning level.</p> <p>Controls</p> <ul style="list-style-type: none">a. one permitted per shop front.b. message relates to the use of the premises or its products or activities.c. the base of bracket is a minimum of 2.3 m above the ground.d. does not project more than 0.5 m from the wall on which it is mounted.
<p>Under Awning Sign</p>  <p>Under awning sign</p>	<p>A sign that is attached to and hangs below an awning and is erected at right angles to the building wall.</p> <p>Controls</p> <ul style="list-style-type: none">a. shall be erected approximately horizontal to the ground and at no point less than 2.6 m from the ground.b. shall be erected at right-angles to the building to which the awning is attached; shall be securely fixed to the awning by means of suitable metal supports not exceeding 50 mm in width or diameter.c. shall not project beyond the edge of the awning, except in the case of an awning wholly within the boundaries of the allotment occupied by the building.d. shall be no greater than 2.4 metres in length and 300 mm in height.e. one permitted per shopfront , however where a premise has exceptionally wide frontage, more than one under awning sign may be permitted, but must be a minimum of ten (10) metres apart.
<p>Window Sign</p>  <p>window sign</p>	<p>An advertisement located or displayed on or in the window or glass entry doors of a building.</p> <p>Controls</p> <ul style="list-style-type: none">a. message relates to the use of the premises or its products.b. at least 75% of the area of the window or glass remains uncovered by any advertising sign.c. located at ground level. <p>Exempt Development except where the above Conditions cannot be Satisfied then a Local Development Application Required</p>

5.0 ASSESSMENT CRITERIA

The following provides information on the assessment criteria used by Council and issues that an applicant should consider in the preparation and submission of any development application to Council.

5.1 Character of the Area

1. Is the proposal compatible with the existing or desired future character of the area or locality in which it is proposed to be located?
2. Is the proposal consistent with a particular theme for outdoor advertising in the area or locality?

5.2 Special Areas

1. Does the proposal detract from the amenity or visual quality of any environmentally sensitive areas, heritage areas, natural or other conservation areas, open space areas, waterways, rural landscapes or residential areas?

5.3 Views and Vistas

1. Does the proposal obscure or compromise important views?
2. Does the proposal dominate the skyline and reduce the quality of vistas?
3. Does the proposal respect the viewing rights of other advertisers?

5.4 Streetscape, Setting or Landscape

1. Is the scale, proportion and form of the proposal appropriate for the streetscape, setting or landscape?
2. Does the proposal contribute to the visual interest of the streetscape, setting or landscape?
3. Does the proposal reduce clutter by rationalising and simplifying existing advertising?
4. Does the proposal screen unsightliness?
5. Does the proposal protrude above buildings, structures or tree canopies in the area of locality?

5.5 Site and Building

1. Is the proposal compatible with the scale, proportion and other characteristics of the site or building, or both, on which the proposed signage is to be located?
2. Does the proposal respect important features of the site or building, or both?
3. Does the proposal show innovation and imagination in its relationship to the site or building, or both?

5.6 Associated Devices and Logos with Signage and Advertising Structures

1. Have any safety devices, platforms, lighting devices or logos been designed as an integral part of the signage or structure on which it is to be displayed?

5.7 Illumination

1. Would illumination result in unacceptable glare?
2. Would illumination affect safety for pedestrians, vehicles or aircraft?
3. Would illumination detract from the amenity of any residence or other form of accommodation?
4. Can the intensity of the illumination be adjusted, if necessary?
5. Is the illumination subject to a curfew?

THIS PAGE HAS BEEN
INTENTIONALLY LEFT BLANK



City of Ryde
Civic Centre
1 Devlin Street
Ryde NSW 2112

www.ryde.nsw.gov.au

City of Ryde Development Control Plan 2014

Part: 9.2 Access for People With Disabilities

In this part, references to access requirements and provisions under the *Building Code of Australia (BCA)*, *Commonwealth Disability (Access to Premises-Buildings) Standards (the Premises Standards)* and *Australian Standards* are under review. Updates have been included where possible and further advice should be sought from Council.

Translation

ENGLISH

If you do not understand this document please come to Ryde Civic Centre, 1 Devlin Street, Ryde Monday to Friday 8.30am to 4.30pm or telephone the Telephone and Interpreting Service on 131 450 and ask an interpreter to contact the City of Ryde for you on 9952 8222.

ARABIC

إننا نعتذر عليك فهم محتويات هذه الوثيقة، نرجو للحضور إلى مركز بلدية رايد Ryde Civic Centre على العنوان: 1 Devlin Street, Ryde من الاثنين إلى الجمعة بين الساعة 8.30 صباحاً والساعة 4.30 بعد الظهر أو الاتصال بمكتب خدمات الترجمة على الرقم 131 450 لكي تطلب من أحد المترجمين الاتصال بمجلس مدينة رايد، على الرقم 9952 8222، نيابة عنك.

ARMENIAN

Եթէ այս գրութիւնը չէք հասկնար, խնդրեմ եկէ՛ք Րայդ Բիւրոյ Սիւվիլ Ենթըր, 1 Տելվին փողոց, Րայդ, (Ryde Civic Centre, 1 Devlin Street, Ryde) Երկուշաբթիէն Ուրբաթ կ.ա. ժամը 8.30 – կ.ե. ժամը 4.30, կամ հեռաձայնեցէ՛ք Հեռաձայնի եւ Թարգմանութեան Սպասարկութեան՝ 131 450, եւ խնդրեցէ՛ք որ թարգմանիչ մը Րայդ Քաղաքապետարանին հետ կապ հաստատուէ ձեզի համար, հեռաձայնելով՝ 9952 8222 թիվին:

CHINESE

如果您看不懂本文，請在周一至周五上午 8 時 30 分至下午 4 時 30 分前往 Ryde 市政中心詢問 (Ryde Civic Centre, 地址: 1 Devlin Street, Ryde)。你也可以打電話至電話傳譯服務中心，電話號碼是: 131 450。接通後你可以要求一位傳譯員為你打如下電話和 Ryde 市政廳聯繫，電話是: 9952 8222。

FARSI

اگر این مدرک را نمی فهمید لطفاً از 8.30 صبح تا 4.30 بعد از ظهر دوشنبه تا جمعه به مرکز شهرداری رايد، Ryde Civic Centre, 1 Devlin Street, Ryde مراجعه کنید یا به سرویس مترجم تلفنی، شماره 131 450 تلفن بزنید و از یک مترجم بخواهید که از طرف شما با شهرداری رايد شماره 9952 8222 تلفن بزند.

ITALIAN

Se non capite il presente documento, siete pregati di rivolgervi al Ryde Civic Centre al n. 1 di Devlin Street, Ryde, dalle 8.30 alle 16.30, dal lunedì al venerdì; oppure potete chiamare il Telephone Translating and Interpreting Service al 131 450 e chiedere all'interprete di contattare a vostro nome il Municipio di Ryde presso il 9952 8222.

KOREAN

이 문서가 무슨 의미인지 모르실 경우에는 1 Devlin Street, Ryde 에 있는 Ryde Civic Centre 로 오시거나 (월 – 금, 오전 8:30 – 오후 4:30), 전화 131 450 번으로 전화 통역 서비스에 연락하셔서 통역사에게 여러분 대신 Ryde 시청에 전화 9952 8222 번으로 연락을 부탁드립니다.

Amend. No.	Date approved	Effective date	Subject of amendment

Table of Contents

1.0 INTRODUCTION	5
1.1 Purpose	5
1.2 Land to which this Part applies	5
1.3 Objectives of this Part	5
2.0 BACKGROUND	6
2.1 Preparation of Controls	6
2.2 Access Committee	6
2.3 Mission Statement	7
2.4 People with Disabilities	7
2.4.1 Definition of disability	7
2.4.2 Incidence of disability in the community	8
3.0 LEGISLATION	9
3.1 Environmental Planning and Assessment Act 1979	9
3.2 SEPP Housing for Seniors or People with a Disability 2004	9
3.3 Building Code of Australia	9
3.4 Disability Discrimination Act 1992	9
3.5 The Commonwealth Disability (Access to Premises - Buildings) Standards (the Premises Standards)	10
4.0 APPLICATION OF THIS PART	11
4.1 Coverage of this Part	11
4.1.1 Applications under the EP&A Act	12
4.1.2 Class of Building – Class 1	14
4.1.3 Class of Building – Class 2	14
4.1.4 Class of Building – Class 3	15
4.1.5 Class of Building – Class 4	15
4.1.6 Class of Building – Class 5	15
4.1.7 Class of Building – Class 6	15
4.1.8 Class of Building – Class 7	16
4.1.9 Class of Building – Class 8	16
4.1.10 Class of Building – Class 9	17
4.1.11 Class of Building – Class 10	17

Table of Contents

5.0 DESIGN REQUIREMENTS 18

5.1 Introduction 18

5.2 Terms 20

5.3 Continuous Accessible Path Of Travel 22

5.4 Width Of Path 22

5.5 Changes in Level 22

5.6 Vertical Clearance 22

5.7 Ramps and Landings 22

5.8 Ground and Floor Surfaces 23

5.9 Approaches and Entrances 23

5.10 Doors and Doorways 23

5.11 Lifts 24

5.12 Tactile Ground Surface Indicators 24

5.13 Stairways, Escalators and Moving Pathways 25

5.14 Lighting 25

5.15 Gateways and Checkouts 25

5.16 Parking Areas 26

5.16.1 Off Street Parking 26

5.16.2 On Street Parking 28

5.17 Sanitary Facilities 28

5.18 Washbasins 29

5.19 Shower Facilities 29

5.20 Bedrooms in Motels etc 30

5.21 Controls 30

5.22 Symbols and Signs 30

5.23 Auditoriums and Assembly Areas 31

5.24 Listening Systems for Hearing Augmentation 31

5.25 Background Sound Levels 32

5.26 Furniture and Fitments 32

5.27 Street Furniture 33

5.28 Emergency Warning Alarms 33

5.29 Emergency Egress 33

5.30 Outdoor Areas – Parks, etc 33

5.31 Infrastructure 35

Table of Contents

6.0	ADAPTABLE HOUSING	36
6.1	Introduction	36
6.2	Requirements	36
6.3	Definitions	37
6.4	Design requirements	38
6.4.1	Drawings	38
6.4.2	Siting	38
6.4.3	Security	39
6.4.4	Letterboxes in Estate Developments	39
6.4.5	Private Car Accommodation	39
6.4.6	Accessible entry	39
6.4.7	Exterior – General	40
6.4.8	Interior – General	40
6.4.9	Living Room and Dining Room	40
6.4.10	Kitchen	40
6.4.11	Main Bedroom	41
6.4.12	Other Bedrooms	42
6.4.13	Bathroom	42
6.4.14	Toilet	42
6.4.15	Laundry	42
6.4.16	Door Locks	43
6.4.17	Floor Coverings	43
6.4.18	Ancillary Items	43
6.4.19	Garbage	43
6.4.20	Wheelchair Storage	43
6.4.21	Guide Dogs	43
7.0	UNJUSTIFIABLE HARDSHIP	44
7.1	Introduction	44
7.2	How are unjustifiable hardship cases assessed in NSW?	45
7.2.1	Access Advisory Committee	45
7.2.2	Certifying Authority	45
7.2.3	When Applications can be Made	46
7.2.4	The Application Process	46
7.2.5	How the Committee considers Applications	46
8.0	OTHER RELEVANT INFORMATION	48
8.1	Relevant Australian Standards	48
8.2	Further reading	49
8.3	Organisations that can assist	49

THIS PAGE HAS BEEN
INTENTIONALLY LEFT BLANK

1.0 INTRODUCTION

1.1 Purpose

The purpose of this Part is to provide guidance to the requirements for access by people with disabilities to and within buildings, the streetscape and open areas in the City of Ryde.

1.2 Land to which this Part applies

This Part applies to all land within the City of Ryde.

1.3 Objectives of this Part

The objectives of this Part are to:

1. Ensure that builders, developers and others provide access for people with disabilities in new and refurbished premises as required by the Disability Discrimination Act 1992 and the new Commonwealth Disability (Access to Premises-Buildings) Standards.
2. Provide design criteria that achieve access for people with disabilities
3. Promote the concept of an accessible environment for the whole community

2.0 BACKGROUND

2.1 Preparation of Controls

It has been known for some time that the provisions for access for people with disabilities in the Building Code of Australia (BCA) do not meet the requirements of the Disability Discrimination Act (DDA). This has meant that developments approved by Council, although complying with the BCA, may nevertheless not provide sufficient access, leaving the building developer / owner subject to a complaint to the Human Rights and Equal Opportunity Commission. Defending such a complaint can be time consuming, costly and poor publicity. Defending a complaint may in fact be more expensive than providing for access for people with disabilities.

A decision in the Human Rights and Equal Opportunity Commission (Cooper vs Coffs Harbour Council) clearly places an onus on councils to take account of the DDA when considering Development Applications. This is over and above the requirements of the Environmental Planning and Assessment Act.

Council has therefore decided that Council officers and developers need further guidance on the access requirements of people with disabilities and that the most appropriate way to provide this is via a Development Control Plan (Access for People with Disabilities).

Whilst this Development Control Plan has been in operation, the Commonwealth Government in 2000, in response to the known inconsistency between the BCA and DDA, amended the Disability Discrimination Act to allow for the development of Disability Standards for access to premises (Premises Standards).

In 2001 the Australian Building Codes Board (ABCB), an intergovernmental body that sets building standards, was asked to develop a proposal, which could form the basis of the Premises Standards. After years of extensive national consultation and enquiries, the new Commonwealth Disability (Access to Premises – Buildings) Standards (the Premises Standards) has been introduced and came into force on 1 May 2011.

The Premises Standards set out administrative provisions and an Access Code detailing technical requirements and applicable set of Performance Requirements in providing non-discriminatory access to, and use of, those buildings and areas of buildings to which they apply. The Access Code is mirrored in the Building Code of Australia (BCA), and, to ensure consistency with the BCA, sets out performance requirements and detailed deemed-to-satisfy provisions.

While the Premises Standards can address a broader range of access issues in the built environment, as at May 2012 they only apply to public buildings of the type covered by the BCA and only to new buildings and existing buildings that undergo renovation that requires a building approval. This means that there are a number of situations where the Premises Standards are either not triggered or do not apply.

Council through this Development Control Plan (Access for People with Disabilities) provides further guidance on the requirements of this new Premises Standards and on general access issues of people with disabilities.

2.2 Access Committee

The City of Ryde Access Committee is a committee of Council and has members who are Councillors, staff and community representatives who may be residents, carers or service providers for people with disability. Meetings are held bi-monthly and are open to the public.

2.3 Mission Statement

The City of Ryde is committed to working towards a fully accessible locality, and working in partnership with other authorities and the community to achieve this. Council shall adopt and implement strategies which aim to ensure that Ryde City becomes an accessible community to all people regardless of their abilities / disabilities.

- To raise the profile of disability needs and access issues within Council, the local community and appropriate authorities and to recommend appropriate action in response to access needs as they are identified
- To ensure that developers comply with the Commonwealth Disability (Access to Premises – Buildings) Standards (the Premises Standards), the provisions of the Building Code of Australia (BCA), the Australian Standard 1428 in respect of the provision of access and facilities for people with disabilities.
- To encourage designers / developers to consider the needs of people with disabilities and provide for greater than minimum requirements for access.
- To ensure that Council complies with the requirements as outlined in these objectives in respect of all buildings erected by Council. That Council further set an example by ensuring that all buildings, structures and recreation areas which Council erects have access and other facilities for people with disabilities.
- To affirm that no person who lives in or works in, or visits the City shall be denied access to any Council provided facility or service on the grounds of personal disability
- To adopt principles which facilitate the employment of people with disabilities, and to note this policy in employment advertisements
- To give priority to the provision of ongoing education to Council employees about the needs and requirements of people with disabilities
- To plan in Council's forward estimates for a progressive works programme designed to achieve a barrier free environment in the City of Ryde
- To develop and maintain a community information and education campaign about the requirements of people with disabilities and the advantages of access for the whole community

2.4 People with Disabilities

2.4.1 Definition of disability

There are many definitions of disability, each developed to meet the particular circumstances under consideration. Here we are primarily concerned with the issue of building developments and the issue of providing adequate access for people with disabilities. If adequate access is not provided, a person with a disability might make a formal complaint, under the provisions of the Disability Discrimination Act 1992, to the Human Rights and Equal Opportunity Commission.

The definition of "person with a disability" used in the Disability Discrimination Act 1992 is very broad. It includes:

- | | |
|----------------|---|
| ▪ Physical | ▪ neurological and |
| ▪ Intellectual | ▪ learning disabilities, as well as |
| ▪ psychiatric | ▪ physical disfigurement and |
| ▪ sensory | ▪ the presence in the body of disease-causing organisms |

The DDA covers disabilities which people:

- have now
- had in the past (for example a past episode of mental illness)
- may have in the future (for example a family history of a disability which a person may develop in the future)
- are believed to have (for example a person may be thought to be living with AIDS)

The DDA also covers people with a disability being discriminated against because:

- they are accompanied by an assistant, interpreter or reader; or
- they are accompanied by a trained animal, such as a guide or hearing dog; or
- they use equipment or an aid, such as a wheelchair or a communication device.

The DDA also protects relatives, friends, carers and co-workers of people with a disability, from discrimination.

2.4.2 Incidence of disability in the community

A survey of the Australian population by the Australian Bureau of Statistics in 1993 revealed that some 18% of Australians have a disability. About 14% of the population have a “handicap”, that is, their disability limits them in relation to one or more of the following activities:

- Self care (showering, toileting, dressing, etc.)
- Mobility (moving around the home, using public transport, etc.)
- Verbal communication (understanding or being understood in one’s own language)
- Schooling (attending school, or learning)
- Employment (ability to work, need for assistance, equipment, etc.)

Disability is closely related to age. People aged 60 and over represent only 16% of the population but account for almost half of people with a handicap. As the population “ages”, the incidence of disability is expected to rise.

Over 94% of people with a handicap live in the community – only 5.7% live in institutions.

Of all the residents in Ryde local government area (92 977 in 1996 census), assuming proportions are the same as NSW as a whole, it is estimated that:

6.1% have high support needs – that is, they always or sometimes need help from another person to perform one or more of the tasks of daily living;

3.5% need no help but have difficulty performing one or more of the tasks of daily living;

5.8% need no help but use an aid or have difficulty walking 200 metres, or going up and down stairs, or in using public transport, or in picking up an object from the floor.

This gives a total of about 14,318 people who experience specific restrictions in self-care, mobility or communication. About 40% of these would be people aged 65 years and over.

These figures are estimates based on the ABS survey of Disability, Ageing and Carers 1998.

3.0 LEGISLATION

3.1 Environmental Planning and Assessment Act 1979

The Environmental Planning and Assessment Act (EPAA) 1979, regulates and controls the carrying out of developments in NSW.

Council when assessing applications for development, construction certificates and complying development certificates, needs to ensure that the any proposed building works meet the requirements (where applicable) of the new Commonwealth Disability (Access to Premises – Buildings) Standards (the Premises Standards and the Access Code which came into force on 1 May 2011 and contained within the Building Code of Australia (BCA).

3.2 SEPP Housing for Seniors or People with a Disability 2004

The aim of the Seniors housing is to encourage a greater supply and diversity of housing, including small scale housing, to meet the needs of older people and people with disabilities, to make better use of existing infrastructure and services and to encourage better housing design.

Provisions in the new policy relating to the location of the development and support services stress the issue of access to services and facilities.

3.3 Building Code of Australia

The BCA details the technical requirements that are applied to buildings and structures that require building approval. The BCA includes the Access Code which is part of the new Premises Standards and sets out performance requirements and detailed deemed-to-satisfy provisions which need to be satisfied before a certifying authority issues construction certificates and complying development certificates.

3.4 Disability Discrimination Act 1992

The Disability Discrimination Act 1992 (DDA) is now known to take precedence over the EPAA and the BCA, where there is conflict in the area of access for people with disabilities (see Coffs Harbour Cases at 3.5).

The objectives of the Discrimination Act 1992 (DDA) are:

1. to eliminate, as far as possible, discrimination against persons on the ground of disability in the areas of:
 - a. work, accommodation, education, access to premises, clubs and sport; and
 - b. the provision of goods, facilities, services and land; and
 - c. existing laws; and
 - d. the administration of Commonwealth laws and programs; and
2. to ensure, as far as practicable, that persons with disabilities have the same rights to equality before the law as the rest of the community; and
3. to promote recognition and acceptance within the community of the principle that persons with disabilities have the same fundamental rights as the rest of the community.

The DDA protects persons with disability from both “direct discrimination”, where the person is treated less favourably because of their disability, and “indirect discrimination”, where all people are treated equally but persons with disability are thereby disadvantaged.

If providing access for people with disabilities will cause “unjustifiable hardship”, the Human Rights and Equal Opportunity Commission can rule that the building owner / occupier is not unlawfully discriminating. It should be noted that unjustifiable hardship takes account of more than the cost to the owner. Also considered are the benefits to the community of the premises being accessible.

3.5 The Commonwealth Disability (Access to Premises - Buildings) Standards (the Premises Standards)

The Commonwealth Disability (Access to Premises – Buildings) Standards (the Premises Standards) commenced on 1 May 2011.

The Premises Standards set out administrative provisions and an Access Code detailing technical requirements. The Access Code is mirrored in the Building Code of Australia (BCA), to ensure consistency with the BCA, and sets out performance requirements and detailed deemed-to-satisfy provisions.

The purpose of the Premises Standards (and corresponding changes to the Building Code of Australia) is:

- to ensure that dignified, equitable, cost-effective and reasonably achievable access to buildings, and facilities and services within buildings, is provided for people with disability, and
- to give certainty to building certifiers, developers and managers that if the Standards are complied with they cannot be subject to a successful complaint under the DDA in relation to those matters covered by the Premises Standards.

4.0 APPLICATION OF THIS PART

4.1 Coverage of this Part

The following information sets out the provisions of this Part as applicable to particular Classes of buildings and includes the requirements of the new Premises Standards (and corresponding changes to the Building Code of Australia).

Compliance with the new Premises Standards, simultaneously with the BCA, is to be achieved by compliance with the Performance Requirements. This can be achieved by compliance with the deemed-to-satisfy provisions or the development of an alternative solution, or by a combination of both, as specified in the BCA.

A person may be excused from complying if compliance would impose unjustifiable hardship on the person. The person still needs to comply to the maximum extent not involving unjustifiable hardship.

If unjustifiable hardship is claimed, all relevant matters as specified in section 4.1(3) of the Premises Standards must be considered prior to determining any application for a complying development certificate or construction certificate.

However, unjustifiable hardship, may only be conclusively determined by a Federal Court or the Federal Magistrates Court. Decisions made by a certifying authority in consultation with suitably qualified persons to address the matters in section 4.1 of the Premises Standards would however, play an important and meaningful role in guiding a court about the existence of unjustifiable hardship in the event of a complaint.

Further details and information on a case of unjustifiable hardship are provided in Part 7 Unjustifiable Hardship.

When the Premises Standards apply

The Premises Standards apply to buildings and structures governed by the BCA that require building approval, that is applications for:

- a construction certificate
- a complying development certificate.

The Premises Standards apply to any application lodged on or after 1 May 2011 for:

- the erection of a building
- alterations and additions to an existing building
- an application for a change in building use where building works are proposed or required to meet fire safety standards.

Persons to whom the Premises Standards apply

Section 2.2 of the Premises Standards specifies that the Standards apply to the building certifier, building developer and building manager.

In NSW, a building certifier is the certifying authority who issues a Part 4A certificate or complying development certificate for any works, including those subject to the Premises Standards.

Building work to which the Standards apply

The Premises Standards apply to:

- a new building
- a new part of an existing building
- the *affected part* of an existing building.

Affected part means:

- *the principal pedestrian entrance of an existing building that contains a new part and*
- *any part of an existing building that contains a new part, that is necessary to provide*
- *a continuous accessible path of travel from the entrance to the new part.*

The affected part of a building must comply with the new access requirements where alterations and/or additions are proposed to an existing building, and the proposed work is subject to a complying development certificate or a construction certificate.

How the affected part applies

The affected part of the building:

- must be “upgraded” to comply with the Premises Standards subject to any exceptions or concessions (see page 3)
- only applies to any part of an existing building once work requiring building approval is to be undertaken.

The affected part of the building does not apply to:

- existing parts of buildings outside the area of the new work and the affected part upgrade
- an accessway from the allotment boundary, from any accessible car parking space on the allotment or between other buildings on the allotment.

Upgrading works for an affected part may include:

- accessibility of upper floors to new work
- providing lift access features such as Braille or tactile buttons
- signage
- removing a step at a building entrance
- upgrading handrails on a ramp
- minimum width requirements of doorways or passageways, including passing and turning spaces.

4.1.1 Applications under the EP&A Act**Development Applications**

While the Premises Standards do not apply at development application stage, best practice will be to show any necessary building works for the affected part upgrade on the development application plans (although technical compliance details are required only for any subsequent construction certificate application). This will avoid unnecessary delays and reduce the need for section 96 modifications of the development consent.

The certifying authority will be responsible for checking compliance with the Premises Standards in the same way compliance with the BCA is currently determined by the certifying authority at construction certificate stage.

Complying Development Certificate Applications

Where proposed work to an existing building is the subject of a complying development certificate, the certifying authority will need to consider whether the required work to any affected part is also complying development so as to include it in the certificate issued.

If the required affected part upgrade falls outside the scope of what is permissible as complying development, the proposed building works, together with the required upgrade works to the affected part, will need to be the subject of a development application.

Exceptions and concessions under the Premises Standards

Part 4 of the Premises Standards sets out applicable exceptions and concessions.

Lessees

Lessees submitting an application for approval for the building work to their leased area only do not need to ensure that the affected part of the building complies with the Premises Standards.

However, this concession does not apply if the new part is within a building with only one lessee, or where the works include works to other parts of the building.

Lift concession

The requirement in the Access Code for a lift to have a floor dimension of not less than 1400mm x 1600mm does not apply to an existing passenger lift that is in a new part, or an affected part, of a building, if the lift:

- travels more than 12 metres
- has a lift floor larger than 1100mm by 1400mm.

If the building is not the subject of the lessee concession and the new part is on a floor other than the ground floor, the affected part upgrade will require that the path of travel from the principal public entrance to the new part be by way of an access ramp or passenger lift.

The provision of a ramp or lift to provide access to upper levels of a building is not required to a Class 5, 6, 7b or 8 building of no more than three storeys where the floor area of each successive storey does not exceed 200m²

Toilet concession

It is not necessary to upgrade an existing accessible sanitary facility that is the subject of new building works provided the existing sanitary facilities comply with AS 1428.1 – 2001. Toilets that are within the 'new part' or the 'affected part' of the building that do not comply with this version of the Standard will need to be upgraded. However, any new toilets must comply with the Premises Standards.

4.1.2 Class of Building – Class 1

A residence which may comprise one or more buildings including any habitable outbuildings which in association constitute:

1. a single dwelling-house, terrace house, townhouse, row house, villa house, or the like, which may be detached or separated by a common wall; or
2. a dwelling-house used as a boarding house, hostel, group house, or the like, in which not more than 12 persons would ordinarily be resident.

Requirements under this Part

- **Class 1a – New development**
 - An accessible path of travel from the street to and through the front door, where the level of land permits.
- **Class 1a - Existing building/change of use or alterations**
 - This Part does not apply
- **Class 1b – New development**
 - Must comply with all applicable provisions of this Part
- **Class 1b - Existing building/change of use or alterations**
 - Does not apply

Premises Standards

Requirements apply to certain specified Class 1b buildings - refer to the Premises Standards and seek advice.

4.1.3 Class of Building – Class 2

A building containing two or more sole-occupancy units each being a separate dwelling, excluding buildings of Class 1.

Requirements under this Part

- **New development**
 - An accessible path of travel from the street to and through the front door of all units on the ground floor, where the level of the land permits. If the development has three or more residential storeys, with 10 or more units, to all units on all storeys.
 - In developments with three or more habitable storeys and with 10 or more units a percentage of units shall comply with the provisions of a Class A adaptable unit as specified in AS4299, in accordance with the following ratio:
 - *up to 9 units, the provision does not apply*
 - *10 – 15 units, 1 adaptable unit*
 - *16 – 20 units, 2 adaptable units*
 - *21 – 30 units, 3 adaptable units*
 - *10% of units thereafter'*

(Refer to Part D of this Part for guidance)

- **Existing building/change of use or alterations**
 - This Part does not apply.

