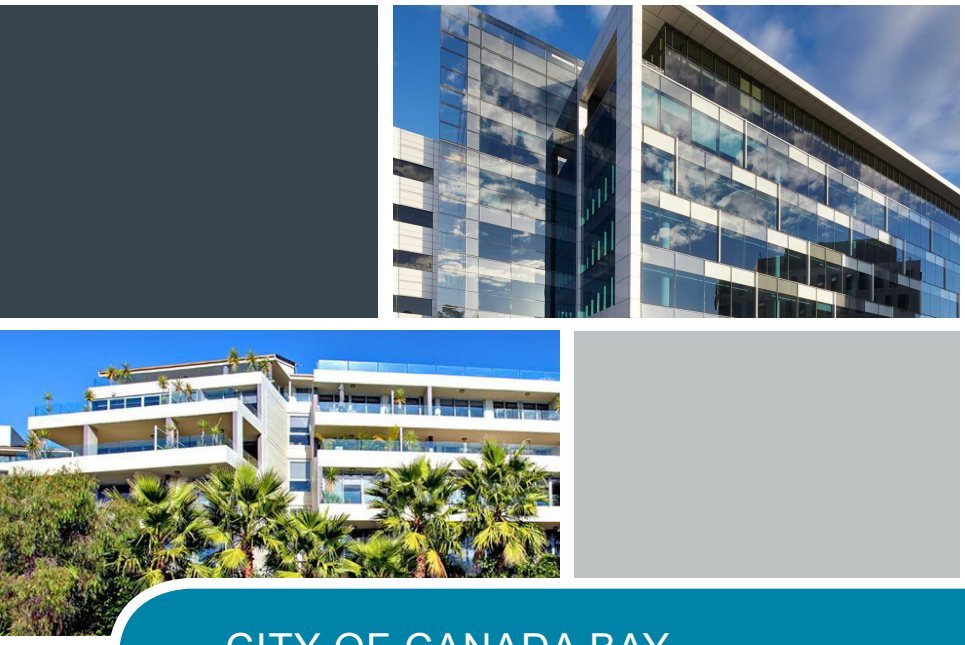


CITY OF CANADA BAY

DEVELOPMENT CONTROL PLAN

Date of adoption: 21 February 2017

Effective date: 7 March 2017

Last amended: 19 November 2019

List of Amendments

Amendment No.	Description	Adopted	Effective	DCP Reference
1	Amends car parking requirements in relation to restaurant, cafe, take away food and drink premises.	5 February 2008	7 March 2008	Part 7.7 Parking
2	Minor amendments including typographical errors, definitions, clarification of controls and general housekeeping	4 August 2009	19 August 2009	Various
3	Minor amendments regarding development on Sydney Harbour.	15 February 2011	24 February 2011	Part 5.2.2 Part 6.3.2
4	Inclusion of guidelines for Bibby Street industrial precinct, western side of Victoria Road (between Church and Day Streets) and 186 Great North Road.	7 May 2013	23 May 2013	Part 6.6.1 Part 6.6.2
5	Notification and Advertising.	20 November 2015	23 November 2015	Part 2.2
6	Updated to incorporate changes resulting from CCBC LEP 2013 Amendment 7 (Five Dock Town Centre).	3 November 2015	19 August 2016	Part 7
7	Updated to incorporate changes resulting from CCBC LEP 2013 Amendment 10 (2A Hythe Street, Drummoyne).	31 May 2016	2 December 2016	Part 6
8	Updated to incorporate changes resulting from CCBC LEP 2013 Amendment 9 (355-359 Lyons Road, Five Dock).	15 March 2016	5 August 2016	Part 7

9	Amendments including addition of engineering specifications, flooding controls, changes to controls for contaminated land and crime prevention, removal of character areas, consolidation of residential controls, relocation of site specific controls from Part 6 to Special Precincts DCP, various housekeeping amendments and changes to formatting, illustrations and maps.	21 February 2017	7 March 2017	Various
10	Updated to incorporate DCP changes resulting from CCBC LEP 2013 Amendment 12 (land west of, and generally fronting Waterview St, bounded by Second Ave and Barnstaple Rd, Five Dock)	6 February 2018	27 April 2018	F2.2 - Five Dock Town Centre
11	Part I - Child Care Centres updated to remove duplication in response to introduction of SEPP (Educational Establishments and Child Care Facilities) 2017	4 December 2018	18 December 2018	Part I - Child Care Centres
12	Part B of this Development Control Plan was repealed.	19 November 2019	3 December 2019	Part B - Notification and Advertising

Table of Contents

PART E - Residential Development

PART H - Signage and Advertising

PART I - Child Care Centres

PART J - Definitions

Appendix 1 - Conservation Areas

A

PART A - INTRODUCTION

A1 Introduction

A1.1 The purpose of this Development Control Plan

The purpose of this Development Control Plan (DCP) is to supplement the Canada Bay Local Environmental Plan (LEP) 2013 and provide more detailed provisions to guide development.

This DCP has been made in accordance with Section 3.43 of the Environmental Planning & Assessment Act 1979 (the Act) and must be read in conjunction with the provisions of Canada Bay LEP 2013.

Compliance with the provisions of this DCP does not necessarily guarantee that consent to a Development Application (DA) will be granted. Each DA will be assessed having regard to the LEP, this DCP, other matters listed in Section 4.15 of the Act, and any other policies adopted by the consent authority.

If there are circumstances when it is not relevant to comply with the controls in this DCP, applicants must provide a written submission clearly demonstrating compliance with the objectives of this DCP, and detailing the reasons the control/s should be varied. The proposed variation must result in a better outcome and meet all objectives of this DCP. The submission must also clearly demonstrate the variation sought will not adversely impact on the local amenity.

A1.2 DCP Name and commencement

This DCP may be referred to as the City of Canada Bay Development Control Plan. The DCP was adopted by Council on 21February 2017 and came into effect on 7 March 2017.

A1.3 Land covered by this Plan

This Plan applies to all land within the Canada Bay Local Government Area except for the sites included in:

- Special Precincts Development Control Plan
- Strathfield Triangle Development Control Plan
- Rhodes West Development Control Plan
- Single Dwellings on Lots at Breakfast Point
- Breakfast Point Development Control Plan 2005.

It should be noted that in certain circumstances site and precinct specific DCPs adopt some of the provisions of this DCP in accordance with Section 3.43 (3) of the Act.

A1.4 Relationship of this DCP to the LEP

The provisions contained in this DCP are in addition to the provisions of the LEP. If there is any inconsistency between this DCP and the LEP, the LEP will prevail.

A1.5 Aims of this DCP

1. Encourage development that responds to its context and is compatible with the existing built environment and public domain;
2. Recognise and reinforce the distinctive characteristics of Canada Bay's neighbourhood and centres;
3. Build upon the detailed objectives and controls under Canada Bay LEP 2013;
4. Protect and enhance the public domain;
5. Encourage design that maintains and enhances the character and heritage significance of heritage items and heritage conservation areas; and
6. Encourage ecologically sustainable development and reduce the impacts of development on the environment.

A1.6 Background information on this document

What is a Development Control Plan?

A Development Control Plan (DCP) is a commonly used town planning document which provides detailed guidance for the design and assessment of new development.

How to work through this document

Each topic contains an explanation, objectives and controls that should be complied with.

Objectives outline what the controls aim to achieve. Applicants should demonstrate that the proposed development fulfils the relevant objectives of each element and complies with the relevant minimum standards.

Structure of this DCP

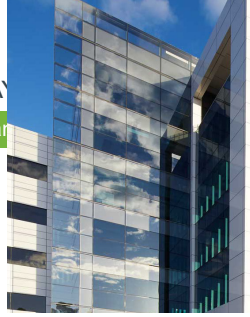
The DCP is divided into the following sections with further detail is provided in the table below:

- Part A - Introduction
- Part B - Community Participation
- Part C - General Controls
- Part D - Heritage
- Part E - Residential Development
- Part F - Mixed Use Areas & Neighbourhood Centres
- Part G - Industrial Development
- Part H - Signage and Advertising
- Part I - Childcare Centres
- Part J - Definitions
- Appendix 1 - Conservation

Monitoring and review

The Council is required to keep the local environmental plans and development control plans under regular and periodic review (see section 3.21 of the Act). The Council is committed to this process to ensure that the Plans continue to be useful and relevant.

THIS PAGE WAS INTENTIONALLY LEFT BLANK

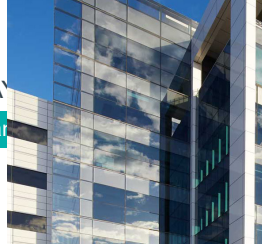


B

PART B - COMMUNITY PARTICIPATION

Part B of this Development Control Plan has been repealed. The City of Canada Bay Community Participation Plan (CPP) sets out Council approach for encouraging community participation and engagement on land use planning matters.

THIS PAGE WAS INTENTIONALLY LEFT BLANK



C

PART C - GENERAL CONTROLS

C1 Equity of access

C1.1 Adaptable housing

What is adaptable housing and why should it be provided?

Adaptable Housing is accommodation that is specifically designed to enable easy modification in the future for occupation and visitation by people with disabilities or progressive frailties. It is designed in accordance with the minimum standards for accessibility but is not designed as special purpose housing such as institutional care. Adaptable housing therefore can suit the needs of many different people, including people with a current disability and people who will acquire disabilities gradually as they age. Adaptable housing is also often attractive to people who prefer open plan type living, or those with children.

Typically, the provision of adaptable housing has been perceived to be onerous on developers. However, it has been demonstrated that the additional cost of incorporating adaptable features is in most cases not more than 5% - in fact nil in many cases. This initial cost is more than outweighed by the benefits of providing adaptable housing which include:

- reduced costs of future modifications, which are often costly, to suit people with disabilities or increasing frailties; and
- a wider range of people are able to access adaptable homes, thereby making them more visitable; and
- residents are able to stay in their homes and use the same services as well as maintain the same support networks despite their changing needs; and
- many adaptable features make homes safer for people of all ages and abilities.

Rates of adaptable housing units and parking spaces to be provided

Adaptable housing units should be constructed to meet the performance requirements and are to include the essential features as required by AS4299 at the rates specified in Table C-A for developments that include a lift. Where the total number of adaptable housing units to be provided is not a whole figure, the figure is to be rounded up to the next whole figure.

Table C-A Adaptable housing ratios for developments including a lift

Total number of dwellings	Number of adaptable dwellings to be provided
Between 0 and 7 inclusive	Nil
Between 8 and 14	1 dwelling
Between 15 and 21	2 dwellings
Between 21 and 29	3 dwellings
30 or more	15% of total dwellings

Issues which should be considered in the assessment of adaptable housing:

Common facilities and services

Access to and within the adaptable housing unit complies with the requirements of the relevant provisions of the Australian Standards. This includes access to at least one type of each common facility or service provided in the development eg. BBQ areas, swimming pools, common laundry facilities etc.

Location

Adaptable housing units should be provided in convenient locations that are close to facilities such as public transport, community facilities and public services. Within the development they should be located along the accessible path of travel, preferably close to the main entrance of the building.

Bathroom facilities

Bathrooms should be large allowing for wheelchair access and maneuvering. A bath need not be provided, but the shower should allow for chair access. The hand wash basin and any shelving should be provided at a height that is accessible at both a standing or seated position.

Laundry facilities

The laundry should also be large to allow for wheelchair access and circulation around the appliances. Washing machines and dryers should be front loading, a wall mounted dryer is also preferable.

Circulation spaces

Bedrooms and living areas should be an adequate size to allow for ease of movement around furniture. Doorways and entrances are wide enough to facilitate wheelchair access and circulation.

Kitchen facilities

The kitchen should be of a flexible design so that modifications can be made if required in the future. Cupboard and pantry shelf heights should be adjustable to make them easy to reach.

Flooring

Tiles or timber flooring is preferable to carpet. However, if carpet is to be provided it should be low pile with no underlay. Non-slip tiling should be provided in wet areas.

Walls

Walls located along main travel paths and in bedrooms and bathrooms should be reinforced to allow for installation of grab rails if necessary.

Windows

Windows should be operatable with one hand (preferably sliding) and located no higher than 700mm from the floor.

Landscaping

Outdoor areas should be designed to be low maintenance, with no lawns and a drip irrigation system. All paving should be even and be wheelchair accessible.

C2 Telecommunications and radiocommunications

This provisions in this section apply to telecommunications and radio communications infrastructure (including broadcasting infrastructure covered under the Telecommunications Act 1997 and the Radio communications Act 1992), within the City of Canada Bay Council Local Government Area (LGA).

The City of Canada Bay Council (Council) is the consent authority for facilities that require development consent under the terms of the Environmental Planning and Assessment Act 1979. These are the facilities that are referred to as “not low impact facilities”.

Council does not have regulatory control over “low impact facilities”. These are facilities described in the Telecommunications (Low Impact Facilities) Determination 1997 (LIF Determination), which exempts low impact facilities from State and Territory planning and environmental laws.

The Telecommunications and Radiocommunication controls of this DCP provide:

- controls for the siting, design and installation of telecommunications and radiocommunications facilities that require development consent from Council; and
- guidelines for telecommunications carriers for the siting, design and installation of “low impact” facilities.

C2.1 To what facilities does this Part apply?

This Part of the DCP applies to any fixed transmitter, its supporting infrastructure and ancillary development under the following legislation:

- Telecommunications (Low-impact Facilities) Determination 1997 [LIF Determination];
- Telecommunications Act 1997, and
- Radiocommunications Act 1992.

The DCP does not apply to temporary emergency services.

C2.2 What is the purpose of this Part?

The purpose of this Part is:

- to provide a consistent and integrated planning framework that addresses the community’s interests in the effective and efficient provision of telecommunications and radio communications infrastructure so that it achieves environmental, economic and social sustainability in the short, medium and long term;
- to provide a consistency of approach which benefits carriers, community and councils;
- to balance the needs of different stakeholders, including the community/ industry/ local, state and federal governments, and
- to provide guidance to carriers about Council’s requirements for:

a) site selection

b) lodging an application

c) conducting community consultation.

Objectives

The Objectives of this plan are:

O1. Social

- to apply a precautionary approach to the deployment of radiocommunications infrastructure; and
- to minimise EMR exposure to the public; and
- to avoid community sensitive locations; and
- to ensure that the general public and local communities have access to telecommunications technology; and
- to achieve equity for the various stakeholders by endeavouring to balance their various needs; and
- to enable members of the public to adequately identify infrastructure and the agencies responsible for them; and
- to provide mechanisms by which information can be disseminated to ensure that the community is adequately informed and empowered to participate in the planning/decision-making process.

O2. Environmental

- to help implement principles of urban design in respect to telecommunications and radio communications infrastructure; and
- to promote good industrial design of infrastructure;
- to provide infrastructure that is visually compatible with surrounding character and locality/visual context with particular regard to heritage buildings/areas and cultural icons; and
- to minimise adverse impacts on the natural environment; and
- to assess whether the proposed infrastructure is consistent with the amenity of the area; and
- to restore the site after discontinuation or removal of infrastructure.

O3. Economic

- to identify the type of land use areas suitable for infrastructure in a local government area; and
- to accommodate the planning requirements of new technology; and
- to provide equitable availability of locations to carriers; and
- to assess whether the proposed infrastructure is consistent with permitted development in adjacent areas; and
- to ensure reasonable access to telecommunications technology; and
- to provide certainty for stakeholders and a consistent approach to the implementation/assessment of telecommunications infrastructure.

O4. Administrative

- to ensure that Council obtains information about existing and proposed infrastructure to assist with strategic planning.

C2.3 Design controls

Visual amenity

Controls	
C1.	Carriers are to design antennas and supporting infrastructure in such a way as to minimise or reduce the visual and cumulative visual impact from the public domain and adjacent areas.
C2.	Within the local context, the infrastructure design should take account of: a) Colour; b) Texture; c) Form; and d) Bulk and scale.
C3.	Infrastructure should: a) Be well-designed; b) Be integrated with the existing building structure unless otherwise justified in writing to Council; c) Have concealed cables where practical and appropriate; d) Be unobtrusive where possible, and e) Be consistent with the character of the surrounding area. A discussion on facility design can be found in Low Impact Facilities for Better Visual Outcomes that can be accessed at www.amta.org.au/mcf
C4.	Infrastructure should be removed when no longer being used.

Co-location

Controls	
C5.	Co-location is the practice of locating a number of different telecommunication facilities, often owned by different carriers, on one facility or structure.
C6.	Co-location may not always be a desirable option where: a) Cumulative emissions are a consideration; b) It may be visually unacceptable; c) There are physical and technical limits to the amount of infrastructure that structures are able to support, or d) The required coverage cannot be achieved from the location.
C7.	Carriers should demonstrate a precautionary approach and effective measures to minimise the negative impacts of co-location.

Location

Controls	
C8.	The applicant should demonstrate that, in selecting a site, it has adopted a precautionary approach in regards to minimising EMR exposures consistent with Section 5.1 of the ACIF Code.
C9.	Preferred land uses (as determined by this Council) include: a) Industrial areas; b) Low-use open space, and c) Commercial centres.
C10.	The application should demonstrate particular consideration of likely sensitive land uses. Sensitive land uses may include areas: a) Where occupants are located for long periods of time (eg residences); b) That are frequented by children (eg schools and child care centres), and c) Where there are people with particular health problems (eg hospitals, aged care facilities)
C11.	Applicants should locate proposed facilities at least 300 metres away from heritage conservation areas and heritage items and any of the following sensitive land uses: a) Areas that are frequented by children (eg schools and child care centres); and b) Where there are people with particular health problems (eg hospitals, aged care facilities).

Heritage and Environment

Controls	
C12.	Infrastructure proposed for areas of environmental significance (as defined in LIF Determination) require: a) Development consent under the LIF Determination and Council's planning instruments and policies; b) The applicant to have regard to avoiding or minimising the visual impact of any proposed facility on the heritage significance of adjacent/adjoining/ surrounding heritage items and conservation areas; c) The applicant is to provide a heritage report/impact statement in accordance with Council's planning instruments and policies; d) The applicant to have regard to avoiding or minimising the physical impact of any proposed facility on endemic flora and fauna; and e) For proposals within heritage conservation and/or special character areas consideration should be given to the impact of the proliferation of telecommunication facilities on the integrity of the heritage conservation and/or special character areas.

Facility physical design controls

Controls	
C13.	Infrastructure should be of high quality design and construction.
C14.	Proposals should consider the range of available alternate infrastructure including new technologies, to minimise unnecessary or incidental EMR emissions and exposures, as required under Section 5.2.3 of the ACIF Code.
C15.	The plan for the facility should include measures to restrict public access to the antenna(s). Approaches to the antenna(s) should contain appropriate signs warning of EMR and providing contact details for the facility(ies) owner/manager.
C16.	The minimum requisites that should apply where relevant are the BCA for purposes of construction and the relevant exposure levels as directed by the Australian Communications Authority (ACA). The applicant should provide Council with certification about the standards with which the facility will comply.

Facility health controls

Controls	
C17.	The applicant is to demonstrate the precautions it has taken to minimise EMR exposures to the public
C18.	The applicant is to provide documentation to show that the proposed facility complies with the relevant Australian exposure standard as specified by the ACA
C19.	The applicant is to provide a mapped analysis of cumulative EMR effect of the proposal.

C3 Vehicle and bicycle parking rates and bicycle storage facilities

C3.1 Vehicle Parking

Council's car parking controls seek to limit car parking in locations that have good accessibility to public transport. This approach recognises that people will continue to use and depend on cars but this dependence reduces in more walkable neighbourhoods with good access to public transport.

Car parking needs to be accessible and convenient. It should also be designed so that it does not detract from the amenity of the streetscape.

Objectives

O1. To identify the maximum number of car parking spaces that may be provided to service particular uses of land.

O2. To provide less resident and visitor parking in localities that are identified as having good accessibility to public transport.

O3. To minimise vehicular traffic generated by development.

O4. To ensure parking areas do not detract from the streetscape.

General

Controls	
C1.	Parking should not detract from the streetscape qualities, while meeting the needs of visitors and employees in the commercial areas.

Car spaces

Controls	
C2.	Parking spaces should be a minimum of 5.4m x 2.4m, with an additional 300mm either side where enclosed (i.e. 5.4m x 3.0m).
C3.	Car parking for people with disabilities should have a minimum dimension of 3.6m x 6m.

Residential

Controls	
C4.	Car Parking is to be provided in accordance with Table C-B.
C5.	All visitor parking should be provided off-street and behind the front setback.
C6.	Visitor parking spaces should be conveniently located, identified as such, and accessible to the general public. They should not be located behind any security grill or gate.
C7.	Dedicated disabled parking spaces should be identified by a clearly visible sign with the international symbol of access for people with disabilities.
C8.	Dedicated disabled parking spaces should be located close to wheelchair accessible entrance lifts.
C9.	If relevant, objectives and controls in section E3.9 Parking and access also apply.

Commercial

Controls	
C10.	Parking should not detract from the streetscape qualities, while meeting the needs of visitors and employees in the commercial areas.
C11.	On site car parking should be provided below ground or located within the building and well screened.
C12.	Vehicular access ways are designed to be integrated with the building and of minimum height and width.
C13.	Loading facilities should be provided in accordance with the current RTA “Guide to Traffic Generating Developments” and AS 2890.2.
C14.	The provision of parking for different types of development should be in accordance with Table C-C.
C15.	Development should be in accordance with the provisions of State Environmental Planning Policy (Infrastructure) 2007.

Industrial

Controls	
C16.	All vehicles should be able to enter and leave the site in a forward direction.
C17.	Car parking areas are to be landscaped with trees and shrubs.
C18.	Separation of service areas (loading/ unloading) and parking areas is required.
C19.	Development should be in accordance with the provisions of State Environmental Planning Policy (Infrastructure) 2007.
C20.	All loading and unloading operations should be carried out wholly within the confines of the site at all times.
C21.	Loading facilities should be provided in accordance with the current RTA “Guide to Traffic Generating Developments” and AS 2890.2.
C22.	All loading docks, car parking spaces and access driveways should be kept clear of goods at all times and should not be used for storage purposes including garbage storage.
C23.	Parking provision should be in accordance with Table C-D.

Accessible Parking

Controls	
C24.	Parking provision should be in accordance with Table C-E.

Adaptable Housing

Controls	
C25.	Where a residential development provides adaptable housing units in accordance with this plan, one accessible car parking space should be provided for every adaptable unit. This is in addition to any accessible parking required by this DCP.

Credit for car parking in existing developments

Controls	
C26.	Council will apply the relevant car parking rate to the entire floor area for new developments and developments proposing substantial alterations and additions to existing buildings.
C27.	A credit will be provided for car parking spaces when calculating required parking numbers for developments involving a change of use of an existing building. The credit shall be calculated on the basis of the demand generated by the existing use that is proposed to be changed.
C28.	A credit for car parking spaces will be provided when calculating required parking numbers for developments involving minor alterations and additions to an existing building. The credit shall be calculated on the basis of the demand generated by the existing use carried out in the building that is proposed to be altered or extended.

C3.2 Bicycle parking

Objectives

O1. To encourage the use of bicycles by residents, employees and visitors of Canada Bay for recreational use and as an alternative mode of transport.

O2. To ensure that residential developments with more than 3 dwellings and non-residential developments, contain sufficient and adequate bicycle parking and storage facilities.

O3. To ensure bicycle parking and storage facilities are designed and located to provide easy, convenient and safe access to buildings.

O4. To ensure bicycle parking and storage facilities are designed and located to minimise conflict with pedestrians and other traffic.

O5. To ensure that bicycle storage and parking facilities are provided at end of trip for cyclists

Controls	
C1.	Bicycle parking and storage facilities should be provided to allow parking or storage of a minimum number of bicycles, in accordance with Table C-F.
C2.	Bicycle parking should be made available to customers and staff

For all residential, commercial and industrial development, fractions should be rounded up in the calculation of the required number of spaces.

Council may waive the requirement for bicycle storage facilities for other non-residential development if it is satisfied that the requirement presents an unreasonable burden on the development.

References to areas are to gross floor area, unless stated otherwise.

Other non-residential development

Controls	
C3.	Bicycle storage facilities may be provided as fully enclosed individual lockers (referred to in AS 2890.3 as Class 1 facilities) or as locked compounds (referred to in AS 2890.3 as Class 2 facilities), depending on the type of development and practicality of access to the facility. Compounds should be fitted with a sufficient number of devices to which stored bicycles can be secured (referred to in AS 2890.3 as Class 3 facilities). Bicycle storage facilities should be covered to provide weather protection. A private garage is deemed to be the equivalent of an individual locker space.
C4.	Showers and lockers should be provided close to secure bicycle storage facilities within new commercial and industrial developments.
C5.	Bicycle storage facilities should generally be designed in accordance with paragraph 2.2 of AS 2890.3.
C6.	Bicycle parking facilities on private land should be located so that the minimum clearance between a parked bicycle and the edge of a motor vehicle traffic lane is 600mm and 1000mm where the average traffic speed exceeds 60km/h.
C7.	Bicycle parking facilities should be located so that the minimum clearance (for a pedestrian pass) between a parked bicycle and any other obstruction is 1200mm.
C8.	Bicycle parking facilities should generally be designed in accordance with figure B3 in AS 2890.3. The provision of weather protection for bicycle parking is encouraged.
C9.	Access paths to bicycle storage or parking facilities should be provided so that the envelope shown in figure 3.1 in AS 2890.3 will fit when projected along the access path.
C10.	Where an access path to a bicycle storage or parking facility includes stairs, such stairs should include a bicycle wheeling ramp in accordance with figure 7.12 in the Austroads Guide to Traffic Engineering Practice (Part 14 Bicycles). The gradient of the ramp should not exceed 25%.
C11.	Unacceptable bicycle parking and storage facilities are facilities where: a) Only a wheel can be secured but not the bicycle frame; b) The device does not provide stability for the bicycle and may result in damage to the bicycle; and c) The device has a slot in the ground which may get dirty and difficult to use over time.
C12.	Directional signs advising the public of the location of bicycle parking and storage areas should be harmoniously designed and erected to assist both the facilitation and promotion of the use of these facilities.

Table C-B Parking Requirements: Dwelling houses, Dual occupancies, Residential flat buildings, Multi dwelling housing and Shop top housing

Dwelling houses, attached dual occupancies and detached dual occupancies	
Dwelling houses	Minimum of One (1) car parking space Maximum of Two (2) car parking spaces
Dual occupancies	Maximum One (1) car parking space per dwelling
Secondary dwellings	Nil space

Residential flat building, Multi-dwelling housing and residential component of shop top housing	
Maximum parking rates in B4 Mixed Use Zones	
Number of bedrooms	Number of car parking spaces
1 bedroom apartments	0.6 spaces
2 bedroom apartments	0.9 spaces
3 bedroom apartments	1.4 spaces
Visitors	1 space per 5 apartments

Minimum parking rates within 800 metres of a railway station or 400 metres of B3 Commercial Core and B4 Mixed Use zones	
Number of bedrooms	Number of car parking spaces
1 bedroom apartments	0.6 spaces
2 bedroom apartments	0.9 spaces
3 bedroom apartments	1.4 spaces
Visitors	1 space per 5 apartments

Minimum parking rates for all other areas	
Dwelling type/ size	Number of car parking spaces
Small dwelling	1 space
Medium dwelling	1.5 spaces
Large dwelling	2 spaces
Visitors	0.5 spaces per dwelling

Note: Any parking in excess of the above requirements will be counted as Gross Floor Area (GFA) (refer to definition in Canada Bay LEP). In calculating the total number of car parking spaces required for a development, the total should:

a) Be rounded up if the fraction of the total calculation is equal or more than half (0.5 of a space); and

b) Include a room that is capable of being converted to a bedroom where calculations involve multi dwelling housing and residential flat buildings.

Table C-C Parking Requirements: Development in mixed use areas and Neighbourhood Centres

Land use	Parking requirements
Accommodation	
Motels	1 space for each unit +1 space per 2 employees if restaurant included then add the greater of: • 15 spaces per 100m² GFA of restaurant/function room, or • 1 space per 3 seats
Hotels	Comparisons should be drawn with similar developments
Office and Business	
Office Premises	1 space per 40m² GFA
Business Premises	1 space per 40m² GFA
Retail	
Shops	1 space per 40m² GLFA
Service stations and convenience stores	Requirements are additive: • 6 spaces per work bay • 5 spaces per 100m² GFA of convenience store If restaurant present, the greater of: • 15 spaces per 100m² GFA, or 1 space per 3 seats
Drive-in take-away food outlets	Developments with no on-site seating: 12 spaces per 100m² GFA Developments with on-site seating: 12 spaces per 100m² GFA or greater of: • 1 space per 5 seats (internal and external), or • 1 space per 2 seats (internal) Developments with on-site seating and drive through facilities greater of: • 1 space per 2 seats (internal), or • 1 space per 3 seats (internal and external), plus queuing area for 5-12 cars
Restaurants, Cafes, Take-away food & drink premises	Whichever is the greater of: • 1 space per 6m² of serviced area, or • 1 space per 4 seats. A parking free threshold of 20 seats and 30m² serviced area shall apply to all restaurants, cafes & take-away food and drink premises (to which this DCP applies) in B1 Neighbourhood Centre and B4 Mixed Use zones, excluding those in the areas listed below. A parking free threshold of 40 seats and 60m² serviced area shall apply to restaurants in the following (commercial centres) B1 Neighbourhood Centre and B4 Mixed Use zones: • Victoria Road, Drummoyne (inc. Lyons Rd to Bayswater Street) • Great North Road, Five Dock (excluding Wareemba/ Abbotsford) • Majors Bay Road, Concord • Parramatta Road, Concord (No B1 or B4 on Parramatta Rd) • Parramatta Road, Five Dock (No B1 or B4 on Parramatta Rd) • Concord Road, Concord West • Concord Road, North Strathfield *Where variation to the above criteria is sought, refer to Additional Criteria below.

Land use	Parking requirements
Footpath Dining	Nil.
Residential	As per Table C-B
Car tyre retail outlets	Whichever is the greater of: • 3 spaces per 100m² GFA, or • 3 spaces per work bay
Roadside stalls	4 spaces
Markets	2.5 spaces per stall (customers only)
Video Stores	6.1 spaces per 100m² GFA
Pub	Comparisons should be drawn with similar developments
Vehicle Showrooms	0.75 spaces per 100m² site area + 6 spaces per work bay (for vehicle servicing facilities
Drive-in liquor stores	Comparisons should be drawn with similar developments
Plant nurseries	Whichever is greater of: • 15 spaces, or • 0.5 spaces per 100m² of site area
Recreational and Tourist Facilities	
Recreational facilities	
• Squash courts	3 spaces per court
• Tennis courts	3 spaces per court
• Bowling alleys	3 spaces per alley
• Bowling greens	30 spaces for first green + 15 spaces for each additional green
• Gymnasiums	7.5 spaces per 100m² GFA (desirable) 4.5 spaces per 100m² GFA (minimum)
Marinas	If a survey of a similar existing development has not been undertaken, the following figures may serve as a general guide: • 0.6 spaces per wet berth • 0.2 spaces per dry storage berth • 0.2 spaces per swing mooring • 0.5 spaces per marina employee
Health and Community Services	
Health Consulting Rooms	Comparisons should be drawn with similar development
Medical centres	1 space for each medical practitioner, plus 1 space for each 2 non medical practitioner employees; plus 1 patient space for every 2 specialists.
Child care centres	1 space for every 4 children in attendance
Hospitals	Comparisons should be drawn with similar developments

Source: Based on RTA Guide to Traffic Generating Developments 2002

Note:

1. Parking spaces, unless stipulated otherwise, are for cars and depending on land use type, parking for delivery/service vehicles, courier vehicles and bicycles should also be provided.
2. Parking free threshold: means an area expressed in both number of seats and serviced area up to which on-site parking does not need to be provided. The standard parking rate applies to any area and seats in excess of the threshold.
3. Serviced area: means the physical area within the restaurant or café which is accessible to the public, but excluding toilets and corridors. Areas such as the kitchen, or behind counters, or display areas should not be included as serviced area.
4. To calculate car parking requirements, applicants must establish the number of spaces required by the proposed development calculated from Tables C-B to C-E in Part C3. The threshold can then be subtracted from this figure and the balance provided.
5. Additional Criteria - Restaurants & Cafes In exceptional circumstances, Council may allow a variation to these requirements where it is demonstrated by the applicant that the proposed use would not have any adverse impacts on the surrounding residential amenity in relation to car parking availability.

To achieve this variation, the following criteria would need to be demonstrated to the satisfaction of Council:

A Parking Impact Study prepared by a qualified traffic consultant shall be provided by the applicant, which demonstrates that the shortfall of parking spaces created by the application is able to be accommodated within 200m (radius) of the subject site. The Parking Impact Study would need to provide the following:

a) Total number of available spaces within 200m of the subject site;
b) Parking availability within the study area over operating hours (including hours open for staff and customers);
c) Demonstrate how the parking shortfall of the proposal can be satisfied by the available parking spaces identified in parts (a) and (b) above.
d) Demonstrate that the amenity of the surrounding residential areas would not be adversely impacted by any additional on-street parking.

Note: Within the Study, the applicant may demonstrate alternative options as to how the proposed use/ development mitigates potential impacts of additional car parking requirements. An example of how this may be achieved includes:

- Demonstrating that parking facilities associated with alternative time-of-day uses can be utilised for the use of the restaurant/café customers.

Table C-D Parking Requirements: Development in Industrial Areas

Land use	Parking requirements
Industry	
Factories	1.3 spaces per 100m² GFA
Warehouses	1.5 spaces per 100m² of total GLA. 1.8 spaces per 100m² gross leasable office/showroom area plus 1.2 spaces per 100m² of gross leasable factory/warehouse area (where information on components of development is available).
Bulky goods retail stores	Comparisons should be drawn with similar development
Road Transport Facilities	
Road Transport Terminals	Surveys should be undertaken of similar developments
Container depots	Surveys should be undertaken of similar developments
Truck stops	1 truck parking space per motel unit + 1 car space per 2 employees For restaurant facilities, the greater of: • 15 spaces per 100m² GFA, or • 1 space per 3 seats
Other	
Caravan parks	1 space per caravan site

Source: Based on RTA Guide to Traffic Generating Developments 2002

Table C-E Accessible Parking Requirements

BCA Classification of the building to which the parking is associated	Parking Requirements Number of spaces required (Table D3.5 of the BCA)
Class 3	
Boarding houses, guest houses, hostel, backpackers accommodation, or the residential part of a hotel or motel	To be calculated by multiplying the total number of car parking spaces by the: a) Percentage of accessible sole-occupancy units to the total number of sole-occupancy units; or b) Percentage of beds to which access for people with disabilities is provided to the total number of beds provided. The calculated number to be taken to the next whole figure. 1 space for every 100 car parking spaces or part thereof
Class 5, 7, 8 and 9c	
	1 space for every 100 car parking spaces or part thereof
Class 6	
a) up to 1000 car parking spaces; and b) for each additional 100 car parking spaces or part thereof in excess of 1000 car parking spaces	1 space for every 50 car parking spaces or part thereof 1 space
Class 9a	
(a) Hospital (non-outpatient area)	1 space for every 100 car parking spaces or part thereof
(b) Hospital (outpatient area) up to 1000 car parking spaces; and	1 space for every 50 car parking spaces or part thereof
for each additional 100 car parking spaces or part thereof in excess of 1000 car parking spaces	1 space
Nursing home	1 space for every 100 car parking spaces or part thereof
Clinic or day surgery not forming part of a hospital	1 space for every 100 car parking spaces or part thereof
Class 9b	
(a) School	1 space for every 100 car parking spaces or part thereof
(b) Other assembly buildings up to 1000 car parking spaces; and	1 space for every 50 car parking spaces or part thereof
for each additional 100 car parking spaces or part thereof in excess of 1000 car parking spaces	1 space

Source: Based on RTA Guide to Traffic Generating Developments 2002

Table C-F Bicycle Parking and Storage Requirements

Residential development (including boarding houses and serviced apartments)		
Development type	Bicycle storage facility	Bicycle parking facility
Residential development with 3 or more dwellings	1 space for every dwelling	1 space for every 12 dwellings (minimum 1 space)
Other development providing longer term residential accommodation such as boarding houses and serviced apartments	1 space for every 4 lodgings/apartments	1 space for every 16 lodgings/ apartments

Commercial and industrial development		
Development type	Bicycle storage facility	Bicycle parking facility
Cafe		1 per 25m^2 public area
Consulting Rooms	1 per 8 practitioners	1 per 4 practitioners
Hotel		1 per 25m^2 bar floor area and 1 per 100m^2 lounge or beer garden
Heavy Industry	1 per 150m^2	See note 2
Light Industry	1 per 100m^2	See note 2
Motel	1 per 40 rooms	See note 2
Office/Commercial	1 per 200m^2	1 per 750m^2
Restaurant	1 per 100m^2 public area	2 per restaurant
Shop	1 per 300m^2	1 per 500m^2
Showroom	1 per 750m^2 sales area	1 per 1000m^2 sales area

Note:

1. The above requirements only apply to new commercial and industrial developments. They do not apply to developments which are changes of use or which are extensions of existing development or which could have been undertaken as Exempt or Complying development but for criteria such as heritage listing and the like.

2. Where the table does not provide a standard, the Council will make an assessment of the required number of spaces based on:

   a) Expected number of employees, and their likely or desired use of bicycles for travel to and from work; and

   b) Expected number of visitors, and their likely or desired use of bicycles to visit the development.

C4 Waste Management

Objectives

O1. Assist in achieving Federal and State Government waste minimisation targets in accordance with regional waste plans.

O2. Minimise overall environmental impacts of waste and foster the principles of ecologically sustainable development (ESD).

O3. Facilitate source separation and provide design standards that complement waste collection and management services offered by Council and private service providers.

C4.1 General Controls

Controls	
C1.	On site storage for waste and recycling facilities must be provided in designated areas for all new developments. The minimum storage space required is to be based on 120 litres of garbage and recycling generated per unit per week. The area should be located so as not to cause offence to adjoining property owners or occupiers with regard to smell, visual appearance, noise disturbance and traffic.
C2.	Source separation facilities and containers shall be provided in kitchens for waste to be divided into separate waste streams to encourage the composting and recycling of materials.
C3.	Common composting facilities should be provided at accessible locations away from dwellings to every residential development for garden waste and organic kitchen waste.
C4.	Consideration should be given to bin storage space for garden organics that are not able to be composted on site ie. thick branches as garden organics cannot be disposed of in Council serviced garbage bins.
C5.	Source separation facilities shall be provided on building sites so that different waste streams may be easily separated during construction and demolition to encourage the re-use and recycling of materials. The source separation facilities are to be clearly indicated on the drawings. Tipping dockets for disposal and recovery of all wastes are required to be held on site during this phase and are subject to auditing and/or inspection by Council.
C6.	In the design of buildings waste should be minimised by: • Matching building dimensions to standard sizes of building materials; • Using recycled materials; • Selecting materials that can be re-used or recycled in the future; and • Utilising component parts that may be easily replaced.
C7.	Plans and drawings of the proposed development that highlight the location of and space allocated to the waste management facilities and the nominated waste collection point must be included in the Waste Management Plan. The path of access for both users and collection vehicles must also be highlighted.

C4.2 Single Dwellings and Dual Occupancies

Controls	
C1.	Residential development are to provide storage space for garbage, recyclables, and garden organics in accordance with the following: Allocated 1x 120L Garbage Bin (1 per dwelling), 1 x 240L Recycling Bin (1 per dwelling) and 1 x 240L Garden Organics (1 per dwelling).

Space Dimensions for Garbage Bins

	Height	Width	Depth
120 L	980mm	500mm	540mm
240 L	1140mm	580mm	715mm

Controls	
C2.	Space must be allocated within each property boundary behind the building line for storing Council specified waste and recycling bins.
C3.	The garbage/recycling storage area shall be constructed of brick or other approved masonry material, have a concrete floor at appropriate level approved by Council and be suitably graded to allow drainage.

C4.3 Multi Dwelling Residential Development

Controls	
C1.	Residential developments are to provide storage space for garbage, recyclables and garden organics in accordance with the following: Allocated 1x 240L Garbage Bin (per 2 residential units), 1 x 240L Recycling Bin (per 2 residential units) and 1 x 240L Garden Organics (per 10 residential units up to a maximum of 20 residential units): and Above 20 units on application to Council.
C2.	In multi-dwelling residential development containing 20 or more dwellings, a bulk garbage and recycling collection service is required. Council supplies 660 ltr bulk recycling and garbage bins. Provision must be made for waste collection vehicles to enter and service all bins on site. Bins cannot be presented on the pedestrian footpath for servicing.
C3.	Garbage chutes are required for all buildings more than 3 storeys in height. All garbage chutes are required to discharge into a compaction unit. Compaction units shall not compact above the ratio of 2:1. Consideration should be given to a chute system that is able to be adapted in the future or space allocated for an additional chute system to be installed, to accept recyclables. It is anticipated that future improvements in resource recovery technologies will allow recyclables to be recovered via a chute system.
C4.	Garbage chute outlets must discharge into the central waste and recycling room. The building caretaker should not be required to transfer waste from one side of the building to the other in order to get it from the chute outlet to the waste and recycling room. All transferring of waste from the central waste and recycling room to the collection point must occur underground.

Spatial requirements

Controls	
C5.	Space must be allocated and a receptacle supplied inside each unit for waste and recycling, each with the capacity to store 2 days' worth of waste and recycling.

Waste Service compartments

Controls	
C6.	In buildings where a chute system is required to be installed, a waste service compartment must be provided on each floor to contain the garbage chute hopper and at a minimum, storage space for 2 days recyclables per unit (34 ltrs) generated on that floor.

C7.	The waste service compartment must have enough space to allow easy use of the chute hopper and manoeuvring of no more than 2 x 240 litre recycling bins. Doors should open outwards to allow maximum storage unless prevented by BCA requirements.
C8.	The space required to collect recyclables within the service compartment will depend upon the number of units on each floor and how frequently the recyclables are transferred to the waste and recycling room. It is recommended that recyclables are transferred daily, however this arrangement will only work when there is a full-time cleaner or maintenance person employed and they are instructed to empty recycling from waste compartment rooms. A service elevator should be considered.

Centralised garbage and recycling room

Controls	
C9.	A centralised waste and recycling room must be provided in an area that is accessible to the users and easy for servicing. The waste and recycling room must be located within the underground carpark or basement. The clearance to the garbage room must be no less than 3.8 m high to allow waste collection vehicles to service bins on site. Waste collection vehicles must move in a forward direction at all times. Where it is not possible to provide this level of access for waste collection vehicles, an alternate area will be required for bin servicing and/or storage. The alternate area must be located on the property boundary line, have a layback of suitable size and be constructed to accommodate collection vehicles. For OH & S reasons access to the alternate servicing/storage room for servicing shall be from the layback to ensure bins are serviced with minimal handling.
C10.	In high rise residential developments where there is a full time caretaker on site, it is advisable that access to waste facilities by residents is limited to only the service compartments located on each floor, and the bulky items storage area. This is to help prevent contamination of recycling bins. Council will not collect recycling bins that are contaminated with unacceptable materials.
C11.	A room or caged area must be allocated for the storage of discarded bulky household items awaiting collection and should be incorporated within the waste and recycling room. The space shall be adequate in size to meet the needs of the residents and shall be divided into sections ie. metals, e-waste, mattresses to maximise resource recovery. The ongoing management of disposal/recovery of these items is to be addressed in the waste management plan. The allocated space must be a minimum of 5m³. Consideration should be given to allocating space for a charity clothing bin, as well as printer cartridge, toner bottle and mobile phone recovery bins as these items are able to be recovered by the private sector at no charge. Implementation of these types of recovery options will reduce the overall waste generated in these development sites.

Residential amenity

Controls	
C12.	Residential dwellings must be adequately insulated from noise and smell if they are adjacent to or above: • chutes or waste storage facilities, or • chute discharge, or • waste compaction equipment, or • waste collection vehicle access points.
C13.	Where possible, chutes should not be situated adjacent to habitable rooms due to the noise from hopper use and waste falling down the shaft.

Waste Management

Controls	
C14.	The Waste Management Plan must describe how the waste management system will work and who is responsible for the transfer of waste and recycling for each stage of the process.
C15.	Signage in waste storage compartments must encourage residents to wrap garbage prior to placement in chutes, specify that no dangerous or bulky items be placed in chutes and provide information about what is acceptable in the recycling system.

C4.4 Controls for Mixed Use Developments

Controls	
C1.	Where a development mixes residential with commercial uses, the waste handling, storage and collection system for residential waste (from the residential area) and commercial waste (from the commercial area) are to be completely separate and self-contained. They must have separate keys and locking systems.
C2.	The Waste Management Plan prepared for a mixed use development must identify the collection points and management systems for both residential and commercial waste streams.
C3.	The waste handling and management system for each component of the mixed development must comply with the relevant provisions of this DCP (eg. Separate residential and commercial collection areas).
C4.	Sufficient space must be allocated in each waste and recycling storage room to store the amount of waste likely to be generated in each respective part of the development.
C5.	Each waste and recycling room must be located in an area that is easily accessible for waste services collection vehicles and convenient to the users.
C6.	Measures must be taken to ensure that noise and odour from the commercial waste facilities does not impact on residents.
C7.	Commercial tenants in a mixed development must be actively discouraged from using the residential waste facilities.
C8.	The waste storage and recycling area shall be designed to enable each separately tenanted or occupied area within the building or complex to be provided with a designated and clearly identified space for the housing of sufficient commercial bins to accommodate the quantity of waste and recycling material likely to be generated.

Commercial/Industrial Premises

Controls	
C9.	A waste and recycling room must be provided on each floor level within a retail development. The waste and recycling area must have the capacity to store at least one (1) day's volume of waste and recycling likely to be generated on that floor level. Refer to Table C-G for waste generation rates.
C10.	Material from the waste and recycling room must be transferred to the centralised waste and recycling room or holding area daily or more frequently, as required.
C11.	If more than 10m³ of non-compacted waste and recycling is calculated to be generated per day (as described in the Waste Management Plan), the central waste and recycling room must be separate from the goods receivable dock or service vehicle bay area.

Controls	
C12.	The waste and recycling area should be flexible in design so as to allow for a variety of bin sizes and types and future changes in the use of the commercial/ industrial units.
C13.	The waste collection area shall be covered, drained to the sewer as per a Sydney Water Trade Waste Agreement and may need bunding depending on the material to be stored within the area.
C14.	All development applications involving demolition or construction are to be accompanied by a completed Waste Management Plan. A Waste Management Plan form may be obtained from Council's website or Council's Customer Service Centre.
C15.	Sufficient space shall be provided on-site for waste separation.
C16.	A well designed and located waste storage and recycling area and/or garbage and recycling room shall be provided on-site.
C17.	Clear access for staff and collection services is to be provided.
C18.	Facilities are to be carefully sited and well designed to not have an adverse impact on adjoining premises or amenity.
C19.	Where multiple occupancy (such as a suite of shops or an office complex) is proposed, communal facilities may be appropriate, particularly where: a) The design makes it difficult for all units to have access to a collection point; or b) Site characteristics restrict entry of vehicles.
C20.	The waste storage and recycling area shall have a concrete floor, suitably graded to allow drainage and be designed to enable each separately tenanted or separately occupied area within the building or complex to be provided with a designated and clearly identified space for commercial waste containers.
C21.	The waste storage and recycling area should be sited to allow easy vehicular access (preferably from the rear of the property) and opportunities for screen landscaping.
C22.	A building containing more than three storeys shall be provided with an acceptable method for transporting waste from each level to a garbage and recycling room. Space must be provided on each floor for temporary storage of waste material and recyclables. Ongoing management should be detailed in the Waste Management Plan.
C23.	For offices and commercial premises, particular attention should be paid to paper, cardboard, glass, aluminium, steel and plastic (1-7) recycling, with source separation at the waste storage and recycling area or garbage and recycling room.
C24.	For restaurants and other premises which deal with perishable food stuffs, special attention should be paid to food scrap generation. Specialised containment should be provided and a regular/daily collection service arranged.
C25.	Refrigerated garbage rooms should be provided when large volumes, perishables (such as seafood) and infrequent collection is proposed.
C26.	Grease traps must be provided, where appropriate. Contact should be made with Sydney Water to obtain their trade waste requirements.

C27.	Where special waste material is to be generated by professional services such as but not limited to medical centres, dentists and aged care facilities, special arrangements will be required which should be detailed in the Waste Management Plan.
C28.	Commercial developments are to provide storage space for garbage and recyclables in accordance with Table C-G below.

Table C-G Waste generation rates for Mixed Use Areas and Neighbourhood Centres

Type of premises	Waste generation	Recycling generation
Backpackers accomodation	40L/occupant/week	20L/occupant/week
Boarding house, guest house	60L/occupant/week	20L/occupant/week
Food Premises		
Butcher	150L/100m^2 floor area/day	120L/100m^2 floor area/day
Delicatessen	150L/100m^2 floor area/day	120L/100m^2
Fish shop	150L/100m^2 floor area/day	120L/100m^2 floor area/day
Greengrocer	240L/100m^2 floor area/day	120L/100m^2 floor area/day
Restaurants	10L/1.5m^2 floor area/day	2L/1.5m^2 floor area/day dining
Supermarket	240L/100m^2 floor area/day	240L/100m^2 floor area/day
Takeaway	150L/100m^2 floor area/day	120L/100m^2 floor area/day
Hotel	5L/bed/day 50L/100m^2/bar area/day 10L/1.5m^2 of dining area/day	120L/100m^2/of bar and dining areas/day
Licensed club	50L/100m^2 of bar area/day 10L/1.5m^2 of dining area/day	120L/100m^2 of bar and dining areas/day
Motel (without public restaurant)	5L/bed/day 10L/1.5m^2 of dining area/day	1L/bed/day
Offices	10L/100m^2 floor area/day	40L/100m^2 floor area/day
Retail (other than food sales)		
Shop less than 100m2 floor area	50L/100m^2 floor area/day	25L/100m^2 floor area/day
Shop over 100m2 floor area	50L/100m^2 floor area/day	50L/100m^2 floor area/day
Showrooms	40L/100m^2 floor area/day	10L/100m^2 floor area/day

C5 Preservation of trees and vegetation

C5.1 Pruning and removal of trees

Objectives

O1. The aim of the DCP is to conserve and enhance the treescape and environmental amenity of the City of Canada Bay.

Controls	
C1.	A person must not ringbark, cut down, top, lop, remove, injure or wilfully destroy any tree or other vegetation to which this development control plan applies if: a) The tree has a height of, or greater than, four (4) metres; b) The tree has a trunk girth of, or greater than, 500mm at any point; or c) The tree is a cycad or mangrove, irrespective of its dimensions without a permit granted by the Council.
C2.	If the tree or other vegetation is or forms part of a Heritage Item or is within a Heritage Conservation Area, then development consent is required. Refer to clause 5.9 of the Canada Bay LEP.
C3.	Exemptions: A person will be exempt from the prohibition stated in C1 above with respect to particular tree works if Council establishes that: a) The tree was dead or that the works were limited to the removal of dead branches; b) The tree was one of the following exempt species (provided the tree is not listed as a Heritage Item in an environmental planning instrument – in which case the prohibition applies):

Alnus jorullensis	Evergreen Alder
Bambusa spp	Bamboo
Celtris occidentalis	Sugarberry
Erythrina x sykesii	Indian Coral
Erythrina crista-galli	Coral Tree
Ficus elastica	Rubber Tree
Ligustrum spp	Privet
Nerium oleander	Oleander
Olea Africana	African olive
Populus spp	Poplar
Salix spp	Willow
Schefflera spp	Umbrella Tree
Syagrus romanzoffianum	Queen/Cocos Palm
Toxicodendron spp	Rhus Tree
Cinnamomum camphora (Camphor Laurel) or Liquidamber spp (Liquidamber) where the outside edge of the trunk of such tree is located within 3 metres of any single storey dwelling (not being an out building eg. Garage, carport, shed, etc).	Camphor Laurel or Liquidamber
A fruit tree grown for the purposes of fruit or fodder production except Acmena spp (Lilly Pilly), Syzygium spp (Lilly Pilly) or Elaeocarpus spp (Blueberry Ash).	Lilly Pilly or Blueberry Ash

c) The tree is a declared noxious weed in the local government area of the City of Canada Bay under the Noxious Weed Act 1993; and

d) The tree works were limited to the maintenance of a minimum clearance of five hundred (500) millimetres from domestic service leads as specified by Energy Australia, provided that the works were carried out by a qualified or experienced Arborist or Tree surgeon, in accordance with the Australian Standards for the Pruning of Amenity Trees AS 4373-1996.

Note: Definitions for Council, Injuring, Removal/Cutting down and Tree are contained within Part J of this DCP.

C5.2 Assessment of trees

Objectives

O1. Providing a guide to the regulatory framework for the preservation of trees;

O2. Helping in establishing a coordinated approach to the assessment and management of trees.

Controls	
C1.	Council may issue a permit or development consent for the removal of tree(s) if the following criteria are met: a) The tree is a poor specimen and is in decline and or inappropriate for the location; b) The tree has caused significant structural damage and supporting documentation is provided i.e. structural engineer's report; and c) It can be demonstrated that there is an on-going problem with the tree and no other course of action will rectify the problem.
C2.	Council may issue a permit or development consent for the pruning of tree(s) if the following criteria are met: a) The tree(s) have structural defects and or disease and remedial pruning (to AS 4373-1996), will improve the health of the tree; and b) The tree(s) require crown thinning (no reduction in height permitted) to reduce weight within the tree if the tree is overhanging property or for other areas deemed appropriate i.e. access issues etc. A percentage no greater than 15% is generally issued. In some circumstances it may be necessary for you to supply, at your cost, an independent arborist's, structural, plumber's and or pest report. A comprehensive report must meet the criteria as outlined in Council's Guidelines for the Preparation of Reports available from Council. The Tree Management Officer will determine if such reports are necessary and such circumstances may include those where there is the possibility that the tree has been deliberately tampered with or extra supporting information is needed.

Emergency Procedures

Controls	
C3.	a) Where a tree(s) pose a potential hazard to property, the applicant should identify this on the application form. Council may expedite the assessment. No responsibility shall be taken by Council should a tree fail and cause damage or injury prior to inspection and the issue of the Tree Preservation Permit; b) Emergency Permits may be issued to applicants if deemed necessary by Council's Tree Management Officer(s); and c) In respect of potential hazard situations, tree problems do not usually occur in the short term, (except in the event of physical/mechanical damage i.e. storm activity etc)

C5.3 Canada Bay tree species

O1. To preserve and enhance native wildlife populations and habitat through appropriate planting of indigenous vegetation.

Controls	
C1.	Trees selected for inclusion in landscaping should comprise native vegetation indigenous to Canada Bay and should be chosen from Table C-H.

Table C-H Native trees

Native Trees	Common Name	Size, Foliage, Fruit, Indigenous	Private Gardens	Small Gardens	Parks	Streets/ Carparks
Acacia falcata	Sickle Wattle	4m, evergreen, indg.	Yes	Yes	Yes	
Acacia fimbriata	Fringed Wattle	7m, evergreen	Yes	Yes	Yes	
Acacia floribunda	Sally Wattle	7m, evergreen, indg.	Yes	Yes	Yes	
Acacia longifolia	Sydney Golden Wattle	5m, evergreen, indg.	Yes	Yes	Yes	
Acacia melanoxylon	Blackwood	7-15m, evergreen	Yes		Yes	
Acacia prominens	Gosford Wattle	8m, evergreen, indg.	Yes	Yes	Yes	
Acacia parramattensis	Sydney Wattle Green	9m, evergreen, indg.	Yes	Yes	Yes	
Acmena smithii	Lilly Pilly	6-10m, evergreen, indigenous	Yes		Yes	Yes
Acmena smithii vaminor	Dwarf Lilly Pilly	7m, evergreen, indg.	Yes	Yes	Yes	Yes
Allocasuarina littoralis	Black She-oak	10m, evergreen, slender shape, indg.	Yes	Yes	Yes	Yes
Angophora costata	Angophora, Sydney Red Gum	15m, evergreen, indg.	Yes		Yes	Yes
Archontophoenix cunninghamiana	Bangalow Palm	5-8m, palm	Yes	Yes	Yes	
Backhousia mytifolia	Grey Myrtle	5-8m, evergreen	Yes	Yes	Yes	
Banksia integrifolia	Coastal Banksia	5-8m, evergreen, indg.	Yes	Yes	Yes	Yes
Banksia serrata	Old Man Banksia	5m, evergreen	Yes	Yes	Yes	Yes
Brachychiton acerifolium	Illawarra Flame Tree	10m, deciduous, Indigenous	Yes		Yes	
Callicoma serratifolia	Black Wattle	8m, evergreen, indg.	Yes	Yes	Yes	
Callistemon viminalis	Weeping Bottlebrush	5m, evergreen	Yes	Yes	Yes	Yes
Callistemon salignus	Willow Bottlebrush	5-7m, evergreen, indg.	Yes	Yes	Yes	
Callitris rhomboidea	Port Jackson Pine	8m, evergreen, indg.	Yes	Yes	Yes	
Cassine australis	Red Olive Berry	5-7m, evergreen	Yes	Yes	Yes	
Casuarina cunninghamiana	River She-oak	10m, evergreen			Yes	Yes
Elaeocarpus reticulatus	Blueberry Ash	10m, evergreen indg.	Yes	Yes	Yes	
Ehreta acuminata	Koda	7-10m, rainforest tree	Yes	Yes	Yes	

Native Trees	Common Name	Size, Foliage, Fruit, Indigenous	Private Gardens	Small Gardens	Parks	Streets/ Carparks
Eucalyptus botryoides	Mahogony	20m, evergreen			Yes	Yes
E. ficifolia	Red Flowering Gum	8m, evergreen	Yes	Yes	Yes	Yes
E. haemastoma	Scribbly Gum	12m, evergreen,indg.	Yes		Yes	Yes
E. leucoxylon roseri	Yellow Gum	10-12m, evergreen	Yes	Yes	Yes	Yes
E. maculata	Spotted Gum	20m, evergreen			Yes	Yes
E. sideroxylon	Ironbark	15m, evergreen			Yes	Yes
Ficus macrophylla	Moreton Bay Fig	35m, evergreen			Yes	
Ficus rubignosa	Port Jackson Fig	20m, evergreen			Yes	
Flindersia australis	Austr. Teak	20m, evergreen			Yes	Yes
Howea forsterana	Lord Howe Island Palm	5m, palm	Yes	Yes	Yes	
Hymenosporum flavum	Native Frangipani	8m; evergreen, flowers	Yes	Yes	Yes	Yes
Leptospermum laevigatum	Coastal Tea Tree	7m, evergreen	Yes	Yes	Yes	
Livistona australis	Cabbage Palm	7m, palm	Yes	Yes	Yes	
Lophostemon confertus	Brush-Box	10m, evergreen			Yes	Yes
Macadamia integrifolia	Macadamia	7m, evergreen	Yes	Yes	Yes	
Melia azedarach	White Cedar	7-10m, deciduous	Yes	Yes	Yes	Yes
Melaleuca armillaris	Honey Myrtle	4m, evergreen	Yes	Yes	Yes	Yes
M. linariifolia	Snow in Summer, Ball Honey Myrtle	4m, evergreen	Yes	Yes	Yes	Yes
M. nodosa		3m, evergreen	Yes	Yes	Yes	
M. quinquinervia	Swamp Paperbark	10m, evergreen	Yes		Yes	
M. squarrosa	Scented Paperbark	10m, evergreen	Yes	Yes	Yes	
M. styphelioides	Prickly Paperbark	12m, evergreen	Yes		Yes	Yes
Omalanthus populifolius	Bleeding Heart	5m, evergreen	Yes	Yes	Yes	Yes
Pittosporum undulatum	Sweet Pittosporum	8m, evergreen			Yes	Yes
Polyscias elegans	Celery Wood	8-10m, rainforest tree	Yes	Yes	Yes	
Syzygium leumanhii	Riberry	8m, evergreen, rainforest tree	Yes	Yes	Yes	
Tristaniopsis laurina	Water Gum	6-7m, evergreen	Yes		Yes	Yes

Table C-I Exotic trees

Exotic Trees	Common Name	Size, Foliage, Fruit, Indigenous	Private Gardens	Small Gardens	Parks	Streets/ Carparks
Acer palmatum	Japanese Maple	5m, deciduous	Yes	Yes	Yes	
Agonis flexuosa	Willow Myrtle	5-7m, evergreen	Yes		Yes	Yes
Bauhinia blakeana	Orchid Tree	7m, evergreen	Yes	Yes	Yes	
Caesalpinia ferrea	Leopard Tree	10m, open crown	Yes	Yes	Yes	
Cercis siliquastrum	Judas Tree	15m, deciduous	Yes		Yes	Yes
Citrus limon Citrus X tangelo Citrus aurantiurn	Lemon Tree Tangelo Tree Orange Tree	3-5m, evergreen	Yes	Yes		
Ginkgo biloba	Maidenhair Tree	10-15m, deciduous	Yes		Yes	Yes
Gleditsia triancanthos sunburst	Honey Locust	15-25m, deciduous			Yes	Yes
Jacaranda mimosifolia	Jacaranda	7-10m, deciduous in spring, purple flowers	Yes		Yes	Yes
Lagerstroemia indica	Crepe Myrtle	7m, deciduous	Yes	Yes	Yes	Yes
Liquidambar styraciflua	Liquidambar	15-20m, deciduous	Yes	No	Yes	Yes
Litchi chinensis	Lychee	7m, evergreen, fruit	Yes	Yes	Yes	
Magnolia denudata	Magnolia	10m, deciduous	Yes	Yes	Yes	
Magnolia grandiflora	Magnolia	15m, wide crown	Yes		Yes	Yes
Malus floribunda	Crab Apple	5m, deciduous, fruit	Yes	Yes		
Morus rubra	Mulberry	5m, deciduous, fruit	Yes	No	Yes	
Olea europaea	Olive	5m, evergreen, fruit	Yes	Yes	Yes	
Paulownia Tomentosa	Butterfly Tree	10m, deciduous	Yes	Yes	Yes	
Pistacia chinensis	Chinese Pistachio	15m, deciduous	Yes	Yes	Yes	Yes
Platanus orientalis	Plane Tree	35m, deciduous			Yes	Yes
Platanus x hybrida	London Plane	15-25m, deciduous, hardy	Yes		Yes	Yes
Plumeria rubra	Frangipani	3-5m, deciduous	Yes	Yes	Yes	
Robinia pseudoacacia	Black Locust	12m, deciduous, white fragrant flowers	Yes		Yes	
Sapium sebiferum	Chinese Tallow Tree	7m, deciduous	Yes	Yes	Yes	Yes
Schinus molle	Peppercorn Tree	12m, evergreen	Yes		Yes	
Ulmus parvifolia	Chinese Elm	10m, deciduous	Yes		Yes	Yes
Washingtonia filifera	Cotton Palm	10m, palm	Yes	Yes	Yes	

C6 Engineering Requirements for Development

C6.1 Engineering works

Council has adopted a separate Civil Infrastructure Works Policy and Engineering Technical Specification which aims to provide engineering requirements for the following:

- Road and Footpath Works
- Vehicular Access
- Stormwater Management

Council requires that all future public infrastructure, development and building works within the Canada Bay Local Government Area comply with the Engineering Technical Specification to ensure that developments and construction of public domain areas are undertaken to aceptable standards.

A full copy of the Engineering Technical Specifications is provided as Attachment 2.

C6.2 Objectives

Road and Footpath Works

Objectives

O1. To povide adequate engineering standards for public domain areas, public road reserves and private access roads.

O2. To ensure that there is a benefit to the public resulting from development and the result is that the public is catered for by uniform infrastructure. Such infrastructure includes the road carriageway, footway, footpath, pavement, kerb and gutter, street trees, utility services, ancillaries and the like.

Vehicular Access

Objectives

O3. To ensure uniformity in the design and construction of vehicular crossings in the City of Canada Bay Local Government Area.

O4. To ensure that safe and convenient vehicular access can be provided to and from parking spaces for all properties.

Stormwater Management

Objectives

O5. To provide uniform guidelines and apply control systems to achieve consistency, in the assessment and conditioning of development applications, in relation to stormwater runoff from all development types.

O6. To minimise any adverse impact on properties caused by stormwater runoff from all development types.

O7. To ensure that the water quality of receiving waterways is not adversely affected by the discharge of pollutants such as nutrients and pathogens, from stormwater runoff as a result of development.

O8. To ensure that uniform stormwater controls are applied throughout the whole of the City of Canada Bay Council Local Government Area.

C7 Flooding Control

C7.1 Introduction

Flooding can be a significant issue that affects people and development in some areas of the City of Canada Bay. The hazard can vary through a wide range over short distances and should be assessed on a location by location basis.

This Section establishes Council's approach to flood related development control for the whole LGA. Council's approach to flooding is based on the requirements of the New South Wales Government's Flood Prone Land Policy and Floodplain Development Manual as amended (FDM 2005).

Different controls are applicable depending on the land use, level of potential flood inundation and flood hazard category.

C7.2 Relationship to other documents

In areas where Council has adopted a Flood Study or Floodplain Risk Management Study or Floodplain Risk Management Plan that sets a flood planning area and freeboards, these will take precedence over the following DCP controls where there is any inconsistency.

C7.3 Land to which this Flood Control clause applies

This section applies to:

- Land which is shown as 'Flood Planning Area' in a Flood Planning Map in the Canada Bay Local Environmental Plan.
- Land which is recommended to be shown as a Flood Planning Area in the Canada Bay Local Environmental plan by a publicly exhibited and/or adopted Flood Study prepared in accordance with the FDM (2005).

Where Council is of the understanding that land subject of an application is or may potentially be affected by flooding, Council may require the applicant to prepare a flood study.

Definitions:

Words and phrases in this section have the meanings assigned in the LEP and FDM(2005).

A 'High Flood Risk' Precinct is an area of land that under 1%AEP conditions is either subject to a high hydraulic hazard or presents significant evacuation difficulties.

A 'Medium Flood Risk' Precinct is an area of land that under 1%AEP conditions is not subject to a high hydraulic hazard and presents less than significant evacuation difficulties.

A 'Low Flood Risk' Precinct is the area above the 100 year flood and includes all area up to and including the 'Probable Maximum Flood (PMF)'.

Freeboard represents a nominated additional height above a flood level to provide a safety factor against inundation. It is used to set minimum floor levels.

Abbreviations:

AEP: Annual Exceedance Probability

FDM 2005: Floodplain Development Manual

FRMP: Flood Risk Management Plan

FRMS: Flood Risk Management Study

Objectives

O1. To ensure the proponents of development and the community in general are aware of the potential flood hazard over the whole range of AEP and of the consequent risk and liability associated with the development and use of flood liable land.

O2. To manage flood liable land in manner that is economically and environmentally sustainable and socially responsible.

O3. To establish whether or not a proposed development or activity is appropriate to be carried out having regard to the economic, property, environmental and human impacts of flooding.

O4. To protect community by ensuring that developments with high sensitivity to flood risk (eg. critical public utilities) are sited and designed to provide reliable access, continued operability during emergencies, quick recovery and to generally minimise risk from flooding.

O5. To allow development with a lower sensitivity to the flood hazard to be located within the floodplain, subject to appropriate design and siting controls and provided that the potential consequences that could still arise from flooding remain acceptable.

O6. To prevent intensification of inappropriate development.

O7. To control the use of 'High Hazard' areas and Floodways, and wherever appropriate and feasible, allow for their conversion to natural waterway corridors.

O8. To ensure that proposed development does not expose existing development to increased risks associated with flooding.

O9. To ensure building design and location address flood hazard.

O10. To ensure that development does not result in unreasonable flood impacts upon the amenity or ecology of an area.

O11. To incorporate the principles of Ecologically Sustainable Development (ESD).

O12. To minimise the risk to life and property arising from flooding.

O13. To ensure the provision of appropriate access to and egress from areas affected by flooding including for extreme events.

O14. To provide controls to ensure that development is carried out in accordance with this Policy.

O15. To implement the principles of floodplain risk management as defined by the NSW Government's Flood Prone Land Policy and the FDM 2005.

Design Principles

D1. Development should not result in any increased risk to human life.

D2. The additional economic and social costs which may arise from damage to property from flooding should not be greater than that which can reasonably be managed by the property owner, property occupants and general community.

D3. Development should only be permitted where effective warning time is available for the evacuation of an area potentially affected by floods to an area free of risk from flooding.

D4. Development should only be permitted where reliable egress is available for the evacuation of an area potentially affected by floods to an area free of risk from flooding.

D5. Evacuation should be consistent with any relevant flood evacuation strategy or flood risk management plan where in existence.

D6. Development should not adversely increase the potential flood affectation on other development or properties, either individually or in combination with similar developments(s) that are likely to occur within the same catchment.

D7. Developments must make allowances for motor vehicles to be relocated to an area with substantially less risk from flooding within an effective warning time.

D8. Developments must provide an evacuation plan detailing procedures that would be in place for an emergency (such as warning systems, signage or evacuation drills).

D9. Flood mitigation measures associated with new developments should not result in significant impacts upon the amenity of an area by way of unacceptable overshadowing of adjoining properties, privacy impacts (eg. by unsympathetic house raising), alienation of otherwise usable open space or by being incompatible with the streetscape or character of the locality (including heritage).

D10. Raised structures shall be designed to cater for the forces of floodwaters. An Engineer's Certificate will be required for the structural design.

D11. Development is to be compatible with any relevant Floodplain Risk Management Study, Floodplain Risk Management Plan, Flood Studies, or Sub-Catchment Management Plan.

D12. Development must not divert flood waters, nor interfere with floodwater storage or the natural function of waterways.

D13. Filling of land up to the Probable Maximum Flood (PMF) must not adversely impact upon flood behaviour. This must be demonstrated by appropriate modelling.

D14. Development must consider the impact of flooding resulting from local overland flooding whether it is a result of Local Drainage or Major Drainage.

D15. Where hydraulic flood modelling is required, flow hazard categories should be identified and adequately addressed in the design of the development.

D16. Council strongly discourages basement car parks on properties within the floodplain. Where site conditions require a basement car park on a property within the floodplain, development applications must provide a detailed hydraulic flood study and design demonstrating that the proposed basement car park has been protected from all flooding up to and including the PMF event. An adequate emergency response and evacuation plan must also be provided where basement car parks are proposed in the floodplain.

C7.4 Development Controls

All proposals are to have regard to the planning matrix at Table C-K. The procedure to determine which design standards apply to proposed development involves:

Step 1: identify the land use category of the development from Table C-K; and

Step 2: determine which flood risk category applies to the land (in some areas Council may have undertaken a formal flood study and published flood risk mapping or made the data available on application. Where Council is of the understanding that land subject of an application is or may potentially be affected by flooding, Council may require the applicant to prepare a flood study.); and

Step 3: apply the objectives and design principles as outlined in this section and then the design standards in the planning matrix at Table C-K as applicable to the floodplain and land use category, the numbers in Table C-K identify the controls which are applicable as detailed in C7.5 Details of Flood Controls (Flood Planning Matrix).

NOTE: An evacuation plan does not negate requirements for compliance with planning and building regulations.

Table C-J Land Use and Development Category Definitions

Sensitive Uses and Facilities	Community facilities or public administration buildings which may provide an important contribution to the notification and evacuation of the community during flood events(eg community buildings that may serve as evacuation centres); Facilities which involve concentrations of more vulnerable people; Child care centres; Hospitals; Residential care facilities; Seniors housing; Educational establishments. (See also “Concessional Development”)
Critical Uses and Utilities	Public utilities, community facilities or public administration buildings which provide direct emergency response. (Eg Police Stations, Ambulance Stations, SES Headquarters, Council Works Depots, Telecommunication facilities.) Hazardous industries; Hazardous storage establishments; Offensive industries; Offensive storage establishments; Liquid fuel depots; Undertakings which may cause pollution during flooding, are essential to evacuation during periods of flood or if affected during flood events would unreasonably affect the ability of the community to return to normal activities after flood events; Waste management facilities. (See also “Concessional Development”)
Subdivisions	Subdivision of land which involves the creation of additional allotments.
Filling	The net importation of fill material onto a site, except where: 1. final surface levels are raised by no more than 100mm over no more than 50% of the site; or 2. filling is no more than 800mm thick beneath a concrete building slab only. Earthworks involving both cut and fill shall not be considered to be filling provided that: 1. there is no net importation of fill material onto the site; and 2. there is no net loss of flood storage.
Residential	Residential accommodation unless more specifically included in the Sensitive Uses and Facilities category above or Commercial Industrial category below. (See also “Concessional Development”)
Commercial or Industrial	Bulky goods premises; Business Premises; Car parks; Depots; Entertainment facilities; Food and drink premises; Freight transport facilities; Funeral chapels; Funeral homes; Function centres; Hardware and building supplies; Heavy industries; Hotel accommodation; Industries; Landscape and garden supplies; Light industries; Materials recycling or recovery centres; Medical centres; Mixed use development; Office premises; Passenger transport facilities; Places of public worship; Public administration buildings (other than an essential community facility); Pubs; Recreation facilities (indoor); Registered clubs; Restricted premises; Retail Premises; Service stations; Sex services premises; Shop top housing; Tourist and visitor accommodation; Vehicle body repair workshops; Vehicle repair stations; Vehicle showrooms; Veterinary hospitals; Warehouse or distribution centres. (See also “Concessional Development”)
Tourism Related Development	Advertising structures; Kiosks; Markets; Information and education facilities; Signage.

Open Space or Non-urban Uses	Recreation facilities (outdoor); Recreation areas and minor ancillary structures (e.g. Amenities blocks or kiosks) Boat launching ramps; Boat repair facilities; Boat sheds; Jetty; Animal boarding and training establishments; Environmental facilities; Helipad.
Concessional Development	Concessional development is any development or redevelopment that would normally not be permitted under this Plan, but may be permitted as a concession provided it:- 1. is kept clear of any floodway; and 2. involves an acceptably small (see below for limits) addition or alteration to an existing development that will not cause a significant increase in potential flood losses or risks or have an adverse impact on adjoining properties; or 3. redevelopment that achieves a substantial reduction of the extent of flood affectation relative to the existing situation provided that such redevelopments incorporate, to the fullest extent practical, design features and measures to reduce the existing potential for flood losses and personal risks and avoid any adverse impacts on adjoining properties – especially obstruction or diversion of floodwaters and loss of flood storage. **Limits for residential development. The maximum size of a concessional development is:** 1. a once-only addition or alteration to an existing dwelling of no more than 10% or 30m^2 (whichever is the lesser) of the habitable floor area which existed at the date of commencement of this Policy or Plan; or 2. the construction of an outbuilding with a maximum floor area of 20m^2. **Limits for other (non-residential) development** In the case of other development categories, the maximum size of a concessional development is a once-only addition to existing premises of no more than 10% of the floor area which existed at the date of commencement of this Policy or Plan.

Table C-K Flood Planning Matrix

Planning & Development Controls — Flood Risk Precincts

Low Flood Risk

Planning Consideration (the numbers below identify the controls which are applicable, as contained in section C7.5)	Sensitive Uses & Facilities	Critical Uses & Facilities	Subdivision	Filling	Residential*	Commercial & Industrial	Tourist Related Development	Open Space & Non-Urban	Concessional Development
Floor Level	3	3			2, 5	2, 5	2, 5		
Building Component	2	2							
Structural Soundness	2	2							
Flood Affection	2	2	2	1	2	2	2		
Car Parking & Driveway Access	1, 3 5, 6, 8	1, 3 5, 6, 8			1, 3 5, 6, 8	1, 3 5, 6	1, 3 5, 6	2, 4 6, 7	
Evacuation	2, 4	2, 4 6	5		3, 4	4	4		
Management & Design	2, 3	2, 3 4	1						

Medium Flood Risk

Planning Consideration	Sensitive Uses & Facilities	Critical Uses & Facilities	Subdivision	Filling	Residential*	Commercial & Industrial	Tourist Related Development	Open Space & Non-Urban	Concessional Development
Floor Level					2, 5	2, 5	2, 5	2, 5	2, 5
Building Component					1	1	1	1	1
Structural Soundness					1	1	1	1	1
Flood Affection			1		1	1	1	2	1
Car Parking & Driveway Access					1, 3 5, 6 7,8	1, 3 5, 6 7	1, 3 5, 6 7	2, 4 6,7	1, 5
Evacuation			5, 3, 4		3, 4, 6	3, 4, 6	3, 4, 6	1, 4	3, 6
Management & Design			1		2, 3, 4	2, 3, 4	2, 3, 4	2, 3, 4	2, 3, 4

High Flood Risk

Planning Consideration	Sensitive Uses & Facilities	Critical Uses & Facilities	Subdivision	Filling	Residential*	Commercial & Industrial	Tourist Related Development	Open Space & Non-Urban	Concessional Development
Floor Level								1, 5	4, 5
Building Component								1	1
Structural Soundness								1	1
Flood Affection								1	1
Car Parking & Driveway Access								2, 4 6, 7	1, 5
Evacuation								1.4	3, 4 6
Management & Design								2, 3, 4	2, 3, 4

Colour Key Not Relevant Unsuitable Land Use * For redevelopment refer also to 'Concessional Development' provisions

Notes

i Canada Bay Local Environmental Plan 2013 identifies development permissible with consent in various zones. Notwithstanding, constraints to individual sites may preclude the granting of consent for certain forms of development on all or part of a site. The above matrix identifies where flood risks are likely to determine where certain development types will be considered "unsuitable" due to flood related risks.

ii Filling of site, where acceptable to Council, may change the FRP used to determine the controls applied in the circumstances of individual applications.

iii Any fencing that forms a part of a proposed development is subject to the relevant Flood Effects and Structural Soundness planning considerations of the applicable land use category. Fences may need to be of open design to address this cause.

iv Development within the floodplain may be subject to Clause 6.4 Limited Development On Foreshore Area and Foreshore building line provisions in the Canada Bay Local Environmental Plan 2013.

Note that the land above the PMF level is not captured by the above matrix.