Premises Standards

Requirements apply to Class 2 common areas - refer to the Premises Standards and seek advice.

4.1.4 Class of Building – Class 3

A residential building, other than a building of Class 1 or 2, which is a common place of living for a number of unrelated persons, including:

- a boarding house, guest house, hostel, or lodging house,
- a residential part of a hotel or motel,
- a residential part of a school,
- accommodation for the aged, disabled or children; and
- a residential part of a health-care building which accommodates members of staff.

Requirements under this Part

- **New development**
 - must comply with all applicable provisions of this Part
- **Existing building/change of use or alterations**
 - does not apply

Premises Standards apply - refer to the Premises Standards and seek advice.

4.1.5 Class of Building – Class 4

A dwelling in a building that is Class 5, 6, 7, 8, or 9 if it is the only dwelling in the building

4.1.6 Class of Building – Class 5

An office building used for professional or commercial purposes, excluding buildings of Class 6, 7, 8 or 9.

Requirements under this Part

- **New development**
 - The ground floor must comply with all applicable provisions of this Part and in developments with two or more storeys, where the aggregate floor area of all storeys above the ground storey is 400 m² or more, all storeys must comply with all applicable provisions of this Part. In particular, lift access is to be provided to the upper storey or storeys.
- **Existing building/change of use or alterations**
 - Must comply with all applicable provisions of this Part where there are structural alterations, major refurbishment or significant change of use affecting a substantial proportion of the gross floor area of the premises.
 - Where there is minor refurbishment to an existing building, accessibility shall not be made worse.

Premises Standards apply - refer to the Premises Standards and seek advice.

4.1.7 Class of Building – Class 6

A shop or other building for the sale of goods by retail or the supply of services direct to the public, including:

1. an eating room, café, restaurant, milk or soft-drink bar;
2. a dining room, bar shop or kiosk portion of a hotel or motel;
3. a hairdresser's or barber's shop, public laundry, or
4. undertaker's establishment;
5. market or sales room, showroom, or service station.

Requirements under this Part

- **New development**
 - The ground floor must comply with all applicable provisions of this Part and in developments with two or more storeys, where the aggregate floor area of all storeys above the ground storey is 400 m² or more, all storeys must comply with all applicable provisions of this Part. In particular, lift access is to be provided to the upper storey or storeys.
- **Existing building/change of use or alterations**
 - Must comply with all applicable provisions of this Part where there are structural alterations, major refurbishment or significant change of use affecting a substantial proportion of the gross floor area of the premises.
 - Where there is minor refurbishment to an existing building, accessibility shall not be made worse.

Premises Standards requirements may apply - refer to the Premises Standards and seek advice.

4.1.8 Class of Building – Class 7

A building which is:

1. a public carpark; or
2. for storage, or display of goods or produce for sale by wholesale.

Requirements under this Part

- **New development**
 - The ground floor must comply with all applicable provisions of this Part and in developments with two or more storeys, where the aggregate floor area of all storeys above the ground storey is 400 m² or more, all storeys must comply with all applicable provisions of this Part. In particular, lift access is to be provided to the upper storey or storeys.
- **Existing building/change of use or alterations**
 - Must comply with all applicable provisions of this Part where there are structural alterations, major refurbishment or significant change of use affecting a substantial proportion of the gross floor area of the premises.
 - Where there is minor refurbishment to an existing building, accessibility shall not be made worse.

Premises Standards requirements may apply - refer to the Premises Standards and seek advice.

4.1.9 Class of Building – Class 8

A laboratory, or a building in which handicraft or process for the production, assembling, altering, repairing, packing, finishing, or cleaning of goods or produce is carried on for trade, sale or gain.

Requirements under this Part

- **New development**
 - The ground floor must comply with all applicable provisions of this Part and in developments with two or more storeys, where the aggregate floor area of all storeys above the ground storey is 400 m² or more, all storeys must comply with all applicable provisions of this Part. In particular, lift access is to be provided to the upper storey or storeys.
- **Existing building/change of use or alterations**
 - Must comply with all applicable provisions of this Part where there are structural alterations, major refurbishment or significant change of use affecting a substantial proportion of the gross floor area of the premises.
 - Where there is minor refurbishment to an existing building, accessibility shall not be made worse.

Premises Standards requirements may apply - refer to the Premises Standards and seek advice.

4.1.10 Class of Building – Class 9

A building of a public nature:

1. Class 9a - a health-care building;
2. Class 9b - an assembly building; and

Class 9a includes a pathology laboratory in a health-care building and Class 9b includes a trade workshop, laboratory or the like in a primary or secondary school, but excludes any other part of these buildings that are of another Class.

Requirements under this Part

- **New development**
 - The ground floor must comply with all applicable provisions of this Part and in developments with two or more storeys, where the aggregate floor area of all storeys above the ground storey is 400 m² or more, all storeys must comply with all applicable provisions of this Part. In particular, lift access is to be provided to the upper storey or storeys.
- **Existing building/change of use or alterations**
 - Must comply with all applicable provisions of this Part where there are structural alterations, major refurbishment or significant change of use affecting a substantial proportion of the gross floor area of the premises.
 - Where there is minor refurbishment to an existing building, accessibility shall not be made worse

Premises Standards requirements may apply - refer to the Premises Standards and seek advice.

4.1.11 Class of Building – Class 10

A non-habitable outbuilding or structure:

1. an open garage, private garage, shed or the like;
2. a fence, mast antenna, retaining or free-standing wall, swimming pool, or the like.

Requirements under this Part

- **Class 10a - New development**
 - An accessible path of travel from the outbuilding or structure to and through the front door of any associated building where the levels of the land permit.
- **Class 10a - Existing building/change of use or alterations**
 - this Part does not apply
- **Class 10b - New development**
 - Swimming pools that are for public use are to have a continuous accessible path of travel to and from them to any entrance, change rooms or shops associated with the swimming pool
 - Swimming pools are to have access for people with disabilities into the pool – either by a ramp, hoist or other means.
- **Class 10b - Existing building/change of use/major structural change or alterations**
 - Swimming pools that are for public use are to have a continuous accessible path of travel to and from them to any entrance, change rooms or shops associated with the swimming pool
 - Swimming pools are to have access for people with disabilities into the pool – either by a ramp, hoist or other means.

Premises Standards requirements may apply - refer to the Premises Standards and seek advice.

5.0 DESIGN REQUIREMENTS

5.1 Introduction

One of the objects of this Part is to ensure that people with disabilities have equitable access to all buildings that are approved by Council for construction or refurbishment.

This equitable access involves more than providing ramps and toilets for people who use wheelchairs. Also included are the provision of appropriate lighting and colour contrast for people with visual impairment, tactile surface indicators for people who are blind, visible alarms for people who are hearing impaired or deaf, appropriate signage for people with visual impairment and those with intellectual disability.

Note: The Disability Discrimination Act 1992 (DDA) makes it unlawful to discriminate against people with disabilities in a number of areas including access to public buildings the provision of goods and services, accommodation and employment unless this would cause “unjustifiable hardship”. When these provisions are taken together it can be seen that the DDA requires access for people with disabilities to all parts of premises which the public or an employee might want or need to go.

Although private free standing dwellings are not considered to be covered by the provisions of the Disability Discrimination Act and the new Premises Standards, Council wants to encourage accessibility to as many houses as possible. This is so people with disabilities have a greater range of homes to choose from when they want to buy a home and also to enable them to visit their friends.

Blocks of home units, multi dwelling housing (attached), etc. are covered by this Part because having more accessible units increases the amount of accessible housing stock.

The Premises Standards and the Access Code as contained within the BCA, specify a nationally applicable set of Performance Requirements in providing non-discriminatory access to, and use of, those buildings and areas of buildings to which they apply and provide technical Deemed-to-Satisfy Provisions for these Performance Requirements.

One of the main objectives behind developing the Premises Standards was to develop a single set of design and construction requirements covering access to new buildings and upgrades to existing buildings.

The DDA definition of premises extends well beyond the scope of the BCA, which is primarily concerned with the construction and safety of buildings. The DDA includes areas such as parkland, playgrounds, transport vehicles and could apply to non-building facilities such as some fixtures and fittings.

While the Premises Standards addresses a broader range of access issues in the built environment, at this stage they only apply to public buildings of the type covered by the BCA and only to new buildings and existing buildings that undergo renovation that requires a building approval.

This means that there are a number of situations where the Premises Standards are either not triggered or do not apply, including:

- Existing buildings – those buildings that existed before the Premises Standards came into force (or where an application for building/construction approval was sought before the Premises Standards came into force) and are not undergoing any building work.
- Fitout features of a building for which building approval is not required – this might include reception desks, drink fountains, change rooms in clothes shops, moveable furniture, fixtures and fittings.

- Some way finding features of buildings not covered by the signage requirements of the Premises Standards – for example tenants' boards, room identification, directions to key building facilities or features.
- Some short-term holiday accommodation buildings such as those bed and breakfast facilities or holiday cabins that are specifically excluded from the Premises Standards (see discussion under Part D3 of the Access Code below).
- Public footpaths, parks, recreation areas, transport conveyances – those parts of the built environment which are not covered by the Premises Standards.

If a building or feature is not within the scope of the Premises Standards and someone experiences discrimination because the building or feature is not accessible a complaint can be made directly under the provisions of the DDA.

So, for example, it will continue to be possible for a person with disability to complain about access to a local shop or hotel that was built before the Premises Standards commenced or about the inaccessibility of certain fixtures and fittings or directional information not covered by the Premises Standards.

The Premises Standards allow for and encourage innovative solutions to meet the Performance Requirements through the development of new technologies and through the use of alternative approaches, so long as the proposed solution provides equivalent or better access than the Deemed-to-Satisfy Provisions.

For example, although the Premises Standards only refer to specific editions of AS 1428.1 and other Australian Standards, the Australian Standards are regularly updated to take account of new technologies and new ways of doing things.

While the Premises Standards only require compliance with the specific editions of Australian Standards referenced in the Access Code, this does not prevent a building owner from complying with a newer Australian Standard if to do so would satisfy the Performance Requirements of the Access Code.

Similarly there may be situations, particularly in relation to existing buildings such as heritage buildings, where it might not be possible to meet the Deemed-to-Satisfy Provisions of the Access Code but an acceptable alternative approach might be proposed.

Building professionals are familiar with this approach referred to as an Alternative Solution in the BCA. Subsections 3.2(2) and (3) of the Premises Standards should be interpreted as allowing for alternative approaches to meeting the Performance Requirements of the Access

The Premises Standards are a set of minimum requirements for the provision of access. While compliance with the Deemed-to-Satisfy Provisions of the Access Code fulfils legal responsibilities in relation to the DDA there is nothing to stop someone from providing a greater degree of access than required by the Deemed-to-Satisfy Provisions.

The Access Code through the BCA only requires the provision of limited access in some situations. For example, ramp or lift access is only required to the upper floor of a two- or three-storey office block if either of the upper floors is greater than 200 m².

These limited access requirements address situations where achieving higher levels of access might be extremely difficult in every instance.

Where it is possible to achieve higher levels of access than the minimum requirements of the Access Code it would be good practice to do so.

For example, the Access Code includes a limit in relation to the number of accessible entrances to a building, requiring only 50% of entrances (including the principle public entrance) to be accessible. However, where there are no topographical or significant financial considerations associated with making all entrances accessible, designing beyond minimum requirements by making all those entrances accessible should be considered as good practice.

Similarly, a building developer or manager may provide more accessible rooms in a motel, or more accessible car parking spaces in a carpark than the minimum number required by the Access Code. They may also decide to install a fixed hearing-augmentation system in a room that does not have an inbuilt public address system to ensure better access.

Some of the important factors that need to be considered in providing access are discussed below.

However, for details of the precise specifications required, reference should always be made to the various Australian Standards shown opposite each section. A list of the relevant Standards is provided in Part 8 of this DCP.

5.2 Terms

Accessible:

Describes all or part of a site, building or facility that complies with AS1428.2 and that can be approached, entered and used by people with disabilities.

Angle of approach:

The angle between the centre line of one path of travel and the centre line of an adjoining path of travel.

Ambulant people with disabilities:

People who are able to walk but have mobility or manipulative impairments.

Circulation space:

Is the space surrounding built elements, landscape elements, and fixtures required for movement into and around buildings and includes an unobstructed area for a minimum height of 2000 mm above the finished floor.

Continuous accessible path of travel:

An uninterrupted path of travel to or within a building providing access to all required facilities. For non-ambulatory people this accessible path shall not include any step, stairway, turnstile, revolving door, escalator or other impediment which would prevent it from being safely negotiated by people with disabilities.

Grabrail:

A rail used to give a steadying or stabilizing assistance to a person engaged in a particular function.

Handrail:

A rail used in circulation areas such as corridors, passageways, ramps and stairways to assist in continuous movement. The handrail must be parallel to the floor.

Hazard:

Any area or object within the environment that may place people at risk.

Kerb:

A side barrier to a trafficable surface.

Kerb ramps:

(AS 1428.1 Clause 5.8) – have a max rise of 190mm, a gradient of 1:8, a landing 1330 mm from top of ramp and a width of 1000mm. Kerb ramps are located within a kerb.

Threshold ramps:

(AS1428.1 Clause 7.1, figure 10) – have a rise less than 56 mm, a gradient of 1:8, a width of 1000mm, no landing and no handrail or kerb required. The length is not more than 450mm.

Step ramps:

(AS 1428.1 Clause 5.8) – have a rise greater than 56mm but a maximum rise of 190mm with a gradient 1:8, width 1000mm, length less than 1520mm and a landing of 1330mm. A handrail and kerb is not required with a step ramp.

Ramps:

(AS 1428.1 Clause 5.3) – have a rise above 190mm and a gradient of 1:14min etc – as is outlined in the above Australian Standards.

Landing:

A flat or crowned surface with a gradient not steeper than 1 in 40, e.g. a rest area on a ramp, stairway or walkway or where a ramp changes direction and at the top and bottom of each ramp.

Luminance factor:

The ratio of luminance of a surface to that of a perfect reflector, identically illuminated.

Path of Travel:

A passageway, walkway, ramp, landing or other space used for circulation.

Ramp:

An inclined accessway with a gradient steeper than 1 in 20 but not steeper than 1 in 14 and should include non slip floor covering.

Sensory impairment:

Any significant loss of hearing or sight.

Step ramp:

An inclined accessway with a length not greater than 1520 mm and a gradient not steeper than 1 in 8, located in, or instead of, a step other than a kerb.

Walkway:

Any accessway with a gradient not steeper than 1 in 20.

(Source AS1428.1 and AS1428.2)

5.3 Continuous Accessible Path Of Travel

The provision of a continuous accessible path of travel is the basic tenet on which access to premises is based. It allows people with disabilities to move without restriction into and throughout the building or other area.

In general, it is expected that all parts of buildings will be accessible to people with disabilities. To do this requires careful planning so that access is not prevented by the inappropriate design or construction of minor aspects of the building that undo or negate the efforts that have been made in other areas.

Note : There is little point in providing an accessible parking bay if a wheelchair user cannot get from the parking area and through the front door because of a step at the door. There is little point in making the entrance accessible if access throughout the building is impeded by steps or narrow doors or obstacles placed in the path of travel.

Australian Standard, AS1428.2 provides technical details of what needs to be done to ensure a continuous accessible path of travel for most people with disabilities and should be referred to for complete specifications. Some of the major factors, however, are explained below.

(AS1428.2 Clause 7)

5.4 Width Of Path

A wheelchair user needs a minimum of 1200 mm except at doors where more space is required. In addition, passing spaces need to be provided every 6 metres to allow two wheelchair users to pass.

(AS1428.2 Clauses 6.1 to 6.5)

5.5 Changes in Level

Even small steps or lips can prevent some wheelchairs from movement and may also be a hazard to ambulant people with disabilities. Any change in level that exceeds 3 mm must be ramped or an alternative access means provided (e.g. a lift).

(AS1428.2 Clause 6.6)

5.6 Vertical Clearance

People who have visual impairment or who are blind need to be sure that the path of travel is free from obstacles that might strike them on the head or upper body. There must be clearance above the path of at least 2000 mm.

(AS1428.2 Clause 6.7)

5.7 Ramps and Landings

Wheelchairs are difficult for many users to push up slopes. This is because of the effort involved and because a steep slope may tip the wheelchair over backwards. Generally ramps must not have a gradient greater than 1:14.

Ramps must have landings every 6 metres to allow users to rest. Ramps must also have kerbs to prevent a wheelchair from leaving the ramp and handrails to assist ambulant people with disabilities.

(AS1428.2 Clauses 8.1 to 8.4.6)



Ramps are to have dual handrails on both sides of the ramp. The top rail is to be 865 to 900 mm from and parallel to the ground or floor and the lower rail is to be 665 to 700 mm from and parallel to the ground or floor. Railings are to be a minimum of 30 and a maximum of 50 mm diameter.

(AS1428.2 Clause 10.1)

Figure 9.2.01

The transition to this ramp involves a step of about 50 mm making the ramp virtually useless.

There is no handrail on the left hand side. Handrail does not conform to the standard

5.8 Ground and Floor Surfaces

Floor surfaces must be slip resistant so as not to be a hazard to people with disabilities. Where carpet is used it must provide a firm surface and be attached so that there are no changes in level greater than 3 mm between the carpet and any other surface.

(AS1428.2 Clause 9)

5.9 Approaches and Entrances

All public entrances and employee entrances are to be accessible to people with disabilities.

Thresholds are to be avoided but where they are essential, they must be no higher than 56 mm and be ramped using a threshold ramp with a gradient of no more than 1:8.

(AS1428.1 Clause 11.2)

5.10 Doors and Doorways

People who use wheelchairs and people using other mobility aids need clear door openings of at least 960 mm wide to enable equitable access. There also needs to be sufficient circulation space at doors to allow people with disabilities to open and close the doors independently. Where they can be used, automatically operated sliding doors offer a good solution for most people with disabilities. Where revolving doors and turnstiles are installed, an alternative entrance shall be provided.

(AS1428.2 Clause 11)

Premises Standards requirements may also apply. Refer to the Premises Standards, BCA and seek advice.



Figure 9.2.02 The false floor prevents access and the doors are less than 960mm in width

Premises Standards requirements may also apply. Refer to the Premises Standards, BCA and seek advice.

5.11 Lifts

Lifts should be provided in easily accessible locations in all buildings of more than two levels, excluding carparking levels, as required by Part B (Coverage of Development Control Plan) of this document.

Lifts must be able to be operated independently by people with disabilities. There must be sufficient room for a wheelchair user to turn around in the lift car and control buttons are to be within reach of a wheelchair user. Handrails are to be provided.

(AS1428.2 Clause 12)

Information in lifts must be provided in tactile, aural and visual formats. Visual information must be able to be read by a person with visual impairment.

(AS1428.4)

Premises Standards requirements may also apply. Refer to the Premises Standards, BCA and seek advice.

5.12 Tactile Ground Surface Indicators

People who are visually impaired or blind need to be warned of hazards in or adjacent to the path of travel. This can be done by including tactile indicators in the path of travel ahead of hazards such as ramps, steps, roadways or before overhead obstacles that are close to the path of travel.

In addition, directional information can be provided by appropriate tactile indicators at points in the path of travel where there are changes of direction.

(AS1428.4)

Premises Standards requirements may also apply. Refer to the Premises Standards, BCA and seek advice.

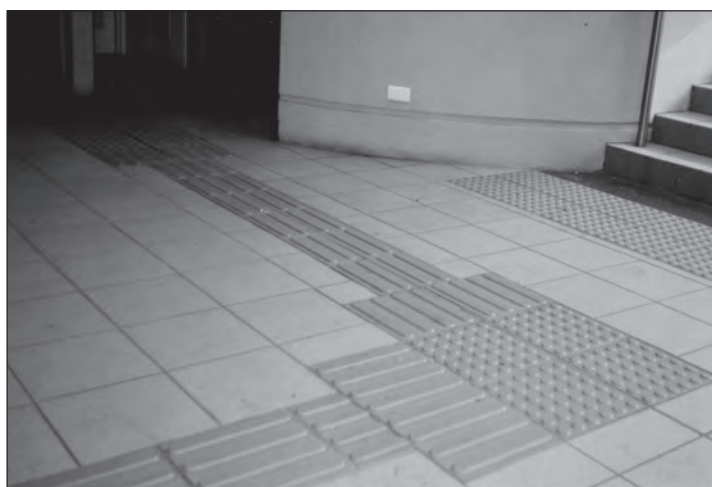


Figure 9.2.03
Effective use of Tactile Ground Surface Indicators

5.13 Stairways, Escalators and Moving Pathways

Some people with ambulant disabilities prefer stairs to ramps. However, any stairs, escalators or moving pathways used must be provided in addition to the continuous accessible path of travel and not as part of it.

Stairs may have a rise of 150 to 165 mm and a tread of 275 to 300 mm. However, where possible, the rise should be 95 to 105 mm with a tread of 575 to 600 mm which suits people using assistive devices such as walking frames.

Stairways are to have dual handrails on both sides of the stairway. The top rail is to be 865 to 900 mm from the top of a step and the lower rail is to be 665 to 700 mm from the top of a step. Railings are to be a minimum of 30 and a maximum of 50 mm diameter.

(AS1428.2 Clause 10.1)

5.14 Lighting

Poor lighting can cause a safety hazard for all people. People with disabilities, particularly people with vision impairment, need good lighting for both safety and so they can find their way around.

Lighting should not glare nor reflect unduly off surfaces as this can cause confusion and disorientation.

In general, the minimum lighting level that complies is 150 lx. Some areas, such as toilets, counter tops and general displays, require more light – up to 300 lx.

(AS1428.2 Clause 19)

5.15 Gateways and Checkouts

If access to, or egress from, a premises is through a gateway or checkout, care needs to be taken that people with disabilities can negotiate it.

Gateways and checkouts suitable for people with disabilities are to be identified by the international symbol for access.

Turnstiles are not appropriate for people with disabilities.

An opening of at least 850 mm is required and any coin device or ticket machine is to be located at a height of between 800 and 900 mm to enable wheelchair users to use it.

Any barrier must be at least 1200 mm past the ticket or coin feed point to allow a wheelchair user access.

(AS1428.2 Clauses 28.1 to 28.4)

5.16 Parking Areas

Many people with disabilities use motor vehicles, at least in part because most public transport is inaccessible.

5.16.1 Off Street Parking

Parking spaces for people with disabilities are to be located close to exits of the parking area or close to entrances to premises (including close to lifts, ramps or walkways).

There must be a continuous accessible path of travel from all parking spaces for people with disabilities to entrances to the premises.

In undercover parking areas, lifts are to provide access to all levels.

The ground surface of parking bays is to be smooth, but non-slip and have a slope in any direction not exceeding 1:40. (There are special provisions for outdoor car parks – see AS2890.1 Clause 2.4.5 (a)).

Parking spaces are to be a minimum of 3660 mm wide to allow a wheelchair user to fully open the car door and then transfer from the car to the wheelchair.

Wheelchairs are often carried on the roof of the car using a wheelchair hoist. A vertical clearance of at least 2500 mm is required to allow the hoist to operate. This clearance must extend from the entrance to the parking bays for people with disabilities.

Parking spaces are to be identified by the international access symbol.

Where boom-gates are used at either the entrance or the exit, any ticket machine is to be within reach of a driver seated in the car and, for drivers who cannot operate the ticket machine, an intercom system provided that can be operated from the driver's seat of the car.

(AS1428.2 Clauses 14.1 and 14.2; AS2890.1 Clauses 2.4.5 to 2.4.6.1, 5.3.1 to 5.4, Appendix C and Table C1.)

Sufficient parking is to be provided for people with disabilities. Minimum numbers required are specified in Table 9.2.01.

TYPE OF FACILITY	NUMBER OF WIDE-BAY SPACES
Class 1a	Nil
Class 1b	If a parking area is provided, 1 wide bay space
Class 1c	Nil
Class 2	1 wide bay space for each accessible or adaptable unit At least 1 wide bay visitors' space
Class 3	The greater of a. or b. c. At least 1 wide bay space for each accessible unit or, d. In parking areas with: less than 10 spaces - nil In parking areas with more than 10 spaces, 3% of spaces are wide bay. That is : 10 to 33 spaces - 1 space 34 to 66 spaces - 2 spaces 67 to 100 spaces - 3 spaces 101 to 133 spaces - 4 spaces, etc
Class 4	At least 1 wide bay for each accessible dwelling
Class 5, 6, 7 and 8	In parking areas with more than 10 spaces, 3% of spaces are wide bay. That is : 10 to 33 spaces - 1 space 34 to 66 spaces - 2 spaces 67 to 100 spaces - 3 space 101 to 133 spaces - 4 spaces, etc
Class 9a	In parking areas of upto 10 spaces, 1 space is wide bay In parking areas with more than 10 spaces, 4% of spaces are wide bay. That is : Up to 25 spaces - 1 space 36 to 50 spaces - 2 spaces 51 to 75 spaces - 3 spaces 76 to 100 spaces - 4 spaces 101 to 125 spaces - 5 spaces, etc
Class 9b	In parking areas with more than 10 spaces, 3% of spaces are wide bay. That is : 10 to 33 spaces - 1 space 34 to 66 spaces - 2 spaces 67 to 100 spaces - 3 spaces 101 to 133 spaces - 4 spaces, etc
Class 10	Nil (parking areas associated with any swimming pool or the like are to comply with the parking provisions for Classes 5, 6, 7 and 8)

Table 9.2.01 Numbers of Parking Spaces for People with Disabilities

5.16.2 On Street Parking

Parking bays for people with disabilities are to be a minimum of 3200 mm wide and 5500 mm long if the bay is at the end of the parking area and 6700 mm long in other circumstances.

Kerb ramps are to be provided at each end of the parking bay.

Where possible the footpath is to be cut away to provide a clear 3200 mm width.

The number of parking bays for people with disabilities will also comply with the provisions of Table 1.

(AS2890.5 Clause 4.5.1 and 4.5.2.)

Premises Standards requirements may also apply. Refer to the Premises Standards, BCA and seek advice.

5.17 Sanitary Facilities

Accessible sanitary facilities are to be provided in every location where other sanitary facilities are provided.

Many people with disabilities need assistance with toileting and this is often provided by a person of the opposite sex to the person with a disability. It is therefore required that accessible facilities should be located so they can be accessed without the need to enter a male only or female only area.

Generally, one unisex accessible facility is required to be provided near each block of male and female facilities.



Developers are particularly urged to consult AS1428.2 Clause 15 before settling on a sanitary facility design.

Accessible sanitary facilities will be a minimum of 2300 mm by 1900 mm, unless a wash basin or other facility is also provided in the same area, in which case extra space is required.

Figure 9.2.04
Toilet centreline is more than 460 mm from wall, putting paper and the handrail out of easy reach

As some wheelchair users are able to transfer to one side only, where more than one accessible sanitary facility is provided there will equal numbers of facilities that allow transfer from wheelchair to toilet from the left and from the right hand side of the wheelchair.

At least one emergency call button will be provided in each facility.

Grabrails will be provided which comply with AS1428.2 Clause 10.2.

(AS1428.2 Clauses 15.1 to 15.3)

In each single sex facility there will be a cubicle that people with ambulant disabilities can use. It will comply with AS1428.2 Figure 12.

5.18 Washbasins

Washbasins will allow a wheelchair user to sit front-on to the basin with room under it for clearance over the person's knees. Provision should also be made for an area which allows for the easy placement of such things as hair brushes.

(AS1428.2 Clause 15.7)



Figure 9.2.05
Towel dispenser is too high above floor and soap dispenser is too close to corner. Mirror is too high for wheelchair users.

Taps will be either lever type, capstan type or sensor plate controlled or the like.

Hot water will be provided through a mixer valve.

(AS1428.1 Clause 11.3)

5.19 Shower Facilities

Where shower facilities are provided, they will also be provided for people with disabilities. The accessible shower facility may be incorporated into the accessible sanitary facility provided sufficient circulation space is provided.

The minimum circulation space required for an accessible shower is 1600 by 2350 mm.

A fold-away seat and grabrails will be provided. A shower hose will be provided. An adjustable temperature control valve will be installed to prevent scalding. There shall be two levers on which to hang the shower hose.

(AS1428.2 Clause 15.4)

5.20 Bedrooms in Motels etc

Many people with disabilities stay in motels and other accommodation facilities. As well as toilets and showers needing to be accessible, bedrooms also need to have sufficient circulation space to enable their use.

On each side of all beds there will be 1200 mm clear space to allow a wheelchair to be positioned on either side of the bed. In addition, there will be sufficient space at the foot of the beds to enable a 180° turn (2070 mm in direction of travel and 1540 mm in width).

Controls for any TV, air conditioner, radio or other facility will be located where they can be operated from the bed.

Any telephone will be able to be operated from the bed. The telephone cable should be long enough to enable location on either side of the bed.

The height of the top of the bed mattress will be not less than 480 mm or more than 500 mm from the floor when compressed by a weight of 90 kg.

(AS1428.2 Clause 24.3)

5.21 Controls, Handles, Fixtures

Many people with disabilities are limited in their reach, in their strength and in their hand function. Controls for such things as lights, doors and power outlets must be designed and positioned to allow their operation by people with disabilities. In addition there needs to be sufficient contrast between the control and its background to enable a person with vision impairment to detect it.

Door handles must be able to be operated with one hand and be of a design that enables a person with no grip to use it – a “D” handle will often suffice where the door is unlocked. Lever handles allow people with limited hand function to open locked doors.

Controls are to be located no less than 900 and no more than 1100 mm from the floor. Switches are to be no less than 500 mm from any corner to allow a wheelchair user to reach them.

Should an outwards opening door be used, for example in a sanitary facility, a horizontal handrail or pull bar will be fitted to the inside of the door. A preferable solution is the use of sliding doors as internal doors.

(AS1428.2 Clause 23.1 to 23.5; AS1428.1 Clause 11)

Premises Standards requirements may also apply. Refer to the Premises Standards, BCA and seek advice.

5.22 Symbols and Signs

Access will be identified by use of the international symbol for access. The figure will be white on a blue background.

In general, a sign using the international symbol for access will face in the direction of the travel and may also include an arrow and a sign or word indicating a facility.

Where hearing augmentation is provided it will be notified by use of the international symbol for deafness.

(AS1428.1 Clauses 14.1 to 14.4)

Signs need to be clear and easily understood. The height of lettering and the colour contrast between lettering and the background needs to be sufficient to ensure signs can be read from a distance.

For example, for a sign to be read from 2 metres the lettering must be at least 6 mm high, to be read from 12 metres, 40 mm high and from 50 metres, 150 mm high.

(AS1428.2 Clause 17.2)

Signs are to be illuminated without glare or reflection.

(AS1428.2 Clause 17.3)

Signs are to be located so they can be read from both a standing and a seated position. In general, signs are to be placed not more than 1600 and not less than 1400 mm from the floor.

(AS1428.2 Clauses 17.4 and 25)

Premises Standards requirements may also apply. Refer to the Premises Standards, BCA and seek advice.

5.23 Auditoriums and Assembly Areas

Many people with disabilities patronize theatres, concert halls and the like. As often as other people they are accompanied by family or friends who may or may not have a disability. Seating in these kinds of venues needs to be designed so that people with disabilities have a range of options as to where they sit. That is, seating should be available to people with disabilities in all price areas and levels of the venue.

Provision must be made for people with disabilities to sit with others with disabilities and with others who do not have a disability.

The surface of any wheelchair seating space will have a gradient no greater than 1:40.

Seating for people with disabilities will be accessible along a continuous accessible path of travel from the street or car parking area.

Any stage or podium is to be accessible by ramp or other means. The stage or podium will have sufficient circulation space for a wheelchair user. All controls will be able to be operated by a seated person.

(AS1428.1 Clauses 15.1 to 15.3; AS1428.2 Clauses 26.1 and 26.2)

The edge of the stage or podium will be identified by barriers or other means.

Premises Standards requirements may also apply. Refer to the Premises Standards, BCA and seek advice.

5.24 Listening Systems for Hearing Augmentation

Many people with hearing impairment can benefit from a hearing augmentation system which amplifies sound and in some cases can be used by people with "T" switches on their hearing aids. Other systems use supplied headphones or other devices.

Where a sound amplification system is provided, at least 10% of the audience area in each classification of seating will be provided with a hearing augmentation system.

The several types of hearing augmentation systems that are available are detailed in AS1428.2 Clause 21.

(AS1428.2 Clauses 21.1 to 21.3)

Premises Standards requirements may also apply. Refer to the Premises Standards, BCA and seek advice.

5.25 Background Sound Levels

For hearing systems to be effective, there needs to be a low level of background noise. Particular care should be taken with the installation of air conditioning and computer systems.

(AS1428.2 Clause 20 & AS2107)

5.26 Furniture and Fitments

People with disabilities need to be able to use the furniture installed in premises. Tables, counters and worktops all need to be designed so that access is provided.

No one table height suits all people with disabilities. Therefore it is necessary to provide for adjustment to table and worktop height or, where this is impractical, to provide tops at a range of heights between 700 and 850mm.

Tables, counters and worktops also need to have clearance under them for a wheelchair user. Generally this clearance should be no less than 710mm.

The width of clearance under a table or counter must be no less than 800 mm.

(AS1428.2 Clauses 24.1 and 24.2)



Figure 9.2.06 Lower counter area is good for wheelchair users but lack of space under counter means it cannot be used to write on

5.27 Street Furniture

Street furniture will not be situated so that it causes a hazard to people with disabilities. Items such as seats, tables, drinking fountains, planter boxes, etc will be positioned at least 500 mm from any accessible path of travel.

All seating should have armrests at a height of 210 to 300 mm above the seat, and have a seat height of 450 mm unless a high proportion of elderly people are likely to use the seating. In this case at least some of the seats are to have a seat height of 520 mm which enables people to stand up from the seat more easily.

(AS1428.2 Clauses 27.1 to 27.3)

5.28 Emergency Warning Alarms

Emergency warning systems need to include both visual and audible alarms so that as many people as possible can be alerted to any emergency.

Signs that warn of danger are to be placed sufficiently ahead of the hazard to allow avoidance.

(AS1428.2 Clauses 18.2 and 18.3)

5.29 Emergency Egress

Emergency exits need to be accessible to people with disabilities. Where egress is required from upper levels, the use of fire rated lifts or other means may be required. There is no Australian Standard dealing with this issue, however the Human Rights and Equal Opportunity Commission's Advisory Notes on Access to Premises provide advice.

(HREOC Advisory Notes on Access to Premises Section 5.21)

5.30 Outdoor Areas – Parks, etc

It is just as important for people with disabilities to have access to outdoor areas as it is for them to have access to buildings.

Continuous accessible pathways of travel are to be provided from all entrances to all of the facilities in the area – e.g. toilets, change rooms, barbecues, activity areas, tables and seats.

In addition, all facilities are to be constructed so as to provide access to them or to enable their use by people with disabilities.



Figure 9.2.07 Leg of table prevents use by wheelchair user



Figure 9.2.08 This table has an extended top and can be used by a wheelchair user

5.31 Infrastructure

People with disabilities need to be able to move between buildings and between transport nodes and their destinations.

This means all train stations, bus interchanges, footpaths, shopping malls and the like must not only be accessible in themselves but also linked by continuous accessible paths of travel.

Kerb ramps are particularly important and must conform to AS1428.1.

To ensure that wheelchair accessible buses can be effective, all kerbs must be a minimum of 150 mm high.

When footpath upgrading occurs, there needs to be a concerted effort to use the opportunity to increase access to shops. This might involve encouraging the shopkeeper / owner to meet some of the cost of making their shop accessible. Shops can often be made accessible by ramps within the shop, perhaps in combination with a threshold ramp on the footpath.

Premises Standards requirements may also apply. Refer to the Premises Standards, BCA and seek advice.

6.0 ADAPTABLE HOUSING

6.1 Introduction

As people age, experience ill health or acquire a disability, their housing needs will change. Homes which have been perfectly satisfactory become unsuitable due to access problems – for example, steps, small bathrooms, high kitchen benches. This usually means either modifications to improve access or the need to purchase a new home. Either way this is an expensive and disruptive exercise.

Buying a house or unit that is accessible or that can be easily adapted, is extremely difficult due to the lack of accessible housing stock.

Many people with disabilities are often isolated in their communities because most homes are inaccessible. This means that people with disabilities are unable to visit friends and neighbours who live nearby.

Adaptable housing is an approach to housing that builds features into new homes that make them immediately visitable by people with disabilities and considerably less expensive to modify for accessibility when that need arises.

In this context, visitable by people with disabilities means there is access to and through the front door, and to at least a sitting room, as well as ensuring that a toilet is usable by people with disabilities.

Council is committed to increasing the amount of housing stock that is adaptable.

Australian Standard AS4299 sets out the requirements of adaptable housing. Some of the more important features are summarized in the following pages.

AS4299 encourages the certification of adaptable houses into one of three classes of adaptable housing, A, B and C.

A house is classified as Class A, B or C depending on the number of features specified in AS4299 that are incorporated in the design. AS4299 designates features as being “essential”, “first priority desirable” or “desirable” depending on their importance to a person with a disability.

An Adaptable House Class A is one in which all essential and desirable features are incorporated.

An Adaptable House Class B has all essential and at least 50% of desirable features, including all those designated as “first priority”.

An Adaptable House Class C has all essential features incorporated.

Adaptable housing can apply to all kinds of housing – single dwellings, semi detached, bed sitters, urban housing, town houses and units in multi storey blocks.

6.2 Requirements

Developments with 10 or more units shall have a percentage of those units that meet the specifications for the Adaptable Housing Standard AS4299, in accordance with the following ratio;

- up to 9 units, this provision does not apply;
- 10-15 units, 1 adaptable unit
- 16-20 units, 2 adaptable units
- 21-30 units, 3 adaptable units, and

- 10% of units thereafter

As explained below, AS4299 provides for three Classes of adaptability. To meet Council's requirements, all adaptable units shall be designed and constructed to Class A.

With regard to urban housing provision needs to be made for 50% of developments containing 4 or more dwellings to be able to be accessed from the street. Common areas and carparking areas by older people and people with a disability.

6.3 Definitions

Accessible:

Able to be approached, entered and used by people with disabilities, including those who use wheelchairs, crutches or other mobility aid.

(Comply with AS 1428.1)

Accessible housing unit:

Housing unit with facilities already in place which allow a person with a disability or progressive frailty to live there.

(Comply with AS1428.1 and AS1428.2)

Adaptable housing unit:

Housing unit which is designed and constructed to meet the performance requirements of AS4299 Clause 2.2 and includes the essential features in AS4299 Appendix A.

Circulation space:

The unobstructed area around built elements, landscape elements, and fixtures and fittings required for movement into and within premises.

General purpose outlet (GPO):

An electrical power outlet (power point).

Housing unit:

A single residence or part of a residence, containing living area and sleeping space, kitchen, toilet and bath or shower room. The term includes bed-sitter flats, detached and semi-detached houses, villa homes, townhouses and apartments in multi-storey blocks.

Ramp:

An inclined accessway with a gradient steeper than 1:20 but not steeper than 1:14.

Shall:

Refers to an essential requirement.

Should:

Refers to a desirable requirement.

Visitable housing unit:

A housing unit that has at least one wheelchair accessible entry with an accessible path of travel to the living area and to a toilet that is either accessible or visitable.

Visitable toilet:

A toilet that has a minimum width of 900 mm clear of any door and fixtures and a minimum of 1250 mm in front of the toilet bowl.

Multi Unit Dwellings attached:

means a residential flat building containing 3 or more dwellings in a group arranged so that each dwelling has attached private open space and separate access from an unbuilt portion of the site.

Walkway:

Any accessway with a gradient not steeper than 1:20.

6.4 Design requirements

6.4.1 Drawings

Where a housing unit is to be certified as complying with AS4299 drawings shall be prepared that show the design of the house before and after adaption.

(AS4299 Clause 2.3)

6.4.2 Siting

1. People with disabilities enjoy outdoor facilities and generally should have access to all outdoor facilities. To facilitate this access, a level site should be selected with a maximum of 1:14 gradient in any direction.

(AS4299 Clause 3.2.2)

2. To allow access to the unit, a continuous accessible path of travel shall be provided from the street frontage and the car parking areas to the entry.

(AS4299 Clause 3.3.2; AS1428.1)

3. Additional paths and walkways should form a continuous accessible path of travel and be slip resistant and hard surfaced.

(AS4299 Clause 3.3.2)

4. Like other people, people with disabilities need to access common use facilities in residential estate developments. All common use facilities should be accessible.

(AS4299 Clause 3.3.3)

5. To aid with the location of residences within residential estate developments, street numbers should be displayed along with street names at intersections.

(AS4299 Clause 3.3.3)

6. In residential estate developments, internal roadways and pedestrian walkways should be kept separate.

(AS4299 Clause 3.3.3)

6.4.3 Security

1. Pathway lighting should be positioned at a low height to avoid glare. Minimum lighting level on pathways to be 50 lx at ground level.

(AS4299 Clause 3.6.1)

2. To assist with security there should be a clear line of sight from any vehicle drop-off point to a safe pedestrian entry point.

(AS4299 Clause 3.6.2)

6.4.4 Letterboxes in Estate Developments

1. Lockable letterboxes should be provided in a central position near a street entrance.
2. Letterboxes shall be on a hard surface area connected to an accessible path of travel.
3. Letterbox area should be roofed and well lit.
4. Letterboxes should have a parcel rack.

(AS4299 Clause 3.8)

6.4.5 Private Car Accommodation

1. Car space or garage shall have a minimum area of 6.0m x 3.8 m with the vertical clearance above the car space a minimum of 2.5 m.
2. Car space should be roofed. and any garage door should be a power operated roller door.
3. There should be a covered, accessible path of travel from the car space to the unit.
4. Car parking area should be illuminated to a minimum of 50 lx.

(AS4299 Clauses 3.7.1 to 3.7.3 and 4.10)

6.4.6 Accessible entry

1. The entry to the unit shall be accessible and have a clear door opening of 850 mm and should be protected by a porch or similar structure.

(AS4299 Clause 4.3.1)

2. The entry shall be level (i.e. no gradient greater than 1:40), with a low level threshold (maximum 56 mm with a threshold ramp with a maximum gradient of 1:8). The entry shall have a landing to allow wheelchair manoeuvrability.

(AS4299 Clause 4.3.2)

3. The entry door should be weatherproofed to prevent water and Adopteds getting in under the door.

(AS4299 Clause 4.3.3)

4. Door handles and other hardware shall comply with AS1428.1. That is, they will be lever type that can be operated by one hand with minimal effort.

(AS4299 Clause 4.3.4)

5. As many people with disabilities have difficulty with separate door / screen door combinations, provision should be made for the installation of a combined door / security door.

(AS4299 Clause 4.3.5)

6. The level of lighting at entrances should be a minimum of 300 lx.

(AS4299 Clause 4.10)

6.4.7 Exterior – General

1. So as to reduce the need for many keys to be carried, all external doors should be keyed alike.
(AS4299 Clause 4.3.4)
2. There should be provision for security screens to be fitted to exterior opening or sliding windows and doors.
(AS4299 Clause 4.7.6)

6.4.8 Interior – General

1. All interior doors shall be a minimum of 820 mm wide to allow easy access for people using wheelchairs and other mobility devices.
(AS4299 Clause 4.3.3)
2. Internal corridors shall have a minimum width of 1000mm and there shall be provision for circulation spaces at doors in compliance with AS1428.1.
(AS4299 Clause 4.3.7)
3. The maximum height of window sills above the floor should be 730 mm in living rooms and 600 mm in bedrooms.
(AS4299 Clauses 4.7.2 and 4.6.2)

6.4.9 Living Room and Dining Room

1. To allow sufficient circulation space in these areas, provision shall be made for a minimum clear space of 2250 mm in diameter after furniture is in place.
(AS4299 Clause 4.7.1)
2. To provide for adequate power, a minimum of four double GPOs should be provided.
(AS4299 Clause 4.7.3)
3. The telephone outlet shall be adjacent to the GPOs and should be between the kitchen and the living area. This minimises the distance needed to travel to answer the phone.
(AS4299 Clause 4.7.4)
4. Two TV antenna outlets should be located adjacent to GPOs so that viewing is possible from both the kitchen and the dining room.
(AS4299 Clause 4.7.5)
5. The potential illumination level shall be 300 lx.
(AS4299 Clause 4.10)

6.4.10 Kitchen

1. To provide sufficient space for a wheelchair user to use the kitchen the kitchen shall be a minimum width of 2.7 m with clearance between benches of 1550 mm and there shall be circulation space at doors to comply with AS1428.1.
(AS4299 Clauses 4.5.1 and 4.5.2)
2. Workbenches shall include at least one that is 800 mm long, adjustable in height from 750 to 850 mm or replaceable.
(AS4299 Clause 4.5.5)

3. The refrigerator shall be positioned adjacent to a work surface.
(AS4299 Clause 4.5.5)
4. The kitchen sink shall be adjustable to heights from 750 to 850 mm or be replaceable and shall have a bowl that is a maximum of 150 mm deep.
(AS4299 Clause 4.5.6)
5. Taps shall be capstan or lever type and there should be a thermostatic mixing valve to reduce the chance of scalding.
(AS4299 Clause 4.5.6)
6. Cooktops shall include either front or side controls and have an isolating switch. Adjacent to the cooktop shall be a work surface that is at the same height and at least 800 mm in length.
(AS4299 Clause 4.5.7)
7. The oven shall be located adjacent to an adjustable height or replaceable work surface.
(AS4299 Clause 4.5.8)
8. Provision should be made for a microwave oven that is mounted between 750 and 1200 mm above the floor.
(AS4299 Clause 4.5.9)
9. The illumination level should be potentially a minimum of 300 lx with 550 lx over work surfaces.
(AS4299 Clause 4.10)
10. To accommodate users with a variety of needs, adjustable shelving should be provided. Cupboard door handles should be "D" handles and in reach of a wheelchair user.
(AS4299 Clause 4.5.10)
11. GPOs shall comply with AS1428.1, with at least one within 300 mm of the front of the work surface. The GPO for the refrigerator shall be easily reachable when the refrigerator is in place.
(AS4299 Clause 4.5.11)
12. Kitchen floors shall be non slip.
(AS4299 Clause 4.5.4)

6.4.11 Main Bedroom

1. At least one bedroom shall have sufficient space to accommodate a queen size bed, wardrobes and have circulation space as specified in AS1428.2. Wardrobes should have sliding doors with full-length mirrors.
(AS4299 Clause 4.6.1 and 4.6.7)
2. Because some people with disabilities and some older people spend considerable time in their bedrooms, it is essential that GPOs, TV antenna outlets and phone connections are positioned to enable operation of these devices from the bed. There also need to be sufficient GPOs.
(AS4299 Clause 4.6.3 to 4.6.6)
3. Electrical wiring should also provide for two way switches for the lights in the bedroom. The potential illumination should be 300 lx.
(AS4299 Clause 4.6.4 and 4.10)

6.4.12 Other Bedrooms

1. In other bedrooms, provision should be made for someone with a disability using the rooms. This should include two double GPOs on one wall and another GPO on the opposite wall, as

well as a telephone outlet and a TV antenna point adjacent to one GPO.

(AS4299 Clauses 4.6.3 to 4.6.6)

2. A two way light switch should be provided and the potential illumination should be 300 lx.

(AS4299 Clauses 4.6.4 and 4.10)

6.4.13 Bathroom

1. The bathroom area is one of the most important areas in an accessible unit. There shall be provision for the bathroom area to comply with AS1428.1.

(AS4299 Clauses 4.4.1, 4.4.2, and 4.4.4)

2. The floor shall be slip resistant and shall fall to the waste which should be a minimum of 80 mm diameter. The shower area shall not have a hob, be waterproofed to AS3740, and be a minimum of 1160 by 1100 mm
3. The shower taps shall be capstan or lever type and shall be within easy reach of a wheelchair user. The soap container shall be recessed as a safety factor.
4. There shall be provision for a detachable, hand held shower rose mounted on a slide rail and for a grabrail to comply with AS1428.1.
5. There should be provision for a folding seat in the shower area.
6. The washbasin and clearances shall comply with AS1428.1.

(AS4299 Clause 4.4.4)

7. A mirror shall be provided extending from a height of not more than 900 mm to a height of not less than 1850 mm above the floor.
8. A double GPO shall be positioned next to the mirror and the potential illumination should be 300 lx generally with 600 lx task lighting.

(AS4299 Clauses 4.4.4 and 4.10)

6.4.14 Toilet

1. There shall be either a visitable toilet or an accessible toilet which complies with AS1428.1. Particular attention needs to be given to the position of the toilet bowl in relation to fixed walls.

(AS4299 Clauses 4.4.1 to 4.4.4)

2. There shall be grabrails and the floor shall be non-slip.

6.4.15 Laundry

1. There shall be sufficient circulation space at all doors to comply with AS1428.1 and circulation space beside or in front of appliances (at least 1550 mm).
2. An automatic washing machine shall be installed and provision should be made for a dryer.
3. Where a clothes line is provided, an accessible path of travel shall be provided to it.

(AS4299 Clause 4.4.8)

4. There should be a thermostatic mixing valve, and taps should be capstan or lever type and positioned on the side of the tub.
5. A shelf for soaps etc. should be no higher than 1200 mm from the floor.

(AS4299 Clause 4.4.8 and 4.10)

6. One double GPO shall be provided and the potential lx should generally be 300 lx with 550 lx task lighting.

7. The floor shall be non-slip.

(AS4299 Clause 4.9.1)

6.4.16 Door Locks

1. Door handles shall be lever or D type, able to be operated with one hand and be located 900 to 1100 mm above the floor.

6.4.17 Floor Coverings

1. Balconies and outside paved areas should be non-slip.

(AS4299 Clause 4.9.1)

6.4.18 Ancillary Items

1. All switches should be located 900 to 1100 mm from the floor in line with door handles. GPOs should be located no less than 600 mm from the floor. The electrical distribution board should be located inside the unit.

(AS4299 Clauses 4.11.1 and 4.11.2)

2. Window controls should be able to be operated from a wheelchair.

(AS4299 Clause 4.11.4)

6.4.19 Garbage

1. There should be provision for garbage bins to be stored in an accessible position.

(AS4299 Clause 4.11.6)

6.4.20 Wheelchair Storage

1. Provision should be made for external wheelchair storage and for an external battery charging facility.

(AS4299 Clause 4.11.6)

6.4.21 Guide Dogs

1. Provision should be made for guide dog accommodation.

(AS4299 Clause 4.11.6)

7.0 UNJUSTIFIABLE HARDSHIP

7.1 Introduction

The Disability Discrimination Act 1992 (DDA) provides that access for people with disabilities is to be provided unless to do so would cause unjustifiable hardship. Past decisions by the Human Rights and Equal Opportunity Commission (HREOC) made it clear that Councils are required to take account of the provisions of the DDA when considering development applications.

The new Commonwealth Disability (Access to Premises – Buildings) Standards (the Premises Standards) which commenced on 1 May 2011, set out administrative provisions and an Access Code detailing technical requirements. The Access Code is mirrored in the Building Code of Australia (BCA), to ensure consistency with the BCA, and sets out performance requirements and detailed deemed-to-satisfy provisions.

The purpose of the Premises Standards (and corresponding changes to the Building Code of Australia) is

- to ensure that dignified, equitable, cost-effective and reasonably achievable access to buildings, and facilities and services within buildings, is provided for people with disability, and
- to give certainty to building certifiers, developers and managers that if the Standards are complied with they cannot be subject to a successful complaint under the DDA in relation to those matters covered by the Premises Standards.

Compliance with the Premises Standards, simultaneously with the BCA, is to be achieved by compliance with the Performance Requirements. This can be achieved by compliance with the deemed-to-satisfy provisions or the development of an alternative solution, or by a combination of both, as specified in the BCA.

A person may be excused from complying if compliance would impose **unjustifiable hardship** on the person. The person still needs to comply to the maximum extent not involving unjustifiable hardship.

Unjustifiable hardship relates to non-compliance with one or more requirements of the Premises Standards, and does not relate to non-compliance with the Building Code of Australia (BCA) whether or not building work is involved.

Part 4 of the Premises Standards outlines exceptions and concessions to the Premises Standards, including that it is “not unlawful for a person to fail to comply with a requirement of these Standards if, and to the extent that, compliance would impose unjustifiable hardship on the person.”

If unjustifiable hardship is claimed, all relevant matters as specified in section 4.1(3) and (4) of the Premises Standards must be considered prior to determining any application for a complying development certificate or construction certificates. Appendix 1 includes the full list of matters.

However, unjustifiable hardship and the Premises Standards, may only be conclusively determined by a Federal Court or the Federal Magistrates Court. Decisions made by a certifying authority in consultation with suitably qualified persons to address the matters in section 4.1 of the Premises Standards would play an important and meaningful role in guiding a court about the existence of unjustifiable hardship in the event of a complaint.

Note: Please visit the following link for any further information:
(http://www.humanrights.gov.au/disability_rights/standards/PSguide.html)

7.2 How are unjustifiable hardship cases assessed in NSW?

7.2.1 Access Advisory Committee

Compliance with the Premises Standards is assessed by a certifying authority when considering an application for a construction certificate (CC), complying development certificate (CDC) or occupation certificate (OC). The circumstances of the unjustifiable hardship may mean, however, that certifying authorities may not have the necessary expertise to assess an applicant's grounds for unjustifiable hardship.

The Building Professionals Board has set up an Access Advisory Committee (the Committee) under the Building Professionals Act 2005, with expertise in disability access, quantity surveying, building surveying, structural engineering and heritage conservation. The Committee makes recommendations on applications for exemption from requirements of the Premises Standards on the grounds of unjustifiable hardship.

Applications for an exemption from compliance with a requirement of the Premises Standards can only be made by the relevant certifying authority (Council or an accredited certifier) engaged in relation to the development.

Applicants must provide the Committee with reasons why it would impose unjustifiable hardship upon a person to comply with the requirements of the Access Code in the Premises Standards. They must demonstrate that compliance with the deemed-to-satisfy provisions of the Access Code, or compliance with a performance requirement, or a combination of both, would impose unjustifiable hardship.

The Committee will make a recommendation as to whether one or more requirements of the Premises Standards cannot be complied with on the basis of unjustifiable hardship.

The certifying authority must then consider this recommendation before issuing a CC or CDC, or prior to the issue of an OC depending upon the circumstances of the unjustifiable hardship.

If the Committee forms the view that compliance with a requirement of the Premises Standards will impose unjustifiable hardship on a person, it will also consider how to achieve compliance with that requirement to the maximum extent not involving unjustifiable hardship. This means that other measures, which may not necessarily involve building upgrade works, may need to be employed to satisfy the requirements of the Premises Standards.

7.2.2 Certifying Authority

It is not mandatory for a certifying authority to determine an application for a certificate in accordance with the Committee's recommendation on unjustifiable hardship – the certifying authority can set the recommendation aside after considering all matters. However, the certifying authority is to notify the Committee if it sets the recommendation aside.

If this does occur, and the certifying authority approves a CC for a proposal that involves non-compliance with the BCA in relation to new building work, approval can only be granted with the concurrence of the Director General of the NSW Planning and Infrastructure (as required under clause 187 of the EP&A Regulation).

Similarly, the concurrence of the Director General is required under clause 187 before a CC is granted when the certifying authority accepts a recommendation of the Committee that a person is not required to comply with one or more requirements of the Premises Standards, and the proposal involves non-compliance with the BCA.

7.2.3 When Applications can be Made

Applications can be made to the Committee before the issue of a CC or CDC, or at any time prior to the issue of an occupation certificate.

Applications can also be lodged to modify a Committee recommendation prior to the issue of a certificate. Modifications may only be sought where the design of the building has altered or the circumstances of the building have changed since the original Committee recommendation.

7.2.4 The Application Process

The certifying authority may apply to the Access Advisory Committee for a recommendation but the application must clearly identify the person who will suffer unjustifiable hardship by complying with the Premises Standards.

Applications may only be submitted electronically, via the downloadable form on the Premises Standards page of the Board's website.

The application must:

- address the relevant matters in Part 4.1(3) and (4) of the Premises Standards
- demonstrate that the person seeking an exemption has sought to comply with the requirements of the Premises Standards by complying with the deemed-to-satisfy provisions of the Access Code, by complying with the performance requirements or by using a combination of these
- demonstrate how the development will achieve compliance with the Premises Standards to the maximum extent possible
- include any supporting reports from relevant suitably qualified persons.

When addressing the matters in Part 4.1(3) and (4), the applicant must identify each requirement of the Access Code in the Premises Standards that cannot be complied with and provide detailed reasons for the non-compliance.

Applicants should review all relevant information on the Board's website, including related links, when developing their application. Informal advice is available from the Board's hotline **1300 001 619**.

7.2.5 How the Committee considers Applications

Applications, once confirmed as complete, are considered at the Committee's next available meeting after the application is received.