C7.5 Details of the Flood Controls
(Flood Planning Matrix see Table C-K)

Floor Level

Controls	
C1.	Floor levels to be equal to or greater than the 20 year Average Recurrence Interval (ARI) flood level plus freeboard.
C2.	Habitable floor levels to be equal to or greater than the 100 year ARI flood level plus freeboard.
C3.	All floor levels to be equal to or greater than the Probable Maximum Flood (PMF) level.
C4.	Floor levels to be equal to or greater than the 100 year ARI flood level plus freeboard. Where this is not practical due to compatibility with the height of adjacent buildings, or compatibility with the floor level of existing buildings, or the need for access for persons with disabilities, a lower floor level may be considered. In these circumstances, the floor level is to be as high as practical, and, when undertaking alternations or additions, no lower than the existing floor level.
C5.	A restriction is to be placed on the title of the land, pursuant to S.88B of the Conveyancing Act, where the lowest habitable floor area is elevated more than 1.5m above finished ground level, confirming that the subfloor space is not to be enclosed.
C6.	Because of the particular catchment characteristics of the Concord West Precinct, additional requirement is for habitable floor levels to be at a minimum of RL 3.0m AHD. Refer to sections 9.3.3, 9.3.6, and 10.2.3 of the CWFS.

Building Components and Method

Controls	
C1.	All structures to have flood compatible building components below the 100 year ARI flood level plus freeboard.
C2.	All structures to have flood compatible building components below the PMF.

Structural Soundness

Controls	
C1.	An Engineer's report is required to certify that the structure can withstand the forces of floodwater, debris and buoyancy up to and including a 100 year ARI flood level plus freeboard.
C2.	An Engineer's report is required to certify that the structure can withstand the forces of floodwater, debris and buoyancy up to and including a PMF level.

Flood Affectation

Controls	
C1.	An Engineer's report is required to demonstrate how and certify that the development will not increase flood affectation elsewhere, having regard to: a) loss of flood storage; b) changes in flood levels, flows and velocities caused by alterations to flood flows; and c) the cumulate impact of multiple potential developments in the vicinity.
C2.	The impact of the development on flooding elsewhere to be considered having regard to the three factors listed in C1 above.

Car Parking and Driveway Access

Controls	
C1.	The minimum surface level of open parking spaces or carports shall be as high as practical, but no lower than 0.1m below the 100 year ARI flood level. In the case of garages, the minimum surface level shall be as high as practical, but no lower than the 100 year ARI flood level.

C2.	The minimum surface level of open parking spaces or carports shall be as high as practical, but no lower than 0.3m above the 20 year ARI flood level.
C3.	Garages capable of accommodating more than 3 motor vehicles on land zoned for urban purposes, or enclosed car parking, must be protected from inundation by floods equal to or greater than the 100 year ARI flood. Ramp levels to be no lower than 0.5m above the 100 year ARI flood level.
C4.	The driveway providing access between the road and parking spaces shall be as high as practical and generally rising in the egress direction.
C5.	The level of the driveway providing access between the road and parking spaces shall be no lower than 0.2m below the 100 year ARI flood level.
C6.	Enclosed car parking and car parking areas accommodating more than 3 vehicles, with a floor below the 100 year ARI flood level, shall have adequate warning systems, signage, exits and evacuation routes.
C7.	Restraints or vehicle barriers to be provided to prevent floating vehicles leaving a site during a 100 year ARI flood.
C8.	Enclosed underground car parks shall have all potential water entry points protected from the PMF. The intent of this requirement is to mitigate the creation of life threatening circumstances and very high economic loss such as may occur with the complete inundation of an underground car park. Council may consider relaxation of this requirement if it can be shown by modelling that the catchment characteristics are such that the maximum depth of inundation is less than 300mm. Because of the particular catchment characteristics of the Concord West Precinct, an additional requirement within that precinct is for habitable floor levels to be at a minimum of RL 3.0m AHD. Refer to sections 9.3.3, 9.3.6, and 10.2.3 of the CWFS.

Evacuation

Controls	
C1.	Reliable access for pedestrians required during a 20 year ARI peak flood.
C2.	Reliable access for pedestrians and vehicles required to a publicly accessible location during the PMF peak flood.
C3.	Reliable access for pedestrians and vehicles is required from the site to an area of refuge above the PMF level, either on site (eg. second storey) or off site.
C4.	Applicant is to demonstrate the development is consistent with any relevant flood evacuation strategy or similar plan.
C5.	Applicant is to demonstrate that evacuation in accordance with the requirements of this DCP is available for the potential development resulting from the subdivision.
C6.	Adequate flood warning is available to allow safe and orderly evacuation without increased reliance upon SES or other authorised emergency services personnel.

Management and Design

Controls	
C1.	Applicant is to demonstrate that potential development as a consequence of a subdivision proposal can be undertaken in accordance with this clause, and any applicable flood study, FRMS and FRMP.
C2.	Site Emergency Response Flood Plan required where the site is affected by the 100 year ARI flood level (except for single dwelling-houses).
C3.	Applicant is to demonstrate that area is available to store goods above the 100 year flood level plus freeboard.
C4.	No storage of materials below the 100 year ARI flood level.

C8 Contaminated land

Objectives

O1. Minimise the risk to human and environmental health on land contaminated by past uses.

O2. To ensure each development application includes information sufficient to allow Council to meet its obligation to determine whether development should be restricted due to the presence of contamination.

O3. To facilitate appropriate site remediation to ensure the land is suitable for the intended use.

Note: These obligations are outlined in State Environmental Planning Policy No.55 at the time of adoption of this plan.

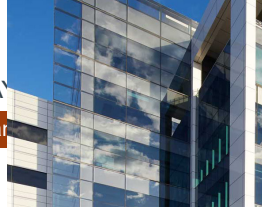
Controls	
C1.	All development must take precautionary steps to prevent the release of substances that cause contamination of soil, surface water, air or groundwater.
C2.	Proposals for the development of contaminated land or potentially contaminated land will need to determine: a) The extent to which land is contaminated (including both soil and groundwater contamination) and; b) Whether the land is suitable in its contaminated state (or will be suitable after remediation) for the purpose for which the development is proposed to be carried out, and; c) Whether the land requires remediation to make the land suitable for the intended use prior to that development being carried out, and; d) If the land has been previously investigated or remediated, development cannot be carried out until Council has considered the nature, distribution and levels of residues remaining on the land and Council has determined that the land is suitable for the intended use.
C3.	In accordance with Clause 9(f) of SEPP 55, Council specifies the following additional works as Category 1 remediation works: a) Remediation work within 40m of an open drainage channel, creek or water body. b) Remediation work involving treatment of groundwater. c) Remediation work involving on-site treatment of contaminated soil e.g., soil stabilisation, land-farming, soil washing or thermal desorption. d) Remediation work involving on-site capping or containment of contaminated soils. e) Remediation work on a site where off site migration of contaminants has occurred. f) Remediation work involving the removal of Petroleum and other Underground Storage Tanks.

C9 Crime prevention through environmental design

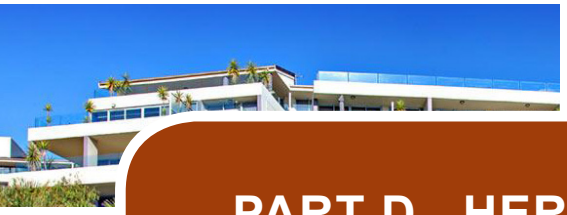
Objectives

O1. Provide a safe environment and minimise opportunities for criminal and anti-social behaviour.

Controls	
C1.	Active spaces and windows of habitable rooms within buildings are to be located to maximise casual surveillance of streets, laneways, parking areas, public spaces and communal courtyard space.
C2.	In commercial, retail or public buildings, facilities such as toilets and parents rooms are to be conveniently located and designed to maximise casual surveillance to facility entries.
C3.	Minimise blind-corners, recesses and other external areas that have the potential for concealment or entrapment.
C4.	Building entries are to be clearly visible, unobstructed and easily identifiable from the street, other public areas and other development. Where practicable lift lobbies, stairwells, hallways and corridors should be visible from the public domain.
C5.	Ground floors of non-residential buildings, the non-residential component of mixed use developments, and the foyers of residential buildings, are to be designed to enable surveillance from the public domain to the inside of the building at night.
C6.	Pedestrian routes from car parking spaces to lift lobbies are to be as direct as possible with clear lines of sight along the route.
C7.	Where dwelling units have individual main entries directly from a public space, the entry is to include a clearly defined transitional space between public and private areas.
C8.	Building details such as fencing, drainpipes and landscaping are to be designed so that illegitimate access is not facilitated by the opportunity for foot or hand-holds, concealment and the like.





D

PART D - HERITAGE

D1 Heritage reports to accompany development applications

Decisions affecting a heritage items or place within a conservation area need to be based on a clear analysis of why a place is significant and how proposals affecting the place have been designed to minimise the impact on the significance of the place. Depending on the significance of the place, strategies or policies to ensure the retention of the significance of the place might need to be developed. For this reason, different types of reports may be required for development proposals affecting places in a conservation area and heritage items.

The following outlines the different types of reports and when they may be required.

Please confirm with Council's heritage advisor if heritage report is needed

D1.1 Statement of heritage impact

A statement of heritage impact analyses and justifies the impact or place in a conservation area, or development in the vicinity of a heritage item of conservation area. Ideally, the impact would be such that the significance of the heritage item is not compromised, but rather enhanced by, for example, its stabilisation or repair and, where appropriate, restoration, reconstruction, adaptive re-use or sympathetic new development.

A statement of heritage impact is required to accompany a building or development application. It should be succinct. Pertinent documents, such as physical condition reports, can be attached. Evidence may be included as to why alternative solutions are not viable.

A statement of heritage impact is to include the following:

- A brief history of the subject site
- A brief description of the subject site including comprehensive photographs
- A statement describing the heritage significance of the site
- A description of the proposed works
- The impact of the proposal on heritage significance
- Any mitigation measures
- Why more sympathetic solutions were not viable
- Relevant heritage controls of this DCP
- Relevant policies in a conservation management document
- For conservation areas, reference could also be made to Design in Context Guidelines for Infill Development in the Historic Environment.

D1.2 Conservation policy

A conservation policy explains the principles to be followed to retain or reveal an item's significance. The aim is to show how the heritage significance of the item can be enhanced and maintained. This relies on a full understanding of the item's significance and a review of the constraints and opportunities arising out of that significance.

The policy should be a positive set of guidelines for enhancing a heritage asset and its significance — not a set of restrictive rules. Heritage items that are restrained by inappropriate policies are in danger of having no viable use and are therefore likely to be neglected, falling into disrepair. The policy should be closely-related and cross-referenced to the statement of significance and to the significance of various elements of the item. Some parts of a heritage item, for example, might be more adaptable to a new use; or it may be essential to retain and enhance some views to, and from, the heritage item.

A conservation policy should be concise, and acceptable to all the parties involved in managing the item's future.

D1.3 Conservation management plan

A conservation management plan states the conservation policy and the statement of significance and looks in more detail at achieving the future viability of the item and retaining the maximum heritage significance in future development proposals.

D1.4 Requirements for heritage reports

The following table outlines what type of Heritage Report is required for a development application.

Table C-A Requirements for heritage reports

Heritage listing	Type of development	Type of heritage report required
Site within a Conservation Area	Demolition – partial or complete	Statement of Heritage Impact
	Change of Use	Statement of Heritage Impact
	Additions and Alterations	Statement of Heritage Impact
	New Development	Statement of Heritage Impact
	Subdivision	Statement of Heritage Impact
	Change of external material (re–roofing, re–cladding, rendering, replacement of windows or joinery)	Statement of Heritage Impact
	Installation of new services	Statement of Heritage Impact
	Landscape work including new fences and driveways, tree removal	No report required
	Change of colour scheme	No report required
	New signage	No report required
	Major Works	Conservation Management Management Plan (or Conservation Management Strategy if agreed by Council)
Heritage item of local significance In some cases, such as where major work is proposed to a heritage item, or where there are compliance issues, a Conservation Management Plan maybe required.	Demolition – partial or complete	Statement of Heritage Impact
	Change of Use	Statement of Heritage Impact
	Additions and Alterations	Statement of Heritage Impact
	New Development	Statement of Heritage Impact
	Subdivision	Statement of Heritage Impact
	Change of external material (re–roofing, re–cladding, rendering, replacement of windows or joinery)	Statement of Heritage Impact
	Installation of new services	Statement of Heritage Impact
	Landscape work including new fences and driveways, tree removal	Statement of Heritage Impact
	New Signage	Statement of Heritage Impact
	Change of colour scheme	No report required
Heritage item of state significance	Demolition – complete or major partial	Conservation Management Plan
	Demolition – minor partial	Conservation Policy
	Change of Use	Conservation Management Plan
	Minor Additions and alterations	Conservation Policy
	Major Additions and alterations	Conservation Management Plan
	Subdivision	Conservation Management Plan
	Change of colour scheme	Conservation Policy
	New development adjacent to heritage item	Statement of Heritage Impact
	New development on the site of a heritage item	Conservation Management Plan
	Change to external material (re–roofing, re–cladding, replacement of windows or joinery)	Conservation Policy
	Installation of new services	Conservation Policy (a Conservation Management Plan might be required if the building is undergoing a major services upgrade)
	Fire Upgrade	Conservation Policy
	Landscape work – minor	Conservation Policy
	Landscape work including new fences and driveways, tree removal	Conservation Management Plan
	New Signage	Conservation Policy

D2 Development of heritage items

Heritage items have been identified as places that should be retained and conserved for future generations. The heritage significance of these places must be understood and respected when designing future development. The following controls assist in designing alterations and additions to places of heritage significance.

D2.1 Setting

Setting is the area around a heritage item that contributes to its heritage significance and may include the visual catchment of a heritage item. Topography, trees, gardens, fencing, and pavement can all contribute to the setting of a heritage item. Where a heritage item is a landmark, it is particularly important that new development does not obscure its visual presence in the streetscape and/or townscape.

Objectives

O1. To provide an appropriate visual setting for heritage items, including landscaping, fencing and carparking.

O2. To ensure that new development respects the contribution of a heritage item to the streetscape and/or townscape.

Controls	
C1.	Original elements that contribute to the setting of a heritage item such as landscaping, fences, driveways, seawalls etc should not be removed.
C2.	Alterations and additions should be located at the rear so that they do not impact on the setting of the heritage item.
C3.	New structures at places of heritage significance such as swimming pools and outbuildings should be located at the rear so that they do not impact on the setting of the heritage item.
C4.	Cut and fill or other work that changes the landform around a heritage item should generally be limited to 1m.

D2.2 Scale

Scale is the size of a building and its relationship with its surrounding buildings or landscape. It is important that new development at places of heritage significance respects the scale of the existing buildings and/or landscape elements that contribute to the significance of the place.

Objective

O1. To ensure that additions to a heritage item and new buildings on the site of a heritage item are of a scale consistent with the heritage item.

O2. To ensure that the heritage item remains the visually dominant element on the site.

Controls	
C1.	Alterations and additions to a heritage item should not be larger in scale than the heritage item and should preferably be single storey.
C2.	Development of a larger scale than the heritage item is allowable only if the new development will not detract from the aesthetic quality and important views of the heritage item.
C3.	Where a large addition or extensive alterations are proposed to a heritage item, conservation works are to be undertaken to the item. This will usually require the preparation of a detailed schedule of conservation works and detail drawings.

D2.3 Form and detailing

The form of a building is its overall shape and volume and the arrangement of its parts. The rooflines of buildings, and elements such as chimneys, parapet walls, verandahs etc are often important elements of the form of a heritage item.

Objectives

O1. To ensure that important elements of the form of a heritage item are not obscured or destroyed by alterations and additions.

O2. To ensure that the form of a heritage item retains its importance in the streetscape and/or townscape.

O3. To ensure authentic restorations or reconstruction, based on documentary (research) or physical evidence.

Controls	
C1.	Important elements of the form of a heritage item such as roof forms, chimneys, parapet walls, verandahs etc should not be demolished or obscured by alterations and additions
C2.	Verandahs on the front and sides of a heritage item should not be infilled.
C3.	Additions should be attached to the original part of the building as wings, linked pavilions or skillions at the back of the house. Additions should not be higher than the ridgeline of the existing building and the existing roof form over the main body of the building should be retained. Pavilions should be set slightly apart from the original house and connected with a lower built element.
C4.	New development, alterations and additions to heritage buildings must be consistent with the scale, shape and materials of the existing (or adjacent) significant building so as not to detract from the visual importance of existing historic buildings in the area or the area's visual consistency and amenity. Materials for additions should be the similar to the existing house, or lighter weight materials such as painted timber, iron or timber cladding.
C5.	Mock historical details should not be applied, as they will not be of any heritage value themselves and can confuse our understanding of what is ‘old’ and ‘new’.
C6.	“Pop top” additions (an additional form extruding above the roof) are not acceptable

D2.4 Materials and colours

The selection of materials and colours is very important to the aesthetic qualities of most built heritage items. Development that includes changing roof materials, re-skinnning of brickwork, rendering or painting of face brickwork and inappropriate textured finishes can degrade the character of a heritage item.

Additions and alterations on the site of a heritage item should take into consideration the original materials of the heritage item. While it is not always necessary to match the materials of the original building, new materials should be carefully selected to ensure they complement the original building.

Objectives

O1. To ensure that original materials that contribute to the significance of heritage items are not obscured.

O2. To ensure that colours of paintwork on heritage items are consistent with the significance of the heritage item.

O3. To ensure that external materials and colours on alterations and additions to heritage items relate well to the materials and colours of the heritage item.

O4. To ensure that heritage items are enhanced through replacement of irreparable or missing elements.

Controls	
C1.	Original materials of heritage items should not be replaced with different materials or materials of different colour.
C2.	Non-original materials of heritage items that are being replaced shall, if possible, be replaced with material that matches the original material as closely as possible.
C3.	Painting or rendering original face brick walls is not permitted, and re-skinning may exceptionally be considered where condition of fabric does not allow its further retention. Timber houses may be re-clad with timber weatherboards of a profile to match existing. Re-roofing should use materials matching original.

C4.	The detail and texture of original rendered finishes should not be changed.
C5.	Materials for additions and alterations to heritage items should be harmonious with the original materials of the heritage item.
C6.	Colour schemes for heritage items should have a hue and tonal relationship with traditional colour schemes for the period and style of the heritage item.
C7.	The use of fluorescent paint and primary colours on heritage items is not permitted.
C8.	The use of modern finishes including stencilled concrete for driveways associated with heritage items is not permitted.
C9.	Where it is not possible to retain an original building or landscape component, the new component is to match the original.
C10.	Missing original components of the heritage item should be replaced.

D2.5 Doors and windows

The spacing, proportions and detailing of doors and windows of heritage items usually contributes greatly to their aesthetic appeal. Altering windows and doors or adding new openings can dramatically affect the character of a building.

Objectives

O1. To retain original windows and doors that contribute to the aesthetic quality and/or significance of a heritage item.

O2. To reinstate lost details that contributed to the aesthetic qualities and/or significance of a heritage item.

O3. To retain the proportions of walls and openings that contribute to the aesthetic quality of a heritage item.

O4. To ensure that original or significant doors and windows are not obscured or altered by fittings and additions.

Controls	
C1.	Original or significant windows and doors in important elevations of a heritage item should be conserved.
C2.	Where original or significant windows and doors in important elevations of a heritage item have been removed and replacement of the new joinery is proposed, the original windows and/or doors should be reconstructed.
C3.	Additions to windows including security bars, grilles and shutters, should be located inside the window so as not to obscure windows or adversely affect the external appearance of buildings.
C4.	Additions to external doors, including security screens and grilles, should not obscure or distort the original form of doors or the character and significance of the building.
C5.	New window and door openings in important elevations of a heritage item must be: a) Carefully located to retain the original relationship of solids and voids; and b) Of proportions, materials and details similar to existing windows and door openings in the building.
C6.	New dormer and roof windows of a house should be located on rear roof slopes in preference to roof slopes visible from the street.
C7.	New dormer windows visible from the street may only be possible on houses of style and period which allow dormer windows. These dormers must:: a) Located to complement the original design of the building; and b) Of proportions and details to complement the original character of the building.

C8.	Extensive areas of glazing are not permitted unless this feature was a feature of the original design of the building visible from the public realm.
C9.	New skylights are not permitted in roof slopes visible from the public realm.

D2.6 Carparking

Garages and carports can have the greatest detrimental impact on the aesthetic qualities of heritage items. Garages and carports in front of the building line obscure views of the buildings and break the rhythm and pattern of the streetscape. The proportions of garage doors do not relate to the smaller and more vertical proportions of windows and doors that are usually found on heritage items.

Objective

O1. To ensure that, where possible, garages and carports are designed to minimise the visual impact on views of heritage items.

Controls	
C1.	Original or significant garages should be retained and conserved.
C2.	Garages and carports must be located as far behind the front building alignment as possible.
C3.	Garages must not be incorporated into the front façade of a heritage item.
C4.	Where a new garage or carport is on the same side of a building as a front verandah, the garage or carport must be detached and located entirely behind the front wall by at least 1m.
C5.	Garages and carports must not be integrated with any auxiliary structure or secondary dwelling.

D2.7 Fencing

Fencing, particularly fencing facing the street, is of particular importance in establishing the setting of a heritage item. Fencing should complement the style and scale of the house.

Objectives

O1. To conserve gates and fences that are early or contemporary with heritage items.

O2. To ensure that new fences and gates are in keeping with the character of the heritage item.

O3. To ensure that the aesthetic quality of the heritage item is not diminished by inappropriate fencing.

Controls	
C1.	Fencing and gates that are original or early components of the heritage item should not be demolished.
C2.	New fencing and gates to a heritage item should be of a style and scale that is consistent with the style of the building.
C3.	Unless documentary or physical evidence is provided to establish a greater height, fencing forward of the building line constructed of solid material such as masonry, should not be greater than 900mm in height above the adjacent public footpath level.
C4.	Unless documentary or physical evidence is provided to establish a greater height, fencing forward of the building line constructed of (non-solid) material such as timber pickets, metal palisades or wrought metal should not be greater than 1.2m in height above the adjacent public footpath level.
C5.	Original face brick or sandstone fencing to a heritage item should not be painted.

D2.8 Landscape elements including paving and driveways

Landscape elements are of great importance in contributing to the aesthetic quality of heritage items. The design of front gardens usually provides a setting for the building and reinforces the character of the heritage item.

Objectives

O1. To retain important landscape elements that contribute to the significance of heritage items.

O2. To reinforce the qualities of the heritage item through appropriate landscaping.

Controls	
C1.	Original driveways and footpath crossings that relate to a heritage item should not be relocated.
C2.	New driveways should be pairs of driveway strips of off-white or red oxide concrete, or brick on edge, with grass or ground cover between.
C3.	Double driveways and footpath crossings will generally not be permitted for houses listed as heritage items.
C4.	Original or early garden layouts that contribute to the significance of the heritage item should not be altered.
C5.	Established trees, shrubs, boundary planting and garden layouts that contribute to the significance of the heritage item should not be removed unless it can be established by an arborist that the health of the a tree or shrub is such that it must be removed. This includes trees in public domain which may be affected by development.
C6.	When designing new gardens, surviving plants and garden elements which indicate the basic garden structure, can be worked into new appropriate designs that complement the style of the building.
C7.	The design and materials of the original driveway should be retained, and if missing, replaced.

D2.9 Outbuildings

Early or significant outbuildings, such as sleep-outs, shade-houses and pergolas, are important in contributing to the aesthetic quality, setting and story of use and development of a place.

New outbuildings such as garden sheds, outhouses, gazebos and pool pavilions can easily detract from the setting of heritage items. The location and setting of these must be carefully considered so that they have minimal impact on important views of heritage items.

Objective

O1. To minimise visual intrusion on views of heritage items due to outbuildings.

O2. To ensure original significant outbuildings are conserved.

Controls	
C1.	Original significant outbuildings including sleep-outs, shade-houses and pergolas should be retained and conserved.
C2.	Outbuildings and other auxiliary structures should be located in the rear yard of heritage items.
C3.	Outbuildings and other auxiliary structures should be single storey and designed so that they have no impact on important views of heritage items.
C4.	Outbuildings and other auxiliary structures should not be integrated with garage or carport.

D2.10 Modern technologies

Modern technologies can include fixtures such as solar electricity collectors, television aerials and satellite dishes. These are usually large elements and are often intrusive elements in a roofscape.

Objective

O1. To ensure that modern technologies do not impact on important views of heritage items.

Controls	
C1.	Modern technologies such as solar electricity collectors, television aerials and satellite dishes are to be located on roof slopes facing the rear yard of heritage items.
C2.	Modern technologies should not be higher than the main ridge line of a building that is or is part of a heritage item and shall be located so that they are not visible from the public realm.

D2.11 Demolition

Full demolition of heritage items is generally not permissible. Partial demolition of heritage items is possible subject to the merits of the proposal. Outbuildings that relate to heritage items can be demolished if the demolition does not impact on the significance of the heritage item.

Objective

O1. To retain buildings that are of heritage significance or components of the site that contributes to the significance of a heritage item.

Controls	
C1.	Buildings that are listed as heritage items or contribute to the significance of a heritage item should not be demolished.
C2.	Partial demolition of a heritage item or its significant components, should only be allowed when it can be established that the partial demolition will have acceptable impact on the significance of the heritage item, or when condition of fabric is such that its failure is imminent . In the latter case, a reconstruction of demolished fabric may be required.
C3.	The Council may, under certain circumstances, give consent to demolish a heritage item or a contributory building in a conservation area. Such demolition, even if it is partial demolition, must be subject to a Development Application. Council will consider not just the outside appearance of the building and whether or not it looks run down. Council will weigh up the heritage significance of the property, its contribution to the history and identity of its street and neighbourhood, and its importance to the local area as a whole, so Council is unlikely to approve demolition unless the property is incapable of reasonable use or would be too costly to make usable.

D2.12 Subdivision

The grounds associated with a building are often of high importance in providing a setting to a heritage item. The grounds of a heritage item can also ensure that important views to or from a heritage item are available. Subdivision can result in the loss of the setting of a heritage item and should only be done if an adequate curtilage can be retained.

Objectives

O1. To ensure that subdivision of a heritage item does not result in a loss of appropriate curtilage for the heritage item.

O2. To ensure that subdivision of a heritage item does not potentially result in development that would obscure important views to or from the heritage item.

Controls	
C1.	Subdivision of an allotment that includes a heritage item should not be allowed unless an adequate curtilage of the heritage item is retained.
C2.	Subdivision of land that includes a heritage item should not be allowed unless it can be established that proposed or future development on the created allotments will not impact on important views to or from the heritage item.

D2.13 Signs

Many commercial buildings built in the late nineteenth and early twentieth century incorporate areas on the main façade designed for locating a sign to identify the business operating within. This allows for appropriate signage while the unity of the streetscape is retained.

Residential heritage items can be obscured by inappropriate signage. For most late nineteenth century and early twentieth century buildings, house names are often incorporated into the building or placed on a small sign fixed to a wall near the front door.

Objectives

O1. To allow for appropriate signage on heritage items

O2. To ensure the original details of heritage items are not obscured by inappropriate signage.

Controls	
C1.	All commercial signs on a heritage item or a building in heritage conservation area are to be restrained in visual prominence, of design compatible with style of the building, of high standard of materials, construction and graphics, and carefully placed in an appropriate location avoiding damage to the significant fabric.
C2.	Any sign proposed for a heritage item is to be consistent with the recommendations of any approved Signs Strategy forming part of a development consent or the policies and recommendations of any Conservation Management Plan applying to the heritage item.
C3.	Signage should include clear business identification by name and type, and should not include contact details, products offered or promotional messages. Graphics may be assessed for potential impact on heritage values.
C4.	New signs should be located in areas or elements of buildings that have traditionally been used for signage. Signs between the awning level and the parapet of a heritage item or a building in heritage conservation area are not permissible.
C5.	Shops in heritage listed buildings or in conservation areas are limited two signs per frontage, and other commercial tenants one sign per frontage from these types: a) Awning fascia sign, b) Under-awning sign, and c) Above-entry (hamper) sign.
C6.	In addition to the above, commercial tenants including shops are permitted traditional gilded lettering to glass. Areas under lettering should be limited to 5% of the overall glass area.
C7.	In addition to the above, commercial tenants including shops are permitted intrinsic sign types, such as written in the pavement, in tile work, etc. Any new intrinsic signs are to be designed and installed sympathetically with regard to existing intrinsic signs. In cases this may result in the potential locations for new signs being restricted or unavailable. Significant intrinsic signs in lead lighting or windows, painted on walls or as raised lettering in render must be conserved in situ. Any other significant existing signs need to be retained.
C8.	Internally illuminated signs are not permitted on a heritage item or a building in heritage conservation area unless they are a reconstruction of an original significant sign.
C9.	Externally illuminated signs are permitted only where cabling and conduit supplying power to the sign is completely concealed and does not involve intervention in or damage to significant fabric.
C10.	The installation of any sign on a heritage item is to be carried out in a reversible manner without damage to the significant fabric. In the case of a sign affixed to any stone or brick wall of a heritage item the sign is to be fixed in such a way that stone is not damaged and any fixings are put only onto mortar joints.

C11.	The consent authority shall have regard to the name of a heritage item and whether or not the name is significant before allowing its building name sign to be changed. On some buildings this may mean that the building name may not be changed.

D2.14 Adaptive reuse

Adaptive reuse of buildings is a process that changes a place that is no longer suitable for its original purpose, to a place that can be used for a new purpose. It is desirable both for environmental sustainability and heritage conservation.

Reusing historic buildings has long term benefits for the community. Adaptive reuse allows buildings that are valued by the community to be retained for future generations. Sometimes it is the only way a place can be conserved for the future.

In many cases, adaptive reuse will involve few if any changes to a building. Where changes are needed to a building of heritage significance, it is important to first understand why the place is significant. Changes should then ensure that significant aspects of the place are conserved and that new development respects the significance of the place.

All buildings have “embodied energy”: the energy consumed by all the processes involved in producing materials, delivering them to site and constructing the building. New buildings have high energy costs. In 2001, new buildings accounted for about 40% of annual energy and raw materials consumption. According to the Australian Greenhouse Office, the reuse of building materials can save approximately 95% of embodied energy. Adaptive reuse of buildings is also an important part of sustainable development.

General

Objectives

O1. To encourage adaptive reuse of buildings which are no longer suitable for their original use.

O2. To ensure that adaptive reuse of heritage items respects the significance of the place.

O3. To ensure that the impacts of adaptive reuse on heritage items is minimised.

Controls	
C1.	Where original use is discontinued, adaptive reuse which requires minimal change to fabric may be considered.
C2.	Where adaptive reuse requires unacceptable degree of change due to legislative compliance, alternative solutions may be sought, or the proposed change of use may not be supported.

Building Design

Objectives

O4. To ensure that alterations and additions to a building as a result of adaptive reuse relate to the architectural qualities of the existing building.

O5. To ensure that changes to the building as a result of adaptive reuse can be interpreted in the future as belonging to its applicable historical period.

Controls	
C3.	Additions to a building as part of adaptive reuse should be designed to respect the original architectural qualities of the building such as building form, façade articulation, fenestration pattern, parapet profile and detail, materials and colours.
C4.	Retention of only the facades of the building is not acceptable.
C5.	New work necessary in the adaptive reuse of a heritage item should be distinguishable from original work on a close inspection.

Structure

Objective

O6. To retain original building structure and fabric.

Controls	
C6.	Fire engineered solutions should be sought to allow retention of original structural systems that would otherwise not meet “deemed to comply” provisions of the Building Code of Australia.

D3 Development in the vicinity of heritage items

Development near a heritage item can have adverse impacts on the heritage item. This may be as a result of blocking views to or from the heritage item, affecting trees or landscape elements, or the setting that is part of the heritage item. It can also have an adverse impact by obscuring the landmark qualities of a heritage item. New development in the vicinity of a heritage item should take into consideration the importance of that item in the local streetscape or townscape. It should also ensure that important views to and from the heritage item are not lost or compromised.

In most cases, development in the vicinity of a heritage item will only affect properties that share a boundary with or are opposite a heritage item. In a few cases, development in the vicinity of a heritage item might have wider impacts. An example of this might be where important views of a landmark building such as a church spire could be lost due to a new development.

D3.1 Setting

Setting is the area around a heritage item that contributes to its heritage significance and may include the visual catchment of a heritage item. Topography, trees, gardens, fencing, and pavement can all contribute to the setting of a heritage item. Where a heritage item has importance as a landmark, it is particularly important that new development in the vicinity of the heritage item does not obscure its visual presence in the streetscape and/or townscape.

Objectives

O1. To ensure the setting of heritage items is not compromised by development in the vicinity of the heritage item.

O2. To ensure that new development respects the contribution of heritage items to the streetscape and/or townscape.

Controls	
C1.	The setbacks of new development in the vicinity of a built heritage item should generally be equal to or greater than that of the heritage item.
C2.	Development in the vicinity of a heritage item should not have a scale, bulk or height that is incongruous with the setting of the heritage item.
C3.	Important views to or from a heritage item should not be impacted or obscured by new development.
C4.	Where a heritage item is part of a streetscape of buildings of consistent style, form and materials, development in the vicinity of the heritage item should incorporate elements of the dominant style, form and materials in the streetscape.
C5.	Where trees are integral to the significance of a heritage item, development should not be allowed within the primary root zone.
C6.	Development in the vicinity of a heritage item should not adversely affect its setting by introducing an uncharacteristic building or element.

D3.2 Scale

Scale is the size of a building and its relationship with its surrounding buildings or landscape. Buildings of inappropriate scale, in the vicinity of a heritage item, can detract from its contribution to the streetscape and/or townscape.

Objective

O1. To ensure that new development in the vicinity of a heritage item is of a scale that does not undermine the significance of the heritage item.

Controls	
C1.	The scale of new development in the vicinity of a built heritage item should not be greater than that of the heritage item.
C2.	Development of a larger scale is allowable only if the new development will not be seen when viewing the heritage item from the public realm.
C3.	New development that obscures important views of a heritage item should not be permitted.

D3.3 Siting

Siting relates to the position of the building on the site and includes the orientation of a building in relation to the street as well as the setbacks of the building from the boundaries.

Setbacks define the overall footprint of a building and the outer extremities of that building in relation to the front, side and rear boundaries.

Setbacks of buildings in the vicinity of heritage items can be of importance in ensuring the retention of important views to and from the heritage item. In some cases, it is also necessary to consider the potential impact of the building on important landscape elements associated with the heritage item.

Objectives

O1. To ensure new development in the vicinity of a heritage item is sited so that it does not obscure important views to or from the heritage item.

O2. To ensure that new development in the vicinity of a heritage item does not adversely impact landscape elements that are or are associated with a heritage item.

Controls	
C1.	The setback of new development (including alterations and additions) in the vicinity of a heritage item should ensure that important views to or from the heritage item are not adversely impacted.
C2.	The setback of new development in the vicinity of a heritage item should ensure that landscape elements associated with or listed as a heritage item are not adversely affected by the development.

D3.4 Materials and Colours

New development should take into consideration the dominant original materials of heritage items in the vicinity of the development. Materials should be selected so that attention is not drawn away from the heritage item to the new development.

Objective

O1. To ensure that new development in the vicinity of a heritage item does not detract from the importance of the heritage item in the streetscape.

Controls	
C1.	Materials and colours for development in the vicinity of a heritage item shall be selected to avoid stark contrast of the adjacent development where this would result in the visual importance of the heritage item being reduced.

D4 Development in and in the vicinity of Heritage Conservation Areas

Heritage Conservation Areas (Conservation Areas) usually have a strong streetscape or townscape character resulting from development of similar style, scale, form and materials during a relatively short period of time. However, a conservation area is more than a place that looks good because of its streetscape, design, neighbourhood amenity, or the individual buildings it contains. Conservation Areas have a sense of place which is hard to define and hard to replace. This is because their character reflects not just the buildings in the area, but also the reasons for the buildings, the changing social and economic conditions over time, and the physical responses to those changes.

For development within a conservation area, it is important to appreciate the character and significance of that area when designing additions, alterations or infill development. An analysis of key aspects of each Conservation Area is given in Appendix 1. Appendix 1 also provides maps indicating if a property is considered to be a contributory item to the conservation area (i.e. it is considered to contribute to the heritage value of the Conservation Area) or whether it is considered to be neutral in the conservation area or whether it is considered to be infill development (i.e it does not contribute to the heritage value of the Conservation Area).

For work to buildings within a conservation area, the following guidelines should be read in conjunction with the description and analysis of the relevant conservation area found in Appendix 1.

The following outlines the criteria for determining whether a place is considered to be contributory, neutral or infill within the conservation area.

- Contributory: Built during a period directly relating to the significance of the conservation area as identified in the statement of significance for the conservation area. The original form of the building is substantially intact, or where additions have been made to the building that are visible in the main streetscape, the additions have respected the original style and form of the building.
- Neutral: Built during a period relating to the significance of the conservation area as identified in the statement of significance for the conservation area, but has been substantially altered so that the original style or character of the building is obscured and the alterations are unlikely to be reversed. New sympathetic layer or representative of a new layer. Non significant historical period layer.
- Infill: Built in a period later than any relating to the significance of the conservation area and is a detracting element.

D4.1 Setting

Setting relates to the space and details around buildings in a conservation area that contribute to its heritage significance and may include the visual catchment of a conservation area. Street trees, gardens, fencing and pavement can all contribute to the setting of a conservation area. The setback of buildings from the street and the space between buildings also contribute to the setting of a place.

Objectives

O1. To provide an appropriate visual setting for conservation areas, including landscaping, fencing and carparking.

O2. To maintain and enhance the existing character of the streetscape of a conservation area.

O3. To ensure that new development respects the established patterns in the streetscape of a conservation area, including setbacks, siting, landscaped settings, carparking and fencing.

O4. To ensure that the character of the conservation area is retained and enhanced.

O5. Contributory buildings, places and components of conservation areas are to be retained and not demolished.

Controls	
C1.	The side and front setbacks of new development in and in the vicinity of a conservation area should be similar to the spacing of contributory buildings in that conservation area.
C2.	New buildings should conform to the orientation pattern of existing buildings in the area.
C3.	No new structures should be built forward of the established street building line.
C4.	The established landscape character of the locality including the height of canopy and density of boundary landscape plantings should be retained in any new development.
C5.	Neutral and intrusive buildings may be demolished if the replacement building makes a greater contribution to the character of the area than the existing building.
C6.	New work in a heritage conservation area is to respect the relevant contributory components of that conservation area.
C7.	Additions are to be set behind the main body of the existing house so that they have limited visibility.
C8.	The existing house, where contributory, is to be the visually dominant element of a site.
C9.	Maintain the historical pattern of development of individual buildings on separate allotments of land separated by garden space.
C10.	Maintain front garden areas with lawns and associated pathways as traditional garden settings for houses.
C11.	Keep at least 60% of the site as garden space. Council will consider a minimum garden space of 50% where allotments are less than 700 m2. Swimming pools, paved hard stands and other artificial areas are not considered part of garden space.
C12.	A minimum of 80m2 of private open space is to be provided to each house at ground level, with minimum dimensions of 4m.
C13.	Minimum setback to the front alignment for new buildings is 8 metres, or average of setbacks of immediately adjoining houses on either side.
C14.	Side walls should not exceed 7 metres in length.

D4.2 Scale

Scale is the size of a building and its relationship with its surrounding buildings or landscape. It is important that new development in conservation areas respects the scale of the existing buildings and/or landscape elements that contribute to the significance of the conservation area.

Objectives

O1. To ensure that new development in or in the vicinity of a conservation area is of a scale consistent with the existing development in the vicinity of the site that contributes to the character of the heritage conservation area.

O2. To ensure that additions and alterations to a building within a conservation area are of a scale consistent with the contributory buildings in the conservation area.

O3. To ensure that landmark buildings which will generally be surrounded by buildings of lower scale are not diminished by large scale development in the vicinity.

Controls	
C1.	For new buildings, keep and repeat the single storey scale with maximum wall height to relate to nearby contributory buildings or heritage items (notwithstanding landmark mansions, public buildings, schools etc.). New buildings should utilise architectural language compatible to that of the area and the adjacent streetscape, including scale, roof form and slope, massing, proportions, fenestration patterns, materials, finishes, colours and other features.

C2.	New development should follow the natural slope of grounds. Cuts, excavations or infill of natural ground levels should be limited to 1m.
C3.	For new buildings, use face brick, clay tiles or corrugated iron, painted timber and other materials predominant in the area. Do not use hearted, speckled, multicoloured or textured bricks in light colours, or glazed tiles. Preference is given to materials in darker, recessive colours.
C4.	Preferred forms of additions are linked pavilions or skillion extensions. Additions to front or side of an existing dwelling are not supported.
C5.	Rear additions are to be formed within existing side setbacks of the house, in order to preserve views and glimpses of light between houses.
C6.	Maximum wall height of a pavilion extension should not exceed the wall height of the existing house, as measured externally from the ground to under the eaves. Links to rear pavilion additions should be lower and the roof space above the original house should not be integrated with the addition.

D4.3 Form and detailing

The form of a building is its overall shape and volume and the arrangement of its parts. The rooflines of buildings, and elements such as chimneys, parapet walls, verandahs etc can contribute greatly to the character of an area.

Objectives

O1. To ensure that new development in a conservation area relates positively to the dominant forms of existing contributory buildings in the conservation area.

O2. To ensure that buildings that contribute to the character of a conservation area retain their importance in the streetscape and/or townscape.

O3. To encourage authentic restoration or reconstruction based on documentary (research) or physical evidence.

Controls	
C1.	Important elements of the form of a contributory building in a conservation area such as main roof forms, chimneys, parapet walls, verandahs etc should not be demolished or obscured by alterations and additions.
C2.	The roof forms of new development in or in the vicinity of a conservation area are to complement the original roof forms of existing nearby buildings that contribute to the conservation area.
C3.	Chimneys and roof features such as ventilation gablets should not be removed from contributory buildings in a conservation area.
C4.	Additions should utilise same or similar materials as the existing house, or lighter weight materials, such as painted timber.
C5.	Additions and alterations to existing buildings that contribute to the character of a conservation area should not detract from the original form of the existing building as viewed from the public realm.
C6.	Additions should utilise architectural language compatible to that of the original house. This includes scale, massing, roof form and slope, proportions, fenestration patterns, materials, finishes, colours and other externally visible features.
C7.	The treatment of the street façade of new development in or in the vicinity of a conservation area should relate to existing nearby buildings that contribute to the conservation area. This should include consideration of the massing and modifications of the building, proportions of verandahs and height.
C8.	Verandahs on the front and sides of buildings within a conservation area should not be infilled and inappropriate infill or enclosure should be reversed.

C9.	Keep existing roof forms on original houses visible in their original form. Additional rooms above the existing main body of the house should be within the existing roof cavities as seen from the street, ventilated by flat in-plane windows facing the rear. Alterations of roof form, dormer windows, or mansard roofs are not supported.
C10.	C10. Council may consider extra rooms above the main body of a house or in the pavilion addition at the rear of a house provided: a) the original roof design and features are clearly apparent, and b) the scale of the building does not disrupt the continuity of the scale and character of houses when viewed from the street, and c) roof space above the original house should is not integrated with the addition.
C11.	Open verandahs visible from the public domain are to be retained.
C12.	Inappropriate changes, such as the enclosure of front verandahs, are to be reversed.
C13.	“Pop top” roof additions are not acceptable as the main roof is to be retained.

D4.4 Siting

Siting relates to the position of the building on the site and includes the orientation of a building in relation to the street as well as the setbacks of the building from the boundaries.

Most buildings in a conservation area are oriented to the street frontage. The regular orientation of buildings contributes to the pattern and rhythm of the streetscape.

Setbacks define the overall footprint of a building and the outer extremities of that building in relation to the front, side and rear boundaries. In conservation areas, setbacks are of greater importance in establishing the continuity of the streetscape. Side setbacks are also of importance in providing separation between buildings and establishing a rhythm in the streetscape.

Objectives

O1. To integrate new development in or in the vicinity of a conservation areas into the established pattern of the streetscape.

Controls	
C1.	The front setback of new development (including alterations and additions) in or in the vicinity of conservation areas should match that of adjacent contributory development. Where adjacent developments have different setbacks, new development should align with the greater setback.
C2.	Side setbacks of new development (including alterations and additions) in or in the vicinity of conservation areas should match the pattern of adjacent and/or nearby contributory development. This will often include a greater setback on one side of the development to provide vehicular access at the side of a property.
C3.	The orientation of new development in or in the vicinity of conservation areas should follow the established pattern of development in the conservation area.
C4.	Where trees are important to a conservation area, new buildings should be sited away from the drip line of the trees.

D4.5 Materials and colours

The quality of many of the conservation areas in Canada Bay is reinforced by the use of a cohesive palette of materials and colours. Use of sympathetic materials and colours can help new development to blend into existing streetscapes.

Development that includes changing roof materials, reskinning, rendering or painting of face brickwork can degrade the character of a conservation area.

New development should take into consideration the dominant original materials of contributory development in the conservation area. Where there are contributory buildings of differing materials in close proximity to the

proposed development, the building that reflects the dominant period of development in the conservation area should be given greater consideration when selecting materials.

Objectives

O1. To encourage external materials on new development in or in the vicinity of conservation areas that is consistent with the original materials of existing contributory building stock in a conservation area.

O2. To encourage colour schemes which complement the style of the building.

Controls	
C1.	Original materials of contributory buildings in conservation areas should not be replaced with different materials, or with materials of different colours.
C2.	Non-original materials of existing contributory buildings in conservation areas that are being replaced shall, if possible, be replaced with material that matches the original material as closely as possible.
C3.	Painting, rendering, bagging or re-skinning of face brickwork and sandstone is not permitted.
C4.	Painting or rendering original face brick walls is not permitted, and re-skinning may exceptionally be considered where condition of fabric does not allow its further retention. Timber houses may be re-clad with timber weatherboards of a profile to match existing. Re- roofing should use materials matching original.
C5.	Materials for new development in or in the vicinity of conservation areas should be compatible with the original materials of the dominant contributory buildings in the conservation area.
C6.	Colour schemes for existing and new development in or in the vicinity of conservation areas should have a hue and tonal relationship with traditional colour schemes for the dominant style of development in the conservation area
C7.	The use of fluorescent paint and primary colours on buildings in or in the vicinity of conservation areas is not permitted.
C8.	The use of modern finishes including stencilled concrete for driveways in or in the vicinity of conservation areas is not permitted.
C9.	Original features of contributory buildings in conservation areas are to be retained and repaired. If missing, they are to be replaced.

D4.6 Doors and Windows

The spacing, proportions and detailing of doors and windows of buildings in or in the vicinity of conservation areas usually contributes to the quality of the streetscape. Altering windows and doors or adding new openings can dramatically affect the character of a building and gradually erode the character and streetscape of a conservation area.

Objectives

O1. To retain original door and window details of contributory buildings in conservation areas.

O2. To ensure that original or significant doors and windows are not obscured or altered by fittings and additions.

O3. To ensure that new development in or in the vicinity of a conservation area has fenestration patterns and proportions consistent with original development in the conservation area.

Controls	
C1.	Extensive areas of glazing are not permitted for doors and windows visible from the public realm on buildings within or in the vicinity of a conservation area.

C2.	Original door and window openings visible from the public realm on contributory buildings in a conservation area should not be widened.
C3.	Original doors and windows visible from the public realm on contributory buildings in a conservation area should be conserved.
C4.	Additions to windows, including security bars, grilles and shutters, should be located inside the window, so as not to obscure windows or adversely affect the external appearance of buildings.
C5.	Additions to external doors, including security screens and grilles, should not obscure or distort the form of doors or the original character of buildings.
C6.	New door and window openings to contributory buildings in a conservation area that are visible from the public realm should be of proportions and details that relate to existing door and window openings.
C7.	Where non-original joinery to doors and windows of buildings in a conservation area that are visible from the public realm is being replaced, the details of the new joinery should be based evidence of the original joinery to doors and windows in the building.
C8.	Skylights should be located on rear roof slopes where they will not be visible in the public realm.
C9.	Dormer windows are not appropriate.

D4.7 Carparking

Garages and carports can have the greatest detrimental impact on the aesthetic qualities of conservation areas. Garages and carports in front of the building line obscure views of the contributory buildings and break the rhythm and pattern of the streetscape. The proportions of garage doors does not relate to the smaller and more vertical proportions of windows and doors usually found on contributory buildings within conservation areas.

Objective

O1. To ensure that, where possible, garages and carports are designed to minimise the visual impact on the streetscape of conservation areas.

Controls	
C1.	Garages and carports must be located as far behind the front building alignment as possible and at least 1m behind front wall.
C2.	Garages should not be incorporated into the building in a conservation area.
C3.	Where possible, garages are to be located on the rear lane.
C4.	Maintain the established pattern of one opening per allotment for car access. Any new vehicular crossover must avoid tree protection zones of street trees.
C5.	Driveways and crossovers should be made of concrete, bitumen, gravel, dark bricks or other non-obtrusive material. Wheel tracks with central grass/planting are preferred to fully paved driveway space.
C6.	Maintain the historical pattern of back garden placement of garages, sheds and other utility buildings, fully detached from the house. Garages should not be integrated into the existing or new house or addition. Residential rooms or areas should not be created above garages.
C7.	Carports may be sited beside the house only where they: a) are constructed of light weight frame of timber or metal, without enclosures b) stand at least 1 m back from the front wall of the building, and c) are fully detached from the building and do not obstruct light into the building.

D4.8 Fencing

Fencing, particularly fencing facing the street, is of particular importance in conservation areas. Consistent and uniform fencing can contribute significantly to the streetscape and character of a conservation area. Fencing should complement the style and scale of the house. Inappropriate fencing can detract from the streetscape by interrupting the pattern of development and by obscuring views.

Objectives

O1. To conserve gates and fences that are early or contemporary with contributory buildings in a conservation area.

O2. To ensure new fences and gates are consistent with the character of the conservation area and in particular with contributory housing in a conservation area.

O3. To ensure that the quality of the streetscape or townscape in a conservation area is not diminished by inappropriate fencing in or in the vicinity of a conservation area.

Controls	
C1.	Keep existing fences that are contemporary and contribute to the understanding of the history and development of the area.
C2.	Retain existing and allow new timber paling fences to side and back boundaries. Metal clad fences are not supported in conservation areas.
C3.	For new developments, use new front low brick fences (under 1.2m high) designed to match the materials of the house and associated metal gates on front boundaries of properties. Sliding gates and automated gates are not supported.
C4.	For contributory houses, allow new front fences under 1.2m high appropriate to style and period of the house, including wire mesh, timber, or brick. New timber picket fences are supported only where these are a historical feature of the area. Low brick fences topped with timber railings are not supported. Lych gates and arbours may be acceptable if accurate reconstructions of originals. Sliding gates and automated gates are not supported.
C5.	Unless documentary or physical evidence is provided to establish a greater height, fencing forward of the building line constructed of solid material such as masonry, should not be greater than 900mm in height above the adjacent public footpath level. In all cases, the height of fencing should relate to the style of the house and width of the allotment.
C6.	Unless documentary or physical evidence is provided to establish a greater height, fencing forward of the building line constructed of material such as timber pickets, metal palisades or wrought metal should not be greater than 1.2m in height above the adjacent public footpath level.
C7.	Original face brick or sandstone fencing in a conservation area should not be painted.
C8.	Original sandstone walls are to be retained and repaired if necessary.

D4.9 Landscape elements including paving and driveways

Landscape elements are of great importance in contributing to the aesthetic quality of conservation areas. They can often be landmarks and contribute to the setting of a building. The design of front gardens provides a setting for the house and reinforces the character of the place. In many conservation areas, street plantings are an integral part of the original design of the area.

Objectives

O1. To retain important landscape elements and the landscape setting that contribute to the significance of conservation areas.

O2. To reinforce the original and significant qualities of the conservation area through appropriate landscaping.

Controls	
C1.	Street trees in conservation areas should not be removed to allow for new development.
C2.	Established trees, shrubs, boundary planting and garden layouts that contribute to the significance and setting of the conservation area should not be removed.
C3.	When designing new gardens, reference should be made to surviving plants and garden elements which indicate the basic garden structure, and can be worked into new appropriate designs that complement the style of the building.
C4.	Existing driveways and footpath crossings that relate to original development in a conservation area should not be relocated.
C5.	Double driveways and footpath crossings will not be permitted in conservation areas.
C6.	New driveways should be pairs of driveway strips constructed of off-white or red oxide coloured concrete, or brick on edge, with grass or ground cover between.
C7.	Established trees, shrubs and garden layouts that contribute to the significance and setting of the conservation area should be retained.
C8.	Where original landscaping elements have been removed, their reinstatement is encouraged.

D4.10 Outbuildings

Early or significant outbuildings, such as sleep-outs, shade-houses and pergolas are important in contributing to the aesthetic quality, setting and story of use and development of a place.

New outbuildings such as garden sheds, outhouses, gazebos and pool pavilions can easily detract from the quality of the streetscape. The location and setting of these must be carefully considered so that they have minimal impact on the streetscape.

Objective

O1. To minimise visual intrusion on the streetscape of the conservation area and views from public places due to outbuildings.

Controls	
C1.	Original or significant outbuildings including sleep-outs, shade-houses and pergolas should be retained and conserved.
C2.	Outbuildings should be located in the rear yard of properties within a conservation area.
C3.	Outbuildings should be single storey and designed so that they have no impact, on the streetscape and setting.

D4.11 Modern Technologies

Modern technologies can include fixtures such as solar electricity collectors, television aerials and satellite dishes. These are usually large elements and are often intrusive elements in a roofscape.

Objective

O1. To ensure that modern technologies do not impact on the streetscape and/or townscape in conservation areas.

Controls	
C1.	Modern technologies such as solar electricity collectors, television aerials and satellite dishes are to be located on roof slopes facing the rear of a property in conservation areas.
C2.	Modern technologies should not be higher than the main ridge line of a building and shall be located so that they are not visible from the public realm in a conservation area.

D4.12 Demolition

Demolition of buildings within a conservation area can gradually diminish the qualities of the conservation area. It is important that contributory buildings in the conservation area are retained.

Objective

O1. To retain the contributory buildings in a conservation area.

Controls	
C1.	Contributory buildings within a conservation area should not be demolished.
C2.	Post WWII additions to contributory buildings in a conservation area that are not visible from the public realm may be demolished subject to assessment of the contribution that the additions make to the heritage value of the conservation area.
C3.	Demolition of rear outbuildings in conservation areas is generally acceptable. For places listed as heritage items, additional restrictions might apply.

D4.13 Subdivision

The subdivision patterns of many conservation areas is important in the existing streetscape. The regular sizes of blocks together with the regular setbacks of buildings helps to establish a rhythm to the streetscape. Consolidation of allotments often results in larger buildings that have an undesirable impact on the pattern of the streetscape. Similarly, subdivision of allotments can result in development with inadequate setbacks and/or narrow allotments that break the pattern of the streetscape.

Objective

O1. To retain subdivision patterns that contribute to the rhythm of streetscapes in conservation areas.

Controls	
C1.	Consolidation of allotments of an early subdivision within a heritage group or heritage conservation area should not be allowed.
C2.	Subdivision of allotments of an early subdivision within a conservation area should not be allowed.
C3.	New subdivision within a heritage group or heritage conservation area should reinforce the original pattern of development within the heritage group or heritage conservation area.

D4.14 Signs

Many commercial buildings built in the late nineteenth and early twentieth century incorporate areas on the main façade designed for locating a sign to identify the business operating within. This allows for appropriate signage while the unity of the streetscape is retained.

Residential streetscapes in conservation areas can be obscured by inappropriate signage. On most late nineteenth century and early twentieth century buildings, house names are incorporated into the building or placed on a small sign fixed to a wall near the front door.

Objectives

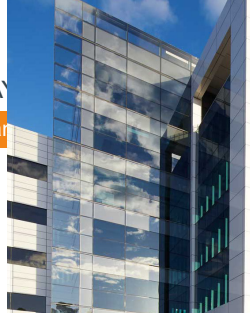
O1. To allow for appropriate signage on commercial buildings in conservation areas.

O2. To ensure the original details of buildings in conservation areas are not obscured by inappropriate signage.

O3. To ensure that signage does not have a detrimental impact on residential parts of conservation areas.

Controls	
C1.	All commercial signs on a heritage item or a building in heritage conservation area are to be restrained in visual prominence, of design compatible with style of the building, of high standard of materials, construction and graphics, and carefully placed in an appropriate location avoiding damage to the significant fabric.
C2.	Any sign proposed for a heritage item is to be consistent with the recommendations of any approved Signs Strategy forming part of a development consent or the policies and recommendations of any Conservation Management Plan applying to the heritage item.
C3.	Signage should include clear business identification by name and type, and should not include contact details, products offered or promotional messages. Graphics may be assessed for potential impact on heritage values.
C4.	New signs should be located in areas or elements of buildings that have traditionally been used for signage. Signs between the awning level and the parapet of a heritage item or a building in heritage conservation area are not permissible.
C5.	Shops in heritage listed buildings or in conservation areas are limited two signs per frontage, and other commercial tenants one sign per frontage from these types: a) Awning fascia sign, b) Under-awning sign, and c) Above-entry (hamper) sign.
C6.	In addition to the above, commercial tenants including shops are permitted traditional gilded lettering to glass. Areas under lettering should be limited to 5% of the overall glass area.
C7.	In addition to the above, commercial tenants including shops are permitted intrinsic sign types, such as written in the pavement, in tile work, etc. Any new intrinsic signs are to be designed and installed sympathetically with regard to existing intrinsic signs. In cases this may result in the potential locations for new signs being restricted or unavailable. Significant intrinsic signs in lead lighting or windows, painted on walls or as raised lettering in render must be conserved in situ. Any other significant existing signs need to be retained.
C8.	Internally illuminated signs are not permitted on a heritage item or a building in heritage conservation area unless they are a reconstruction of an original significant sign.

C9.	Externally illuminated signs are permitted only where cabling and conduit supplying power to the sign is completely concealed and does not involve intervention in or damage to significant fabric.
C10.	The installation of any sign on a heritage item is to be carried out in a reversible manner without damage to the significant fabric. In the case of a sign affixed to any stone or brick wall of a heritage item the sign is to be fixed in such a way that stone is not damaged and any fixings are put only onto mortar joints.
C11.	The consent authority shall have regard to the name of a heritage item and whether or not the name is significant before allowing its building name sign to be changed. On some buildings this may mean that the building name may not be changed.



PART E - RESIDENTIAL DEVELOPMENT

E1 Design Quality

E1.1 Design of dwelling houses, dual occupancies and semi-detached dwellings

Objectives

New buildings and alterations and additions should:

O1. Reflect the dominant building pattern of the streetscape with regard to the location, spacing and proportion of built elements in the streetscape.

O2. Complement and conserve the visual character of the street and neighbourhood through appropriate building scale, form, detail and finish.

O3. Reinforce existing streetscape features such as building setbacks, alignments, heights and fence design.

O4. Ensure that development conserves and respects significant streetscape items (such as street tree planting) and points of interest (such as views to waterways).

Street presentation

Controls	
C1.	Buildings adjacent to the street should address the street by having a front door and/ or living room addressing the street. The frontage of buildings should by their design, and the location of entries (including pedestrian pathways), be readily apparent from the street.

Front facade articulation

Controls	
C2.	New buildings and additions should be designed with an articulated front façade - See Figure E1.1. The front façade should comply with the following requirements: • Where a garage is attached to a dwelling it must not be located within the primary façade; and • The secondary building façade should be set back a minimum of 1.5 metres from the primary building façade.
C3.	Entry alcoves recessed into, or protruding from, the front facade will not be considered as an articulated front facade.
C4.	Secondary building façade must not exceed 55% of the total site frontage and must be setback 1.5m from the primary building façade.
C5.	Primary Building façade must not exceed 40% of the total site frontage.
C6.	The ground floor of the primary building facade must contain a habitable room.

Refer to Figure E1.1

Roof design

Controls	
C7.	Use a similar roof pitch, form and materials to those predominantly identified in the Streetscape Character Analysis.
C8.	Where the prevailing roof form identified in the streetscape character analysis comprises a pitched roof, the roof pitches should be a minimum of 25 degrees.
C9.	Where it is considered that the streetscape will not be significantly altered and on the basis of improving the solar access or view corridors of nearby residential properties, Council may consider lower roof pitches than 25 degrees.
C10.	Dwelling designs must have a minimum eave overhang of 450mm (excluding the gutter).
C11.	Dormers are not to have a height of more than 1.5 metres from base to ridge.

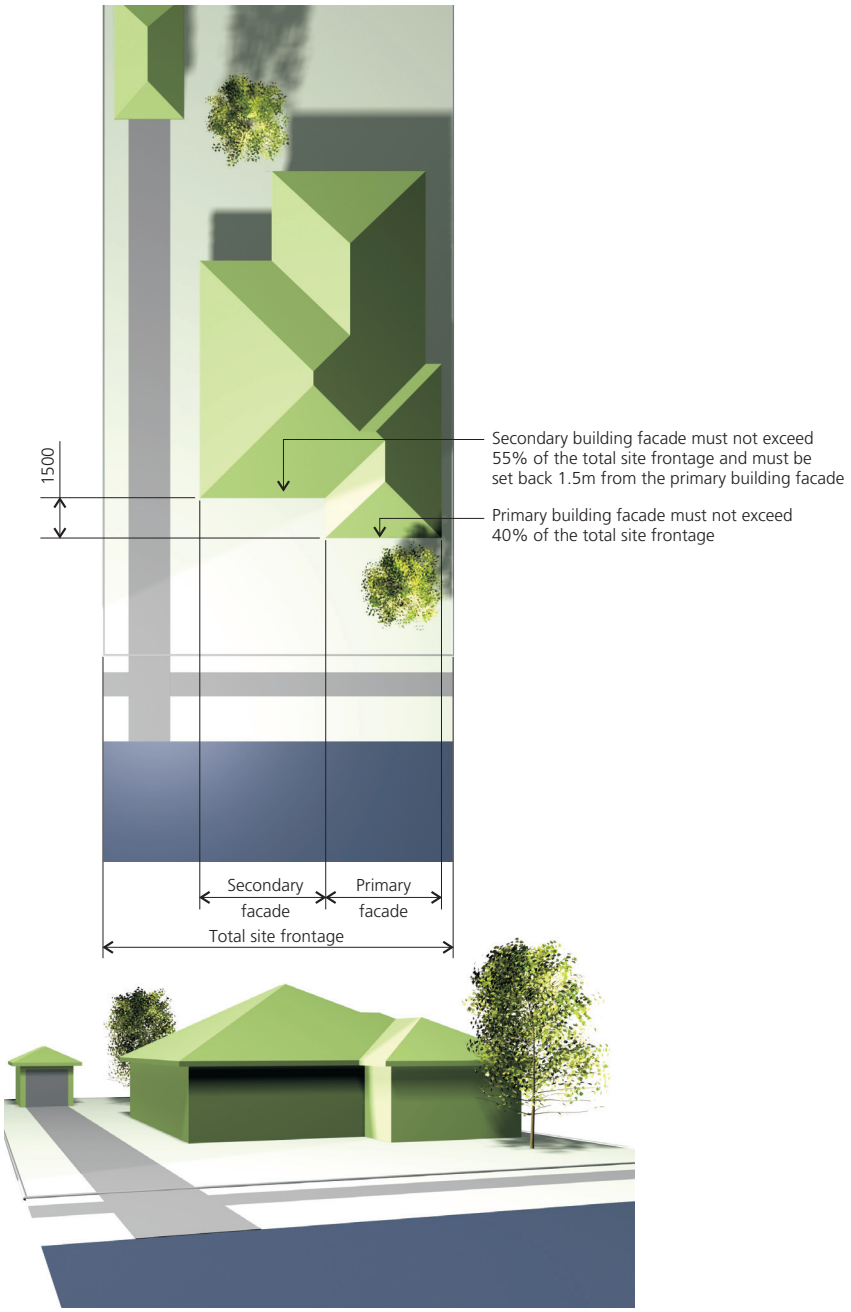


Figure E1.1 - Example of front facade articulation control

Verandahs

Controls	
C12.	Existing original verandahs should be retained.
C13.	The enclosure of original verandahs visible in the streetscape is not permitted. Enclosed verandahs are intrusive elements and should be re-opened and restored wherever possible.

Balconies

Controls	
C14.	The enclosure of balconies visible in the streetscape is not permitted. Balconies on existing housing visible in the streetscape should not be enclosed. Existing enclosed balconies should be re-opened and restored wherever possible.

Additions to semi-detached dwellings

Controls	
C15.	Any alteration and addition to an individual semi or terrace should recognise it as being one pair or group of similar, identical or complementary buildings. In this regard, any extension should be carefully integrated with the building to which it is attached, both in its present form and on the assumption that the adjoining owner may wish to undertake extensions in the future.
C16.	First floor additions should be set back from the principal street frontage of the building, in order to maintain a substantial portion of the existing roof unaltered over the front of the building and to locate the bulk of new development towards the rear. First floor additions should be set back beyond the apex or main ridge of the principal roof form of the building and should retain chimneys
C17.	The choice of materials utilised on additions and alterations to a semi-detached dwelling should complement the building as a whole.

Design of attached dual occupancies

Objective

O1. Ensure that the design of attached dual occupancies complements and enhances the character and streetscape of their locality and protects the amenity of neighbouring properties.

Controls	
C18.	Attached dual occupancies should be designed to have the appearance of a typical, single occupancy dwelling house when viewed from the street or a public place.
C19.	One dwelling in a dual occupancy should not extend into the rear yard further than 5 metres beyond the other.
C20.	Attached dual occupancies should reflect the building form and roof lines of adjoining dwellings, where a pattern is established by a group of adjoining houses.

Driveways and access ways for attached dual occupancies

Controls	
C21.	No more than one third of the width of the frontage of a property should be used for driveways and access ways.
C22.	The provision of access to garages and additional parking spaces for dual occupancy dwellings should minimise paved surfaces to the front of the building.
C23.	Garages for each dwelling within an attached dual occupancy should be single car width only.
C24.	Where all existing dwellings are located to the left or right side of their respective allotment and have a side driveway, this pattern should also be observed by the design of the attached dual occupancy.

E1.2 Design of residential flat buildings and multi dwelling housing

The Objectives and controls contained within this part of the DCP support the design quality principles of State Environmental Planning Policy No. 65 – Design Quality of Residential Flat Development (SEPP 65).

The Principles apply to proposals subject to SEPP 65, that is, residential buildings that comprise or include:

a) 3 or more storeys (not including levels below ground levels provided for car parking or storage, or both, that protrude less than 1.2 metres above ground level), and

b) 4 or more self-contained dwellings (whether or not the building includes uses for other purposes, such as shops), but do not include a Class 1a building or a Class 1b building under the Building Code of Australia (e.g townhouses or villas where dwellings are side by side).

This DCP adopts design quality principles contained within the SEPP65 and the Apartment Design Guide, Department of Planning, 2015

Alterations and additions to multi dwelling housing and residential flat buildings

Objectives

O1. To provide a set of controls for the external alteration or modification of existing multiple dwelling residential developments.

O2. The controls aim to ensure that development is aesthetically, environmentally and harmoniously compatible with the original Development Consent.

O3. To maintain the internal and external streetscape or other design and appearance qualities which contribute to the character, identity and acceptability of the approved development.

Building height

Controls	
C1.	Other than attic conversions a proposal which creates the impression of an additional level externally to what was originally approved by Council will not be permitted.

Roofs

Controls	
C2.	The pitch (slope) of any roof facing or visible from a street or public place is to match the approved development. Where the roof cannot be seen from any street or public place, Council may allow some change to the form and/or pitch.

Attic conversions

Controls	
C3.	In approved developments where a close unity and harmonious design prevails, the uniformity and coherence of the streetscape/appearance (either internal or external) should be maintained. Attic windows may be permitted if it is in character with the general architectural design of the development, is appropriately proportioned and has no doors or balconies.

Balconies

Controls	
C4.	The enclosure or addition of balconies or the addition of awnings after a building has been completed will not be acceptable unless the overall design is in keeping with the approved architectural theme.

Privacy and overlooking

Controls	
C5.	Care is to be taken to avoid any changes creating opportunities of further overlooking of other dwellings including private open space and pedestrian access ways. Care must also be taken not to inhibit the use of any areas provided for public open space or foreshore access through overlooking. Council shall consider whether reasonable privacy is maintained when making its determination.

Views

Controls	
C6.	Care should be taken to protect views from existing buildings and public areas. Development proposals should be designed to minimise impact on the views enjoyed by adjoining buildings or sites by maintaining view corridors in relation to other dwellings, buildings or place. Council shall consider whether any views are affected.

Solar access

Controls	
C7.	Development should not reduce solar access to adjoining dwellings, private open space or public open space. Council may require an applicant to prepare shadow diagrams showing the impact of a proposal. Such diagrams should be based on a survey of the relevant site and adjoining development.

Landscaping

Controls	
C8.	Existing landscaping is to remain in accordance with plans approved by Council and not be varied except with Council's consent. A reduction in landscaping from the approved scheme is generally not favoured. Where permitted, Council may require some additional landscaping to be placed elsewhere. An increase in areas of hard paving will generally not be acceptable.

Vergolas/pergolas

Controls	
C9.	A vergola/pergola must be attached to the building but not enclosed in any way. Pergolas/Vergolas are not permitted in any building setbacks, or where they will adversely affect sunlight or privacy of adjoining properties. They will generally only be considered on existing hard paved areas. Approval will not generally be granted to a vergola/pergola that is built to the site boundary.

Garden/tool sheds and glass houses

Controls	
C10.	Where the erection of a garden/tool shed or glass house is proposed it will be considered to be gross floor area. Structures of this type will not be permitted within building setbacks. If the garden/tool shed or glass house is visible from a public vantage point then the proposed structure should be sympathetic to the approved architectural theme and integrity of the development.

Car parking spaces

Controls	
C11.	The reallocation or alteration of parking spaces may be permitted provided that it complies with Council's car parking requirements. The erection of carports over external parking spaces may be permitted where the architectural design is maintained. The purchasing, leasing or allocation for exclusive use of car parking spaces which are not allocated to any particular dwelling or purpose in the approved scheme may be permitted subject to: a) The parking space must be in the same strata plan as the dwelling it is proposed to be allocated to or a different strata plan in the same community title. b) If external to the building the parking space is not to be enclosed or altered in any way. c) The use of such additional spaces is limited to parking or storage of private vehicles only (including boats on trailers).

Materials and finishes

Controls	
C12.	The proposed alterations and additions should match as far as possible the existing building in its use of materials and finishes.

E1.3 Materials, colour schemes and details

Objectives

O1. To ensure that the choice of external materials, colour schemes and building details on new development and existing houses visible from a public place, reinforces and enhances any identifiable visual cohesiveness or special qualities evident in the street and the adjoining locality.

O2. To encourage complementary and sympathetic wall treatments on new development and existing houses that are consistent with the architectural style of existing dwellings found in the street and the adjoining locality.

O3. To encourage roof forms and materials consistent with the positive qualities evident in the street and the adjoining locality.

O4. To encourage verandahs/balconies etc. that are consistent with original structures evident in the street and the adjoining locality.

O5. To permit flexibility in the choice of materials to meet the practical requirements of energy efficiency, construction and maintenance costs.

Controls

The colour and surface finish of external building materials should minimise the overall visual impact of new development and be sympathetic to the surrounding locality as identified in the relevant Character statement and the Streetscape Character Analysis submitted with the application.

Walls/ masonry

Controls	
C1.	Use darker face brick in streetscapes which predominantly exhibit this external finish.
C2.	Retain or incorporate existing sandstone fences, walls or wall bases into the design of the building.

Roof finish

Controls	
C3.	Terracotta coloured (orange/red) roof tiles should be utilised in streets where this is the predominant roof colour.

Balconies

Controls	
C4.	First floor balcony balustrades facing the street should use a different material to the main wall finish.

Colour schemes

Controls	
C5.	Subject to the Streetscape Character Analysis, no large expansive surface of predominantly white, light or primary colours which would dominate the streetscape or other vista should be used.
C6.	New development should incorporate colour schemes that have a hue and tonal relationship with the predominant colour schemes found in the street.
C7.	Matching buildings in a row should be finished in the same colour, or have a tonal relationship.

General

Controls	
C8.	All materials and finishes utilised should have low reflectivity.

E2 Environmental criteria and residential amenity

E2.1 Topography

Objectives

O1. To ensure that the natural topography and landform is maintained and the amount of excavation is minimised.

Controls	
C1.	Natural ground level should be maintained within 900mm of a side and rear boundary.
C2.	Cut and fill should not alter natural or existing ground levels by more than 600mm.
C3.	Habitable rooms (not including bathrooms, laundries and storerooms) are to be located above existing ground level.
C4.	Rock outcrops, overhangs, boulders, sandstone platforms or sandstone retaining walls are not to be removed or covered.
C5.	Soil depth around buildings should be capable of sustaining trees as well as shrubs and smaller scale gardens.

E2.2 Harbour foreshore development and foreshore access

Objectives

O1. To recognise, protect and enhance the natural, scenic, environmental, cultural and heritage qualities of the foreshore of the City of Canada Bay.

O2. To ensure the Parramatta River foreshore is developed and promoted as a community asset in public ownership or with unrestricted public access.

O3. Sydney Harbour is to be recognised as a public resource, owned by the public, to be protected for the public good:

- The public good has precedence over the private good whenever and whatever change is proposed for Sydney Harbour and its foreshores.
- Protection of the natural assets of Sydney Harbour has precedence over all other interests.
- The public good includes but is not restricted to the existing views, vistas and amenity available from the public and private domain.

Controls	
C1.	Building forms should follow the natural topography and maintain and enhance vegetation cover as viewed from the Parramatta River. For example, buildings are not to be cantilevered.
C2.	Roof lines should be below the tree canopy backdrop to maintain the importance of any treeline.
C3.	Buildings should be designed and constructed to present a recessive appearance when viewed from the Parramatta River through the use of materials, colours, wall articulation, building form and landscaping. Glass elevations and excessive use of windows resulting in reflectivity and glare will not be permitted.

C4.	Pergolas, boatsheds and other structures are to be designed and constructed to complement the overall appearance of the development. Such structures are to be no more than one storey in height.
C5.	Swimming pools and spa pools constructed within the foreshore setback are to have no more than 300mm of the pool wall visible above existing ground level.
C6.	Swimming pool and spa pool walls are to be suitably treated to complement the natural foreshore and where visible, are to be sandstone and to incorporate suitable screen landscaping.
C7.	Boundary fences are not permitted within 8.0 metres of the mean high water mark.
C8.	Retaining walls are to have a maximum height of 500mm.
C9.	Hard surfaces and artificial surfaces, such as paving, within the Foreshore Building Line Area must be limited to swimming pool surrounds or modest walkways between the residential building and foreshore structures such as swimming pools or boat ramps.
C10.	Mature trees or significant landscaping are not to be removed to locate foreshore structures.
C11.	Any development on the foreshore should: a) Enhance the existing flora of the allotment; b) Where appropriate, include native trees which will be 12 metres or greater at maturity; and c) Avoid introduced species known to seed freely or spread easily.

Protection of the natural foreshore

Controls	
C12.	Development on foreshore properties must not significantly alter the topography and must preserve natural foreshore features including cliffs, rock outcrops, rock shelfs and beaches.
C13.	Seawalls or retaining walls are not permitted in areas where the foreshore is in its natural state.
C14.	Where seawalls or retaining walls are permitted, they must be constructed of coarse, rock-faced stone or with stone facing (preferably sandstone) and not protrude more than 1.0m above the mean high water mark.
C15.	Slipways and stairs are to be designed and constructed to closely conform with the character of the natural foreshore.

Foreshore access

Please refer to the Canada Bay LEP for considerations in relation to the provision of foreshore access.

Controls	
C16.	Public access along the foreshore should be provided by means of (as a minimum) a 3 metre strip of land between mean high water mark and the development. The access may be secured by means of a registered covenant, agreement or instrument in favour of the Council (as provided for in the Conveyancing Act 1919) that burdens the relevant land, or by means of an obligation contained in a planning agreement that is entered into between the relevant landowner, the Council, or both.
C17.	Public access to the foreshore over public land is not to be obstructed by the location of foreshore structures.

E2.3 Solar access

Objectives

O1. To maximise solar access to living areas and private open space in order to improve residential amenity.

O2. To minimise the amount of overshadowing of neighbouring developments and outdoor spaces to maintain their amenity.

Controls	
C1.	New buildings and additions are sited and designed to maximise direct sunlight to north-facing living areas and all private open space areas.
C2.	Direct sunlight to north facing windows of habitable rooms and all private open space areas of adjacent dwellings should not be reduced to less than 3 hours between 9.00am and 3.00pm on 21 June.

Note: The numerical guidelines will be applied with the following principles in mind, where relevant:

a) The ease with which sunlight access can be protected is inversely proportional to the density of development. At low densities, there is a reasonable expectation that a dwelling and some of its open space will retain its existing sunlight. (However, even at low densities there are sites and buildings that are highly vulnerable to being overshadowed.) At higher densities sunlight is harder to protect and the claim to retain it is not as strong;

b) The amount of sunlight lost should be taken into account, as well as the amount of sunlight retained;

c) Overshadowing arising out of poor design is not acceptable, even if it satisfies numerical guidelines. The poor quality of a proposal's design may be demonstrated by an alternative design that achieves the same amenity without substantial additional cost, while reducing the impact on neighbours;

d) To be assessed as being in sunlight, the sun should strike a vertical surface at a horizontal angle of 22.5° or more. (This is because sunlight at extremely oblique angles has little effect.) For a window, door or glass wall to be assessed as being in sunlight, half of its area should be in sunlight. For private open space to be assessed as being in sunlight, either half its area or a useable strip adjoining the living area should be in sunlight, depending on the size of the space. The amount of sunlight on private open space should be measured at ground level;

e) Overshadowing by fences, roof overhangs and changes in level should be taken into consideration; and

f) The impact on what is likely to be built on adjoining sites should be considered as well as the existing development.

E2.4 Visual and acoustic privacy

Objectives

O1. Ensure the siting and design of a building provides a high level of visual and acoustic privacy for residents and neighbours in dwellings and private open space.

O2. To provide personal and property security for residents and visitors.