Seven core members will sit at any one meeting – the Chair, Deputy Chair, a Board member, two access consultants, a quantity surveyor, and a building industry representative. Specialist expertise in building surveying, engineering, heritage conservation and financial accounting will be brought in when needed.

The Committee will provide written advice to the applicant, advising of its recommendation and the reasons for this opinion. The advice will recommend any works or measures required to ensure compliance with the Premises Standards to the maximum extent possible in the circumstances.

Can appeals be made against the Access Advisory Committee's decision?

The Committee's decision is only a recommendation that will guide the final decision of a certifying authority. This means appeals against a decision are not possible.

Applicants can apply for a modification of the Committee's recommendation if circumstances have altered, the design of the building has changed or if new information comes to light (for example, if complying with a performance requirement of the Access Code in the Premises Standards is no longer possible).

Applicants should use the same application form and follow the same process to apply for a modification. The Committee will consider the application in the same way, against the same considerations detailed in Part 4.1(3) and (4) of the Premises Standards.

Reference should also be made to the Premises Standards, in particular Part 4.1, for circumstances to take into account in determining whether compliance with the requirement of the Premises Standards would involve unjustifiable hardship.

8.0 OTHER RELEVANT INFORMATION

8.1 Relevant Australian Standards

There is a large number of Australian Standards that are relevant to access for people with disabilities. They are constantly under review and developers should take care to always refer to the latest version.

The following list of Standards is offered as a guide and should not be considered as necessarily complete and their provisions are not necessarily regarded by Council as binding or appropriate

AS

1088	Hearing aids
1088.4	Part 4: Magnetic field strength in audio-frequency induction loops for hearing aid purposes
1172	Water closet pans
1371	Toilet seats of moulded plastics
1428	Design for access and mobility
1428.1	Part 1; General requirements for access – buildings
1428.1	Supplement 1: General requirements for access – Buildings – Commentary
1428.2	Part 2: Enhanced and additional requirements – Buildings and facilities
1428.3	Part 3: Requirements for children and adolescents with physical disabilities
1428.4	Part 4: Tactile ground surface indicators for the orientation of people with vision impairment
1680	Interior lighting
1680.1	Part 1: General principles and recommendations
1680.2	Part 2: Recommendations for specific tasks and interiors
1735	SAA Lift Code
1735.7	Part 7: Stairway lifts
1735.8	Part 8: Inclined lifts
1735.12	Part 12: Facilities for persons with disabilities
1735.13	Part 13: Lifts for persons with limited mobility – Manually powered
1735.14	Part 14: Lifts for people with limited mobility – Restricted use – Low rise platforms
1735.15	Part 15: Lifts for people with limited mobility – Restricted use – Non-automatically controlled
1744	Forms of letters and numerals for road signs
1924	Playground equipment for parks, schools and domestic use
1924.2	Part 2: Design and construction – Safety aspects
2107	Acoustics – Recommended design sound levels and reverberation times for building

	interiors
2220	Emergency warning and inter-communication systems in buildings
2220.1	Part 1: Equipment design and manufacture
2220.2	Part 2: System design, installation and commissioning
2700	Colour standards for general purposes
2890	Off-street parking
2890.1	Part 1: Car parking facilities
2890.5	Part 5: On-street parking
2999	Alarm systems for the elderly and other persons at risk
3979	Hydrotherapy pools
4299	Adaptable housing

8.2 Further Reading

- Disability Discrimination Act 1992
- Anti-Discrimination Act 1977
- A User Guide to the Disability Discrimination Act, Villamanta Publishing Service
- Right of Access – a Guide to Developing Action Plans and Improving Access for People with Disabilities, Villamanta Publishing Service 1997
- Advisory Notes on Access to Premises, Human Rights and Equal Opportunity Commission, March 1998
- Access Codes as contained within Building Code of Australia
- Australian Human Rights Commission’s Guidelines
- Disability (Access to premises – Building) Standards 2010

8.3 Organisations that can Assist

Human Rights and Equal Opportunity Commission GPO Box 5218 SYDNEY NSW 1042 Phone: 9284 9600 Facsimile: 9284 9611	Anti-Discrimination Board Level 4, 181 Lawson Street REDFERN NSW 2016 Phone: 9318 5400 Facsimile: 9310 2235
Standards Australia 1 The Crescent HOMEBUSH NSW 2140 Phone: 9746 4700 Facsimile: 9746 8450	Australian Building Codes Board GPO Box 9839 CANBERRA ACT 2601 Phone: 1300 134 631 Facsimile: 6213 7287

Australian Attorneys General Department

1 The Crescent

HOMEBUSH NSW 2140

Phone: 6141 6666

Email: enquiries@ag.gov.au

The Building Professionals Board

PO Box 3720

PARRAMATTA NSW 2124

Phone: 9895 5950

Facsimile: 9895 5949



City of Ryde
Civic Centre
1 Devlin Street
Ryde NSW 2112

www.ryde.nsw.gov.au

City of Ryde Development Control Plan 2014

Part: 9.3 Parking Controls

Translation

ENGLISH

If you do not understand this document please come to Ryde Civic Centre, 1 Devlin Street, Ryde Monday to Friday 8.30am to 4.30pm or telephone the Telephone and Interpreting Service on 131 450 and ask an interpreter to contact the City of Ryde for you on 9952 8222.

ARABIC

إننا نعتذر عليك فهم محتويات هذه الوثيقة، نرجو للحضور إلى مركز بلدية ريد Ryde Civic Centre على العنوان: 1 Devlin Street, Ryde 1 من الاثنين إلى الجمعة بين الساعة 8.30 صباحاً والساعة 4.30 بعد الظهر أو الاتصال بمكتب خدمات الترجمة على الرقم 131 450 لكي تطلب من أحد المترجمين الاتصال بمجلس مدينة ريد، على الرقم 9952 8222، نيابة عنك.

ARMENIAN

Եթէ այս գրութիւնը չէք հասկնար, խնդրեմ եկէք՝ Բայր Սիվիլ Սենթըր, 1 Տելվին փողոց, Բայր, (Ryde Civic Centre, 1 Delvin Street, Ryde) Երկուշաբթիէն Ուրբաթ կ.ա. ժամը 8.30 – կ.ե. ժամը 4.30, կամ հեռաձայնեցէք Հեռաձայնի եւ Թարգմանական Սպասարկութեան՝ 131 450, եւ խնդրեցէք որ թարգմանիչ մը Բայր Քաղաքապետարանին հետ կապ հաստատուէ ձեզի համար, հեռաձայնելով՝ 9952 8222 թիվին:

CHINESE

如果您看不懂本文，請在周一至周五上午 8 時 30 分至下午 4 時 30 分前往 Ryde 市政中心詢問 (Ryde Civic Centre, 地址: 1 Devlin Street, Ryde)。你也可以打電話至電話傳譯服務中心，電話號碼是: 131 450。接通後你可以要求一位傳譯員為你打如下電話和 Ryde 市政廳聯繫，電話是: 9952 8222。

FARSI

اگر این مدرک را نمی فهمید لطفاً از 8.30 صبح تا 4.30 بعد از ظهر دوشنبه تا جمعه به مرکز شهرداری راید، Ryde Civic Centre, 1 Devlin Street, Ryde مراجعه کنید یا به سرویس مترجم تلفنی، شماره 131 450 تلفن بزنید و از یک مترجم بخواهید که از طرف شما با شهرداری راید شماره 9952 8222 تلفن بزند.

ITALIAN

Se non capite il presente documento, siete pregati di rivolgervi al Ryde Civic Centre al n. 1 di Devlin Street, Ryde, dalle 8.30 alle 16.30, dal lunedì al venerdì; oppure potete chiamare il Telephone Translating and Interpreting Service al 131 450 e chiedere all'interprete di contattare a vostro nome il Municipio di Ryde presso il 9952 8222.

KOREAN

이 문서가 무슨 의미인지 모르실 경우에는 1 Devlin Street, Ryde 에 있는 Ryde Civic Centre 로 오시거나 (월 – 금, 오전 8:30 – 오후 4:30), 전화 131 450 번으로 전화 통역 서비스에 연락하셔서 통역사에게 여러분 대신 Ryde 시청에 전화 9952 8222 번으로 연락을 부탁드립니다.

Amend. No.	Date approved	Effective date	Subject of amendment
1	10 March 2015	1 April 2015	Clause 2.6 to align with Ryde S94 Development Contributions Plan & Ryde LEP 2014

Table of Contents

CONTENTS

1.0 INTRODUCTION	5
1.1 Objectives of this Part	5
1.2 General Principles	5
1.3 Application	5
2.0 PARKING REQUIRED IN RESPECT OF SPECIFIC USES	6
2.1 General	6
2.2 Residential Land-uses	6
2.3 Non-residential Land Uses	8
2.4 Mixed-use Development	10
2.5 Large Development	10
2.6 Parking Contributions	11
2.7 Bicycle Parking	11
3.0 OTHER REQUIREMENTS	12
3.1 On- Site Loading and Unloading Facilities	12
3.2 Design of Parking Areas	12

THIS PAGE HAS BEEN
INTENTIONALLY LEFT BLANK

1.0 INTRODUCTION

1.1 Objectives of this Part

Objectives

Recognising the varying degrees of availability of public transport within Ryde, the aim of this Part of Ryde DCP is to provide a comprehensive guide for the provision of parking for new development in order:

1. To minimise traffic congestion and ensure adequate traffic safety and management;
2. To ensure an adequate environmental quality of parking areas (including both safety and amenity);
3. To minimise car dependency for commuting and recreational transport use, and to promote alternative means of transport - public transport, bicycling, and walking.
4. To provide adequate car parking for building users and visitors, depending on building use and proximity to public transport.
5. To minimise the visual impact of car parking when viewed from the public domain and adjoining sites.
6. To maximise opportunities for consolidated areas of deep soil planting and landscaping.

1.2 General Principles

- a. In the event of a discrepancy between the parking rates specified in this Part of the Ryde DCP and another Part of the DCP, this Part shall prevail.
- b. Council will take the following factors into account in determining car parking provision for a particular development:
 - i. The size and type of the development and its traffic generation;
 - ii. The availability and accessibility of public parking (particularly if within or close to a shopping centre);
 - iii. Traffic volumes on the street network, including expected future traffic volumes relating to the City's road hierarchy; and
 - iv. Hours of operation and any other specific characteristics of the development proposal.
- c. Council relies upon the following when considering applications:
 - AS 2890.1 Parking facilities - Off-street car parking
 - AS 2890.2 Parking facilities - Off-street commercial vehicle facilities
 - AS 2890.3 Parking facilities - Bicycle parking facilities
 - AS 2890.6 Parking facilities - Off-street parking for people with disabilities

1.3 Application

- a. This part of Ryde DCP applies to all land identified under *Ryde Local Environmental Plan 2014*.
- b. This part of the DCP applies to development that includes one or more of the following:
 - i. New floor space or buildings.
 - ii. Alterations or additions to any existing building, whether or not such additions or alterations involve any change in the purpose for which such buildings are used.
 - iii. Change of use.
- c. The parking rates specified in this Part of Ryde DCP do not apply to the Macquarie Park Corridor which are specified in *Ryde Local Environmental Plan 2014*.

2.0 PARKING REQUIRED IN RESPECT OF SPECIFIC USES

2.1 General

Controls

- a. Where the calculation of the parking required results in a fraction, the parking requirement will be rounded up to the nearest whole number.
- b. Where it is proposed to provide more parking than required, the additional parking floor space will be included in the calculation of floor space for the purposes of Floor Space Ratio calculations in accordance with *Ryde Local Environmental Plan 2014*.
- c. Where a change of use which, under this Part, would require the provision of a greater number of on-site parking spaces than the previous use, the amount of parking required will be the difference between the existing parking for the previous use and the amount of parking required for the proposed use.
- d. All car parking must be provided on-site.
- e. Tandem or stack parking may be carried out for a development if it is considered appropriate to the proposed development or land use/s. Tandem or stack parking will only be permitted where:
 - i. each tandem or stacked parking arrangement is limited to a maximum of two spaces;
 - ii. in residential buildings and commercial/retail developments, the spaces are attached to the same strata title;
 - iii. in residential buildings and serviced apartments, they are used for resident parking only;
 - iv. in commercial or retail development, they are used for staff parking only;
 - v. they are not used for service vehicle parking; and
 - vi. the manoeuvring of stacked vehicles is able to occur wholly within the premises.
- f. The minimum length of a tandem or stacked space is to be 10.8 m.
- g. Up to 10% of the required car spaces may be nominated as “small” car spaces within any development. Small car spaces shall comply with AS 2890.1 2004 (at least 2.3 m wide and 5.0 m long)
- h. A Traffic and Parking Impact Assessment Report will be required by Council, where:
 - i. development is likely to generate significant traffic and / or parking;
 - ii. an activity or land use is not included in Section 2.0 Parking Required In Respect of Specific Uses.

2.2 Residential Land-uses

Controls

Car parking spaces are to be provided on-site in accordance with the following requirements:

Boarding Houses

In accordance with the requirements of State Environmental Planning Policy (Affordable Rental Housing) 2009 and Part 3.6 Boarding Houses under this DCP:

Boarding Houses – accessible area:

- At least 0.2 parking spaces / boarding room (1 space /5 boarding rooms). In terms of dwelling size this equates to:
 - At least 0.2 parking spaces/dwelling containing 1 bedroom
 - At least 0.5 parking spaces / dwelling containing 2 bedrooms
 - At least 1 parking space / dwelling containing 3 or more bedrooms
- Not more than 1 parking space for each person employed in connection with the development.

(Refer section 2.3 of Part 3.6 Boarding Houses under this DCP)

Boarding Houses – not in accessible area:

- At least 0.4 parking spaces / boarding room (2 spaces / 5 boarding rooms). In terms of dwelling size this equates to:
 - 0.5 parking spaces/dwelling containing 1 bedroom
 - 1 parking spaces / dwelling containing 2 bedrooms
 - 1.5 parking spaces / dwelling containing 3 or more bedrooms
- Not more than 1 parking space for each person employed in connection with the development.

(Refer section 2.4 of Part 3.6 Boarding Houses under this DCP)

Note: An “accessible area” is defined in State Environmental Planning Policy (Affordable Rental Housing) 2009 as amended. An accessible area is generally within 800m walking distance of a rail station or ferry wharf serviced by Sydney Ferries or 400m walking distance of a light rail station or bus stop that is serviced by at least one bus / hour Monday to Friday. Reference should be made to the SEPP for definitions of walking distance and the unabridged definition of “accessible area”

Note: Bicycle and motor cycle parking requirements also apply to boarding houses. (Refer section 2.7 under this part.)

Housing for aged and disabled

- Must be provided in accordance with *State Environmental Planning Policy: Housing for Seniors or People with a Disability 2004 (the Seniors Housing SEPP)*.

Note: The following information is provided as a guide. Please note that the Seniors Housing SEPP may be subject to change and differs from the RMS guidelines.

Self contained dwellings

0.5 spaces / bedroom OR

1 space / 5 dwellings if developed in conjunction with a social housing provider

Residential Care Facility

1 visitor space / 10 beds AND

1 space / 2 employees AND

1 space / ambulance

Hostel

1 space / 5 dwellings AND

1 space/2 employees AND

1 space / ambulance

Residential Development - High Density (Residential Flat Buildings)

- 0.6 to 1 space / one bedroom dwelling
- 0.9 to 1.2 spaces / two bedroom dwelling
- 1.4 to 1.6 spaces / three bedroom dwelling
- 1 visitor space / 5 dwellings

Residential Development - Medium Density (Multi Dwelling Housing)

- 1 space / one bedroom or two bedroom dwelling
- 2 spaces / three or more bedroom dwelling
- 1 visitor space / four dwellings

Residential Development - Low Density

- Dwelling houses up to 2 spaces / dwelling
- Dual Occupancy 1 space / dwelling

2.3 Non-residential Land Uses

Note: Gross floor area (GFA) is separately defined within Ryde Local Environment Plan 2014.

Controls

a. Car parking spaces are to be provided on-site in accordance with the following requirements:

Child Care Centres

- 1 space / 8 children AND
- 1 space / 2 employees (see Part 3.2 Child Care Centres in this DCP).

Drive-in Takeaway Food Shops (a subset of Food and Drink Premises)

- Whichever is the greater of:
1 space / 10 m² GFA OR
1 space / 5 seats (internal & external)

Educational Establishment - other than schools

- 1 space / two employees AND
- 1 space / five students

Educational Establishment - Primary and Secondary Schools

- 1 space / two employees AND
- 1 space / ten students over 17 years of age

Entertainment Facility, Places of Public Worship / Assembly, Funeral Chapel and Funeral Home

- Whichever is the greater of:
1 space / 10 seats OR
1 space / 10 m² GFA

Health Consulting Rooms

- 1 space / doctor or dentist AND
- 1 space / 2 employees AND
- 1 patient's space/doctor or dentist

Health Services Facility

- 1 space / doctor likely to be on the premises at any one time; AND
- 1 space / two employees likely to be on duty at any one time; AND
- 1 space / four beds; AND
- 1 visitor space / four beds.

Hotel and Motel Accommodation, and Serviced Apartments

- 1 space / 1.5 units

Industry and Light Industry

- 1.3 – 1.5 spaces / 100 m² GFA

Note: The upper end of the range should be applied to land uses that generate more traffic such as garden supplies and business parks. The parking provision and rate is to be addressed in the Statement of Environmental Effects.

Office and Business Premises

- 1 space / 40 m² GFA

Pub and Registered Club

- 1 space / 5 m² GFA, AND
- 1 space / 10 m² GFA auditorium and games rooms
- See also Hotel Accommodation above

Recreation Facilities (indoor) / Gymnasium

- 1 – 1.5 spaces / 20 m² GFA

Note: Squash Courts are calculated at the rate of 3 spaces / court.

Recreation Facilities (outdoor) / Tennis Courts

- 3 spaces / court

Research Station

- 1 space / 25 m² GFA

Restaurant / Function Centre

- 1 space / 5 m² GFA OR
- 1 space / 25 m² on all land zoned for Business activities

Note: Where the property does not have frontage to a Main or Classified Road and where the hours of operation are restricted to outside normal business hours, this requirement may be reduced at Council's discretion. Council may require a Traffic and Parking Impact Assessment Report

Retail Premises and Industrial Retail Outlet

- 1 space / 25 m² GFA

Service Stations, Vehicle Body Repair Workshop and Vehicle Repair Station

- 6 spaces / work bay (for vehicle servicing facilities) AND
- 1 space / 20 m² GFA for convenience store

Transport Depot

- 1 space / two employees
- 1 space / commercial vehicle

Vehicle sales or hire premises

- 0.75 spaces / 100 m² GFA AND
- 6 spaces / work bay (for vehicle servicing facilities)

Warehouse or Distribution Centre

- 1 space / 300 m² GFA

Other

To establish the parking rate for any development type not specified above, comparisons should be drawn with similar development and outlined in a Traffic and Parking Impact Assessment Report submitted together with the Development Application. Such comparisons should include a minimum of two case studies drawn from the Ryde Local Government Area or adjoining Local Government Areas and be prepared in accordance with the *RMS Guide to Traffic Generating Development*.

Note: In preparing Traffic and Parking Impact Assessment Report the proponent is advised to contact Council.

2.4 Mixed-use Development

- Where a development comprises two or more different land uses, parking provisions will be assessed as the sum of the requirements in s2.0 for each component of the mixed-use development. Calculations shall include an appropriate proportion of any common or administrative areas.
- Where the main usage periods for components of mixed-use development do not coincide, Council may consider a reduction in the required parking. In this case, the parking requirement will be based on whichever of the components generates the greatest parking requirement. The onus will be on the proponent to satisfy Council that the uses will not be operated concurrently.

2.5 Large Development

- To vary the provisions of this Part (particularly required parking) for large scaled development, comparisons should be drawn with similar development and outlined in Traffic and Parking Impact Assessment Report submitted together with the Development Application. Such comparisons should include a minimum of two case studies drawn from the Ryde Local Government Area or adjoining Local Government Areas.

Note: Large scaled development will generally be defined as having a parking provision greater than 100 spaces. In considering large scaled development the proponent is advised to contact Council regarding the preparation of a Traffic and Parking Impact Assessment Report. Where a site is sufficiently large to include a local roads network Council will require the roadways to be designed to allow for two lanes of travel and one parking lane (i.e. the

carriageway is to be approximately 9 metres wide). This requirement will be implemented where it is proposed that waste collection services will be carried out on-site and / or to accommodate on site loading and unloading facilities.

Note: The local roads network may include an on-site laneway or existing local roads.

- b. All large retail and commercial development shall be required to provide parking facilities and secure storage of electric scooters used by people with disabilities. Facilities should be generally in accordance with AS 2890.6.

2.6 Parking Contributions

Council may accept or require the payment of a parking contribution in lieu of the provision of off-street parking.

Note: Council may not levy or accept s94 levies in lieu of parking in relation to dwelling house, dual occupancy and villa development in the R2 zones, given the need for parking provision to meet the needs of future occupants.

2.7 Bicycle Parking

- a. In every new building, where the floor space exceeds 600 m² GFA (except for dwelling houses and multi unit housing) provide bicycle parking equivalent to 10% of the required car spaces or part thereof.

Note: Cycling is approximately 10% of the journey to work. The control provides for minimum quantum of bicycle parking to cater for anticipated increasing demand and additional space to meet current cycling rates.

- b. Bicycle and motor cycle parking is to be provided for boarding house development in accordance with the requirements of State Environmental Planning Policy (Affordable Rental Housing) 2009, and Part 3.6 Boarding Houses under this DCP.

Note: The requirements are at least 1 space for bicycle and 1 space for motorcycle per 5 boarding rooms.

- c. Bicycle Parking should be designed in accordance with *AS 2890.3 Parking facilities - Bicycle Parking Facilities*.
- d. Bicycle parking and access should ensure that potential conflicts with vehicles are minimised.

Note: Minimising conflicts between vehicles and bicycles may include providing separate ramp access for bicycles within car parks and providing safe rideable approaches along road frontages to the bicycle parking area.

- e. Bicycle parking is to be secure and located undercover with easy access from the street and building entries.
- f. Bicycle parking is to be located in accordance with *Safer by Design* principles.

Note: Safety may be addressed by ensuring that Bicycle parking is located to ensure passive surveillance (e.g. highly visible areas such as near building entries) and where adequate lighting is provided.

- g. End of trip facilities accessible to staff (including at least 1 shower and change room) are to be provided in all commercial, industrial and retail developments.
- h. Provide secure bicycle storage in all residential developments where the floor space exceeds 600 m² GFA except for dwelling houses and multi-unit housing.
- i. Provide signage to Council's satisfaction indicating the location of bicycle parking and bicycle facilities, where provided, in all new buildings.

3.0 OTHER REQUIREMENTS

3.1 On- Site Loading and Unloading Facilities

Controls

- a. All developments involving new floor space are required to provide on-site loading and unloading facilities, except:
 - i. Dwelling houses, dual occupancies
 - ii. Residential flat buildings and multi dwelling housing with access from the local road network.
 - iii. Residential flat buildings and multi dwelling housing located on Main or County Roads are required to provide on-site loading and unloading facilities to ensure that vehicles do not stand on the road or footway.
- b. Loading docks shall be located in such a position that vehicles do not stand on any public road, footway, laneway or service road and, that where possible, vehicles entering and leaving the site move in a forward direction.

3.2 Design of Parking Areas

Controls

General

- a. All parking areas shall be designed in accordance with *Australian Standards AS2890.1, AS2890.2 and AS2890.6*
- b. The appearance of car parking and service vehicle entries and areas is to be improved by:
 - i. locating or screening visually from the street
 - ii. setting back or recessing car park entries from the main façade line
 - iii. avoiding black holes in the façade by providing security doors to car park entries
 - iv. where doors are not provided, it is to be ensured that the visible interior of the car park is incorporated into the façade design and material selection and that building services pipes and ducts are concealed.
- c. Provide safe (well lit and free of concealment opportunities) and direct 24 hour access between car parking areas and building entries.
- d. Where practicable car parking and loading access is to avoid areas where active frontage is required (refer Part 4 of this DCP for Active frontage requirements).

Note: This is to reduce conflict with pedestrians and promote pedestrian safety.

Basement parking

- e. Basement parking areas are to be located directly under building footprints to maximize opportunities for deep soil areas unless the structure can be designed to support mature plants and deep root plants.
- f. Along active frontages, basement parking must be located fully below the level of the footpath. Refer Part 4 for locations of active frontage within Urban Centres.
- g. Basement parking should be contained wholly beneath the ground level along public streets. Where this cannot be achieved due to topography, the parking level must protrude no more than 1.2 m above ground level.
- h. Ventilation grills or screening devices of car park openings are to be integrated into the overall façade and landscape design of the development.

At-grade parking

- i. Parking areas must not be located within the front building setbacks including for sites located along Victoria Road, Epping Road and Lane Cove Road. Refer also Part 4 Urban Centres for setbacks.
- j. Parking areas are to be screened from view from the street, public domain and communal open space areas, using site planning and appropriate screen planting or structures.

Construction Standards

- k. All parking areas are to be constructed in accordance with Part 8.1 Construction Activities of this DCP.



City of Ryde
Civic Centre
1 Devlin Street
Ryde NSW 2112

www.ryde.nsw.gov.au

City of Ryde Development Control Plan 2014

Part: 9.4 Installation of Satellite Dishes and MDS - Microwave Antennae

Translation

ENGLISH

If you do not understand this document please come to Ryde Civic Centre, 1 Devlin Street, Ryde Monday to Friday 8.30am to 4.30pm or telephone the Telephone and Interpreting Service on 131 450 and ask an interpreter to contact the City of Ryde for you on 9952 8222.

ARABIC

إننا نعتذر عليك فهم محتويات هذه الوثيقة، نرجو للحضور إلى مركز بلدية رايد Ryde Civic Centre على العنوان: 1 Devlin Street, Ryde من الاثنين إلى الجمعة بين الساعة 8.30 صباحاً والساعة 4.30 بعد الظهر أو الاتصال بمكتب خدمات الترجمة على الرقم 131 450 لكي تطلب من أحد المترجمين الاتصال بمجلس مدينة رايد، على الرقم 9952 8222، نيابة عنك.

ARMENIAN

Եթէ այս գրութիւնը չէք հասկնար, խնդրեմ եկէ՛ք Րայդ Բիւրոյ Սիւվիլ Ենթըր, 1 Տելվին փողոց, Րայդ, (Ryde Civic Centre, 1 Devlin Street, Ryde) Երկուշաբթիէն Ուրբաթ կ.ա. ժամը 8.30 – կ.ե. ժամը 4.30, կամ հեռաձայնեցէ՛ք Հեռաձայնի եւ Թարգմանական Սպասարկութեան՝ 131 450, եւ խնդրեցէ՛ք որ թարգմանիչ մը Րայդ Քաղաքապետարանին հետ կապ հաստատուէ ձեզի համար, հեռաձայնելով՝ 9952 8222 թիվին:

CHINESE

如果您看不懂本文，請在周一至周五上午 8 時 30 分至下午 4 時 30 分前往 Ryde 市政中心詢問 (Ryde Civic Centre, 地址: 1 Devlin Street, Ryde)。你也可以打電話至電話傳譯服務中心，電話號碼是: 131 450。接通後你可以要求一位傳譯員為你打如下電話和 Ryde 市政廳聯繫，電話是: 9952 8222。

FARSI

اگر این مدرک را نمی فهمید لطفاً از 8.30 صبح تا 4.30 بعد از ظهر دوشنبه تا جمعه به مرکز شهرداری رايد، Ryde Civic Centre, 1 Devlin Street, Ryde مراجعه کنید یا به سرویس مترجم تلفنی، شماره 131 450 تلفن بزنید و از یک مترجم بخواهید که از طرف شما با شهرداری رايد، شماره 9952 8222 تلفن بزند.

ITALIAN

Se non capite il presente documento, siete pregati di rivolgervi al Ryde Civic Centre al n. 1 di Devlin Street, Ryde, dalle 8.30 alle 16.30, dal lunedì al venerdì; oppure potete chiamare il Telephone Translating and Interpreting Service al 131 450 e chiedere all'interprete di contattare a vostro nome il Municipio di Ryde presso il 9952 8222.

KOREAN

이 문서가 무슨 의미인지 모르실 경우에는 1 Devlin Street, Ryde 에 있는 Ryde Civic Centre 로 오시거나 (월 – 금, 오전 8:30 – 오후 4:30), 전화 131 450 번으로 전화 통역 서비스에 연락하셔서 통역사에게 여러분 대신 Ryde 시청에 전화 9952 8222 번으로 연락을 부탁하십시오.

Amend. No.	Date approved	Effective date	Subject of amendment

Table of Contents

1.0 INTRODUCTION	5
2.0 PLANNING CONTROLS AND GUIDELINES	6
3.0 INFORMATION TO BE SUBMITTED WITH DEVELOPMENT APPLICATION	7

THIS PAGE HAS BEEN
INTENTIONALLY LEFT BLANK

1.0 INTRODUCTION

The purpose of this Part is to provide policies relating to the installation and location of satellite dishes and multipoint distribution system (MDS) microwave antennae within residential areas. To date the most common use for both has been receiving transmissions of free to air international and fee-based television channels.

Objectives

This Part has two major objectives:

1. To provide a guide for persons who wish to install satellite receiving dishes and Multipoint Distribution System (MDS) microwave antennae in the City of Ryde.
2. To ensure that any satellite receiving dish or MDS Microwave antennae does not detrimentally affect the amenity of an area or intrude upon the streetscape.

2.0 PLANNING CONTROLS AND GUIDELINES

These controls only apply to a satellite dish with a diameter greater than one metre and MDA Antennae with a diameter greater than 600mm.

Objectives

1. It is essential that when approving a development the existing and likely future quality of the residential environment be protected.

Controls

If you are seeking to install a satellite dish with a diameter in excess of 1 metre or a MDS microwave antennae with a diameter in excess of 600 millimetres, it must comply with the following provisions:

- a. Not visible from a common area, public place or street.
- b. Located behind the building line.
- c. Setback from side and rear boundary by at least three (3) metres. All parts must be within property boundaries and must not encroach onto any adjoining property or over any public space including a road.
- d. Located so as not to cast glare or interfere with neighbour's views.
- e. Sympathetic in colour with regards to the background roof or wall material.
- f. Installed in accordance with the manufacture's specifications and the Building Code of Australia.
- g. Not restricting any vehicular or pedestrian access to or from the site or reducing the number of off street vehicle parking spaces on site.
- h. Not requiring any tree to be removed that would otherwise require consent under *Part 9.6 Tree Preservation*.
- i. Not labelled with symbols or wording greater than 300 mm in height.
- j. Heritage Items and Conservation Areas: not to be visible from a common area, public place or street. If it must be fixed to structure it should be attached to a fabric of least significance and fixed in such a way to be reversible without damage to the existing fabric.

3.0 INFORMATION TO BE SUBMITTED WITH DEVELOPMENT APPLICATION

To ensure that the impacts of development proposals are clearly stated and to reduce the potential for misinterpretation of these impacts, the following information is required to be submitted with a development application. This information will enable the application to be assessed without delay.

1. A Statement of Environmental Effects with a minimum four (4) sets of suitably drawn and dimensioned plans showing elevations, height, type, siting and method for installing the satellite dish or MDS microwave antennae.
2. Certification by a suitably qualified person demonstrating the structural adequacy of the installed satellite dish or MDS microwave antennae.



City of Ryde
Civic Centre
1 Devlin Street
Ryde NSW 2112

www.ryde.nsw.gov.au

City of Ryde Development Control Plan 2014

Part: 9.5 Tree Preservation

Translation

ENGLISH

If you do not understand this document please come to Ryde Civic Centre, 1 Devlin Street, Ryde Monday to Friday 8.30am to 4.30pm or telephone the Telephone and Interpreting Service on 131 450 and ask an interpreter to contact the City of Ryde for you on 9952 8222.

ARABIC

إننا نعتذر عليك فهم محتويات هذه الوثيقة، نرجو للحضور إلى مركز بلدية رايد Ryde Civic Centre على العنوان: 1 Devlin Street, Ryde 1 من الاثنين إلى الجمعة بين الساعة 8.30 صباحاً والساعة 4.30 بعد الظهر أو الاتصال بمكتب خدمات الترجمة على الرقم 131 450 لكي تطلب من أحد المترجمين الاتصال بمجلس مدينة رايد، على الرقم 9952 8222، نيابةً عنك.

ARMENIAN

Եթէ այս գրութիւնը չէք հասկնար, խնդրեմ եկէք՝ Բայր Սիվիլ Ենսթրը, 1 Տելվին փողոց, Բայր, (Ryde Civic Centre, 1 Delvin Street, Ryde) Երկուշաբթիէն Ուրբաթ կ.ա. ժամը 8.30 – կ.ե. ժամը 4.30, կամ հեռաձայնեցէք Հեռաձայնի եւ Թարգմանութեան Սպասարկութեան՝ 131 450, եւ խնդրեցէք որ թարգմանիչ մը Բայր Քաղաքապետարանին հետ կապ հաստատուէ ձեզի համար, հեռաձայնելով՝ 9952 8222 թիւին:

CHINESE

如果您看不懂本文，請在周一至周五上午 8 時 30 分至下午 4 時 30 分前往 Ryde 市政中心詢問 (Ryde Civic Centre, 地址: 1 Devlin Street, Ryde)。你也可以打電話至電話傳譯服務中心，電話號碼是: 131 450。接通後你可以要求一位傳譯員為你打如下電話和 Ryde 市政廳聯繫，電話是: 9952 8222。

FARSI

اگر این مدرک را نمی فهمید لطفاً از 8.30 صبح تا 4.30 بعد از ظهر دوشنبه تا جمعه به مرکز شهرداری رايد، Ryde Civic Centre, 1 Devlin Street, Ryde مراجعه کنید یا به سرویس مترجم تلفنی، شماره 131 450 تلفن بزنید و از یک مترجم بخواهید که از طرف شما با شهرداری رايد شماره 9952 8222 تلفن بزند.

ITALIAN

Se non capite il presente documento, siete pregati di rivolgervi al Ryde Civic Centre al n. 1 di Devlin Street, Ryde, dalle 8.30 alle 16.30, dal lunedì al venerdì; oppure potete chiamare il Telephone Translating and Interpreting Service al 131 450 e chiedere all'interprete di contattare a vostro nome il Municipio di Ryde presso il 9952 8222.

KOREAN

이 문서가 무슨 의미인지 모르실 경우에는 1 Devlin Street, Ryde 에 있는 Ryde Civic Centre 로 오시거나 (월 – 금, 오전 8:30 – 오후 4:30), 전화 131 450 번으로 전화 통역 서비스에 연락하셔서 통역사에게 여러분 대신 Ryde 시청에 전화 9952 8222 번으로 연락을 부탁하십시오.

Amend. No.	Date approved	Effective date	Subject of amendment
1	28 June 2016	10 August 2016	<p>Key amendments including:</p> <ul style="list-style-type: none">- Allowing pruning of up to 10% of the canopy of a tree within each calendar year without approval;- Increasing the distance where tree works can be conducted without approval from 3 to 4 metres;- Addition of further exempt species;- Introducing assessment criteria for consideration of Tree Management Applications; and- Insertion of additional provisions relating to the protection of trees during construction.

Table of Contents

1.0	INTRODUCTION	4
1.1	Preservation of the Urban Forest	4
1.2	Objectives of this Part	4
1.3	How to use this Part	4
1.4	Meaning of Words	5
1.5	Application of Australian Standards	6
1.6	Enforcement	6
2.0	EXEMPT WORKS	7
3.0	TREE PERMITS	9
4.0	DEVELOPMENT APPLICATIONS	11
5.0	CONSTRUCTION ACTIVITIES	12

1.0 INTRODUCTION

1.1 Preservation of the Urban Forest

Individually and collectively, trees have environmental, economic and social value. The benefits of trees include amenity, visual quality, enhanced streetscape, native fauna habitat, soil conservation, enhanced microclimatic conditions, solar access control and improved air quality. Collectively all the individual trees form the Urban Forest canopy of the City of Ryde. This Urban Forest is a combination of street trees, park trees (including bushland) and trees on private property.

Effective management of trees as a natural resource and as part of the urban infrastructure of the City of Ryde depends upon the long term retention of existing trees, appropriate tree maintenance, protection of trees on development sites, and in relation to replacement trees, suitable tree location and considered species selection.

1.2 Objectives of this Part

Objectives

The objectives of this part are:

1. To maximise a sustainable Urban Forest canopy across the City of Ryde.
2. To conserve trees of ecological, heritage, aesthetic and cultural significance.
3. To protect and manage individual trees as an important community asset.
4. To establish the procedural framework and requirements governing the pruning, removal and subsequent replacement of trees within the City of Ryde.
5. To ensure all new development considers existing trees on the development site and provides opportunity for the healthy growth of large trees.

1.3 How to use this Part

1. This Part is to be read in conjunction with:
 - The City of Ryde Urban Forest Technical Manual (Technical Manual) and Application Guide (Guide) which provide instructions on:
 - i. requirements for arboriculture and other technical reports;
 - ii. technical arboricultural information;
 - iii. requirements as to the protection of trees on development sites;
 - iv. how to make an application under this Part; and
 - v. dealing with trees on adjoining properties.

Both documents can be viewed at www.ryde.nsw.gov.au

- Clause 5.9 Preservation of Trees or Vegetation of the City of Ryde Local Environment Plan 2014 (LEP 2014).
2. The controls in this Part, to the extent of any inconsistency in relation to trees, take precedence over the controls in other Parts of the City of Ryde Development Control Plan 2014 (DCP 2014).

3. All references to Acts, Regulations, Codes, Australian Standards, Plans, policies, the Technical Manual and the Guide are to those documents as amended from time to time.
4. This Part has 4 sections:
 - Section 1 Introduction
 - Section 2 Exempt Works - Explains which Tree Works do not require a permit or Development Application approval.
 - Section 3 Tree Permits - Explains which Tree Works require a Tree Permit and sets out the controls for these works.
 - Section 4 Development Applications - Explains when a Development Application must be submitted and approved under this Part and sets out the controls for these Development Applications.

1.4 Meaning of Words

1. In this Part:

Crown means the portion of the tree consisting of branches and leaves and any part of the stem from which branches arise.

Deadwood means dead branches within the crown of a tree.

Stem means the part of the tree which supports branches, leaves, flowers and fruit and is also called "the trunk".

Structural Root Zone (SRZ) means the following area:

Diameter of trunk at ground level (mm)	0-150	300	500	1000	1500	2000
SRZ radius from trunk at ground level (mm)	1500	2200	2500	3600	4200	5000

Note: This does not apply to trees that have already been pruned. An advice from a Level 5 Arborist is required to determine where tree roots can be pruned. Please also refer to Figure 1.4.1 below:

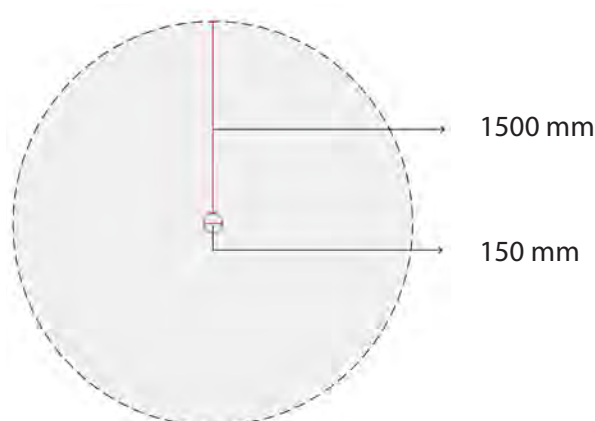


Figure 1.4.1 Structural Root Zone Example

Tree means:

- a. trees as defined in Part 10 Dictionary of DCP 2014 where the tree has a height of 5 metres or a stem circumference of 450mm at a height of 1.4 metres above ground level and
- b. trees described as "major", "substantial" and "significant" in other Parts of DCP 2014.

Tree Protection Zone means a specified area above and below ground calculated in accordance with AS 4970 - 2009 Protection of trees on development sites and is a radial distance from the centre of the stem set aside for the protection of a tree's roots and crown to provide for the viability and stability of the tree. Refer to section 3 of the Technical Manual for TPZ calculation guidelines.

Tree Works means:

- a. Pruning of more than 10 per cent of the crown of a Tree in a 12-month period (except for deadwood in accordance with Section 2 of this Part);
- b. any removal of a Tree; and/or
- c. any works within the Structural Root Zone.

Urban Forest means all trees and vegetation (both naturally occurring and planted) that occur within or near urban areas.

2. Where the meaning of a term is not set out in Section 1.6 (1) above, the term will have the same meaning as set out (in order of precedence) in Part 10 Dictionary, LEP 2014, and the Environmental Planning and Assessment Act 1979 (EP&A Act) and Regulations.

1.5 Application of Australian Standards

All pruning work must be carried out in accordance with Australian Standard 4373 - 2007 Pruning of amenity trees.

The provisions of Australian Standard 4970 – 2009 Protection of trees on development sites must be fully complied with on all development sites upon which trees are located.

The Technical Manual sets out how these Australian Standards must be applied.

1.6 Enforcement

1. The following activities are prohibited: ringbarking, cutting down, topping, lopping, removing, injuring or wilfully destroying any Tree without a Tree Permit or Development Application approval issued by Council in accordance with this Part.

Note: A person will "injure" a tree if they damage the tree including (but not limited to) by:

- poisoning, applying herbicides or other toxic chemicals to a tree, spilling chemicals, washing off or directing water contaminated by chemicals (eg. oil, petroleum, paint, cement or mortar) within the Tree Protection Zone;
 - tearing, breaking or snapping off the stem, branches and roots;
 - damaging the root zone by compaction, excavation, filling and stockpiling materials within the Tree Protection Zone;
 - wounding the stem with machinery (eg lawn mowers), fixing objects (eg. signs) to the stem or branches by nails, staples or wire, using tree climbing spikes in healthy trees to be retained (except for access to an injured tree worker), fastening materials around the stem or branches that circle and restrict the normal vascular function of the stem or branches.
2. Failure to comply with this Part is a breach of section 126 of the EP&A Act for which pecuniary penalties apply. The court dealing with the offence may, in addition to or in substitution for any pecuniary penalty, direct a person to plant new trees and vegetation, maintain those trees and vegetation to mature growth, and provide security for the performance of that obligation.

2.0 EXEMPT WORKS

Introduction

This section explains when approval from Council (either by Tree Permit or by Development Application) is not required to carry out Tree Works including the removal or pruning of a Tree.

This section does not apply to any Tree which:

- is listed on the City of Ryde Significant Tree Register;
- is or is located on a site classified as being part of a vulnerable, threatened or endangered ecological community or provides or has the potential to provide habitat for native fauna or fauna classified as vulnerable or threatened under the Threatened Species Conservation Act 1995 (NSW) or the Environmental Protection and Biodiversity Conservation Act 1999 (Cth);
- is or forms part of a heritage item; or
- is within one of the five heritage conservation areas within the City of Ryde.

Trees classified as being part of a vulnerable, threatened or endangered ecological community within the City of Ryde include the following tree species: *Syncarpia glomulifera* (Turpentine), *Eucalyptus punctata* (Grey Gum), *Eucalyptus paniculata* (Grey Ironbark), *Eucalyptus eugenioides* (Thin-leaved Stringybark), *Eucalyptus saligna* (Sydney Blue Gum), *Eucalyptus pilularis* (Blackbutt), *Allocasuarina torulosa* (Forest Oak) and *Angophora costata* (Sydney Red Gum). To identify if any of these classifications apply to your Tree please view www.ryde.nsw.gov.au/Environment/Bushland+and+Wildlife/Native+Vegetation

To identify if your Tree or land has heritage significance please view: www.ryde.nsw.gov.au/Development/Heritage

Controls

a. The following are exempt works:

- i. Removal of deadwood provided the work is carried out in accordance with Australian Standard 4373 – 2007 Pruning of amenity trees and NSW WorkCover Code of Practice: Amenity Tree Industry 1998.
- ii. Tree Works on a Tree where the stem of the Tree at ground level is within 4 metres of:
 - the outside enclosing wall of a legally constructed dwelling or outbuilding of over 20 square metres;
 - the outside edge of the footings of a carport; and/or
 - the outside edge of the coping of a legally constructed swimming pool.

This exemption does not apply to a Tree on adjoining land. The Tree and the dwelling house or other structure referred to above must both be on the same land for the exemption to apply.

Note: The term “legally constructed” means built in compliance with environmental and planning legislation and instruments in force within the City of Ryde at the time of construction.

- iii. Pruning of less than 10 per cent of the crown of a tree in a 12-month period.

Note: All work must be carried out in accordance with the Australian Standards 4373-2007 “Pruning of Amenity Trees” and in accordance with the current NSW Workcover Code of Practice - Amenity Tree Industry.

- iv. Tree Works on a Tree on land owned or under the care, control and management of Council where the Tree Works are carried out by Council.

- v. Tree Works carried out on a Tree by the State Emergency Service or Rural Fire Service in response to an emergency or severe natural event.
- vi. Tree Works on a Tree on land owned by private schools, the Macquarie University, or the State Government and carried out by the agency or their contractor.
- vii. Tree Works required under the provisions of Section 48 of the Electricity Supply Act 1995.
- viii. Tree Works on any Tree on the following list:

BOTANICAL NAME	COMMON NAME
<i>Acacia saligna</i>	Golden Wreath Wattle
<i>Acer negundo</i>	Box Elder
<i>Ailanthus altissima</i>	Tree of Heaven
<i>Alnus jorulensis</i>	Evergreen Alder
<i>Arecastrum romanzoffianum</i> (syn. <i>Syagrus romanzoffianum</i>)	Cocos Palm
<i>Bambusa</i> spp.	Rhizomatous Bamboo
<i>Celtis sinensis</i>	Hackberry
<i>Cinnamomum camphora</i>	Camphor Laurel
<i>Cotoneaster</i> sp.	Cotoneaster
<i>Erythrina crista-galli</i>	Cockscomb Coral Tree
<i>Erythrina x sykesii</i>	Indian Coral Tree
<i>Ficus benjamina</i>	Weeping Fig
<i>Ficus elastica</i>	Rubber tree
<i>Lagunaria patersonii</i>	Norfolk Island Hibiscus
<i>Ligustrum lucidum</i>	Broad leaf Privet
<i>Ligustrum sinense</i>	Narrow leaf Privet
<i>Nerium oleander</i>	Oleander
<i>Olea europaea africana</i>	African Olive
<i>Populus</i> spp.	Poplars
<i>Robinia pseudoacacia</i>	Golden Robinia or Golden Locust
<i>Salix</i> spp.	Willows
<i>Schefflera actinophylla</i>	Umbrella tree
<i>Tamarix aphylla</i>	Athel tree
<i>Toxicodendron</i> spp.	Rhus tree
All edible fruit and nut trees except <i>Acmena</i> spp. (Lilly Pilly), <i>Syzygium</i> spp. (Lilly Pilly), <i>Elaeocarpus</i> spp. (Blueberry Ash) or <i>Macadamia</i> spp. (Macadamia Tree).	

3.0 TREE PERMITS

Introduction

This section explains when a Tree Permit is required to carry out Tree Works. Trees on private land are critical to the Urban Forest within the City of Ryde and accordingly Council wishes to preserve and protect these trees.

If you are applying for a Complying Development Certificate under State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 you need to obtain a Tree Permit to carry out any Tree Works to a Tree on your land.

If a Development Application has been approved for the removal of a Tree, a Tree Permit is not required for that Tree.

Controls

- a. A Tree Permit must be obtained before any Tree Works are carried out on a Tree other than works requiring a Development Application under Section 4 of this Part. An arboricultural report, and other reports and information may be required to be submitted as part of the Tree Permit assessment process. Requirements for arboricultural reports are set out in section 4 of the Technical Manual.
- b. A Tree Permit must be obtained for any pruning:
 - i. of the crown of a Tree, (including deadwood) and / or
 - ii. pruning or removal of roots (greater than 40mm in diameter) from a Tree inside its Tree Protection Zone that is or forms part of a heritage item or is within one of the five heritage conservation areas within the City of Ryde.
- c. All Tree Works must be carried out in accordance with the NSW Work Cover Code of Practice: Amenity Tree Industry 1998 and, in relation to pruning, Section 5 of the Urban Forest Technical Manual.
- d. Trees removed as a consequence of approval by a Tree Permit must be replaced, in accordance with Section 6 of the Urban Forest Technical Manual, to effectively maintain the Urban Forest canopy.

Note: If a Tree is considered to be:

- dead;
- dying; or
- posing an imminent risk to human life or property,

a Tree Permit Application is required to be submitted to Council for the removal of that Tree. If Council is satisfied that the tree is dead, dying or posing an imminent risk to human life or property, it will issue a letter confirming that the Tree is exempt from the requirement for a Tree Permit and Tree Works may be undertaken.

Note: If you want to remove a Tree which is or forms part of a heritage item or is within one of the five heritage conservation areas within the City of Ryde you must also apply for an exemption from lodging a Development Application in accordance with Clause 5.10.3 When Consent Not Required of the Ryde LEP 2014. Details are available on City of Ryde website:

(<http://www.ryde.nsw.gov.au/files/assets/public/forms-and-documents/heritage-exemption-form.pdf>)

- e. The applicant must outline the justification for conducting the tree works with regard to the following assessment criteria:
 - i. The tree's species, age, health, vigour, structural condition, stability, and growth habit and surrounding environment
 - ii. Existing and potential habitat value of the tree or section of the tree being considered for pruning

Note: Trees with hollows or other potential habitat may need to be assessed by an ecologist or wildlife specialist.

- iii. The tree's ecological value, including whether the tree is located within a threatened ecological community
- iv. Risk of spreading disease from the tree to other trees
- v. Potential structural damage to property and/or risk to human life
- vi. The likely effect of the proposed tree works (e.g. root pruning) on the stability of the tree
- vii. The tree's amenity value including visual amenity and canopy coverage

Note: The following are not considered valid reasons for removing or pruning a tree:

- To improve solar access or views
- Impact to minor structures
- To reduce leaf, fruit, resin, or bird droppings into gutters, downpipes, and pools
- To construct a fence
- Damage to buildings or structures which have not been built in accordance with the relevant planning controls and legislation in force at the time of construction
- Damage to buildings or structures where alternative tree sensitive construction measures could be undertaken
- Root damage to a water, drainage, or sewer system that is old (e.g. terracotta pipes) or in a poor condition
- Bushfire Hazard control works not undertaken by the NSW Rural Fire Service (in the instance of an emergency)

4.0 DEVELOPMENT APPLICATIONS

Introduction

The City of Ryde contains a number of areas with heritage significance. On land within these areas, Development Application approval must be obtained before carrying out Tree Works on any Tree regardless of whether any other development is proposed for that land. This section explains when Development Application approval under this Part must be obtained.

Requirements relating to Trees on development sites are set out in section 2 of the Technical Manual.

Controls

- a. Development Application approval must be obtained before any removal of a Tree if either the Tree or the site upon which the Tree is located:
 - i. is or forms part of a heritage item.
 - ii. is within one of the five heritage conservation areas within the City of Ryde.

Note: Heritage items are identified in Schedule 5 of LEP 2014 and are shown on the Heritage Map www.ryde.nsw.gov.au/Development/Heritage

- b. If a Tree forms part of a heritage item and/or is within a conservation area and is considered to be:
 - i. dead;
 - ii. dying; or
 - iii. posing an imminent risk to human life or property,

Note: An application for exemption from lodging a Development Application may be submitted in accordance with Clause 5.10.3 When Consent Not Required of the Ryde LEP 2014. Details are available on City of Ryde Website:

(<http://www.ryde.nsw.gov.au/files/assets/public/forms-and-documents/heritage-exemption-form.pdf>)

- c. Trees removed as a consequence of Development Application approval must be replaced, in accordance with Section 6 of the Urban Forest Technical Manual, to effectively maintain the Urban Forest canopy.

5.0 CONSTRUCTION ACTIVITIES

Introduction

This section details the preservation and protection measures that must be undertaken to ensure that trees are protected against damage during construction upon obtaining development approval.

Controls

- a. All reasonable efforts are to be taken to protect trees from damage during construction. Such measures should include:
 - i. clearly marking trees to remain;
 - ii. avoiding compaction of ground around these trees (generally caused by vehicles driving through these areas); and
 - iii. avoiding stockpiling of material within the dripline of these trees.
- b. Tree protection zones are to be fenced off to ensure that they are not disturbed and to prevent vehicles, building materials, and refuse being placed in those locations.
- c. Fences for tree protection zones are to be erected prior to any demolition or construction work being undertaken. Areas on the building site that are affected by tree roots on an adjoining private or public property should be similarly fenced off.
- d. Trees that are to remain on the site are to be protected against damage during construction. All mature trees to remain shall be clearly marked and a 1.8-metre high chainwire fence attached to 50 mm steel posts erected around their dripline or a minimum of 4 metres from the trunk where a structure is to be constructed under the canopy. A qualified arborist shall inspect the tree protection measures and issue a Compliance Certificate to indicate that if maintained, the tree protection measures will provide sufficient protection during normal construction activities.
- e. Installation of Services:

Trenches for services shall be located outside the dripline of all trees that must be retained on the property and all trees on adjoining public and private lands. If this is not possible, the services, including stormwater pipelines, shall be hand dug under the trees roots. At any time where a pipe is being laid within the dripline of a tree that is to be retained, or the dripline of a tree on an adjoining property, a qualified arborist must be on-site to oversee the operation.
- f. Cutting of Roots:

All roots in excess of 25 mm that shall be severed, cleanly cut (not with a backhoe bucket), be kept moist at all times, and not be left exposed to the air.

THIS PAGE HAS BEEN
INTENTIONALLY LEFT BLANK



City of Ryde
Civic Centre
1 Devlin Street
Ryde NSW 2112

www.ryde.nsw.gov.au



Tree Management Technical Manual

A tool to assist the Ryde community to understand the requirements for the protection of trees within the City of Ryde.



 City of Ryde

Lifestyle and opportunity
@ your doorstep

ADOPTED 21 August 2012 (Updated 10 August 2016)




Copyright City of Ryde 2012.

The City of Ryde is pleased to allow this material to be reproduced in whole or in part provided the meaning is unchanged and the City of Ryde is acknowledged as the author.

DOCUMENT CONTROL

ISSUE NAME	ISSUE DATE	PURPOSE
DRAFT 9	20 February 2012	Council Report
FOR PUBLIC EXHIBITION	8 March 2012	For Public Exhibition
FOR ADOPTION	15 June 2012	For Adoption
ADOPTED	21 August 2012	Adopted by Council, 21 August 2012
ADOPTED	30 September 2014	Updated - Replaced wording: " Development Control Plan 2010 Part 9.6 Tree Preservation " to " Development Control Plan 2014 Part 9.5 Tree Preservation "
	10 August 2016	Updated - Replaced wording " Urban Forest Technical Manual " to " Tree Management Technical Manual "; Added 5 new species to tree exemption list



Tree Management Technical Manual

Contents

1.	Introduction.....	5
2.	Trees on development sites	7
3.	Tree Protection Zones	13
4.	Arborists	17
5.	Pruning	27
6.	Replacement planting	31
7.	References	39
8.	Glossary	40



This page has been intentionally left blank



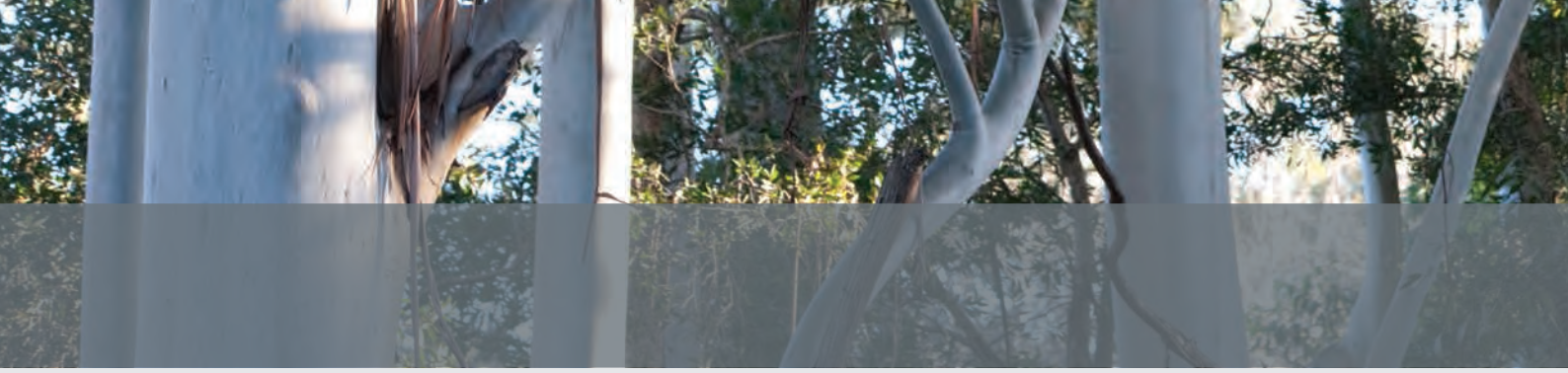
Tree Management Technical Manual

1. Introduction

Individually and collectively, trees have environmental, economic and social benefits. These benefits include amenity, visual quality, enhanced streetscape, native fauna habitat, soil conservation, enhanced microclimatic conditions, solar access control and improved air quality. Collectively, all the individual trees form the Urban Forest canopy of the City of Ryde. This Urban Forest is a combination of street trees, park trees (including bushland) and trees on private property.