Controls	
C1.	Openable first floor windows should be located so as to face the front or rear of the building. Where it is impractical to locate windows other than facing an adjoining building, the windows should be off-set to avoid a direct view of windows in adjacent buildings.
C2.	Balconies should be located so as to face the front or rear of the building. No balconies are permitted on side elevations.
C3.	Provide a minimum sill height of 1.5 metres from finished floor level to windows on a side elevation which serves habitable rooms and has a direct outlook to windows or principal private open space (not being front yard) of adjacent dwellings or alternatively use fixed obscure glass.
C4.	Upper level balconies to the rear of a building should be set back a minimum of 2.0 metres from any side boundary and should have a maximum depth of 1.8 metres.
C5.	Upper level balconies that face side or rear boundaries will not be permitted when the upper level setback is less than 6.0 metres.
C6.	Provide suitable screen planting on a rear boundary that will achieve a minimum mature height of 6.0 metres where the rear upper floors are proposed to be less than 7.0 metres off a rear boundary.
C7.	Ground floor decks, terraces or patios should not be greater than 500mm above natural ground level. If expansive terraces are sought on sloping ground, they should be designed to step down in relation to the topography of the site.
C8.	Where the visual privacy of adjacent properties is likely to be significantly affected from windows, doors and balconies, or where external driveways and/or parking spaces are located close to bedrooms of adjoining buildings, one or more of the following alternatives are to be applied: a) Fixed screens of a reasonable density (minimum 85% block out) should be provided in a position suitable to alleviate loss of privacy; b) Where there is an alternative source of natural ventilation, windows are to be provided with translucent glazing and fixed permanently closed; c) Windows are off-set or splayed to reduce privacy effects; d) An alternative design solution is adopted which results in the reduction of privacy effects; and e) Suitable screen planting or planter boxes are to be provided in an appropriate position to reduce the loss of privacy of adjoining premises. Note: This option will only be acceptable where it can be demonstrated that the longevity of the screen planting has been provided for eg. Automatic watering systems.
C9.	The introduction of acoustic measures to reduce traffic/aircraft noise should not detract from the streetscape value of individual buildings.
C10.	Habitable rooms for detached dual occupancy development are to have a minimum separation of nine (9) metres.
C11.	Habitable rooms for multi-dwelling development are to have a minimum separation of nine (9) metres.

Use of rooftops of buildings and garages

Controls	
C12.	No trafficable outdoor spaces are permitted on the uppermost rooftop of a building or on garage roofs, such as roof decks, terraces, patio, gardens and the like, however; Outdoor roof space may be considered for buildings on steeply sloping sites where this is the dominant characteristic in the immediate vicinity as demonstrated by the Streetscape Character Analysis and there are no noise, privacy or amenity issues.

Refer to figures E2.1 to E2.4

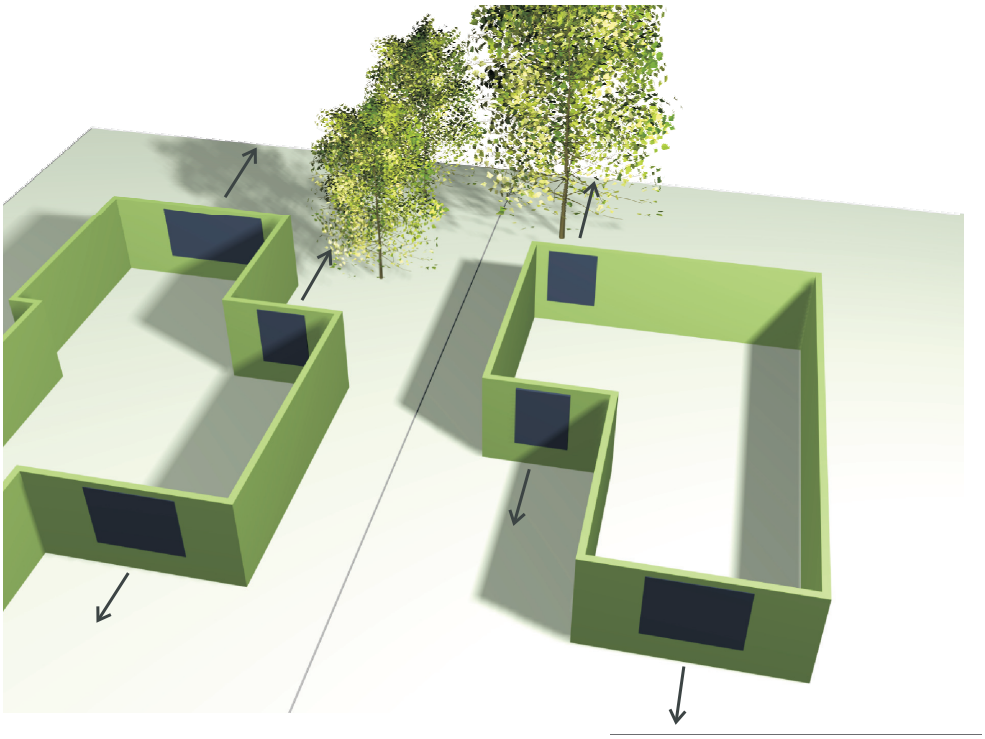


Figure E2.1 - Illustrated examples of appropriate measures to protect privacy - Orientation for private outlook

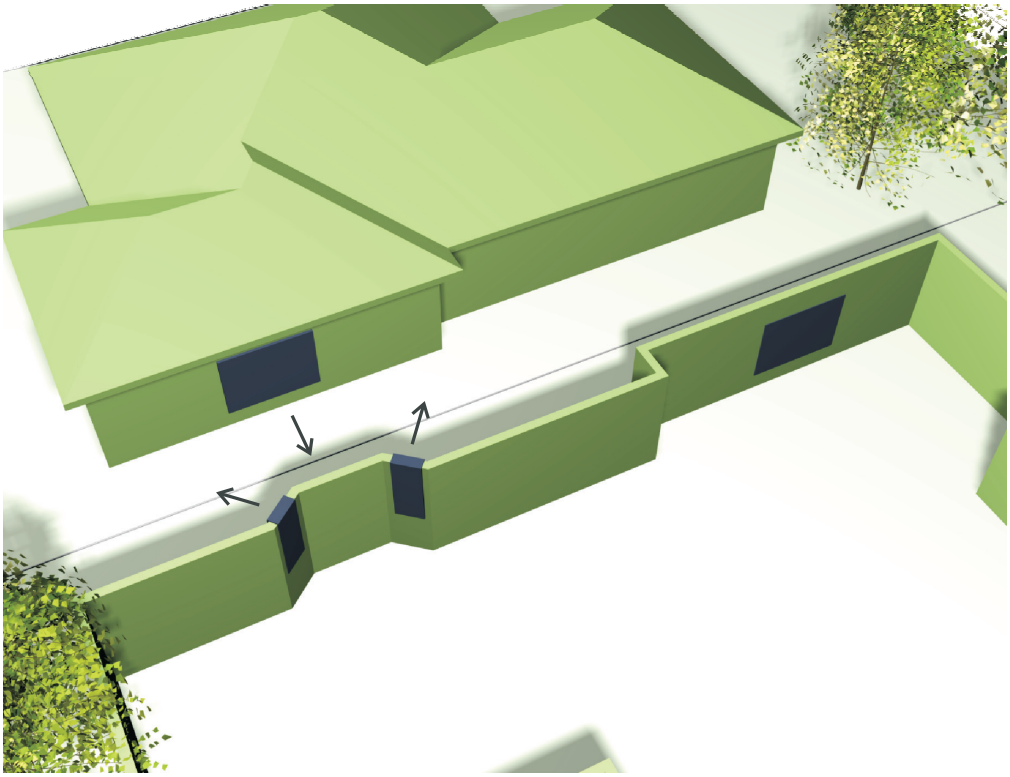


Figure E2.2 - Illustrated examples of appropriate measures to protect privacy - Splay windows

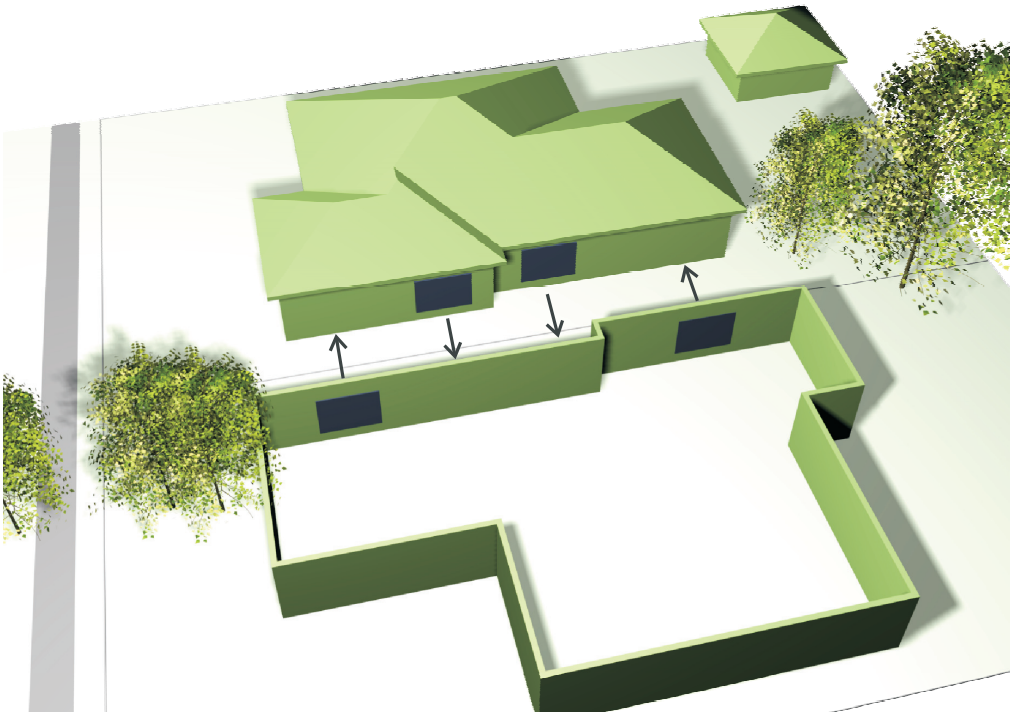


Figure E2.3 - Illustrated examples of appropriate measures to protect privacy - Offset windows

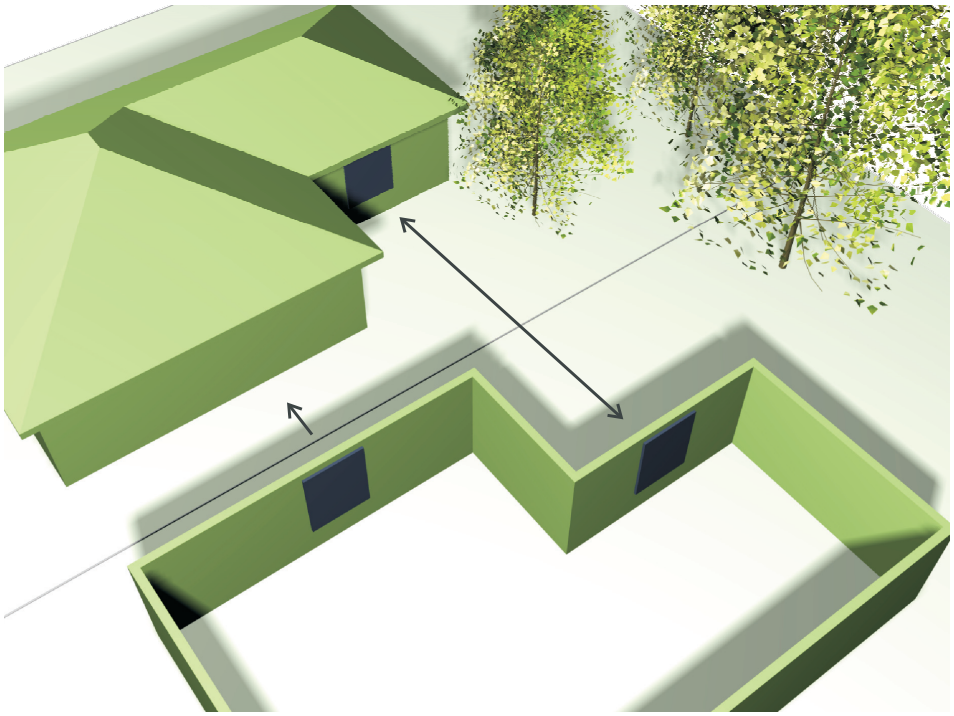


Figure E2.4 - Illustrated examples of appropriate measures to protect privacy - Separation between rooms

E2.5 Access to views

Objectives

O1. To protect and enhance opportunities for vistas and public views from streets and public places.

O2. To ensure views to and from the site are considered at the site analysis stage.

O3. To recognise the value of views from private dwellings and encourage view sharing based on the following four controls.

O4. To recognise the value of view sharing whilst not restricting the reasonable development potential of the site.

To determine whether a development is satisfactory in relation to the Objectives pertaining to access to views, the following controls will be applied:

Controls	
C1.	Development should seek to protect water views, iconic views and whole views. Water views are valued more highly than land views. Iconic views (eg of the Harbour Bridge or the City skyline) are valued more highly than views without icons. Whole views are valued more highly than partial views (eg a water view in which the interface between the land and water is visible is more valuable than one in which it is obscured). An icon should be a prominent identifying feature of the landscape and should be commonly held by the wider community as having iconic status.
C2.	Development should seek to protect views from the front and rear of buildings and where views are obtained from a standing position. The expectation to retain side views and sitting views is often unrealistic.
C3.	Development should seek to protect views from living areas and minimise the extent of impact. The impact on views from living areas is more significant than from bedrooms or service areas (though views from kitchens are highly valued because people spend so much time in them). The impact may be assessed quantitatively, but in many cases this can be meaningless. For example, it is unhelpful to say that the view loss is 20% if it includes the Harbour Bridge. Council will attempt to assess the view loss qualitatively as negligible, minor, moderate, severe or devastating.
C4.	Development in view affected areas should not only be designed to meet relevant development controls but also be designed to achieve view sharing. A development that complies with all planning controls is more reasonable than one that breaches them. Where an impact on views arises as a result of non-compliance with one or more planning controls, even a moderate impact is unreasonable. A complying proposal of a more skillful design could provide the applicant with the same development potential and amenity and reduce the impact on the views of neighbours.

Note: In some cases, Council will insist on the erection of height poles/building templates to indicate the height of the proposed development together with written and/or photographic montages to ensure that view losses are minimal. Template construction is to be to the satisfaction of Council officers and is to be certified by a registered surveyor upon erection.

E2.6 Safety and security

Objectives

O1. To facilitate a safe physical environment by promoting crime prevention through design.

O2. To facilitate the security of residents and visitors and their property and enhance community safety and well-being.

O3. To ensure a development relates well with the public domain and contributes to an active pedestrian-orientated environment.

O4. Effective use of fencing or other means to delineate private and public areas.

Controls	
C1.	Ensure lighting is provided to all pedestrian paths, shared areas, parking areas and building entries for multi unit development.
C2.	High walls which obstruct surveillance are not permitted.
C3.	The front door of a dwelling house should be visible from the street.
C4.	Buildings adjacent to public streets or public spaces should be designed so residents can observe the area and carry out visual surveillance. At least one window of a habitable room should face the street or public space.
C5.	A Council approved street number must be displayed at the front of new development or the front fence of such development.
C6.	Roller shutters are not permitted on window and door openings that have frontage to the street or are adjacent to public open space.
C7.	Fences higher than 900mm should be of an open semi-transparent design.
C8.	Balconies and windows should be positioned to allow observation of entrances.
C9.	Proposed planting must not obstruct the building entrance from the street or sightlines between the building and the street frontage.
C10.	Blank walls facing a rear laneway should be avoided as they attract graffiti.
C11.	Pedestrian and vehicular entrances must be designed so as to not be obstructed by existing or proposed plantings.
C12.	If seating is provided in communal areas of a development it should generally only be located in areas of active use where it will be regularly used.
C13.	Development on properties which adjoin a rear laneway must provide at least one habitable room window in the rear elevation capable of overlooking the laneway. If appropriate to the site context and neighbouring property privacy considerations, a balcony on the rear elevation would be an appropriate alternative.

E3 General Controls

E3.1 Subdivision and allotment size

Subdivision is the division of land into two or more parts for separate occupation, use or disposition.

Objectives

O1. To minimise any likely impact of subdivision and future development on the amenity of neighbouring properties.

O2. To ensure lot size and dimension are able to accommodate a dwelling and provide adequate open space and car parking consistent with the relevant requirements of this DCP.

O3. To ensure lot size and dimension take into account the slope of the land and existing vegetation identified in the site analysis.

O4. To ensure lot size and dimensions enable dwellings or future dwellings to be sited to protect natural or cultural features including heritage items and retain special features such as trees and views.

Where relevant, Torrens Title subdivision standards are contained on the Lot Size Map to the Canada Bay Local Environment Plan.

Controls	
C1.	The minimum frontage to the street for normal allotments is:

Allotment type	Minimum frontage to street
Normal allotment	14.0m
Hatchet–shaped allotment	4.0m

Controls	
C2.	Where the subdivision of an allotment is creating: a) A single battle-axe allotment, the minimum width of an access handle is 4.0 metres; or b) Two or more battle-axe allotments, the minimum width of an access handle is 4.0 metres plus a passing bay at 30 metre intervals.

In each case, a 0.5 metre wide landscape strip is to be provided on the outer edge of the access handle.

E3.2 Frontage

Objective

O1. To ensure lot dimensions are able to accommodate residential development and provide adequate open space and car parking consistent with the relevant requirements of this DCP.

Controls	
C1.	The following minimum frontage requirements should be achieved:

Dwelling Type	Frontage
Attached Dual Occupancy	14.0m
Detached Dual Occupancy	16.0m
Multi–Dwelling Housing & Residential Flat Buildings	20.0m

E3.3 Site coverage

Objectives

O1. To ensure that new development and alterations and additions to existing development result in a site coverage that is consistent with the existing character of adjoining dwellings and those found in the wider locality.

O2. To ensure that new development and alterations and additions to existing development result in site coverage which allows adequate provision to be made on site for infiltration of stormwater, deep soil tree planting, landscaping, footpaths, driveway areas and areas for outdoor recreation.

O3. To minimise impacts in relation to overshadowing, privacy and view loss.

Controls	
C1.	The following site coverage provisions should not be exceeded:

Dwelling type	Maximum site coverage
Multi-Dwelling Housing & Residential Flat Buildings	Precinct 1 – 40% Precinct 2 – 40% Precinct 3 – 30%

E3.4 Density

Objective

O1. Provide a low to medium density residential environment which will accommodate a variety of building forms.

Controls	
C1.	The following density provisions should not be exceeded:

Dwelling Type	Site Area Per Dwelling
Multi-Dwelling Housing & Residential Flat Buildings	**Precinct 1** Small – 185m^2 Medium – 210m^2 Large – 230m^2 **Precinct 2** Small – 100m^2 Medium – 140m^2 Large – 185m^2 **Precinct 3** Small – 100m^2 Medium – 140m^2 Large – 185m^2

Refer to figures E3.1 to E3.6 for location of Precincts.

Definitions for small, medium and large dwellings are contained within the Definitions Section of Part J of this DCP.

Figure E3.1 Precinct map

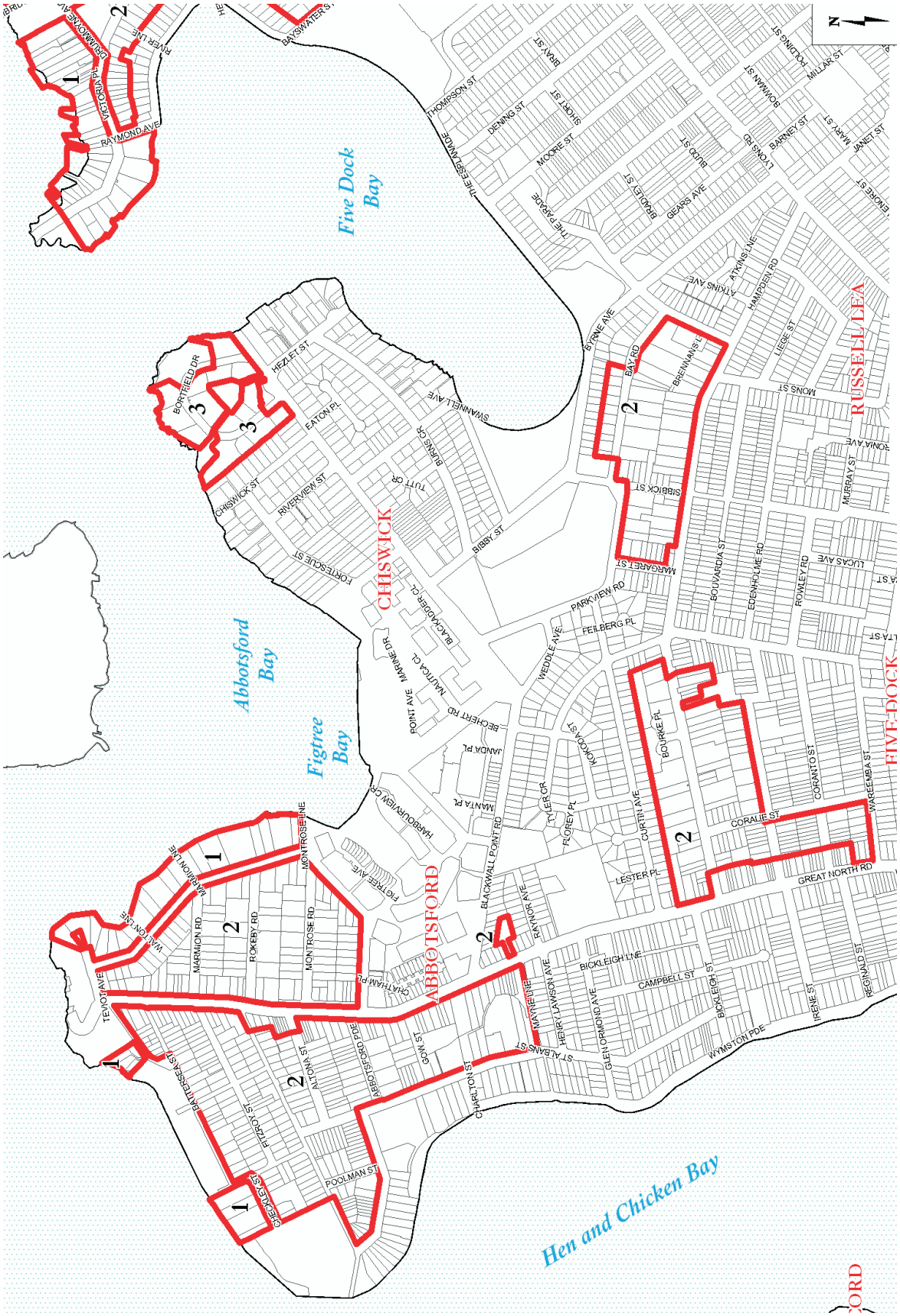


Figure E3.2 Precinct map

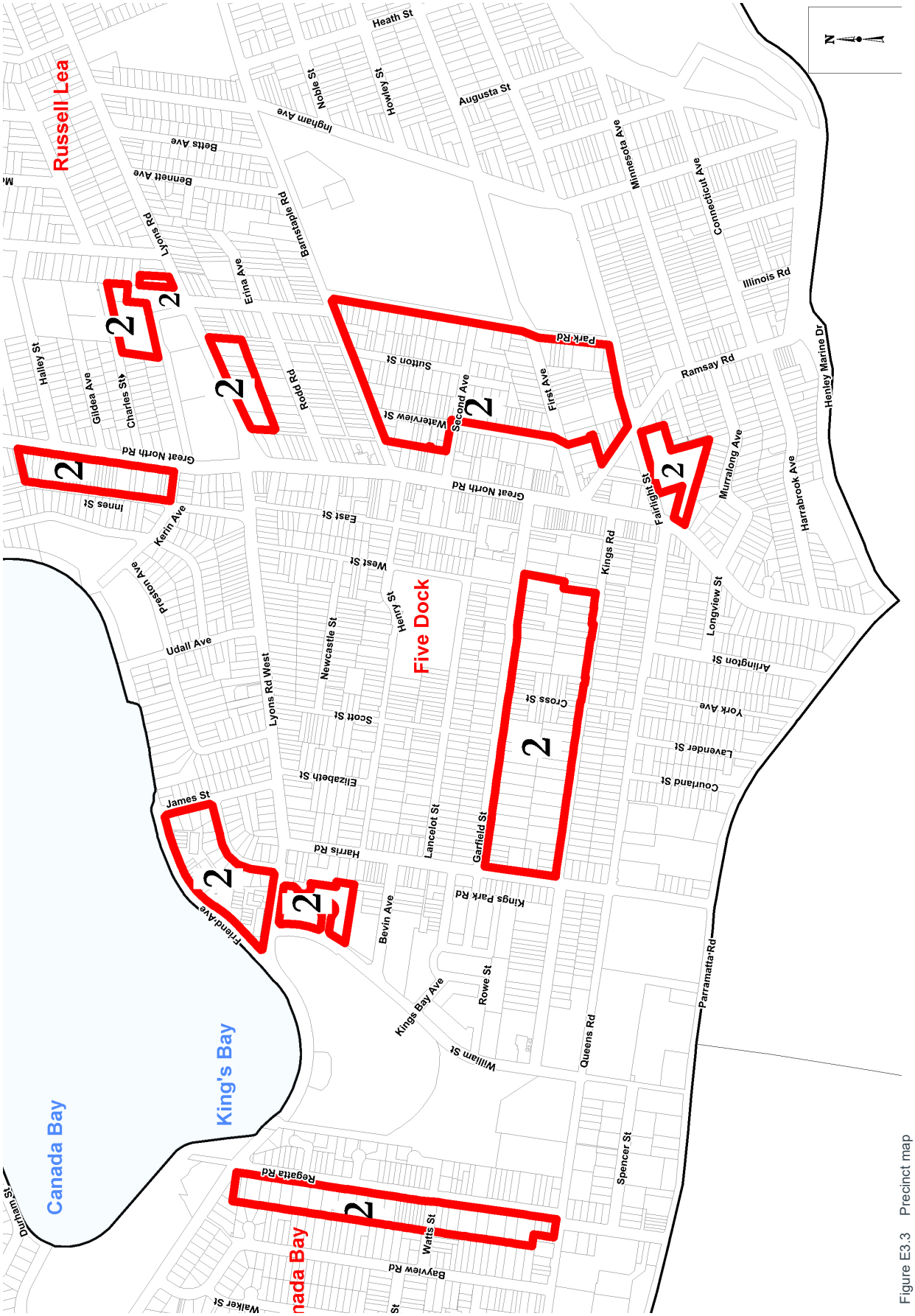


Figure E3.3 Precinct map

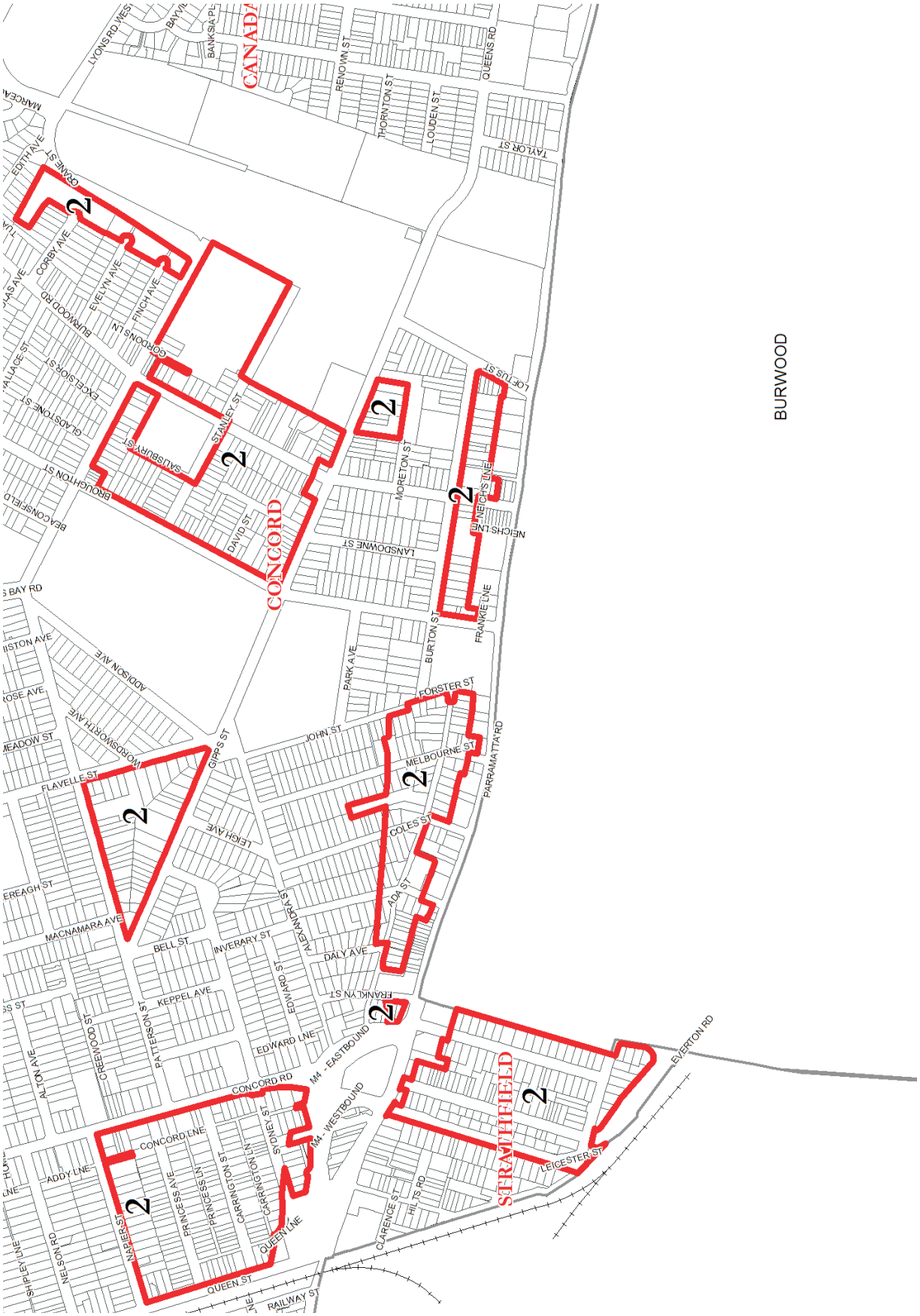


Figure E3.4 Precinct map

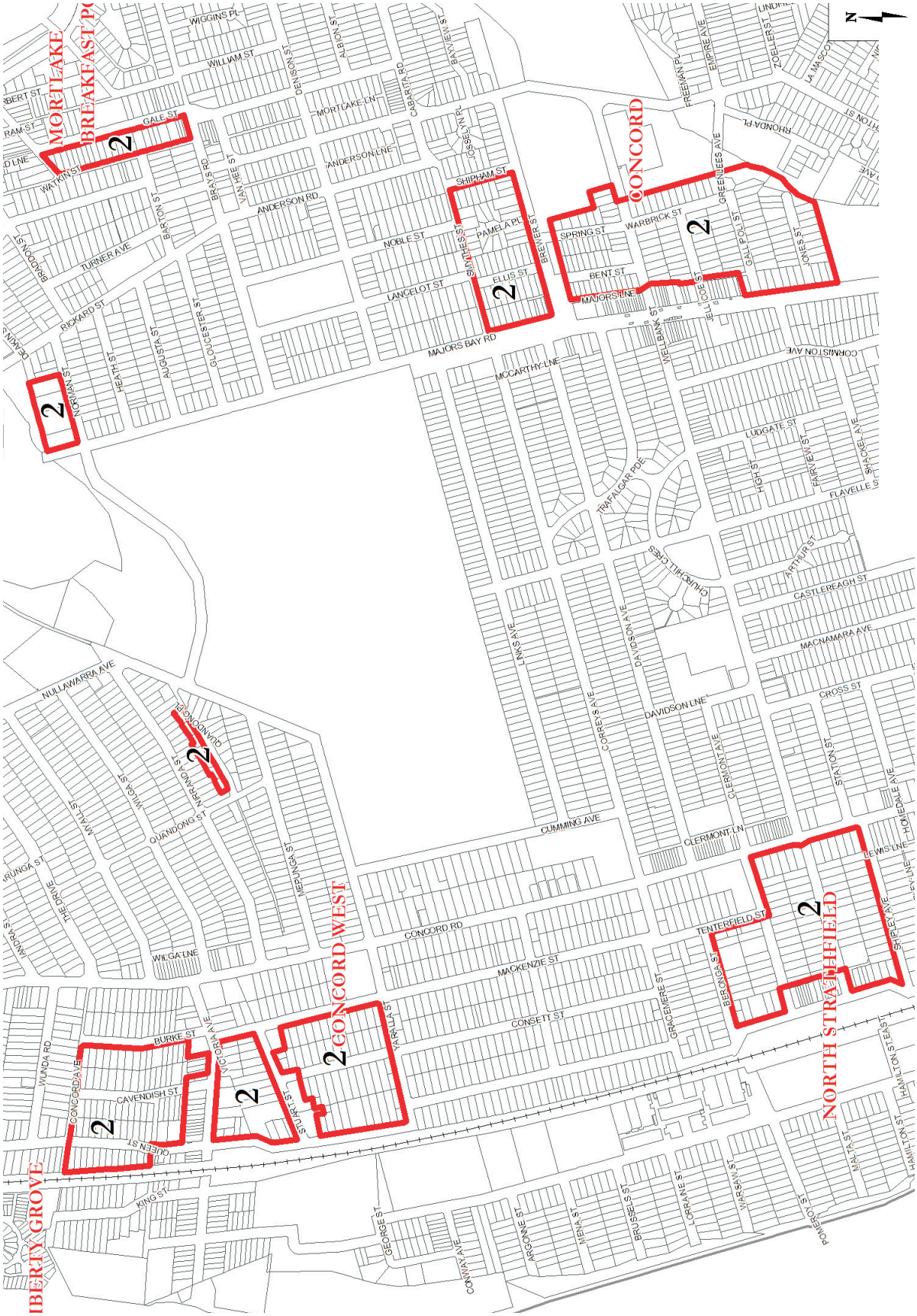


Figure E3.5 Precinct map

Figure E3.6 Precinct map

E3.5 Building setbacks

Setbacks define the overall footprint of a building and the outer extremities of that building in relation to the front, side and rear boundaries.

Appropriate street setback controls can contribute to the public domain by enhancing the streetscape character and the continuity of street facades. Street setbacks also enhance the setting of a building. Canada Bay Council places particular emphasis on continuing the building alignment in uniform streetscapes.

Rear setbacks provide space for planting, including trees, which will achieve a reasonable height and canopy and provide for adequate open space for the amenity of residents. Rear setbacks also promote privacy between residents of adjoining properties, particularly where development is greater than single storey.

Objectives

O1. To integrate new development with the established setback character of the street.

O2. Preserve significant vegetation which contributes to the public domain and allows for street landscape character to be enhanced.

O3. Ensure adequate separation between buildings consistent with the established character and rhythm of built elements in the street.

O4. To ensure adequate separation between buildings for visual and acoustic privacy.

O5. Maximise solar access to achieve amenity for neighbours.

Front setbacks

Controls	
C1.	The front setback of all residential buildings is to be a minimum of 4.5 metres or no less than the Prevailing Street Setback, whichever is the greater. The “Prevailing Street Setback” is the setback calculated by averaging the setback of five (5) adjoining residential properties on both sides of the development. Where there are fewer than five residential properties or a non-residential use property between a street end or corner and the development site, the “Prevailing Street Setback” is the setback calculated by averaging the setback of the five next residential properties fronting the street (if any) on both sides of the property. *Note: In many instances, the front setback of buildings in Canada Bay is 7.5 metres or greater and development in these areas will be required to comply with this prevailing setback.*
C2.	No balconies, entry porches or verandahs are permitted to encroach within the front setback. The only encroachments permitted within the front setback are restricted to eaves and awnings for weather protection but no supporting columns or posts.
C3.	Where detached dual occupancy development is on a corner lot, the design should acknowledge the prevailing setback on both streets.

Refer to figures E3.7 to E3.10

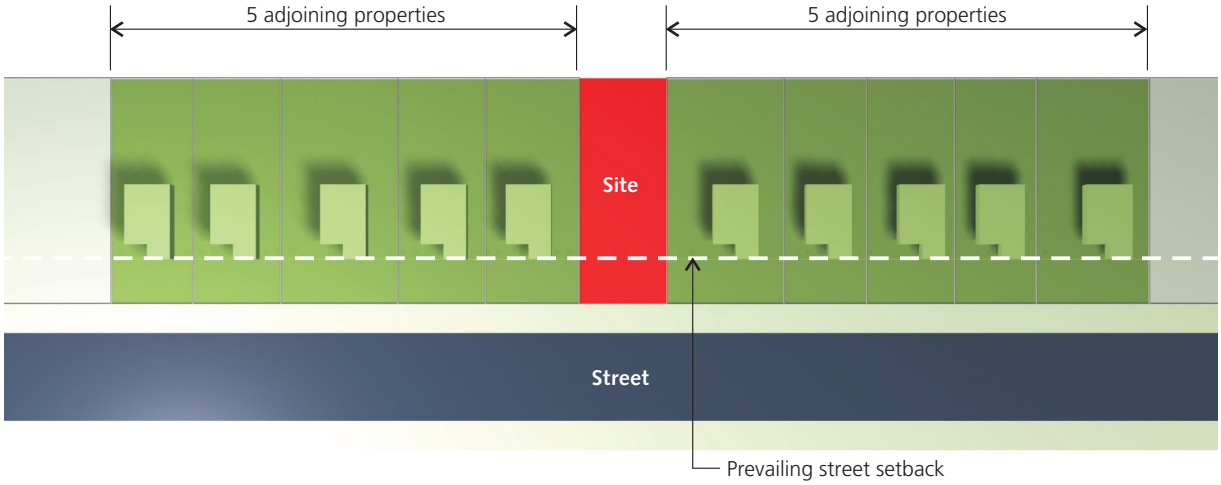


Figure E3.7 Calculation of the prevailing street setback

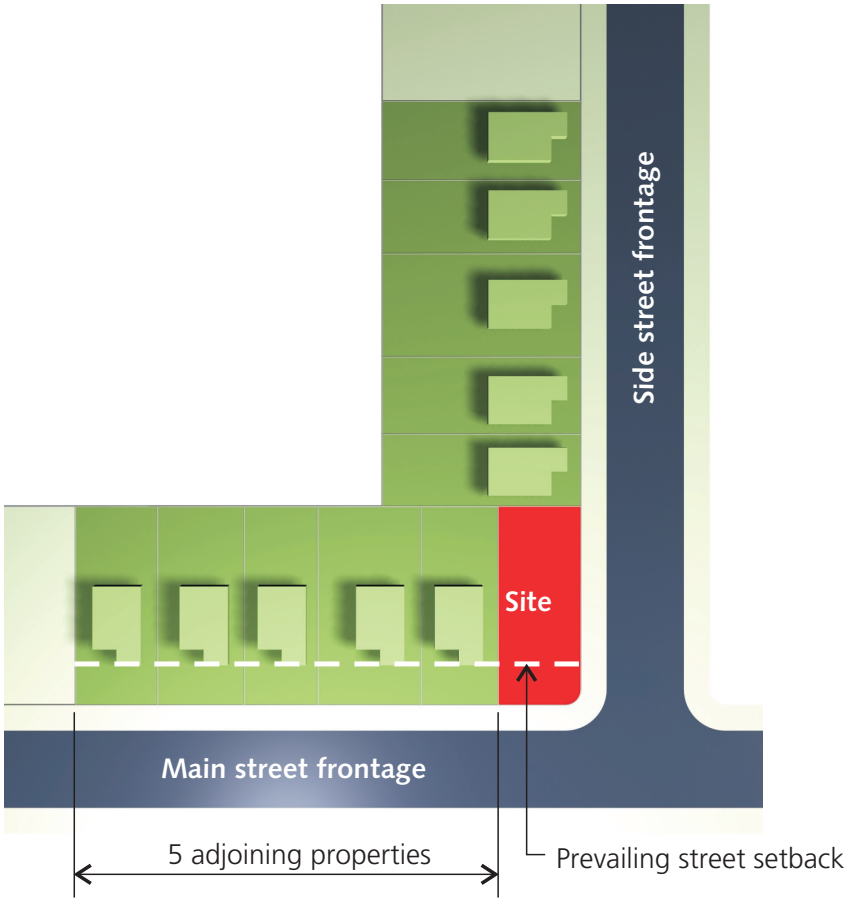


Figure E3.8 Calculation of the prevailing street setback on a corner development site

Figure E3.9 Prevailing street setback near corner sites

Figure E3.10 Prevailing street setback near corner sites

Side setbacks

Controls	
C4.	Any wall facing a boundary which contains a window should be set back a minimum of 900mm.
C5.	Dwelling Houses, Dual Occupancies, Multi-Dwelling Housing and Residential Flat Buildings are to comply with the following numerical requirements:

Development	Minimum distance from side boundary
Dwelling houses and attached dual occupancies	• Single storey dwellings and attached dual occupancies are to be set back a minimum of 900mm from side boundaries. • The second storey of all dwellings and attached dual occupancies is to be set back a minimum of 1500mm from side boundaries. • This may be achieved by integrating any proposed upper floor within the roof form or by setting back both the ground and first floors a minimum of 1500mm from the side boundaries.
Detached Dual Occupancies	• Front Dwelling – all walls should be set back a minimum of 900mm for single storey buildings and 1500mm for the 2nd storey component of two storey buildings. • Rear Dwellings – all walls should be set back a minimum of 1.5 metres.
Multi-Dwelling Housing & Residential Flat Buildings	• All building walls are to be set back a minimum of 5.0 metres from side boundaries.

Rear setbacks

Controls	
C6.	All new developments, including Dwelling Houses, Dual Occupancies, Multi-Dwelling Housing and Residential Flat Buildings, are to have a minimum rear setback of 6.0 metres.

Basement setbacks

Controls	
C7.	Basement excavation for all development is limited to the area of the building at ground level. The excavation setback includes the driveway access to the basement.
C8.	The outer edge of excavation, piling and all subsurface walls including driveway excavation to basement car parking for dwelling houses should not be less than 900mm from any boundary.
C9.	Where it can be demonstrated the site is so constrained (for example by its width) that it is impossible to provide basements without extending beyond the permitted side and rear setbacks, excavation up to but no closer than 3.0 metres to a site boundary will be considered.

Internal setbacks

Controls	
C10.	If two or more rows of dwellings are proposed in Multi-Dwelling Housing or Residential Flat Buildings, an internal setback of 12.0 metres is required between rows.

Outbuildings

Controls	
C11.	Outbuildings are to be located behind the main building alignment and should have a minimum setback of 900mm to side and rear boundaries.

However, reduced side and rear boundary setbacks may be considered on merit where:

a) they are consistent with the setbacks of outbuildings in the vicinity;
b) they require no maintenance (including roof gutters);
c) there are no adverse impacts to the amenity of the adjoining properties; and
d) the total area of all outbuildings does not exceed 35m^2.

Advisory Notes

Notwithstanding compliance with the above numerical controls, Council may require building setbacks to be increased if necessary to reduce bulk, overshadowing, visual impact, view loss, privacy concerns and to retain existing trees on site.

Any Foreshore Building Line will continue to apply and overrides any setback provisions in this plan.

E3.6 Height of buildings

Height is an important control because it has a major impact on the physical and visual amenity of a place. Building height is also critical in addressing impacts from development such as solar access, privacy and view loss.

Objectives

O1. To ensure that buildings are compatible with the height, bulk and scale of the existing and desired future character of the locality.

O2. To minimise visual impact, disruption of views, loss of privacy and loss of sunshine to existing residential development.

O3. To minimise the adverse impact on Conservation Areas, Heritage Items and contributory buildings.

O4. To reduce the visual impact of development when viewed from the Parramatta River as well as other public places such as parks, roads and community facilities.

Controls	
C1.	Dwellings and attached dual occupancies are not to exceed the building height plane projected at an angle of 45 degrees over the site from a vertical distance of 5.0 metres above ground level at any boundary of the site.
C2.	The Building Height Map to the Canada Bay Local Environmental Plan includes a maximum 8.5 metre building height for dwelling houses and attached dual occupancies.
C3.	The following maximum building heights should not be exceeded:

Dwelling type	Maximum storeys
Dwelling houses and attached dual occupancies	Dwelling houses and attached Dual Occupancies are to have a maximum height of two (2) storeys.
Detached Dual Occupancy	Two (2) storey (front dwelling) One (1) storey (rear dwelling) (On a corner site the dwelling facing the primary street frontage is considered the front dwelling).
Multi-Dwelling Housing & Residential Flat Building	Precinct 1 – Two (2) storey Precinct 2 – Two (2) storey Precinct 3 – Three (3) storey
Outbuildings	The storey limit for an outbuilding is single storey.

Reference should be made to the Building Height Maps which accompany the Canada Bay Local Environmental Plan.

Controls	
C4.	The rear dwelling of a detached dual occupancy must have a ground floor ceiling no higher than 3.6 metres when measured vertically at any point above existing ground level.

Attic rooms

Controls	
C5.	The use of an attic room within the roof space of a dwelling house or outbuilding is permitted for habitable purposes, provided that: • no external balconies are proposed for the attic room; • the attic room does not increase the bulk of the building; • it does not compromise the privacy of adjacent properties.

Refer to Figures E3.11 to E3.15

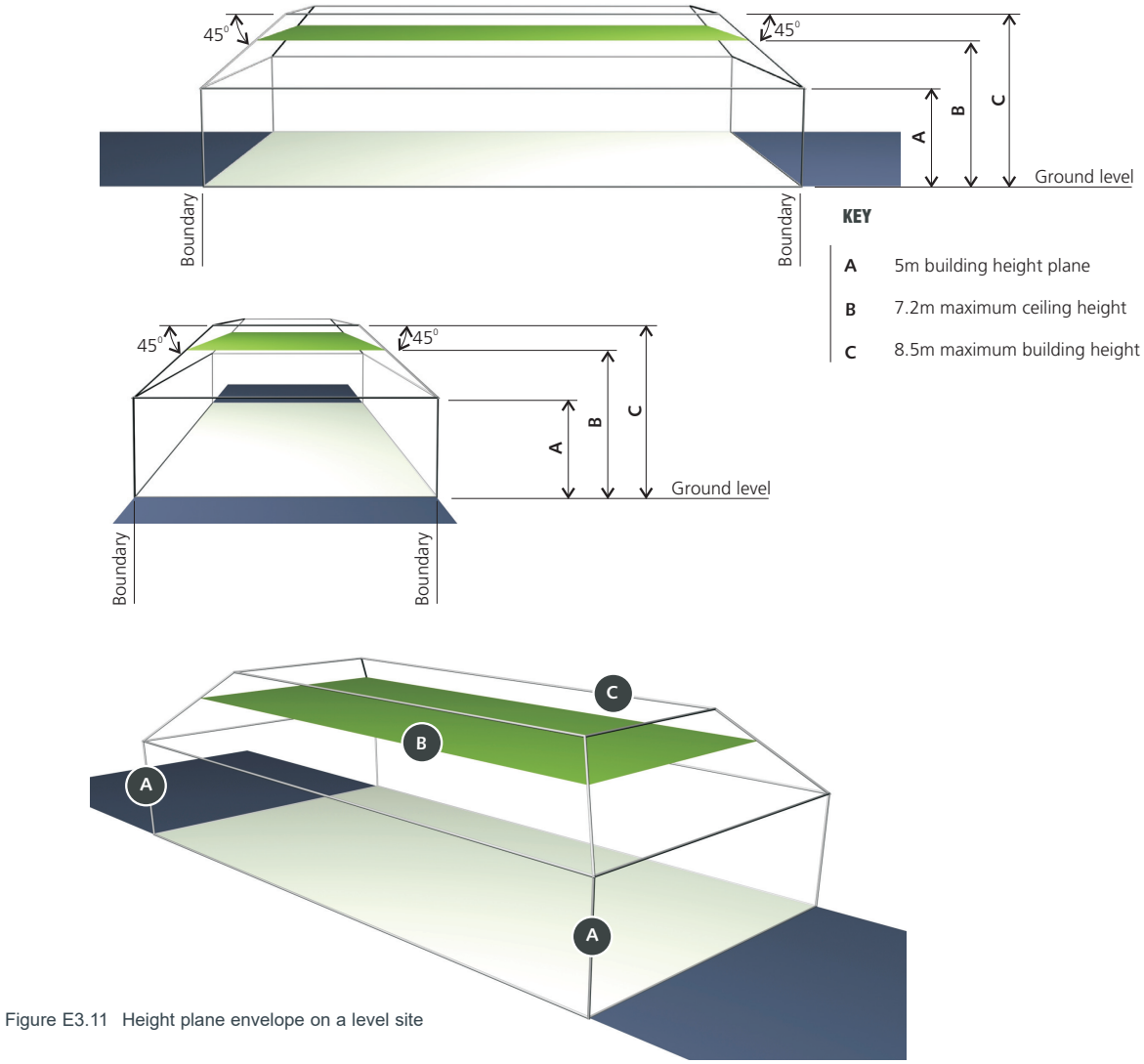


Figure E3.11 Height plane envelope on a level site

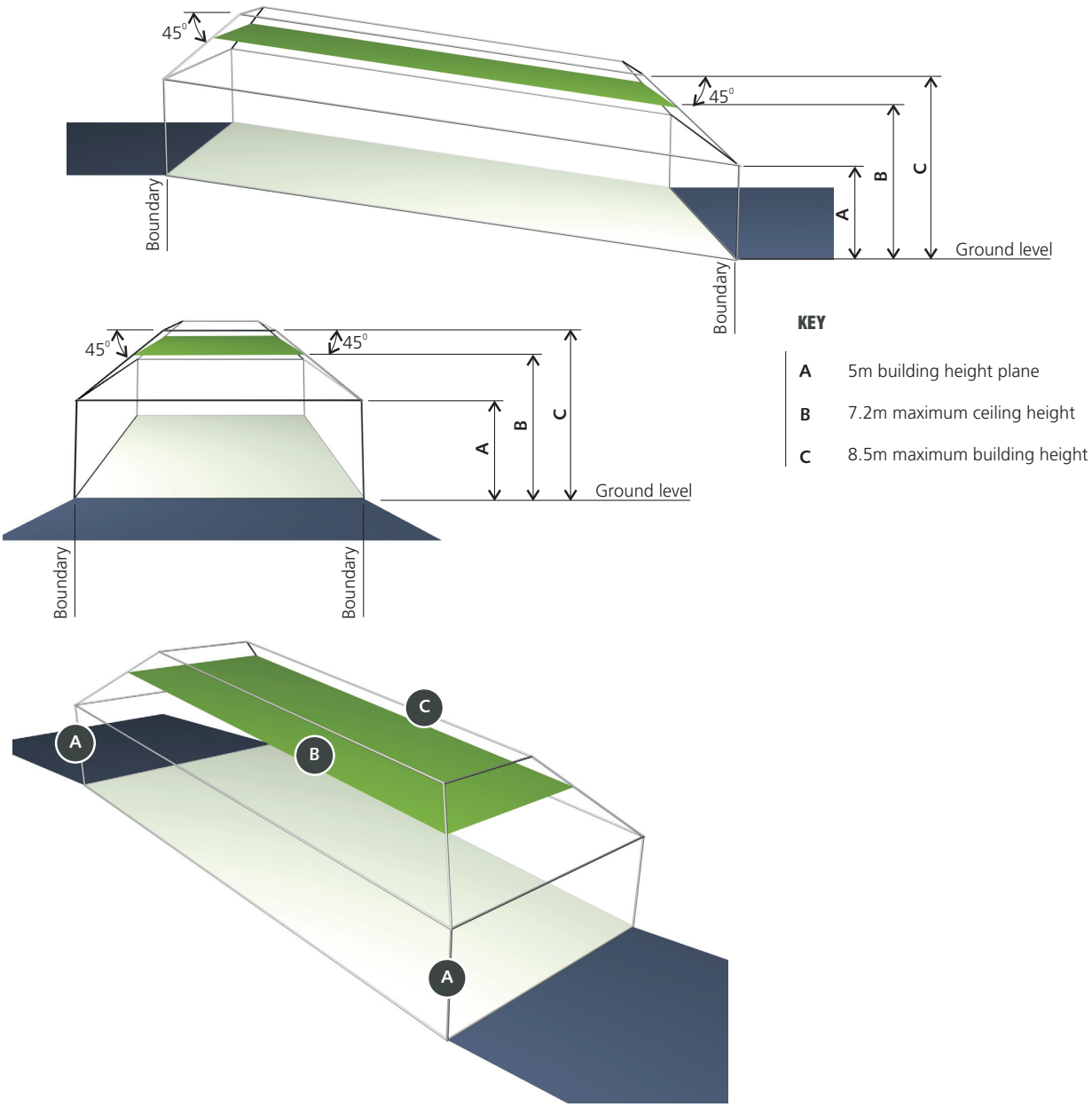


Figure E3.12 Height plane envelope on a sloping site

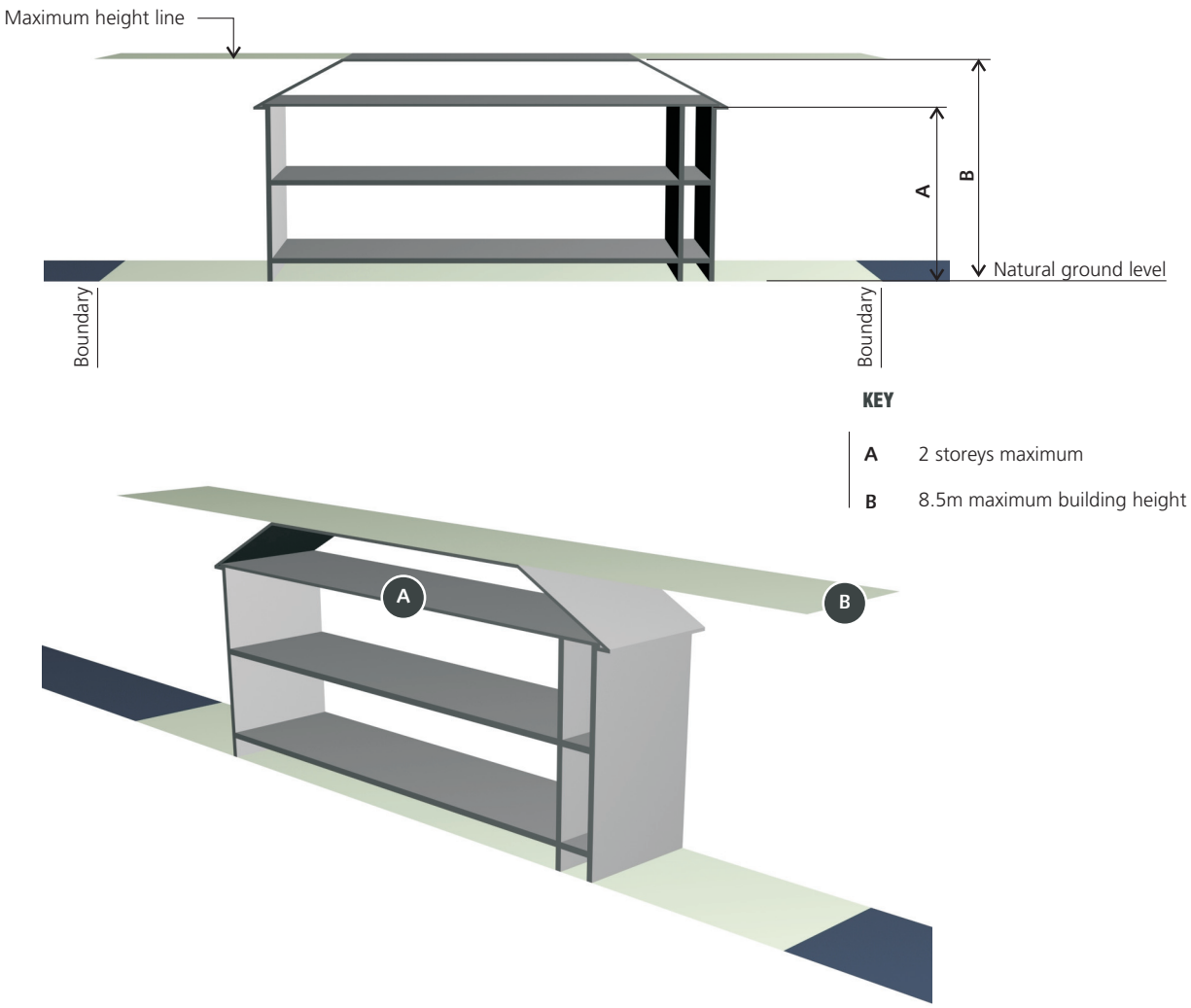


Figure E3.13 Maximum building height and maximum number of storeys on a level site

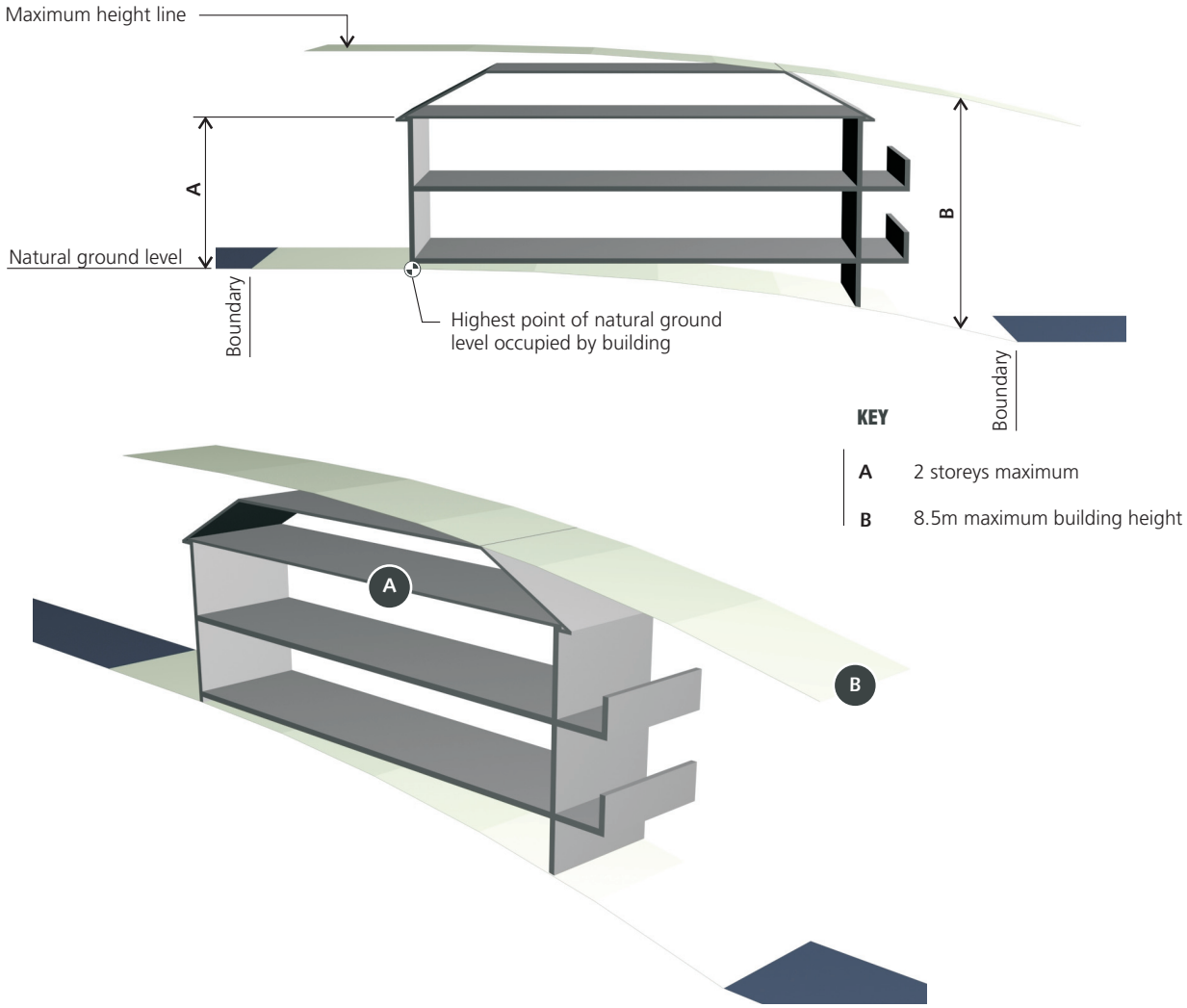


Figure E3.14 Maximum building height and maximum number of storeys on a sloping site

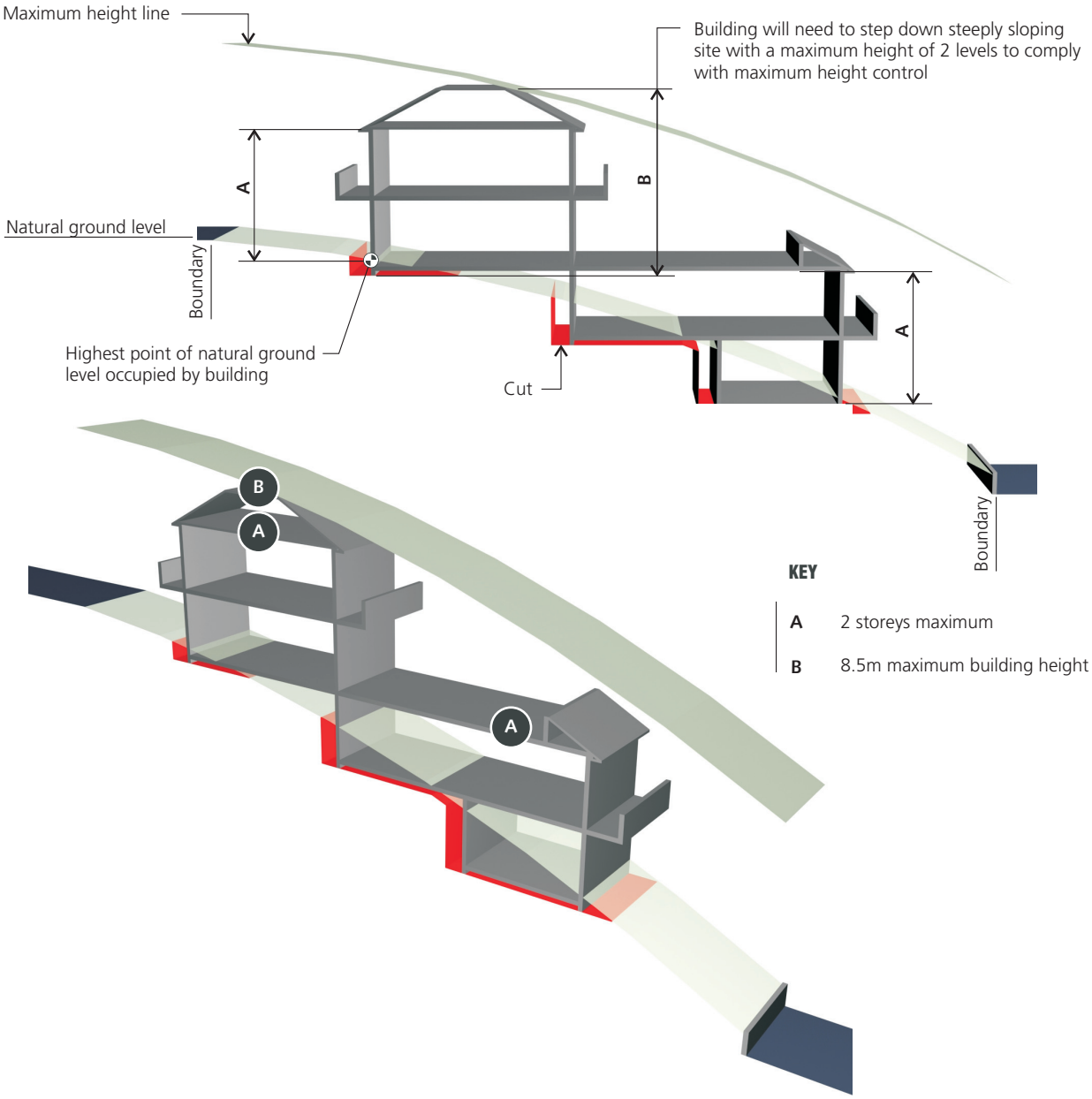


Figure E3.15 Maximum building height and maximum number of storeys on a steep site

E3.7 Private open space

Objectives

O1. To ensure private open space provides each dwelling with a space for outdoor activities and functions as an extension of the living area.

O2. To enhance the built environment by providing open space for landscaping.

Controls	
C1.	The provision of private open space for residential development is to be in accordance with the following table:

Type of Development	Minimum Private Open Space Provisions
Dwellings & Attached dual occupancy	40m² per dwelling with a minimum dimension of 5m x 5m
Detached dual occupancies	40m² per dwelling with a minimum dimension of 5m x 5m
Multi-Dwelling Housing & Residential Flat Buildings	• 40m² per dwelling at ground level with a minimum dimension of 5m x 5m • 10m² per dwelling above ground, with a minimum dimension of 1.5m provided as a balcony; and • all balconies should be recessed unless special circumstances, as determined by Council, are considered to exist

Controls	
C2.	A development should locate the private open space behind the front building line.
C3.	At least one portion of the private open space with a minimum area of 40m2 should be adjacent to and visible from the main living and/or dining rooms and be accessible from those areas.
C4.	Development should take advantage of opportunities to provide north facing private open space to achieve comfortable year round use.

E3.8 Landscaping

Objectives

O1. To enhance the existing streetscape.

O2. To enhance the quality & amenity of the built form.

O3. To provide privacy and shade.

O4. To minimise the extent of hard paved areas and facilitate rainwater infiltration.

O5. To preserve and enhance native wildlife populations and habitat through appropriate planting of indigenous vegetation.

Controls	
C1.	Landscape areas need to be consistent with the definition in Part J of the DCP. Note: Synthetic turf, permeable paving and gravel do not form part of landscaped area calculation.
C2.	Landscaped area for dwelling houses and dual occupancies is to be provided in accordance with the following tables:

Landscaped area for dwelling houses and attached dual occupancies

Site area	Landscape area as percentage of site area for two storey dwellings	Landscape area as percentage of site area for single storey dwellings
Less than 450m²	35%	25%
450m² or more but less than 550m²	37%	27%
550m² or more but less than 650m²	39%	29%
650m² or more but less than 750m²	41%	31%
750m² or more but less than 850m²	43%	33%
850m² or more	45%	35%

Note: Attached dual occupancies are not permitted on lots under 450m².

Landscaped Area for detached dual occupancies

Minimum landscaped area as a percentage of site area	
Detached Dual Occupancies	35%

Controls	
C3.	Landscaped open space for multi-dwelling development and residential flat buildings may comprise both communal and private open space and is to be provided in accordance with the following table.

Landscaped area for dwellings in multi-dwelling housing and residential flat buildings

Development type	Dwelling size	Minimum landscaped area per dwelling
Precinct 1	Small Medium Large	90m^2 110m^2 120m^2
Precinct 2	Small Medium Large	55m^2 75m^2 90m^2
Precinct 3	Small Medium Large	70m^2 90m^2 110m^2

Controls	
C4.	The following minimum number of canopy trees capable of achieving a minimum mature height of 8.0 metres are to be accommodated on site for all new development: a) Sites less than 400m^2 1 tree b) Sites between 400 – 800m^2 2 trees c) Sites over 800m^2 4 trees Trees should comprise native vegetation indigenous to Canada Bay and should be chosen from Council's list of suitable species (refer to Section C5.3).
C5.	Existing trees are to be retained and integrated into a new landscaping scheme, wherever possible. Suitable replacement trees should be provided.
C6.	Minimum soil depth for balcony gardens is 800mm.
C7.	The majority of the front building setback and private courtyard areas of all development should comprise landscaping in accordance with the definition in this DCP.
C8.	A significant landscaped setting is to be established for pathways and paved areas.
C9.	Pathways and driveways are to be located a minimum of 1.0 metres from common boundaries.
C10.	Any development on the foreshore should: a) Enhance the existing flora of the allotment; b) Plant native trees with a mature height greater than 12.0 metres; c) Avoid introduced species known to seed freely or spread easily by rhizomes or vegetative means.

E3.9 Parking and access

Objectives

O1. To provide off street parking for residents.

O2. Provide vehicular and pedestrian safety.

O3. To encourage the location of carports and garages behind the building line where possible.

O4. To ensure that car parking structures respect the character of the street.

O5. To ensure carports and garages etc are designed to be in sympathy with existing dwellings without becoming the dominant feature on the site.

O6. To limit the width of driveways depending on site frontage.

O7. To limit the number of garage doors to the street.

O8. To provide vehicle parking at the rear of properties and off laneways instead of along the street where feasible.

O9. To encourage the location of carports and garages behind the building line where possible.

Car spaces

Controls	
C1.	Parking space should be a minimum of 5.4m x 2.4m, with an additional 300mm either side where enclosed (i.e 5.4m x 3.0m).
C2.	Garage dimensions should be as follows:

Garage size	Minimum internal dimension
Single Garage	5.5m x 3.0m and not less than 2.6m between door jambs
Double Garage	5.5m x 5.4m and not less than 5.2m between door jambs

Controls	
C3.	For existing and new dwellings, a garage or carport in order of priority should be: a) Located at the rear of the site with access from a rear lane; b) Located at the rear of the site with access from the street frontage; and c) Located at the side of the dwelling house, behind the front building alignment.
C4.	Carports, garages and car parking areas are located and designed to: a) Conveniently and safely serve users; b) Enable efficient use of car spaces and access ways, including adequate manoeuvrability for vehicles between the site and the street; c) Not dominate or detract from the appearance of the existing dwelling or new development and the streetscape; d) Be compatible in scale, form, materials and finishes with the associated dwelling or development found on the site; and e) Retain any significant trees.
C5.	Where the frontage of the site is 20.0 metres wide or less, garages, parking structures and driveways should not occupy more than 40% of the frontage.
C6.	Where the frontage is more than 20.0 metres in width, the garages, parking structures and driveways should not exceed 30% of the frontage.
C7.	No outdoor spaces are permitted on garage roofs, such as terraces, patio, gardens and the like.

Note: Reference should be made to Table C-B in Part C3 for the maximum number of parking permitted.

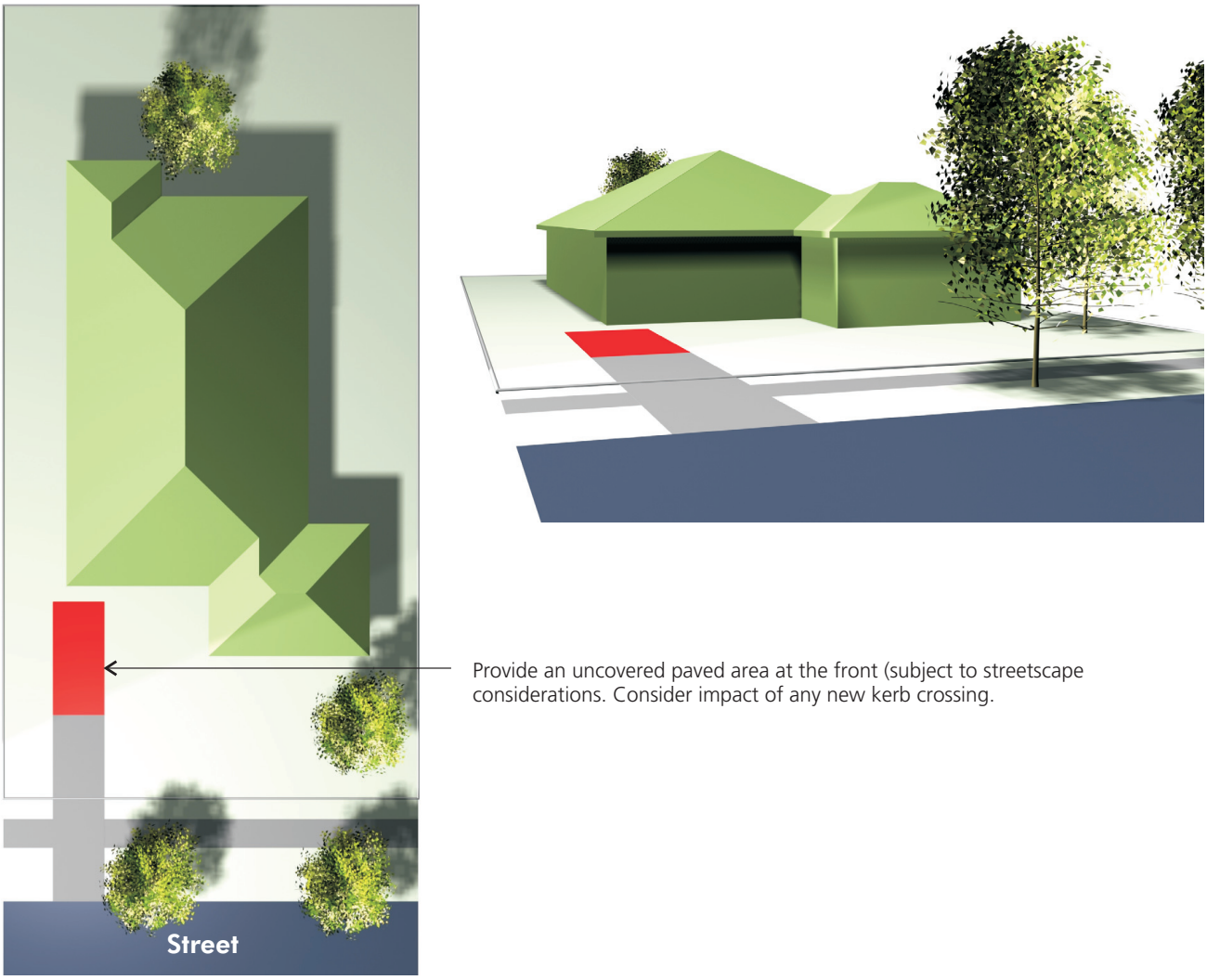


Figure E3.16 Location of car parking at the front consisting of an open paved area

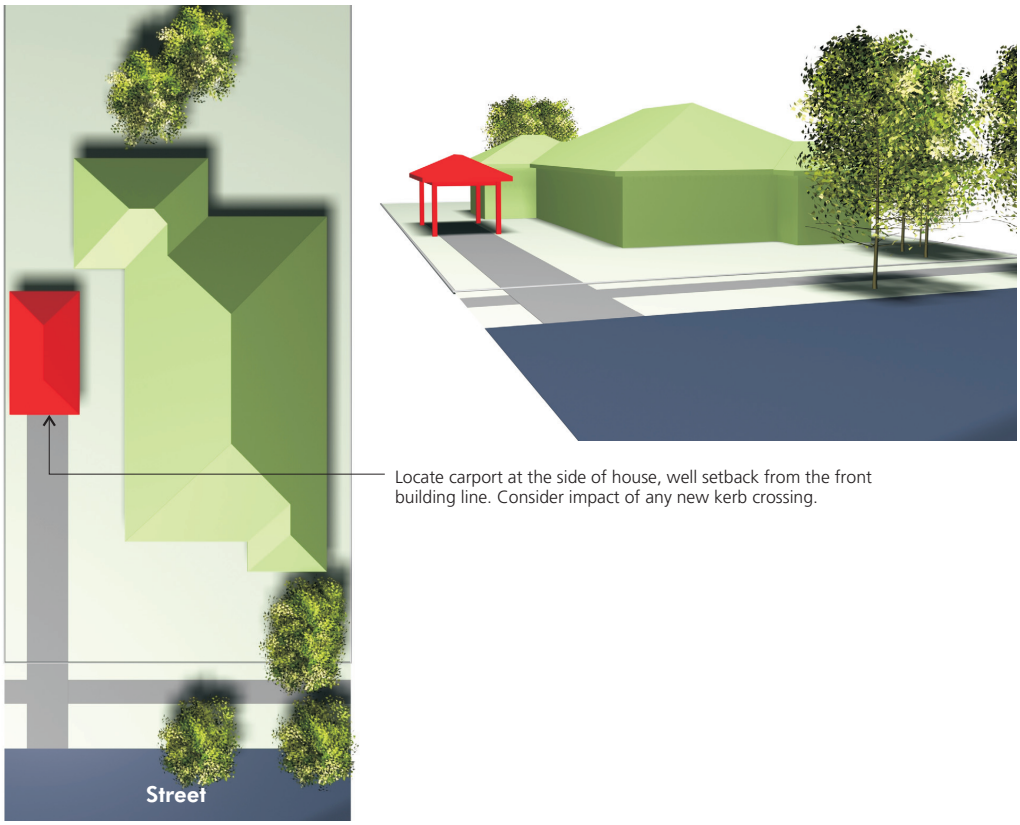


Figure E3.17 Location of car parking at the side behind the front alignment

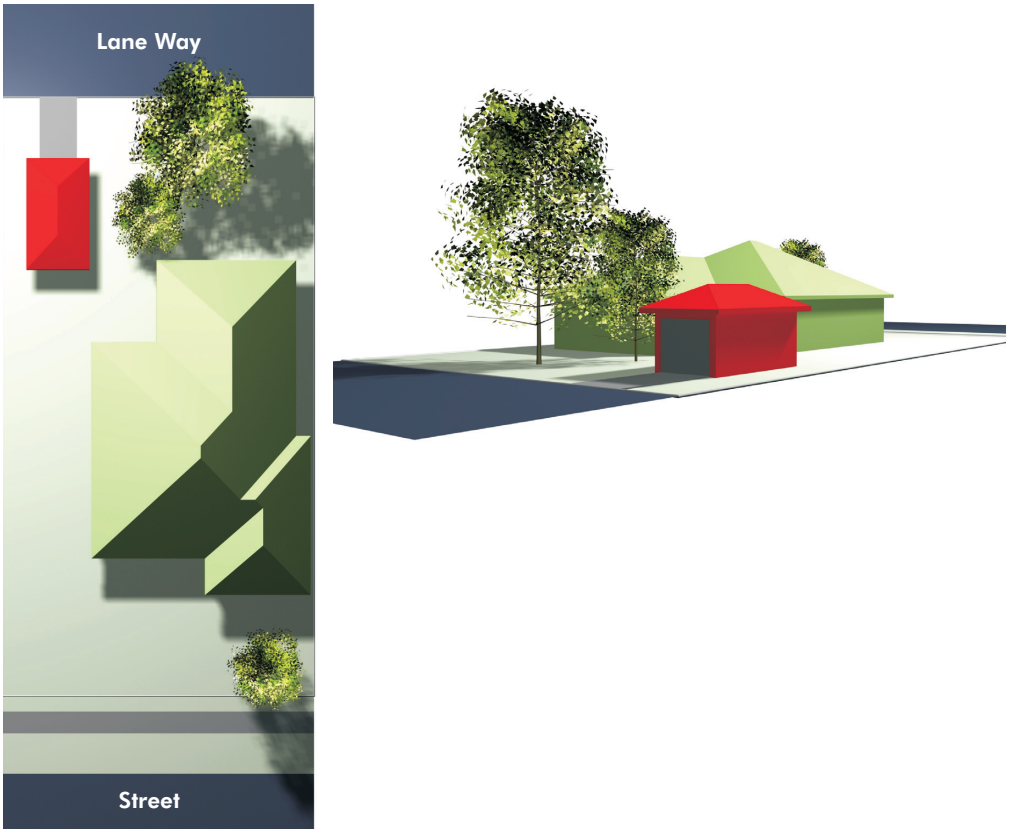


Figure E3.18 Location of car parking at the rear of the site with access from a rear lane

Hardstand

Controls	
C8.	Where a garage/carport cannot be provided at the side or rear of a dwelling house or semi, a hardstand area forward of the building alignment which is integrated into the landscape character of the front yard may be considered by Council. The distance between the front property boundary and building is to be a minimum of 5.5m.