This Technical Manual is a tool to assist the community to understand the requirements of the City of Ryde Development Control Plan 2014 Part 9.5 (Tree Preservation). It contains:

- Details of the technical requirements for the assessment and protection of trees on development sites
- Guidance on how to calculate the DBH and TPZ of a tree
- Qualification and reporting specifications for arborists to support submissions to the City of Ryde
- Qualification requirements and standards applicable to persons carrying out work on trees
- Details of pruning requirements and
- Guidance and specifications in relation to replacement tree planting.



This page has been intentionally left blank



Tree Management Technical Manual

2. Trees on development sites

2.1 Introduction

This section applies to all development sites upon which trees are located. It applies to Development Applications under all Parts of Development Control Plan 2014 (DCP 2014) and not only to Development Applications under Part 9.5 (Tree Preservation).

The protection of trees on development sites must be planned and managed. Developments should be designed to avoid or minimise potential conflict between trees and proposed structures. The future growth of trees (both above and below ground) must be considered when proposing to construct a structure close to a tree.

The provisions of Australian Standard 4970 – 2009 *Protection of trees on development sites* and the provisions set out in this Technical Manual shall be complied with in all development within the City of Ryde.

All Development Applications relating to land upon which trees are located shall:

- Include a determination of the retention value of all trees on the land
- Design for the retention of the trees categorised as having high or medium retention values
- Specify construction techniques which avoid or minimise the adverse impact of the development on trees to be retained
- Include details of the species and location of proposed replacement planting.

2.2 Determining tree retention values

Tree retention values shall be used to guide site analysis, site planning and development design. The retention value of a tree is an estimation of the overall significance of the tree in the landscape. Because this estimation of retention values is subjective, the retention value of each tree on a site shall be calculated using a consistent qualitative method using appropriate industry methods, eg SULE, Tree AZ, STARS or SRIV.

An arborist shall determine the retention value of a tree if any development is proposed within the Tree Protection Zone of that tree. This includes:

- trees on land upon which development is proposed
- trees on adjoining land
- street trees.

Refer to Section 3 for instructions on how to calculate a Tree Protection Zone. Refer to Section 4 for qualification requirements for arborists.

The retention value of each tree shall be calculated in accordance with the following three step process:

Step 1: Assess the sustainability of the tree in its location. This is determined by considering the vitality, structural condition, age/longevity of the tree and suitability of the tree to the site.



Step 2: Assess the landscape significance of the tree. This is calculated by considering the amenity, heritage and environmental value of each tree.

Step 3: Consider sustainability and landscape significance together to determine the retention value.

Trees shall be categorised as having a high, medium, low or very low retention value. The City of Ryde considers trees with a high retention value as a priority for retention on a site and trees with a medium retention value should be considered for retention. Both must be considered as constraints on development. Trees given a low or very low retention value can usually be removed and are therefore not considered to be a constraint on development.

2.3 Design for the retention of trees

All developments should be designed to enable the preservation and the long term ongoing viability of trees categorised as having a high or medium retention value. Alternative design options shall be considered prior to recommending tree removal including (but not limited to) the following:

- altering the building footprint ;
- altering the development layout; and/or
- altering hard surface design and the extent of hard surfacing, and using permeable materials.

2.4 Tree sensitive construction techniques

Construction techniques which avoid or minimise the adverse impact of the development on trees should be used in all developments within the City of Ryde. These include (but are not limited to):

- Pier and beam footings;
- Localised pier footings;
- Suspended slabs;
- Cantilevered building sections;
- Screw piles; and
- Contiguous piling.

2.5 Replacement planting

If trees on the development site cannot be retained, the City of Ryde shall require replacement trees to be planted. Section 6 below applies to all replacement planting.

2.6 Tree protection measures

Tree protection on all development sites within the City of Ryde must comply with Australian Standard 4970 – 2009 *Protection of trees on development sites*. The Tree Protection Zone shall be calculated in accordance with section 3 and not be less than that area. All tree protection measures must be in place prior to the commencement of construction works (including demolition, excavation or earthworks) and before any machinery or materials are taken onto the site.



Tree Management Technical Manual

All tree protection measures must be maintained in good condition during the construction works and kept in place until the completion of works or as otherwise advised by the Project Arborist. All tree protection measures shall then be removed.

Details of requirements relating to Project Arborists are set out in section 4.

The following tree protection measures are mandatory on all development sites within the City:

1. Each Tree Protection Zone shall:
 - a. be enclosed by a 1.8m high fully supported chainmesh protective fencing. The fencing shall be secure and fastened to prevent movement. The fencing shall have a lockable opening for access. Roots greater than 40mm in diameter shall not be pruned, damaged or destroyed during the installation or maintenance of the fencing. The fencing shall not be moved, altered or removed without the approval of the Project Arborist;
 - b. have a minimum of two signs that include the words "Tree Protection Zone – Keep Out". Each sign shall be a minimum size of 600mm x 500mm and the name and contact details of the Project Arborist. Signs shall be attached facing outwards in prominent positions at 10 metre intervals or closer where the fence changes direction. The signs shall be visible within the site;
 - c. be kept free of weeds and, except where the existing surface is grass, grass. Weeds shall be removed by hand; and
 - d. unless the existing surface is grass, have mulch installed and maintained to a depth of 75mm.
2. Where the Project Arborist determines that tree protection fencing cannot be installed, the tree protection fencing needs to be removed temporarily, access within or through the Tree Protection Zone is necessary or where work will be carried out within the Tree Protection Zone (as approved and supervised by the Project Arborist):
 - a. the stem and branches of trees to be retained shall be protected, as follows:
 - two layers of carpet underlay (or other padding approved by the Project Arborist) shall be installed around the stem and branches. Stem protection shall cover the stem from ground level; and
 - hardwood or treated pine timbers (100mm x 50mm) the same length as the stem or branch shall be positioned over the padding and next to each other around the stem or branch, secured together with galvanised wire or strapping. Boards shall not be nailed or screwed into the stem or branch. No part of the protection shall be secured to the tree.
 - b. The ground surface within the Tree Protection Zone shall be protected by placing geotextile fabric on the ground surface, covering this with a layer of mulch to a depth of 75mm and then placing boarding (scaffolding board, plywood sheeting or similar material) on top. The geotextile fabric and mulch shall be kept clear of tree stems by at least 50mm.



3. The following activities shall not be carried out within any Tree Protection Zone:
 - a. disposal of chemicals and liquids (including concrete and mortar slurry, solvents, paint, fuel or oil);
 - b. stockpiling, storage or mixing of materials;
 - c. refuelling, parking, storing, washing and repairing tools, equipment, machinery and vehicles;
 - d. disposal of building materials and waste;
4. The following activities shall not be carried out within any Tree Protection Zone unless under the supervision of the Project Arborist:
 - a. increasing or decreasing soil levels (including cut and fill);
 - b. soil cultivation, excavation or trenching;
 - c. placing offices or sheds;
 - d. erection of scaffolding or hoardings; and/or
 - e. any other act that may adversely affect the vitality or structural condition of the tree.
5. All work undertaken within or above a Tree Protection Zone shall be supervised by the Project Arborist.
6. Excavation within the Tree Protection Zone of any tree to be retained shall:
 - a. be undertaken using non-destructive methods (eg. an Airspade or by hand) to ensure no roots greater than 40mm in diameter are damaged, pruned or removed. All care shall be taken to preserve and avoid damaging roots;
 - b. not occur within the Structural Root Zone.
7. The City of Ryde shall only give approval for minor pruning works. All pruning works shall be specified by the Project Arborist. All pruning shall be carried out in accordance with section 5 and by an arborist qualified in accordance with section 4.
8. Written approval from the City of Ryde shall be obtained prior to removing or pruning any street tree. All street trees not approved for removal shall be protected in accordance with the tree protection measures set out above.

The City of Ryde may include additional tree protection requirements as conditions of Development Application approval.

2.7 Arboricultural reports

If any part of the proposed development will encroach into the Tree Protection Zone of any Tree on the site, on adjoining land or any street tree, the City of Ryde may require an arboricultural report to be submitted as part of the Development Application process. The City of Ryde Planning and Environment team shall specify the type of arboricultural report required and any issues they wish to be addressed in the report. The requirements for arboricultural reports are set out in section 4.



Tree Management Technical Manual

Effects of development on Trees

All parts of a tree may be damaged by development, as follows:

1. Crown damage: Leaf area can be lost through pruning or from mechanical damage caused by construction machinery. Poor pruning techniques can cause wounds that are susceptible to infection by wood decay organisms. Damage to foliage reduces the level of photosynthesis, production of sugars, and consequently the tree's ability to withstand stress and respond to wounds.
2. Trunk damage: Mechanical damage from construction machinery causes wounds which lead to decay. Damage may also interfere with the transport of water, sugar and nutrients throughout the tree reducing the tree's ability to function normally.
3. Root damage: The roots of a tree can be 4 to 7 times larger than the crown area and most roots are found in the top of the soil. Roots can be damaged or severed, the soil compacted, root space lost, soil levels changed (eg. by stripping the soil surface, excavation and cut and fill), soil hydrology altered and surfaces sealed. Damage to roots may lead to a loss of tree stability, reduction in water and nutrient uptake adversely affecting tree vitality, and decay as a result of wounding.

Trees take years to grow but can be injured or killed in a very short time. **It is usually not possible to repair trees stressed or injured through construction damage.** The ability of all trees to tolerate construction impacts depends on a number of factors:

1. Tree age, health and vigour. Healthy, vigorous trees are better able than non- vigorous trees to tolerate adverse impacts because they have more energy reserves to recover from injury. In general, mature and over-mature trees are less able to tolerate construction impacts and adapt to environmental changes than young or semi-mature trees.
2. Tree species. Some species of tree are more tolerant of site changes than others.
3. The cumulative impact of construction throughout the construction process. Mature trees on a site may have already been affected by past construction activities (eg. excavation, compaction and fill when the original building work was carried out).

Trees may respond to construction impacts in a variety of ways. Common symptoms of tree stress from construction injury are slower growth, smaller leaves and poor foliage colour, thin foliage, wilting, twig and branch dieback, decay at wounds caused by mechanical damage, attack by stress-related pests such as borers and tree death.



This page has been intentionally left blank



Tree Management Technical Manual

3. Tree Protection Zones

3.1 Introduction

The Tree Protection Zone of a tree is a distance from the stem set aside for the protection of a tree's crown and roots to provide for the viability and stability of the tree. It is an estimate of the area required to protect a tree from adverse construction impacts. No construction activity or changes to soil levels should occur within this area. Because a tree's crown and roots do not always grow in a perfect circle around the stem, it is a hypothetical estimation of the area to be protected. The actual location of tree roots can only be determined by carrying out root investigation via excavation by a qualified arborist (refer to section 4).

3.2 When does the Tree Protection Zone need to be calculated?

The Tree Protection Zone of a Tree must be calculated:

- before soil levels are altered (eg. by excavation or fill) close to a Tree to determine if the works are within the Tree Protection Zone. If it is, a Tree Permit must be obtained for the works before they commence.
- before a Development Application is submitted to determine if any development is proposed within the Tree Protection Zone of any:
 - tree on land upon which development is proposed,
 - tree on adjoining land, or
 - street tree.

3.3 Tree Protection

The Tree Protection Zone is a minimum area set aside for protection of a tree. The Tree Protection Zone shall not be less than this area. Section 2 specifies activities that are prohibited within Tree Protection Zones and tree protection measures. These requirements are mandatory for all development within the City. The City of Ryde may specify in the Tree Permit or Development Application approval additional prohibited activities and tree protection measures. All tree protection measures must be installed before any works are commenced (including demolition, excavation and earthworks) and before any machinery or materials are taken on to the site.

3.4 Encroachment into a Tree Protection Zone

Encroachment (eg. excavation, trenching or fill) of the Tree Protection Zone should be avoided however the City of Ryde recognises that this is sometimes unavoidable. Encroachments of less than 10% of the area of the Tree Protection Zone area are generally considered minor and may be compensated for elsewhere and contiguous with the Tree Protection Zone. Such encroachments must be determined by the Project Arborist who should consider the factors listed in clause 3.3.4 of AS 4970-2009 *Protection of trees on development sites*. If the encroachment is outside the Structural Root Zone of the tree, the City of Ryde will generally not require detailed root



investigation to be carried out.

Encroachment into the Tree Protection Zone greater than 10% into the Tree Protection Zone is generally considered to be major. If this, or an encroachment into the Structural Root Zone will occur, advice shall be sought from the Project Arborist who must determine if the tree will remain viable. The area lost to the encroachment must be compensated for elsewhere and contiguous with the Tree Protection Zone. The Project Arborist shall determine whether detailed root investigation is required (refer to section 4 for Project Arborist qualification requirements and responsibilities).

Depending on the site constraints and the tree's tolerance for root loss, the development may need to be changed to satisfy the requirements of **AS 4970-2009 Protection of trees on development sites**. Tree sensitive design and construction options can reduce the impact of encroachment and may be conditioned as part of a Development Application approval or Tree Permit.

3.5 How to calculate a Tree Protection Zone

Figures 3.1 and 3.2 illustrate how to calculate the Tree Protection Zone.

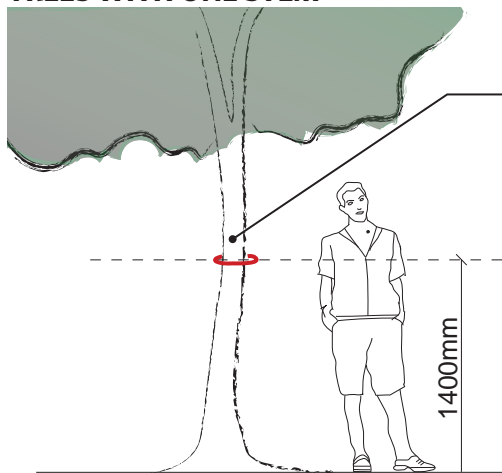
If you are unsure whether you have calculated the Tree Protection Zone correctly, you can use Tree Protection Zone Calculator on the City of Ryde website at www.ryde.nsw.gov.au. If you input your measurements into the calculator it will calculate the Tree Protection Zone for you.

Tree Management Technical Manual

Figure 3.1 Calculating a Tree Protection Zone (TPZ)

STEP 1 Calculating the circumference of a tree stem

TREES WITH ONE STEM



For a single trunk tree, measure the trunk at chest height.

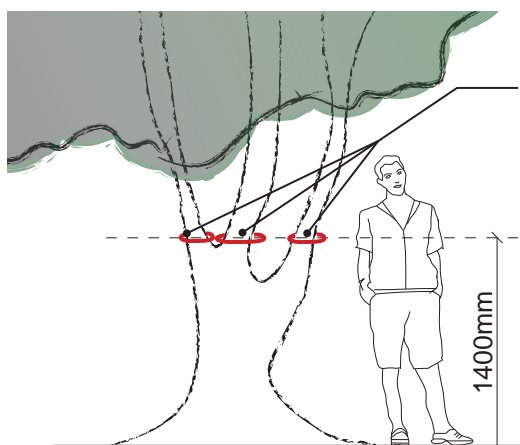
Circumference at chest height

The circumference of a tree stem is the length around it.

The circumference can be calculated by wrapping a flexible tape measure around the stem tightly. The tape should be wrapped around the stem at 1.4 metres above ground level.

TREES WITH MORE THAN ONE STEM

Where a tree has more than one stem, a measurement should be taken on each stem at 1.4 metres above ground level. The formula for calculating the TPZ of trees with multiple stems is complex. Because of this, you should input your measurements into the TPZ Calculator on the City of Ryde website and it will calculate the TPZ for you. The TPZ Calculator can be viewed at www.ryde.nsw.gov.au.



For a multi trunk tree, measure each trunk at chest height

Circumference at chest height

Plan View: Measure the circumference of the tree trunk at 1400mm above ground level (at breast height) with a tape measure

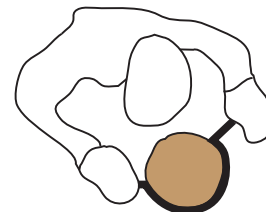




Figure 3.2 Calculating a Tree Protection Zone (TPZ)

STEP 2 - Using the circumference measurement to calculate the TPZ

1. Calculate the DBH (Diameter at Breast Height)

Divide the circumference (as calculated in Step 1) by 3.14

2. Calculate the TPZ

Multiply the DBH figure by 12.
This measurement should be calculated in metres.

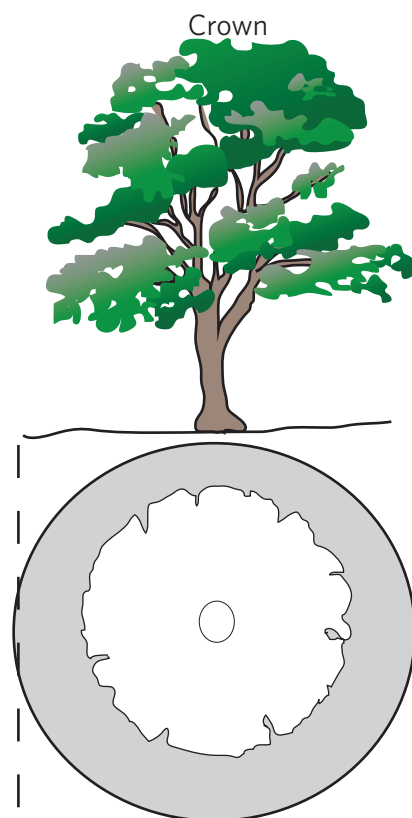
3. Measure the TPZ

The TPZ of a tree is then measured by laying a tape measure on the ground and measuring the TPZ distance radially from

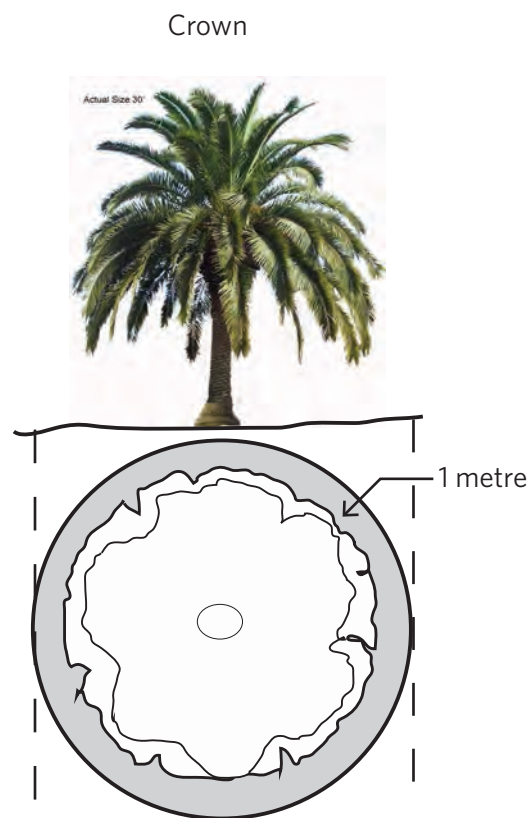
the stem to form a circle around the tree stem. This circle is the TPZ, as shown in the examples below.

NOTE: A TPZ should not be less than 2 metres or more than 15 metres from the tree stem.

NOTE: You do not need to calculate the TPZ of palms, cycads and tree ferns. For these plants, the TPZ should not be less than 1 metre outside the crown.



TPZ for all other trees



TPZ for palms, cycads and tree ferns

Tree Management Technical Manual

4. Arborists

4.1 Qualifications

Tree work is technical and inherently dangerous. Therefore it is important that appropriately qualified people are hired to carry out this work. Table 4.1 sets out the qualification requirements for arborists within the City of Ryde.

Table 4.1 Arborist Qualification Requirements

TASK / ACTIVITY	MINIMUM QUALIFICATIONS
Assess and carry out tree pruning	Australian Qualification Framework level 3 or equivalent in Horticulture (Arboriculture). Registered as a member of either: <ul style="list-style-type: none">▪ Tree Contractors Association Australia▪ Arboriculture Australia
All tree assessment and report preparation including: <ul style="list-style-type: none">▪ Tree health and condition assessment▪ Tree retention value assessment▪ Arboricultural impact assessment▪ Tree protection plan▪ Root mapping▪ Testing with a sonic tomograph▪ Testing with resistance drilling technology	Australian Qualification Framework level 5 or equivalent in Horticulture (Arboriculture).
Project Arborist in relation to all development	Australian Qualification Framework level 5 or equivalent in Horticulture (Arboriculture).



4.2 Suitably qualified arborists

Qualified and industry approved arborists can be found by contacting the following organisations:

- **Tree Contractors Association Australia**
Web: <http://www.tcaa.com.au> Telephone: 1300 660 379
- **Institute for Australian Consulting Arboriculturists**
Web: <http://www.iaca.org.au>
Telephone 1300853 288
- **Arboriculture Australia**
Web: <http://arboriculture.org.au> Telephone: 1300 664 374

Before you employ an arborist you should check that they are qualified to carry out the work (in accordance with Table 4.1) and insured to carry out the type of work proposed.

Note: You must obtain a Tree Permit or Development Application approval before you carry out all non exempt Tree Works within the City of Ryde. If you employ a person or company to carry out Tree Works without prior approval you will be in breach of section 126 of the *Environmental Planning and Assessment Act (1979)* for which pecuniary penalties apply. The City of Ryde may issue penalty infringement notices.

4.3 Arboricultural Reports

Reports prepared by an arborist who does not hold the qualifications specified in Table 4.1 or reports that do not include the minimum information as specified in this Section will not be accepted.

When preparing an arboricultural report, the arborist must not act as an advocate for their client but instead has an overriding duty to assist the City of Ryde in making an impartial decision. All arboricultural reports must provide an objective, balanced assessment of the tree and must reflect the arborist's expert opinion.

The City of Ryde shall consider the level of detail and relevance of the information contained within an arboricultural report. The City of Ryde may:

- require further investigation to be carried out, for example aerial inspection or testing via a sonic tomograph or resistograph.
- disagree with the findings and/or recommendations in the report, and the report may form the basis for refusing an application for tree removal.

Pages 21-25 set out the minimum content requirements for all arboricultural reports. Reports submitted that do not comply with these requirements shall not be accepted.

The City of Ryde may require plans to be submitted in both hard copy and AutoCAD dwg. format.

4.4 Project Arborist

A Project Arborist is an arborist appointed by a property owner or development applicant to monitor the vitality and condition throughout the construction process of all trees being retained on the land, and any trees on adjoining land and street trees where the development encroaches into



Tree Management Technical Manual

the Tree Protection Zone of those trees. Project Arborists must have the qualifications set out in Table 4.1.

Throughout the construction process, the Project Arborist shall be responsible for:

- inspecting and assessing the trees
- supervising any work within the Tree Protection Zone of the trees
- specifying and supervising pruning works
- preparing reports required by the City of Ryde
- specifying and monitoring compliance with tree protection measures
- specifying and certifying remediation works
- providing written statements of compliance (certification) at specific milestones throughout the construction process in accordance with AS 4970 - 2009 *Protection of trees on development sites*.

The property owner or development applicant should employ the Project Arborist at the initial design stage of the development and prior to the commencement of any construction works (including demolition, excavation or earthworks). The same Project Arborist should be retained throughout the construction process to ensure a consistent approach in the protection and preservation of the trees.

The City of Ryde shall include monitoring and reporting requirements as conditions at development application approval and construction certificate stages.

The City of Ryde shall require the Project Arborist to be involved at pre-determined stages of the development process, as listed in Table 4.2. Reports prepared by the Project Arborist during the development process shall include (as a minimum) the following:

- details of the vitality and structural condition of all trees being retained and their growing environment
- details of any works undertaken within the Tree Protection Zone of each tree
- documentary evidence of compliance with tree protection measures (eg. photographs)
- details of proposed remedial works and the time frame for these works to be completed if:
 - the vitality or structural condition of the tree or the growing environment has been adversely affected
 - the tree has been damaged in any way
 - any tree protection measures are non-compliant
- Confirmation (certification) that remedial works specified in previous reports have been completed.
- Any other information reasonably required by the City of Ryde in relation to the health and structural condition of trees being retained. Copies of monitoring documentation may be required.



Table 4.2 Development Stages

STAGE OF THE PROJECT	ROLE OF PROJECT ARBORIST
Pre-construction	<ul style="list-style-type: none"> Tree removal and pruning – the Project Arborist shall: <ul style="list-style-type: none"> mark all trees for pruning, retention, removal or transplanting on site and check these correspond with those shown on the relevant construction plans; specify all pruning works; and certify all tree pruning, removal and transplanting works on the completion of these works. Tree protection – the Project Arborist shall certify that all tree protection measures are installed in compliance with the Tree Protection Plan and specification.
Construction	<p>The Project Arborist shall submit reports to the City of Ryde regularly throughout the construction process. The number and timing of reports required will vary according to the size of site and size and complexity of the development. Report requirements shall be specified by the City of Ryde in the Development Application approval and construction certificate documentation. The following milestones are typical triggers for the preparation of reports:</p> <ul style="list-style-type: none"> Completion of site establishment Installation of services Installation of footings and slabs Erection of scaffolding Works within the Tree Protection Zone of any tree on the site or on adjoining land or any street tree Completion of building works Practical completion of all construction and landscape works.
Post-construction	<p>Completion of the defects liability period. The Project Arborist shall:</p> <ul style="list-style-type: none"> certify that all tree protection measures throughout the construction and landscaping works have complied with all plans, specifications and reports prepared by the Project Arborist and conditions specified in Development Application approval or Tree Permit. If any tree protection measures have not been complied with, provide details of the non-compliance and the impact on the trees. assess the vitality and structural condition and growing environment of all trees on the site, and trees on adjoining land and street trees where any work has occurred within the Tree Protection Zone of those trees, make recommendations for any necessary remedial works and certify that all remedial works have been completed.



Tree Management Technical Manual

Minimum content for Arboricultural Reports

MANDATORY REPORT REQUIREMENTS

All arboricultural reports submitted to the City of Ryde must include the following information:

- The name, business address and telephone number of the arborist and/or business who inspected the tree(s) and prepared the report.
- The qualifications and industry experience of the arborist who prepared the report.
- Disclosure by the arborist of any pecuniary or non pecuniary interests in the site or development.
- The name of the person or business who commissioned the report.
- The address of the site where the tree(s) affected by the proposed development are located.
- The date(s) when the tree inspection was undertaken.
- The purpose of the report.
- Methodology used in the inspection.
- A survey plan of the site, to scale (with scale shown), accurately showing:
 - The lot boundaries
 - The location of the all trees on the site with an individual number given to each tree
 - A brief description of any other vegetation on the site
 - Trees on adjoining properties 5 metres or less from the site boundaries.
 - A table showing, for each tree surveyed:
 - a. the full botanical name (genus and species) and common name
 - b. age class
 - c. estimation of the height
 - d. DBH - trunk diameter at 1.4 metres above ground level
 - e. an estimation of canopy spread to the four cardinal points.
- The arborist's observations and findings:
 - A description of the health, condition and structure of each tree, addressing root system, the stem, branches and foliage.
 - Supporting evidence (eg. photographs and laboratory results).
- A discussion of the observations made and data collected. This should include a discussion of all management options available (eg. tree pruning, site or design modification) to avoid the removal of the tree.



Minimum content for Arboricultural Reports

- The estimated useful life expectancy and an analysis of the landscape amenity and significance of each tree to the site and locality.
- The retention value of each tree using appropriate industry methods (eg, SULE, Tree AZ, Stars or SRIV).
- Recommendations: These must be based on the observations made and any test results. Recommendations made to support a specific development outcome will not be considered. An explanation of why options are recommended or not recommended must be included.
- Sources of references referred to in the report. References not used in the report should not be included.

Root Mapping

Roots must be located and exposed using minimally destructive techniques (eg. hand digging or Air-spade) or non-destructive techniques (eg. sonic tomograph). Machinery or tools such as mattocks and crow bars must not be used.

In addition to the mandatory report requirements, the report must contain the following information:

- a plan showing the location of all excavation lines including points of reference and orientation details
- a section plan of the excavation showing all material found within the excavated area
- photographs (including points of reference and orientation details)
- a schedule of findings for each individual excavation line including details of:
 - total linear distance of the excavated line
 - number of roots found
 - linear distance along the excavation that roots are located
 - depth at which roots were located
 - condition of the roots
 - diameter of the roots.

Tree Hazard Assessments

A tree hazard assessment may be required when an applicant considers a tree to be potentially hazardous.

In addition to the mandatory report requirements, the report must contain the following information:

- a description of any identified hazards (eg. the extent of decay or basal cavity)
- details of the hazard rating system used



Tree Management Technical Manual

Minimum content for Arboricultural Reports

- the hazard rating under that system
- recommendations for hazard abatement. These must be based on the observations made. An explanation of why options are recommended or not recommended must be included.

Resistograph Reports

In addition to the mandatory report requirements, the report must contain the following information:

- The reason why the resistograph assessment is being carried out (eg, testing for decay associated with a wound)
- The type of defect being tested for
- Drill depth and resonance setting
- The type or model of resistograph used
- The location of the drill test readings on the tree in relation to the defect
- The failure criteria applicable to the defect
- Photographs of the defect
- A clear copy of the resistograph charts resulting from the test, with the wood quality indicated on the charts by colour coding
- Plotted diagram of the decay
- Assessment as to whether the defect passes or fails the applicable failure criteria (including details of calculations made)
- Recommendations and the reasons for the recommendations.

Arboricultural Impact Assessment Reports

Where development is being carried out on a site upon which trees are located or within the Tree Protection zone of a tree on adjoining land or a street tree, an Arboricultural Impact Assessment report may be required by the City of Ryde as part of the Development Application process.

In addition to the mandatory report requirements, the report shall contain the following information:

- Retention values for all trees.
- In accordance with ***Australian Standard 4970-2009 Protection of trees on development sites***, for each tree on the site, and for each tree on adjoining land and street tree where the development will occur within the Tree Protection Zone of those trees:
 - stem diameter measured above the root buttress
 - recommended Tree Protection Zone (TPZ) and Structural Root Zone (SRZ)
 - percentage of encroachment into each TPZ and details of any encroachment into any SRZ



Minimum content for Arboricultural Reports

- proposed method used to excavate within the TPZ and SRZ.

Note: This information shall be clearly presented in table form.

- An accurate and comprehensive assessment of the likely impact of the proposed development on each tree including:
 - Details of the proposed development including but not limited to alterations to existing buildings, services, drainage and driveways, and proposed building footprints
 - Details of above and below ground constraints on trees to be retained
 - Details of any modifications to existing soil levels on the site (for example, cut, fill and excavation)
 - The location of proposed sediment controls on the site
 - The impact of proposed landscape modifications.
- Recommendations as to design modifications and construction methods to minimize the adverse impact on trees that should be retained.
- Recommendations on protection measures to ensure the protection of the trees to be retained.
- Details of any pruning required for construction works and the proposed development, and a pruning specification setting out the:
 - pruning type (classification) in accordance with AS 4373 – 2007 Pruning of amenity trees
 - number of branches to be pruned
 - branch orientation
 - branch diameter, and
 - approximate percentage of live canopy to be removed

Note: All pruning shall be carried out in accordance with section 5.

- A Tree Protection Plan (to scale, with scale shown) showing the TPZ and location and type of tree protection measures that will be erected or installed around each tree. This plan must include all trees being retained on the site, and trees on adjoining land and street trees if development will occur within the TPZ of these trees. The Plan shall include details of proposed protection measures throughout the entire development and construction process (including during the demolition and excavation stages).
- A Tree Removal Plan showing all trees on site and clearly marking all trees proposed to be removed.
- A Landscape Plan showing:



Tree Management Technical Manual

Minimum content for Arboricultural Reports

- All trees that are proposed to be retained and transplanted on the site
- For all replacement tree plantings proposed
- a replacement plant schedule (showing the botanical and common names the expected mature height of the tree with the City of Ryde)
- tree stock specification in accordance with section 6.
- locations of proposed plantings.
- A post-construction tree establishment and maintenance programme. The City of Ryde requires a 52 week establishment and maintenance period and this period shall commence at practical completion.



This page has been intentionally left blank



Tree Management Technical Manual

5. Pruning

5.1 Introduction

Tree pruning should result in healthy, structurally sound and aesthetically pleasing trees. One of the key objectives when pruning a tree is to create and maintain a strong structure with a functional and pleasing form. This can be achieved by undertaking pruning regularly throughout the life of the tree. Pruning can guide the form of a tree and correct defects such as poor structure.

There should always be a good reason to prune a tree because pruning causes wounds which the tree has to respond to. Frequent and indiscriminate pruning will stress the tree and consequently adversely affect its health.

5.2 General requirements

All pruning works within the City of Ryde must be carried out:

- by an arborist with a minimum qualification of AQF level 3 (refer to Table 4.1 in section 4)
- in accordance with Australian Standard 4373 – 2007 *Pruning of amenity trees*
- in accordance with the *Workcover Code of Practice - Amenity Tree Industry 1998*
- in accordance with this Technical Manual.

5.3 Pre pruning assessment

Prior to any pruning works being carried out, the tree must be assessed by a person competent in arboricultural assessment (Table 4.1 in Section 4). This must include:

- an assessment of the tree's species, age, health, growth habit, structural condition, stability and growing environment
- an assessment of existing habitat and potential habitat value of the tree or section of the tree being considered for pruning.

Note: Tree with hollows or other potential habitat may need to be assessed by an ecologist or wildlife specialist.

- an assessment of the risk of disease spreading from the tree to other trees and the need for disinfecting pruning tools between trees
- consideration of the reason for pruning the tree
- an assessment of the likely effect of any root pruning
- consideration of the impact of the pruning on the health, structure, amenity and stability of the tree.

The arborist must:

- Determine whether pruning is required or not having regard to the criteria set out above.
- Recommend the pruning works only if the tree will not be adversely affected by the pruning.



5.4 Pruning practices

Trees must be pruned to maintain their natural habit. The arborist must aim to remove the smallest possible amount of living tissue when pruning. Lopping, topping, lion's tailing, flush cutting, wound painting and wound filling must not be specified or undertaken within the City of Ryde. Tree pruning should not:

- result in the premature death of the tree
- create a hazard
- be excessive or indiscriminate
- result in the overall crown shape becoming unbalanced or the tree unstable.

All pruning tools must be sharp to ensure clean cuts will be made. Equipment that will wound, penetrate or bruise bark and conductive tissues (including spurs, spikes, hooks, chained platforms and lowering systems) must not be used on or in sections of trees to be retained. When pruning palms all pruning tools must be disinfected in between trees to avoid the spread of disease.

Roots to be pruned shall be located and exposed using minimally destructive techniques (eg. hand digging or by Air-spade) or non-destructive techniques (eg. sonic tomograph).

5.5 Pruning specifications

The City of Ryde's Tree Management team or the Project Arborist shall specify the type (pruning class) and amount of pruning which may be carried out before any pruning work commences. Pruning of less than ten (10) per cent of the entire canopy of a tree within a 12 month period may be undertaken without an application to Council. However, it is advised that when pruning exceeds 60mm diameter branches an application should be sought. All pruning shall be undertaken in accordance with these specifications and the provisions of this Section 5.

AS 4373 – 2007 *Pruning of amenity trees* sets out a number of pruning classes. Pruning may maintain or modify the crown of a tree. Crown maintenance does not reduce the volume of the crown and retains the structure and size of the tree. Crown modification changes the form and habit of the tree. The class specified by the Tree Management team or Project Arborist will depend on the reason for pruning a tree. The specification shall include:

- For deadwooding, the minimum diameter and location of the branches to be removed (refer to the Note below)
- For crown thinning, the percentage of the crown to be removed, and maximum diameter and location of branches to be removed
- For selective pruning, the specific branches to be removed
- For formative pruning of young trees, the specific branches to be removed
- For reduction pruning, the extent of the crown or limb reduction
- For crown lifting, the clearances to be achieved, and the maximum diameter and location of the branches to be removed
- For remedial (restorative) pruning, specific details of pruning and number of pruning stages



Tree Management Technical Manual

- For pruning palms, specific parts (fronds and/or fruit) to be removed.

Note: Written consent (by way of a Tree Permit or Development Application approval) is not required to remove dead branches, provided the work is carried out:

- by a qualified arborist (in accordance with Table 4.1 in Section 4)
- in accordance with:
 - Australian Standard 4373 -2007 *Pruning of Amenity Trees*
 - NSW WorkCover *Code of Practice: Amenity Tree Industry 1998*.

However, prior written approval to remove deadwood from a Tree must be obtained if the Tree:

- is or forms part of a heritage item; or
- is within one of the five heritage conservation areas within the City of Ryde.



This page has been intentionally left blank



Tree Management Technical Manual

6. Replacement planting

6.1 Introduction

DCP Part 9.5 (Tree Preservation) aims to preserve the urban forest within the City of Ryde. An urban forest has environmental, social and economic functions and benefits. The environmental function largely depends on the amount of canopy cover. In addition many of the benefits of individual trees are directly related to size. When a large mature tree is removed from a site it will take a significant amount of time and resources to regain those benefits and replace the canopy cover. A small replacement tree does not have the same function or benefits as an existing large mature tree.

Effective management of trees as a natural resource and as part of the urban infrastructure of the City of Ryde depends, amongst other things, upon the long term retention of existing trees. However the City of Ryde recognises that trees need to be removed in some situations. In order to maintain the urban forest within the City of Ryde, the Tree Management team may require replacement of any tree removed.

The success of the replacement tree will depend upon:

- Selecting an appropriate tree species and a suitable planting location (refer to section 6.2)
- Purchasing a good quality tree to buy (refer to section 6.3)
- Correctly planting the tree to give it the best conditions in which to grow (refer to section 6.4)
- Maintaining the tree during the period in which it establishes (Refer to section 6.5).

6.2 Replacement planting as a condition of tree removal

The City of Ryde may require replacement planting as a condition of a Tree Permit or Development Application approval. The Tree Permit or Development Application approval may specify in relation to the replacement tree:

- the minimum height at planting or minimum container size
- the minimum height at maturity
- whether the tree is native or exotic
- the genus and species (refer to the Note below)

Note: Within Urban Bushland areas, specific native trees may be specified.

6.3 Selecting the right tree for the right place

When selecting a tree, the following factors should be considered:

- The mature size and habit of the tree. Large trees should not be planted in very small spaces where they may conflict with buildings and service infrastructure (eg solar panels or sewerage pipes). The height and spread of trees can only be controlled by frequent and ongoing maintenance which may be costly.



- Desirable features of the tree, eg. weeping habit, flowering, bird attracting, drought tolerant, evergreen or deciduous, native or exotic. The City of Ryde considers both native and exotic trees to be valuable natural assets and does not advocate the planting of native trees only. In many urban situations, native trees do not grow as well as exotic species.
- The specific benefits to be achieved or problems to be avoided. Eg, planting a deciduous tree on the northern side of a dwelling house will provide shade to that part of the house in summer and allow light through in winter. Conversely planting a potentially large, evergreen tree to the north of solar panels will cause overshadowing which will adversely affect energy collection.

The mature size of a tree and what it looks like (habit/shape) will vary depending on where it has been planted (soil and climate conditions) and how much care it has received. However, in general, a good way of finding out how big a tree will grow and what it will look like when mature is to look at mature specimens within the City of Ryde. For example in parks, nearby gardens and street trees.

Trees listed in Table 6.1 are considered undesirable and should not be planted within the City.

Table 6.1 Undesirable Tree Species

BOTANICAL NAME	COMMON NAME
<i>Acacia saligna</i>	Golden Wreath Wattle
<i>Acer negundo</i>	Box Elder
<i>Ailanthus altissima</i>	Tree of Heaven
<i>Alnus jorulensis</i>	Evergreen Alder
<i>Arecastrum romanzoffianum</i> (syn. <i>Syagrus romanzoffianum</i>)	Cocos Palm
<i>Bambusa spp.</i>	Rhizomatous Bamboo
<i>Celtis sinensis</i>	Hackberry
<i>Cinnamomum camphora</i>	Camphor Laurel
<i>Cotoneaster sp.</i>	Cotoneaster
<i>Erythrina x sykesii</i>	Indian Coral Tree
<i>Erythrina crista-galli</i>	Cockscomb Coral Tree
<i>Ficus benjamina</i>	Weeping Fig
<i>Ficus elastica</i>	Rubber Tree
<i>Lagunaria patersonii</i>	Norfolk Island Hibiscus
<i>Ligustrum lucidum</i>	Broad Leaf Privet
<i>Ligustrum sinense</i>	Narrow Leaf Privet
<i>Nerium oleander</i>	Oleander
<i>Olea europaea africana</i>	African Olive
<i>Populus spp</i>	Poplars
<i>Robinia pseudoacacia</i>	Golden Robinia or Golden Locust

Tree Management Technical Manual

BOTANICAL NAME	COMMON NAME
<i>Salix spp.</i>	Willows
<i>Schefflera actinophylla</i>	Umbrella Tree
<i>Tamarix aphylla</i>	Athel Tree
<i>Toxicodendron spp.</i>	Rhus Tree

6.4 Choosing good quality plants

Choosing good quality stock is as important as choosing suitable species, planting location, correct planting and maintenance of the tree. The selection of a good quality plant is essential for the long term success of the tree. In particular, a well developed and well formed root system is critical to the long term health and viability of a tree.

Poor plant selection can cause early death, poor growth, poor vitality and poor form. Most root defects cannot be corrected. A tree with above ground defects will need remedial care. Eg, poor form will need to be corrected by formative pruning by an arborist whilst the tree is young or establishing. It is not economical in the long term to buy cheap plants if they are of poor quality.

The City of Ryde recommends that tree stock planted within the City should comply with the NATSPEC document Specifying Trees – A guide to assessment of tree quality by Ross Clark (2003).

The following guidelines are intended to help residents identify good quality stock at the plant nursery/garden centre. They are based on the NATSPEC document.

Tree stock should be assessed for overall balance between the size of the roots below ground and the crown above ground, and for both above ground and below ground characteristics, as follows and as shown in Figure 6.1:

- Balance between the size of the tree above the ground and the size of the rootball/container: In general, large trees in small containers are likely to have root defects and will need a high level of maintenance (eg frequent watering) when planted. A tree with a moderately sized crown in proportion to the root system is likely to grow more vigorously when planted than a tree with a large crown.
- Above ground:
 - Does the tree look healthy?
 - Is the tree free from pests and disease?
 - Is the tree free from wounds or injury? Are there any recent pruning wounds? Select plants with no or very few wounds. All pruning wounds should be cleanly cut.
 - Is the tree self supporting? A tree should be able to stand up without being staked. If the stem of the tree bends when the stake is removed, the tree is not self supporting and should be rejected.
 - Does the stem of the tree taper? The circumference of the stem at the base of the tree



should be larger than the circumference higher up the stem. This shows that the stem is strong. Often trees that have been staked do not have stem taper.

- Does the tree have a intact (unpruned) central stem?
- Is the crown of the tree symmetrical? Are there branches on all sides of the stem?
- Are all branches smaller in diameter than the stem? The diameter of each branch should be no more than half the diameter of the stem.
- Are the junctions between the stem and branches convex (similar to a wide “U” shape)? Structural problems may occur on some trees if the space between the stem and branches forms a very narrow fork (similar to a narrow “V” shape).
- Is the stem of the tree approximately in the middle of the container?
- Below ground (these characteristics can only be seen if the plant is taken out of the container):
 - Root growth should be symmetrical and roots should grow downwards.
 - The outside of the rootball should be free of circling or large, sharply bent roots.
 - There should be sufficient roots in the pot so that when the tree is removed from the pot, the root mass will keep its shape. On shaking or handling the rootball outside of the pot most (at least 90%) of the soil should remain around the roots.
 - The root crown (the uppermost roots emerging from the stem) should be at the surface of the rootball/potting mix.

The Tree Management team, arborists and your local plant nursery/garden centre will be able to explain these characteristics to you and give you advice on how to select good quality trees.

6.5 Tree planting

Correctly planting a tree is a very simple process but an important one. Correctly handling the tree when planting, preparing the planting hole and caring for a tree after it has been planted will ensure the survival and optimal growth of the tree.

The best time to plant a tree is during autumn when the soil is still warm and the roots of the tree have time to grow before winter. Trees take up water through their roots. In general, trees require more water when they actively start to grow in spring and during hot summer months. Planting in autumn gives the tree more time to grow new roots and for roots to start growing into the surrounding soil before the increased demand for water starts. However container grown trees can be planted at any time of the year if they are properly cared for after planting.

Handling a tree

Trees should be kept in a sheltered and shady spot before being planted to keep them from wilting. Care should be taken not to damage trees when moving them. If the tree must be lifted by its stem, the stem should be wrapped with soft padding (eg. carpet underlay or rubber) and only the padded part of the stem handled. If the tree is large, a soft sling should be placed under the rootball rather



Tree Management Technical Manual

than lifting the tree by its stem.

Watering

The tree should be well watered a number of times during the planting process:

- prior to planting, whilst the tree is still in the container. The soil in the container should be moist when you plant the tree.
- immediately after planting by watering within the watering berm (see below). This will ensure the rootball of the plant receives the water and not the surrounding soil (refer to the Note below and Figure 6.2).
- after laying mulch or, if mulch isn't immediately placed around the newly planted tree, both before and after laying the mulch.

The soil should be thoroughly wetted. It is better to give the plant a few long, thorough applications of water rather than a small amount of water frequently.

Note: When the tree is first planted all of its roots are contained inside the potting mix from the container. This is the tree's rootball at this time. The tree will not have any roots in the surrounding soil and therefore there is no need to water the surrounding soil at the time of planting.

Digging the planting hole

Before digging the planting hole, the location of underground services should be ascertained to avoid injury, and interruption or damage to services. The City of Ryde recommends contacting Dial Before you Dig on 1100 before you carry out any excavation works. All excavation within 300mm of services should be carried out by hand.

Tree roots need oxygen and generally most fine absorbing roots of trees are to be found in the top 200-300mm of soil. The planting hole should be dug to a depth slightly less than the height of the rootball in the container so that when the tree is placed in the hole the top of the rootball sits up to 20mm above the top of the hole. This is because the weight of the tree will make the tree settle down in the hole over time and eventually the top of the rootball will be level with the top of the surrounding soil.

Root trimming

Root pruning may increase fine root growth within the root ball. Shaving or trimming off the very outermost edge (up to 20mm) of the rootball of a container grown tree will stimulate root division and growth. An increased root system will allow the tree to absorb more water and nutrients, and consequently the tree may establish more quickly. Root trimming can be done when the tree has been placed in the planting hole prior to backfilling.

Backfilling the hole

Backfill the planting hole in layers, gently tamp down the soil in each layer and lightly water to remove any air pockets. Fill the hole with soil and construct a berm (see below). There should be no soil placed over the top of the rootball because this buries the existing tree roots impacting on



the tree's ability to absorb oxygen. Placing soil over the rootball up to the trunk may also cause collar rot.

Constructing a berm

Form a mounded edge of soil approximately 60mm high on top of the rootball just inside the outermost edge of the rootball. This makes a shallow basin around the stem which prevents water run off to lower ground and allows the water to soak into the soil. The tree should be watered within this area until the tree is established.

Staking

Good quality trees should not require staking.

Mulching

Applying organic mulch over the surface of the soil after planting is beneficial because it:

- adds organic matter (and nutrients) to the soil
- protects the soil surface
- reduces water run-off
- insulates the soil from temperature extremes and
- inhibits weed growth.

Mulch should be placed at an approximate maximum depth of approximately 50mm. If mulch is too deep it can have negative effects such as reducing the amount of surface water reaching the soil and roots. Mulch should be kept well clear of the tree trunk. Mulching up to the trunk may cause collar rot.

6.5 Care after planting

Trees may take up to two years to successfully establish. Care during this period will lead to healthy and vigorously growing trees. The following maintenance practices should be regularly carried out during the establishment period:

- Watering: Water both the rootball and the surrounding soil thoroughly
- Weeding: Remove weeds close to the tree (weeds compete with the tree for water and nutrients)
- Fertilising: To maintain healthy growth in accordance with the fertiliser manufacturer's application instructions
- Pest and disease control: inspect to monitor and protect the tree from pests and diseases
- Mulching: Replenish water to keep the mulch depth to approximately 50mm deep.

Tree Management Technical Manual

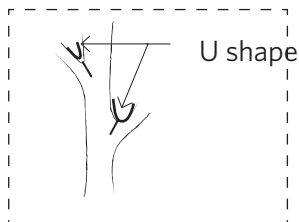
Figure 6.1 Choosing a good quality tree what to look for above ground

When buying a tree, look for a balance between the size of the container (the root ball) and the size of the crown.

The tree should :

- be able to support itself without a stake
- have few, if any, pruning wounds
- be free from injury, pests and disease

The join between the stem and the branches should be in a wide "U" shape (as shown below)



The tree should be free from wounds or injury. The diameter of any pruning wound should be less than half the diameter of the stem immediately above the wound

The stem of the tree should be in the middle of the container

The tree should have one central stem which has not been pruned

There should be branches on all sides of the tree

The diameter of each branch should be smaller than the stem where they join

All pruning wounds should be cleanly cut at the branch collar

The circumference of the stem should be largest at the base and get increasingly smaller up the stem

The uppermost roots emerging from the stem should be at the surface of the potting mix.

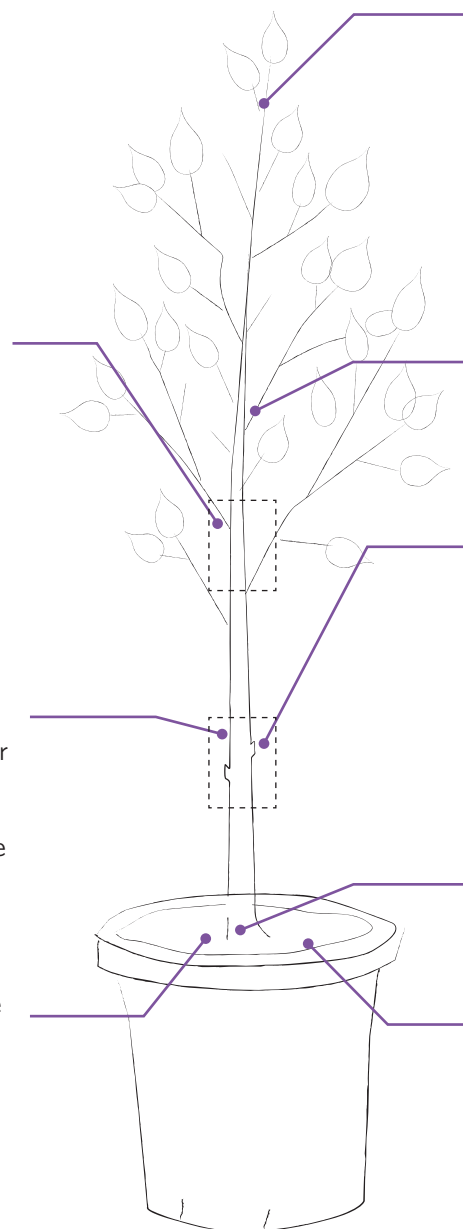
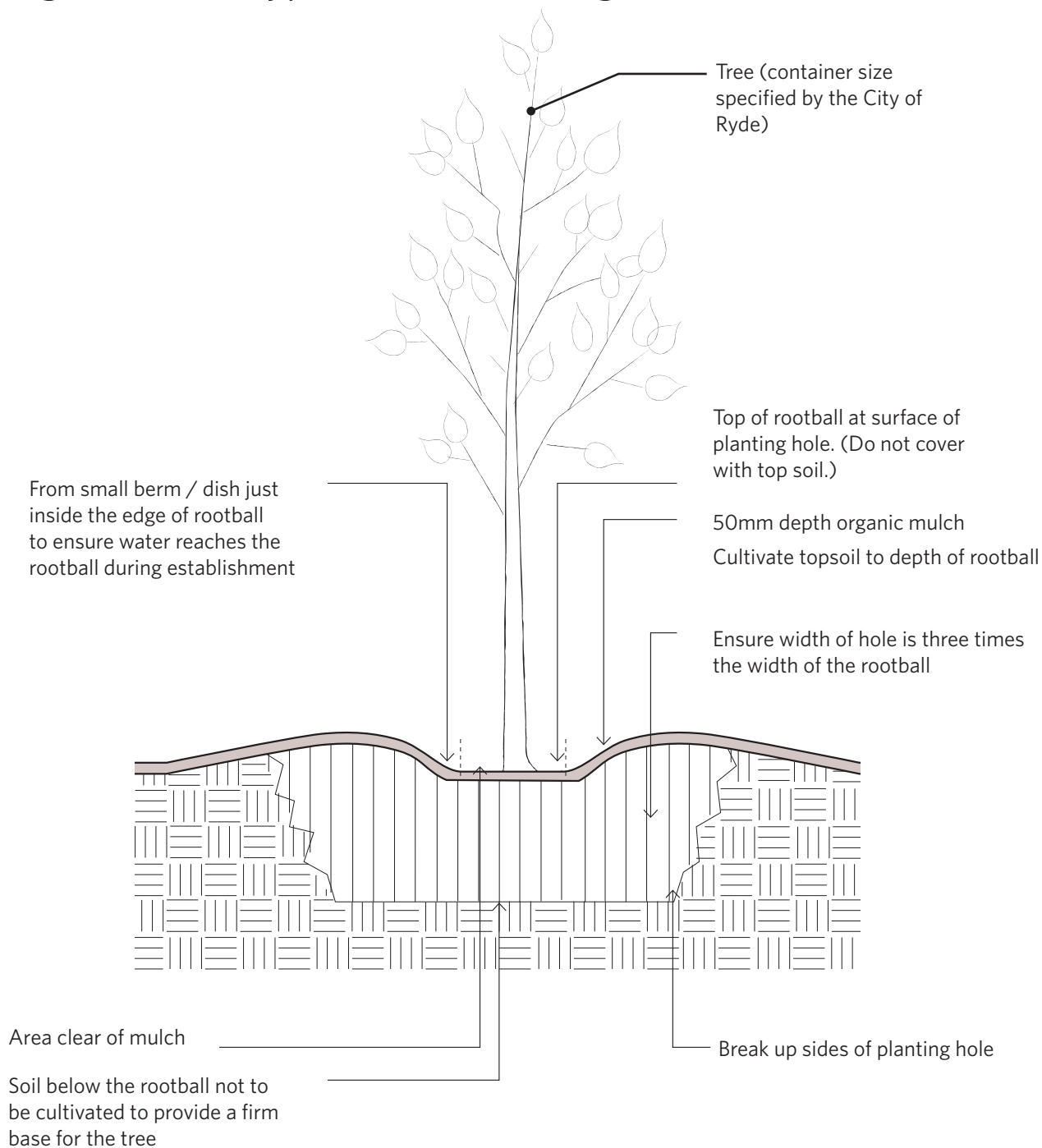




Figure 6.2 Typical Tree Planting Detail





Tree Management Technical Manual

7. References

Australian Standards:

AS 4373 - 2007- Pruning of amenity trees

AS 4970 - 2009 - Protection of trees on development sites

Tree supply standards:

Clark, R 2003, Specifying Trees - A guide to assessment of tree quality, 2nd edn, Sydney NSW

Codes of practice:

NSW WorkCover Code of Practice: Amenity Tree Industry 1998.

City of Ryde documents:

City of Ryde Local Environment Plan 2010

City of Ryde Development Control Plan 2010

Other references:

City of Newcastle 2010, The Newcastle Urban Forest Technical Manual, The City of Newcastle Council, Newcastle NSW

Harris, RW Clark, JR & Matheny, NP 2004, Arboriculture Integrated Management of Landscape Trees, Shrubs and Vines, 4th edn, Prentice Hall, New Jersey USA



8. Glossary

Branch collar means a swelling around the base of a branch containing defensive chemicals formed by overlapping stem and branch tissue.

Crown means the portion of the tree consisting of branches and leaves and any part of the stem from which branches arise.

Crown lifting means the removal of the lower branches of a tree.

Crown thinning means the selective removal of branches that does not alter the overall size of the tree.

DBH means diameter at breast height at 1.4m above ground level.

Deadwooding means the removal of dead branches from a tree.

Exotic means a plant introduced or not originating from Australia.