Carports

Controls	
C9.	Council may consider a carport forward of the front building alignment where: a) It is a single carport with an external width of no more than 3.0 metres; b) The site is of a sufficient width that the carport will not obscure the existing building; c) The distance between the building and the front property boundary is a minimum of 5.5 metres; d) It is of a simple post design, with no side panel infill; is not elaborate in its decoration and colour and does not detract from the existing building; e) There is no solid panel lift or roller shutter door proposed; f) Does not significantly affect the landscaped front garden; g) Is within a varied streetscape that currently has carports forward of the building alignment; h) The roof is either flat or of a pitch that relates to the existing house; i) The views of the house from the public domain will not be adversely affected; and j) There is no rear lane access or side access of 2.6 metres or more available. k) Where existing car parking is available, no new structures are permitted forward of the building line.

Garages

Controls	
C10.	Garaging is to be provided to the rear of the site or on a secondary elevation if it is a corner site or behind the main street elevation of the dwelling (behind the primary building façade) in all instances.
C11.	Garage doors should be of timber or simple metal cladding.
C12.	Garage doors and gates are not to encroach over a public footpath during operation.
C13.	Garages for each dwelling within an attached dual occupancy should be single fronted only.

Refer to figures E3.16 to E3.19

New detached garages and carports to existing dwellings

Controls	
C14.	Locate detached garages and carports either at the rear of the site where rear access is available or between the side elevation and the side property boundary. Note: Rear and side access is considered available where there is an existing side boundary setback of 2.6 metres or more or where there is rear lane or secondary street access

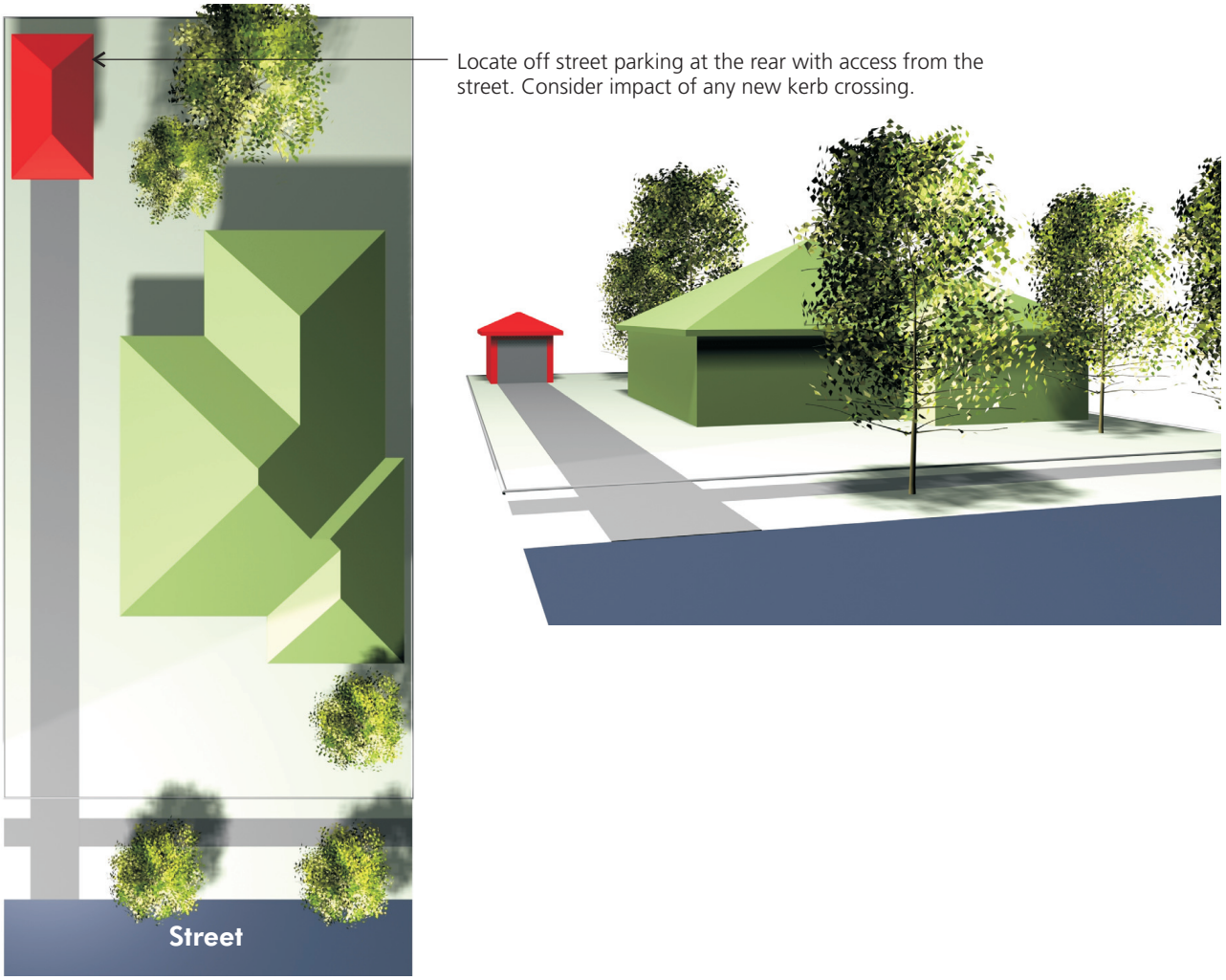


Figure E3.19 Location of car parking at the rear of the site with access from street frontage

Driveways

Controls	
C15.	All side driveways are to comprise a 0.5m wide landscape strip.
C16.	The first 4.5 metres of any driveway should be at grade. This will improve both appearance and pedestrian safety.
C17.	Entries to underground car parking are to be set back behind the building line.
C18.	The alignment of driveways should, where possible, create visual interest and avoid the creation of a “gun barrel” effect.
C19.	The number of vehicle crossings is limited to one (1) per site.
C20.	Vehicular entrances to parking areas should be visually inconspicuous, appropriately screened and ideally not be located along the front façade, but rather to the side or rear.
C21.	The surface and slope of driveways and parking areas facilitate stormwater infiltration on-site and are to be appropriately landscaped eg, driveways should have sealed wheel tracks with grass strips.
C22.	Development should have a maximum driveway crossover of: a) 6m for residential flat buildings; and b) 4m for other residential development where the lot width is 12m or greater and 3.5m where the lot width is less than 12m.
C23.	All multi unit development and residential flat buildings should ensure that all vehicle parking is behind the building line and arranged so that all vehicles may be driven in a forward direction during both ingress and egress from the site.

Access Aisles

Controls	
C24.	A 4.0 metre wide access handle is to be provided to detached dual occupancy development to enable access to the rear dwelling.

E4 Ancillary structures

E4.1 Fencing

Fencing is an important streetscape element and can indicate the architectural period of an area. Consistent and uniform front fencing contributes significantly to the streetscape and character of an area.

For the purpose of this DCP, front fencing is any fence between the front alignment of a building and the street boundary.

Whilst privacy and security of individual households is an important consideration, high blank fencing along the street has a negative impact on the streetscape, personal safety and security by reducing the opportunities for overlooking of private areas. The construction of high blank front fencing is therefore not desirable and should be avoided.

Objectives

O1. To maintain and enhance the character of streetscapes within the Canada Bay LGA.

O2. To ensure that views from streets are maintained and not negated by excessively high fences.

O3. To reduce the impact of front fencing on the streetscape and encourage fencing consistent with the existing streetscape pattern and in sympathy with the general topography and the architectural style of the existing dwelling or new development.

O4. To ensure that materials used in front fencing are of high quality and are in keeping with the existing streetscape character.

O5. To retain and re-use original fences and gates.

O6. To reinstate traditional period fences and gates on street frontages (including side streets) that is of an appropriate architectural style to complement existing buildings.

Height of front fencing

Controls	
C1.	Front fencing and side fencing forward of the building line constructed of a solid material such as brick/masonry, lapped and capped, timber, brushwood and the like should not exceed 900mm (including piers) in height above the footpath level.

Refer to Figure E3.20

C2.	Front fencing and side fencing forward of the building line, constructed of visually transparent material such as timber picket/ metal grill, should not exceed 1.2m in height above the footpath level. Visually transparent components should be no less than 40% of the fence structure and should be distributed evenly along the entire length of the fence.

Refer to Figure E3.21

C3.	From the building line, side fences are to taper down to the height of the front fence line.
C4.	In the case of sloping streets, the height limitations may be averaged, with regular steps.
C5.	Solid fences greater than 1.2 m will only be considered in a streetscape which is shown in the Streetscape Character Analysis to exhibit in excess of 70% high solid fence forms. In such circumstance the appearance of the fence should be softened by: a) Providing a continuous landscaped area of not less than 600mm wide on the street side of the fence, planted with tree and shrub species selected on the basis of low maintenance attributes; and b) The use of openings and variations in colour, texture or materials to create visual interest.

Design of fences

Controls	
C6.	Avoid painting or rendering original masonry and sandstone fencing.
C7.	New fencing should complement any original fencing found on adjoining properties and in the street in terms of style, height, materials, colour, texture, rhythm of bays and openings. Note: Blank walls disrupt established fencing patterns and should be avoided.
C8.	Fencing and associated walls must be positioned so as not to interfere with any existing trees.

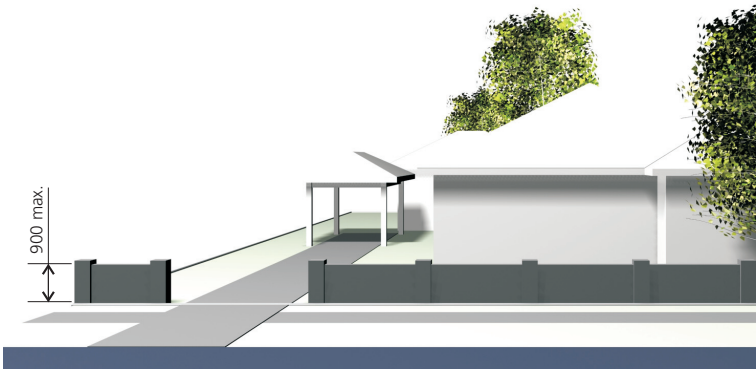


Figure E3.20 Example of solid front fencing with a height of 900mm

Materials

Controls	
C9.	Materials of construction will be considered on their merit, with regard being given to materials of construction of other contributory fences in the vicinity and/or that of the building on the allotment where such materials enhance the streetscape – with a general prohibition on the following materials: a) Cement block; b) Metal sheeting, profiled, treated or pre-coated. c) Fibro, flat or profile; d) Brushwood; and e) Barbed wire.

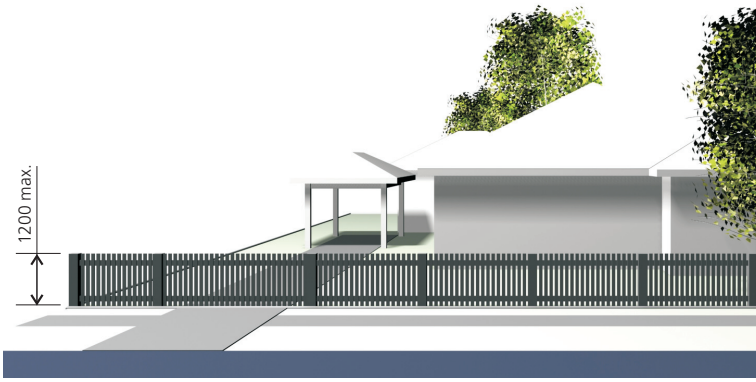


Figure E3.21 Example of open front fencing with a height of 1200mm

General

Controls	
C10.	Gates and doors are to be of a type which do not encroach over the street alignment during operation.

Advisory Notes

All controls are subject to the provision of adequate sight lines for emerging vehicles to enable surveillance of pedestrian and vehicle traffic.

E4.2 Site facilities

Site facilities include:

- Air conditioners;
- outbuildings;
- TV aerials and satellite reception dishes;
- mail boxes;
- garbage storage and collection areas;
- external storage areas;
- clothes drying areas;
- external laundry facilities and
- swimming pools and spas.

Proposals need to ensure adequate and appropriate provision of site facilities. These need to be accessible and not create amenity problems such as smell and unsightliness. The impact of site facilities on the overall appearance of the site and on the local streetscape needs to be considered.

The design of site facilities for multi-unit dwellings needs particular consideration as these facilities are shared. They need to be designed and located so that they are accessible by all residents and do not detract from the amenity of any residence.

Objectives

O1. To ensure that adequate provision is made for site facilities.

O2. To ensure that site facilities are functional and accessible to all residents.

O3. To ensure that site facilities are easy to maintain.

O4. To ensure that site facilities are thoughtfully and sensitively integrated into development, are unobtrusive and not unsightly.

Air Conditioners

Controls	
C1.	Air conditioning units should be sited so that they are not visible from the street.
C2.	Air conditioning units should not be installed on the front façade of a building.
C3.	Air conditioning units should not be installed within window frames or otherwise obscure a window.
C4.	Air conditioning units should not obscure architectural details visible from the street.
C5.	The noise level from air conditioning systems is not to exceed the L aeq 15 minute by 5dBA measured at the property boundary.

Outbuildings and outdoor structures

Controls	
C6.	Outbuildings and outdoor structures should be located behind the front building line. This clause does not apply to any required waste storage area for multi dwelling housing and residential flat buildings, front fences or carports permissible under the provisions of this DCP.
C7.	Windows and doors of outbuildings should face into the rear yard, or be frosted, if facing into a neighbour's property.

Clothes drying facilities

Controls	
C8.	Adequate open air clothes drying facilities should be provided that are easily accessible to all residents and are visually screened from the street and adjoining premises.

Numbering of buildings

Controls	
C9.	Street numbers are to be placed on the building in accordance with Council's street numbering system and be visible from the primary street frontage.

Public utilities

Controls	
C10.	For new development and substantial alterations to existing premises provision must be made for connection to future underground distribution mains. In such developments the following must be installed: • an underground service line to a suitable existing street pole; or • sheathed underground consumers mains to a customer pole erected near the front property boundary (within 1 metre). Council may require the bundling of cables in the area surrounding the development to reduce the visual impact of the overhead cables. For further details see Energy Australia requirements.

Mail boxes

Controls	
C11.	All mail boxes associated with multi-dwelling housing and residential flat buildings should be designed in a manner that enhances the visual presentation of the building(s) they serve.
C12.	Individual mail boxes should be located close to each ground floor dwelling entry. A mail box structure may be located close to the major pedestrian entry to the site. All mail boxes must comply with the requirements of Australia Post.
C13.	Mail box structures should not dominate the street elevation.

Swimming pools and spas

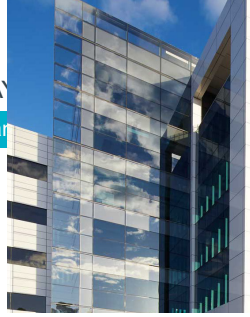
Controls	
C14.	Swimming pools and spas should be located behind the front building line.
C15.	For corner allotments or where the property has two street frontages, the location of swimming pools/spas is not to be in the primary frontage.
C16.	Swimming pools/spas should be positioned so that the coping is a minimum of 800mm from the property boundary.
C17.	In-ground swimming pools should be built so that the top of the swimming pool is as close to the existing ground level as possible. On sloping sites this will often mean excavation of the site on the high side to obtain the minimum out of ground exposure of the swimming pool at the low side.
C18.	Provided one point on the swimming pool or one side of the swimming pool is at or below existing ground level, then one other point or one other side may be up to 500mm above existing ground level.

Tennis Courts

Controls	
C19.	Tennis courts are to be sited at the rear of properties.
C20.	For corner allotments or where the property has two street frontages, the location of tennis courts is not to be in the primary frontage.
C21.	A minimum of five (5) metres should be maintained between the tennis court fencing and habitable rooms of any dwelling.
C22.	Tennis courts should be positioned having regard to the location of habitable rooms both on site and on adjoining properties and to the maintenance of appropriate private open space.
C23.	Screen planting should be provided between court fencing and the nearest property boundary or any dwelling on an adjoining property.
C24.	The court playing surface should be of a material that minimises light reflection.
C25.	Flood lighting is generally not permitted unless it can be demonstrated the lighting and use of the court at night will not interfere with neighbour amenity.
C26.	Fencing material is to be a recessive colour.
C27.	Fences are to be set back a minimum of 1.5 metres from boundaries.
C28.	Cut and fill associated with the construction of a tennis court should not unreasonably intrude into the natural topography of the land.

TV antennae and satellite dishes

Controls	
C29.	Satellite dishes, telecommunication antennae and ancillary facilities are to be: a) Located away from the front and side boundries; b) Installed so that they do not encroach upon any easements, rights of ways, vehicular access or parking spaces required for the property, and c) Painted in colours selected to match the colour scheme of the building.
C30.	Satellite dishes where they are situated in rear yards are to be less than 1.8m above ground.
C31.	Only one (1) telecommunications/TV antennae will be permitted for each residential flat building.



F

PART F - MIXED USE AREAS AND NEIGHBOURHOOD CENTRES

F1 General Requirements

F1.1 General objectives

The controls in this section of the DCP apply to permissible development in mixed use areas and neighbourhood centres. It contains general controls that apply to all commercial development and specific controls that apply to selected commercial precincts.

O1. To facilitate the development of ALL commercial areas in a way that is economically sustainable and environmentally sensitive.

O2. To encourage the revitalisation of commercial areas by enabling mixed use development including residential in certain areas.

O3. To ensure development contributes to the improvement and amenity of public spaces.

O4. To maintain the heritage values through appropriate alterations and additions.

F1.2 Building design and appearance

The City of Canada Bay's business centres are characterised by retail shopping strips, formed by a unique interaction between local topography, street layout, subdivision pattern and building form.

Façade treatment, the line of continuous awnings and the general vertical building proportions assist in tying buildings together into cohesive groups.

Objectives

O1. To ensure infill development is well articulated, makes a positive contribution to the streetscape and responds to local urban character.

O2. To ensure development presents a clear and visually interesting address to the street.

O3. Alterations and additions respect the identified heritage and conservation values of the place.

O4. To retain the use of awnings as visually dominant and co-ordinating townscape features.

O5. To encourage awnings which are lighter and more elegant in appearance to allow more light through to shop fronts.

O6. To ensure new development maintains a pedestrian scale and provides weather protection at street level.

Articulated infill development responds to local urban character

Lighter, elegant awnings increase the visibility of shop fronts

Controls

Building massing	
C1.	Building mass should maintain the prevailing vertical character found in Canada Bay's business centres.
C2.	Disruption of the street wall massing is not permitted.
Building facades	
C3.	Where development has two (2) street frontages the streetscape should be addressed by both facades. Development should provide a definitive street address to both facades when fronting a main road and a smaller road or car park.
Roofs and parapets	
C4.	In commercial areas where parapet skylines predominate, infill development should also include parapet skylines.
Awnings	
C5.	Refurbishment or redevelopment of a building should include the provision of an awning of a similar height, width and general appearance to that of adjoining contributory awnings.
C6.	Awnings should be reinstated where there is evidence that they were originally fitted or where there is a break in a continuous run of awnings.
C7.	New awnings on corner buildings should wrap around into side streets.
C8.	New awnings should be no more than 600mm higher or lower than neighbouring awnings, for continuity.
C9.	Awnings are to be flat or near flat in shape. Raised or curved awning structures are not permitted.
C10.	Eaves and fascias are to be flat or near flat in shape.
C11.	Awning fascias are to be a maximum 300mm high including any added on signage and in keeping with the scale and character of the building.

Verandahs and balconies	
C12.	The reinstatement of verandahs is encouraged where evidence of the original structure exists.
C13.	Balcony balustrades should be of a light open material. Where possible, balustrades are to match predominant examples within the streetscape.
C14.	Existing verandahs and balconies should be retained and not infilled.
Car parking	
C15.	On-site car parking should be located below ground level where possible or located within the building and well screened, or to the rear off a laneway.
Public utilities	
C16.	For new development and substantial alterations to existing premises provision must be made for connection to future underground distribution mains. In such developments the following must be installed: • an underground service line to a suitable existing street pole; or • sheathed underground consumers mains to a customer pole erected near the front property boundary (within 1 metre). Council may require the bundling of cables in the area surrounding the development to reduce the visual impact of overhead street cables.

F1.3 Retail frontages

Direct and easy access from the footpath to the retail premises “draws the street into the shop”. Active frontages are therefore a vital contributing factor to a business centre's vitality.

Objectives

O1. To preserve the surviving examples of original whole shop frontages and elements.

O2. To encourage new or replacement shop fronts to be compatible with the architectural style or period of the building to which they belong and the overall character of the business centre.

Controls	
C1.	New shopfronts should be designed to make maximum use of vertical elements, i.e. windows should emphasise a vertical proportion (height greater than width).
C2.	Original early shop fronts in existing buildings should be retained and conserved.
C3.	If security shutters are required, they should be visually permeable (75% permeability) to allow viewing of windows and allow light to spill out onto the footpath. Open grilles (concertina style) are preferred. Note: Block-out roller shutters are not permitted.

Retail frontages on corner sites should "turn the corner"

F1.4 Visual and acoustic privacy

Privacy refers to both visual and acoustic privacy.

Where buildings are constructed adjacent to residential properties, particular regard should be had to any possible loss of privacy which may be caused to residents.

Objective

O1. New development is to ensure adequate visual and acoustic privacy levels for neighbours and residents.

Controls	
C1.	Openable first floor windows and doors as well as balconies should be located so as to face the front or rear of the building.
C2.	Where it is impractical to locate windows other than facing an adjoining building, the windows should be offset to avoid a direct view into windows in adjacent buildings.

Fixed screens help ensure adequate privacy

C3.	Where the visual privacy of adjacent properties is likely to be significantly affected from windows, doors and balconies, or where external driveways and/or parking spaces are located close to bedrooms of adjoining buildings, one or more of the following alternatives are to be applied: (a) Fixed screens of a reasonable density (minimum 75% block out) should be provided in a position suitable to alleviate loss of privacy; (b) Where there is an alternative source of natural ventilation, windows are to be provided with translucent glazing and fixed permanently closed; (c) Suitable screen planting or planter boxes are to be provided in an appropriate position to reduce the loss of privacy of adjoining premises: Note: This option will only be acceptable where it can be demonstrated that the longevity of the screen planting will be assured. (d) Windows are off-set or splayed to reduce privacy effects; and (e) Windows to have a sill height of 1.8 metres or more above floor level or fixed translucent glazing to any part of a window less than 1.8 metres above floor level.
C4.	New development containing dwellings along a major road or along a railway corridor should incorporate noise attenuation measures.

F1.5 Safety and security

Sensible design can contribute significantly to crime prevention by providing environments where members of the public feel safe and secure and conversely vandals have a feeling of being under surveillance.

Objectives

O1. To ensure a safe physical environment by promoting crime prevention through design.

O2. To encourage increased use of shopping centres, particularly at night.

O3. To create a balance of uses that are safe and easily accessible.

O4. To ensure there is adequate lighting and signage.

Controls	
C1.	Pedestrian ways and car parking, particularly those used at night, are to be direct, clearly defined, visible and provided with adequate lighting.
C2.	Landscaping and site features that might block sight lines are to be minimised.
C3.	Shadows and concealment spaces are to be minimised.
C4.	All entrances and exits are to be made clearly visible.
C5.	Windows etc. should be arranged to overlook public areas and streets to maximise surveillance.
C6.	Developments generating a significant amount of pedestrian movement through a car park (such as shopping centres or office car parks) are to establish clear and convenient pedestrian routes. These routes must minimise the number of points which cross vehicle paths and be appropriately marked to heighten driver awareness (e.g. painting, use of contrasting materials, lighting and/ or signage).
C7.	Pedestrian access to buildings should be separate to vehicular access to the site.

F1.6 Daylight and sunlight access

The design of a development should attempt to ensure that where adjoining buildings, particularly residential dwellings, are located in close proximity, the design of such projects minimises any potential loss of sunlight or daylight to residences.

Objectives

O1. To ensure that daylight access is provided to all habitable rooms and other areas to improve amenity and energy efficiency.

O2. To minimise the amount of overshadowing of neighbouring developments and outdoor spaces to maintain their amenity.

Controls	
C1.	Direct solar access (sunshine) to windows of principal living areas and to the principal area of open space of dwellings adjacent to commercial zones should not be reduced to less than 3 hours between 9.00am and 3.00pm on 21 June.

Articulated infill development responds to local urban character

Screens can help control sunlight access

Stepping a building down to the rear can minimise the overshadowing of neighbouring developments

F1.7 Building envelope controls and site specific design controls

The building envelope is the three dimensional space within which development may take place. The building envelope is generated by maximum building height, FSR and setback controls.

The building envelope aims to ensure that the scale and bulk of future development is compatible with site conditions and the desired future character.

The building envelope helps achieve the LEP and DCP's objectives of:

- ensuring a scale of commercial development that is compatible with the amenity of surrounding areas;
- ensuring the bulk and scale of development reflects the character of the streets which define these precincts; and
- ensuring that the bulk and scale of development is compatible with the amenity of surrounding areas.

The building envelope helps to achieve the DCP's objectives by setting out guidelines and controls that work with the LEP requirements for FSR.

The building envelope controls contain flexibility to ensure that these controls can be appropriately adapted to site opportunities and the important character elements of a street or locality.

The building envelope for a site represents the maximum limits of development. It cannot always be 100% developed due to different building standards for different building types.

Objectives

O1. To ensure front setbacks maintain the continuity of setbacks in the street.

O2. To ensure buildings are of a height and scale which is consistent with the character of the area.

O3. To maintain the privacy and amenity of adjoining and nearby residential developments.

Successful buildings balance solid and void components within the building envelope

F2 Building Envelope controls and site specific design controls

F2.1 Victoria Road, Drummoyne

Victoria Road is the transport artery of Drummoyne that moves people and goods in and throughout the area. Its character reflects the bustling and aggressive transport function combined with a mix of commercial and retail uses.

The Victoria Road commercial area is defined by the strip of commercial and retail buildings which line both sides of Victoria Road. A mix of 1-3 storey buildings address Victoria Road with varying setbacks. Collectively these buildings display a pattern of vertical elements, detailed awnings, parapets and silhouettes.

The intersection of Victoria and Lyons Road is located on a ridgetop and is an important urban and landscape feature containing a mix of civic scaled and articulated buildings. It is a landmark location due to these architectural and topographic qualities. This intersection and the buildings located here form the gateway to Drummoyne and establish the key character.

Parts of the Victoria Road strip are located within conservation areas. Individual heritage items are also found in this area. Conservation areas and heritage items are important for their contribution to the streetscape character and history of the area.

The intersection of the eastern side of Victoria Road and Lyons Road is part of a conservation area. The buildings on the south east side of this intersection are identified as having heritage significance and represent an example of Edwardian shopping centre development that forms an almost intact streetscape at the crown of the hill.

The zoning of this area allows for mixed use activities including shop top housing with ground floor retail. Encouraging mixed use development is considered appropriate in some areas provided resident amenity is satisfactory. Providing mixed use development can enhance street activity and surveillance while revitalising the area with new shops, services and residents.

The future character of Victoria Road:

- emphasise the distinctive “busy” urban quality
- encourage mixed use development to create a thriving urban area with retail, residential and commercial uses;
- improve the streetscape character by coordinated advertising policies;
- encourage street edge development to activate the street;
- ensure that any alterations and additions respect the conservation and heritage values of the area; and
- emphasise the western corner of the Victoria and Lyons Road intersection as a strong corner site to signify the gateway to Drummoyne.

Controls have been developed for seven key precincts within the commercial area (labeled A-G in Figure F2.1). These have been developed in response to the streetscape, type and form of buildings and relationship with adjoining areas.

Controls	
C1.	Infill development in the Drummoyne Commercial Area should include parapet skylines and use non-reflective materials.
C2.	Buildings should be built to the street alignment.
C3.	Transitional building heights should be provided between the commercial and residential areas to protect the amenity of surrounding neighbours.

Figure F2.1 Victoria Road Drummoyne - Location Plan

Area A

Controls	
C4.	Development is to be built to the street edge.
C5.	Maximum building height is two (2) storeys.

Area B

Controls	
C6.	Development is to be built to the street edge.
C7.	The maximum building height is six (6) storeys.
C8.	For mixed use development, special consideration must be given to: • noise attenuation measures; • privacy issues; • the provision of landscaping and private open space as roof gardens; • residential amenity; • ESD objectives, including cross ventilation and floor to ceiling heights; • fenestration treatment and adequate solar shading; • articulation and massing of the façade; and • limited reflective surfaces with a more solid wall to window void opening ratio.

Area C

Controls	
C9.	Maximum building height is four (4) storeys at Victoria Road reducing to two (2) storeys along Formosa Street. The two (2) storey development should extend for a minimum depth of 1/3 of the site east of Formosa Street. Refer to building envelope in Figure F2.2.
C10.	Street edge development is required along Victoria Road and Formosa Street.
C11.	Roof form at Formosa Street is a parapet edge.
C12.	Development of a heritage item should be in accordance with the controls in Part D - Heritage. For heritage items, a statement of heritage impact is required to accompany development applications.

Area D

Controls	
C13.	Street edge development is required along Victoria Road and Formosa Street.
C14.	Maximum building height at the Victoria Road alignment is five (5) storeys, stepping up to six (6) storeys. The six (6) storey component is to be set back a minimum of 3 metres from the five (5) storey component on Victoria Road. The maximum building height at the Formosa Street alignment is two (2) storeys, stepping up to three (3) storeys. The three (3) storey component is to be set back a minimum of 5.0 metres from the two (2) storey component on Formosa Street. The two (2) and three (3) storey component is to extend for a minimum of 1/3 of the site east of Formosa Street Refer to building envelope in Figure F2.3.
C15.	Roof form at both Victoria Road and Formosa Street is a parapet edge.

C16.	A continuous cantilevered awning is to be provided on the Victoria Road frontage.

Area E

Controls	
C17.	Maximum building height is two (2) storeys.

Area F

Controls	
C18.	Maximum building height of three (3) storeys to Victoria Road tapering to one (1) storey at the rear boundary. Refer to building envelope in Figure F2.4
C19.	Development is to be built to the street edge.
C20.	Any development of a heritage item should be in accordance with the controls in Part D - Heritage. For heritage items, a statement of heritage impact is required to accompany development applications.

Area G

Controls	
C21.	Maximum building height is two (2) storeys on Victoria Road, Lyons Road and Wrights Road, with four (4) storeys within the centre of the site.
C22.	Development is to be built to the street edge.
C23.	Any development of a heritage item should be in accordance with the heritage controls contained within this DCP. For heritage items, a statement of heritage impact is also required to accompany development applications. Refer to building envelope in Figure F2.5

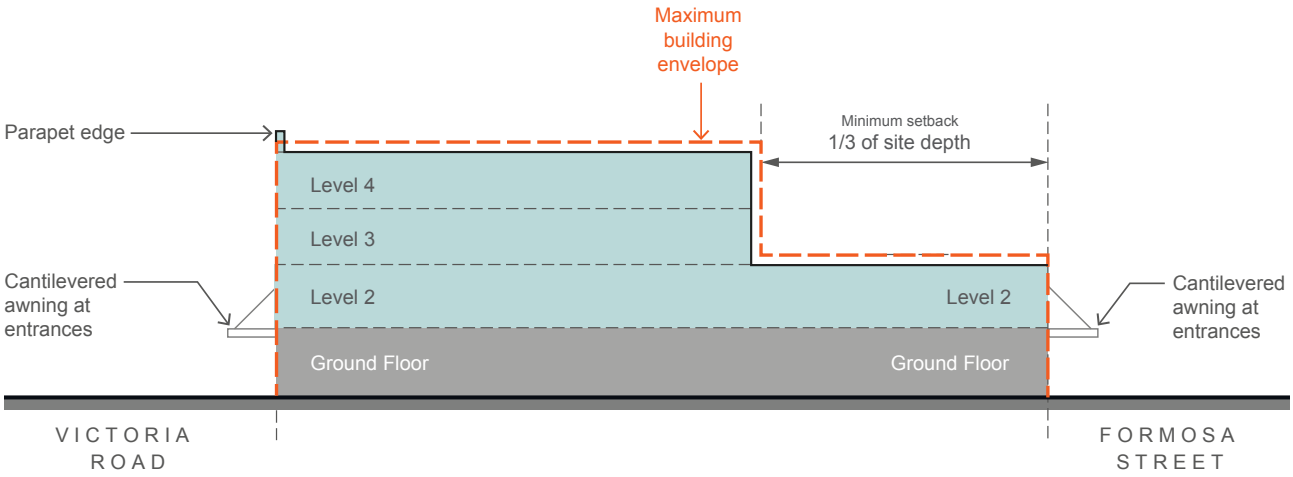


Figure F2.2 Victoria Road Drummoyne Area C- Maximum Building Envelope Section

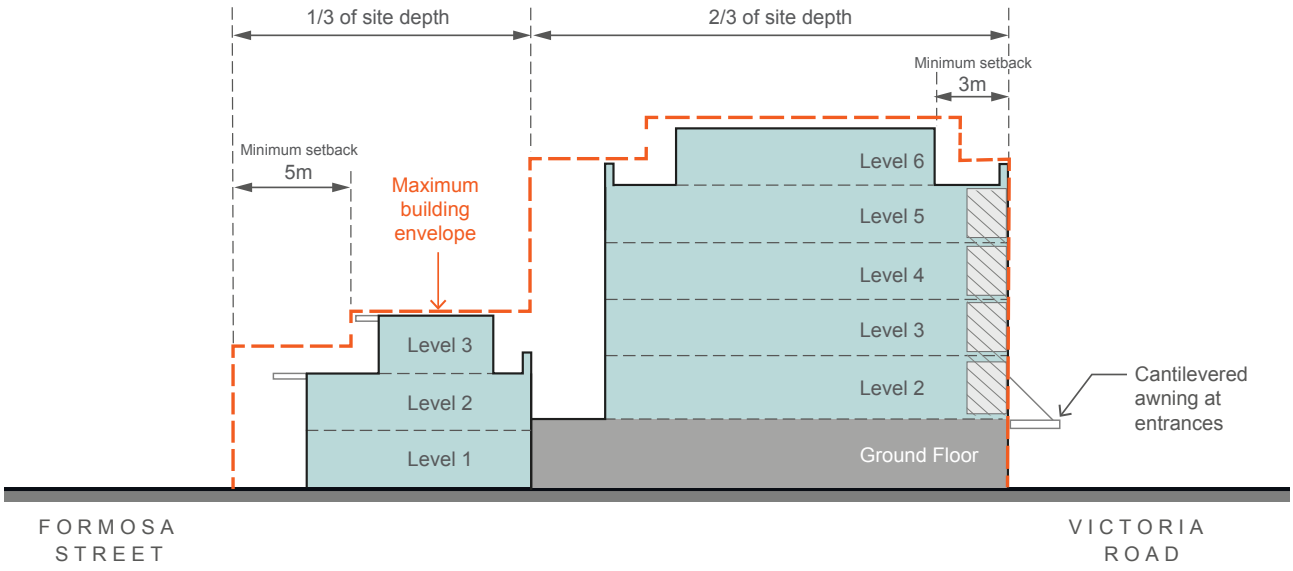


Figure F2.3 Victoria Road Drummoyne Area D- Maximum Building Envelope Section

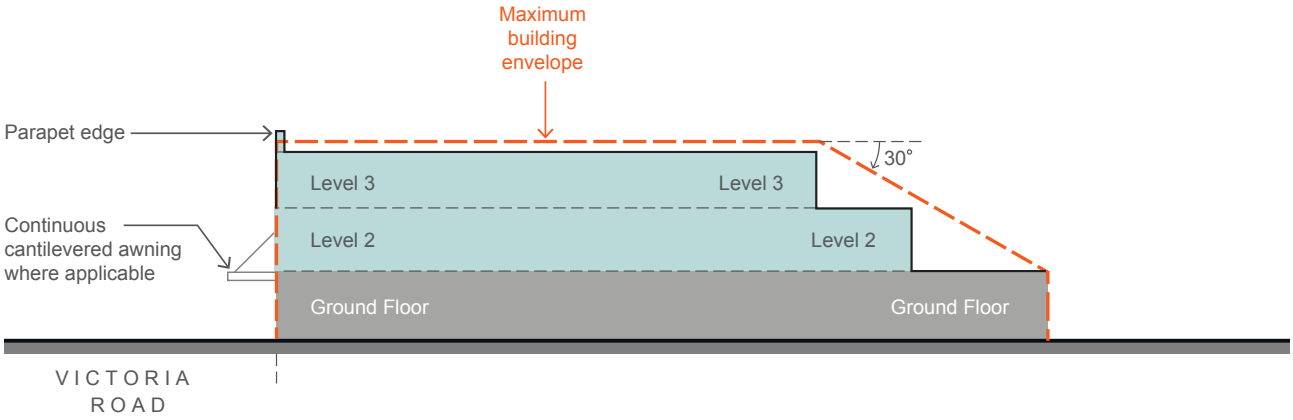


Figure F2.4 Victoria Road Drummoyne Area F - Maximum Building Envelope Section

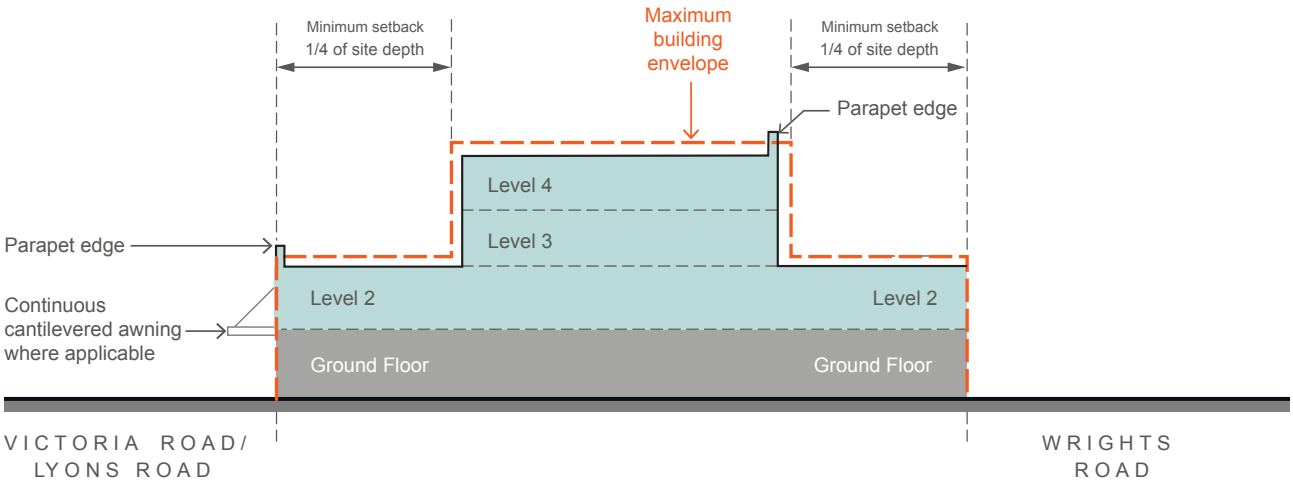
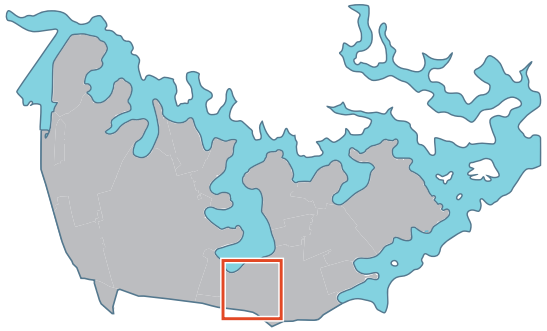


Figure F2.5 Victoria Road Drummoyne Area G - Maximum Building Envelope Section

F2.2 Five Dock Town Centre



Council area map

Context

The Five Dock Town Centre is focused along each side of Great North Road between Queens Road and Fairlight Street to the south and Lyons Road to the north. The centre is a commercial, civic, community and residential precinct, with a local neighbourhood emphasis and consists primarily of 2-3 storey buildings.

Variety is created along the streetscape through different building styles which range from Edwardian and inter-war buildings to more recent development including a mixed use building on Garfield Street, which incorporates the Five Dock public library.

The centre starts in the south at the ridge line intersection at Fairlight/Queens Road with Great North Road and extends along Great North Road past First Avenue and Garfield Street with the northern end defined by intersection with the Lyons Road/Lyons Road West. The highest part of the centre occurs to the south of the centre between Kings Road and Second Avenue.

Taller buildings have views to the Sydney CBD and the Sydney Harbour Bridge to the north-east, Hen and Chicken Bay to the north-west and the Blue Mountains to the west. Land use zoning allows mixed use activities, including apartments with retail uses located on the ground floor, along Great North Road.

Land to which this DCP applies

This Part applies to all land shown within the area identified in Figure F2.6 Location Plan.

Desired future character

The Five Dock Town Centre will be a place where new buildings, alterations and additions contribute to the local 'village character' and heritage values through appropriate building forms, setbacks and heights.

Development proposals in the centre are required to provide a written statement that outlines how the following future character performance criteria have been achieved:

- ***Mixed use:*** New developments and alterations add to the centre's function as a vibrant destination for the local community and visitors, by providing a diverse mix of uses including retail, hospitality, residential and recreational facilities.
- ***Well-proportioned streetscapes:*** The bulk and scale of new development and alterations ensures good access to sunlight and natural ventilation is retained along the centre's streets and to areas of public open space. Built form will also create consistent street wall heights, especially along Great North Road, and ensure the bulk and scale steps down towards adjoining residential areas.
- ***Quality built form:*** New buildings and alterations display a high level of architectural design quality with construction methods and materials that are proven to be durable over time, colours that integrate with the context and building articulation that is sympathetic with adjoining built form and the local 'village character'.
- ***Safety and surveillance:*** New buildings and alterations support street level activity by paying particular attention to the design of ground floors, facades, signage and awnings and by providing opportunities for passive surveillance of the public domain from upper levels.
- ***Access and mobility:*** New development supports accessibility of the centre by reinforcing, and where possible adding to, a permeable and attractive network of streets, lanes, footpaths and pedestrian links.

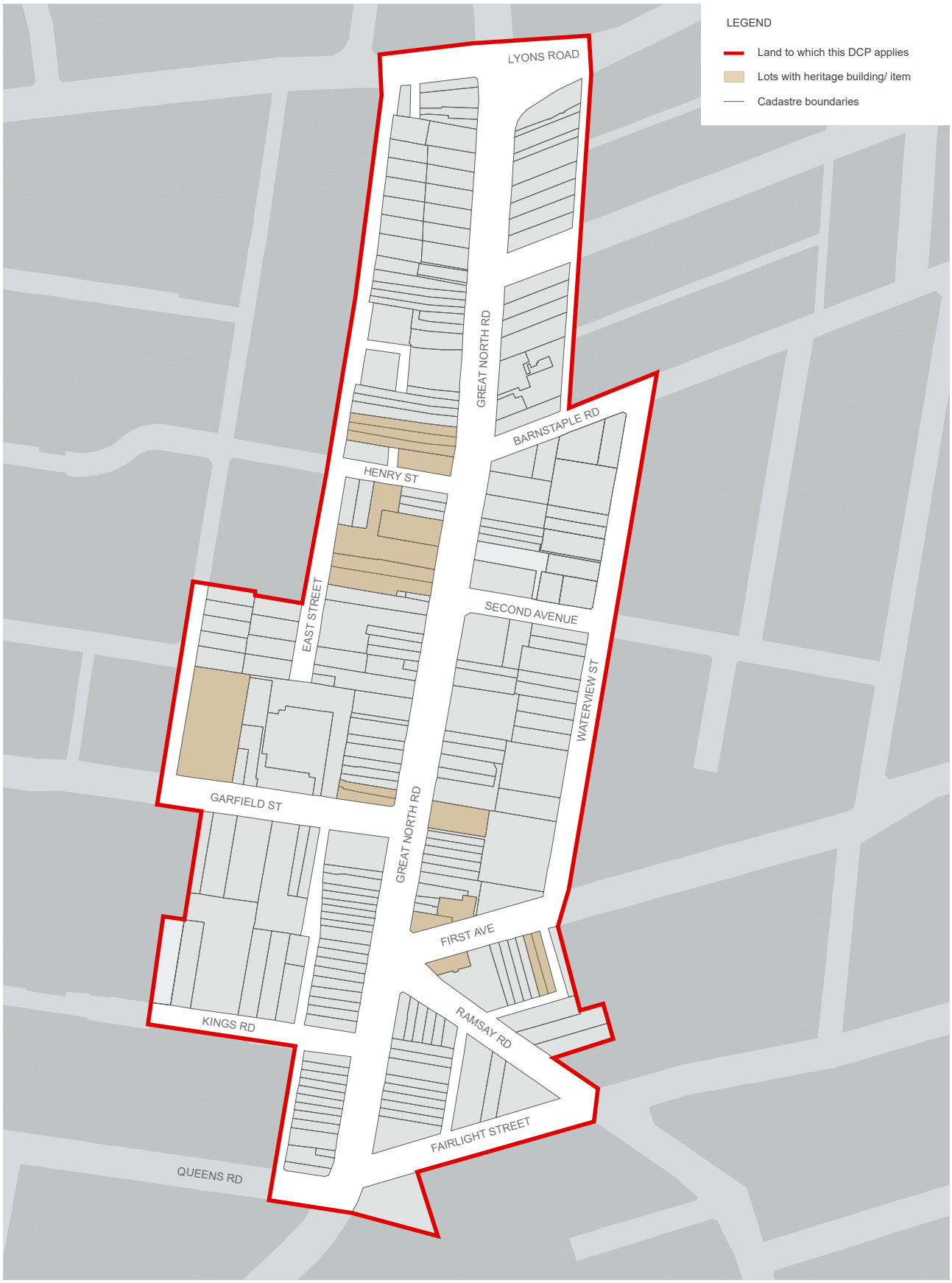


Figure F2.6 Location Plan

Public open space

Objectives

O1. To increase the amount of open space in the centre and to provide more areas for the community to meet, gather and relax.

O2. To ensure areas of open space have access to adequate sunlight especially in mid-winter between 12-2pm.

O3. To ensure new areas of open space are of a sufficient size to accommodate a wide variety of activities.

Controls	
C1.	Provide a Northern Gateway Plaza on the corner of Lyons Road and Great North Road (identified as Public Open Space A in Figure F2.8 Public Domain).
C2.	Widen Fred Kelly Place to the north (identified as Public Open Space B in Figure F2.8 Public Domain).
C3.	Provide a new town square on the eastern side of Great North Road opposite Fred Kelly Place (identified as Public Open Space C in Figure F2.8 Public Domain).

New laneways

Objectives

O4. To improve east west access and connectivity, making it easier and more attractive to cycle and walk through the centre.

O5. To attract people to the new town square and create a pleasant safe environment around the square.

O6. To facilitate car parking exits and entries for buildings fronting Great North Road.

O7. To provide the opportunity to service businesses on Great North Road and limit service vehicle movements along residential streets, e.g. along Waterview Street.

O8. To improve existing and create new connections between the Five Dock Public School (West Street) and Great North Road.

Controls	
C4.	Provide a network of new laneways in the block bounded by First Avenue, Second Avenue, Waterview Street and Great North Road.
C5.	Provide a new laneway between East Street and West Street along the alignment of Lancelot Street.
C6.	Provide a new laneway between Barnstaple Road and Second Avenue.
C7.	All laneways are to be a minimum of six (6) to nine (9) metres wide. Where a laneway is less than nine (9) metres, the design of the laneway must demonstrate how vehicular and pedestrian traffic can be managed to avoid conflicts and safety issues.
C8.	New development between Barnstaple Road and Second Avenue is not permitted to provide vehicular access and servicing off Great North Road, Waterview Street, Barnstaple Road or Second Avenue. All vehicular access and servicing must be provided off the proposed laneway.

Pedestrian connections

Objectives

O9. To improve east-west access, making it easier to cycle and walk through the centre.

O10. To create new access routes that support pedestrian activity along Great North Road.

Controls	
C9.	Provide a new mid-block link between Great North Road and East Street within the hatched area identified in Figure F2.7 Access Network and Hierarchy.
C10.	Provide a new mid-block link between Garfield Street and Kings Road within the hatched area identified in Figure F2.7 Access Network and Hierarchy.
C11.	Widen the existing pedestrian link to the east of Great North Road opposite Garfield Street.
C12.	All pedestrian links are to be a minimum of four (4) metres wide.
C13.	All links are to be activated by retail, civic and/or commercial uses.
C14.	All links are to be naturally lit and ventilated, and well-lit after hours.
C15.	All links are to be publicly accessible between at least 6am and 8pm daily, however 24-hour public access is preferred.
C16.	All links are to follow Safer-by-Design (or CPTED) principles (i.e. clear lines of sight).

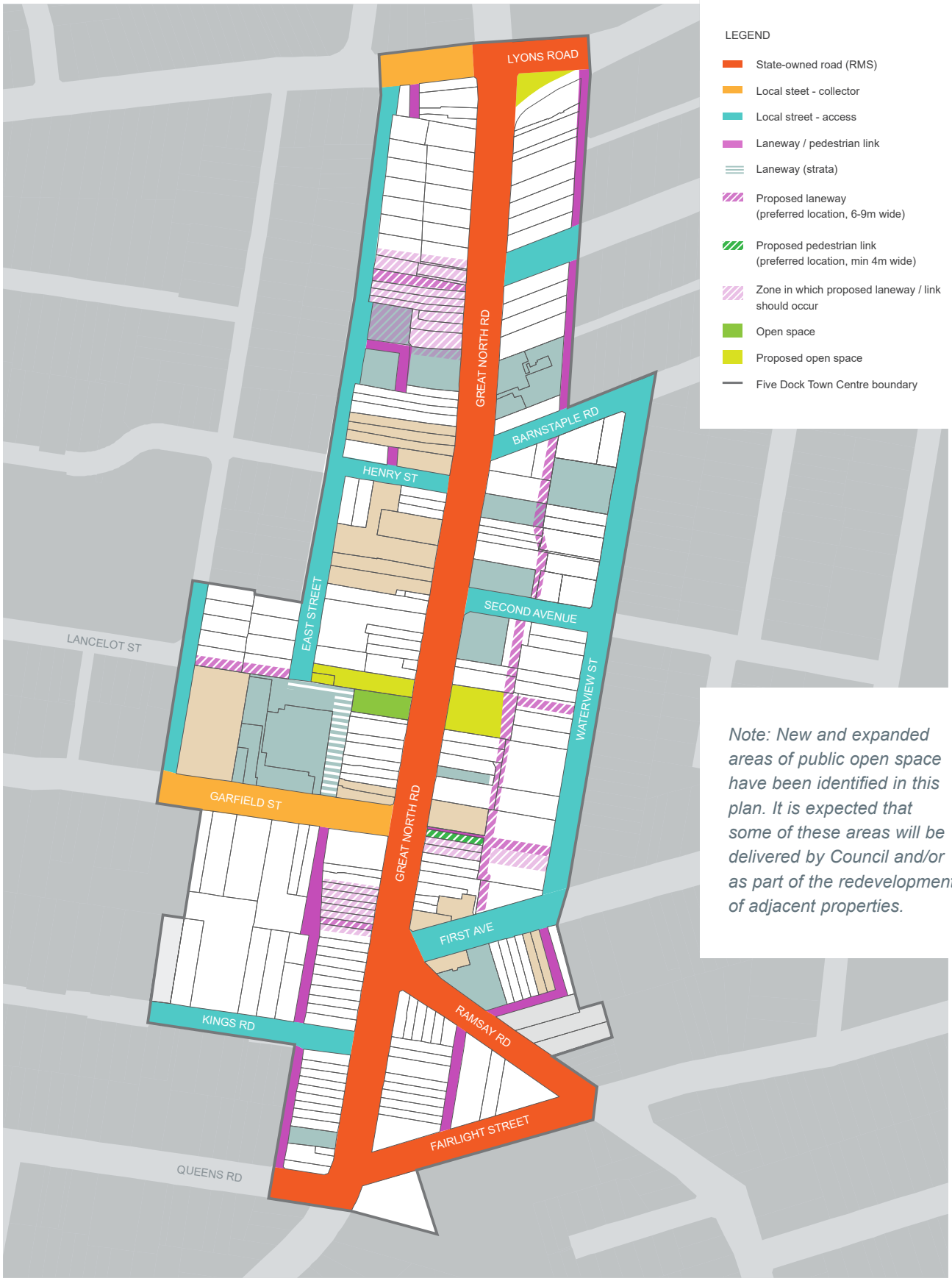


Figure F2.7 Access Network and Hierarchy

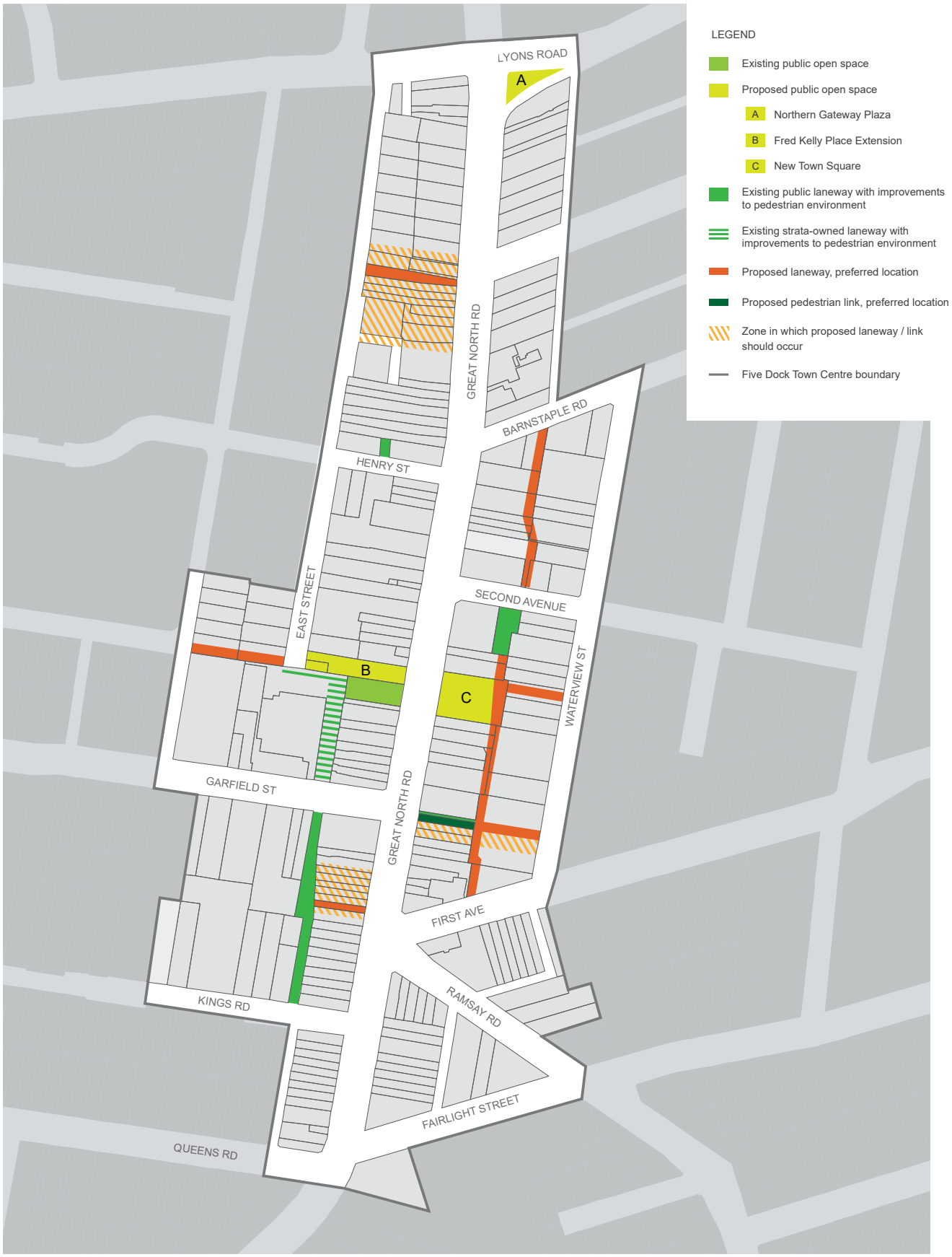


Figure F2.8 Public Domain

Built Form

The built form controls shape the form of new development in the centre, establishing the location, height and shape of new buildings. The controls also consider visual privacy, sunlight access to adjoining properties, usability of private open spaces and pedestrian scale and amenity along the street.

Objectives

O1. To encourage investment in the town centre and create attractive places to live, shop and recreate.

O2. To ensure adequate sunlight is available for all buildings, streets and public open spaces.

O3. To promote opportunities for catalyst and landmark developments in appropriate locations.

O4. To ensure the ground floor levels along key streets are appropriate for retail uses and that ground level uses in the remaining streets are adaptable over time to a wide range of uses.

O5. To ensure the urban grain, built form and palette of materials used in the design of new buildings respond to the “fine grain” character of the surrounding area.

O6. To minimise the visual impact of above ground car parking and encourage car parking that is adaptable to other uses in the future.

O7. To enhance the existing streetscape and ensure appropriate development scale and interface near heritage buildings and residential areas.

High-quality residential development

Objectives

O8. To position the Five Dock Town Centre as an attractive place to live.

Controls	
C17.	Recommendations within the SEPP 65 (State Environmental Planning Policy No 65 - Design Quality of Residential Apartment Development) and the accompanying Apartment Design Guide are adopted by this DCP for apartment developments.

Landscaping and setbacks

Objectives

O9. To ensure that the amenity of residents, workers and visitors to the centre is enhanced by high quality landscaping.

O10. To create appropriate landscaping for private and common open space areas.

O11. To soften and screen the interface between buildings in the centre and adjoining residential areas.

O12. To increase building separation along East Street between Henry Street and Lyons Road West.

O13. To encourage the landscape character of West Street to continue past new development and up to Garfield Street.

Controls	
C18.	Landscape setbacks are to be in accordance with Figure F2.9 Primary Setbacks.
C19.	A landscape plan prepared by a qualified Landscape Architect is to be submitted with the development application that shows levels adjacent to the public domain; planting schedules; and type and detail of paving, fencing and other details of external areas.
C20.	The area within the minimum landscape setback is to be a deep soil zone, i.e. where there are no structures below.
C21.	For residential apartment development common open space is to be provided that occupies a minimum of 25% of the site area and has a minimum dimension of 3.0m. The common open space may be located on an elevated garden (i.e. above car parking) or on roof tops provided the area provides for the recreational and amenity needs of residents.
C22.	Landscaping is to give preference to species with low water needs, including native plant species and select and position trees and shrubs to control sun and winds and provide privacy.

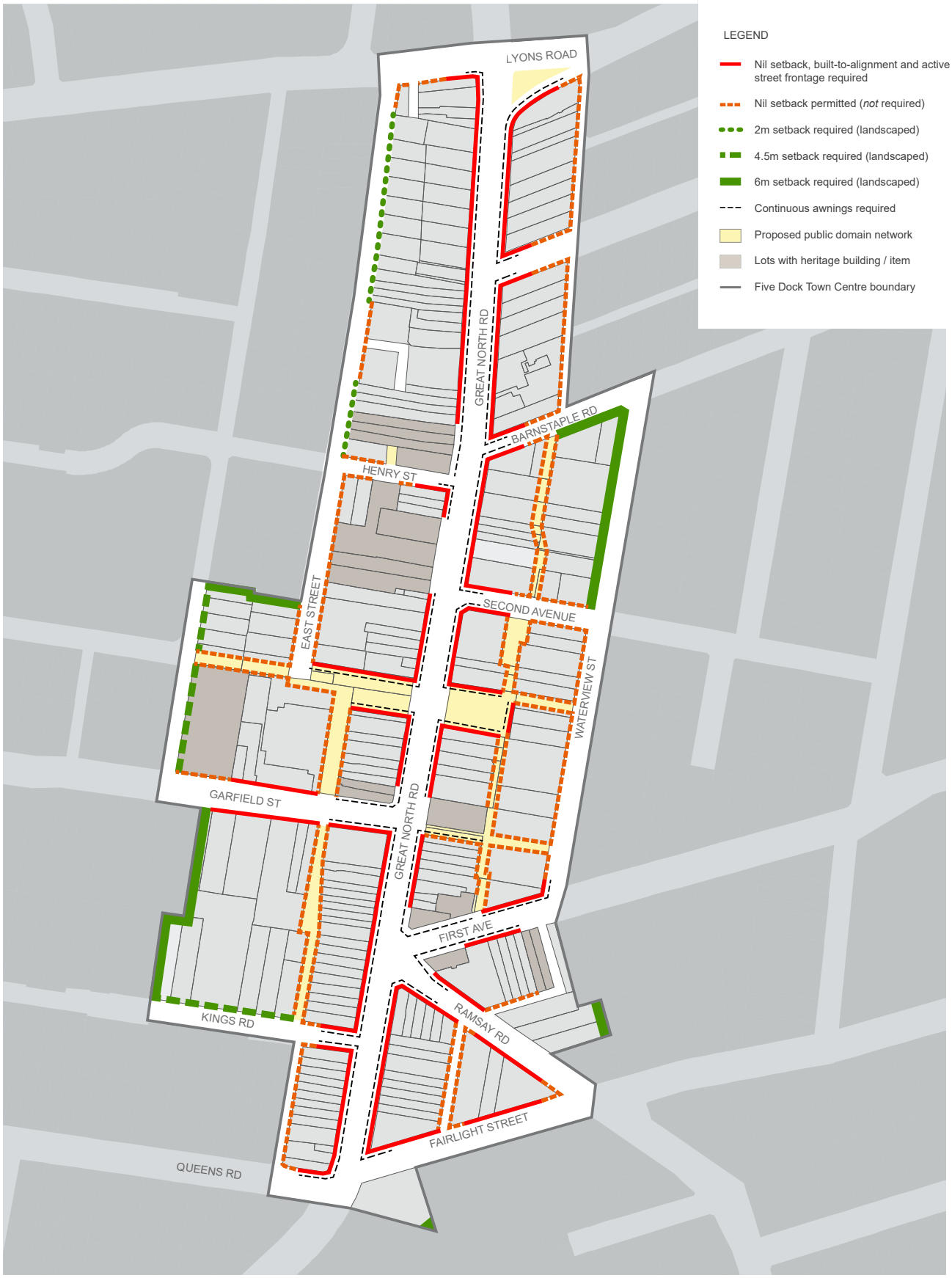


Figure F2.9 Primary Setbacks

Building setbacks

For the purpose of this section of the DCP, the primary building setback is the setback between the public domain/street boundary and the building alignment, and the secondary building setback is the additional setback above the street wall height.

Objectives

O14. To allow redevelopment and gradual transition to higher densities while at the same time respecting heritage buildings and the 'village character' of the centre.

O15. To locate balconies and terraces along streets and laneways where they can provide passive surveillance (and increased safety) of streets and public open spaces.

O16. To reduce potential negative impacts of development such as overshadowing of streets and public open spaces.

O17. To minimise negative impacts of development on existing development in the town centre and surrounding the town centre.

Controls	
C23.	Building setbacks are to be in accordance with Figure F2.9 Primary Setbacks, Figure F2.10 Secondary Setbacks, Figure F2.12 Maximum Street Wall Heights, Figure F2.13 Example Street Frontage Section and Figure F2.15 Maximum Building Height Zones; and any additional controls set out below.
C24.	Any additional floors above four storeys have a minimum setback of 6.0m unless otherwise shown in Figure F2.10 Secondary Setbacks.
C25.	Where possible along 6.0m wide laneways, increase setbacks above two (2) storeys and/or increase ground level setbacks to improve pedestrian amenity.

Active frontages

Active frontages and uses contribute to visual and physical activity in the centre and include community and civic facilities, recreation and leisure facilities and shops, restaurants and cafes.

Objectives

O18. To promote activity and interest along key streets in the centre, in particular along Great North Road

O19. To enhance the commercial viability and function of the centre and compliment current retail, commercial, entertainment and community uses.

O20. To enhance safety and security in the centre.

Controls	
C26.	Provide ground level active uses where indicated on Figure F2.9 Primary Setbacks.
C27.	Residential entries and foyers are permitted along active street frontages but are not to dominate or compromise the commercial viability of the street.
C28.	Where required, active uses must be at least 10.0m deep.
C29.	A continuous awning is to be provided where indicated on Figure F2.9 Primary Setbacks, and meet the requirements of C5 - C11 of Section F1.2 Building Design and Appearance.
C30.	Vehicle access points are not permitted along active street frontages. Where rear or side access is not possible, development without parking will be considered.

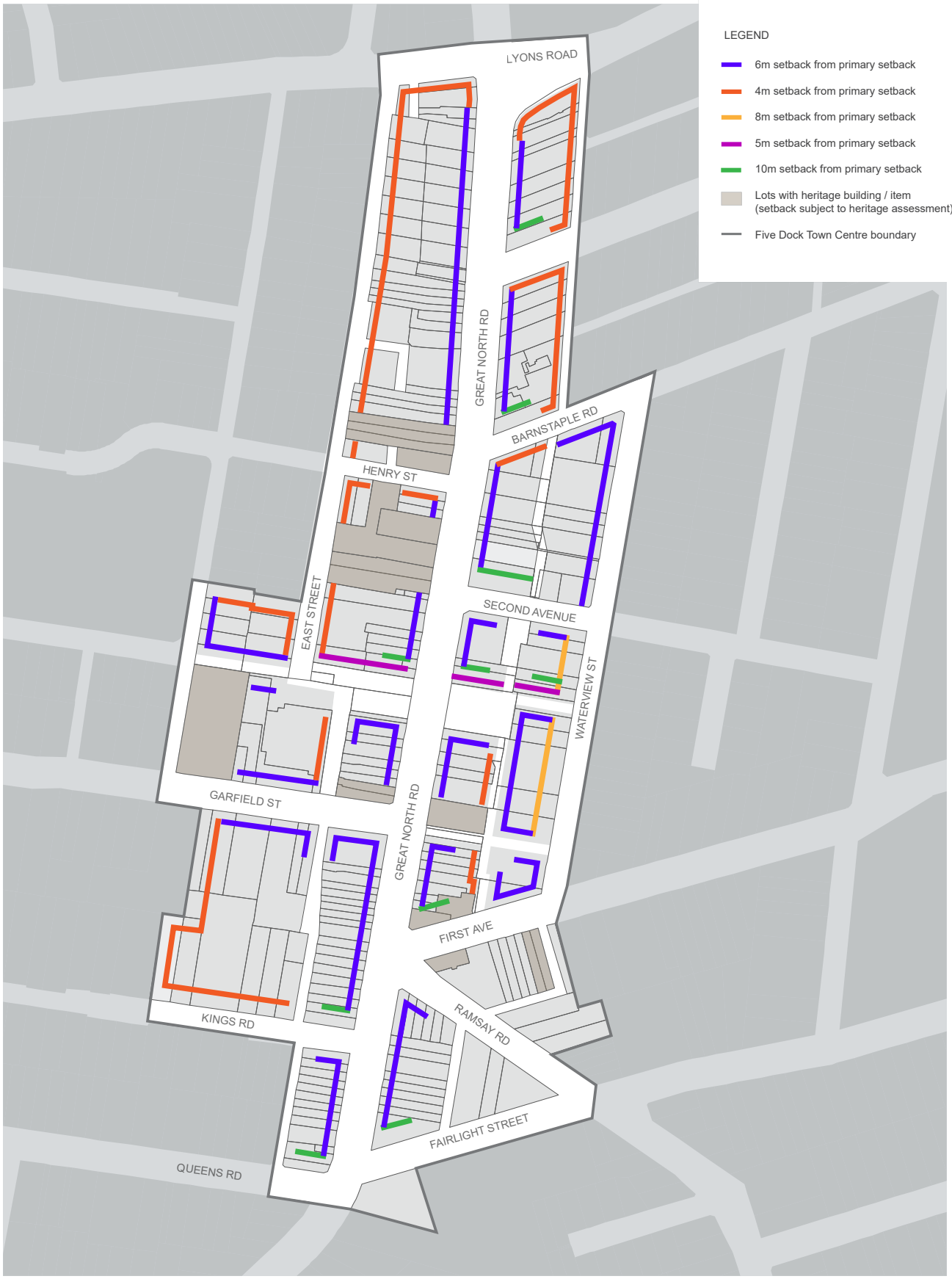


Figure F2.10 Secondary (Upper Level) Setbacks

Ground floor residential

Objectives

O21. To ensure residential dwellings on the ground level have a high level of amenity and create a positive interface with the street.

Controls	
C31.	Residential uses will only be permitted on the ground floor within the R3 Medium Density Residential zone.
C32.	The floor to ceiling height of ground level residential is to meet the requirements of the “Adaptable” category of Table F-A Minimum Floor Heights.
C33.	Ground floor private open space on the street frontage is to be designed as a private terrace a minimum of 0.4m and a maximum of 1.0m above the adjacent public domain level.
C34.	Dwellings on the ground floor facing the street are to have individual entries from the street.

Site amalgamation and isolated sites

Site amalgamations will result in a more efficient built form. This is particularly true of corner sites which could be integrated with adjoining land to both maximise development potential and also provide enhanced amenity for building occupants and for users of public, communal and private open space.

Objectives

O22. To encourage site consolidation of allotments for development in order to promote the efficient use of land.

O23. To avoid development that may create isolated sites.

O24. To support more efficient car parking and servicing and reduced number of driveways.

O25. To support the provision of new and/or improved public spaces as identified in Figure F2.8 Public Domain.

O26. To avoid the creation of isolated sites that may be incapable of being developed in a manner that responds to the site’s context and characteristics and that maintains a satisfactory level of amenity.

Controls	
C35.	Provide new or improved connections as identified in Figure F2.8 Public Domain.
C36.	Where development may create an isolated site, the applicant is required to demonstrate negotiations with property owners to include the site commenced early, well prior to the lodgement of the development application. Written evidence of negotiations is to be provided, including reasonable offers based on independent valuation and that take into account expenses likely to be incurred.
C37.	Where development may create an isolated site, the applicant must demonstrate with a schematic design that the isolated site can be redeveloped under the current planning controls. This must demonstrate the likely impacts between the development and the isolated site such as solar access, separation distances and privacy.
C38.	Site amalgamation should seek to minimise the number of driveway crossings provided to the street.

Fine grain frontages

Objectives

O27. To ensure development of existing small and/or narrow lots prevalent in the centre can still occur.

O28. To ensure a diversity of retail shop size.

O29. To encourage narrow frontage, fine grain retail in the centre.

Controls	
C39.	On narrow sites less than 12.0m wide alternative methods to address car parking, including car share, off site provision and/or exemptions are encouraged.
C40.	Developments are to create retail frontages of less than 8.0m in width or be designed so that larger frontages can be divided into smaller units in the future.
C41.	Reinforce the fine grain of the centre by creating smaller shop fronts or by providing articulation so that the flexibility exists to create narrower shops (5-7m) in the future.

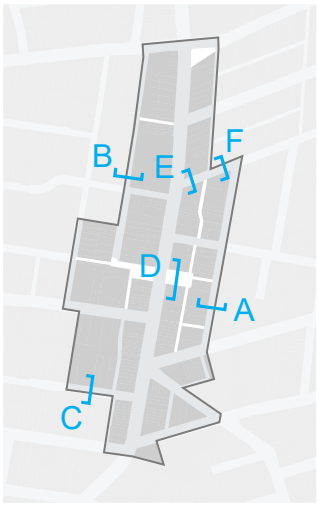
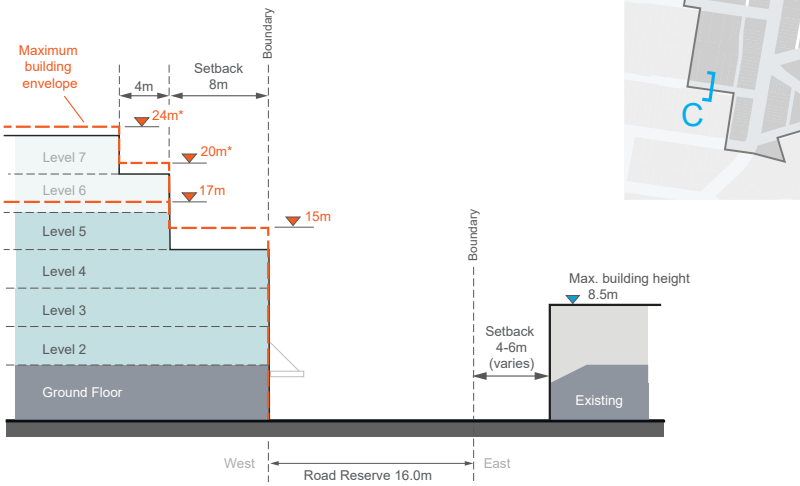


Figure F2.11 Built form sections

Section A

Interface Waterview Street

Along Waterview Street the street wall height is four (4) storeys. Active street frontages, providing both residential and non-residential uses at street level are encouraged.



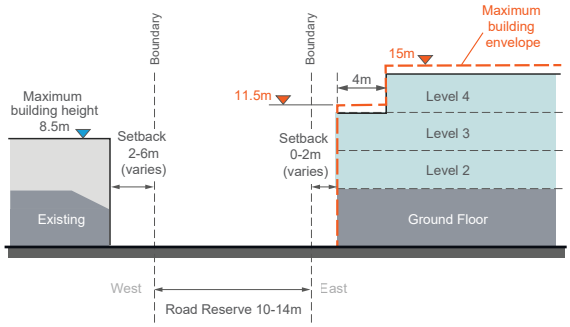
Waterview Street

*Level 6 and 7 only where permitted

Section B

Interface East Street

East Street has a landscape setback of 0-2.0m. The street wall is three (3) storeys with an additional setback of 4.0m to the fourth (4) storey. Residential uses at street level are encouraged along this street.

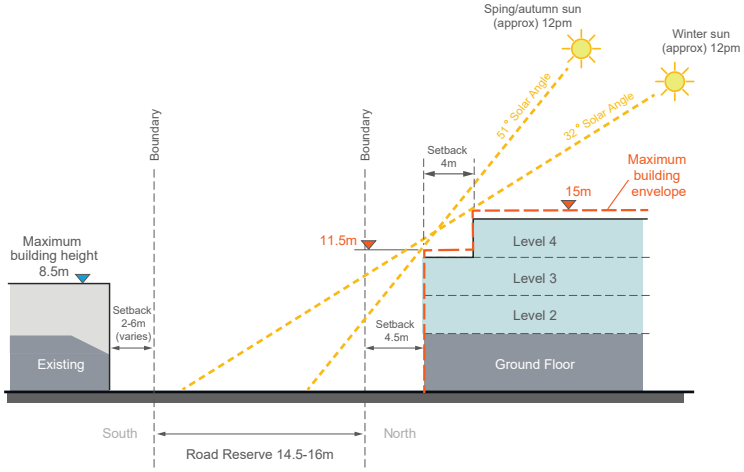


East Street

Section C

Interface Kings Road

Kings Road has a landscaped setback of 4.5m. The street wall height is three (3) storeys with a maximum building height of 15.0m.

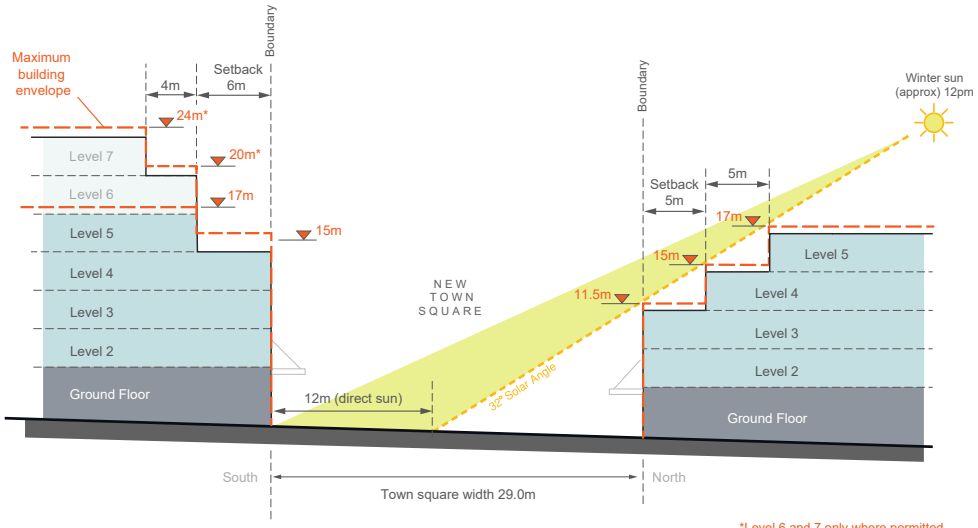


Kings Road

Section D

Interface New Town Square

In order to allow for direct sunlight in the new town square, buildings on the north side of the square are required to have a three (3) storey street wall and a 5m setback for each level above.