Flush cut means a cut that damages or removes the branch collar or removes the branch and stem tissue and is inconsistent with branch attachment as indicated by the branch bark ridge.

Formative pruning means the pruning of young or establishing trees with the aim of directing growth and/or developing a sound structure.

Lion's tailing means the practice of removing branches from the interior of the crown leaving most of the foliage at the ends of branches. This may lead to structural hazards.

Lopping means the cutting branches or stems between branch unions or internodes.

Native means all plant species indigenous to Australia including all plant species locally indigenous to the City of Ryde.

Project Arborist means an arborist qualified in accordance with section 4.1 who is retained by a property owner or development applicant to carry out the responsibilities set out in section 4.4.


Reduction pruning means the removal of ends of branches to lower internal lateral branches or stems in order to reduce the height and/or spread of the tree.

Remedial (restorative) pruning means the removal of damaged, diseased or lopped branches back to undamaged tissue in order to induce the production of shoots from latent or adventitious buds, from which a new crown will be established.

Stem means the part of the tree which supports branches, leaves, flowers and fruit and is also called "the trunk".

Structural Root Zone (SRZ) means an area around the base of a tree required for the tree to be stable. The tree's woody roots and soil cohesion in this area are necessary to hold the tree upright. It is a radial distance from the stem calculated in accordance with **AS 4970 -2009 Protection of trees on development sites**.

Topping means reducing the height of a tree by lopping.



Tree Management Technical Manual

Tree Protection Zone (TPZ) means an area above and below ground calculated in accordance with AS 4970 -2009 *Protection of trees on development sites*. It is a radial distance from the stem set aside for the protection of a tree's roots and crown to provide for the viability and stability of the tree.

Urban Bushland means land designated as Urban Bushland within the City as shown on maps and in documents commissioned by the City of Ryde from time to time.

Urban Forest means a collection of trees that grow within a city for the purpose of improving the urban environment.

City of Ryde Development Control Plan 2014

Part: 10 Dictionary

Translation

ENGLISH

If you do not understand this document please come to Ryde Civic Centre, 1 Devlin Street, Ryde Monday to Friday 8.30am to 4.30pm or telephone the Telephone and Interpreting Service on 131 450 and ask an interpreter to contact the City of Ryde for you on 9952 8222.

ARABIC

إننا نعتذر عليك فهم محتويات هذه الوثيقة، نرجو للحضور إلى مركز بلدية رايد Ryde Civic Centre على العنوان: 1 Devlin Street, Ryde من الاثنين إلى الجمعة بين الساعة 8.30 صباحاً والساعة 4.30 بعد الظهر أو الاتصال بمكتب خدمات الترجمة على الرقم 131 450 لكي تطلب من أحد المترجمين الاتصال بمجلس مدينة رايد، على الرقم 9952 8222، نيابة عنك.

ARMENIAN

Եթէ այս գրութիւնը չէք հասկնար, խնդրեմ եկէ՛ք Րայդ Բիւրոյ Սիւվիլ Սենթըր, 1 Տելվին փողոց, Րայդ, (Ryde Civic Centre, 1 Devlin Street, Ryde) Երկուշաբթիէն Ուրբաթ կ.ա. ժամը 8.30 – կ.ե. ժամը 4.30, կամ հեռաձայնեցէ՛ք Հեռաձայնի եւ Թարգմանական Սպասարկութեան՝ 131 450, եւ խնդրեցէ՛ք որ թարգմանիչ մը Րայդ Քաղաքապետարանին հետ կապ հաստատուէ ձեզի համար, հեռաձայնելով՝ 9952 8222 թիւին:

CHINESE

如果您看不懂本文，請在周一至周五上午 8 時 30 分至下午 4 時 30 分前往 Ryde 市政中心詢問 (Ryde Civic Centre, 地址: 1 Devlin Street, Ryde)。你也可以打電話至電話傳譯服務中心，電話號碼是: 131 450。接通後你可以要求一位傳譯員為你打如下電話和 Ryde 市政廳聯繫，電話是: 9952 8222。

FARSI

اگر این مدرک را نمی فهمید لطفاً از 8.30 صبح تا 4.30 بعد از ظهر دوشنبه تا جمعه به مرکز شهرداری رايد، Ryde Civic Centre, 1 Devlin Street, Ryde مراجعه کنید یا به سرویس مترجم تلفنی، شماره 131 450 تلفن بزنید و از یک مترجم بخواهید که از طرف شما با شهرداری رايد شماره 9952 8222 تلفن بزند.

ITALIAN

Se non capite il presente documento, siete pregati di rivolgervi al Ryde Civic Centre al n. 1 di Devlin Street, Ryde, dalle 8.30 alle 16.30, dal lunedì al venerdì; oppure potete chiamare il Telephone Translating and Interpreting Service al 131 450 e chiedere all'interprete di contattare a vostro nome il Municipio di Ryde presso il 9952 8222.

KOREAN

이 문서가 무슨 의미인지 모르실 경우에는 1 Devlin Street, Ryde 에 있는 Ryde Civic Centre 로 오시거나 (월 – 금, 오전 8:30 – 오후 4:30), 전화 131 450 번으로 전화 통역 서비스에 연락하셔서 통역사에게 여러분 대신 Ryde 시청에 전화 9952 8222 번으로 연락을 부탁드립니다.

Amend. No.	Date approved	Effective date	Subject of amendment

Unless a definition is provided in this Part, meanings in this DCP have the same meanings as defined in Ryde Local Environmental Plan 2014. Reference should otherwise be made to definitions under the:

- Environmental Planning and Assessment Act, 1979 (as amended); and
- Environmental Planning and Assessment Regulations 2000 (as amended).

Where not otherwise defined, the meaning is to be taken as the meaning most commonly understood.

TERM	MEANING
Active Solar Energy Systems	The use of mechanical devices to harness the energy of the sun to achieve thermal comfort.
Advertised Development	<p>Advertised Development is development that is identified as advertised development by the Act, the Regulations, an environmental planning instrument or a development control plan.</p> <p>Advertised development is state significant development, integrated development, threatened species development, class 1 aquaculture development under State Environmental Planning Policy No.62 and other advertised development.</p> <p>The Act sets out the requirements for the notification and advertisement of advertised development.</p>
Afflux	The rise in water level on the upstream side of a constriction in a stream or channel caused by that constriction.
AHD	Australian Height Datum is the datum level to which reduce survey levels are based upon.
Allowable Site Discharge	The volume of fluid per unit of time flowing along a pipe or channel as allowed by the most restrictive point within the site.
Aquatic Habitat	The natural home of marine or freshwater animals, plants or organism.
Area	In relation to an advertisement, means the total surface area, including the sides, of the advertisement occupied by the displayed matter.
Backwater	The part of a stream where the water level is kept above normal due to some controlling influence downstream.
Biological Integrity	A natural, self regulating ecosystem.
Bulky Goods	<p>Means large goods which in Council's opinion are of such a size and shape as to require:</p> <ol style="list-style-type: none"> a. large area for handling, storage or display and b. easy and direct vehicular access to enable the goods to be collected by customers after sale.
Bushland	Land on which there is vegetation which is a remainder of the natural vegetation of the land or, if altered, is still representative of the natural vegetation.
Catchment	An area of land from which all run-off water flows to a low point (river, creek, harbour, etc.).
Centre Based Children's Service	<p>Has the same meaning as in the Children and Young Persons (Care and Protection) Act 1998.</p> <p><i>Note: The term is defined as a children's service that is provided at a fixed premises (other than the home of the licensee of the premises).</i></p>
Child Care	(refer Children's Service)

TERM	MEANING
Children's Service	Means a service that provides education or care (other than residential care), or both education and care, whether directly or indirectly, for one or more children under the age of 6 years and who do not ordinarily attend school (disregarding any children who are related to the person providing the care) and includes a centre based children's service, a mobile children's service, a family day care children's service or a home based children's service. (Refer Children and Young Persons (Care and Protection) Act 1998 and Children's Services Regulation 2004).
City	Means the City of Ryde.
Class	Means the classification of a building as determined by the Building Code of Australia.
Clear Width	Is the width unobstructed by walls, columns, pipes or the like.
Clerestory	A small row of windows high in the wall below the ceiling
Collection Area	Means the location on the development site where garbage, compostible material and/or recyclable material are transferred from a building's storage containers to a collection vehicle for removal from the site.
Collection Point	Means the usual (or agreed) point on the footpath/roadway or on-site where garbage and recyclables are loaded onto vehicles.
Commercial Premises	Means a building or place used as an office or for other business or commercial purposes, or retail (refer to Ryde LEP 2014)
Complying Development	Means development that requires the issuing of a complying development certificate. This certificate maybe obtained from either the council or accredited certifier.
Compost	Means vegetative material capable of being converted to humus by a biological microbial process in the presence of oxygen
Conservation	Use, management and protection of resources so that they are not degraded, depleted or wasted and are available on a sustainable basis for present and future generations
Consolidated Stormwater Flows	Where several sources of stormwater flow are funneled into the same path, and the volume and flow rate is increased.
Constructed Wetland	Shallow water body containing aquatic plants installed to receive and treat contaminated stormwater run-off.
Consultation	This is a process where dialogue is established between residents, stakeholders and the Council. This process involves advertisement, stakeholder identification, public participation opportunities, inclusion of outcomes and comments, feedback on the outcomes provided to stakeholders.
Contaminated Land	Means land in, on or under which any substance is present at a concentration above that naturally present in, on or under the land and that poses, or is likely to pose, an immediate or long-term risk to human health or the environment.
Contributing Item	Is a building which contributes to the significance of an area as identified in a DCP or Adopted DCP.
Council's Stormwater System	This refers to the system of pipes, channels and overland flowpaths which drain water run-off (stormwater), not including those on private property. The system is designed to discharge the water into receiving waters.

TERM	MEANING
Critical Habitat	Has the same meaning as in the Threatened Species Conservation Act 1995.
Designated Development	Is development listed in Schedule 3 of the Regulations. It is development that requires the preparation of an Environmental Impact Study. The notification provisions for designated development are set out within the Act.
Detention Systems	Are holding storages which temporarily store stormwater to control and reduce downstream flow rates. They are designed to retard stormwater during intense rainfall and to empty once the peak of the storm has passed.
Developer	Any person or organisation who carry out development of land.
Development	Includes the erection of any building the subdivision of land and the carrying out of any work and the use of the land or building or work thereon for a purpose which is different from the purpose for which the land or building or work was last being used.
Double Glazing	A form of window which uses two panes of glass separated by a vacuum of stationary air.
Drainage Easements	Common law rights attached to land whereby another parcel of land has the right to use part or all of the land for the purpose of draining water.
Drainage Reserves	Lands vested in Council and reserved for drainage purposes.
Drive-in Take-away Food Shop	Fast food outlet, where orders can be placed from vehicles on-site.
Dwelling house	Means a building containing only one dwelling (refer to Ryde LEP 2014).
Ecologically Sustainable Development (ESD) Has the same meaning in the Act.	<p>Development that uses, conserves and enhances the community's resources so that ecological processes, on which life depends, are maintained and the total quality of life now and in the future can be increased (<i>Source: National Strategy for Ecologically Sustainable Development, 1992</i>). ESD is essentially about creating a system which is self sustaining in the long term. It is more a process than a product. It incorporates conservation principles and practices into the development process, so that a sustainable balance between environmental and economic objectives can be achieved. The principles behind this theory are outlined below.</p> <ul style="list-style-type: none"> ▪ Anticipatory and Precautionary Principle: policies and decisions should err on the side of caution, placing the burden of proof on technological and industrial developments to demonstrate that they are ecologically sustainable. ▪ Community Involvement: strong community motivation, participation and involvement in change are intrinsic to the achievement of a truly ecologically sustainable society. ▪ Intergenerational Equity: the present generation ensuring the next generation is left with an environment which is at least as healthy, diverse and productive as the one they enjoy. ▪ Sustainable Income: natural capital (eg. biological diversity, healthy environments, fresh water supplies, and productive soils) must be maintained or enhanced from one generation to the next. ▪ Social Equity: equality within our society must be a key principle when developing economic and social policies as part of ecologically sustainable development.

TERM	MEANING
Embodied Energy	The total amount of energy used in the production, manufacture and transportation of a materials.
Energy	The capacity to perform work. All work is a consequence of a change of energy from one form to another.
Enhanced Greenhouse Effect	The accelerated warming of the earth's atmosphere believed to be due to the emission of gases from human activities such as the burning of fossil fuels to produce electricity.
Erosion Control Devices	Are measures to assist in minimising erosion and sedimentation at a site, and include catch drains, diversion drains, banks and energy dissipaters.
Erosion Protection Works	Structures, actions or works which protect the land from deterioration or wearing away by forces such as wind, water, etc.
Exempt Development	Means development that does not require the consent of Council.
Family Day Care	<p>Is a care service for children aged 0-12 years offered in the home environment in the form of regular long day care pre-school care, or before and after school care. A ratio of one carer for up to seven children (including the carer's own children) applies. Family day carers and home based carers work under identical conditions and ratios (according to DOCS requirements), however unlike home based carers who work alone, family day carers are registered with a family day care children's service.</p> <p>See also:</p> <ul style="list-style-type: none"> ▪ Family day care children's service ▪ Home based child care
Family Day Care Children's Service	<p>Has the same meaning as in the Children and Young Persons (Care and Protection) Act 1998.</p> <p>Note: The term is defined as a children's service that organises or arranges for the care to be provided at the home of a carer other than the licensee of a home based children's service.</p>
First Flush	The entire run-off received at a downstream location up to the time when the whole catchment is contributing, this is generally the 3 monthly ARI event.
Flood Standard	<p>Is the higher water surface level generated for:</p> <ol style="list-style-type: none"> The 100 year event with subsurface drainage systems operating; and The five (5) year event with subsurface systems fully blocked.
Floodplain	Relatively level part of a river valley, adjacent to a river or creek channel formed from sediments deposited by the river during periods of flooding.
Floodways	The many controlled and uncontrolled routes taken by stormwater in the event of blockage of the underground system or its capacity being exceeded. Land inundated by the flood standard.
Footpath Converters	A structure that directs stormwater from drainage pipe systems into the kerb and gutter (also referred to as a Converter Pit)
Freeboard	The height between water level and the underside of a structure or top of an embankment/channel wall.

TERM	MEANING
Front Setback	Is the distance between the front elevation of the building other than a verandah, and the property boundary, which fronts the street.
Garbage	Means refuse or waste material other than trade waste, effluent, compostable material, green waste or recyclable material.
Garbage Chute	Means a duct in which deposited material descends from one level to another within the building due to gravity.
Green Waste	Means vegetative matter including trees, branches, shrubs, cuttings, lawn clippings and untreated timber and wood products.
Gross Pollutant Trap (GPT)	Is a structure which acts as the initial water pollution control measure typically located on the trunk drainage system. They act to intercept and retain coarse sediment, trash and debris.
Habitable Room	A room used for normal domestic activities and includes a bedroom, living room, lounge room, music room, television room, kitchen, dining room, sewing room, study, playroom and sunroom, but excludes a bathroom, laundry, water closet, food-storage pantry, walk-in wardrobe, corridor, hallway, lobby, photographic darkroom, clothes-drying room, and other spaces of a specialised nature occupied neither frequently nor for extended periods.
Hatchet Shaped Allotment	Is an allotment that is located behind another allotment and has only a driveway access to the street to which it has frontage.
Hazardous waste	Means any waste that because of its physically, biologically or chemically damaging properties is capable of causing a danger to the life or health of any living thing if it is released into the environment.
HMB	The House Energy Rating Management Body provides design and building professionals, council planners and homebuyers with the security that a house energy rating certificate from an Accredited NatHERS Assessor, is one that they can trust.
Home Based Children's Service	<p>Has the same meaning as in the Children and Young Persons (Care and Protection) Act 1998.</p> <p><i>Note: The term is defined as a children's service in which the care (not being the care organised or arranged by a family day care children's service) is provided at the home of the carer, not being the home of any of the children receiving the care (other than a child related to the carer).</i></p> <p>See also:</p> <ul style="list-style-type: none"> ▪ Family day care children's service ▪ Home based child care
Impervious	Surfaces that do not allow water to penetrate.
Impervious Footprint	The outline of the impervious area (this includes driveways, tennis courts, swimming pools, houses, etc.) on a land parcel.
Interallotment Drainage	Common stormwater drainage system that serves one or more private properties.
Lagged	To cover a pipe or cylinder with insulating material to prevent loss of heat.
Living Area Room	A room used for normal domestic activities excluding non-habitable rooms and bedrooms.

TERM	MEANING
Local Development	Refers to the use of land, the subdivision of land, the erection of a building – including alterations and additions in whole or part, the carrying out of a work, the demolition of a building or a work or strata subdivision of a building.
Long Day Care	Is a centre based children's service that provides regular care for children aged 0-6 years, open a minimum of 8 hours per day, (generally 8-12 hours per day), 5 days per week for most weeks of the year. The purpose of care is primarily to provide a service for parents who work. Centres are purpose-built or adaptations of existing buildings, and may be attached to other uses such as hospitals and educational institutions. It is common for these facilities to provide children with daily meals, an educational program (including pre-school program) and sleeping facilities. Management can vary, including privately operated, community-based, or work-based, etc. Licensing is required by DOCS as a centre based children's service.
Mainstream Retailing	Means a shop used for the sale of goods for everyday need such as food, clothing and small electrical appliances.
Major Residential Subdivisions	New subdivisions involving the creation of ten or more allotments.
Medium Dwelling	Means a dwelling designed and constructed with 2 bedrooms;
Mixed Use Development	Has the same meaning as in the Standard LEP Instrument (LEPs) Order (Amendment 1 15 September 2006). <i>Note: The term is defined as meaning a building or place comprising 2 or more different land uses.</i>
Mobile Children's Service	Has the same meaning as in the Children and Young Persons (Care and Protection) Act 1998. <i>Note: The term is defined as a children's service that visits specific premises, areas or places at specific times for the purpose of providing the care.</i>
Motorway Service Centre	Means a development which has vehicular access to a motorway only and which is designed to provide a range of goods and services related to the needs of the travelling public only and may include a multi-functional convenience centre comprising a service station either with or without a car wash facility.
Multipurpose Child Care Centres	Provide a combination of services, most commonly offering Long Day Care, Pre-school, and Out of School Hours care. Licensing by the NSW Dept of Community Services is mandatory.
NatHERS	The Nationwide House Energy Rating Scheme or NatHERS, is a scheme for rating the thermal performance of houses across Australia.
Neutral Item	A house that was constructed after the area was developed, but because of its design and scale does not detract from the area. A neutral item would be dealt with in the same manner as a non-contributing item.
Non Perennial	Intermittent running water throughout the year or years.
Non-renewable Fuels	Fuels that are derived from fossil remains such as coal, oil, or gas and are not capable of being replenished.

TERM	MEANING
North or True Solar North	When relating to solar orientation, a reference to “North” is a reference to true North and not magnetic, or compass North. True North varies from magnetic North. In Sydney, true North is approximately 12 degrees west of magnetic north. Most street directories show True North.
Nutrients	Compounds required for growth by plants and other organisms present in the soil. Major plant nutrients are phosphorus and nitrogen.
Occasional Child Care	Is a centre based children’s service that provides for care of children between 0-6 years of age on a casual or temporary basis, to cater mainly for the needs of families who require short-term care for their pre-school aged children. Hours are variable up to 5 days per week. Centres are purpose-built or adaptations of existing buildings, and their management can vary, including privately operated, community-based, or work-based, etc. Staffing ratios are the same as for long day care centres. Licensing is required by DOCS as a centre based children’s service.
Ongoing Management (of waste)	Means post occupancy management of waste on-site.
Orientation	Siting a building to obtain the maximum benefit from the sun’s energy.
Out-of-school-hours Care (including vacation care)	Is centre based care provided before and after school hours, and during school holidays, for children who attend school. The purpose is to assist working parents of school-aged children, with a focus on recreational activities. The service is usually provided incorporated within existing schools and within long day care centres in a limited form, in purpose built buildings or adaptations of existing buildings. Hours may vary according to community needs. Services are required to be registered with DOCS.
Outbuilding	Means a small building ancillary to the use of the dwelling, and includes garden sheds, covered pergolas, storage sheds, workshops and the like, but does not include garages and carports.
Passive Solar Energy Systems	The use of energy from the sun to achieve thermal comfort by incorporating local climatic characteristics in building designs.
Payback Period	The time taken to recover savings in running costs of the extra capital investment in an energy efficient system over and above the capital cost of a conventional system.
Perennial	Continuous running water throughout the year, or many years, including natural springs
Permitted Site Discharge	The rate of discharge determined from the developed surface area of a property and a multiplying factor for the suburb.
Pervious	Surfaces that allow water to soak in.
Pervious Area	Is the amount of the site expressed as a percentage that permits surface water to soak or sink into the soil.
PMF	Possible Maximum Flood
Potable Water Supply	Supply of water of drinking quality.

TERM	MEANING
Pre-school Care	Is centre based care provided for pre-school age children, that is for children generally from 3 to under 6 years of age (although some may be licensed to take children from 2 years of age) who do not ordinarily attend school. Preschools are generally open from 9am until 3pm and closed during school holidays. The care is provided to enhance children's early learning and development in the years immediately preceding school entry, in purpose-built buildings or adaptations to existing buildings. Licensing is required by DOCS as a centre based children's service.
Principal Certifying Authority	The Principal Certifying Authority appointed under Section 109E of the Environmental Planning and Assessment Amendment Act 1997.
Property Drainage	The stormwater drainage pipe system that lies within private property and carries only run-off from private property.
Public Reserve	Land zoned or reserved for public open space purposes.
R value	A measure used to describe the insulation performance of different materials. The greater the R value, the greater will be the effectiveness of the insulation on resisting heat flow into a building in summer or out of it in winter. The R-Value of the insulation should be visible on the product at the place of purchase.
Recyclable	Capable of being reprocessed into usable material or reused.
Renewable Fuels	Sources of energy which do not deplete the supply. Solar energy includes wind and ocean waves, which are derived from the effects of the sun.
Restriction as to User	A restrictive covenant on the transfer of land and is a binding promise to restrict the use of the land or some part of it in a specified manner, such as a Positive Covenant or Deed of Charge.
Ridge Height	The height of the highest point of the roof measured from the natural ground level immediately below.
Riparian Zone	Consists of 5 metres either side from the top of the bank of a non-perennial watercourse, or 20 metres either side from the top of the bank of a perennial watercourse, or within the 100 year flood plain, whichever is greater.
Sediment Control Devices	Devices to remove sediment from run-off before it leaves the site and include temporary measures such as straw bale barriers, sediment/geo-textile fabric fences and semi-permanent measures such as sediment traps and sedimentation basins.
Sediment Traps	Structures located on construction sites to receive contaminated run-off from disturbed areas and retain sediment.
Sedimentation Basins	Permanent structures located to receive and treat all sediment-laden run-off.
Sewage	The waste water from homes, offices, shops, factories and other premises discharged to the sewer.
Sewage Management Facility	A human waste storage facility, or a waste treatment device intended to process sewage, and includes a drain connected to such a facility or device.
Sewerage System	Please refer to Ryde LEP 2014.
Site Waste Bins	Means the receptacle provided for surplus and unwanted materials on site.

TERM	MEANING
Site Waste Minimisation and Management Plan (SWMMP)	Means a plan prepared in accordance with this DCP relating to a specific development that provides details of the volume and type of waste to be generated, how the waste is to be stored and treated onsite, how the residual is to be disposed of and how ongoing management will operate.
Solar Collector	A device for capturing the sun's energy.
Solar Radiation	Radiation that is emitted from the sun.
Special Waste	Means a waste that posed or is likely to pose an immediate or long term risk to human health or the environment. This includes hazardous waste, clinical waste and contaminated waste. Special arrangements need to be made for the management of these wastes.
Standard Junction Pit	A structure used in the drainage system to assist with changes in pipe slope or alignment and includes a sealed lid at ground level for inspection.
Stockpile	Means accumulation of materials for future reuse, recycling or disposal.
Stormwater	Rain water which runs off land, frequently carrying various forms of pollution, such as rubbish, animal droppings and dissolved chemicals. This untreated water is carried in stormwater channels and discharged directly into creeks, rivers, the harbour and the ocean. Stormwater includes run-off from rainfall, spring, soakage and seepage.
Stormwater Detention	Temporary storage of stormwater, with a controlled release into the drainage system.
Stormwater Drainage Systems	Include: <ol style="list-style-type: none"> Roof and property drainage. including subsoil drainage, detention and retention systems; Street drainage. including both surface open channel and piped systems; Trunk drainage generally located on land reserved for drainage purposes or within easements; and Receiving waters. They may be: <ol style="list-style-type: none"> Natural depressions. watercourses. creeks and rivers; Excavated earth and constructed open channels; and Underground systems with pipes. culverts, pits, inlets, outlets, and energy dissipation structures.
Stormwater Quality Control Structures	Devices designed to improve the quality of the stormwater which passes through it.
Stormwater Retention	Retaining and storing water for later use on-site.
Stormwater System	The system of pipes, overland flowpaths, creeks, canals and other channels used to carry stormwater to bodies of water, such as rivers or oceans.
Street Block	Is an area of land wholly bounded by streets or roads at least 6 metres wide at their narrowest point or partly by such streets and roads and partly by either or both of the following; <ol style="list-style-type: none"> A pedestrian way or lane or the like that is at least 6 metres wide at its narrowest point, and Land zoned other than Residential 'A'.

TERM	MEANING
Street or Secondary Drainage System	The smaller feeder pipe system along streets with pipes generally smaller than 600 mm diameter.
Subsoil Cutoff Drains	A perforated field drain laid below ground surface and covered with granular material to intercept ground water to protect structures.
Thermal Comfort	The internal temperature and degree of comfort of a building.
Thermal Insulation	A material having a relatively high resistance to heat flows and used principally to retard heat flow.
Thermal Mass	A measure of the amount of potential heat storage capacity available in building materials.
Total Catchment Management	The coordinated and sustainable use of land, water, vegetation and other natural resources on a water catchment basis so as to balance resource utilisation and conservation.
Trade Waste	Means refuse or waste material arising from any trade or industry but excludes liquid waste, demolition waste, building waste, special waste, contaminated waste, green waste or recyclable waste.
Tree	Means a single or multi-trunked wood perennial plant, which develops many branches, usually at a distance of not less than 1 metre above the ground. It does not include any plant, which is a noxious plant, in its location, under the Noxious Weed Act 1993.
Trunk Drainage	The stormwater drainage system that links property, interallotment and street drainage with the receiving waters and is greater than 600 mm in diameter.
Unit Development	A building or group of buildings containing two or more units occupied or used or so designed, constructed or adapted as to be capable of being occupied or used as a separate domicile and includes a group dwelling but does not include a dwelling house.
Ventilation	The process of supplying or removing air by natural or mechanical means to or from any space
Volume Reduction Equipment	Means devices which reduce the volume of waste or recyclable material including compressing devices such as compactors and balers and shredding, pulverising or crushing devices.
Waste	Includes: <ul style="list-style-type: none"> any substance (whether solid, liquid or gaseous) that is discharged, emitted or deposited in the environment in such volume, constituency or manner as to cause an alteration in the environment, or any discarded, rejected, unwanted, surplus or abandoned substance, or any otherwise discarded, rejected, unwanted, surplus or abandoned substance intended for sale or for recycling, processing, recovery or purification by a separate operation from that which produced the substance, or any processed, recycled, re-used or recovered substance produced wholly or partly from waste that is applied to land, or used as fuel, but only in the circumstances prescribed by the regulations, or any substance prescribed by the regulations to be waste for the purposes for Protection for the Environment Operations Act 1997.

TERM	MEANING
Waste Cupboard	Means a storage area within each dwelling (usually in the kitchen) of a size sufficient to enable source separation of a single day's waste into garbage, recyclables and compostable material.
Waste Storage and Recycling Room/Area	Means a designated room or area, or a combination of designated rooms/ areas upon the site of a building for the housing of approved containers to store all waste material (including recyclable material) likely to be generated by the building's occupants.
Waste Water	Excess or used water.
Water Re-use	The use of water more than once, following treatment of wastewater, to an appropriate quality standard and delivery to the point of use.
Waterbody	Refer to Ryde LEP 2014.
Watercourse	Refer to Ryde LEP 2014.
Waterway	Refer to Ryde LEP 2014.
Wet Retention Systems	Similar to detention systems. but retain some or all of the run-off from a site detaining sediment and improving the quality of run-off.



City of Ryde
Civic Centre
1 Devlin Street
Ryde NSW 2112

www.ryde.nsw.gov.au