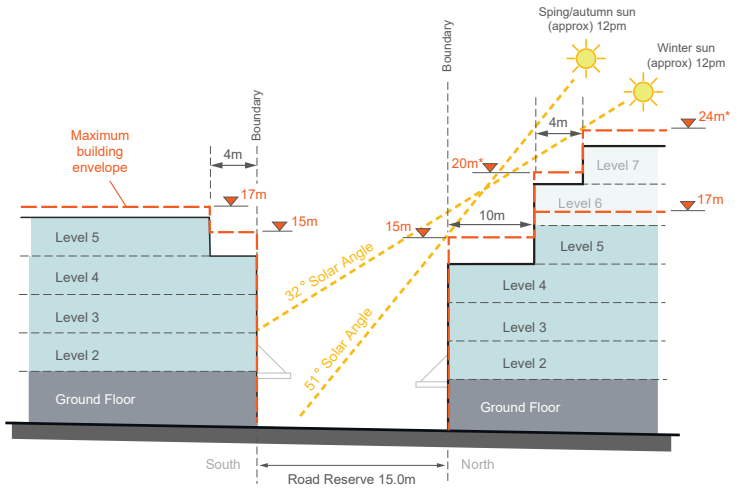


New town square

Section E

Interface Barnstaple Road (West)

Along Barnstaple Road to the west of the proposed laneway, the street wall height on both sides of the street is four (4) storeys. The upper level setbacks of built form to the north facilitates solar access to Barnstaple Road.

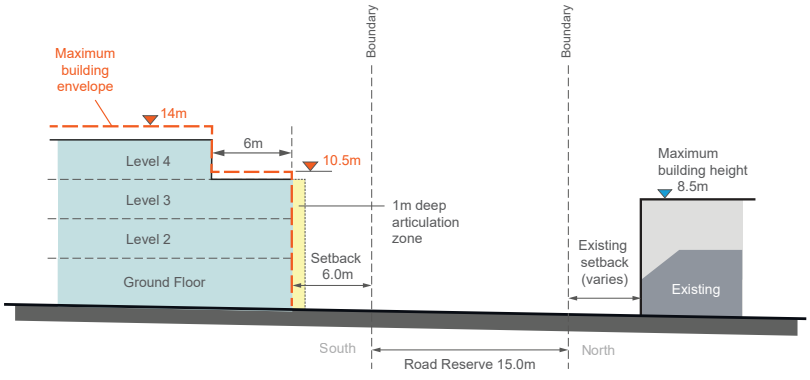


Barnstaple Road

Section F

Interface Barnstaple Road (East)

Along Barnstaple Road to the east of the proposed laneway, the maximum street wall height on the southern side of the street is three (3) storeys.



Barnstaple Road

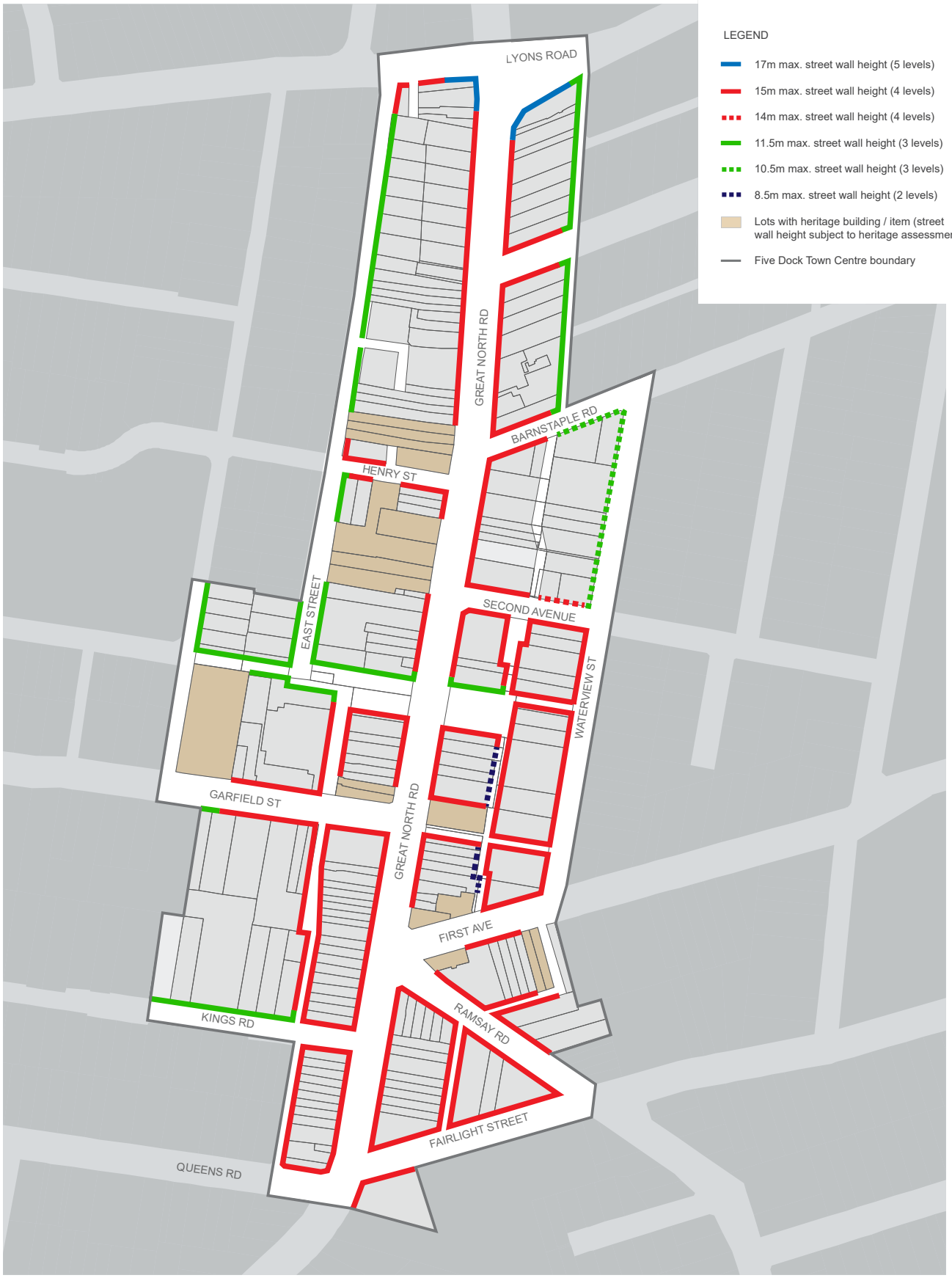


Figure F2.12 Maximum Street Wall Heights

Build to alignment

Objectives

O30. To encourage a consistent street alignment and street wall height along key streets in the centre.

O31. To ensure corner buildings, located where two streets meet, provide a continuous street edge and front both streets.

O32. To ensure new buildings provide a well-defined, active edge to areas of public open space.

Controls	
C42.	Building setbacks are to be in accordance with Figure F2.9 Primary Setbacks, Figure F2.12 Maximum Street Wall Heights and Figure F2.14 Example Street Frontage Section; and any additional controls set out below.
C43.	The nil setback applies only to the first four (4) storeys of development, unless otherwise indicated in Figure F2.10 Secondary Setbacks.

Building heights

Objective

O33. To ensure adequate sunlight is available for all buildings, streets and public open spaces.

O34. To ensure the ground floor levels along key streets in the centre are appropriate for retail uses and that ground levels in the remaining streets are adaptable over time to a wide range of uses.

O35. To encourage redevelopment while at the same time respecting heritage buildings and the “village character” of the centre.

Controls	
C44.	Building heights are to be in accordance with Figure F2.9 Primary Setbacks, Figure F2.10 Secondary Setbacks, Figure F2.11 Built form Sections, Figure F2.12 Maximum Street Wall Heights, Figure F2.14 Typical Street Frontage Section and Figure F2.15 Maximum Building Height Zones; and any additional controls set out below.
C45.	Development is to be consistent with the minimum floor to ceiling heights for the specified uses within the centre shown in Table F-A Minimum Floor Heights.
C46.	For development sites to the north of Fred Kelly Place and the new town square the maximum building height is to be in accordance with Figure F2.10 Secondary Setbacks and Figure F2.15 Maximum Building Height Zones; and no incursions (including plant, balcony rails etc.) are to be permitted.
C47.	The finished floor level of the ground floor above the footpath level is to be no greater than 1.0 metre for residential uses and 0.35 metre for retail and commercial uses.
C48.	Where active uses are specified on the ground floor as identified in Figure F2.9 Primary Setbacks, the minimum floor to ceiling height is to comply with the category of “Retail - restaurant/cafe” in Table F-A.
C49.	Where active uses are not specified on the ground floor, the minimum floor to ceiling height is to comply with the category of “Retail - general" in Table F-A.
C50.	Building heights are to conform with Table F-B Building Heights, which shows the relationship between the height of building in storeys and the height of the building in metres.
C51.	New buildings are to have a scale that is visually compatible with adjacent buildings and heritage items. This may require the height of new development to be lower than the maximum height permitted.
C52.	The upper-most level is to be designed to reduce the visual bulk and scale of the building. Options to achieve this include increased setbacks and/or the use of dark colours and roof elements that create deep shadows.

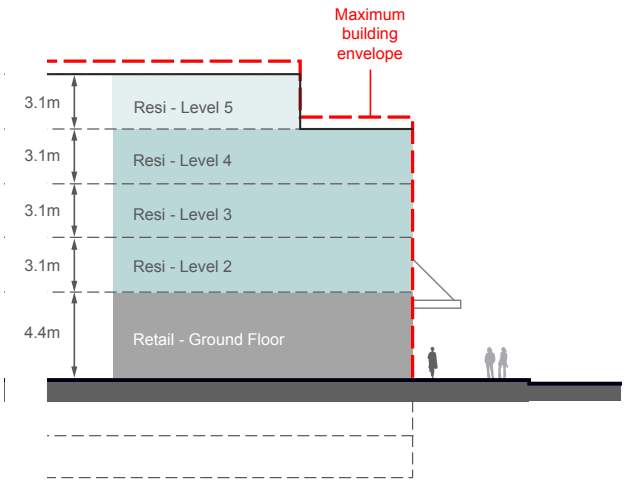
Table F-A Minimum Floor Heights

Use	Floor to ceiling height in metres (min)	Approx. floor to floor height in metres (min)
Retail - general	3.3m	3.7m
Retail - restaurant /cafe	4.0m	4.4m
Commercial	3.0m	3.6m
Adaptable	3.3m	3.7m
Residential	2.7m	3.1m
Community	3.0m	3.6m

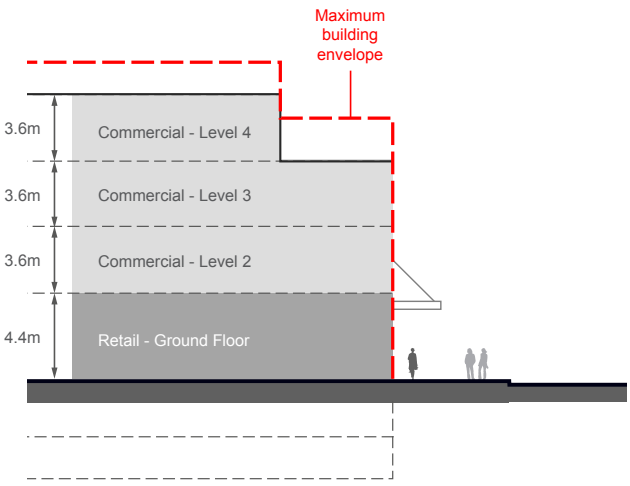
Table F-B Building heights

Building height (in metres)	Building height*
24.0m	7 storeys
20.0m	6 storeys
17.0m	5 storeys
15.0m	4 storeys
11.5m	3 storeys
8.5m	2 storeys

** The number of storeys possible within any maximum building height is dependent on the use (See Fig F2.13 below)*



Option: Ground floor retail, upper levels residential



Option: Groud floor retail, upper levels commercial

Figure F2.13 Alternate uses within the building envelope

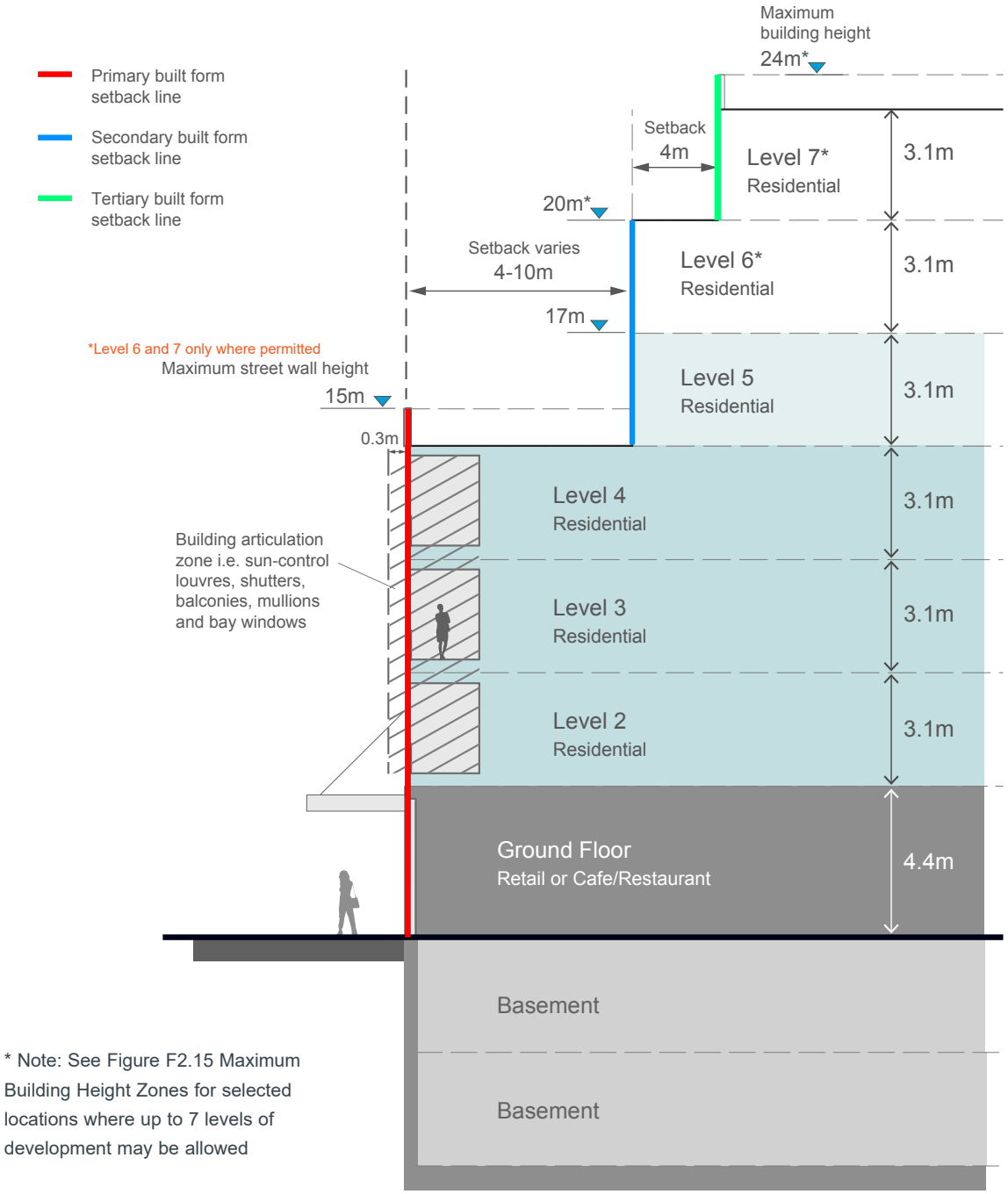


Figure F2.14 Example Street Frontage Section showing maximum potential building height

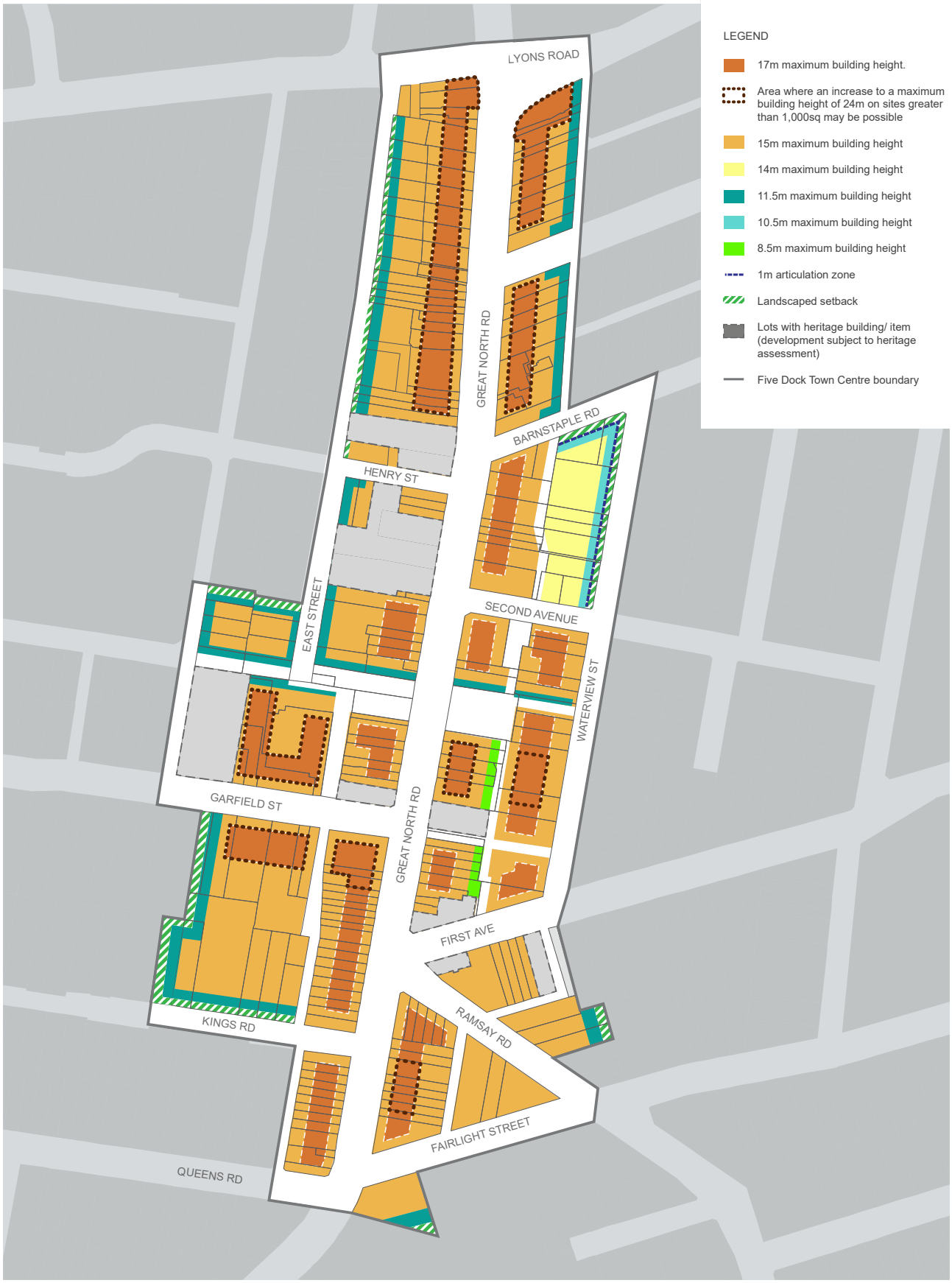
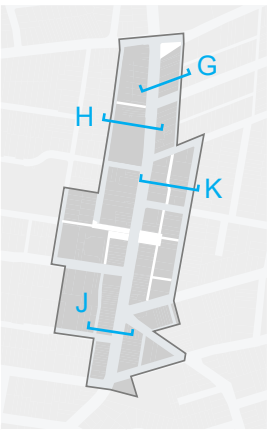
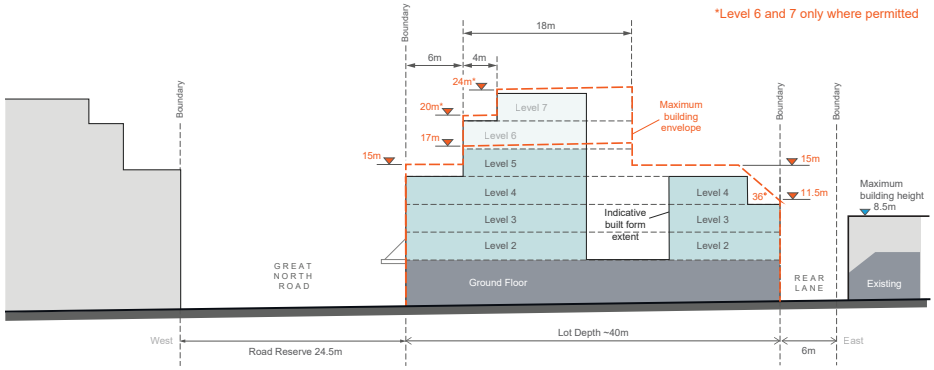


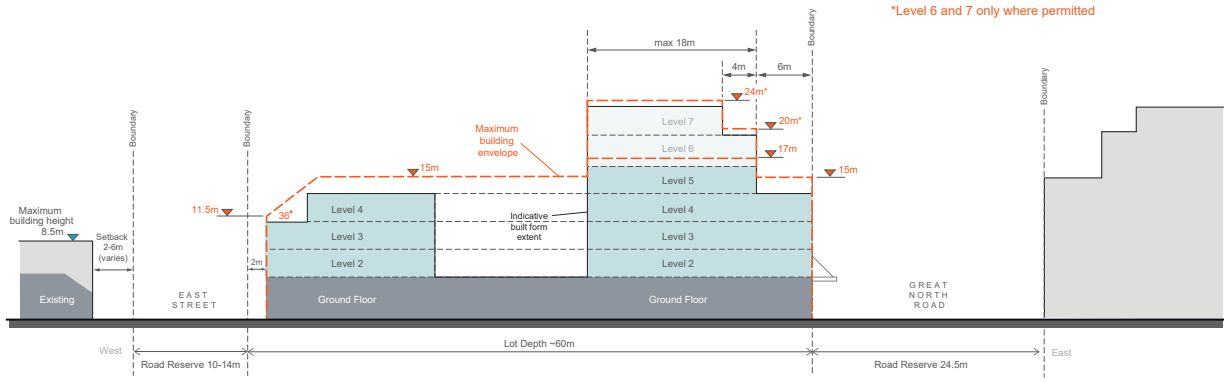
Figure F2.15 Maximum Building Height Zones

Figure F2.16 Building envelope sections

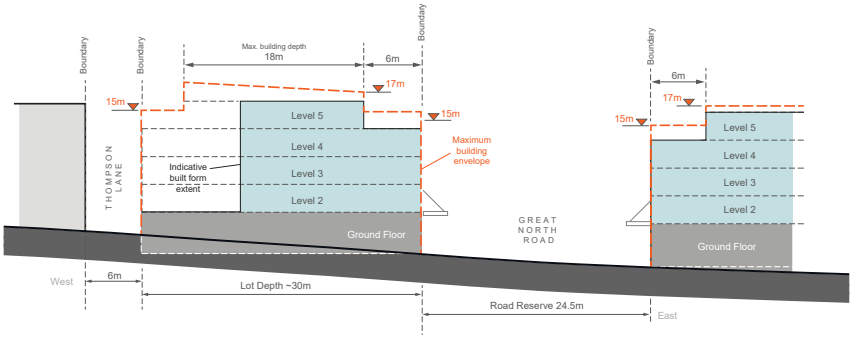




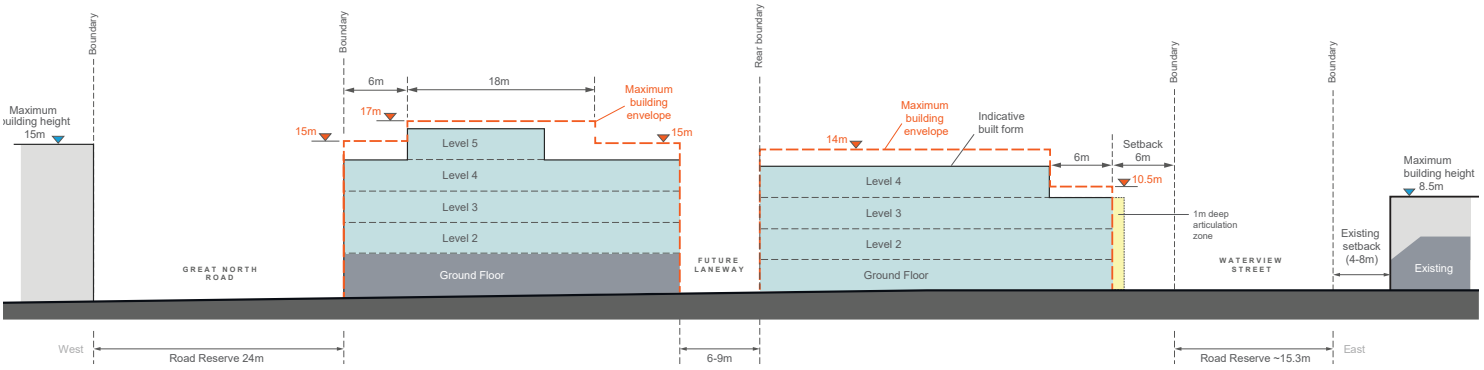
Section G



Section H



Section J



Section K

Facades

Objectives

O36. Buildings are to provide facade articulation and variation to reduce visual bulk and create shadows and texture along the facade. This can include variations in window and/or balcony size and treatment, a design with a well-defined base, middle and top, the use of horizontal and/or vertical elements and variations in setback.

Controls	
C53.	Balconies are to support a balance of solid and void treatment in the composition of the facade. A facade which is dominated by a repetitive balcony design is to be avoided.
C54.	External walls are to include variations in colour and the types of materials used in order to articulate different parts of a building facade and reduce the overall bulk and scale.
C55.	External walls are to be constructed of high quality and durable materials and finishes with 'self-cleaning' attributes such as face brickwork, rendered brickwork, stone, concrete and glass. Materials and finishes with high maintenance costs, and those susceptible to degradation or corrosion are to be avoided.
C56.	A 1m deep facade 'articulation zone' for architectural expression and elements (e.g. balconies) is permitted within the primary setback zone along Waterview Street and Barnstaple Road as identified in Figure F2.15 Maximum Building Height Zones. The maximum length of straight wall, without articulation such as a balcony or return, is 8m.

Example of balconies with a balance of solid and void in the facade composition and treatment

Heritage

Objective

O37. To protect buildings and spaces of heritage significance.

O38. To ensure that new development on the same site as or adjacent to a heritage item responds sensitively to its heritage significance.

Controls	
C57.	New buildings on the same site as or adjoining a heritage item will need to consider the impact on heritage when determining: • the appropriate alignment and street frontage heights; • setbacks above street frontage heights; • appropriate materials and finishes selection; • the design and articulation of the facade; and • appropriate side and rear setbacks.
C58.	Prior to the demolition of the former heritage item at 39 Waterview Street, Five Dock (Lot 11 DP 869673), an archival record is to be prepared and submitted to Council. Once demolition has been completed, a Baseline Archaeological Assessment on the entire site is to be submitted.

The composition of the facade of the new building on the right considers the adjoining a heritage item on the left.

F2.3 Majors Bay Road Shopping Centre, Concord

Majors Bay Road Shopping Centre is a linear shopping centre with a strong boulevard quality. The street is well orientated for vistas and was laid out with the subdivisions of the surrounding estates for residential purposes between 1900-1915. The buildings within the centre, whilst not being particularly historic or architecturally impressive in themselves, impart a unified streetscape by virtue of their two storey scale and architectural styles. These elements convey a sense of history and continuity, form part of Canada Bay's cultural heritage, and provide a sense of identity to the shopping centre. The scale of the buildings also relates well to the surrounding low rise character of Concord.

The height of buildings is an important visual element in the streetscape and represents one of the more important facets of development control in the shopping centre. Most buildings in the Majors Bay Road shopping centre are two (2) storeys high and constructed with a flat, pitched or parapet-type roof. Roof forms on new buildings should be sympathetic to adjoining buildings and materials should be selected so as to blend with the surrounding environment.The design of the developments should attempt to ensure that where adjoining buildings, particularly residential dwellings, are located in close proximity to new commercial buildings, the design of such projects should attempt to minimise any potential loss of sunlight or daylight to residences.

Refer to Figure F2.17.

Controls	
Height	
C1.	All new work (including extensions to buildings) should not exceed a maximum height of 11.0 metres.
C2.	Where buildings display a uniform height at the front street alignment, new development should maintain a complementary height relationship with adjoining development. In this regard, any upper floor additions should be confined to the rear, either out of sight or setback far enough from the front building alignment so as to reduce its visibility and prominence from the shopping street.
C3.	Buildings are to step down at the rear, to a maximum external wall height of 7.5 metres, to be compatible with the scale and character of adjacent residential areas and in keeping with the built form pattern of retail streets. Refer to Figure F2.18.
Siting	
C4.	Where new buildings are erected within established frontages, such buildings should, at least along the main street frontage, be similarly orientated to existing adjoining buildings.
Front setbacks	
C5.	New development should be built to the predominant setback, generally the front alignment.
Roof forms	
C6.	The style and pitch of new roofs should relate sympathetically to neighbouring buildings where possible.
C7.	Materials used in the construction of roofs should be selected so as to blend in and harmonise with both the subject building, adjoining properties, and the streetscape generally.
C8.	Structures such as ventilation shafts, lift towers etc., should not project above the roof line or disturb the symmetry of the roofscape of buildings.
Vehicular access/crossings	
C9.	New vehicular access ways across public footpaths within the shopping centre will not generally be permitted.
C10.	Where rear lane access and/or parking facilities are provided to properties, Council will request owners (either by co-operation or via conditions attached to development applications) to close existing front vehicular access ways.

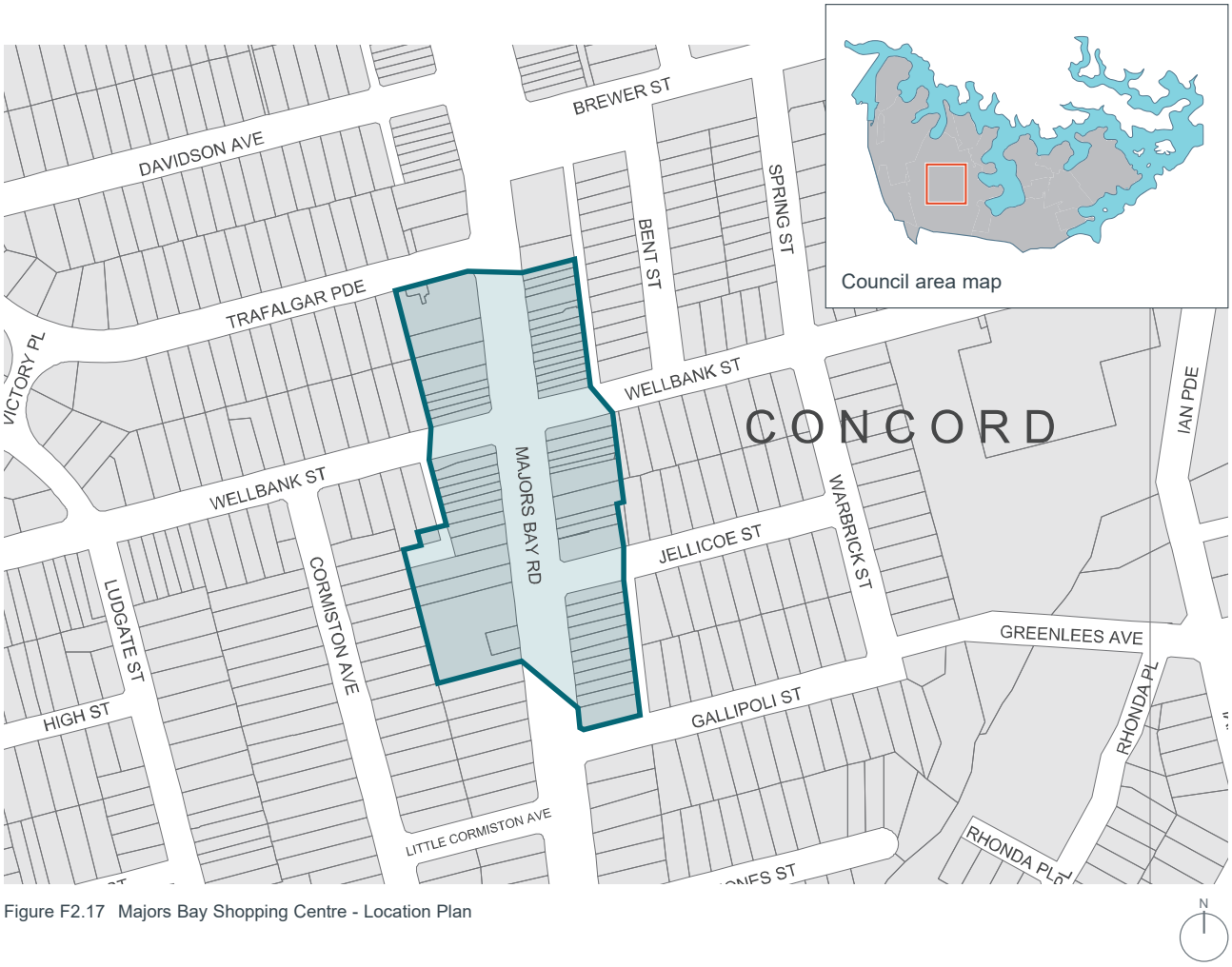


Figure F2.17 Majors Bay Shopping Centre - Location Plan

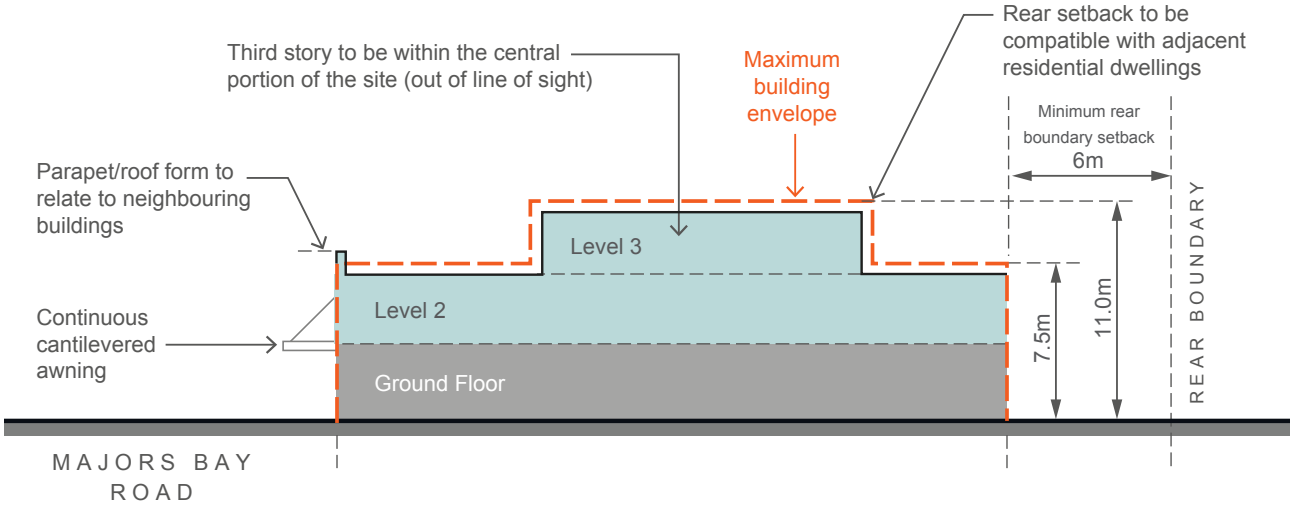


Figure F2.18 Majors Bay Shopping Centre - Maximum Building Envelope Section

F3 Local Neighbourhood Shops

There are other scattered retail and commercial areas that provide local neighbourhood goods and services outside the main retail nodes of Great North Road, Majors Bay Road, Victoria Avenue and Victoria Road.

The general planning, design and environmental management controls outlined in Section F1.1, F1.2, F1.3, F1.4, F1.5, F1.6, F1.7 apply in these areas to ensure the form and scale of development is appropriate.

F3.1 Victoria Avenue Shopping Centre, Concord West

Most buildings in the shopping centre are one (1) to two (2) storeys in height and are constructed with flat, pitched or parapet type roofs.

There is a shortage of car parking in the centre which was designed and constructed before the advent of mass car ownership. The rear building line is intended to reserve parts of lots for future parking and loading areas accessed from rear service roads and to prevent such areas being "built out". This building line applies to both new and existing buildings.

Refer to Figure F2.19.

Controls	
Floor space ratio	
C1.	The residential component of buildings is not to exceed 50% of the total gross floor area.
Front setbacks	
C2.	New development or extensions to existing buildings should be built to the predominant setback, generally the front alignment.
Rear setbacks	
C3.	New development or extensions to existing buildings should be built a minimum of six (6) metres from the rear boundary.
Building height	
C4.	Where buildings display a uniform height at the front street alignment, new development should maintain a complementary height relationship with adjoining development. In this regard, any upper floor additions should be confined to the rear, either out of sight or setback far enough from the front building alignment so as to reduce its visibility and prominence from the shopping street.
C5.	Buildings are to step down at the rear, to a maximum external wall height of 7.5 metres, to be compatible with the scale and character of adjacent residential areas and in keeping with the built form pattern of retail streets. Refer to Figure F2.20.
Building design	
C6.	The design of new buildings should respect the existing built form of the shopping centre. New buildings, particularly those which "infill" between existing properties, should respect the scale, roof forms and proportions of adjoining buildings. This means that new buildings should attempt to "fit in".
Vehicular access/crossing	
C7.	New vehicular access ways across public footpaths within the shopping centre will not generally be permitted.
C8.	Where rear lane access and/or parking facilities are provided to properties, Council will request owners (either by co-operation or via conditions attached to development applications) to close existing vehicular access ways.

Figure F2.19 Victoria Avenue Shopping Centre - Location Plan

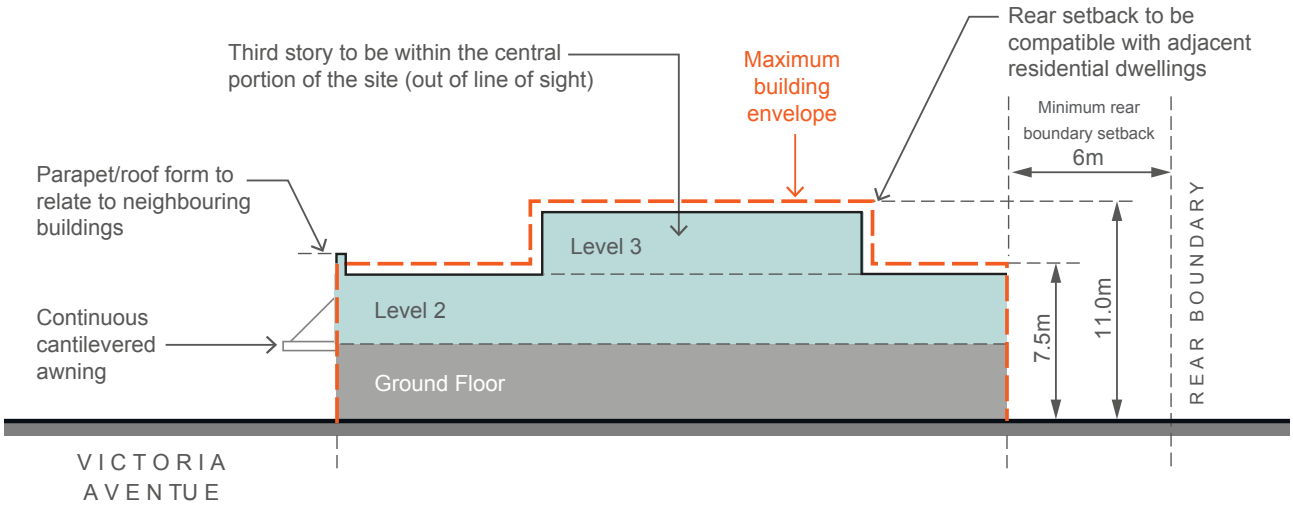


Figure F2.20 Victoria Avenue Shopping Centre - Maximum Building Envelope Section

F3.2 355-359 Lyons Road, Five Dock

The land at 355 – 359 Lyons Road is part of a small cluster of shops that are surrounded by a predominantly residential area. The general planning controls outlined below apply in these areas to ensure the form and scale of development responds to the surrounding context and achieves an integrated urban design outcome for all properties between 355 and 359 Lyons Road.

Objectives

O1. To achieve a coordinated urban design outcome.

O2. To enhance the existing streetscape and ensure appropriate development scale and interface near residential areas.

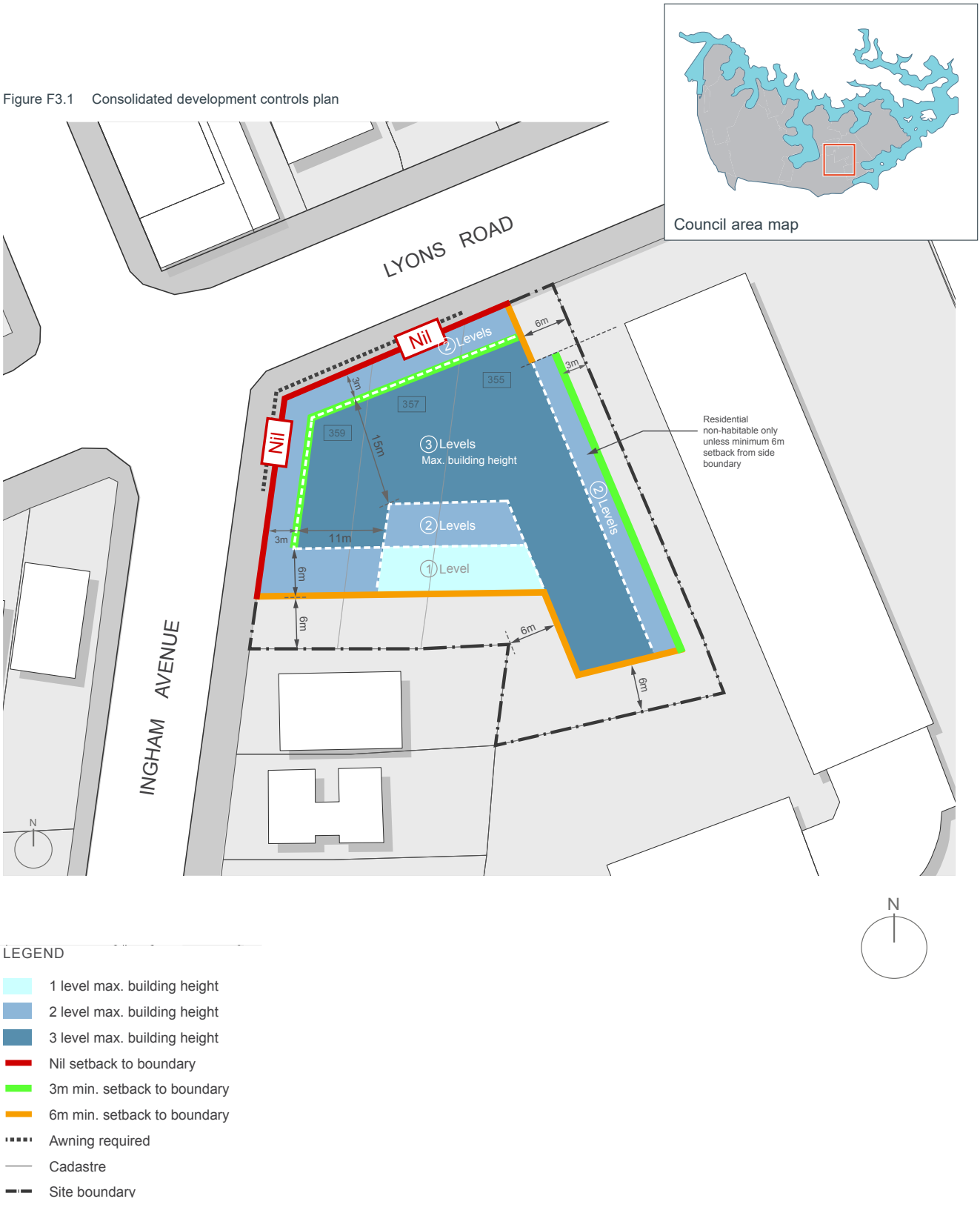
O3. To minimise solar access and privacy impacts upon surrounding properties.

O4. To ensure future buildings provide a continuous street edge to Lyons Road.

Controls	
C1.	Buildings are to be constructed to the front boundary (street edge) on Lyons Road.
C2.	A continuous awning is to be provided on the Lyons Road frontage of the site and wrap around into Ingham Avenue.
C3.	Buildings are to adhere to the minimum separation requirements of the Apartment Design Guide.
C4.	The maximum building height is 3 storeys.
C5.	A two (2) storey street edge is to be provided to Lyons Road and Ingham Avenue and the third floor is to have an upper level setback of 3.0 metres from both of these streets and a solid 'parapet style' balustrade for the upper floor.
C6.	The building envelope is the three dimensional volume that defines the outermost part of the site that buildings may occupy. Proposed buildings will also need to demonstrate that solar access is maintained to the north facing window and private open spaces of surrounding properties.
C7.	The third storey element of the building is to have a roof design and material selection that assists in minimising the overall bulk and scale of the building.

Example of an increased setback to the upper floor and a solid parapet balustrade that helps the building to 'read' as a two storey building from the street.

Figure F3.1 Consolidated development controls plan



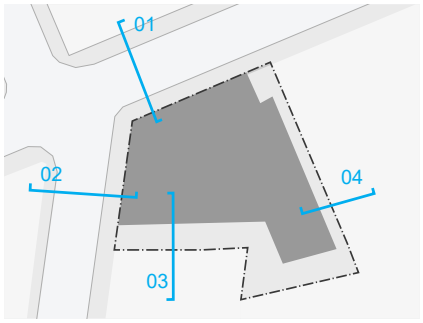
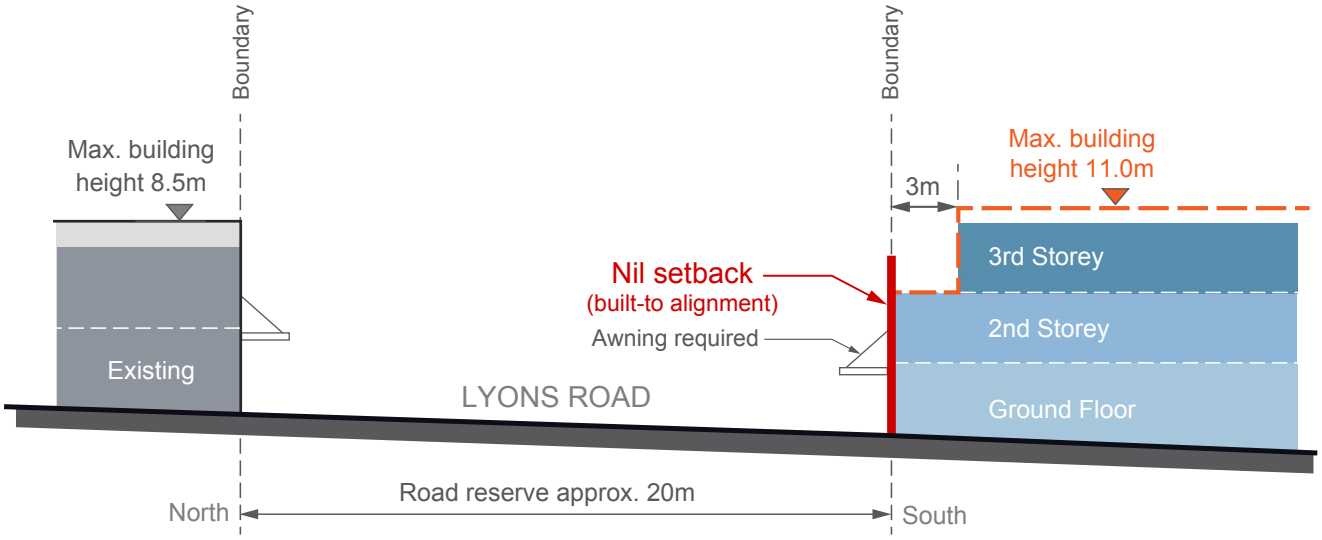
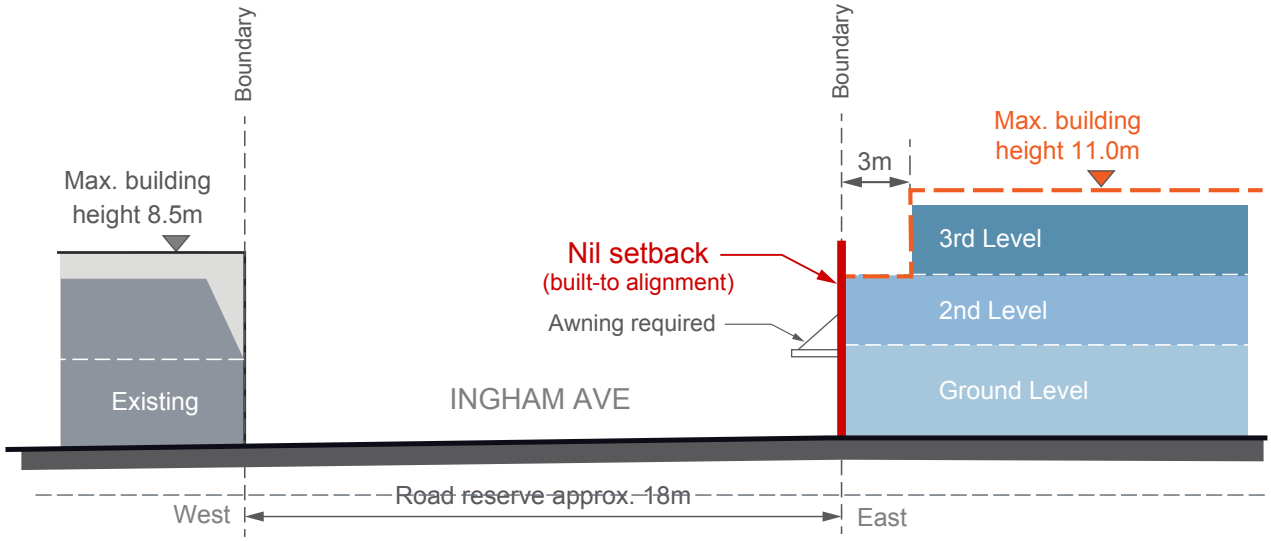


Figure F3.2 Interface sections

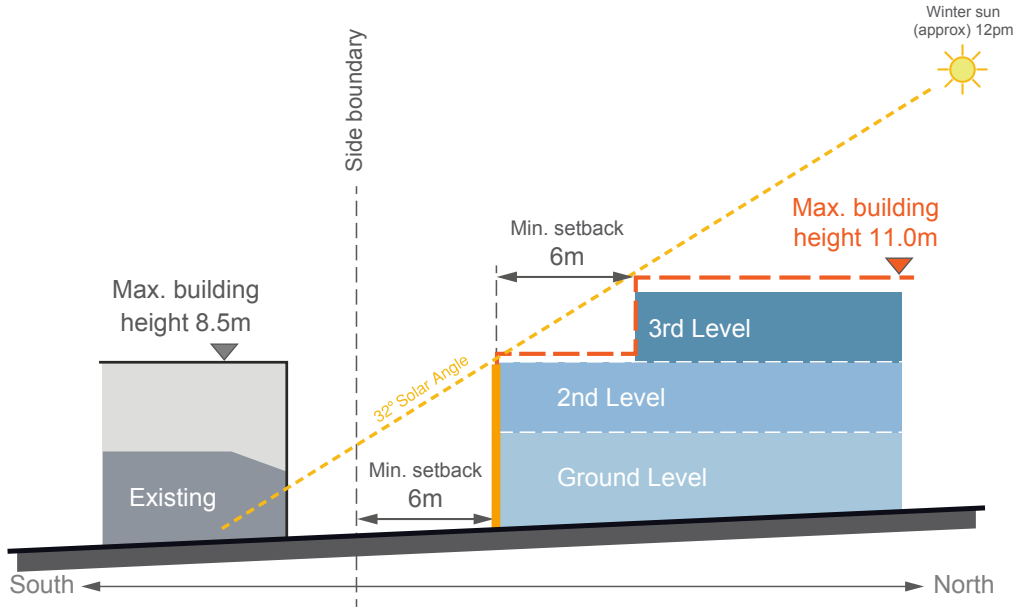
Section 01 Interface Lyons Road



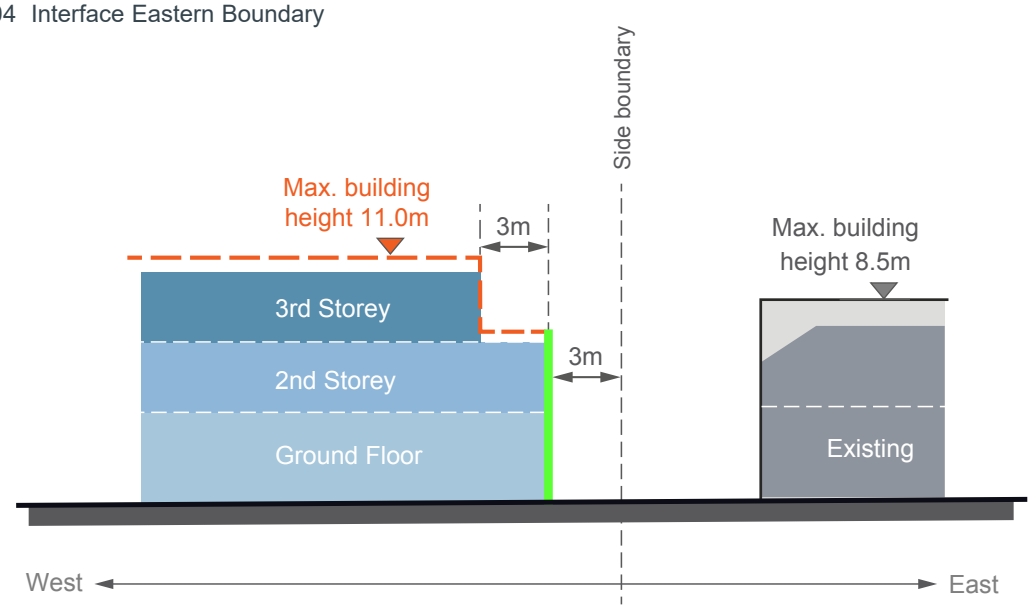
Section 02 Interface Ingham Avenue



Section 03 Interface Southern Boundary



Section 04 Interface Eastern Boundary



THIS PAGE WAS INTENTIONALLY LEFT BLANK

PART G - INDUSTRIAL DEVELOPMENT

G1 General Objectives

Objectives

O1. To implement the Objectives of the Canada Bay LEP.

O2. To improve the quality of industrial development within the City of Canada Bay.

O3. To ensure that industrial development does not unreasonably adversely impact on residential amenity.

O4. To encourage employee amenity within Industrial areas.

O5. To facilitate employment generation and maximise the potential of employment generating industries.

O6. To encourage design that is sustainable and environmentally responsible, and takes into account its social impact on environmental amenity.

O7. To encourage design that is of a type, scale, height, bulk and character that is compatible with and will enhance the streetscape characteristics of the surrounding area.

G2 Setbacks

Setbacks play a number of important roles in areas developed for industrial uses. Front, side and rear setbacks ensure space for landscaping, contribute to streetscape consistency and modulate building bulk and scale. Setbacks also provide a transitional area or buffer to adjoining land uses and ensure building entrances are clearly visible

Objectives

O1. To encourage design that is in keeping with the streetscape characteristics of the surrounding area.

O2. To ensure sufficient space for landscaping, on site parking, access, and circulation.

O3. To modulate the bulk and scale of development.

O4. To provide a buffer to adjoining land uses, reducing adverse impacts on surrounding land uses and residential amenity.

O5. To integrate development with the existing street and footpath network.

O6. To ensure development provides adequate disabled access, wherever possible.

Controls	
C1.	The front or road setback of buildings should be consistent with the setback of adjoining buildings. Where the setback of adjoining buildings is inconsistent, the building should be consistent with the dominant setback found along the street. In some instances, Council may require a minimum setback of 6.0m, depending on the circumstances of the case.
C2.	Front setbacks are to comprise soft landscaping in accordance with the requirements of section F3.
C3.	A minimum side and rear setback of 6.0m is required - 50% of the side setback can be used for off street parking providing the remaining area comprises soft landscaping in accordance with the requirements of section F3.
C4.	Greater setbacks may be required for bulky, hazardous and noise or odour generating activities.

G3 Landscaping

Landscaping provides a setting for development and can contribute positively to the creation of a strong corporate identity. It contributes to the creation of a pleasant working environment for employees and increases the amenity of on-site car parking and storage areas. Landscaping can also play an important buffer role for industrial development that adjoins residential development.

Objectives

O1. To ensure that there is accessible and useable open space for the use of employees.

O2. To integrate building design, car parking and service facilities with landscaping to achieve a pleasant working environment.

O3. To protect and enhance the existing landscape character of the City of Canada Bay.

O4. To improve the visual amenity of industrial development sites and areas.

O5. To provide robust landscaping within new industrial development that contributes to biodiversity, sustainability, water efficiency and reduction of airborne pollutants.

O6. To enhance stormwater management by minimising hard non-porous surfaces.

Controls	
C1.	Open space dedicated to the recreational use of employees is to be provided on site within a landscaped setting.
C2.	Front and side setbacks are to be landscaped to soften and screen buildings, storage, service and parking areas.
C3.	Landscaping and fencing should not obscure the main building entry.
C4.	A minimum of 10% of the subject site should be landscaped.
C5.	All security fencing should be located behind the landscaped setback. Council may vary this requirement if it is considered desirable in the circumstances.
C6.	All landscaped areas should be supplied with a fully automatic irrigation system.
C7.	All new proposals for industrial development should be accompanied by a landscaping plan prepared by a qualified professional.

G4 Building form and appearance

Building form and appearance encompasses a number of aspects of building design including amenity, relationship to the streetscape, materials, energy use, and noise mitigation.

Objectives

O1. To ensure the form and scale of development enhances the streetscape and visual quality of the area.

O2. To encourage innovative, contemporary and sustainable building design.

O3. To ensure that materials used contribute positively to ecological sustainability.

O4. To minimise energy use in all parts of buildings.

O5. To ensure building materials mitigate noise impacts to adjoining development, particularly residential areas.

Controls	
C1.	Building height, mass, and scale should compliment and be in keeping with the character of surrounding and adjacent development.
C2.	Colours should be consistent with the themes of adjoining development and enhance the visual amenity of the industrial area.
C3.	Building entrances should be clearly defined and well articulated through form, materials and colour and provide level or ramped access.
C4.	Buildings should not contain long, blank, and unarticulated walls, particularly on street frontages.
C5.	Buildings should be of a contemporary and innovative design. All public frontages should be specially articulated with the use of brick, stone, concrete, glass (non-reflective), and like materials.

Public utilities

Controls	
C6.	For new development and substantial alterations to existing premises provision must be made for connection to future underground distribution mains. In such developments the following must be installed: • an underground service line to a suitable existing street pole; or • sheathed underground consumers mains to a customer pole erected near the front property boundary (within 1 metre). Council may require the bundling of cables in the area surrounding the development to reduce the visual impact of overhead street cables. For further details see Energy Australia requirements.

G5 Light and noise

It is important to maintain the amenity of adjoining land. Light spillage and noise emissions are two key design considerations.

Objectives

O1. To ensure industrial development maintains the amenity of surrounding development.

O2. To ensure appropriate noise attenuation measures are incorporated into building design and site layout.

O3. To ensure lighting does not distract or annoy vehicle drivers or the occupants of adjoining properties.

Controls	
C1.	Sources of noise, where practicable, should be sited away from adjoining properties and where necessary, be screened by acoustical treatments.
C2.	High-intensity noise generating industries will not normally be permitted in close proximity to residential uses.
C3.	Light sources should be directed away from adjoining residential properties.

PART H - SIGNAGE AND ADVERTISING

H1 Signage and Advertising

The purpose of this section is to ensure signs and advertising structures can be designed and located so they fit into the environment and do not detract from the character of an area.

The role of signs and advertising structures

Signs and advertising structures:

- are important for business advertising and the creation of a company's corporate image;
- provide information and identification; and
- are used for community purposes such as advertising local events, informing of community services and identifying features of historic interest.

The controls aim to minimise excesses, such as advertisements which are so large they overwhelm buildings and landscaping, or the clutter which results from too many advertisements of different shapes and sizes on one site.

Fewer, simpler and "clean-lined" signs which are well located have greater visual impact, are of greater value to businesses and better for the visual environment.

Making an application

Council should consider the following matters when dealing with an application to erect an advertising sign:

a) class of advertising structure, eg. awning sign, fascia sign, roof sign, pole or pylon sign, etc.;
b) design of the structure;
c) the siting, location and colour of the structure;
d) the area of the advertising structure;
e) the nature of any advertisement intended to be associated with the structure;
f) the number of advertising structures proposed;
g) the multiplicity of existing signs;
h) the architectural qualities, appearance and balance of the building;
i) the erection of signs without relationship to the function of the premises upon which the sign is to be erected;
j) the erection of signs without relationship to other signs erected on the premises or other premises within the vicinity;
k) the visual impact on the local environment; and
l) the benefit to the community of the proposed advertising signs.

H2 General Objectives and standards applicable to all development

Objectives

The siting, location, size, height, scale, design, colour, shape and materials of construction of advertisements should:

O1. Complement and enhance the predominant character of the locality;

O2. Complement and enhance any building, structure or site of heritage significance on which it is to be erected or located;

O3. Not obscure the view of attractive landscapes, streetscapes, or significant buildings; and

O4. Not adversely affect the safety of traffic or pedestrians.

Controls	
C1.	The minimum controls for all signs are included in Table H-A.

Inappropriate development

Controls	
C2.	The following signs and advertising structures are not considered to be appropriate: a) Signs erected or attached to the sides of buildings where such side is adjacent to residences or residential flat buildings, or where the side of the building faces a residential street unless special circumstances as determined by Council are considered to exist; b) Signs or advertisements other than those relating to the occupier(s) of the building; c) Flashing, moving, or video signs; d) More than one (1) projecting wall sign, flush wall sign or painted wall sign per building, or any such sign which is not exclusively for business or building identification purposes; e) Signs located on an awning or signs attached above the awning; f) Any sign or signboard exhibited on Council's footpath; g) Signs attached above the roof; h) Permanent inflatable signs; i) Flag pole signs; and j) Signs of more than 20m^2 in area or 8.0 metres in height.

Table H-A Requirements for signage

Type of sign	Maximum size/area and number	Location/ other requirements
Under Awning Sign (Illuminated or non-illuminated)	• 2.5m x 0.3m (maximum) • One per shop; or • One every 5.0m provided that distance of not less than 3.0m between the centres of signs on adjoining properties is maintained	• Erected at right angles to the building • Minimum clearance of 2.6m to footpath • Not to project beyond the awning
Top Hamper Sign	• Restricted to that portion of the shop front above the level of the head of the doorway or window to which it is attached. • Restricted to the underside of the awning • Not illuminated • Where shop front facade comprises full glass, hamper signs will only be permitted behind the glass	• Not to project more than 20mm beyond the face of the building and below the head level of the doorway or window to which it is attached.
Pole or Pylon Sign	• Max advertising area 4.65m^2 • Max height 8.0m • One per site	• At least 2.6m above ground level and not to project more than 1.2m beyond the street alignment • Only where buildings are remote from the street alignment
Flush Wall Signs	• 5m^2 or 5% of the wall area* up to 100m^2 • One per building • Should not extend beyond wall edges	• For wall areas* over 100m^2 proposed signs will be considered on a merit basis but should not exceed 7.5% of wall area or a maximum of 30m^2 whichever is the lesser
Projecting Wall Sign (Vertical) where: lowest part of sign is between 2.6m and 3.7m lowest part of sign is 3.7m-4.5m lowest part of sign exceeds 4.6m	• 0.6m maximum projection from wall face & maximum 1.8m height • 0.7m maximum projection from wall face & maximum 2.4m in height • 0.9m maximum projection from wall face & maximum 3.0m in height	• Only permitted where no awnings exist on a building • Height of sign should not be less than width • Should be erected at right angles to the face of the building • Should provide 2.6m clearance to footpath from underside of sign • Should not extend within 0.6m of the kerb alignment • One per building • Maximum width 0.4m
Projecting Wall Sign (Horizontal)	• Maximum dimensions as follows: • 1.3m (length) x 0.8m (height) x 0.4m (width) for rectangular signs • 1.2m x 1.2m for square signs • 1.2m diameter for round signs • One per building	• Only permitted where no awnings exist on a building • Height of the sign is less than its width • Should be erected at right angles to the face of the building • Should provide 2.6m clearance to footpath from underside of sign but not more than 4.0m above footpath • Should not extend within 0.6m of the kerb alignment

Type of sign	Maximum size/area and number	Location/ other requirements
Multi-Occupancy Buildings	• One sign per building for identification.	• Under awning signs should meet above requirements for such signs
Signs attached above awning	• Not permitted	
Fascia Sign	• Not permitted except painting of a sign on the fascia of an awning • Must not project above or below the awning or the return end of the fascia	
Roof Sign	• Not permitted	
Floodlit Sign	• Not permitted except where special circumstances exist	

* Measurement of the wall area does not include the area below awning area or any area obscured by the adjoining property.

Figure H2.1 Types of advertising signs

H3 Sign proliferation and dominance

The number of signs displayed on any site should be minimised in order to avoid visual clutter, duplication of message and adverse impacts on the amenity of adjacent areas from which the signs are visible.

Refer to figure H3.1

Objectives

O1. To minimise the proliferation of signs and visual clutter.

O2. To ensure signs are clearly visible without dominating buildings or streets.

Controls	
C1.	Signs, other than those relating to the occupier of the building are not permitted.
C2.	Maximum size/area and number are included in Table H-A.
C3.	The number of advertisements displayed on any site should be minimised in order to avoid visual clutter and duplication of message.
C4.	Signs should be designed to provide clear property and business identification without dominating the site or the streetscape.
C5.	Signage should be visually sub-ordinate to the building as a whole and its façades.
C6.	In multi-tenanted buildings, a single coordinated free-standing advertisement or directory board should be used.

Undesirable sign dimensions

Preferred sign dimensions

Figure H3.1 Undesireable and preferred sign dimensions

H4 Sign dimensions

Signs should be designed to provide clearly identifiable business identification without dominating the appearance of the site or streetscape.

Objectives

O1. To ensure signs do not dominate buildings or streetscape and are in keeping with the character of the surrounding area.

Controls	
C1.	Maximum size/area and number are included in Table H-A.
C2.	The supporting structure of free-standing advertisements should be of dimensions which provide good visual balance to the structure in addition to the necessary structural supports.
C3.	Supporting structures should not dominate the sign, building or streetscape.
C4.	Free standing signs and advertisements on multi-tenanted buildings should be limited to one per building.

H5 Integration

Signs and advertising structures are valuable in providing information, identification and warning. Signs need to be clearly visible. Signs and advertising structures should be sensitively sited and designed so they are well integrated with building and landscape design to minimise adverse impacts on streetscape and urban character.

Objectives

O1. To ensure signs are well located and integrated with building and landscape design where possible.

Controls	
C1.	Signs attached to buildings should be of appropriate colour, scale and proportion, and of an integrated design that is coordinated with the architectural form and design of the building upon which the advertisement or advertising display is located.
C2.	Free-standing advertisements should not rely upon the removal of trees or lopping of branches in order to be visible.

H6 Conservation areas

Outdoor advertising should be designed and located in a manner which conserves the character and heritage significance of the building, street or area which have been identified as significant. Generally, signs on individual buildings or within conservation areas should be sensitively designed and located and should complement the building or area.

Objectives

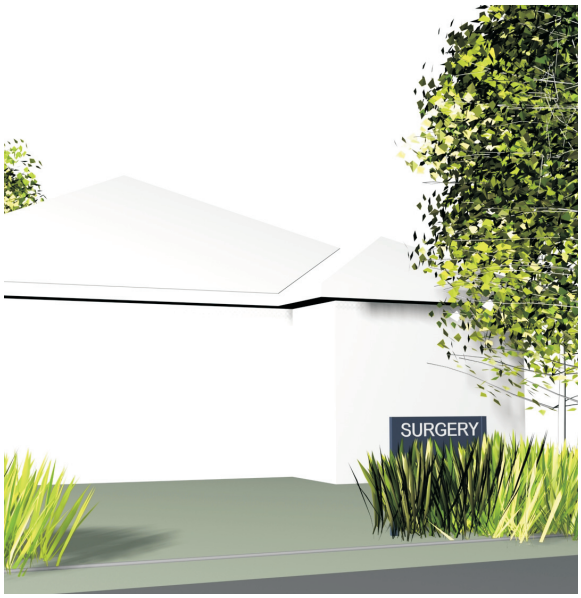
O1. To ensure signs associated with heritage buildings are sensitively designed and located.

O2. To ensure signs do not detract from the appearance and character of Conservation Areas.

Controls	
C1.	Signs and advertising structures should be designed and located in a manner which conserves or enhances heritage places and buildings, and the appearance and character of conservation areas.
C2.	New signs should not be placed on the side of buildings.
C3.	Signs should observe traditional sign locations, and wherever possible original signs should be retained and conserved at the site.
C4.	Signs should not break the historic parapet or roofline.
C5.	Signs should temper modern advertising styles with sympathetic design details (eg. sympathetic colours, margins, type, style) without trying necessarily to recreate a “historic” theme.
C6.	Proponents should demonstrate through research that the advertising proposal is in keeping with the historic building or place.
C7.	Illuminated signs should not be placed on heritage items or in conservation areas.
C8.	Signs should be constructed with a high standard of materials and graphics.
C9.	Signs should be minimalist in their scale and design.

Refer to figure H6.1

Undesirable sign dimensions



Preferred sign dimensions

Figure H6.1 Undesireable and preferred signs for conservation areas

H7 Concord Oval and Drummoyne Oval Signage

Council recognises the need for corporate and community sponsorship of sporting groups in the local area. At the same time, it acknowledges the need to ensure that the appearance and amenity of the natural built environment of the reserves and surrounding areas is protected.

Signage approval is valid for the term stated in the consent. After this time, applicants must reapply to Council for approval to erect sponsorship signage.

Objectives

O1. To allow sponsorship signage for community based sporting clubs in locations and a manner that complements the role of the reserves.

O2. To control the display of advertising material in such a manner as will reasonably protect the amenity of the local area.

O3. To ensure that sponsorship signage is directly related to the reserve/sporting facility in which it is displayed.

O4. To coordinate the placement of signage on reserves and associated facilities to minimise clutter, avoid unnecessary duplication and improve the reserves attractiveness and function.

Location of sponsorship signs

Controls	
C1.	Signage is to be located so as to be visible only to persons attending the organised sports activities on the reserve and should not face outward (see figure H7.1). The protection of views into and within public areas is to be maintained and enhanced. Signage is only permitted on fencing around the sporting field. Applications for signage on grandstands and scoreboards at Concord and Drummoyne ovals will be considered based on merit assessment. Signage on perimeter fences shall face inwards towards the sporting facility and shall be restricted to the height of the fence surrounding the sporting field. Where the rear side of the sign is visible from any road, street or waterway, the rear side shall be treated in a manner so as to blend with the existing fence structure. The visibility of the signage from the surrounding roads, streets, waterways or residential areas is to be minimised.

Design and content of sponsorship signs

Controls	
C2.	Illuminated, animated, flashing or moving signs are not permissible. No signage is to be painted directly onto a fence or other structure. All signage must include the sporting clubs name on at least 25% of the overall area of the sign. Signage content is restricted to information about the sponsors of the teams or organisations using the sporting facility or about the products of those sponsors. Where permissible, signage on scoreboards, grandstands etc, shall not exceed the width of the structure by more than 1 metre. No signs are to extend above the existing height of the structure. Signage is not to contain any advertisements for cigarettes.

General

Controls	
C3.	The applicant is to be responsible for maintaining signage in a good state of repair. All sporting bodies and advertisers are to be made aware that signs may be removed or covered up during special “one off” events.

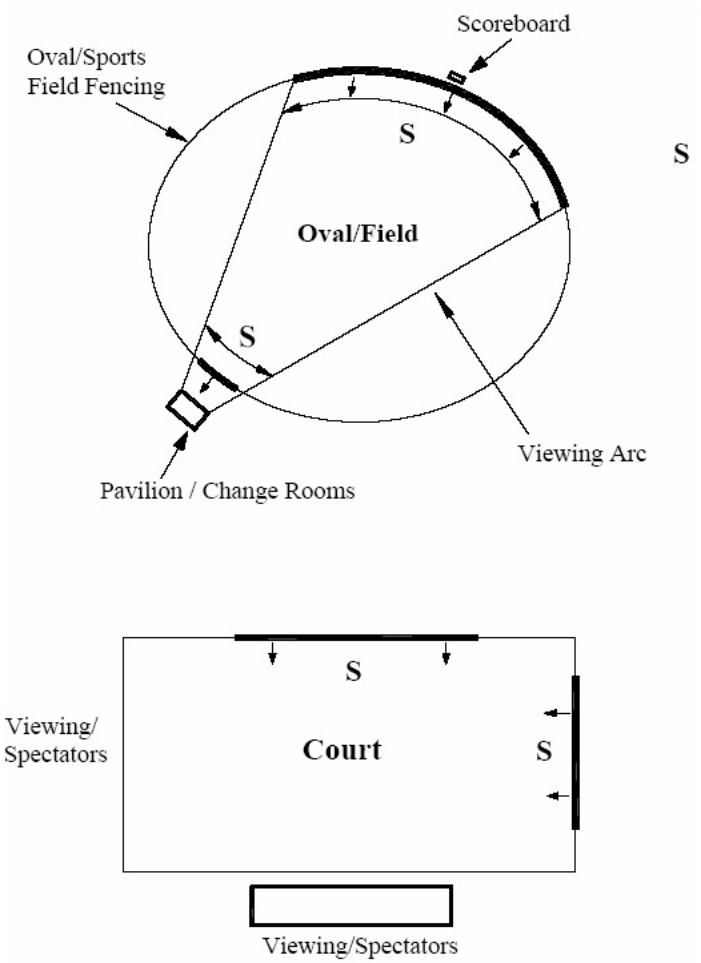


Figure H7.1 Location criteria for signage

Key: Section of fence suitable for permanent signage. Signs to face Pavilion or viewing area. Signage must not be visible from outside the reserve.

Note: The locational criteria apply to tennis courts, lawn bowls and other relevant recreation facilities within the Council Reserve system.

H8 Architectural amenity and residential character

The scale of advertising signs should be compatible with the buildings they are on as well as with nearby buildings and other existing signs. Many traditional building designs can be easily broken into a grid based on the alignments of the parapet (skyline), cornice, verandah, window and door.

Appropriate dimensions are often achieved by restricting signs to grid locations or panels. This ensures that the original architectural character (set by the lines of awnings, window and door openings, parapet lines and setbacks) remains dominant.

Objectives

O1. To ensure signs and advertising structures respect the architectural character of the building and the locality.

O2. To ensure the location of signs maintains and protects the amenity of residential areas.

Controls	
C1.	The scale of advertising signs should be compatible with the buildings they are on, nearby buildings, street widths and other existing signs.
C2.	On buildings with decorative facades, signs should not be placed on the decorative forms or mouldings. Instead they should appear on the undecorated wall surfaces, unless architecturally designed sign panels are provided.
C3.	Where commercial areas adjoin residential areas, signs should not be permitted on walls facing adjoining dwellings.

THIS PAGE WAS INTENTIONALLY LEFT BLANK





PART I - CHILD CARE CENTRES

I1 Child Care Centres

The aim of this section of the DCP is to support the planning controls provided within the State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017 and achieve appropriate development of Child Care Centre within each land use zone.

Objectives

To ensure that Child Care Centres:

O1. Are compatible with neighbouring land uses;

O2. Integrate into existing residential environments and are unobtrusive in terms of size, bulk and height;

O3. Are appropriate for the surrounding built form and natural landscape;

O4. Will have minimum impact on surrounding land uses; and

O5. To ensure the health, safety and wellbeing of children and staff in Child Care Centres.

I2 Building setbacks

Objectives

O1. To ensure the height and scale of a child care centre relates to site conditions, complements the prevailing character of the streetscape and minimises any adverse amenity impacts upon the surrounding properties.

O2. To ensure the appearance of the development enhances the streetscape.

Controls	
C1.	The Child Care Centre should comply with the relevant setback controls as stipulated in the Canada Bay Development Control Plan as follows: • Within a residential zone, setbacks for dwelling houses; and • Within a commercial / industrial zone – setbacks will be considered on a merit basis.

I3 Provision of parking

Objectives

O1. To ensure the adequate provision of car parking.

Controls	
C1.	One (1) car parking space is to be provided for every four (4) licensed places at the Child Care Centre.
C2.	A designated space is to be provided for disabled parking/service vehicles close to the main entrance of the child care centre.

I4 Signage

Objectives

O1. Complement and enhance the predominant character of the locality;

O2. Not obscure the view of attractive landscapes, streetscapes, or significant buildings; and

O3. Not adversely affect the safety of traffic or pedestrians.

Controls	
C1.	For Child Care Centres in residential zones, advertising should be limited to not more than one sign per Child Care Centre which a) Has a maximum area of 0.5m^2; and b) Serves only to identify the name and phone number of the Child Care Centre and the hours of operation.
C2.	For Child Care Centres in all other zones, compliance should be achieved with Council's signage requirements.

J

PART J - DEFINITIONS

Definitions

Acid sulfate soils

Acid sulfate soils - means naturally occurring sediments and soils containing iron sulfides (principally pyrite) or their precursors or oxidation products, whose exposure to oxygen leads to the generation of sulfuric acid (for example, by drainage or excavation).

Attic

Attic - means any habitable space, but not a separate dwelling, contained wholly within a roof above the ceiling line of the storey immediately below, except for minor elements such as a dormer windows and the like.

Basement

Basement - means the space of a building where the floor level of that space is predominantly below ground level (existing) and where the floor level of the storey immediately above is less than 1 metre above ground level (existing).

Bicycle Parking Facility

Bicycle parking facility - is an area reserved or designed for short term parking of one or more bicycles. It includes a device to which the bicycle frame and wheels can be locked. It is mostly used by visitors to the development at which it is provided.

Bicycle Storage Facility

Bicycle storage facility - is an area reserved or designed for long term parking of one or more bicycles. It is usually enclosed to provide security. It is mostly used by employees or residents of the development at which it is provided.

Building Envelope

Building envelope - means the three-dimensional space within which a building is to be confined.

Building Footprint

Building footprint - means the area of land measured at finished ground level which is enclosed by the external walls of a building

Building Height (or height of building)

Building height (or height of building) - means the vertical distance between ground level (existing) at any point to highest point of the building, including plant and lift overruns, but excluding communication devices, antennae, satellite dishes, masts, flagpoles, chimneys, flues and the like.

Building height plane

Building height plane - means a plane projected at an angle of 45° over the actual land to be built upon from a vertical distance of 5.0 metres above ground level at the side boundaries of the site.

Building identification signs

Building identification sign - means a sign that identifies or names a building and that may include the name of a building, the street name and number of a building, and a logo or other symbol, but that does not include general advertising of products, goods or services.

Building line or setback

Building line or setback - means the horizontal distance between the property boundary or other stated boundary (measured at 90 degrees from the boundary) and:

a) A building wall, or

b) the outside face of any balcony, deck or the like, or

c) the supporting posts of a carport or verandah roof,

whichever is the shortest.

Business identification sign

Business identification sign - means a sign:

a) That indicates:

1. the name of the person or business, and
2. the nature of the business carried on by the person at the premises or place at which the sign is displayed, and

b) may include the address of the premises or place and a logo or other symbol that identifies the business, but does not include any advertising relating to a person that does not carry on business at the premises or place.

Ceiling Height

Ceiling height - in relation to buildings means the greatest distance measured vertically from the ceiling of the upper most habitable room, or in the case of raked or cathedral ceilings a line projected from associated ceilings, to the existing ground level, or the lowest habitable floor immediately below that point, whether or not at natural ground level, excluding chimneys, attic rooms, and non-habitable rooms which are entirely below natural ground level and have no visible external elevation whatsoever.

Child Care Centre

Child care centre - means a building or place used for the supervision and care of children that:

a) Provides long day care, pre-school care, occasional child care or out-of-school-hours care, and

b) does not provide overnight accommodation for children other than those related to the owner or operator of the centre,

but does not include:

c) a family day care home or home-based child care home, or

d) an out-of-home care service provided by an agency or organisation accredited by the NSW Office of the Children's Guardian, or

e) a baby-sitting, playgroup or child-minding service that is organised informally by the parents of the children concerned, or

f) a service provided for fewer than 5 children (disregarding any children who are related to the person providing the service) at the premises at which at least one of the children resides, being a service that is not advertised, or

g) a regular child-minding service that is provided in connection with a recreational or commercial facility (such as a gymnasium), by or on behalf of the person conducting the facility, to care for children while the children's parents are using the facility, or

h) a service that is concerned primarily with the provision of:

1. lessons or coaching in, or providing for participation in, a cultural, recreational, religious or sporting activity, or
2. private tutoring, or

i) a school, or

j) a service provided at exempt premises (within the meaning of section 200 of the Children and Young Persons (Care and Protection) Act 1998), such as hospitals, but only if the service is established, registered or licensed as part of the institution operating on those premises.

Co-located facilities

Co-located facilities – means one or more facilities on or within an original facility or a public utility structure.

Co-Siting

Co-siting – means the siting of a number of telecommunication facilities, often owned by different carriers, in one location.

Collection Area

Collection area - is the location where garbage or recyclable material is transferred from a building's storage containers to a collection vehicle for removal from the site.

Communal Open Space

Communal open space - means useable shared open space for the recreation and relaxation of residents of a housing development and which is under the control of a body corporate or equivalent.

Conservation Plan

Conservation plan - means a document establishing the significance of a heritage item and recommending an appropriate policy to enable that significance to be retained.

Cumulative impact

Cumulative impact – in relation to Telecommunications and Radiocommunications infrastructure - means the impact of radiation from various sources or over time.

Council

Council - means the City of Canada Bay Council or any officer or delegated authority authorised to act on behalf of Council.

Development Control Plan (DCP)

A plan made to provide more detailed provisions than those included in a local environmental plan.

Dormer Window

Dormer window - means a construction containing a vertical window framed into and projecting through a steeply sloping roof. It can be a window or a group of windows forming a bay or recess in a room projecting outward from the general line of the wall.

Dual Occupancy

Dual occupancy – means two (2) dwellings (whether attached or detached) on one lot of land.

Dwelling House

Dwelling house - means a building containing only one dwelling.

Ecologically sustainable development

Ecologically sustainable development - means development that meets the needs of the present without compromising the ability of future generations to meet their own needs. ESD encompasses energy efficiency, minimising greenhouse gas emissions, the efficient use of land and resources, biodiversity conservation and equity within and between generations.

Electromagnetic radiation (EMR)

Electromagnetic radiation (EMR) – means the radiation in the microwave and radiofrequency band of the electromagnetic spectrum.

Floor Space Ratio

Floor Space Ratio – See clause 4.5 of the Canada Bay Local Environmental Plan.

Frontage

Frontage - means the alignment at the public road reserve at the front of a lot and in the case of a lot that abuts two or more streets, the boundary of which, when chosen, would enable the lot to comply with the DCP provisions.

Garbage and Recycling Room

Garbage and Recycling Room - means a room where garbage and recycling receptacles are stored, awaiting reuse or removal from the premises.

Gross Floor Area

Gross Floor Area – means the sum of the floor area of each floor of a building measured from the internal face of external walls, or from the internal face of walls separating the building from any other building, measured at a height of 1.4 metres above the floor, and **includes**:

a) The area of a mezzanine, and
b) habitable rooms in a basement or an attic, and
c) any shop, auditorium, cinema and the like, in a basement or attic,

But excludes:

d) any areas for common vertical circulation, such as lifts and stairs, and
e) any basement:
   i) storage, and
   ii) vehicular access, loading areas, garbage and services, and
f) plant rooms, lift towers and other areas used exclusively for mechanical services or ducting, and
g) car parking to meet any requirements of the consent authority (including access to that car parking), and
h) any space used for the loading or unloading of goods (including access to it), and
i) terraces and balconies with outer walls less than 1.4 metres high, and
j) voids above a floor at the level of a storey or storey above.

Ground Level (existing)

Ground level (existing) means the existing level of a site at any point.

Gross Leaseable Floor Area

Gross Leaseable Floor Area – the sum of the areas of each floor of a building that is taken to be the area within the internal faces of the walls, excluding stairs, amenities, lifts, corridors and other public areas but including stock storage area.

Habitable Room

Habitable room - is a bedroom, living room or kitchen, dining room, study, play room and sun room.

but excludes:

a bathroom, laundry, water closet, food storage pantry, walk-in wardrobe, corridor, hallway, lobby, photographic darkroom, clothes drying room, ancillary storage or parking area and other spaces of a specialised nature occupied neither frequently nor for extended periods.

Injuring

Injuring - includes the administration to any part of a tree of any chemical or compound or substance which has the potential to harm the tree, irrespective of whether it actually harms the tree; “injuring” also includes altering the ground level in the near vicinity of the tree; “injuring” also includes changing the level of the water table so as to adversely affect the tree.

Landscaped Area

Landscaped area - means a part of a residential site used for growing plants, grasses and trees, but does not include any building, structure or hard paved area.

Large Dwelling

Large dwelling - means a three (3) or more bedroom dwelling, the floor space of which is more than 98m^2.

Local Environmental Plan (LEP)

An LEP is a legal document and generally provides the land use zones, Council Objectives and development standards for different types of development.

Low Impact Facility (LIF)

Low impact facility (LIF) - a facility that is exempted from state and council local planning under the Telecommunications (Low-impact Facilities) Determination 1997.

Medium Dwelling

Medium dwelling - means a two (2) bedroom dwelling, the floor space of which is not less than 79m^2 but not more than 98m^2.

Multi Dwelling Housing

Multiple dwelling housing - means three (3) or more dwellings (whether attached or detached) on one lot of land (not being an individual lot in a strata plan or community title scheme) each with access at ground level, but does not include a residential flat building.

NatHERS or equivalent

NatHERS or equivalent - NatHERS (Nationwide House Energy Rating System) is a computer simulation tool developed by the CSIRO for rating the thermal performance of houses across Australia. The Energy Management Task Force is responsible for delivering a NatHERS compliance protocol. Any software or paper checklist which passes under this protocol is deemed “NatHERS or equivalent” (SEDA 1997).

North Facing

North facing - means the orientation within 20 degrees east and 30 degrees west of true north.

Outbuilding

Outbuilding - means a detached building or structure used for purposes ancillary to the main dwelling on an allotment and includes cabanas, gazebos, garden sheds, greenhouses, garages, carports and the like.

Private Open Space

Private open space - means an area external to a building (including an area of land, terrace, balcony or deck) that is used for private outdoors purposes ancillary to the use of the building.

Radiocommunications facility

Radiocommunications facility – means a base station or radio communications link, satellite-based facility or radio communications transmitter.

Recycable

Recyclable - means capable of being reprocessed into useable material or re-used.

Removal and Cutting down

Removal and cutting down - means the cutting down of a tree so that the tree, including its branches, foliage, trunk, stump and root system will not regrow. This includes the poisoning of the stump and/or roots and/or removal or grinding out of its remains to prevent regrowth. “Transplanting” is “Removal” when a tree is relocated from one property to another.

Residential Flat Builidng

Residential flat building – means a building containing three (3) or more dwellings, but does not include an attached dwelling or multi dwelling housing.

Semi-Detached Dwelling

Semi-detached dwelling - means a dwelling that is on its own lot of land (not being an individual lot in a strata plan or community title scheme) and is attached to only one other dwelling.

Site Coverage

Site Coverage – means the proportion of a site area covered by buildings. However, the following are not included for the purpose of calculating site coverage:

a) Any basement,
b) any part of an awning that is outside the outer walls of a building and that adjoins the street frontage or other site boundary,
c) any eaves,
d) unenclosed decks, pergolas and the like.

Small Dwelling

Small dwelling - means a one (1) bedroom dwelling or studio apartment, the floor space of which is not more than 79m^2.

Solar Access

Solar access - means the amount of direct access to sunlight enjoyed by a building, room or open space.

Statement of Heritage Impact (SOHI)

Statement of Heritage Impact (SOHI) - means a statement prepared in accordance with the requirements of the Heritage Manual that addresses the significance of the place or item; adequately describes the existing features of the item or place; describes the proposed works and its contribution to the significance of the item; and justifies any proposed works.

Special Waste

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.

Storey

Storey - means a space within a building that is situated between one floor level and the floor level next above, or if there is no floor above, the ceiling or roof above, but does not include:

a) A space that contains only a lift shaft, stairway or meter room, or
b) a mezzanine, or
c) an attic.

Telecommunications facility

Telecommunications facility - any part of the infrastructure of a Telecommunications Network. It includes any telecommunications line, equipment, apparatus, telecommunications tower, mast, antenna, tunnel, duct, hole, pit, pole or other structure or thing used, or for use in connection with a Telecommunications Network.

Telecommunications Network

Telecommunications Network – means a system, or series of systems, that carries, or is capable of carrying, communications by means of guided and/or unguided electromagnetic radiation.

Tree

Tree - means a perennial plant with at least one self-supporting woody or fibrous stem.

Wall Height

Wall height - means the greatest distance measured vertically from the topmost point on an external wall of a building, other than a gable wall or the wall of a dormer window, to existing ground level immediately below that point.

Waste

Waste – means any substance that is no longer able to be used for the purpose for which it was originally intended, and defined under the Waste Minimisation and Management Act, 1995, as:

a) Any substance (whether solid, liquid or gaseous) that is discharged, emitted or deposited in the environment in such volume or manner as to cause an alteration in the environment; or
b) any discarded, rejected, unwanted, surplus or abandoned substance; or
c) any otherwise discarded, rejected, unwanted, surplus or abandoned substance intended for sale or recycling, reprocessing, recovery or purification by a separate operation from that which produced the substance; or
d) any substance prescribed by the regulation to be waste under the Waste Minimisation and Management Regulation.

For the purpose of the DCP, a substance is not precluded from being waste merely because it can be re-processed, re-used or recycled.

Waste Management Plan

Waste Management Plan – means a checklist showing the volume and type of waste to be generated, stored and treated on site, and how the residual is to be disposed, re-processed, re-used or recycled.

Waste Storage and Recycling Area

Waste storage and recycling area – means a designated area or a combination of designated areas on 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 occupants of the building.

For a comprehensive list of definitions please refer to the Canada Bay LEP.

THIS PAGE WAS INTENTIONALLY LEFT BLANK






A1

APPENDIX 1 - CONSERVATION AREAS

Overview

List of Conservation Areas	
CA.1	Birkenhead and Dawson Estates Conservation Area
CA.2	Bourketown Conservation Area
CA.3	Creewood Street Conservation Area
CA.4	Drummoyne Avenue East Conservation Area
CA.5	Drummoyne Avenue West Conservation Area
CA.6	Drummoyne Park Conservation Area
CA.7	Gale Street Inter-War Californian Bungalow Group
CA.8	Gale Street Victorian Housing Group
CA.9	Gears Avenue Conservation Area
CA.10	Gipps Street Conservation Area
CA.11	Hampden Road Conservation Area
CA.12	Lindfield Avenue Conservation Area
CA.13	Majors Bay Road Conservation Area
CA.14	Marlborough and Tavistock Streets Conservation Area
CA.15	Mons Street and Boronia Avenue Conservation Area
CA.16	Moore Street Conservation Area
CA.17	Mortlake Workers' Housing Group
CA.18	Park Avenue Conservation Area
CA.19	Parklands Estate Conservation Area
CA.20	Powell's Estate Conservation Area
CA.21	Sailsbury Street Housing Group
CA.22	Thompson Street Conservation Area
CA.23	Victoria Road Retail Conservation Area
CA.24	Yaralla Estate Conservation Area

Statements of significance

CA.1 Birkenhead and Dawson Estates Conservation Area

History

This conservation area includes the subdivisions of two major estates. The first was the 1882 Birkenhead Estate subdivision that included the land bounded by Lyons Road, Victoria Road, Ferry Lane, Ferry Road, and Iron Cove Bay. That was followed in 1901 by two subdivisions of the Dawson Estate that included most of the land to the east of Ferry Lane. A third subdivision of the Dawson Estate in 1908 included the land between Albert Street, Alexander Street and Queen Victoria Road.

Development in this Conservation Area followed the subdivisions and houses from the Victorian period survive in Renwick Street and on Park Avenue, Thornley Street and Day Street. Most of the remaining development is from the Federation period, reflecting the continued development of the Birkenhead Estate and the rapid development of the Dawson Estate subdivisions.

Description

This area contains some of the earliest surviving buildings in Drummoyne with an interesting collection of buildings from the late Victorian period including a number of stone houses in Renwick Street. The area is also of historical interest with the very high retention rate of items of heritage significance in Renwick Street due to its long term road widening affectation which effectively prevented any development for over 20 years. This has resulted in this group of properties surviving as the most intact early and modest housing streetscape in the Municipality.

The styles of housing in the Conservation Area reflects the various subdivisions. Renwick Street was developed early in the development of Drummoyne, along with other streets close to Victoria Road. In contrast the adjoining streets released for development at a later period are more typical of the strong Federation character of Drummoyne.

The scale of building is modest with a large number of simple timber cottages, stone cottages and generally unpretentious buildings. This is particularly seen in Alexandra Street and Day Street.

The area falls into three distinct characters:

- Renwick Street with its late Victorian through to inter-war housing
- Alexandra, Albert and Day Streets which have a predominantly Federation character and
- Thornley Street and Park Avenue which have a mix of Edwardian, Federation and several late Victorian buildings.

The generally narrow allotments (15-16m frontages) has resulted in tightly packed development. Access to the rear of allotments on Alexandra Street and Renwick Street has allowed garages and carports to be built away from the main streetscape.

Statement of Significance

The Birkenhead and Dawson Estates Conservation Area is of high heritage significance for the very intact and complete streetscapes reflecting the intense development of Drummoyne in the late nineteenth and early twentieth century. The styles of housing clearly reflect the pattern of subdivision of the area.

This Conservation Area includes extensive groups of Federation and Edwardian housing interspersed with Victorian cottages and some larger two storey homes. The narrow allotments and generally consistent scale of development create a cohesive and interesting streetscape.

Analysis - Setting

This conservation area has narrow allotments. Setbacks are generally smaller closer to Victoria Road. Street trees are important in contributing to the character of much of this area. The angled junction of Ferry Lane and Thornley Streets gives additional interest to the streetscape in that part of the Conservation Area.

Scale

Most of the housing has single storey frontages to the street, consistent with the narrow allotments. Two storey housing is scattered through the area. Some semi-detached housing utilising double allotments is included in the area and gives the impression of larger scaled housing.

Form

Some of the earlier development has simple rectangular massing with simple hipped roofs and verandahs running across the full width of the houses. The dominant Federation period housing breaks up the overall massing with projecting wings and more complex roof forms. Gables are used either as decorative features or as the main roof form. The two storey housing on the smaller allotments generally has quite simple massing with the main bulk of the building set behind a verandah to help reduce the overall bulk in the streetscape.

Facades usually include verandahs and elements that step forward of the main part of the building. This often adds interest to the roof form as well as the street front of the house. Simple verandahs across the street facades help to soften the impact of the higher two storey facades on the streetscape.

Materials and Colours

Face brickwork is the most common original material. Sandstone and render is found on the earlier Victorian housing. Roofs of the Federation and Edwardian housing are usually terracotta or slate shingled. Some cottages have galvanised corrugated steel roofs.

Doors and Windows

Doors and windows are usually vertically proportioned. Larger openings, when they occur, are divided vertically.

Carparking

Parking is generally at the rear of the property, in some cases taking advantage of rear street access. On steeply sloping sites, some garages have been built into the retaining walls on the street front.

Fencing

A mixture of fencing is used and depends to some extent on the nature of the site and the character of the house.

Masonry retaining walls of face brick or stone are used on sloping sites. Low masonry fences of either face brick or stone are common on the early twentieth century development. On some late Federation and Inter-War housing, the brick piers are linked by a pipe rail. Timber picket fences are usually modern reproductions and are not original to the streetscape.

Garden Elements including Paving and Driveways

Hedges are often used where increased privacy is desired. Driveways are often a pair of concrete strips parallel to the side boundary of the house. Terraces provide a setting on steeply sloping sites where houses are located on the high point to maximise views.

Refer to figures App1.1 to App1.3

Figure App1.1 Birkenhead and Dawson Estates Conservation Area - Overview

Figure App1.2 Birkenhead and Dawson Estates Conservation Area - Sheet 1

Figure App1.3 Birkenhead and Dawson Estates Conservation Area - Sheet 2

CA.2 Bourketown Conservation Area

History

Bourketown was initially established in the 1840 period making it one of the first planned developments in the area along with Gipps Town at Five Dock. The subdivision had Bourke Square at its centre and was first offered for sale in 1841.

Although some land was taken up little development took place until the area was linked by the Iron Cove Bridge to the city in 1882. The new bridge resulted in further sales and was the start of the development that currently typifies the area. There appear to be no structures remaining from the pre-1880 period of development.

The area between Formosa Street and South Street was re-subdivided in 1883 as the Tranmere Estate. Further re-subdivision of larger blocks continued into the Inter-War period and is reflected in the housing styles.

The most intensive phase of development in the Bourketown area was the Federation period. Speculative developments of semi-detached houses are concentrated closer to Victoria Road and free-standing Federation period houses dominate other parts of the conservation area. A small number of late Victorian houses survive, primarily in the area closer to Bourketown Square. The dominant Federation phase of development is reinforced with a good range of Inter-War housing.

Statement of Significance

The Bourketown Conservation Area is of high value in reflecting the principal late Victorian and Federation period of development of the Drummoyne Area. The street layout survives from the original Bourketown subdivision, one of the earliest subdivisions of the area. The focal point of Bourketown is Bourke Square and it is in this vicinity that some of the finest individual buildings and groups of buildings are located, along with a small group of commercial buildings and the Drummoyne Public School.

Bourketown is important for its remaining Victorian housing, particularly in the vicinity of Bourke Square, which includes substantial houses on generous allotments as well as a scattering of worker's homes. This development is surrounded by the Federation housing that dominates the streetscapes and, importantly, includes a range of housing from semi-detached speculative development closer to Victoria Road, through to smaller freestanding houses, to large houses of high individual value. These are representative of most styles of residential development from the Federation period and include housing for a variety of social classes.

The conservation area includes a number of important urban buildings including four churches, a public school, commercial buildings and a major water reservoir all relating to the early twentieth century development of the precinct and all of high value both individually and for understanding the development of the area.

Future Character

The future character for this large and mixed area is principally to retain the strong overall heritage urban character of the streets with their mix of one and two storey houses on lots of mixed size.

Existing building stock is predominantly Victorian and Edwardian with some Inter-war pockets of housing and these characters should be retained. Buildings built prior to the Second World War should not be demolished and new buildings should retain the scale and overall character of the immediate area as it relates to bulk, form and use of materials. Given the large lot sizes for much of the area, additions and new buildings can be in a range of forms including good contemporary design with the emphasis on 'fit' into the setting. Garages and carports should not be added in front of the building line.

Analysis - Setting

The area falls into a number of separate zones or precincts that are related to groups of streets.

Firstly the major north-south streets linking to Lyons Road: Gipps; Thompson; Tranmere and College Streets. These streets are wide, have long vistas, established street plantings and strong heritage value. They have a strong suburban character with a sense of spaciousness that relates to the scale of houses. The central street, Thompson Street, contains Bourketown Square which is a major public space of high heritage value that represents the first development of the Drummoyne area and forms a focal point in the area. The location of important civic buildings of high heritage value, such as churches and public utilities on these streets adds to their importance in the townscape.

The secondary north-south streets are narrower and have a smaller scale of housing development, greater use of semi-detached forms and a tighter urban fabric. These streets are: Ullathorne, Henley, and Formosa Streets and South Street (for its northern section). Formosa Street in particular is noted for its fine streetscape of semi-detached Federation housing.

The east-west streets have a completely different character. They are narrow (except for Day Street and sections of Plunket and Broughton Streets which are of varying widths) and contain a much tighter sub-division pattern with generally small blocks and far less pretentious houses. This is particularly seen in Bowman and Polding Streets. The western blocks of Polding and Bowman Streets and Plunkett Street contain the largest scattering of Victorian cottages and houses outside Thompson Street.

The major houses are not confined to one location within Bourketown, but the major groupings are in Thompson Street, the south end of Tranmere and South Streets and Lyons Road. The precinct in Thompson Street from Broughton Street to Bowman Street contains the most substantial and significant group of buildings, but this does not devalue the smaller scale buildings around it.

Another distinctive area of the Bourketown Conservation Area is the Lyons Road frontage from Formosa Street to Thompson Street. This frontage, which effectively forms part of the main road frontage rather than the residential character of the rest of the precinct, contains:

- commercial buildings at both the Drummoyne shopping centre, Tranmere Street and Thompson Street corners, several of which are individually important and intact examples of Inter-war retail buildings
- Drummoyne Fire Station
- Drummoyne Presbyterian Church at a key visual location
- blocks of Inter-war apartments of very fine proportion and detailing set amongst a series of substantial Federation and later homes which indicate the predominant early character of this road frontage.

Scale

The buildings fall into a range of groups. The predominant form for Thompson Street, South Street and Tranmere Street is single residences of significant scale. Most of Formosa Street and its side streets have single storey semi-detached housing built as speculative development. Other streets have small single fronted cottages or large groups of semi-detached dwellings generally speculatively built as seen for much of the length of Formosa and Edwin Streets and part of Day Street and Bowman Street.

Single storey housing is dominant with two storeys housing usually only confined to freestanding homes on larger allotments or for buildings originally incorporating shops.

Form

The dominant Federation period housing in the Bourketown Conservation Area is noted for the use of interesting roof forms with decorative gables providing interest and rhythm to the streetscape.

Siting

The siting of buildings in Bourketown is related to the scale of the building and the size of the site. The closely spaced semi-detached groups have small setbacks. Setbacks generally increase on larger allotments.

Materials and colours

Red face brickwork is the dominant material in the Bourketown Conservation Area. A few surviving Victorian buildings are rendered but this is the exception and these contrast to the general streetscape. The red tones continue in the terracotta roof tiles used either as a main roof material or as a highlight to the grey slate roofs.

Timber is generally used for verandah framing and joinery elements.

Colours were selected from a limited palette and complement the natural tones and textures of the materials.

Doors and Windows

Windows on contributory buildings are almost exclusively timber framed. The dominant Federation period housing has either casement or double hung windows. Larger openings are created by grouping two or three sashes together or by using French doors.

Fencing

The small number of Victorian houses in the area had transparent fencing of either iron pickets between masonry posts or timber pickets. The iron picket fencing could be up to 1.8m high on larger blocks, but clear documentation of physical evidence of this would be needed before reproduction of fencing of that height was approved. Most picket fencing would be a maximum of 1.2m high.

The dominant Federation period housing usually had low masonry fencing with panels of timber pickets or wrought steel up to a maximum of 900mm high.

Inter-war period housing in the Bourketown Conservation area usually had face brick fencing with brick piers separated by low brick panels with horizontal steel pipe rails.

Subdivision

The late nineteenth and early twentieth century subdivision patterns are typically small allotments. Larger allotments are generally only found with surviving free standing houses or are the sites of churches, schools and other public buildings. The subdivision patterns in the Bourketown Conservation Area are closely related to the rhythm of the streetscape.

Refer to figures App1.4 to App1.8

Figure App1.4 Bourketown Conservation Area - Overview

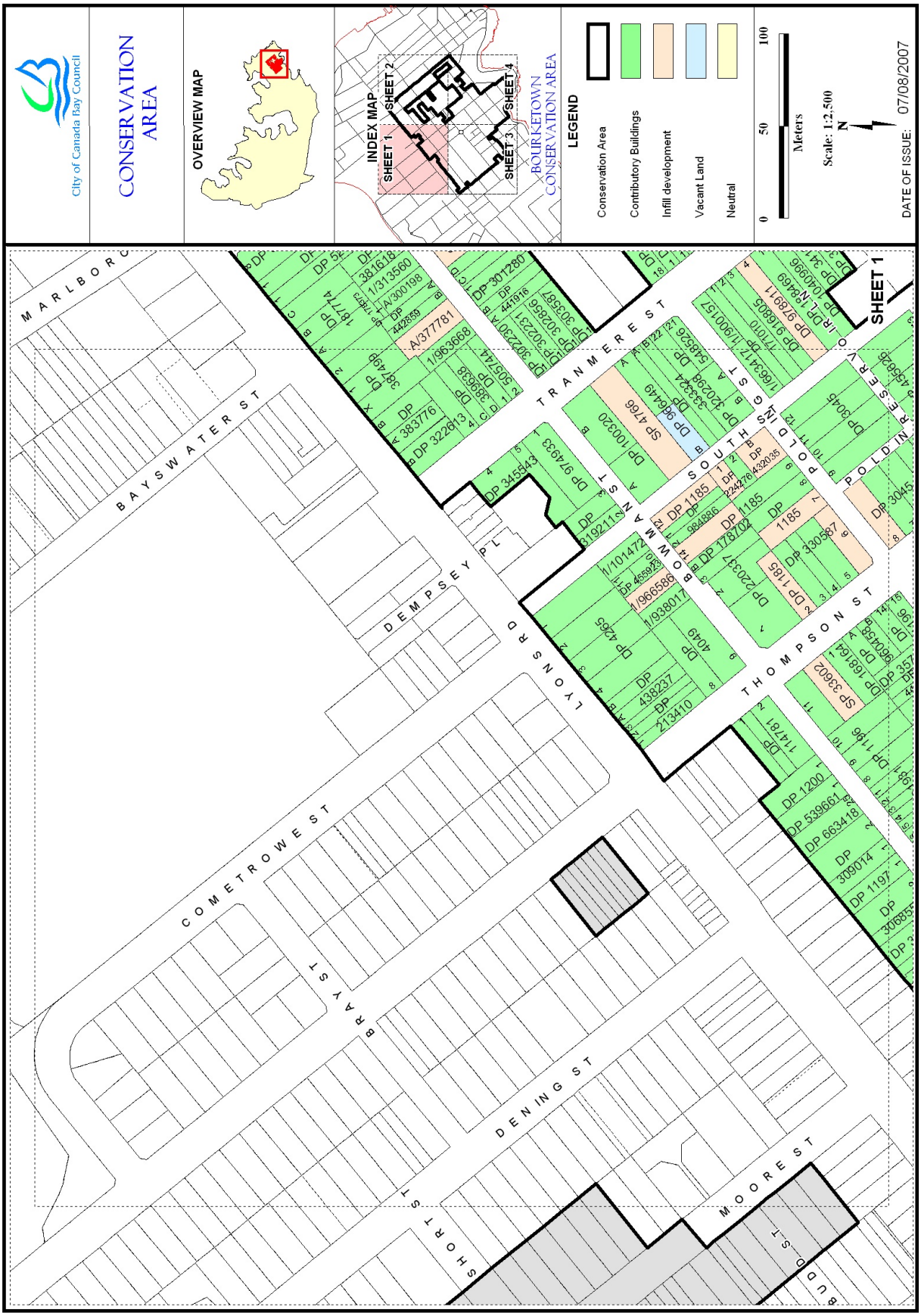


Figure App1.5 Bourketown Conservation Area - Sheet 1

Figure App1.6 Bourketown Conservation Area - Sheet 2

Figure App1.7 Bourketown Conservation Area - Sheet 3

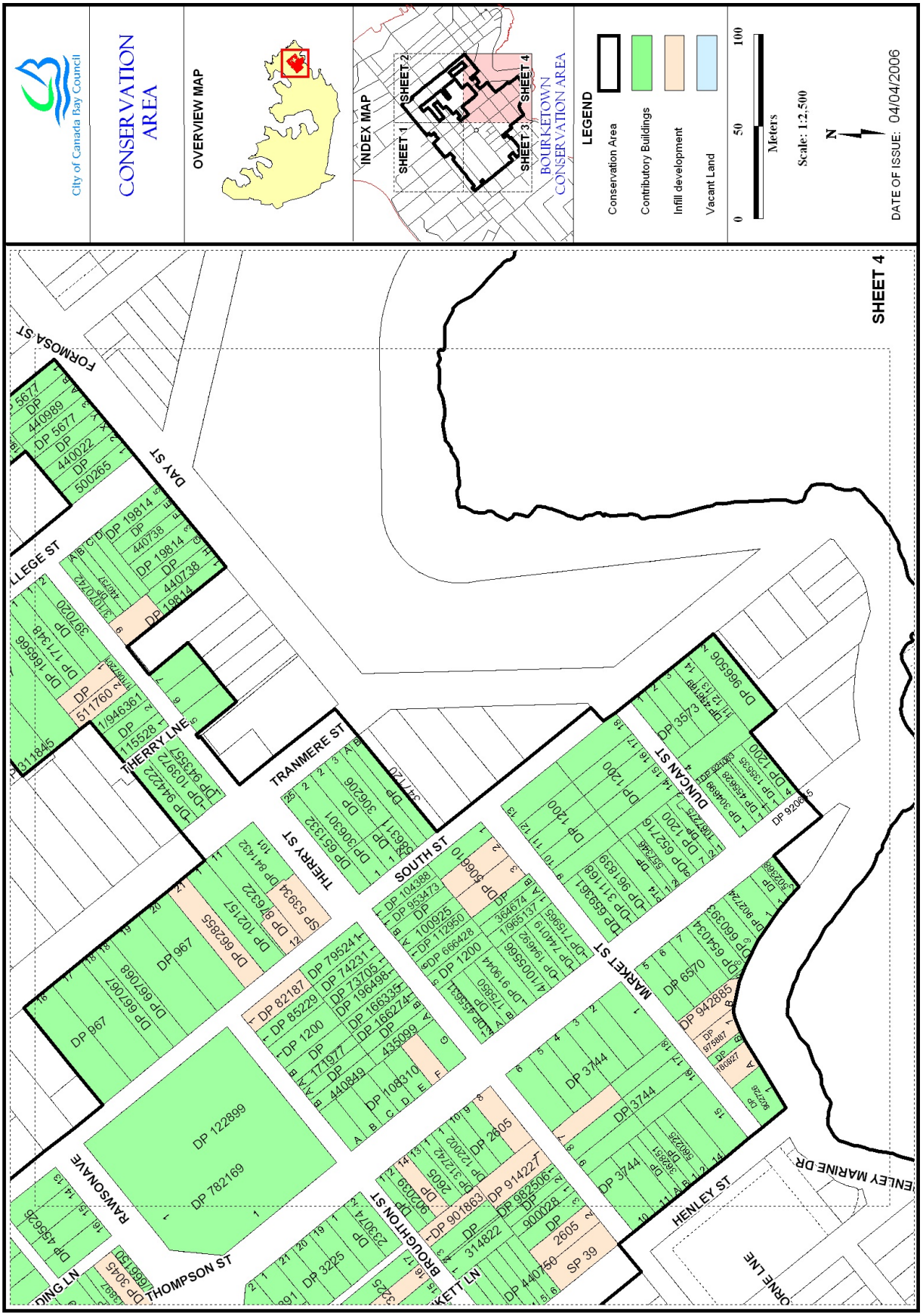


Figure App1.8 Bourketown Conservation Area - Sheet 4

CA.3 Creewood Street Conservation Area

History

Creewood was a prominent house facing Concord Road. The land to the east of the house was developed in two subdivisions creating Creewood Street. The southern and eastern sections were subdivided in 1926 with the northern part of the street subdivided in 1927. Development of Inter-War housing appears to have rapidly followed the subdivision.

Description

The development in this short street is characterised by intact Inter-War California bungalows. The houses feature multiple gables facing the street, verandahs across part of the front elevation, dark face brick walling and tiled roofs. The houses retain their landscaped setting with low brick fences with metal railing complementing the low horizontal lines of the housing. The turn in the street adds to the visual amenity of Creewood Street.

Statement of Significance

Developed in a short period from 1926, Creewood Street is one of the areas finest streetscapes of Inter-War bungalows. The streetscape is remarkable for the integrity of the landscaping and street fencing.

Analysis - Setting

Developed as a cul-de-sac, Creewood Street is a contained streetscape. The bend in the street contributes to the visual quality of the street. Intact fencing, contemporary with the houses is important to the setting of the houses.

Scale

Apart from infill development, the housing in Creewood Avenue is all single storey.

Form

The houses in Creewood Street are exemplars of Inter-War bungalows, incorporating strong horizontal lines created by the low-medium pitched gables, deep verandahs with simple brick balustrades and heavy verandah piers. Verandahs are always incorporated into the front elevation of the houses, giving depth to the façade.

Siting

Setbacks from the front boundary are consistent. Side setbacks include a generous setback on one side to allow driveway access.

Doors and Windows

Window openings are usually divided into sets of casement sashes, sometimes with a flat awning and a decorative brick sill. Doors may be multi-paned glazed leafs, sometimes with pairs of doors opening to the verandah.

Materials and Colours

Face brick walls of liver or redbrick with commons to side and rear walls. Roofs are usually of terracotta roof tile. The gables are often trimmed with shingles or weatherboards. Verandahs are trimmed with bands of cement render and stub columns.

Carparking

Garages and carports are set well behind the building line.

Fencing

Fencing has brick piers between panels of brickwork matching the houses. Pipe rails or wrought metal panels join the piers.

Refer to figure App1.9

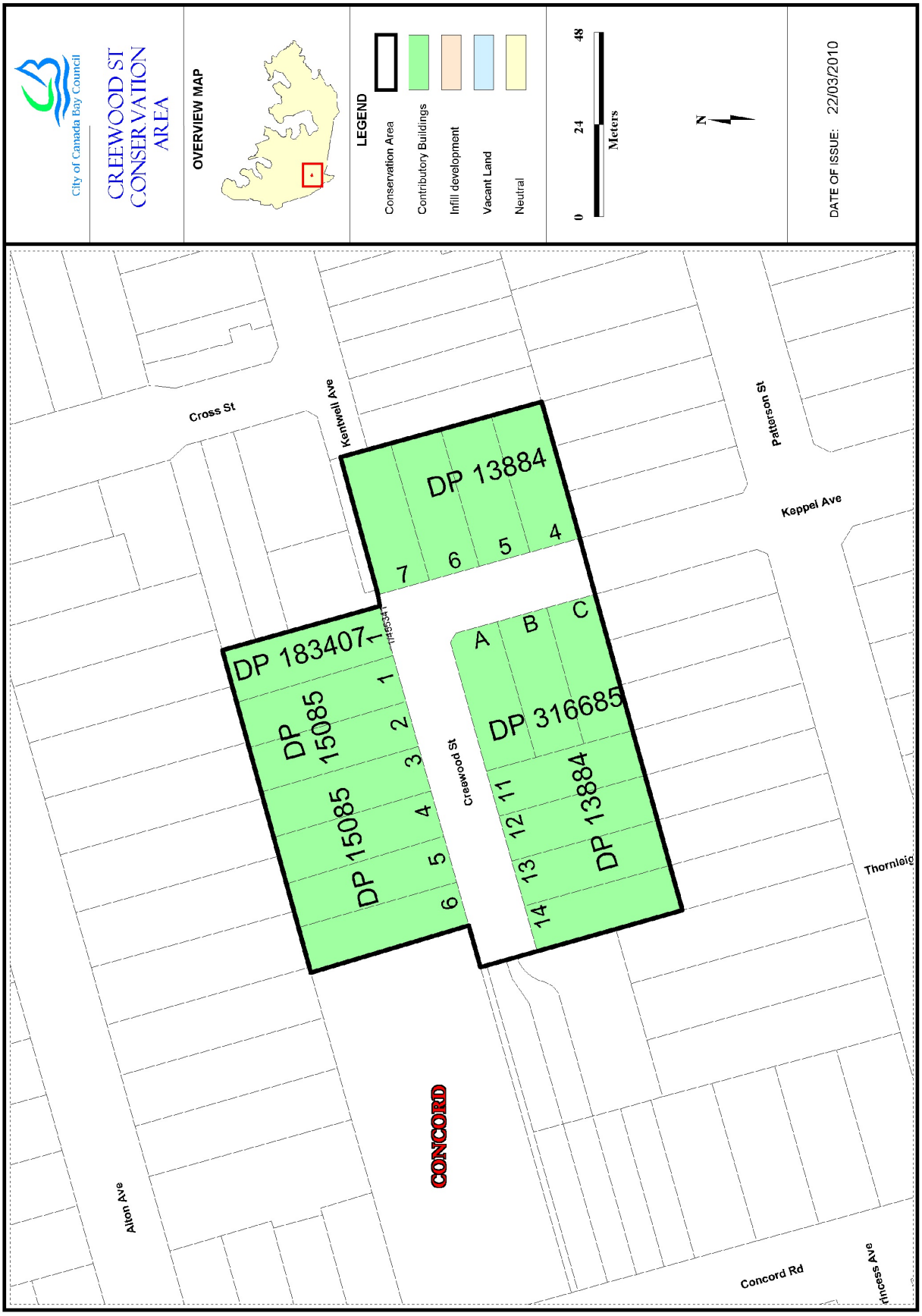


Figure App1.9 Creewood Street Conservation Area

CA.4 Drummoyne Avenue East Conservation Area

History

The subdivision of Drummoyne House in 1894 created suburban allotments at Wrights Point. The proximity to Parramatta River attracted purchasers who could afford to build fine homes, most of which were oriented to the water. This Conservation Area includes some of the finest waterfront houses to survive in Drummoyne. It also includes the house on the southwest corner of Wrights Road and Drummoyne Avenue that, due to its corner location and elevated position, provides a visual link to this group and to the Drummoyne Avenue West Conservation Area.

5 Drummoyne Avenue is the earliest house of the group, probably built soon after the subdivision in 1894. Other houses, with the exception of 8A Drummoyne Avenue, followed in the next 10-15 years.

Description

This Conservation Area includes some of the more significant waterfront houses to survive in the Drummoyne Area. They retain their setting with their major orientation to the water. Most of the group are large and notable examples of the Federation Queen Anne style.

Many of the houses retain important elements of their original gardens. Boatsheds and sea walls also contribute to the setting of the houses.

Statement of Significance

Drummoyne Avenue East Conservation Area forms one of the last intact groups of waterfront residences on the Parramatta River and has high regional as well as local value. They are indicative of the major development form along the eastern Drummoyne waterfront which has been almost completely obliterated by State Government Planning policies since the 1970's period. This is the last major waterfront group in the Canada Bay Council area and a key group of buildings at the entrance to Parramatta River.

Analysis - Setting

The houses in Drummoyne Avenue East Conservation Area respond to their proximity to the water with frontages to Parramatta River as well as to Drummoyne Avenue. Gardens are important to the setting of the houses. Large setbacks from Drummoyne Avenue are used to take advantage of water frontages.

Scale

These are generally large houses of one to two storeys located on large allotments that allowed appropriate setbacks from side boundaries.

Form

Generally interesting roof forms incorporating hipped and gabled forms. The larger houses also include tower and turret elements

These houses use elements such as bay windows, projecting gabled fronts and verandahs to break down the overall mass of the building.

Siting

The houses in this group are sited well back from the street frontage taking advantage of the site depth and river frontage.

Materials and Colours

Roofs are either slate or terracotta tiles or a combination of the two. Walls are generally face brickwork, originally unpainted.

Doors and Windows

A variety of window forms are often used in any one of the Federation houses in this group. Groups of casement windows, usually with toplights, are dominant and might be contrasted with bullseye or keyhole windows. French doors are also used to provide access to balconies.

Carparking

Garages for houses with river frontages have generally been located on the street to minimise impact on the garden setting. For other sites, garages are set back as far as possible from the street boundary.

Garages and carports may be allowed in front of the building line subject to the merit of the design. However they should be located where they will have minimal impact on original or early garden layouts and should avoid blocking important views of the houses from the street.

Garages should not be allowed where they occupy more than 40% of the street boundary.

Fencing

Fencing on the street boundary should generally be not more than 900mm high. Where higher fencing is used, it should be of a transparent design such as simple iron or timber pickets between brick piers.

Landscape Elements Including Paving and Driveways

The gardens are important to the setting of the house and incorporate curved paths, mature trees and areas of lawn. The paths often incorporate a focal element such as a fountain or urn.

Pools are generally located between the houses and the river.

Outbuildings

Outbuildings should be carefully located to avoid impacting on important views of houses from the street or the water. Where outbuildings are visible in important views, they should be designed to relate to the original house.

Small boatsheds are acceptable subject to design merit and approval of the relevant authority (N.S.W. Roads & Maritime Services).

Refer to figure App1.10

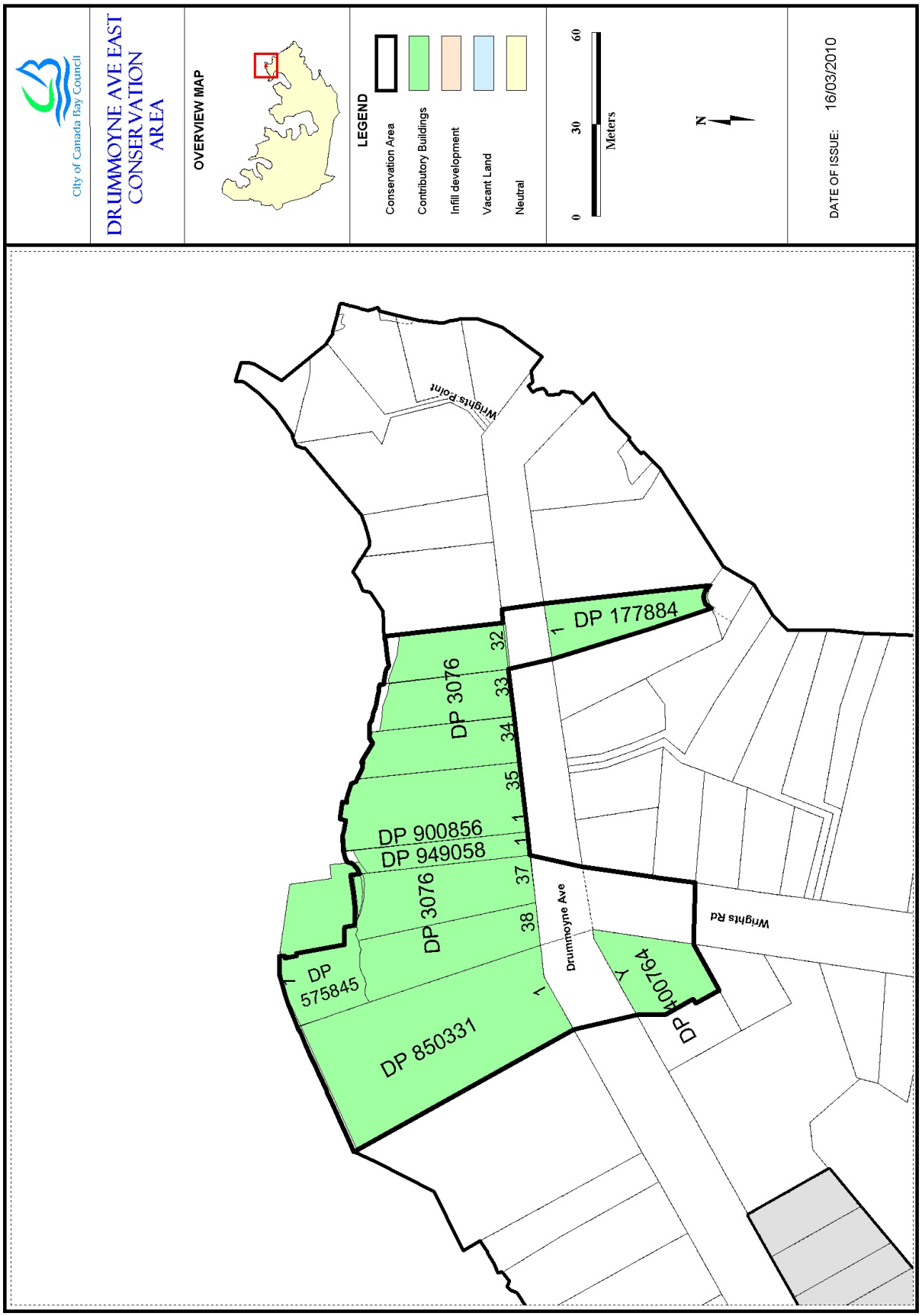


Figure App1.10 Drummoyne Avenue East Conservation Area

CA.5 Drummoyne Avenue West Conservation Area

History

The subdivision of Drummoyne House in 1894 created suburban allotments at Wrights Point. The land around and including Drummoyne House was re-subdivided in 1907 and housing was built facing the water and with its back to Drummoyne House. The present housing at 15-27 Drummoyne Avenue is an intact part of that prestigious sub-division. It is an important element in the streetscape and the continuous character of Drummoyne Avenue.

Description

This group of housing is from the Federation and Inter-War periods. The group has single storey fronts with high sub-floor spaces taking advantage of the slope of the sites. The four properties at the west end of this group date from the 1907 subdivision. The next house is Post World War II and the last two houses are very fine Inter-war houses with high quality detailing.

Statement of Significance

This group demonstrates the sub-division of one of the major Drummoyne estates and is representative of the prevalent form of housing built in east Drummoyne reflecting the importance of the area. This is a remnant of the once contiguous Federation character of the area.

Objectives

Retain the Federation and Inter-War character of this group and their garden settings.

Additions should be controlled to conserve the streetscape contribution of the group.

Analysis - Setting

The setting of these houses is elevated from Drummoyne Avenue. Low masonry retaining walls on the street boundary provide grassed terraces between the street and the house.

Scale

These houses are single storey with high sub-floor areas facing the street. First floor additions are possible subject to merit. These should generally incorporate the existing roof form facing the street.

Form

Overall bulk is generally broken up with projecting wings either under a gabled or hipped roof. Roofs of houses in this conservation area have medium pitches. Hipped and gabled forms are used on the earlier houses with more simple hipped forms on later houses.

Siting

Houses are set back from Drummoyne Avenue to take advantage of the elevated part of the site.

Materials and Colours

Roofs are either terracotta or glazed roof tiles or slate. Walls are generally face brickwork in red or dark colours. The sub-floor is usually of sandstone or brick.

Doors and Windows

Generally timber framed with pairs or groups of casement and double hung sashes.

Carparking

Garages in this conservation area were originally located to the rear of the site and this pattern continues for the majority of sites in this conservation area.

Fencing

Low masonry retaining walls on the street boundary

Garden Elements including Paving and Driveways

Grassed terraces between the street boundary and the house with low shrubs. Mature trees are placed to minimise interference with the views. Driveways are usually single width running past the house.

Refer to figure App1.11

Figure App1.11 Drummoyne Avenue East Conservation Area

CA.6 Drummoyne Park Conservation Area

History

The land on the eastern side of the present Victoria Road, north of Lyons Road, was subdivided in 1881-2 as Drummoyne Park Estate. Subsequent development included a number of substantial and well detailed Victorian Italianate houses followed by large Federation Arts and Crafts and Federation Queen Anne style housing. Much of the earlier housing was located on sites where elevated land provided good views of the harbour. This late nineteenth century development was reinforced by smaller Federation and Inter-War housing both on the original allotments of the Drummoyne Park Estate and on the subsequent subdivisions of the larger landholdings in the area.

Statement of Significance

The Drummoyne Park Estate Conservation Area, developed from 1881, includes substantial late nineteenth century homes in prestigious locations, such as nos. 2, 8 and 45 Wrights Road and 5-11 and 23 Collingwood Street, interspersed among smaller early twentieth century housing. The smaller scale of the early twentieth century housing gives the Conservation Area an underlying consistency of scale, materials and form that highlights the larger houses of the late nineteenth century in the streetscape. Apart from the heritage items within the area most of the buildings and features within this precinct are of high local heritage value and a combination of representative and rare examples of their period and style in the Drummoyne context.

Analysis - Setting

Larger late nineteenth century houses have prominence in the streetscape. The surrounding streetscape is dominated by smaller scaled Federation period housing.

Scale

Two to three storey houses occupy larger sites and usually have a garden setting. On smaller sites, single storey houses dominate. Some semi-detached housing utilising double allotments is included in the area and gives the impression of larger scaled housing.

Form

Most of the housing that contributes to the heritage character of this Conservation Areas has prominent roof forms with terracotta being the dominant material followed by slate shingles. Facades usually include verandahs and elements that step forward of the main part of the building. This often adds interest to the roof form as well as the street front of the house. Many of the late Victorian houses incorporate bay windows.

Siting

Most groups of houses in this conservation area have regular setbacks from the front and side boundaries. Deeper setbacks on one side of many allotments has allowed for side driveways and provides space between houses. The earlier houses in the Drummoyne Park Estate sometimes have deeper setbacks relating to the larger scale of the buildings and the larger sites.

Materials and Colours

The majority of housing in the Conservation Area has face brick walling with render or cement sheeting used as a contrast. Rendered walls are restricted to the large Victorian homes in this Conservation Area.

Doors and Windows

Doors and windows are usually vertically proportioned. Wider openings, when they occur, are divided vertically.

Carparking

Parking is generally at the rear of the property, in some cases taking advantage of rear street access. On steeply sloping sites some garages have been built into the retaining walls on the street front.

Fencing

A mixture of fencing is used and depends to some extent on the nature of the site and the character of the house. Masonry retaining walls of face brick or stone are used on sloping sites. Low masonry fences of either face brick or stone are common on the early twentieth century development. On larger houses this might support a higher wrought steel fence. On many late Federation and Inter-War houses, the brick piers are linked by a pipe rail.

Landscape Elements including Paving and Driveways

Terraced gardens provide a setting on steeply sloping sites where houses are located on the high point to maximise views. Hedges are often used where increased privacy is desired. Driveways are often a pair of concrete strips parallel to the side boundary of the house.

Refer to figures App1.12 and App1.13

Figure App1.12 Drummoyne Park Conservation Area

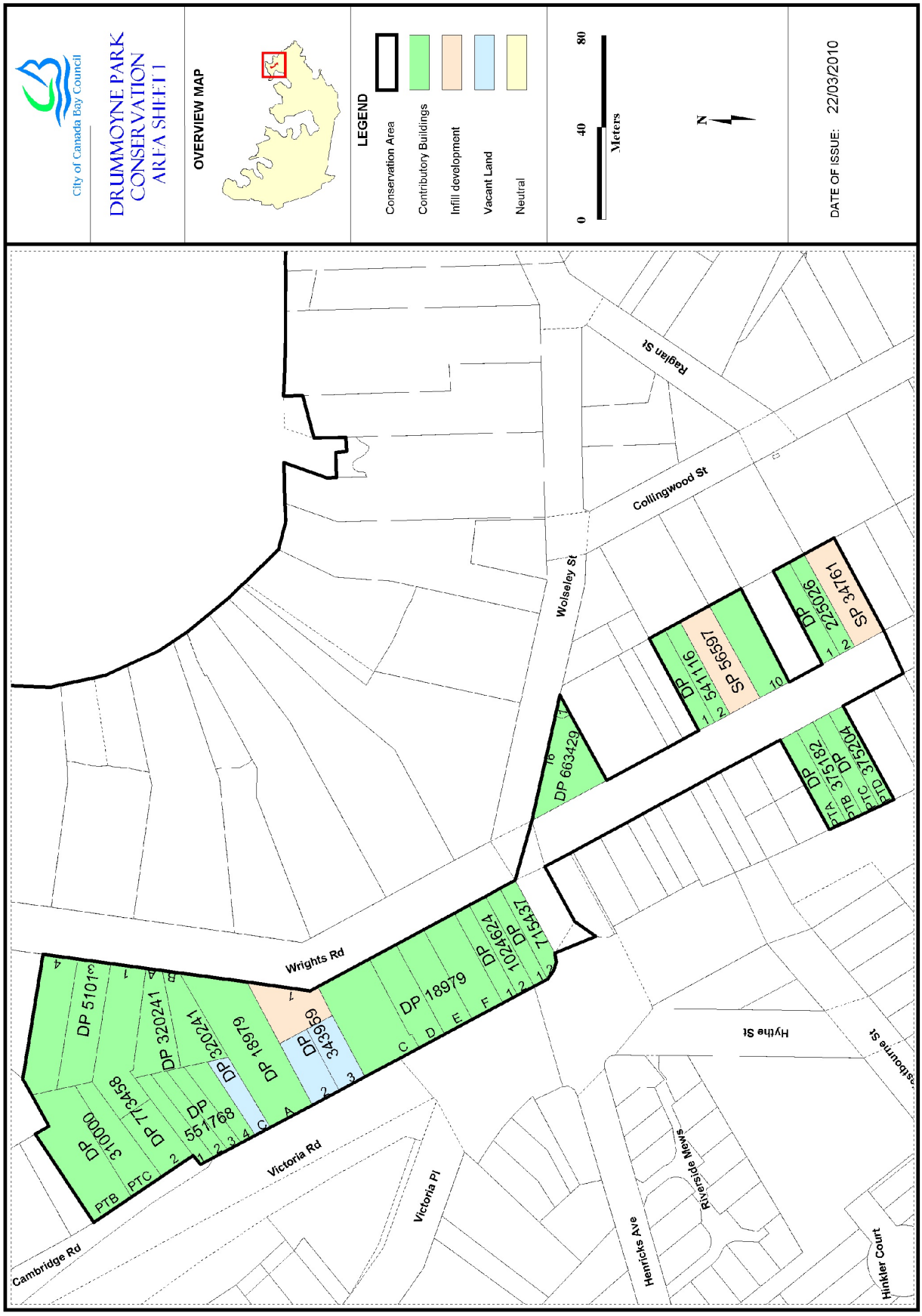


Figure App1.13 Drummoyne Park Conservation Area - Sheet 1

CA.7 Gale Street Inter-War Californian Bungalow Group

History

Mortlake township began with the establishment of the Australian Gas Light Company's works at Mortlake in 1886. Subdivision of the township took place in the following two years. The group of houses at 36-44 Gale Street were built in the 1920's and appear to have been a speculative development.

Description

The Gale Street Conservation area is a group of five Inter War Californian bungalows all designed to the same pattern with double gable to the front and an inset verandah. The houses have gardens to the front with low brick walls to the street. Most have been altered to some extent.

Statement of Significance

The Gale Street Conservation area is a good example row of five Inter-War Californian style bungalows that form an important group in the streetscape and that have historical associations with the AGL gasworks and the development of the Mortlake Township.

Analysis - Setting

The group is set on identical blocks along a tree lined street with rear lane access to garages and carports. The adjoining scale is predominantly single storey with a mix of Victorian and Federation cottages with some later infill development.

Scale

All the houses in the group are single storey with no second floor additions. There is some later two storey development close by.

Form

The group is in the classic Californian bungalow style in dark face brick with double gables, low pitched roofs and low, brick verandahs to the front.

Siting

The front setbacks are the same with a small garden to the front. The setback of adjoining houses varies.

Materials and Colours

The houses are predominantly in red face brick with terracotta tile roofs and painted timber casement windows. Some of the verandahs have been infilled and external walls rendered.

Car Parking

The rear lanes provide car access to garages and carports.

Fencing

The front fencing is not consistent, with a mix of low masonry walls, timber pickets of various styles and metal palisade fencing.

Landscape Elements including Paving and Driveways

Front gardens are dominated by lawns with perimeter shrub planting with some hedging. There are some street trees with Paperbarks predominant.

Refer to figure App1.14

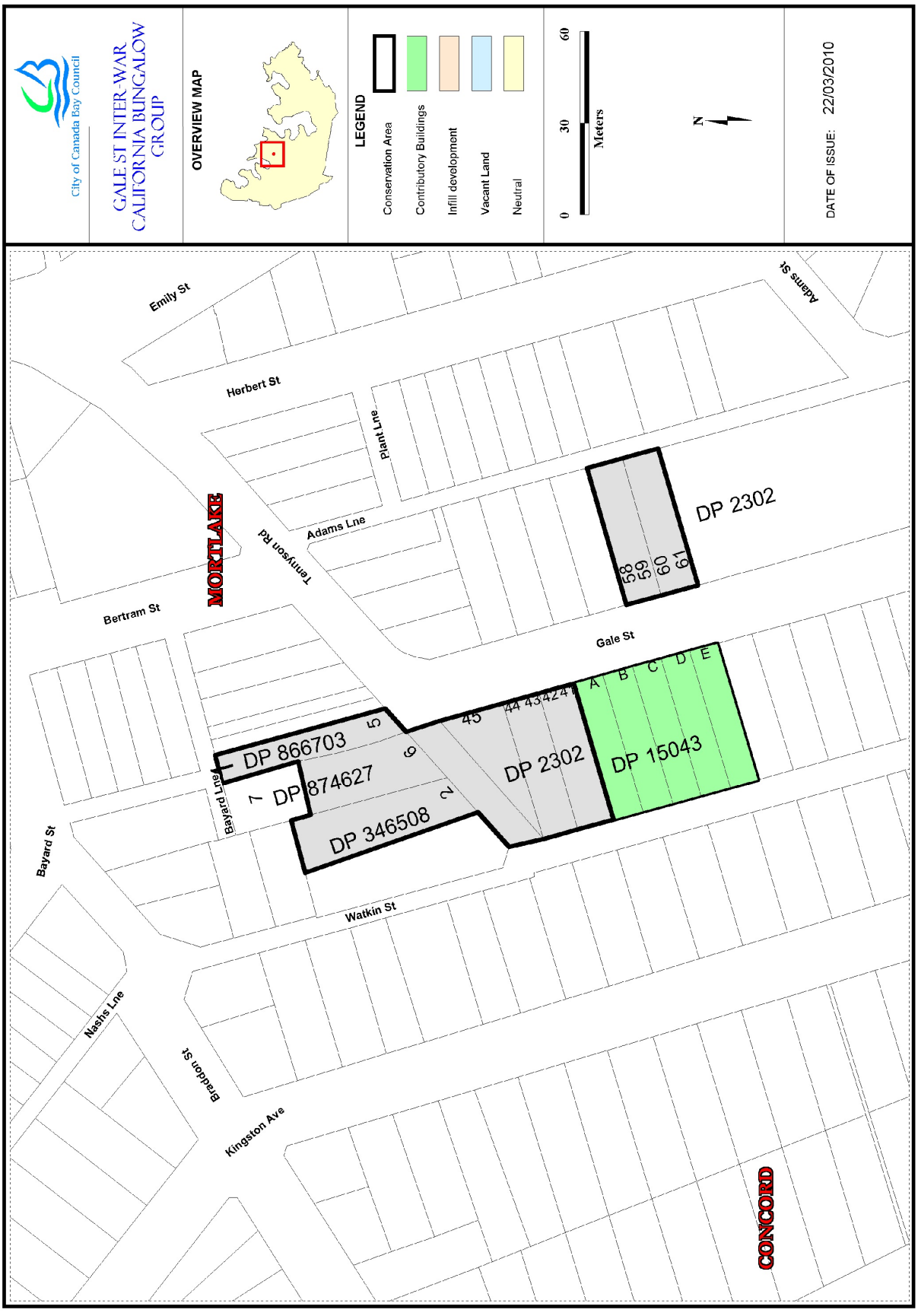


Figure App1.14 Gale Street Inter-War Californian Bungalow Group

CA.8 Gale Street Victorian Housing Group

History

Mortlake township began with the establishment of the Australian Gas Light Company's works at Mortlake in 1886. Subdivision of the township took place in the following 2 years. The houses at 37-39 Gale Street were built soon after the subdivision of the township.

Description

The Gale Street Conservation area is a group of two, single storey, Victorian cottages with symmetrical front verandahs.

Statement of Significance

The Gale Street Conservation area is a good example of two Victorian cottages that form an important group in the streetscape that have historical associations with the AGL gasworks and the subdivision of the Mortlake Township.

Analysis - Setting

The group is set on similar blocks along a tree lined street with rear lane access to garages and carports. The adjoining scale is predominantly single storey with a mix of Victorian and Federation cottages with some later infill development.

Scale

The houses are single storey with no second floor additions. There is some later two storey development close by.

Form

The group is in the Victorian cottage form style with double fronted elevations and front verandahs

Siting

The front setbacks are the same with a small garden to the front. The setback of adjoining houses varies.

Materials and Colours

The houses are in different materials. 37 Gale Street is in painted brick with high gables to the side and has a bullnosed verandah with a corrugated metal roof. 39 Gale Street is in weatherboard with a concrete tile roof.

Car Parking

The rear lane provides car access to rear garages and carports.

Fencing

The front fencing varies with a metal tube and wire fence to 39 Gale Street and no fence to 37 Gale Street.

Landscape Elements including Paving and Driveways

The small front gardens are laid to lawn with some shrub planting.

Refer to figure App1.15

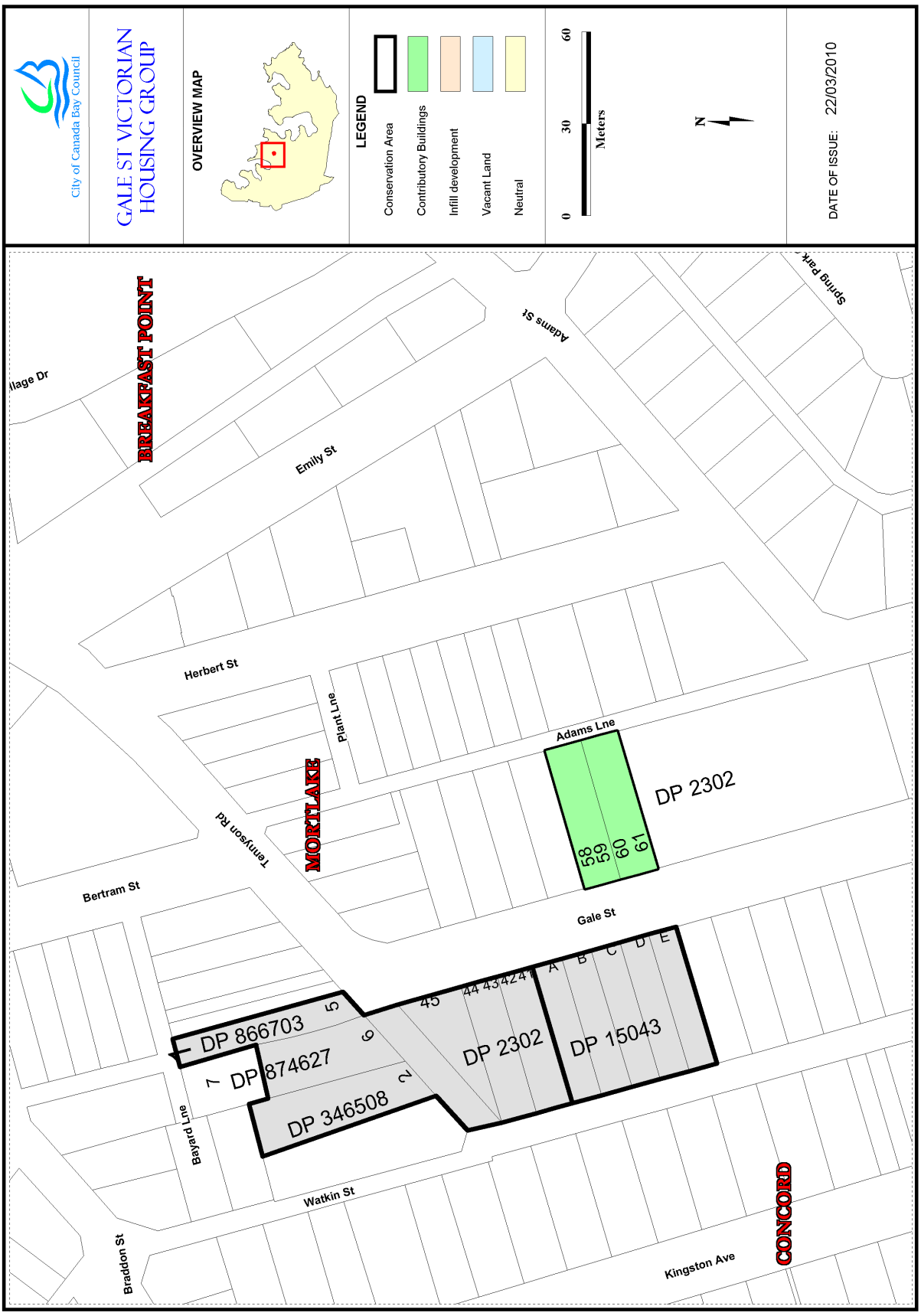


Figure App1.15 Gale Street Victorian Housing Group

CA.9 Gears Avenue Conservation Area

History

Gears Garden Estate was subdivided in 1924 creating lots generally with 50 foot frontages to Gears Avenue. The present 17-35 Gears Avenue were re-subdivided in 1926 to create allotments with 40 foot frontages. The housing in the Gears Avenue Conservation Area all appear to have been built in a short period following the subdivisions.

Description

This group of Inter-war houses is an intact group of predominantly bungalow influenced houses with one very good example of the Californian Bungalow style set high up on the rise and well above the street.

Statement of Significance

The Gears Avenue, Drummoyne Conservation Area is a very good example of housing from the Inter-War period and has survived intact with setting, fences and detailing. The vista down the hill towards the water typifies the development of Drummoyne with Lyons Road on the ridge and streets falling towards the water. The regular division of the allotments, consistency of materials and scale of the housing combines with the slope of the land to create an attractive streetscape.

Objectives

Original details of houses should be retained with fencing and garden settings to enhance the character of the street. Additions should reflect the character of the existing buildings in order to retain the streetscape and heritage value of the streetscape. Garages and carports should not be added in front of the building line.

Analysis - Setting

Housing has a consistent setback behind low street fencing and gardens. One side of each allotment has a greater setback to allow a driveway to go to the rear yard.

Scale

The housing in Gears Avenue is mainly single storey facing the street.

Form

The front of the houses are generally broken down with a verandah section and a projecting room with a gabled or hipped roof. The repetition of gables and hipped forms is an important part of the streetscape. The verandahs have low horizontal proportions with heavy masonry piers.

Siting

The houses in this group have regular setbacks from the street boundary. A deeper setback on one side boundary of most houses provides space between houses and vehicular access to the rear of the site.

Materials and Colours

Walls are generally of face brickwork with use of battened fibro on gables as a contrasting element. The roofs are typically glazed tiles.

Doors and Windows

Timber casements in pairs or groups of three or double hung windows in pairs.

Carparking

Single driveways with garages or carports located well behind the building line.

Fencing

Many original fences have survived in this conservation area. They are typically low street fences with brick piers and panels sometimes using pipe rails between piers.

Landscape Elements including Paving and Driveways

Single driveways with concrete driving strips typically run along the side boundary past the house. Gardens to these houses often include a curved path to the front door and hedge type plants behind the front fence.

Subdivision

This conservation area has a regular subdivision pattern of 40 and 50 feet frontages (12.192m and 15.25m).

Refer to figure App1.16

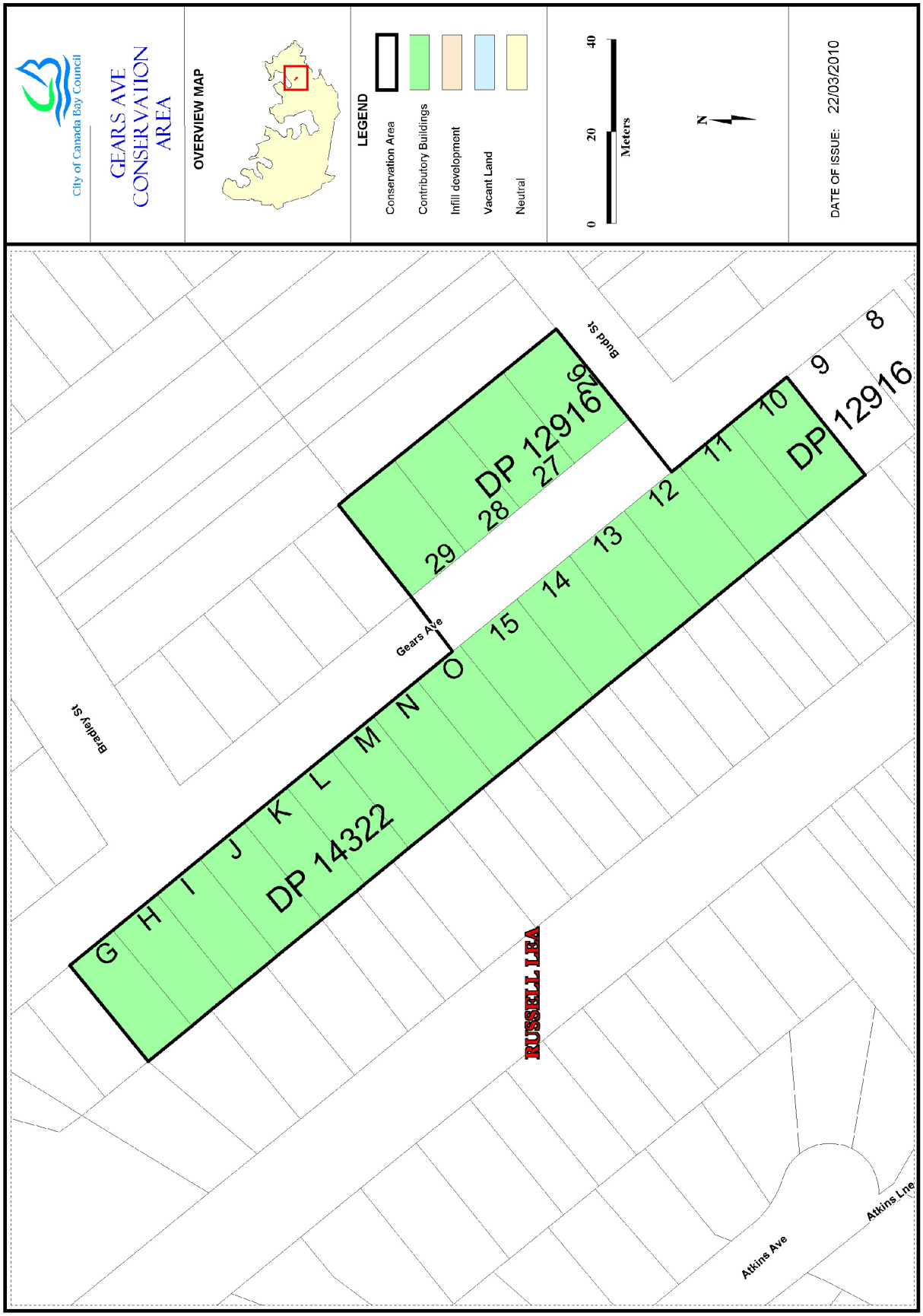


Figure App1.16 Gears Avenue Conservation Area

CA.10 Gipps Street Conservation Area

History

Of this small group of buildings, Euroka, at 9 Gipps Street, Drummoyne is the earliest, existing, with its tennis court, on the site in 1912 when the block bounded by Gipps, Therry, Miller and Market Streets was subdivided. The remaining houses in the group appear to have been built soon after the subdivision.

Description

This is a small group of very fine timber and brick dwellings that formed part of the major subdivision around Bourketown but which are now separated from the main conservation area by altered and unsympathetic development.

Statement of Significance

This group forms a fine group stepping down the slope towards the water, each sited with good views towards the city and set up from the road to maximise their setting. They form a complete block which adds to their integrity. They demonstrate the dominant form of the architectural style of Drummoyne and make a very fine contribution to the streetscape and the important views down Gipps Street to the water.

Objectives

All of the buildings in this small group should be retained in their predominant early twentieth century form. Additions should respect the character of the buildings and first floor additions should be controlled to retain the heritage value of the buildings. Garages and carports should not be constructed in front of the building line.

Analysis - Setting

The slope of Gipps Street towards Iron Cove Bay contributes to the setting of these houses. Euroka at 9 Gipps Street, as the house that preceded the subdivision, was the dominant building in the group until 2005.

Scale

The houses in this conservation area include one and two storey houses with the height relative to the size of the allotment.

Form

These are free standing houses with hipped roofs over the main rectangular block of the house. The hipped roofs are relieved in most of the houses by a projecting gabled wing facing the street. For all but one of the houses the roof forms incorporate hipped and gabled forms. Slate with terracotta tile trim is the dominant original roof material, although this has been replaced on some roofs. Glazed tiling to the roofs is not original and could in due course be replaced with more appropriate roofing materials. Verandahs are incorporated into the front elevation, usually offset by a gabled wing.

Materials and Colours

Face brickwork walls dominate, trimmed with battened fibro to the gables. Original roofs surviving in the group are slate with terracotta trim. Verandahs are framed with timber incorporating decorative fretwork and balanced by decorative timberwork to the gables.

Doors and Windows

Various forms of windows and doors are used but are not all combined in a single dwelling. The proportion of wall space to fenestrations is important, as is the vertical proportions of most of the openings.

Carparking

Carparking is set well behind the front building alignment. Driveways utilise side streets where possible, otherwise are restricted to single width.

Fencing

Original fencing is reasonably low and usually incorporates a masonry base of either face brick or sandstone. Transparent panels of either metal or timber pickets are used between piers.

Subdivision

Apart from Euroka at 9 Gipps Street that preceded the subdivision, the allotments of this Conservation Area were of regular size with 40-44 foot frontages.

Landscape Elements including Paving and Driveways

Front gardens are dominated by lawn with plantings of low shrubs.

Refer to figure App.17

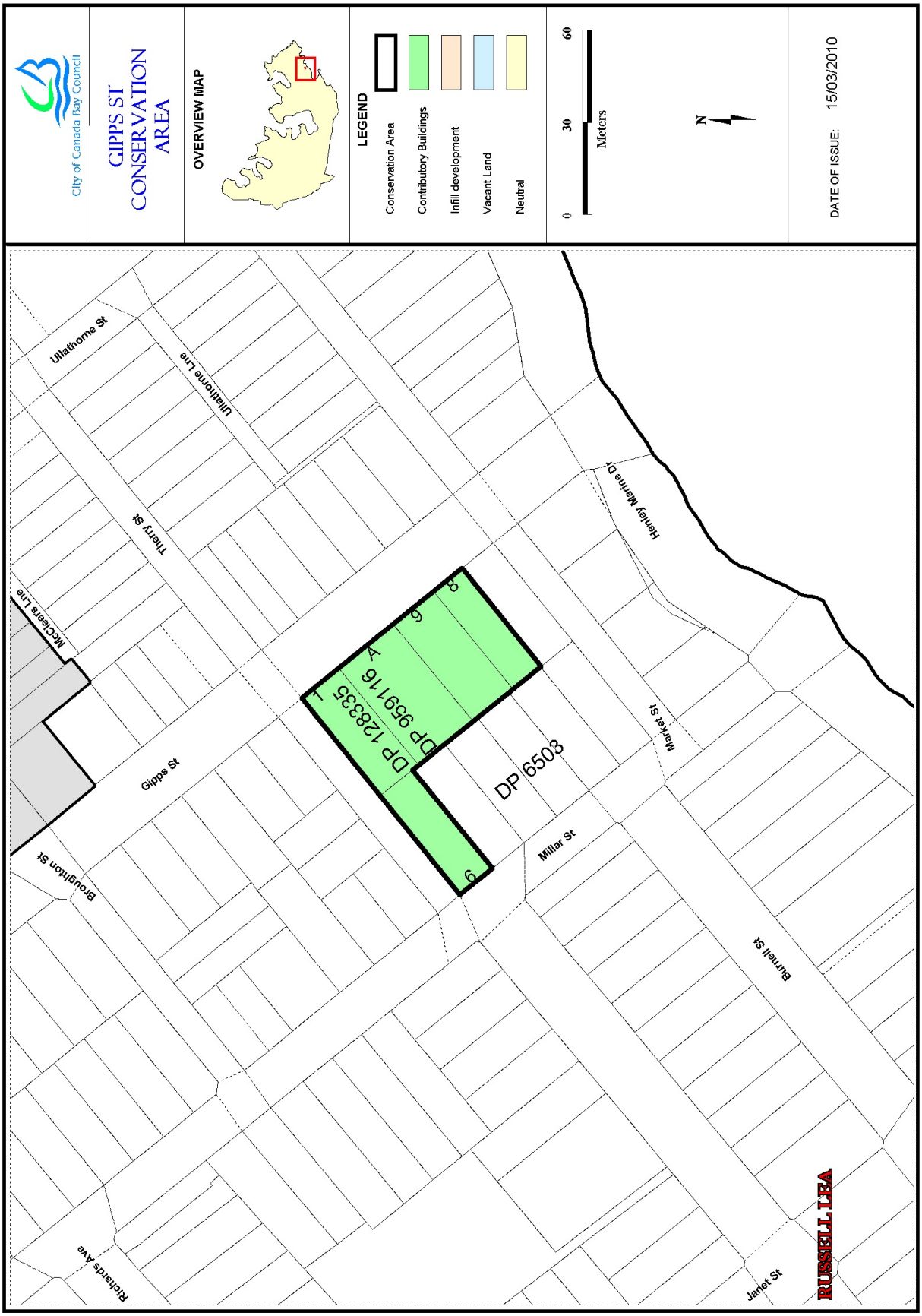


Figure App1.17 Gipps Street Conservation Area

CA.11 Hampden Road Conservation Area

History

The north and south sides of Hampden Road were subdivided in two separate subdivisions in 1915. The north side of the road was part of the Five Dock Estate subdivision and the south side was part of the Liryclea subdivision. Apart from the Victorian house Faleofa, facing Lyons Road, that preceded the 1915 subdivisions, most of the development of this conservation area followed soon after the subdivisions. Faleofa was further subdivided in 1928 prior to the construction of shops on the corner of Lyons and Hampden Roads.

Description

This is a predominantly residential group with largely intact houses from the late Federation and Inter-War periods as well as the Victorian house Feleofa and some Inter-War shops on the corner of Lyons Road.

The houses include a very fine group of c1915 houses of matching style with terracotta shingle roofs, well set back from the road in garden settings. The group represents the mix of development that took place in the Edwardian period with houses ranging from modest but well detailed semi-detached residences to more impressive two storey houses through to idiosyncratic arts and crafts cottages. The shops on Lyons Road are typical of the Inter-War period. As a substantial Victorian house, Faleofa provides a contrast to the group.

Statement of Significance

The Hampden Road, Drummoyne Conservation area is one of the rare surviving streetscapes on a main road in the municipality. Located on the main road through Drummoyne and Five Dock this group is of high visual value. The group also includes a substantial and attractive Victorian residence, Faleofa, illustrating the earlier development of the area. The commercial building on the corner of Lyons Road and Hampden Road demonstrates the importance of these roads in the local transport network.

Future Character

The Federation to Inter-war housing should be retained without demolition and in its historic form to the street with retention of facade materials and details. Additions should reflect the character of the existing buildings to retain the streetscape and the heritage value. Garages and carports should not be added in front of the building line.

Analysis - Setting

The houses in this group have reasonably deep setbacks from the street. Street trees and the slope of Hampden Road contribute to the setting of this group.

Scale

This conservation area has a consistent single storey scale to Hampden Road with the larger two storey residence Faleofa on a larger site fronting Lyons Road.

Form

The front of the houses are generally broken down with a verandah section and a projecting room with a gabled or hipped roof. Roofs include low to medium pitched hipped and gabled forms, most clad with terracotta tiles or slate. The commercial building contrasts with a solid parapeted form.

The facades typically incorporate verandahs with heavy masonry piers. Awnings are also used to provide interest in the street facades.

Siting

Houses fronting Hampden Road have regular front and side setbacks. The commercial building at the corner of Lyons Road contrasts with these and with Faleofa by having no street setback.

Materials and Colours

Dark face brickwork is almost exclusively used in this conservation area. This blends well with the terracotta and slate roofs.

Doors and Windows

Windows are usually timber casements in pairs or groups of three or double hung windows in groups.

Carparking

Single driveways with garages or carports located well behind the building line.

Fencing

Surviving original fencing is generally low brick or sandstone fencing.

Landscape Elements including Paving and Driveways

Most houses in the group have established gardens with trees and shrubs in the front garden.

Subdivision

The houses in this group fronting Hampden Road have a reasonably regular allotment size.

Refer to figure App1.18

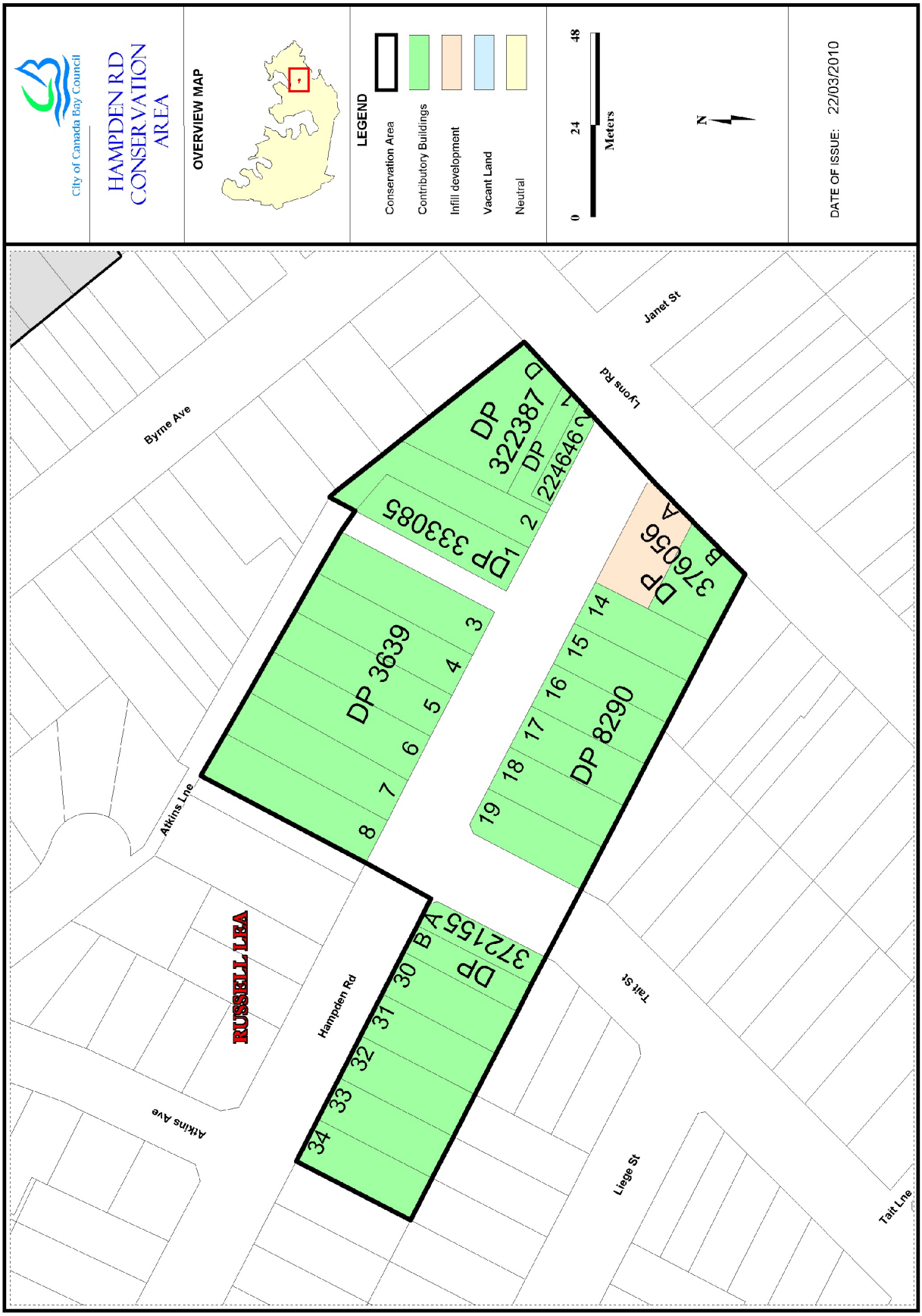


Figure App1.18 Hampden Road Conservation Area

CA.12 Lindfield Avenue Conservation Area

History

Lindfield Avenue was created by a 1928 subdivision and was originally called Ardath Avenue. The Inter-War California Bungalows that line this street were built soon after.

Description

Lindfield Avenue is a short cul-de-sac featuring facing rows of consistent Inter-War California Bungalows, set in period gardens. The buildings display a high degree of integrity, with one notable exception. The street facades of the buildings are remarkably intact, as are fences and period garden features.

Statement of Significance

The Lindfield Avenue Conservation Area is an excellent local example of an Inter-War subdivision, in an area noted for its 1920s and 1930s streetscapes. It is also considered one of the best examples in the Sydney region of a streetscape of Inter-War California Bungalows. The high consistency of design suggests development within a very short time span. The street facades of the buildings are remarkably intact, as are fences and period garden features. The subdivision consists of a street and is unusual locally for its cul-de-sac design.

Analysis - Setting

Designed as a cul-de-sac, Lindfield Avenue is an enclosed streetscape. Street plantings are mixed with some clipped hedges and more recent plantings of native plants.

Scale

Apart from one rear addition, this is a street of single storey houses.

Form

The Inter-War California Bungalow form is exclusively used in this area. It features low to medium pitched gables facing the street with a front verandah an important part of the main elevation of the house.

Siting

The houses have regular setbacks from the street. A deeper setback from one side allows vehicular access to the rear of the allotments.

Materials and Colours

Houses that have not been altered have face brick trimmed with render to lintels and battened fibro to the gables complemented by terracotta tiled roofs.

Doors and Windows

Windows are usually timber casements sashes in groups of two or three, often with horizontal sun hoods. Later houses have groups of double hung windows, sometimes in a chamfered bay. Doors are often glazed and sometimes are paired.

Carparking

Garages and carports are usually set well back from the front building alignment.

Fencing

Original fencing is usually low brick panels between brick piers. Metal rails or wrought metal panels are sometimes used between piers.

Landscape Elements including Paving and Driveways

Street trees are important in this conservation area. Front gardens are usually dominated by lawn with low plantings of shrubs to provide interest.

Refer to figure App1.19

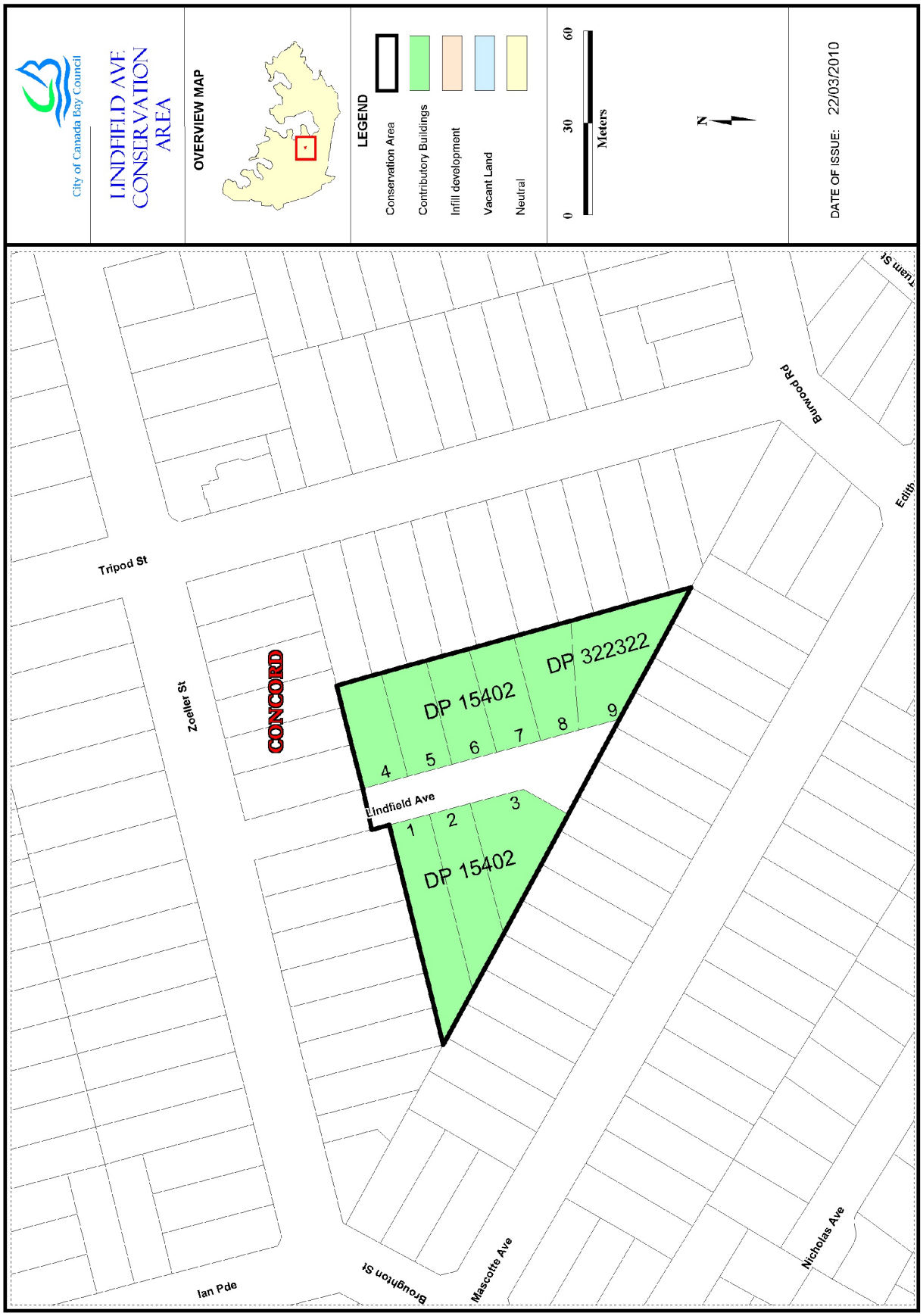


Figure App1.19 Lindfield Avenue Conservation Area

CA.13 Majors Bay Road Conservation Area

History

Commercial development in the early twentieth century tended to be in ribbons lining major transport routes. The development along Majors Bay Road followed this pattern, taking advantage of the importance of the road in connecting Queens Road to the industrial areas at Mortlake. It also relied on the importance of Wellbank Street to provide a direct link to North Strathfield Railway Station.

On the east side of Majors Bay Road between Wellbank Street and Jones Street the Terrabona Estate subdivision of 1915 appears to have provided the impetus for commercial development along Majors Bay Road. The precinct was planned as a commercial boulevard to complement the Inter-War housing boom in Concord.

Description

The commercial precinct of Majors Bay Road between 48-114 Majors Bay Road on the west side and 23-95 Majors Bay Road on the east side is dominated by Inter-War commercial development. The buildings are generally two storey with retail premises on the ground floor and offices or flats on the upper floor. Parapet walls front the street on most buildings and the floors are divided on the facades by cantilevered awnings. Some residential buildings survive on the west side of Majors Bay Road.

Statement of Significance

This commercial precinct reflects the importance of Majors Bay Road and Wellbank Street in providing connections from the main transport links of Queens Road to the south and Strathfield North Railway station to the west with the industrial area of Mortlake and with the growing residential development of Cabarita from the Inter-War period to the late twentieth century.

The Majors Bay Road commercial precinct is a good quality streetscape dominated by Inter-War commercial buildings. The consistent scale and rhythm of facades, and use of materials contributes to an attractive streetscape.

The Majors Bay Road commercial precinct provides a focal point for the local community and continues to function as a popular meeting place.

Analysis - Setting

This conservation area derives its importance from its location at the junction of two important local roads.

Scale

Two storey development is dominant with ground floor used for retailing and the upper floor for office or residential use. A few single storey shops and houses are scattered through the group.

Form

These are two storey buildings usually with no setback from the street or side boundaries creating a continuous wall to the street. The buildings are usually parapeted. Roofs are usually tiled. The buildings have engaged piers at regular intervals reflecting traditional structural spans.

Recessed verandahs were incorporated into the upper floor of many of the commercial buildings, some of these have been filled in. The lower floors of the earlier buildings in the group generally have commercial shopfronts.

The freestanding buildings in the conservation area are more residential in form with hipped and gabled roofs and usually with front verandahs.

Siting

Most buildings in this group have no setbacks from the front and side boundaries.

Materials and Colours

Masonry is used for most buildings. Face brickwork trimmed with rendered or decorative details was the most common wall treatment. Rendered panels in the parapet provide space for signs. Other buildings have rendered facades with decorative rendered details.

Doors and Windows

Windows to the upper floors are often in square or arched openings, infilling the original open verandahs. Some buildings retain the French doors opening to the upper verandahs.

Refer to figure App1.20

Figure App1.20 Majors Bay Road Conservation Area

CA.14 Marlborough and Tavistock Streets Conservation Area

History

The South Hythe subdivision of the 1870s included all the land west of Lyons Road, between the present Victoria Road and Bayswater Road. It included Tavistock, Marlborough and Westbourne Streets, establishing the general street layout that survives to the present day. Many of the initial purchases were for a number of allotments. Speculative development and subsequent subdivision in the Federation and Inter-War periods created rows of housing of similar scale, form and materials.

The housing on the southeast side of Tavistock Street and from 21 to 39 Westbourne Street appear to have been groups of speculative development built in the Federation period. Groups of semi-detached houses have since been subdivided to allow individual ownership. 43 Marlborough Street also dates from this period.

The houses at 4-8 Tavistock Street were probably built soon after a re-subdivision of land fronting the present Victoria Road in 1915. Those at 10-12 Tavistock Street along with 26-28 Marlborough Street are also part of one development comprising detached and semi-detached houses.

Description

The character of the Marlborough and Tavistock Streets Conservation Area is defined by:

- a consistent row of speculative semi-detached Federation houses in Westbourne Street,
- consistent Federation housing, both semi-detached and free standing, on the southeastern side of Tavistock Street including a very good group of speculative semi-detached Edwardian houses towards Victoria Road.
- a group of Inter-War bungalows on the northwest side of Tavistock Street between Victoria Road and Marlborough Street, extending along Marlborough Street.
- consistent Federation housing on the northeast side of Marlborough Street.

The housing in the Conservation Area is predominantly of c.1910 to 1930 construction. It has a consistent character dominated by single storey housing of dark face brick, terracotta and slate roofing, hipped and gabled roof forms and front verandahs.

Statement of Significance

The Marlborough and Tavistock Streets, Drummoyne Conservation Area is of significance for its largely intact early twentieth century residential development. The group has an overall homogeneity due to consistent use of materials, scale, setbacks and forms. Groups of speculative development also contribute to the regular rhythms in the streetscape.

Objectives

To retain the high level of integrity and homogenous character of the group.

To ensure new development does not detract from established rhythms in the streetscape created by the group.

Analysis - Setting

Groups of houses within each block have regular setbacks. The setbacks of the groups of semi-detached houses are usually less than for the free standing houses.

Plantings of street trees as well as trees in front gardens adds to the amenity of this conservation area.

Scale

This conservation area has a dominant single storey scale facing the street.

Form

The groups of houses within this conservation area have regular form and massing. Front verandahs are an important element of the front of the houses. Gabled elements are used in most of the roofs as either a complement to the main hipped roof or as the main roof form facing the street.

Materials and Colours

Terracotta and/or slate are the dominant materials for roofs and are complemented by face brick walls with some rendered and/or battened fibro sheet for contrast. Verandahs have face brick piers and balustrades with timber posts. Driveways are formed with concrete strips.

Doors and Windows

Casement windows are common with some use of double hung sashes. French doors are also used to provide access to verandahs. Front doors usually have toplights and, where space permits, might have sidelights.

Carparking

Some freestanding houses have space for parking at the rear of the allotment. Many of the semi-detached houses have no space for on-site parking that does not intrude on the front garden.

Fencing

Original fencing is usually low allowing good views from the footpath to the houses. Fencing often incorporates masonry elements including sandstone and low face brick walls, often with pipe rails. More recent fencing has a variety of picket fencing.

Landscape Elements including Paving and Driveways

Street trees are important to the character of this area and are reinforced with mature trees in front gardens. Front gardens should incorporate low shrubs and lawn areas.

Refer to figure App1.21

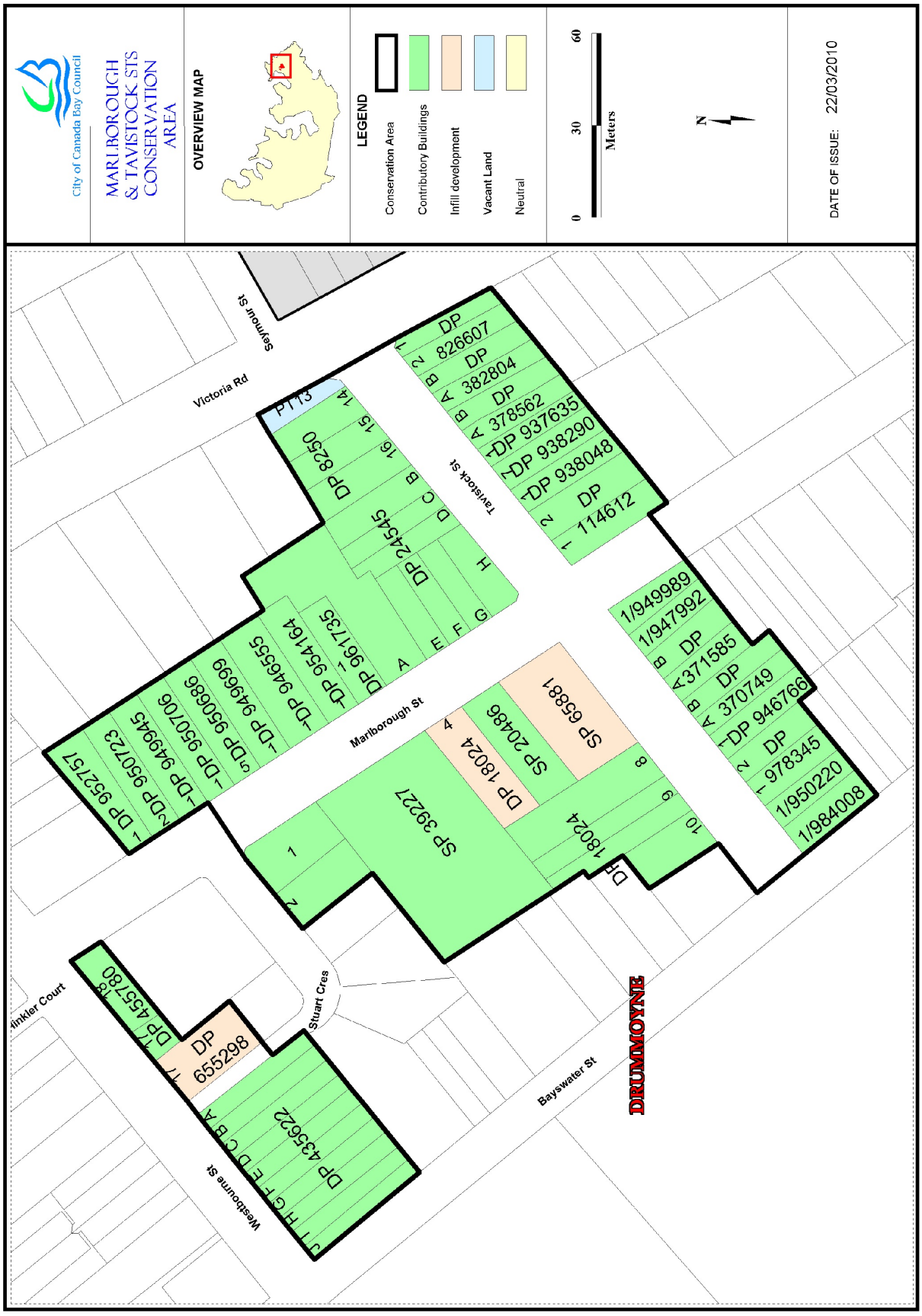


Figure App1.21 Marlborough and Tavistock Streets Conservation Area

CA.15 Mons Street and Boronia Avenue Conservation Area

History

This conservation area comprised two subdivisions; the Sunlight Estate subdivision of 1926 creating Mons Road and the Boronia Avenue subdivision of 1927.

Description

The Mons Street and Boronia Avenue Conservation Area is dominated by Inter-War California Bungalow style housing creating a regular rhythm of gables in the streetscape. Street plantings of box hedge in Mons Street have been pruned ensuring the houses have a close relationship to the street.

Statement of Significance

The Mons St and Boronia Avenue Conservation Area contains a very intact group of Inter-war houses representing the major sub-division of the Municipality that took place during this period. The group is one of a small number of excellent groups in the Five Dock/ Russell Lea area that demonstrate the pattern of sub-division of the Municipality and which contain a very fine representative group of houses from one period, mostly with intact settings and detailing. Most houses in the area have not been substantially altered.

Objectives

The high level of integrity of this group is a key feature, which should be retained. With only one or two significant alterations to significant properties there should be no demolition of existing early housing, controls on first floor additions to retain the character of housing and retention of façade details such as windows and wall treatments. Garages and carports should not be added in front of the building line.

Analysis - Setting

The houses in this conservation area have regular setbacks from front boundaries. Side setbacks are wider on one side to allow vehicular access.

Street trees are restricted to clipped box hedges.

Scale

The housing in this conservation area was originally single storey development, consistent with the low horizontal character of the Inter-War California Bungalow style.

Form

The Inter-War California Bungalow style that dominates this Conservation Area has strong low-medium pitched gabled roof forms facing the street. Verandahs are incorporated into the front elevations and emphasise the low horizontal lines of the houses.

Materials and Colours

Face brick walls trimmed with rendered lintels and battened fibro gables. Original roofs are of terracotta tiles.

Doors and Windows

Windows facing the street are grouped sets of casement sashes, often with horizontal sunhoods. Front doors are simple glazed doors, sometimes in pairs.

Carparking

Carparking is provided well behind the building line of most houses.

Fencing

Original surviving fencing is low face brick fencing of piers and panels. The low brick panels usually had a metal pipe or panel above.

Landscape Elements including Paving and Driveways

Single driveways to the side of the house. Front gardens are dominated by lawns with low shrubs providing interest. Street plantings are restricted to clipped hedges.

Refer to figure App1.22

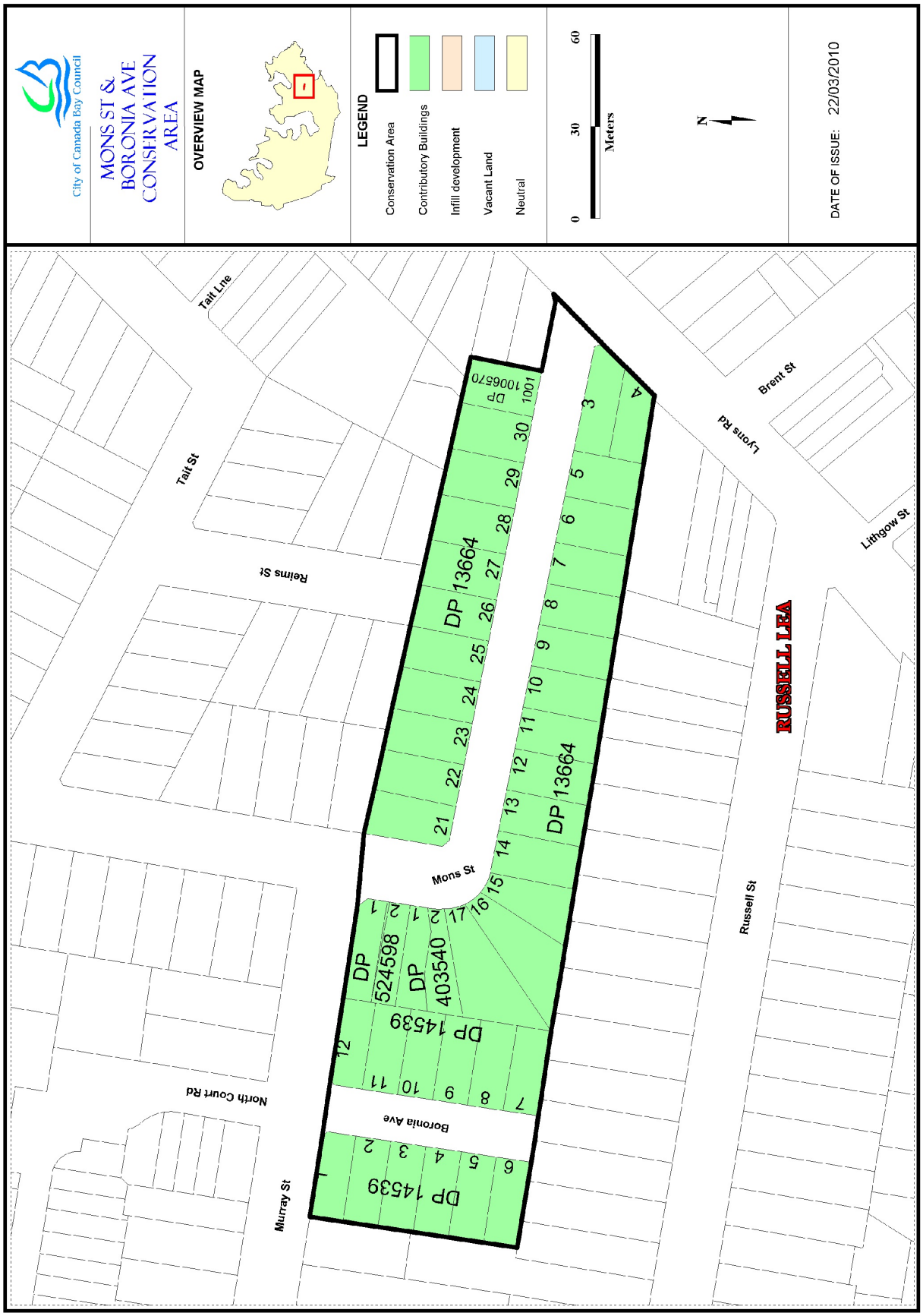


Figure App1.22 Mons Street and Boronia Avenue Conservation Area

CA.16 Moore Street Conservation Area

History

The Lyonsville subdivision of the 1880s created Moore Street and Short Street. Development of small cottages followed through to the Inter-War period.

Description

The Moore Street Conservation area encompasses a range of building styles and periods of construction, typifying the pattern of development of the central areas of Drummoyne. The earlier development relates to waterfront activity and extends from late nineteenth century through to the Inter-War period with several fine bungalow influenced cottages and semi-detached buildings. The street also contains a very good range of timber buildings from the first decade of the twentieth century or possibly earlier. On the corner of Short Street is a two storey store and commercial building that provides a focal point in the streetscape.

Statement of Significance

The Moore Street Conservation Area includes a variety of houses that, while modest, display fine detailing and varied forms that are not generally seen in Drummoyne. Buildings of particular interest in this conservation area are the large timber house at no 40, the two storey corner store and residence, one of three very good examples in the municipality, the fine timber houses, and several very modest timber and fibro cottages. Together, these buildings represent the early development of the street and its lower status than the south side of Lyons Rd.

Analysis - Setting

Moore Street has a gradual slope down from Lyons Road. Groups of cottages have fairly regular setbacks from the street. The two storey shop at the corner of Short Street provides contrast with no setback from the street frontages. Street trees also contribute to the amenity of the street.

Scale

Single storey scale is dominant in this conservation area.

Form

Most houses have simple rectangular forms with hipped roof forms relieved by gabled elements. Verandahs provide depth to the front elevations of the houses.

Materials and Colours

Weatherboard and face brick are the common wall materials in this group. Roofs were originally either corrugated steel or terracotta tiles.

Doors and Windows

Windows are usually in vertically proportioned openings. Double hung windows are most common with sets of casement windows used in some later houses. Front doorcases usually incorporate toplights and, on larger houses, sidelights.

Carparking

Where space allows, car parking has been set behind the building line. Few carports and garages have been located in front of the main building line in this conservation area.

Fencing

Original surviving fencing includes low masonry fencing of either sandstone or face brick. Some reproduction picket fencing has been introduced.

Landscaping Elements including Paving and Driveways

Front gardens are usually dominated by lawn with low plantings of shrubs to provide interest.

Refer to figure App1.23

Figure App1.23 Moore Street Conservation Area

CA.17 Mortlake Workers' Housing Group

History

Mortlake township began with the establishment of the Australian Gas Light Company's works at Mortlake in 1886. Subdivision of the township took place in the following 2 years. The houses at 46-50 Gale Street were built soon after the subdivision of the township closely followed by the houses at 4-8 Tennyson Road.

Description

A group of single storey houses from the late Victorian and Federation periods.

Statement of Significance

The Tennyson Road conservation area is an interesting group of workers' housing from the late Victorian and Federation period directly relating to the development of the AGL gasworks and the establishment of the Mortlake township. The group makes an important contribution to the streetscape and forms a precinct of great charm and character.

Analysis - Setting

The group is set on various size blocks at the corner of the two streets with rear lane access to garages and carports. The adjoining scale is predominantly single storey with a mix of Victorian and Federation cottages with some later infill development.

Scale

The houses are single storey with no second floor additions. There is some later, two storey development close by.

Form

The group is in the Victorian and Federation cottage form style with double fronted elevations and front verandahs or gables.

Siting

The front setbacks vary due to the angled nature of the lots with small gardens to the front.

Materials and Colours

The houses are in a variety of materials with timber weatherboards, rendered masonry and stone. Roofs are in tile and corrugated metal. 8 Tennyson Street is unusual in being in timber with the boards cut to appear as stone. 48 Gale Street is in sandstone with an Italianate style verandah with decorative lacework.

Car parking

The rear lanes provide car access to rear garages and carports.

Fencing

The front fencing varies with masonry walls, picket and timber fences or with the garden open to the footpath.

Landscape Elements including Paving and Driveways

Small front gardens generally laid to lawn with some shrub planting

Refer to figure App1.24

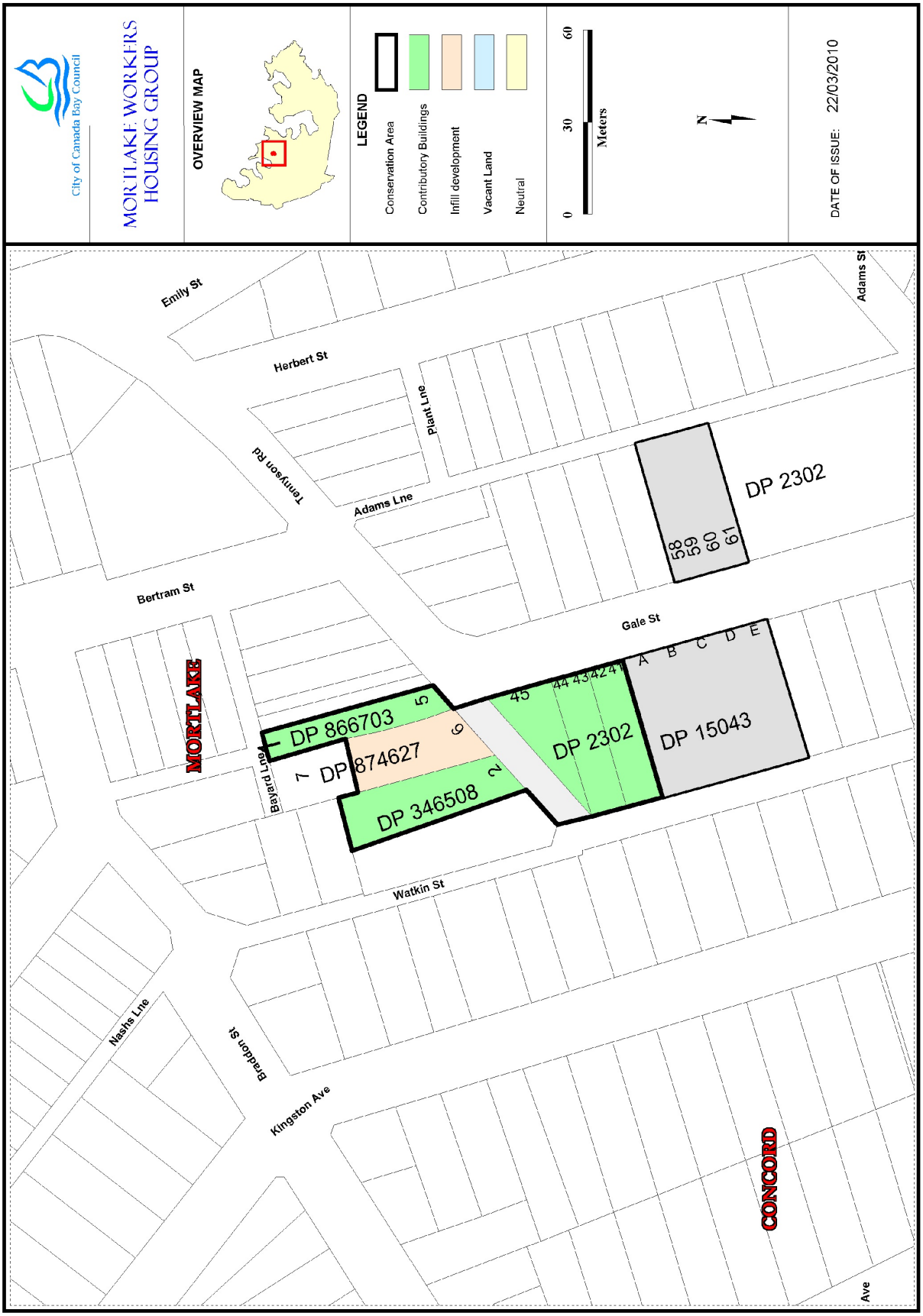


Figure App1.24 Mortlake Workers' Housing Group

CA.18 Park Avenue Conservation Area

History

Longbottom Stockade was established in the eighteenth century as an overnight detention centre for convicts on their journey between Sydney and Parramatta. From 1840 to 1842 it was used to house 58 French speaking Canadian rebels. A ramshackle settlement gradually grew around the stockade that was gradually falling into disrepair. In 1843 the Village of Longbottom was laid out to formalise the settlement and included the south side of the present Park Avenue. The large allotments from this settlement generally survive on the south side of Park Avenue, although the west end was re-subdivided in 1927.

Description

A grouping of early homes on large allotments, generally well set back from the street. The group includes a number of Victorian villas, all enjoying an outlook over the park opposite.

Statement of Significance

Park Avenue, Concord is a notable group of heritage homes on large allotments, enjoying an outlook over public parkland. It includes a number of outstanding Victorian villas with large front gardens, rare for Concord. The large lots and deep setbacks are unique in the Council area. The group has considerable aesthetic and historical significance.

Analysis - Setting

Goddard Park on the north side of Park Avenue provides a setting for this conservation area. Street plantings and large front gardens reinforce the amenity provided by the park.

Scale

Park Avenue includes larger one and two storey houses, usually on large allotments.

Form

The houses in this conservation area have a variety of forms. Most of the original houses in the group were built with generous verandahs on the front of the house taking advantage of the northerly aspect and view of Goddard Park.

Siting

Most of the contributory houses in this group have generous setbacks from the front boundaries.

Materials and Colours

Masonry is the dominant wall material with render used on some of the earlier homes. Roofs are either slate or tiled.

Doors and Windows

Vertically proportioned double hung windows are most common in this conservation area. Front doorcases incorporate toplights and sidelights. French doors are also used with verandahs.

Carparking

Garages and carports have usually been set behind the front building line of contributory houses.

Fencing

Only one original fence survives in this group, an iron palisade fence with sandstone gateposts at 2 Park Avenue.

Landscape Elements including Paving and Driveways

Street trees add to the amenity of the area. Gardens are usually generous and incorporate lawns with mature trees and shrubs.

Refer to figure App1.25

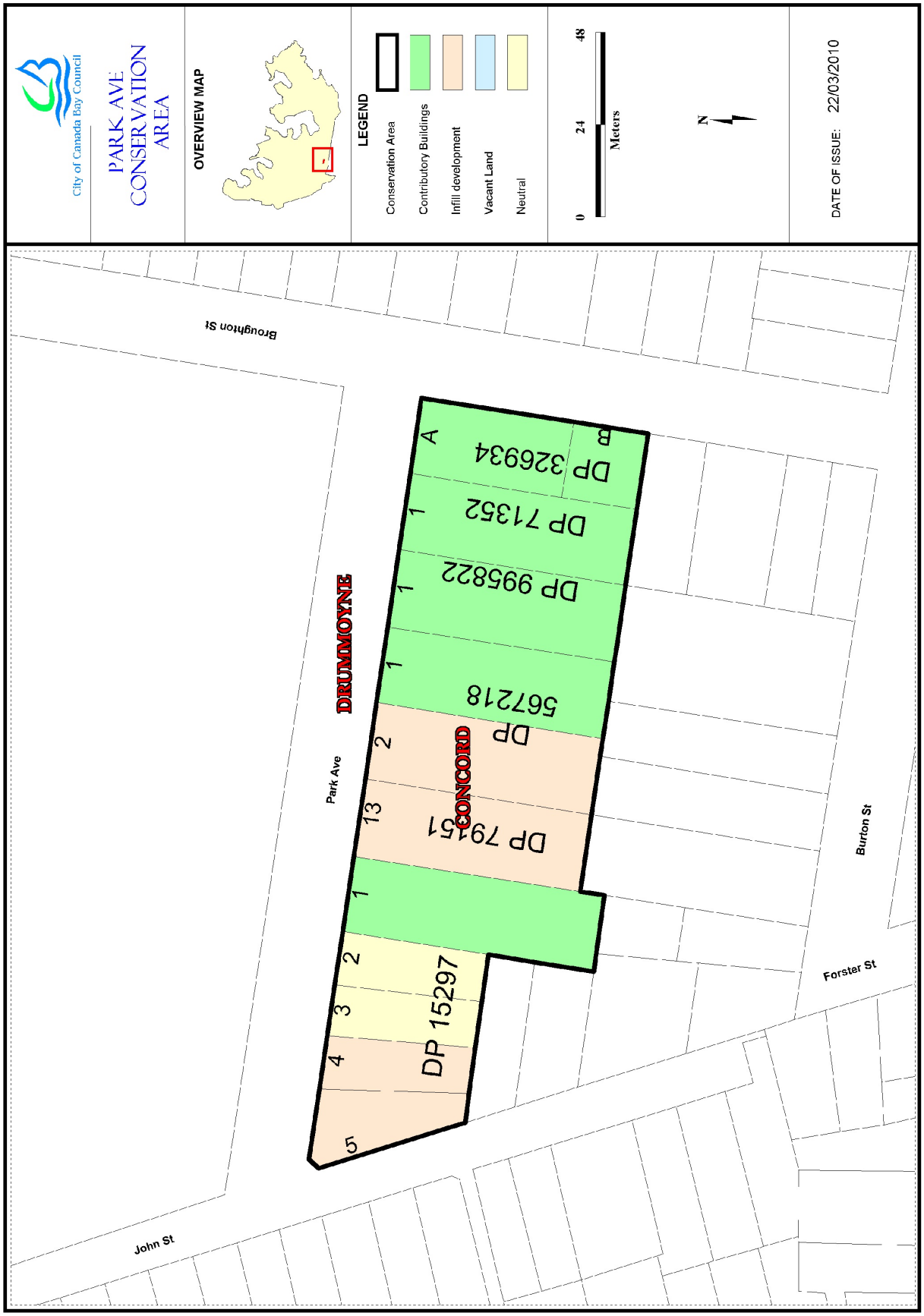


Figure App1.25 Park Avenue Conservation Area

CA.19 Parklands Estate Conservation Area

History

Parklands Estate, between Lyons Road and Barnstaple Road, was subdivided in 1927 creating Bennett Avenue and a cul-de-sac, Mitchell Street. This small group of houses were developed between 1927 and the late 1930s.

Description

The buildings stylistically are predominantly derivatives of Californian Bungalows with several later houses from the immediate post World War Two period at the end of the cul-de-sac which add to the group. All are fine if modest examples of the style and reflect the pattern of further sub-division that took place as larger estates were gradually broken up.

Statement of Significance

Developed in a short period from 1927, Parklands Estate has high heritage value locally as an intact group within an intact streetscape setting reflecting an excellent range of Inter-war housing types. The group is complemented by street planting, fencing and gardens.

Future Character

The high level of integrity of this group is a key feature which should be retained. With only one or two significant alterations to significant properties there should be no demolition of existing Inter-war housing, controls on first floor additions to retain the character of housing and retention of facade details such as windows and wall treatments. The important street planting should be retained. Garages and carports should not be added in front of the building line.

Analysis - Setting

The Parklands Estate has a relatively enclosed streetscape dominated by mature street trees.

Scale

Single storey scale is dominant, consistent with the low horizontal emphasis of the Inter-war housing styles in this estate.

Form

The houses in the Parklands Estate usually have multiple gables and include a deep verandah to offset a projecting room on one side of the street front.

Low-medium pitched roofs of terracotta tiles with multiple gables provide rhythm to the streetscape. Houses in the group from the later part of the Inter-war period have simple hipped roofs with glazed tiles.

Siting

Development in the Parklands Estate has a regular street setback. Side setbacks include a wider setback on one side to allow for vehicular access.

Doors and Windows

Windows are usually arranged in groups with bungalows having sets of casement windows. Later houses in the Parklands Estate have grouped double hung sash windows.

Materials and Colours

Terracotta roof tiles and dark face brick walls with light coloured rendered trim are typical of this streetscape. Windows are generally timber framed.

Carparking

Garages are usually located well behind the building line so that they are not visible in the streetscape.

Fencing

Many houses have reproduction picket fencing which, while not authentic to the Inter-war character of the houses, provides cohesion to the streetscape.

Landscape Elements including Paving and Driveways

Front gardens incorporate large areas of lawn with some planting of shrubs. Driveways are single width usually located to the side of the allotments.

Subdivision

The regularity of the original subdivision is important in establishing the rhythm of the streetscape.

Refer to figure App1.26

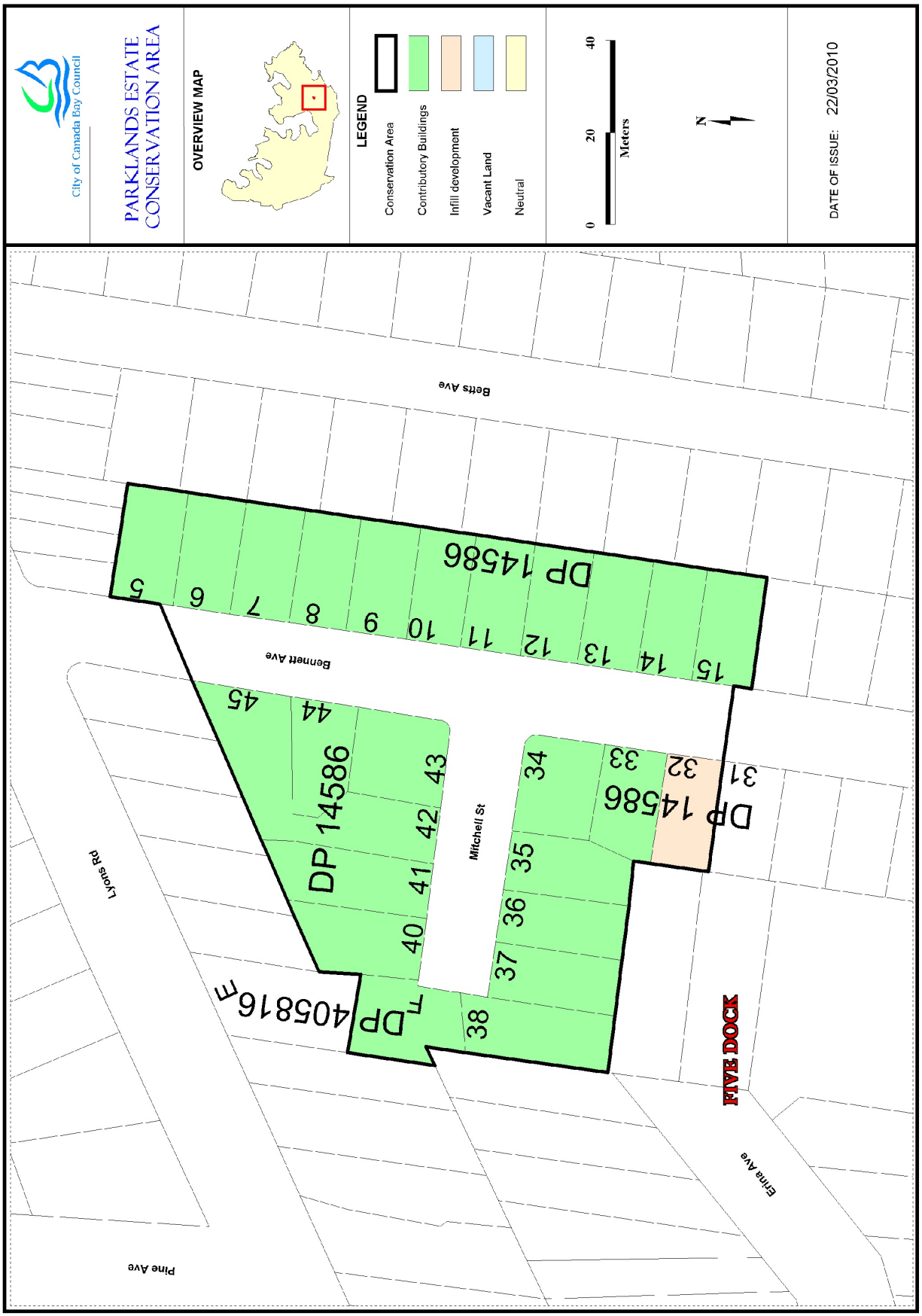


Figure App1.26 Parklands Estate Conservation Area

CA.20 Powell's Estate Conservation Area

History

Powell's Estate was subdivided in 1886 and included housing allotments with regular frontages. The allotments were wider further away from Parramatta Road. Rear lanes were incorporated into the subdivision, originally providing access for night soil collection. Due to the narrow allotment width (20 feet), many houses were built on double allotments. The main period of development of the estate continued through the late Victorian and Federation period. Much of this housing has survived through to the twenty-first century, except where removed to make way for the development of the M4.

Description

Powell's Estate is an area of late Victorian housing interspersed with Federation and Inter-War period housing on small allotments. The development includes a mixture of large individual homes and semi-detached housing. Street plantings add to the amenity of the area.

Statement of Significance

The Powell's Estate Conservation Area is a rare local example of Victorian period development. A number of the original Victorian homes survive, including some fine villas. The area retains considerable historical significance.

Analysis - Setting

The Powell's Estate has regular sized allotments on a rectilinear street layout. Street trees provide amenity to the area. Lanes now allow vehicular access to the rear of the allotments.

Scale

Single storey housing is dominant. A few one and a half and two storey houses are located on double allotments. A notable one and a half storey group faces Concord Road.

Form

The houses in this conservation area include free standing and semi-detached forms. Most have a simple rectilinear footprint to the main front wing and incorporate a verandah in the street elevation. Roofs are usually hipped, sometimes incorporating a gable as a feature.

Siting

Front setbacks are reasonably uniform along each street. Some larger houses have greater setbacks. Side setbacks are small, possibly as a result of the small allotments.

Materials and Colours

Rendered masonry is used for most of the Victorian houses and is complemented by slate roofs (where the original roofing survives). Later houses are face brick with tiled roofs. There are a small number of weatherboard houses with corrugated steel roofs.

Doors and Windows

Windows are vertically proportioned usually with timber double hung sashes. Some of the Victorian houses incorporate bay window elements. A few later homes have sets of timber casement sashes. Front doors usually incorporate a toplight and, in larger homes, sidelights.

Carparking

The rear lanes provide access for parking at the rear of the properties.

Fencing

Few original fences survive. Iron palisades might be expected for some of the larger Victorian houses. Smaller cottages could be expected to have timber picket fences. Later houses appear to have used brick fencing with low brick panels between brick piers.

Landscape Elements including Paving and Driveways

Front gardens are dominated by lawns with plantings of low shrubs.

Refer to figure App1.27

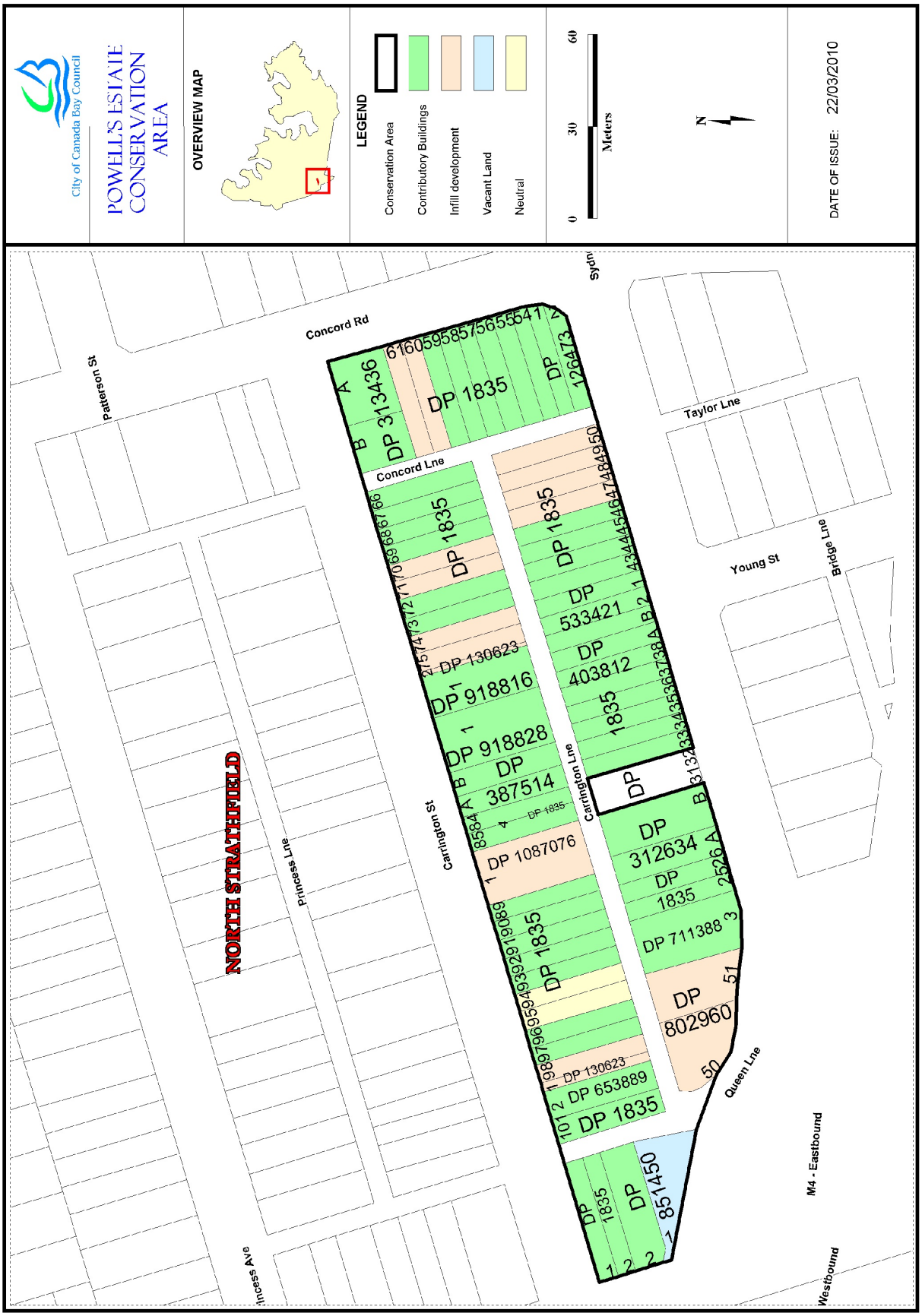


Figure App1.27 Powell's Estate Conservation Area

CA.21 Sailsbury Street Housing Group

History

This group of houses is located on the 1886 Beaconsfield Square subdivision. They include cottages built soon after the subdivision through to the Inter-War period.

Description

This is a group of single storey verandahed cottages from the 1880s to the Inter-War period. The narrow setback from the street and the consistent scale and simple forms of these houses creates a cohesive streetscape.

Statement of Significance

This is a cohesive streetscape of cottages built soon after the 1886 Beaconsfield Square subdivision. They include cottages built soon after the subdivision through to the Inter-War period.

Analysis - Setting

The group is set on similar blocks with narrow setbacks from the street. The group contrasts with the open space and larger scale building of the public school on the opposite side of the street.

Scale

The houses are originally single storey, with one now having a first floor addition. This is consistent with the narrow width of the street

Form

The group have a range of cottage forms. All are based on simple rectangular cottages with hipped roofs and a front verandah. The later examples have a gabled element on the front elevation to provide interest.

Siting

The front setbacks are quite narrow. Some have a wider setback on one side to allow vehicular access.

Materials and Colours

The houses are in different materials. Traditional materials of weatherboard or face brick is used for walls and, originally, corrugated steel or terracotta tiles for the roof.

Car parking

Some of the cottages have sufficient side setbacks to provide access for rear garages. The narrow street setbacks limit parking in front of the houses.

Fencing

No original fencing survives. Fencing is low to medium height.

Landscape Elements including Paving and Driveways

The small front gardens are laid to lawn with some shrub planting.

Refer to figure App1.28

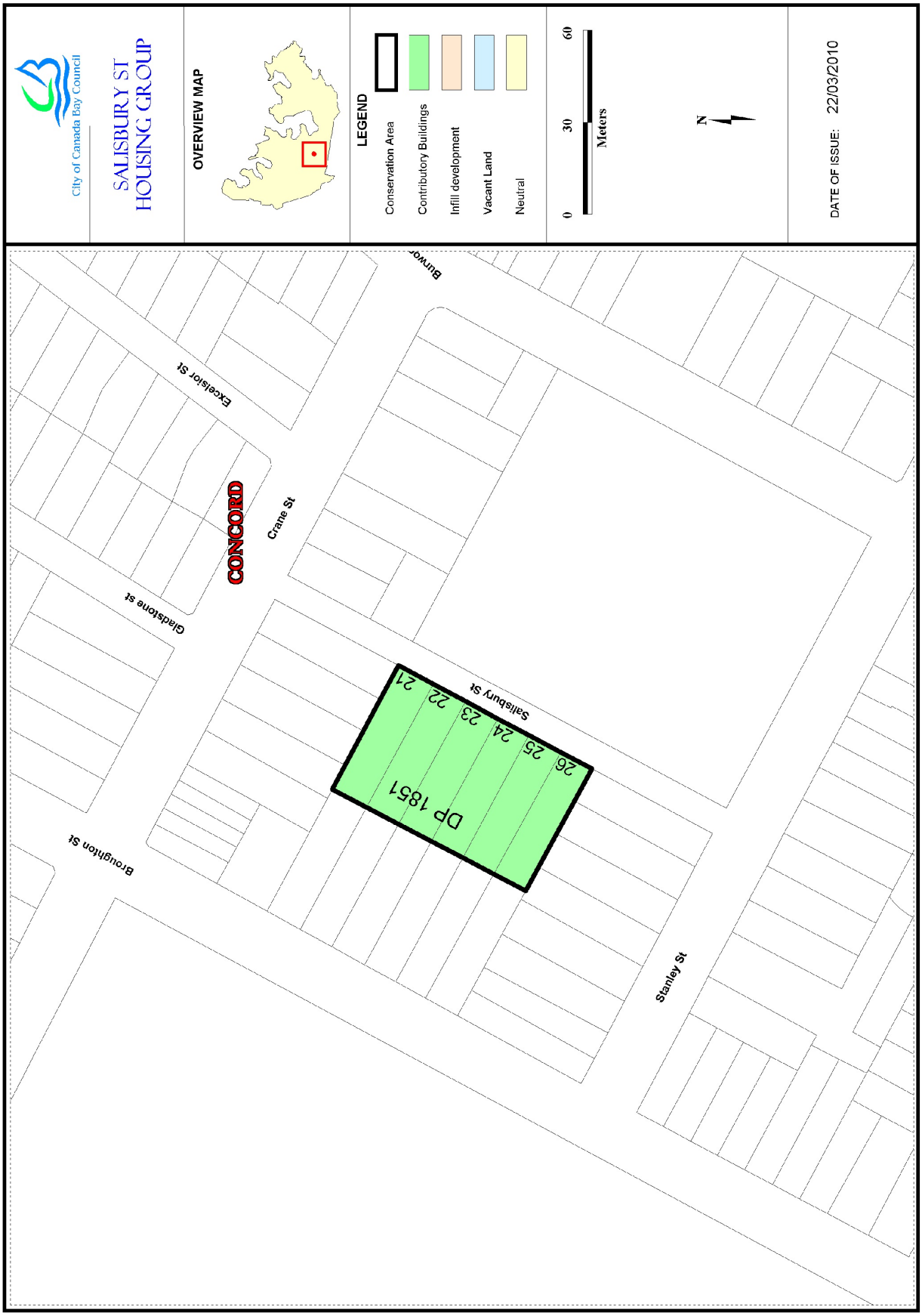


Figure App1.28 Salisbury Street Housing Group

CA.22 Thompson Street Conservation Area

History

This terrace of seven houses was built on the 1904 subdivision of the Cometrowe Estate. The terrace remained under one title until 1958 when it was subdivided into individual allotments for each house.

Description

This small group comprises a row of single level terrace style housing with narrow frontages and matching facades. They have a strong Federation Queen Anne character.

Statement of Significance

The terrace of seven houses in Thompson Street is a very rare building form in Drummoyne. This is the only significant terrace in the Canada Bay Council area and is a strong form in the Thompson Street streetscape and illustrates one of the major stages of Drummoyne's development.

Objectives

The integrity of this row is to be retained without any alterations to the street elevations. No further painting of face brick walls should take place and timber joinery details should be retained.

Analysis - Setting

This terrace has a narrow setback from the street. The slope of Thompson Street away from Lyons Road adds interest to the group.

Scale

This is a single storey group.

Form

The houses have a repetitive pattern of verandahs and gabled fronts in front of a main roof slope.

The terracotta tiled roof is a regular gabled form parallel to the street with individual houses separated by parapet walls. Transverse gables are used on the projecting bays.

Siting

This terrace has a small setback from Thompson Street.

Materials and Colours

The face brick walls of this group have been painted. The roof is of terracotta tiles with crenellated ridging and rams horn finials.

Windows

Double hung windows are used in the projecting gabled fronts.

Carparking

No off-street car parking is provided with these houses.

Fencing

The street boundaries are marked by consistent low reproduction picket fencing.

Landscape Elements including Paving and Driveways

The houses have small front gardens sometimes incorporating shrubs and hedges. Paving is restricted to pedestrian paths.

Subdivision

The subdivision pattern of this group related directly to the individual houses.

Refer to figure App1.29

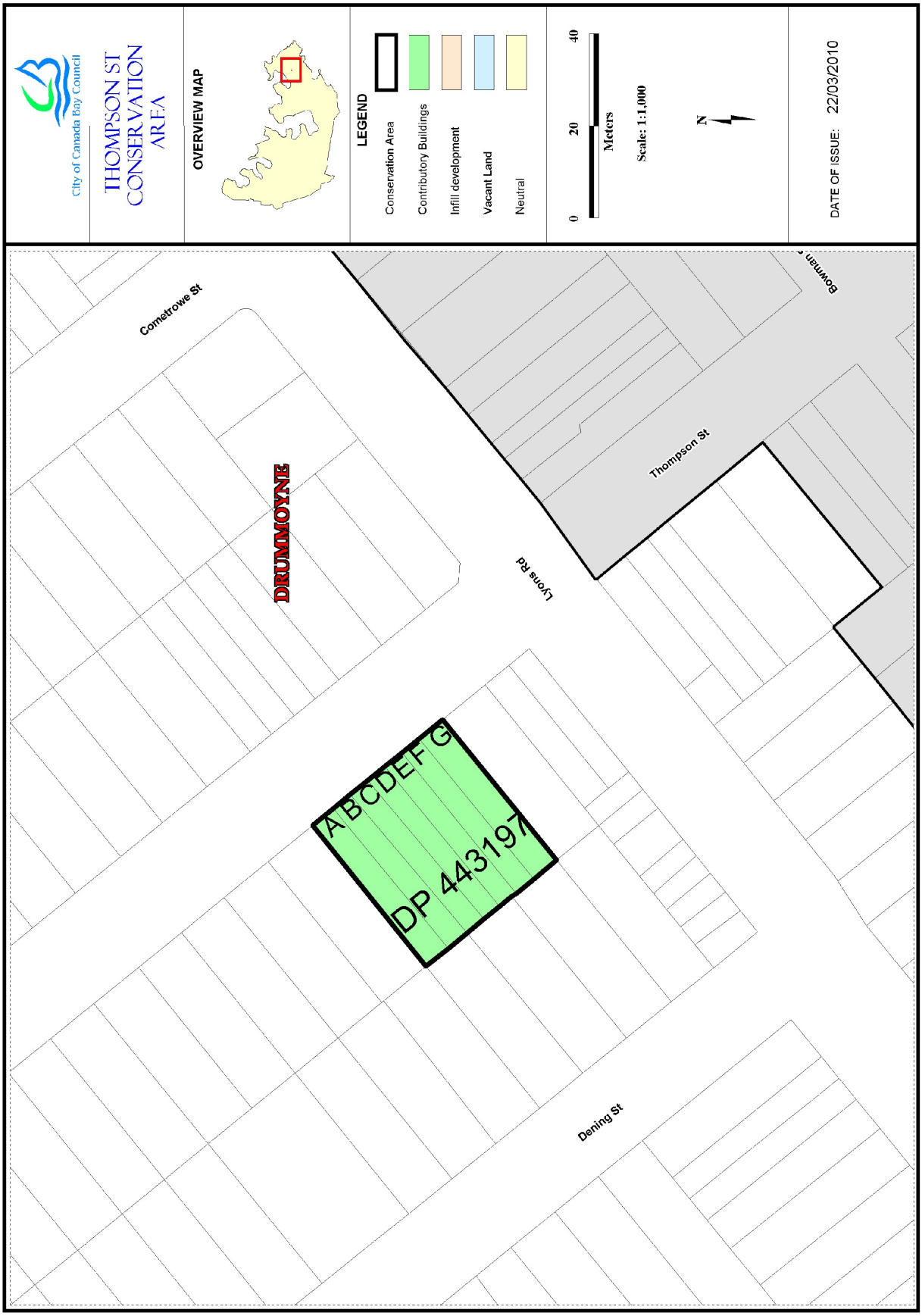


Figure App1.29 Thompson Street Conservation Area

CA.23 Victoria Road Retail Conservation Area

History

Victoria Road can be clearly seen with its two phases of development; the earlier eastern side from the early years of the twentieth century and the western side which is predominantly post World War II development except where buildings were set well back from the street alignment. The eastern side of Victoria Road is of particular interest as it has survived the numerous road widenings that have removed much of the building stock on the opposite side of the road.

Description

This small group of retail buildings are a very fine example of Edwardian shopping centre development and form an almost intact streetscape across the crown of the hill. The buildings vary in style but the predominant form is the two storey building with shopfront below and residence over. A number of these have cantilevered balconies to the street of design interest and rarity. The other buildings are the post office, several well detailed buildings originally used for banks and the Inter-War commercial building on the northwestern corner of Lyons Road.

Statement of Significance

This Victoria Road, Drummoyne Retail Conservation area is a very good example of early twentieth century retail development, incorporating Edwardian, Classical Revival and Art Deco designs. With the Sutton Place shopping centre and the hotel on the opposite corner, these buildings create a significant townscape at this very busy and prominent corner. All of these buildings form a gateway to Drummoyne and establish a strong and key character. The survival of cantilevered verandahs on a number of the buildings adds particular interest to the group.

Objectives

The strong Federation to Inter-war character of these retail buildings should be retained with their masonry facades, often intact shopfronts, upper floor verandahs, parapet forms and overall consistent and intact streetscape setting. Original shopfronts should be retained. Infill buildings should respect the overall scale of the street development.

Analysis - Setting

This is an urban group with buildings abutting or separated by narrow walkways. They have visual prominence due to the location at the crest of a hill and the absence of a setback from the street alignment.

Scale

Generally two storey buildings, usually divided horizontally by an awning.

Form

Continuous street facades are modulated by cantilevered and recessed verandahs, regularly spaced shopfronts, fenestration patterns, use of piers to divide first floor façade and articulation of the parapet walls. Cantilevered balcony roofs are generally corrugated steel and use a skillion form. The main roofs are generally concealed behind parapet walls. This group is distinctive for the incorporation of cantilevered balconies to a number of the buildings. The first floor façade is generally articulated with engaged piers and a shaped parapet.

Siting

These commercial buildings usually have no setback from the street boundary and little or no setback from the side boundaries, forming a continuous wall to Victoria Road.

Materials and Colours

Walls of masonry contrasting with render. Some Inter-War buildings are finished with render incorporating decorative details. Face brick is important to the character of the Edwardian buildings.

Doors and Windows

A range of window openings are used, generally with a vertical emphasis. Larger window openings are avoided ensuring a regular proportion of wall and windows in the facades. Ground floor shopfronts are generally modern, although a few buildings in the conservation area are notable for being designed as a cohesive façade over both floors, undivided by an awning or balcony.

Carparking

Where available, car parking is at the rear of the site.

Refer to figure App1.30

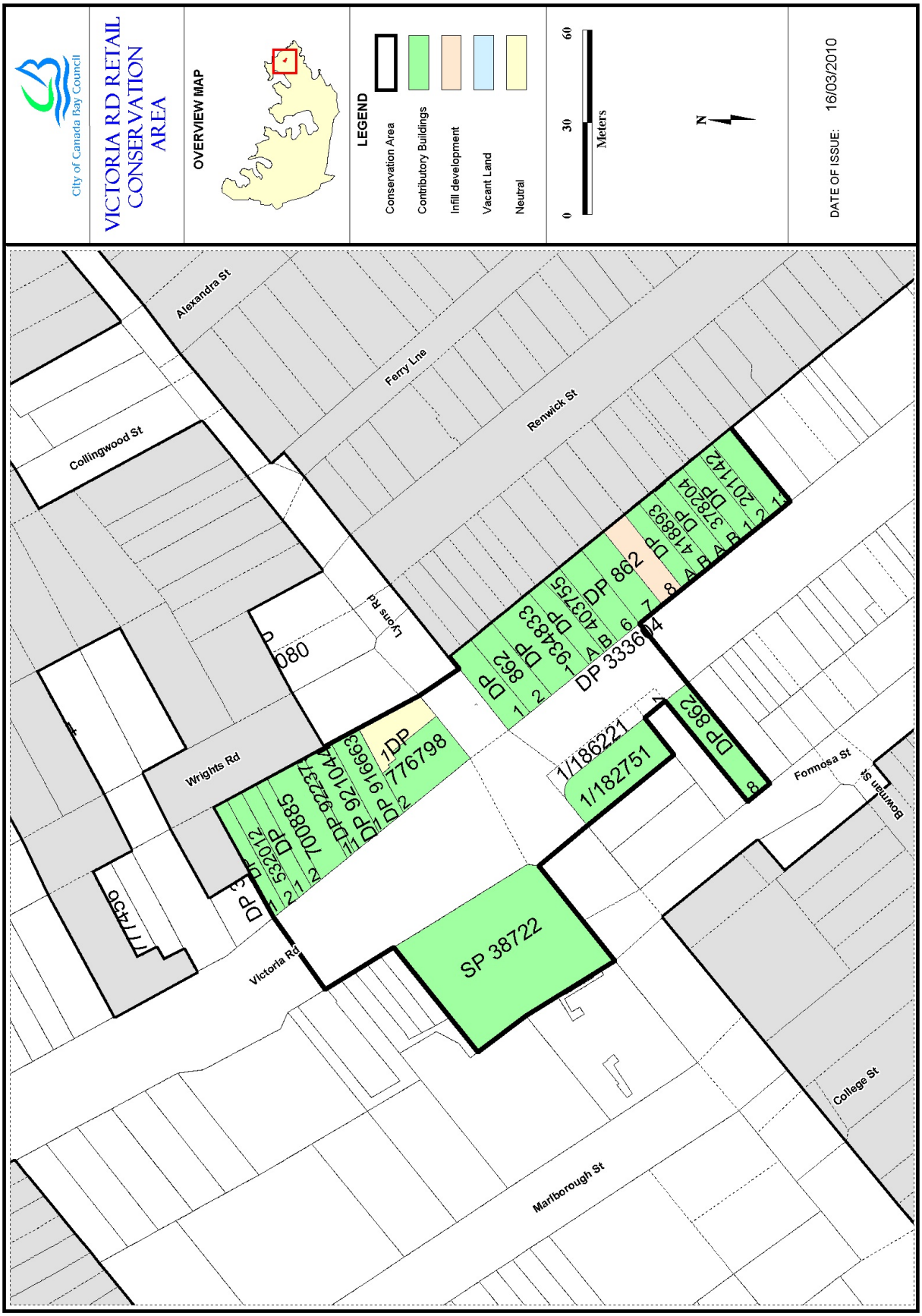


Figure App1.30 Victoria Road Retail Conservation Area

CA.24 Yaralla Estate Conservation Area

History

The Yaralla Estate conservation Area comprises a major part of the 1920 release of the Yaralla Park Estate. This was the largest single release of land for urban subdivision in the former Concord Municipality's history. It included the main entrance driveway to the old Walker Estate, retained on its original alignment as The Drive. The rapid development of the subdivision, closely associated with the Main Northern Railway, produced highly consistent Inter-War streetscapes.

The 1920 subdivision extended from Colane Street to the northern side of Wilga Street. The southern side of Wilga Street was developed shortly afterwards.

Description

This is an area of regular subdivision and generally uniform Inter-War housing. The repetition of the gabled roof forms of Inter-War bungalows create a strong rhythm in the streetscape and is reinforced by consistent use of dark brick and tiled roofs. Iandra Street at the north of the Conservation Area and Wilga Street at the south of the Conservation Area include groups of Inter-War cottages.

It includes significant street planting, most notably along The Drive. The area's original 1920s townscape character survives essentially unaltered. Subtle bends in the parallel street system add visual interest. The area includes a small neighbourhood shopping centre on Concord Road.

Statement of Significance

This 1920s precinct is representative of Concord's major developmental period. It is one of the best preserved examples of Inter-War streetscapes in the Council area and includes some of the Sydney region's best examples and some outstanding rows of typical 1920s bungalows, for which Concord is noted. The Drive has special significance as the alignment of the original entry to the Walker family's Yaralla estate.

The inclusion of subtle bends in the streetscape and of street planting adds to the distinctive qualities of this Conservation Area.

Analysis - Setting

The Yaralla Estate Conservation Area has long streetscapes of wide streets with subtle bends. Street plantings add to the amenity of the residential streets.

Scale

Single storey housing dominates the residential development in this conservation area. Two storey commercial development and flats facing Concord Road reflect the importance of that road as a main traffic route.

Form

The Inter-War California Bungalow style with its strong gabled form dominates this conservation area. Verandahs on the front of the house provide depth to the street facades. Later housing has a similar scale with verandahs incorporated below hipped roof forms.

Siting

Housing in the Yaralla Conservation Area has regular front setbacks from the streets. Most houses include a wide setback to one side to allow for vehicular access. This provides space between houses and helps reinforce the rhythm in the streetscape.

Materials and Colours

Face brickwork trimmed with render below terracotta or slate roofs is almost uniform in the Yaralla Conservation Area.

Doors and Windows

Windows are usually timber casement sashes in groups of two or three, often with horizontal sun hoods. Later houses have groups of double hung windows, sometimes in a chamfered bay. Doors are often glazed and sometimes are paired.

Carparking

Garages and carports are usually set well back from the front building alignment.

Fencing

Original fencing is usually low brick panels between brick piers. Metal rails or wrought metal panels are sometimes used between piers.

Landscape Elements including Paving and Driveways

Street trees are important in this conservation area. Front gardens are usually dominated by lawn with low plantings of shrubs to provide interest.

Refer to figures App1.31 to App1.33

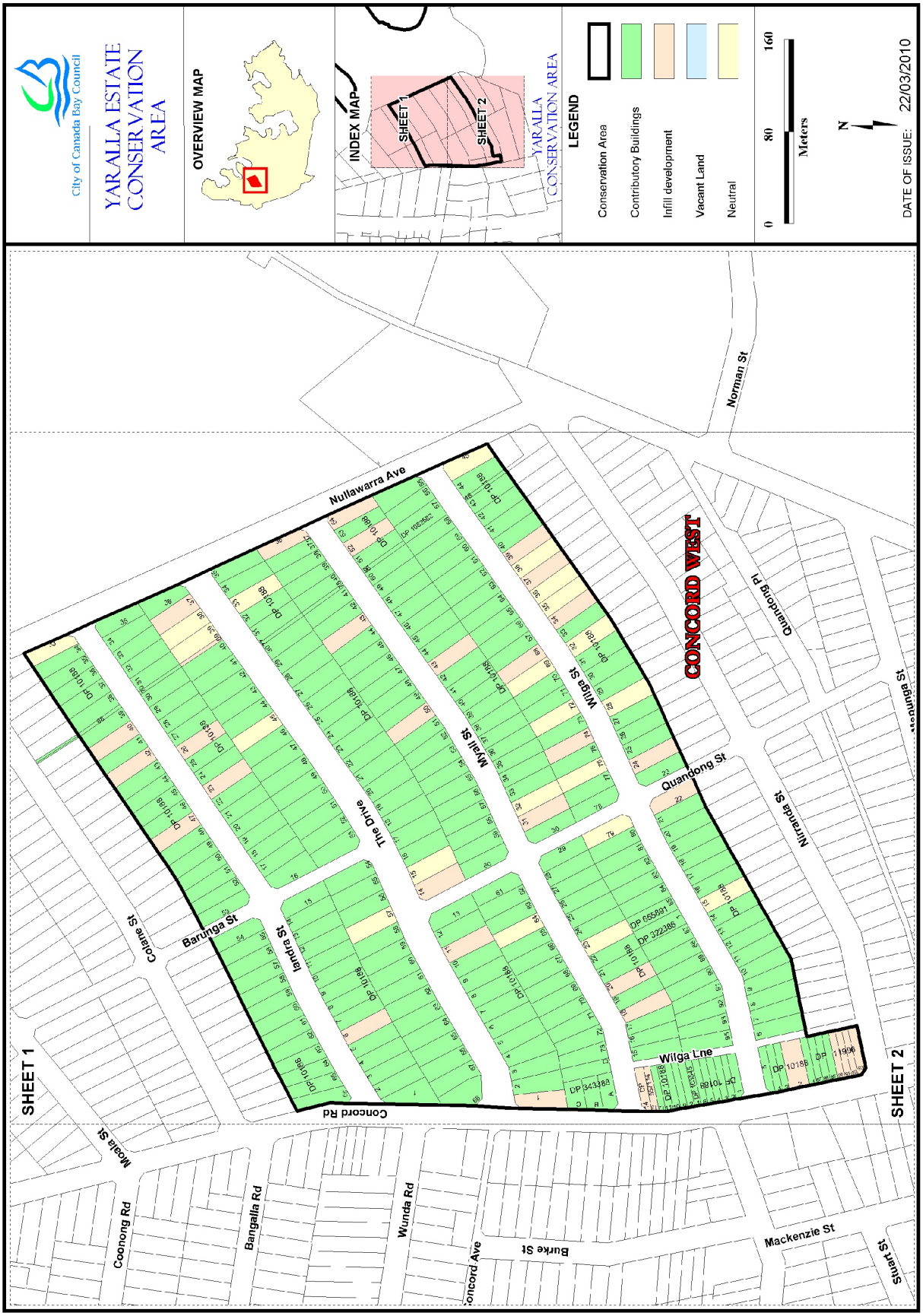


Figure App1.31 Yaralla Estate Conservation Area - Overview

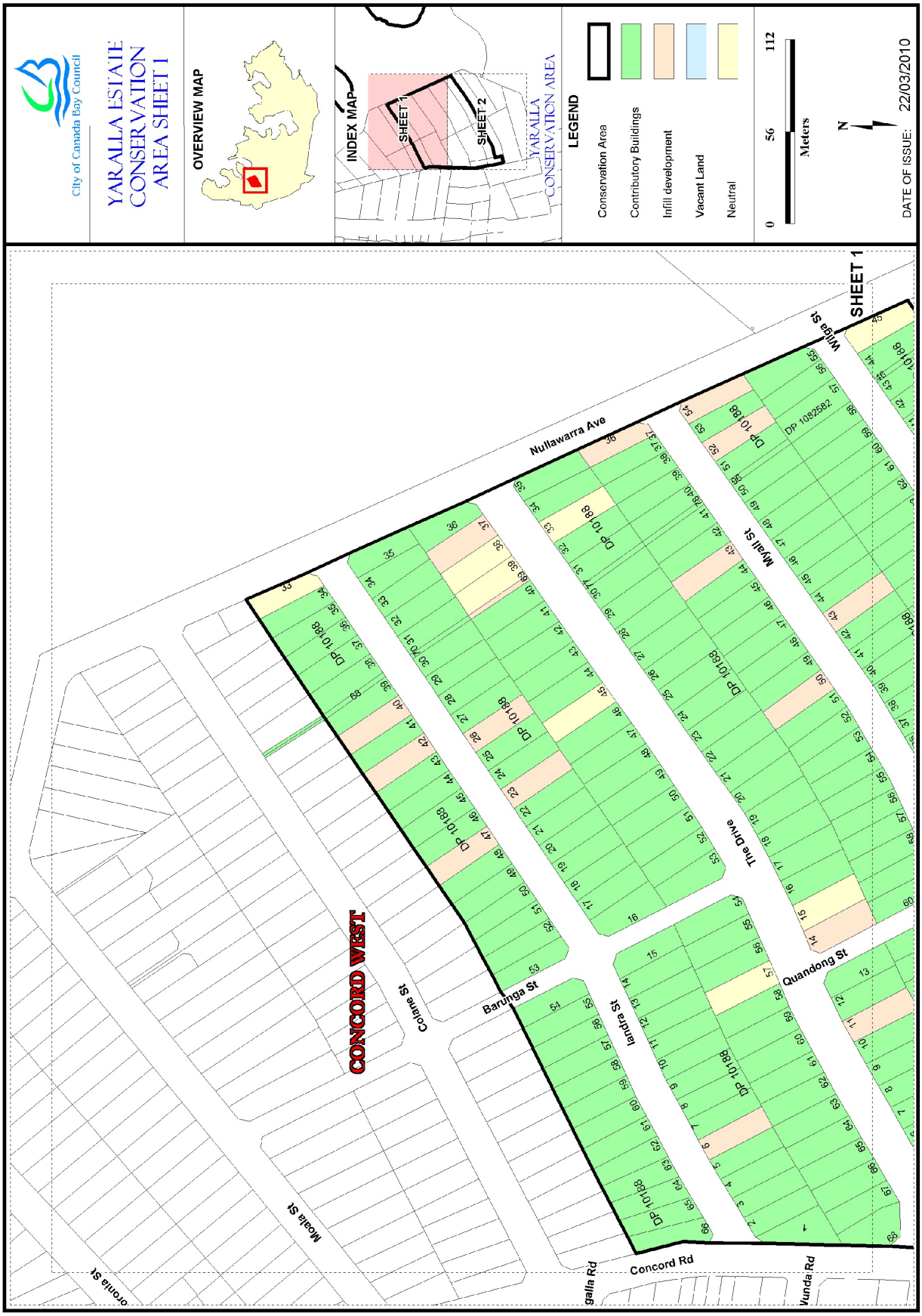


Figure App1.32 Yaralla Estate Conservation Area - Sheet 1

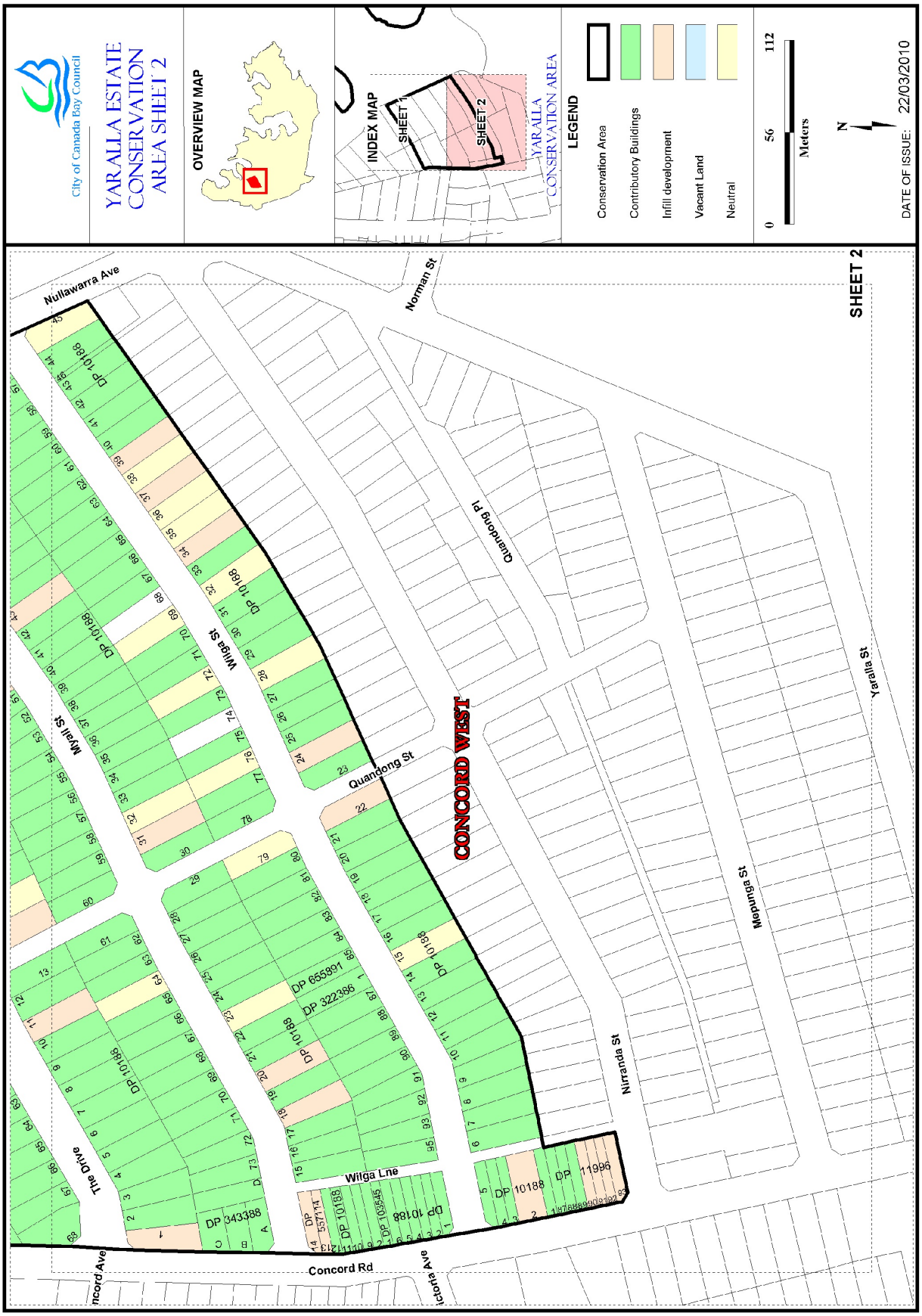


Figure App1.33 Yaralla Estate Conservation Area - Sheet 2

A2

APPENDIX 2 - ENGINEERING SPECIFICATIONS

Road and Footpath Works

Objectives

O1 Engineering Standards - To provide adequate engineering standards for public domain areas, public road reserves and private access roads.

O2 Uniformity - To ensure that there is a benefit to the public resulting from developments and the result is that the public is catered for by uniform infrastructure. Such infrastructure includes the road carriageway, footway, footpath, pavement, kerb and gutter, street trees, utility services, ancillaries and the like.

Definitions

D1 Components - The road reserve is defined by the following components:

- Footway - the section of land between the kerb face and the property boundary
- Footpath - the section of pavement within the footway dedicated for pedestrian and/or bicycle access
- Kerb and gutter - the separation or interface between the footway and vehicular (road) carriageway
- Road carriageway - the section of land dedicated for vehicular traffic
- Ancillary items - any stormwater drainage asset, road/street furniture, edging, lighting, poles, services, signage etc., that forms part of the road reserve

D2 Significant Developments - Major commercial and industrial developments, developments which occupy more than three sites across a street frontage, three or more allotment sub-divisions would be considered as "significant developments".

Controls

C1 Requirements - All development involving demolition and/or construction will be required to satisfy the requirements of this Engineering Specification.

C2 Footway Area Minimum Standards - The footway area shall be reconstructed to satisfy the following minimum standards.

Development	Requirement
1. Demolition only	Repair/ reinstate damaged areas not reported in the Damage Report Form or Dilapidation Report
2. Alterations and additions	Repair/ reinstate damaged areas not reported in the Damage Report Form or Dilapidation Report
3. New dwelling with existing footpath along frontage	Repair/ reinstate damaged areas not reported in the Damage Report Form or Dilapidation Report
4. New dwelling with no existing footpath	Repair/reinstate damaged areas not reported in the Damage Report Form or Dilapidation Report. Construct new footpath
4a. Dual Occupancy (duplexes, town homes, etc.) with no existing footpath	Repair/ reinstate damaged areas not reported in the Damage Report Form or Dilapidation Report. Construct new footpath
5. Residential Flat Building, commercial and mixed developments	Repair/ reinstate damaged areas not reported in the Damage Report Form or Dilapidation Report. Construct new footpath
6. Development under SEPP Housing for Seniors or People with a Disability	Repair/reinstate damaged areas not reported in the Damage Report Form or Dilapidation Report. Construct new or reconstruct existing footpath from site to nearest transport facility to ***AS1428.1*** compliance
7. Significant Development other than those listed herewith	Construct new footway, footpath, road carriageway and ancillaries
8. Subdivision of one into two allotments	Repair/ reinstate damaged areas not reported in the Damage Report Form or Dilapidation Report. Construct new footpath, ancillaries and access road/s
9. 'Greenfields' site, subdivision of more than two allotments	Construct new footway, footpath, road carriageway and ancillaries. Construct access road/s. For Rhodes Peninsular Developments refer to Appendix 5F for additional requirements

Footway

Re-grading the grassed verge within Footway

FW1 Footway Re-grading - The grassed verge within the footway is to be re-graded across the entire property frontage, for development types 7, 8, and 9, and in the following circumstances regardless of the development type:

- Grassed verge has cross-fall of more than 5% (1 vertical: 20 horizontal).
- Matching in with constructed and existing driveway/s.
- Existing grassed verge is difficult (undulating) for pedestrians to negotiate.
- The construction of a vehicular crossing into the site results in unreasonable undulations in the footway or steep level changes.
- The construction of a footpath pavement and/or re-alignment of the road carriageway require the footway to be raised or lowered to match.
- Access difficulties for both pedestrian and vehicular traffic would occur without adjustment of the verge.
- Walls and fences within the property boundary must match in with the new levels.

Minimum Footway Design Requirements

FW2 Constraints - When adjusting footway levels, factors such as the levels of adjoining properties, the degree of pedestrian usage, existing trees, rock outcrops and other physical features and the alignment of existing road, must be taken into consideration.

FW3 Minimum Design Criteria - The minimum design criteria are set out as follows:

- The longitudinal gradient of new footways shall not exceed 10%.
- The longitudinal change in gradient along footways shall not be greater than 1 in 10 with a minimum ease of 4.0 metres.
- A concrete footpath shall be constructed along the entire section of new footways.
- Where it is necessary to raise or lower the section of footway at the front of properties, the adjoining sections shall be re-graded to provide a smooth transition to the new levels.
- The construction of steps is generally not permitted unless the footway transition will extend more than 5.0 metres beyond the property frontage along the footway in order to achieve smooth transition.
- Where a footpath is to be installed and its longitudinal gradient exceeds 10%, over a distance of not less than 5.0 metres, steps may be installed subject to Council's approval.
- Grassed footway cross-fall shall be graded at 10% adjacent to the property boundary, where there is no formal or concrete footpath. The grassed verge near the kerb side shall not have a cross fall exceeding 5%. The absolute minimum footway cross-fall shall be at 1.0% (for grassed surfaces only). A footpath shall be constructed at all times. The footway shall be graded such that there will be no localised depressions which may cause water to pond or to allow the concentration of stormwater or directing stormwater into private property/s or creates a step or height difference which makes it difficult for the 85th percentile vehicle (B85) to open its doors on the verge side.
- Where access to properties is affected by re-grading of the footway, all work necessary must be done to ensure that satisfactory pedestrian and vehicular access is provided. This may necessitate transitions within the development. Where works are required on adjoining property/s, such as driveway adjustments, written consent from the property owner/s must be obtained.

Footway Material

FW4 Material - Material to be used for filling of the footway shall be of clean fill consisting of granular material of not less than 70%, free of vegetation, stumps, roots, rubbish, construction waste and other deleterious material.

FW5 Rock Excavation - Where excavation is in rock, the rock shall be removed to a depth of 300mm below the finished surface level and replaced with clean fill.

FW6 Topsoil - Minimum 100mm thick layer of topsoil shall be placed over the footway. Topsoil shall not contain more than 40% clay content. Clods in the topsoil shall not be greater than 50mm in diameter.

FW7 Ground Cover - The footway shall be protected with couch, kikuyu or buffalo or other types of ground cover to match the existing surface type which provides good protection from surface erosion.

FW8 Ground Cover Maintenance - The ground cover shall be maintained by the Developer for a minimum two (2) months after placement or laying.

FW9 Developer Responsibilities - The Developer shall be responsible, at his expense, for the replacement of dead ground cover during the first two (2) month period after placement.

FW10 Footway Acceptability - The footway will not be considered satisfactory if:

- The finished level of the footway adjacent to the kerb is below the top of the kerb or edging.
- There is a step-down or uneven transition from any foot paving or driveway crossing to the finished level of the footway.
- There are localised depressions in the footway which would cause the ponding of water or the concentration of stormwater runoff.
- There are areas of eroded or dead ground cover.

Footway within Private Property

FW11 Requirements of Footways - Generally footways for private access roads are not required unless access into the property/s, for example, as part of land subdivision including community title sub-division, requires the construction of an access road where its length exceeds 30 metres and no other safe access is made available for pedestrian thoroughfare.

FW12 Width of Footways - Where a footway is required, the width of the footway shall not be less than 1.2 metres with service corridor/s located within the footway area, where possible.

Footpath

Where Footpaths Required

FP1 New Concrete Footpath - Full concrete footpath construction is required across the entire property frontage for development types 4, 5, 6, 7, 8, and 9 and beyond the development frontage for development type 6.

FP2 Footpath Reconstruction - Full sections of footpath are to be reconstructed for development types 1, 2 and 3, replacing broken pavements to ensure safety for pedestrian thoroughfare.

Footpath Minimum Widths

FP3 Minimum Widths - Minimum footpath pavement widths are given in the following table.

Development type	Minimum Width (metres)
1, 2 and 3	Width to match existing but not less than 1.2m unless constrained by site conditions such as footway width being less than 1.2m
4	1.5
5, 6, 7, 8 and 9	2.0
Regardless of above development type, the footpath is a shared route	Width as per Aust Roads Guidelines

Footpath Design Requirements

FP4 Construction Material - All footpath pavements are to be constructed in plain full concrete. Pavers, bitumen, patterned concrete, coloured concrete, any other form of cosmetic treatment of concrete pavement or a combination of pavement types is not acceptable unless it has been approved as part of the streetscape planning of the area or the pavement is a replacement of an existing slab of similar material, pattern or colour.

FP5 Footpath Cross fall - Footpath pavement cross-fall shall be a minimum of 0.5% and a maximum of 2.5% (1 in 40 for disabled access) or absolute maximum 5.0% (where disabled access is not required).

FP6 Grading of Footpaths - Footpath cross-falls shall be graded away from the property boundary, towards the kerb and gutter or to an approved drainage system. Cross-fall must not be graded into private property/s.

FP7 Concrete Minimum Strength - The minimum concrete strength shall be 25 MPa at 28 days and 80mm slump in accordance with ***AS3600 – 1994, Concrete Structures Code.***

FP8 Concrete Thicknesses - Concrete shall be installed at the minimum uniform thicknesses as given in the table below (except where footpath is across driveways, in which case, it shall be the same thickness as the driveway slab). Concrete footpath shall be laid on a minimum 100mm thick road base (compacted to minimum 98% maximum dry density) or 50mm thick and well compacted sand (compacted to a density index of not less than 65%).

Footpath Width (metres)	Slab Thickness (mm)
1.2 to 1.5	75
2.0	100
2.5	130
> 2.5	150

FP9 Sub-Grade - The sub-grade shall be compacted and checked for uniformity and all irregularities made good prior to the pouring of concrete.

FP10 Finish - The concrete shall be broom or coving trowel finished. All edges shall be rounded with a 75mm edging tool, with a 5mm radius.

FP11 Joint Material - Contraction/expansion or construction joints shall be formed from 10mm thick compressible bituminous cork filler board (mastic jointing material).

FP12 Joint Installation - Contraction/expansion joints shall be installed at the full depth of the slab at each side of vehicular crossing slabs, against concrete structures and at intervals given in table below.

Width of Slab (metres)	Distance C/E Joints (metres)
1.5	6.0
2.0	8.0
3.0	12.0
3.5	14.0

FP13 Weakened Plane Joints - Weakened plane joints shall be 3mm wide and formed at intervals as given in the table below except for integral kerbs where they are to match joint locations in the slab.

Width of Slab (metres)	Distance WP Joints (metres)
1.5	1.5
2.0	2.0
3.0	3.0
3.5	3.5

FP14 Concrete Curing - Concrete shall be cured for at least seven (7) days. Any damage or unsatisfactory finish of the slab shall be replaced at the Developer's expense.
The footpath slab up to 75mm in thickness and 1.5 metres in width will not require any reinforcement. The footpath thickness between 75mm and 100mm and more than 1.5 metres in width will require SL62 reinforcement and the footpath slab between 100mm and 150mm and more than 1.5 metres in width will require SL72 reinforcement. Reinforcement shall be placed centrally in the slab.

Location of Footpaths within the Footway

FP15 Footpath Location - New footpaths shall be abutted against the property boundary or in the same alignment or continuation of the existing footpath or as deemed appropriate by Council's Asset Engineer, where no existing footpath is present. For reconstruction of existing footpaths, the same location as the adjoining footpath.

FP16 Extension of Footpath - If the installation of a footpath results in the grassed verge to be less than 600mm in width, then the footpath shall be extended for the full width of the footway, that is, the concrete footpath shall be constructed from the edge of the property boundary to the back of kerb.

Signage

FP17 Signage - Where footpath is to be used for both pedestrians and cyclists, adequate signage shall be installed at the commencement of the footpath indicating that the footpath is for shared pedestrian and bicycle usage.

FP18 Signage Location - Signage shall be provided both on stems and painted onto the pavement at the appropriate locations, in accordance with the RTA ***Aust Roads Bicycle Design Guidelines.***

FP19 Signage Clearance - Signage stems shall have at least 600mm clearance from the face of kerb.

Kerb and Gutter

Where Kerb and Gutter is Required

KG1 Kerb and Gutter Requirement - Regardless of the development type, kerb and gutter shall be constructed in the following circumstances:

- The proposed works includes the reconstruction or construction of an existing road or new road for access.
- Kerb and gutter along an existing paved carriageway servicing the development is in an unsatisfactory condition or at unacceptable or non-standard level. For example, kerb height is more than 150mm or less than 150mm.
- Kerb and gutter along an existing paved carriageway servicing the development does not exist.
- Kerb and gutter along the property frontage is in an unsatisfactory condition or at unacceptable or non-standard levels.
- Kerb and gutter along the property frontage does not exist.
- The construction of kerb and gutter provides protection to the property/s from the inflow of stormwater off a public road or reserve.
- The construction of kerb and gutter would prevent the likely erosion of the road shoulder as a result of vehicular and/or pedestrian traffic outside the proposed development.
- Kerb and gutter is to be reconstructed as part of the footway and/or carriageway reconstruction.

Minimum Design Standards

KG2 Minimum Design Criteria - Kerb and gutter shall be constructed to the following criteria:

- The minimum longitudinal gradient along the gutter shall be at 1%, where practical.
- Cross fall from the centreline of the road to the invert of the gutter shall be at 3%.
- The road maximum cross fall from the centre line of the road to the shoulder shall not exceed 5%.
- The proposed kerb and gutter shall match in with existing kerb and gutter.
- A section of not less than 1.0 metre of the existing kerb and gutter need to be reconstructed to ensure that there is a smooth transition between new and old works.
- Existing crossovers and drainage outlets affected by the proposed works shall be replaced and extended to the new kerb face.
- Kerb and gutter refers to standard 150mm high concrete kerb with integral gutter.
- Other types of edge treatment such as rolled kerb and gutter, mountable kerb and gutter, dish crossing, sandstone blocks or brick kerbs may be used if it has been approved as part of the streetscape planning of the area or the edging type is a replacement of an existing material, pattern or colour.
- Kerb only is not to be used where the cross fall of the road diverts stormwater to the kerb.

Road Carriageway

General

R1 Reference - The road carriageway refers to the section of the road reserve dedicated for vehicular traffic flow. This includes any private access roads (e.g. right-of-ways).

When road carriageway is to be reconstructed

R2 Carriageway Construction - The road carriageway is to be reconstructed in the following situations:

- Half road reconstruction for development type 7 and full road construction for development types 8 and 9.
- Regardless of the development type, a Damage or Dilapidation Report confirms that the road has been significantly damaged as part of the development or is in very poor condition or failure at the time of construction/development, half road reconstruction will be required.
- Regardless of the development type, the existing road carriageway outside the property frontage is at a cross fall which results in the scraping of vehicles when a vehicular crossing has been installed for the property.
- Full road slab construction will be required for local road concrete pavements or as per specification form the Roads and Maritime Services (RMS) where it is an RMS controlled roads, unless noted otherwise.

Road carriageway construction

R3 Cross-fall - Construction of the road carriageway is to have the following cross-falls:

- Cross-fall to be graded from the centre or crown of the carriageway to the gutter.
- One-way cross-falls may only be permitted for narrow roads and one-way trafficked carriageways of less than 5.0 metres in width.
- Offset crowns are not acceptable.
- Super-elevation is not normally provided but shall be a maximum of 6% at bends.
- The minimum cross-fall for asphaltic concrete carriageway pavement shall be 2.5% to 3% (with absolute maximum of 5%).

R4 Longitudinal Gradient - Longitudinal gradient of the road carriageway shall be as follows:

- For bitumen pavements, the minimum longitudinal gradient of the road carriageway shall be 1%.
- For concrete pavements, an absolute minimum fall of 0.5% is allowed, construction accuracy permitting.
- For all pavement types, the general maximum longitudinal gradient shall be 12.5% for residential (local) roads. For other road classification, in accordance with the RTA's ***Aust Roads Pavement Design Manual***.
- For all pavement types, the general maximum longitudinal gradient shall be 8.5% for local distributor roads.
- An absolute maximum longitudinal gradient of 16% may be permitted depending on adequate sight distance of vertical curves.

R5 Matching in with Existing - The proposed road pavement shall match in with the existing pavement with regard to adequate vertical eases and horizontal transitions. This may require the reconstruction of a portion of the existing road pavement to match in smoothly with the new works.

R6 Pavement Design - Pavement design shall be as follows:

- All roads shall be designed based on traffic classification counts and traffic loading as specified in AUSTROADS Guide to Pavement Technology Part 2: Pavement Structural Design AGPT02-12 or Roads and Maritime Services Form 76 – Supplement to the Austroads Guide to the Structural Design of Road Pavements or ARRB Structural Design Guide for residential street pavements as applicable, except where specified elsewhere in this document.
- Road pavement constructed in concrete shall be minimum 50MPa compressive strength at 230mm uniform thickness with two layers of reinforcement fabric (SL81) top and bottom 50mm cover over a 150mm lean mix slurry of 5MPa compressive strength.
- Road pavement shall be designed for a traffic loading of not less than 2.5 x 10^6 ESA for all roads except roads with bus routes which shall be designed for minimum 1.23 x 10^7 ESA and in accordance with the ***Aust Roads Pavement Design Guidelines***.
- Verification of sub-grade suitability shall require submission of a geotechnical report with relevant core sampling tested and reported.
- Collector, local distributor, commercial and industrial pavements shall be designed by a qualified Geotechnical Engineer in accordance with the ***Aust Roads Pavement Design Manual***.

Ancillaries

Pedestrian Crossing Ramps

A1 Location - Pedestrian crossing 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.

A2 Design and Installation - Pedestrian crossing ramps shall be designed and installed as per ***AS1428.2***.

A3 Raised Tactile Pavers - Raised tactile pavers shall be installed on pedestrian ramps and positioned as per ***AS1428.2***.

A4 Tactile Paver Material and Colour - Raised tactile pavers shall be of grey coloured concrete or black coloured polyurethane type material or as specified as part of the streetscape planning for the area or the tactile paver is a replacement of an existing paving of similar material, pattern or colour.

Vehicle Crossings and Laybacks

A5 Minimum Standards - The minimum standards for the construction of driveways and laybacks across the footway are provided in Section ***Vehicular Access***.

Stormwater drainage

A6 Installation of Piped Drainage - For development types 7, 8, and 9, piped stormwater drainage must be installed to cater for at least the minor system flows as described in Section ***Stormwater Management***.

A7 Minimum Standard - The minimum standards for stormwater drainage system design are given in Section ***Stormwater Management***.

Traffic Calming Devices

A8 Minimum Standards - Traffic calming devices such as thresholds, slow points, speed humps, chicanes, and the like are to be designed in accordance with ***Aust Roads Guide to Traffic Engineering Practice, Part 10, Local Area Traffic Management***.

Steps

A9 When Steps Required - Steps should be avoided whenever possible. However where necessary, they shall be installed along all pedestrian-only footpaths where the longitudinal gradient of the pathway is sufficiently steep to warrant its installation or that the installation of a transition ramp cannot be extended adequately to achieve a smooth transition due to site constraints. "Steepness" is measured in accordance with the Building Code of Australia requirements or as determined by Council's Asset Engineer, where BCA requirements cannot be met.

Steps are also to be installed where the longitudinal gradient of the footpath exceeds 1 in 4, over a distance of not less than 5.0 metres.

A10 Material - Steps shall be constructed in reinforced concrete, pre-cast units or prefabricated metal and supported on-ground and are to be painted in highly visible paint to delineate change in height. Suspended types are not preferred.

A11 Preference of Ramps over Steps - Ramps are favoured over steps whenever possible. To permit access for disabled persons, steps are considered as a last resort and only when ramps cannot be installed to comply with the disabled access code due to physical constraints.

A12 Handrails - Where the level change between the steps and/or footpath and the adjoining surface level, at a distance of 1.5 metres or less, exceeds 500mm, handrails are to be installed. Handrails are to be designed in accordance with ***AS1428.2***.

Utility services

A13 Satisfactory Provision of Services - Satisfactory arrangements for sewer, water, gas, electricity and telecommunication services must be provided for all developments including "greenfield" sites and land subdivisions.

A14 Approval - Approval will not be granted unless satisfactory service provisions can be provided.

A Section 73 Certificate under the Sydney Water Act 1994 must be obtained for "greenfield" sites and new land subdivisions. This Certificate must be provided prior to the release of the Subdivision or Occupation Certificate.

A15 Provision of Electricity Services - Direct access to electricity supply must be provided for all "greenfield" sites and new land sub-divisions. New electrical sub-stations, generators, kiosks, and turrets servicing the development must be located wholly within the property boundary. New electrical sub-stations, generators, kiosks and turrets must not be located on public land.

A16 Undergrounding of Electrical Services - Development types 7, 8 and 9 including "greenfield" sites and new land subdivisions must have electricity supply provided underground. Including public domain areas, existing overhead power lines are to be re-installed as underground cables.

A17 New Light Poles and Power Poles - New light poles and power poles are to be provided for development types 7, 8 and 9. These shall be installed at a minimum offset distance of 300mm between the face of the kerb to the face of the pole, unless specified otherwise. The minimum spacing between light poles will be based on the required luminance for the area.

A18 Gas Services - Reticulated gas supply, where available, must be provided for all "greenfield" sites and new land subdivisions.

A19 Certification - A Compliance Certificate from each utility service authority must be provided certifying that its requirements for the satisfactory provision of the service have been met before release of Subdivision or Occupation Certificate.

A20 Dedicated Service Corridor - For "greenfield" sites and new land sub-divisions, a dedicated service corridor, conduit and easement shall be provided to service each allotment created.

A21 Relocation of Services - If, as part of the proposed development, mains, services and poles need to be relocated, it shall be carried out at the Applicant's expense to the satisfaction of Council and the relevant utility authority, as required.

A22 Developers' Responsibility - It is the responsibility of the Developer to ensure that all care has been exercised to prevent damage to any public utility, e.g. gas, water, sewerage, electricity and telecommunication. The Applicant will be responsible for any damage caused by him or his agents, either directly or indirectly.

A23 House Service Alterations - Alterations to house services shall be carried out only by qualified tradesperson.

A24 Location of Utility Services -The locations and depths of utility services under a road reserve shall be installed in accordance with the ***New South Wales Streets Opening Conference 1997*** resolution.

A25 Liaising with Relevant Utility Service Authorities - In particular relation to "greenfield" sites, new land subdivisions, and where a new or existing public road is to be reconstructed or constructed, the Developer must liaise with the relevant authority, arrange and pay all costs and fees associated with providing street lighting, underground electrical power, telecommunication services, and adjustment of surface fittings, pits, etc. affected by the propose works.

A26 Engineering Plans - All underground services and services in general must be detailed on engineering plans, submitted and approved by Council prior to development approval.

Street Trees and Landscaping

A27 Installation of Street Trees - Street trees are to be installed across the entire property frontage, for development types 7, 8, and 9 and where the footway and road is to be reconstructed regardless of the development type.

A28 Suitable Species - Council's Landscape Architect is to be consulted in regards to suitable plant species.

A29 Location - Street trees are to be planted at an offset distance of not less than 600mm from the face of kerb to the centre of the tree. Trees are to be planted at the distances tabulated below.

Location	Distance (metres)
From any road intersection (tangent point/kerb return)	10
Between tree centres	6
From the top of driveway wings	2
From signs, poles, posts	1

A30 Edging - For concrete pavements, no timber edging is required around the landscape islands. For surface types other than concrete pavements (e.g. turf or bitumen), the perimeter edging around the landscape island, shall be timber 30mm wide by 100mm deep. Landscape islands shall be square in shape, 1200mm wide by 1200mm long.

A31 Bedding Material - For concrete pavements, bedding material shall be "arboresin" or equivalent. For bitumen pavements or grassed areas, bedding material shall be mulch. Colour shall be as specified by Council's Landscape Architect at the lodgement of the Development Application (DA).

A32 Submission of Detailed Landscape Plans - Detailed landscape plans are to be submitted and approved by Council prior to development consent.

Vehicular Access

Objectives

V1 Uniformity - To ensure uniformity in the design and construction of vehicular crossings in the City of Canada Bay Local Government Area.

V2 Safe and Convenient Access - To ensure that safe and convenient vehicular access can be provided to and from parking spaces for all properties.

Definitions

V3 General - Vehicular access or driveway crossing refers to the formal access for vehicles (85th percentile vehicle in accordance with ***AS/NZS2890.1:2004 Off Street Car Parking Code***).

V4 Formal Access - Driveway refers to the formal platform between the kerb line and the property boundary by which vehicular access is provided.

V5 Exclusions - In this Section, vehicular access does not include internal access roads, (both vehicular and pedestrian access) within the property boundary, suspended structures and the like, which would be assessed separately on its merits and will require separate Development Application (DA) approval.

V6 Ancillary Works - Ancillary works refers to any works other than driveways and laybacks such as footpath construction or reconstruction, pavements, stormwater drainage pipes and pits and the like within the road reserve. These works could be undertaken in conjunction with or separately from driveway construction.

Application

V7 Applications to Council for the Location and Construction of a Vehicular Crossing or Ancillary works must be submitted.

No construction work will be permitted until formal written approval is obtained from Council following the submission of the Application.

An Application for Driveway Construction and Ancillary Works must be submitted for all proposed construction and reconstruction of vehicular access and this applies to:

- All Developments Applications involving residential, commercial, and industrial development, and
- Where a stand alone formal crossing(s) or cross-over (layback) is proposed.

V8 Consultation - Prior to the lodgement of a Driveway Application, please ensure that:

- The Applicant has consulted with Council's Planning Section, in regards to heritage, LEP and DCP matters and has been given advice that a driveway at the specified location is permissible; and that
- The Applicant has read this Specification and is fully aware of any limitations and/or constraints, which may preclude the approval of a driveway.

Statutory and Design Requirements

Persons who can undertake Construction

V9 Approved Persons - Vehicle crossings can be constructed by either Council's Construction Team or a Private Contractor, to ensure that works are built to a reasonable standard and uniformity.

Property owners may appoint their own Private Contractor to construct the driveway. However, to ensure that the quality of the work is maintained and public safety is not compromised, the nominated Contractor must have extensive experience in concrete works especially in the construction of vehicle crossings with current public liability insurance cover and must be approved by Council.

A Private Contractor, nominated by the Property Owner, may be approved by Council to carry out the works following submission of the following:

- A copy of the current public liability insurance is provided to Council. The insurance cover shall be for a sum not less than $A20,000,000 for a period of six (6) months, and nominating on the policy the City of Canada Bay Council as indemnifying them against public risk claims, arising during the construction of the crossing or as a result of the construction of the crossing;
- A copy of the Contractor's current concrete license and record of previous work are provided to Council; and
- A Security Deposit is paid to Council by the Contractor, as set down in Council's Fees and Charges lodged prior to any works commencing. This Deposit is refundable upon satisfactory completion of the works, at the discretion of Council.
- An additional non-refundable administration fee, as set down in Council's Fees and Charges shall also be paid. This fee covers the processing of the driveway application and three (3) site inspections. Note this fee applies to each driveway applied for per property. If more than one driveway is to be constructed, the same fee must be paid for any additional driveway to be processed.

If all of the above requirements are not satisfied, the application may be rejected and a further fee (10% of the Security Deposit) will be required before reconsideration.

For ancillary works such as the construction of a concrete footpath, an administration fee is payable. A refundable deposit is also required.

Issuing Driveway Levels

V10 Written Permission - No work shall commence without written permission from Council.

The Contractor is to submit a driveway design appropriate for the site, complying with ***AS/NZS2890.1:2004***. This design must be approved by Council in writing before any construction can be carried out.

In exceptional circumstances, e.g. due to omission of information on the part of the applicant and notwithstanding the above advice, Council may consider that the construction of a driveway at the proposed location or site is inappropriate or impractical. The Applicant will then be advised accordingly and all but $A50 will be refunded.

Supervision and Inspections

V11 Supervision - Works are to be carried out in accordance with this document, relevant Council Specifications and Australian standards.

No work is to be carried out except under the supervision and approval of Council or its nominated representative.

Council shall meet with the nominated Contractor and/or Owner to carry out mandatory inspections for the purpose of:

- Formwork inspection - at least forty-eight (48) hours notice must be given for checking timbering for alignment, reinforcement placement, level and stability and sub-grade preparation.
- Final inspection - the Owner or Contractor shall notify Council for a Final inspection once the concrete has been poured and finished, formwork removed and area restored. At least twenty-four (24) hours notice must be given.

To arrange for appropriate inspection times, bookings shall be made through Council's Customer Service Section.

If more inspections are required above the mandatory inspections due to any omission or unsatisfactory work, including the storage of materials, insufficient barricading and site safety, on the part of the owner or contractor, or remedial actions that Council deems necessary to achieve compliance, an additional fee shall be charged, as defined in Council's Fees and Charges Schedule.

Final Approval

V12 Notification in Writing - Council will notify the owner in writing of the Final Approval of the work. Any defects found during the Final Inspection must be remedied. This is the responsibility of the owner and therefore it is advised that final payment not be made to the Contractor until such approval has been received.

Once the driveway is completed and Council is satisfied with the works, a refund of the crossing bond can be arranged. The Applicant shall apply in writing to Council.

Adjustments to Utility Services

V13 Service Alterations - Any alteration, which may be necessary, for the construction of the vehicle crossing, to any water, sewer, gas, electricity, telecommunication, stormwater system, and other utility services is to be arranged by the contractor with the relevant utility authority.

V14 Protective Box Adjustments - The protective boxes over any hydrant, gas cocks, stop valves, sewer lines, and the like shall be adjusted by the contractor, in consultation with the relevant utility authority, so that they are flush with the finished surface.

V15 Physical Location - The contractor is responsible for the physical location of all utility services likely to affect the proposed works. The contractor is liable for any damage to service utilities. The contractor is required to contact “Dial before you dig” (ph 1100) before any work commencing.

V16 Associated Costs - Any cost incurred as part of the adjustment will be borne by the owner.

V17 Conflicts with Stormwater Conduits - Where an existing or proposed house stormwater pipe traverses the proposed driveway crossing, and there is insufficient cover over the pipe, the section of pipe shall be converted to a galvanised steel 200 x 100 x 6 rectangular hollow section (RHS) across the footpath, to achieve adequate cover. Alternatively, relocate the pipe, where possible, away from the driveway and in the direction which allows adequate drainage

Road Design Affecting Driveway Levels

V18 Proposed Design - Where a proposed design has been prepared by Council to alter the carriageway and/or footpath fronting the property concerned, the driveway works shall be carried out in conformity with the proposed design. Information for this purpose shall be supplied by Council or its representative.

V19 Proposal to Modify Street Levels - Where Council has a proposal to modify the area at the front of the property but a proposed design has not yet been prepared, the work shall be set out in accordance with the best available information and in accordance with this Document and any other relevant standards, on the understanding that if Council should carry out future construction works to a proposed design, which may involve the alteration to part or whole of any of the constructed work, then a contribution may be payable had no work been carried out, will be levied and must be paid by the property owner, in accordance with the Roads Act, at the time when the Council proposed works are to be carried out.

Public Safety and Provision for Traffic

V20 Pedestrian and Vehicle Safety - The contractor is responsible for the safe passage of pedestrian and vehicular traffic. During the progress of the works, all necessary warning notices, barricades and lights must be installed, in accordance with ***AS1742.3 - 1996, Traffic control devices for works on roads***.

Where the works require traffic control, the contractor will be responsible for appropriate traffic control devices being put in place, including necessary lamp signage, maintenance and the like in accordance with ***AS1742.3 - 1996.***

Where works are to be carried out on roads of a "Collector Road" status or higher, and obstruction to traffic is unavoidable, a Traffic Management Plan must be submitted with the application to Council, endorsed by the Police and relevant authorities e.g. RTA, for approval. This plan is to be prepared in compliance with ***AS1742.3 - 1996***. A minimum notification period not less than ten (10) working days shall be provided prior to the commencement of works.

These ancillaries should be included in the total cost towards the works.

V21 Liability - The contractor shall be liable for any accident, damage or injury to persons or property resulting from the work. In this regard, the Contractor must have appropriate and current public liability insurance to this effect.

Compliance with Other Regulations

V22 Compliance - Works shall be carried out in compliance with The Clean Waters Act, The Roads Act, The Motor Traffic Act and the Occupational Health and Safety Act, and any other Acts as deemed relevant.

Hours of Construction/ Demolition

V23 Hours of Construction/Demolition - The hours of construction/demolition shall be restricted to 7:00am to 5:00pm, Mondays to Fridays and 8:00am to 1:00pm Saturdays, with a total exclusion of work on Sundays and Public Holidays.

V24 Non-offensive Works - Non-offensive works, where power operated plant is not used such as setting out, surveying, plumbing, electrical installation, or site cleaning by hand shovel and site landscaping, is permitted between the hours of 1:00pm to 4:00pm Saturdays, at Council's approval.

Important Note: The Protection of the Environment Operations Act 1997 may preclude the operation of some equipment on site during these permitted working hours.

Preparation and Excavation

V25 Minimum Excavation - The Contractor shall excavate to the full depth required for the specified thickness of the proposed crossing slab.

In rock, clay or unstable foundation material, additional excavation shall be carried out and a sub-base of sand, or other approved material, to a minimum depth of 75mm consolidated thickness, shall be provided.

V26 Compaction - The sub-grade or sub-base shall be adequately compacted to the required minimum depth of 150mm to the following requirements:

- Sands - density index of 70% in accordance with ***AS 1289.E3.1*** where the compaction test is in accordance with ***AS 1289.E5.1***.
- Material other than sand - dry density rates in accordance with ***AS 1289.E4.1*** of more than 95% where the compaction test is in accordance with ***AS 1289.E1.1*** (standard).

V27 Adjacent Surface - The surface adjacent to the proposed driveway shall be trimmed to conform generally to the levels and cross-fall similar to the adjoining area, free of trip hazard, unless otherwise instructed by Council's Engineer. This shall include lifting and resetting footpath lawns where necessary.

Driveway Dimensions and Alignment

V28 Maximum Driveway Slab Widths - The width of any crossing to a property must be kept to a minimum. Excessively wide vehicle crossings will not be approved because it:

- compromises pedestrian safety by encouraging vehicles to cross the footway at greater speeds,
- minimises the area for pedestrian refuge,
- encourages illegal parking on the footway,
- detracts from passive streetscape by increasing the amount of visible hard paving, and
- reduces on-street parking spaces.

The following table gives maximum allowable crossing slab widths for various residential property frontage widths:

Width of Property Frontage (metres)	Maximum Allowable Width of Crossing Slab at (metres)	
	kerb line	boundary
less than 10.0	3.5	3.5
10.0 to less than 12.0	3.5	4.0
12.0 to less than 15.0	3.5	5.0
15.0 to less than 20.0	3.5 to 4.0	6.0
20.0 to less than 30.0	4.0 to 6.0	7.0
greater than 30.0	Merit based, to be determined by Council	

Important Note: The minimum width refers to the crossing slab only and does not include the width of the layback with 0.6 metres wing-walls at each end.

V29 Driveway Slabs for Commercial Premises - Commercial premises, properties requiring two-level entries, or where traffic is heavy (for example, the property frontage to a main road with heavy vehicular traffic movement); the above widths may be increased at Council's discretion. For example, service stations may be granted wider driveway widths based on swept vehicle paths and submission of a Traffic Report.

V30 Wheel Strips - Wheel strips **are not acceptable** because they do not provide sufficient protection to the public footway. Constant wearing by vehicular traffic may cause rutting in the grass verge which compromises the safety of pedestrians using the footway.

V31 Vehicle Crossings to be Perpendicular to Kerb Line - Vehicle crossings are to be constructed perpendicular to the kerb line. In special circumstances, to reduce disturbance to traffic flow along a major road, an angled driveway may be permitted subject to the approval of Council's Asset Engineer.

Driveways off Narrow Roads

V32 Splays and Widened Driveways - Splays are not to be used. The minimum crossing slab width shall be 3.5 metres. Council does not encourage the construction of wide crossovers where it is unnecessary as it increases the risk to pedestrians and diminishes the opportunity for on-street parking.

Vehicle crossings are generally required to be constructed perpendicular to the kerb line. This encourages vehicles to slow down whilst entering properties.

In special circumstances, the driveway may be widened to prevent vehicles from driving onto the nature-strip or where safer access and egress can be provided. This is likely where the road carriageway width is less than 5.5 metres.

Where the width of the road carriageway is less than 5.5 metres, the driveway may be permitted to be widened, subject to a check using a standard swept turning path of the 85th Percentile vehicle (B85).

Permitted Number of Driveways per Property

V33 Residential Driveways - For residential developments, a maximum of one (1) vehicle crossing for vehicle access, is permitted unless the property is located on a corner block or has the front and rear backing onto a street, where it enjoys access to two (2) or more street frontages, in which case, it may be permitted to have two (2) driveways, at Council's discretion.

V34 Maximum Number of Vehicle Crossings Permitted - A maximum of two (2) crossings may be permitted at Council's discretion and under the following circumstances:

- The property is a commercial/industrial development where there are currently separate entry and exit points or there are two (2) or more entry levels or multiple ramps and the installation of the second crossing is unlikely to diminish on-street parking.

V35 Minimum Gap between Driveways - A minimum gap of 0.5 metres must be provided between driveways to prevent the two driveways across the footway to be used as one.

V36 Duplexes and Multi-Residential Developments - Duplexes and other similar types of development may be permitted to have two (2) vehicle crossings where the location of the garages or parking spaces within the property does not permit the use of a shared driveway and the installation of the second crossing is unlikely to diminish on-street parking. For a single combined driveway, the maximum width will be assessed as if the site was for a single dwelling, or to a width which would be sufficient to permit only one vehicular movement to enter and exit the site in a forward direction.

Important Note: Council at its discretion may restrict the number of driveways permitted for a site even if the property enjoys more than one street frontage for the following reasons:

- The proposed driveway connects into a section of road which is considered hazardous for vehicular traffic entering or exiting the site
- The proposed driveway connects into a section of unformed road reserve
- Vehicles entering or exiting the proposed driveway do not have good sight distance
- The proposed driveway diminishes on-street parking
- The proposed driveway will be near or in front of an existing bus stop or shelter.

Driveway Locations

V37 Prohibition - Access shall be located so that sight distances are not affected by existing structures such as street trees, earth mounds, bus shelters, and other physical features. Council may not approve the location of such an access if the location will adversely affect sight lines or detracts from the streetscape of the area.

Vehicle access will not be permitted at the following locations and circumstances:

- At Council's discretion
- Where the proposed vehicle access is likely to diminish on-street parking
- To a major road if reasonable access can be gained from another public road of lower classification
- Opposite or within 6.0 metres of a median opening in a major road
- Within 25.0 metres of a signalised intersection*
- Within 9.0 metres at non-signalised intersections*
- At localised depressions** ("sag" points)
- At the entrance into a basement or sub-floor level regardless of whether it is in a localised depression or not***

The above distances are measured perpendicular from the face of the kerb of the intersecting street (or prolongation of the kerb line or tangent point if curved).

***Important Note 1:** Access may be permitted provided that it can be demonstrated, to Council's satisfaction, that it is safe to do so and that extenuating circumstances exist, for example, where this is the only location where vehicular access can be gained.

****Important Note 2:** At sag locations in the road, if the proposed driveway could result in the driveway becoming a spillway for stormwater entry or stormwater ponding here, unless an appropriate hydraulic model (using either Manning's Equation or HEC-RAS, which-ever being appropriate and based on the 100-yr ARI design storm) is used to determine the water surface profile to demonstrate that the driveway profile has a design crest which prevents stormwater from entering into the premises and/or that the stormwater runoff can be safely conveyed along a suitably designed overland flow path, then the driveway will not be approved.

*****Important Note 3:** All driveways to basement or sub-floor areas, whether it be located in a sag or not, will not be approved unless a catchment analysis for the 100-yr ARI design storm is undertaken to determine the stormwater runoff and then an appropriate hydraulic model (using either Manning's Equation or HEC-RAS, which-ever being appropriate) is used to determine the water surface profile, to demonstrate that the proposed driveway will offer adequate protection from stormwater entering into the premises. Refer Section ***Overland Flow and Flood Studies*** for further details.

V38 Minimum Length of Parking Bay - A driveway will not be permitted if the proposed parking space within the property between the boundary and building line is less than 5.5m in length, causing a parked vehicle to encroach onto the footway reserve.

V39 Sight Lines - Vehicle crossings shall be located so that minimum sight distances to traffic and pedestrians can be provided. Sight distance to pedestrians shall be met by providing clear sight lines in accordance with ***AS/NZS 2890.1 - 2004, Parking Facilities, Part 1: Off-street car parking.***

Vehicle crossings should also not be located where existing trees or power poles may obstruct sight lines or where it is too close to the root zone of trees. Similarly, the driveways shall not be located too close to power poles where undermining may occur.

V40 Removal of Obstructions - In certain situations, Council may grant approval for the removal or relocation of these structures, where there is no alternative location.

In this circumstance, approval must be sought from Council's relevant officers who may include Asset Engineer, Traffic Engineer, Tree Preservation Officer and Planners. All costs associated with such work shall be borne by the Owner.

V41 Stormwater Pits - All driveways must be clear of existing stormwater inlet pits. The removal or reduction in the length of the pit lintel or grating is not acceptable, as this would reduce the rate of stormwater collection. However, excluding existing pits located in a depression (sag), if the hydraulic characteristics of the drainage system are not made less efficient, the relocation of the pit may be permitted. In this circumstance Council will undertake the works of pit relocation or nominate an approved Contractor. All costs associated with the relocation of the pit shall be borne by the Owner.

V42 Street Trees - Driveways must not be located over or near trees to be retained. The minimum clearance to trees will depend on factors such as the proximity to the trees root zone and sight lines.

Existing Crossings

V43 Retention of Existing Crossings - Existing crossing slabs and laybacks may be re-utilised if:

- They are in the correct location, set at the correct levels and in reasonable condition, **and**
- its retention is NOT contrary to this Document.

V44 Removal of Existing Crossings - Existing crossings and layback must be removed, where the crossing slab and layback is made redundant. It shall be completely removed and the footway area and kerb/gutter restored to Council's satisfaction.

V45 Owner's Cost for Removal of Redundant Crossings - Any existing un-used crossing(s) and/or layback(s) must be removed and the kerb/gutter and footpath reinstated/restored at the owners expense to Council's satisfaction.

Driveway Levels and Gradients

V46 Design – The Applicant shall submit a longitudinal driveway profile, which will show dimensions, levels and gradients, for Council approval.

V47 Absolute Maximum Longitudinal Gradient - The absolute maximum longitudinal gradient of driveways shall not exceed 25% within the property and 10% in the footway (unless justification can be provided to vary these grades). Where the gradient exceeds 18%, a check is required using standard vehicle template (B85) to ensure that it does not scrape.

If a pedestrian footpath exists or is required, the gradient across the footway must not exceed 2.5% (1 in 40) where the footpath meets the driveway.

The location of the footpath is to match existing or 450mm offset from the property boundary or as directed by Council's Asset Engineer if no footpath currently exists. It may be necessary to transition existing footpaths both sides of the driveway to align with the new driveway such that cross fall across the footpath is maintained at not more than 2.5% (3% absolute maximum). Driveways are to be graded to fall towards the kerb wherever possible.

V48 Changes in Gradients - Changes in gradients shall not exceed 12.5% algebraically (1 in 8) in a crest and 15% (1 in 6.7) in a depression (sag) to prevent vehicles scraping or bottoming.

Changes in grades in excess of 12.5% (crest) and 15% (sag) will require the introduction of transitions. A minimum transition of 2.0 metres in length will be required (a 1.5 metres transition may be permitted if a template is overlaid onto the driveway profile which demonstrates that it will not scrape).

V49 Compliance – Driveways shall be designed to match in with the topography of the site, and shall comply with ***AS/NZS 2890.1 - 2004, Parking Facilities, Part 1: Off-street car parking***.

Council, at its discretion, may not approve a Driveway Application on the basis that the information provided to Council, at the time of approval, was in error or there are deficiencies in the information provided for Council to make an informed determination at the time of the assessment.

Driveway Material

V50 Concrete - All vehicle crossing slabs and laybacks are to be constructed in plain concrete with a minimum compressive strength of 32MPa at 28 days.
Ready mixed concrete conforming to ***AS1379-1973*** shall be used. The Contractor is to arrange for certificates by the manufacturer to be given for all concrete delivered and shall be able to produce these to Council's Representative upon request.

V51 Cosmetic Pavement - Construction of driveways, within the road reserve, using brick pavers, coloured, stained, stamped or patterned concrete, pebblecrete, or any other cosmetic material other than plain concrete **will not be approved**. Only standard plain concrete finishes to vehicle crossings will be permitted.

V52 Base - Clean sand shall be used, free of any deleterious material, compacted and screeded to a smooth finish. Bedding thickness is to be a minimum of 50mm uniform thickness.

Compact sand bedding to a minimum density index of 70 as per ***AS1289 5.6.1***.

For road base (DGB20), the standard shall be ***AS1289.5.2.1***.

V53 Filling Material - Where filling under the proposed concrete is necessary, such filling shall consist of granular material of maximum size of 40mm and shall be spread in layers of a maximum thickness of 150mm and consolidated to provide a 95% compaction when tested under the modified proctor method.

Expansion and Construction Joints

V54 Expansion and Construction Joints - Shall be provided to the full depth of the slab, at each side of the slab and where required or as directed by Council.

The joint shall be filled with a 12mm thick bitumen impregnated material such as a compressible mastic board. Other types of jointing material can only be used with the approval of Council.

Expansion joints shall separate the concrete apron from the driveway area that it adjoins, in line with the leading edge of paths.

V55 Concrete Footpaths - Concrete footpaths shall have expansion and tooled (dummy) joints installed at the widths as indicated below:

Slab Width (metres)	Tooled Joint (metres)	Expansion Joint (metres)
1.2	1.2	3.6
2.0	2.0	6.0
3.0	3.0	9.0
3.5	3.5	10.5

Finish

V56 Concrete Finish - The concrete surface shall be finished true and even, free from air and stone pockets, depressions and projections. The concrete shall be tamped and screeded to the correct surface levels and shall be given an even non-skid finish.

The crossings are to be cove finished in the direction of the kerb and gutter unless it has a gradient steeper than 1 (vertical) to 5 (horizontal), where it shall be finished with a wooden float and then grooved (ensure grooves do not create tripping hazard to pedestrians). The path section behind the apron shall be soft broom finished across the path. All edges of the slab shall be rounded with a 50mm edging tool.

V57 Slip Resistance - In general, driveways should have a slip resistance appropriate for the pavement slope in accordance with ***AS3600***.

Minimum Driveway Slab Thickness

V58 Council Standards - All work is to be carried out in accordance with Council's standard details, Construction Specification for Concrete and Restoration Works, where applicable.

V59 Minimum Thickness of Gutter Crossings - Gutters and gutter crossings (laybacks) shall have a minimum uniform thickness of 150mm or 180mm for commercial and industrial sites.

V60 Minimum Thickness of Driveway Slabs - The minimum crossing slab thickness shall be in accordance with the following table:

Development Type	Minimum Slab Thickness (millimetres), Reinforcement
Residential	110, SL62
Commercial	180, SL72
Industrial	180, SL72
Residential Flat Buildings	150, SL72

V61 Minimum Thickness of Footpaths - Footpaths shall be a minimum of 75mm in thickness to match existing pathways unless under driveway in which the thickness shall be the same as for the driveway or as directed otherwise by Council

Non-Compliance

V62 Non-compliance - Failure to comply with the conditions of this Document will result in the approval to carry out construction of the crossing being revoked. If works are constructed in non-conformity, Council will issue an order to have the area restored or remedied.

V63 Recovery of Costs - The cost for reinstatement of non-complying works shall be recoverable by Council, for example, deducted from the Security Deposit held by Council.

Stormwater Management

Objectives

SWM1 Uniform Guidelines - To provide uniform guidelines and applying control systems to achieve consistency, in the assessment and conditioning of Development Applications, in relation to stormwater runoff from all development types.

SWM2 Minimise Adverse Impact to Properties - To minimise any adverse impact on properties caused by stormwater runoff from all developments types.

SWM3 Minimise Impact on Water Quality - To ensure that the water quality of receiving waterways is not adversely affected by the discharge of pollutants such as nutrients and pathogens, from stormwater runoff as a result of development.

SWM4 Uniform Controls - To ensure that uniform stormwater controls are applied throughout the whole of the City of Canada Bay Council Local Government Area.

Controls

SWM5 Controls - To achieve the above objectives, the following controls are applied:

- For controls where the site is within a Flood Planning Area, refer to the Flood Planning Section of Council's Development Control Plan.
- The provision of safe overland flowpaths within developments and on public land.
- The definition of floodways for major storms within developments and on public land.
- The provision of controls such as on-site stormwater detention, community basins and the like and on-site retention systems to reduce and control stormwater runoff.
- The application of alternative methods of merit based stormwater control and conveyance devices.
- The removal of flood effected development from known floodways and the prohibition of future developments in such floodways.
- The provision of minimum free-boards for assigning floor levels to reduce the risk of flood damage to property/s.
- The installation of pipe/channel systems to minimise hazard to pedestrian and vehicular traffic caused by uncontrolled surface stormwater runoff.
- The installation of water quality control devices such as trash screens, gross pollutant traps, water quality ponds and the like and encouraging the use of water sensitive urban design to protect the quality of receiving waters.
- Depending on the development type and general site fall, the following stormwater control types would be applicable.

Development Type	Site slope/ Site drains to	Control Type
1	Front boundary	E, G
	Rear boundary	B, C, D, E, G
2	Front boundary	A*, F**
	Rear boundary	A+, B***, C, D, F**
3, 4, 4a	Front boundary	A, D++, F
	Rear boundary	A+, B***, C, D++, F
5, 6, 7, 8, 9	Front boundary	A, D++, F, H
	Rear boundary	A+, B***, C, D++, F, H
2, 3, 4, 4a, 5, 6, 7, 8, 9	Waterfront property or site drains to a public reserve or park	E, F, H

Key:

Development Type

1 - Demolition Only
2 - Alterations and additions
3 - New dwelling with existing footpath along frontage
4 - New dwelling with no existing footpath
4a - Dual occupancy, town homes etc.
5 - Residential Flat Building (RFB), commercial and mixed developments
6 - Development under SEPP Housing for Seniors or People with a Disability
7 - Substantial Development
8 - Sub-division of one into two allotments
9 - "Greenfields" site, sub-division of more than two allotments

Stormwater Control System

A - On-site Stormwater Detention System (OSD)
B - On-site Retention System or absorption system (OSA)
C - "Charged" system
D - Mechanical Pump-out System
E - Scour and erosion control system/devices
F - Rainwater Re-use System
G - Sediment Pond
H - Water Sensitive Urban Design (WSUD)

* Where additional impervious area increase of building or structure is 50sqm or more.
** Where additional impervious area increase of building or structure is 40sqm or more
*** Geotechnical Investigation is required to support OSA design if more than 50sqm is to drain into the OSA
+ OSD is not required if all stormwater collected from impervious areas can be disposed by OSA
++ To drain basement or sub-floor areas only

Nuisance Overland Flooding to Low-Lying Habitable Floors and Basement Areas

SWM6 Gutter Capacity - Where the proposed development will result in the exposure of low lying habitable floors or basements including sub-floor areas, garages and low level car parking areas to potential ingress of surface runoff, the determination of the street gutter capacity based on the peak runoff for the 100-year ARI storm event will be required. This is to ensure that the likelihood of surface runoff from the street entering the proposed low lying areas does not occur.

SWM7 Flood Protection – For all low lying habitable floors or basements including sub-floor areas, garages and low level car parking areas, following determination of the 100-year ARI design storm and gutter capacity, if it is found that there is potential for surface stormwater to enter into the property or minimum free boards cannot be achieved, it will be necessary to introduce a crest in the driveway ramp, or relocate the basement entry to a location where it is not vulnerable to water ingress , or install flood gates or raise floor levels to provide adequate free board protection.

Overland Flow and Flood Studies

SWM8 Gutter Capacity - Where the proposal has the potential to obstruct natural flow paths, encroach over stormwater drainage easements, is a proposed driveway into a basement or sub-floor area, or the area proposed for development is potentially flood affected, an overland stormwater flow assessment or flood study will be required.

SWM9 Design Storm - The design storm to be used to determine the flowrate for the overland flow assessment or flood study shall be the peak 100-year ARI storm event. Design guidelines are given in Section ***Stormwater Drainage Design***.

On-site Stormwater Detention Systems

General

OSD1 Runoff Control - On-site Stormwater Detention (OSD) systems are to be implemented to control the rate of runoff from development sites and subdivisions to limit or reduce the rate of runoff to existing conditions or better.

OSD2 Alternative Methods - Alternative methods of stormwater control may be used but are merit based and would only be permitted if OSD is found to be of no benefit in attenuating flows and reducing the peak discharge downstream.

Exemptions

OSD3 Exemptions - OSD will be applied to the developments types as listed in the table under the Section ***Controls***. Exemption from OSD would only apply in the following situations:

- The proposal is a residential development consisting of only alterations and additions to an existing dwelling where the additional increase in impervious area does not exceed 50sqm outside the footprint of the existing building and the land naturally falls towards the property street frontage with direct access to a formed public road/street.
- The development consists of improvements only to the existing building such as a second floor extension or internal refurbishments, which are wholly confined within the footprint of the existing building.
- The development is located within a known flood affected area or subject to tidal influence. This does not include areas where it is affected by nuisance flooding caused by inadequate capacity of the drainage system. Council should be consulted on this matter for further clarification.
- The runoff from the development is directly discharged into one of the bays or waterways and does not pass through any public drainage system (e.g. piped conduit, dish drain, open channels, kerb and gutter, public reserve, public roadway etc.) or that downstream properties could be adversely affected by the discharge from the development site.
- An alternative method of stormwater disposal is applied such as an on-site absorption system, which fully caters for the site's runoff.

Site Storage Requirement and Permissible Site Discharge

OSD4 Catchment Based Method - The Catchment Based Method for determining the Site Storage Requirement (SSR) and Permissible Site Discharge (PSD) is to be used to size OSD systems for all development types except demolition works. The hydrological Site Based Method (ILSAX or DRAINS) is only to be used if more than 30% of the site cannot be routed through the OSD system.

OSD5 Design Parameters - OSD design parameters are as follows:

- Site Storage Requirement (SSR) is 200cum per hectare.
- Permissible Site Discharge (PSD) is 180L/s per hectare.

OSD6 Area for Calculating Volume and Discharge – For the Catchment Based Method, the area to be used in calculating the OSD volume (SSR) and discharge (PSD) shall be based on the total site area.

For the hydrological Site Based Method, the PSD shall be calculated on a 0% pre-development site impervious area during the peak 5 year ARI storm event or 25L/s (which-ever is the smaller value in the case of discharge to the kerb) and the volume shall be sized on the basis of reducing the fully developed (post-development) site discharge for the peak 100 year ARI storm event back to the PSD.

OSD7 Alterations and Additions - In the case of development type 2, where the proposed alterations and additions are to be completely separated from the existing building/s and represent less than 10% of the total site area, then the SSR and PSD can be determined from the proposed footprint of the additions only.

OSD8 Maximum Site Discharge - The maximum discharge from the site must not be greater than the calculated PSD. This would include both piped and uncontrolled flows. That is, the total outflow from the site must not exceed the PSD.

OSD9 Concentrated Discharge - If the discharge from the development is to be concentrated at a single point (e.g. to the kerb and gutter) in the road reserve or public land, the maximum concentrated discharge is limited to 25L/s per 15 lineal metre of frontage, for all storm events.

Rainwater Re-use deductions

OSD10 Rainwater Re-use Deductions - Rainwater re-use volume can be deducted from the calculated SSR only if the rainwater re-use volume has been obtained from the BASIX Certificate. A maximum of 50% reduction is allowed. The PSD shall be retained for all controlled outflows.

Orifice controls

OSD11 Orifice Types - Orifice is to be a circular shaped hole drilled in a flat plate made from a stainless steel plate of 3mm thick and 200mm x 200mm minimum dimension. The orifice shall be formed to a circular square edged cut (circular hole is to be pre-drilled into the plate) and the plate permanently fixed to an oversized conduit or pipe stub if the hole is greater than 100mm.

OSD12 Permanent Fixture of Orifice - Dyna bolts or equivalent are to be used to permanently fix orifice plates. For orifice stubs/pipes, the fixture is to be such that tampering and removal is minimised.

OSD13 Minimum Orifice Diameter - For orifice plates, the size of the orifice must not be less than 50mm in diameter to avoid blockages.

OSD14 Orifice equation - The orifice equation to be used is:
$Q = C.A.\sqrt{(2.g.h)}$
Where
D = diameter of orifice = $\sqrt{(4.A/\pi)}$ in metres
A = area of orifice hole in square metres
π = pi = 3.1416 (dimensionless)
g = acceleration due to gravity = 9.81 m/s^2
C = orifice coefficient (dimensionless). Ref table
h = depth of water to centre of orifice in metres

OSD15 Orifice Coefficient - Orifice coefficients are given in table below.

Orifice Type	Discharge Coefficient
Stainless steel flat plate with circular hole	0.6
Pipe stub 100mm long	0.8

High Early Discharge (HED) Control

OSD16 HED Control Pit Type - The control pit in the OSD system must be a "High Early Discharge" (HED) arrangement for the Catchment Based Method.

OSD17 Non HED Control Pit Type - If a HED control configuration is not used, then an additional 20% volume must be added to the basic storage (SSR) for the Catchment Based Method.

Tail-water influence

OSD18 Orifice Control - The centre-line of the orifice must be higher than the water level at the point of connection into the existing receiving drainage system otherwise a "drowned orifice" or downstream control occurs.

OSD19 Drowned Orifice - Where a "drowned orifice" occurs, supporting hydraulic calculations will need to be submitted to ensure that there is no loss in storage volume as a result.

OSD20 Control Types - Adopted water control levels are given in table below.

Discharge point	Water level to be adopted
Kerb and Gutter	At the top of kerb
Pipe outlet or culvert	Top of conduit if super-critical flow or "free outlet"
	Depth as calculated if sub-critical flow
Pit	150mm above top of pit
Open channel	Depth as calculated
Waterway or Bay	Depth at High Tide

Site area to be routed through OSD

OSD21 Area to be routed through OSD System - The majority of the site runoff must be routed through the OSD facility.

A maximum of 30% of the site is permitted to bypass the OSD system if the Catchment Based Method is to be used. The 30% bypass must not be made up of more than 50% of the site's impervious areas.

For the Site Based Method, a maximum of 50% of the site is permitted to bypass the OSD system. This must be made up of at least 80% of the site's impervious areas.

OSD22 Adjustment of Volume and PSD due to Bypass for the Catchment Based Method.

For a bypass of 30% of total site area, an additional 20% increase in the calculated SSR volume shall be applied and the PSD shall be reduced by 20%. Proportional increase of the basic volume and reduction of the PSD shall apply between 0% and 30% bypass.

Trash screens

OSD23 Purpose - A rustproof screen or cage is to be used to protect the outlet from potential blockages.

OSD24 Removable - The screen or cage must be removable for ease of maintenance and inspections.

OSD25 Material - The screen or cage is to be made from Lysaght's maxi-mesh RH3030 or similar material.

OSD26 Minimum Surface Area - The minimum surface area of the screen is to be 50 times the area of the orifice outlet.

OSD27 Location - The screen or cage shall completely protect the outlet. It is to be located at a distance 1.5 times the orifice diameter or 200mm away, whichever is the greater.

OSD28 Orientation - Where possible, the main incoming line is to flow across the face of the mesh.

OSD29 Lifting Handle - The screen or cage shall include a lifting handle for ease of removal for inspection and maintenance.

Minimum requirements for underground OSD systems

OSD30 Purpose - Underground OSD systems shall be designed and located to attenuate and safely control stormwater runoff from the site to the public road gutter or receiving drainage system.

OSD31 Overland Flow path - Where likely overflow from the OSD facilities pass through private property and a controlled and safe overland flow path cannot be provided, the overflow is to be fully contained within an underground piped drainage system with a design capacity equivalent to the peak 100-year ARI storm event.

OSD32 Location - Underground OSD systems must be located external to all building footprints. This includes basements, ground floor parking areas, garages, or patios unless all access points and emergency overflow provisions are external to the structure.

Underground OSD systems must be located outside the root zones of trees that are to be retained.

Underground OSD systems must be located in areas which will not impede existing overland flow paths, or cause concentration or diversion of stormwater into public or private property/s resulting in the undermining of existing structures or services or jeopardising public safety or cause public nuisance.

Where underground OSD systems are located under soft landscaped areas, it must have a minimum topsoil cover of not less than 600mm over the tank.

Underground OSD systems are to be located where they can be easily accessible for inspections and routine cleaning.

In this regard, for development types 4a, 5, 6 and 7, the following requirements must be met:

- The underground OSD facility must be located in common areas and not in private courtyards
- The location of the underground OSD system is such as to ensure that the facility is located where easy unimpeded access is possible for routine inspections and maintenance requirements. It needs to be accessible for third party inspectors including Council

OSD33 Provision of Formal Surcharge Path - A formal surcharge path must be provided even when the 100-year ARI flows can be fully catered for by the system, to account for pipe blockages and higher intensity storms.

OSD34 Easements - Easements must be created over private property/s for pipe systems and surcharge paths through adjoining property/s.

OSD35 Structural Adequacy - Underground OSD systems are to be designed to be structurally sound and able to adequately withstand all service loads.

OSD36 Adequate Soundproofing - Underground OSD systems must be adequately soundproofed to minimise noise when stormwater is collected or discharged.

OSD37 Drainage of Base - The base of the OSD system must be graded to drain completely. Permanent water ponding in the tank encourages insect infestation and will not be acceptable. The base of the structure is to have a minimum longitudinal gradient of 0.7% to the outlet.

OSD38 Material - Underground OSD systems must be constructed from reinforced concrete, pre-fabricated material or proprietary system/s approved by Council. Atlantis units or similar type systems are not to be used for detention storage due to reduced storage and difficulties with maintenance and inspections.

OSD39 Inspection Access - Underground OSD systems must have at least one (1) inspection access opening over the outlet. This inspection point must be a minimum 600mm x 600mm in dimension.

For ease of maintenance at least one (1) additional access at the extreme corner of the tank must be provided.

Additional access or flushing points shall be provided for irregular shaped structures to allow for easier access for routine cleaning and maintenance.

Underground OSD systems must have additional access points at distances of not less than 5000mm.

Where the tank is less than 500mm in clearance height, gratings over the tank must be installed which cover at least 30% of the surface area of the structure.

OSD40 Confined Spaces - Underground OSD systems must comply with ***AS2865 Safe Working in a Confined Space*** and be appropriately designed to eliminate gas build-up.

OSD41 Steps - Underground OSD systems must have step irons when the depth exceeds 1200mm.

Minimum requirements for above-ground OSD systems in landscaped areas

OSD42 General - Above-ground OSD systems include areas where detention storage is provided in soft and hard landscaped area and above ground storage structures such as rainwater tanks.

OSD43 Purpose - As with Underground OSD systems, above-ground OSD systems are to be designed to collect, attenuate and safely control all stormwater runoff from the site to the public road gutter or drainage system.

OSD44 Overland Flow path - Where likely overflow from these OSD facilities is across private property and a suitable overflow path cannot be provided then the overflow shall be contained within an underground piped drainage system with a design capacity equivalent to the peak 100-year ARI storm event. This underground system (both pits and pipes) shall be designed to receive and fully contain controlled flows and overflows from the OSD facility.

OSD45 Location - Above-ground OSD systems must be located external to all building footprints, basements, ground floor parking areas, garages, or patios unless access points and emergency overflow provisions are either provided externally or are easy to get to for the purpose of inspections and maintenance to the system.

Above-ground OSD systems must not be located across the boundary/s of allotment/s.

Above-ground OSD systems must not be located such as to restrict pedestrian access from the public road to the building.

Where above-ground structures such as rainwater tanks are to be used, they must be located in an area least visually obtrusive and in compliance with Councils other planning requirements.

Above-ground OSD systems must be located where they can be easily accessible for inspections and routine cleaning. In this regard, for development types 4a, 5, 6 and 7, the following requirements must be met:

- The OSD facility must be located in common areas and not in private courtyards
- The location of the OSD system is such as to ensure that the facility is located where easy unimpeded access is possible for routine inspections and maintenance requirements

OSD46 Provision of Formal Surcharge Path - A formal surcharge path must be provided even when the 100-year ARI design flow is fully accommodated within the piped system to account for greater storm intensities and blockages.

OSD47 Easements - Formal easements must be created on private property for pipe systems and surcharge paths.

OSD48 Adequate Soundproofing - Above-ground OSD systems must be adequately soundproofed to minimise noise when stormwater is collected or discharged.

OSD49 Adequate Waterproofing - The barrier around the perimeter of the OSD storage area must be constructed of masonry type material or a fully waterproof (prefabricated) material or equivalent.

OSD50 Accessibility of Control Structures - Control structures must be located where they can be easily accessible for routine inspections and cleaning.

OSD51 Drainage of OSD Base - The base of above-ground OSD systems must be graded to drain completely. In soft landscaped areas, the gradient of the base must not be less than 1.0%.

OSD52 Subsoil Drainages - To avoid ground saturation in soft landscaped areas, subsoil drains shall be installed where gradients are less than 1.0%.

OSD53 Good Design - Above-ground OSD systems must be designed in a manner which minimises inconvenience, unsightliness and hazard and is compatible with the proposed development in terms of functionality and purpose.

OSD54 Maximum Ponding Depths - Above-ground OSD systems must not allow water to pond more than 200mm in tennis court areas and other hard paved surface areas.

Above-ground OSD systems may be allowed to pond more than 300mm in soft landscaped areas, provided that the following parameters are satisfied:

- Restricted access is enforced
- Embankment batter slopes are greater than 1 in 4
- OSD basin is fully fenced off with approved pool fencing and childproof, self-closing gates with batter slopes into the basin, around its perimeter, not to exceed 1 in 6
- The maximum depth of ponding in landscaped areas must not exceed 1200mm, regardless of other restrictive measures implemented

Minimum requirements for above-ground OSD systems in driveways and car parking areas

OSD55 Purpose - These OSD systems must be designed and located to collect, attenuate and safely control stormwater runoff from the site to the public road gutter or drainage system.

OSD56 Overland Flow path - Where likely overflow from these OSD facilities is across private property and a suitable overflow path cannot be provided, the overflow shall be contained within an underground piped drainage system with a design capacity equivalent to the peak 100-year ARI storm event. This underground system (both pits and pipes) shall be designed to receive and fully contain controlled flows and overflows from the OSD facility.

OSD57 Location - These above-ground OSD systems must be located external to all building footprints. This includes basements, ground floor parking areas, garages, or patios unless all access points and emergency overflow provisions are external to the structure.

These above-ground OSD systems must not be located such as to restrict pedestrian access from the public road to the building.

Control structures must be located where they can be easily accessible for routine inspections and cleaning.

OSD58 Provision of Formal Surcharge Path - A formal surcharge path must be provided even where the 100-year ARI design flow is fully accommodated within the piped system to cater for greater storm intensities and blockages.

OSD59 Drainage of Base - To avoid localised ponding within the detention area, the base of the OSD system must be graded to drain completely, with gradients not less than 0.5% in concrete paved areas or similar and 0.7% in bitumen surfaced areas.

OSD60 Good Design - These above-ground OSD systems must be designed in a manner which minimises inconvenience, unsightliness and hazard and is compatible with the proposed development in terms of functionality and purpose.

OSD61 Adequate Waterproofing - These above-ground OSD systems must be totally impermeable unless permeable pavement has been designed as a function provided any water penetration will not affect adjoining buildings, structures and the like.

OSD62 Maximum Ponding Depths - Water is not permitted to pond more than 200mm in depth for all storm intensities, in these above-ground OSD systems.

Overland Flows and Flow Paths

OSD63 Existing and Natural Overland Flow paths- Existing and natural overland flow paths for surface stormwater are to be maintained whenever possible.

Overland flows or surface runoff collected from the site or passing through the site from upstream property/s is not permitted to be concentrated and channelled onto adjoining property/s.

OSD64 Concentration of Overland Flow paths - Where surface runoff or overland flows become concentrated, they will need to be safely re-directed to the street or to the site's OSD facility.

OSD65 Diversion of Surface Runoff or Overland Flows to OSD System - Where concentrated surface runoff or overland flows are to be controlled through the OSD facility, the OSD system must be designed to cater for any additional inflow.

OSD66 Emergency Overland Flow path - To cater for unexpected blockages in the OSD system or additional runoff in excess of the design storm, provision must be made for an emergency flow path from the OSD system to the street such as installing overflow weirs or spillways. The width of overflow weirs shall not exceed more than 2000mm across any property frontage.

OSD67 Designated Flow paths - Any likely overflow from these facilities must be fully contained within designated flow paths and must be conveyed safely to the nearest public road reserve or waterway.

Designated flow paths shall be designed for the peak 100-year ARI storm event. Open channels, kerbs, pits and pipes may be used to contain runoff within the flow path.

Freeboard

OSD68 Definition - Freeboard refers to the clearance distance between the maximum water level and the surface level of habitable floors and garage floors.

OSD69 Adequate Freeboard - Adequate freeboard or clearance distance between the maximum depth of ponding in the detention system and the finished floor level of all habitable areas, garages, storage facilities, etc., are to be provided so that damage to goods and materials, nuisance flooding, or hazard is avoided.

OSD70 Minimum Freeboard - The minimum freeboard requirements for OSD pondage are tabled below.

Maximum water level in (A)	Finished floor level (B)	Minimum Freeboard between (A) and (B)
Detention facility	Warehouse	150mm
Detention facility	Factory	150mm
Detention facility	Garage	150mm
Detention facility	Carport	150mm
Detention facility	Office space	300mm
Detention facility	Habitable rooms	300mm
Detention facility	Living rooms	300mm
Detention facility	Retail space	300mm
Detention facility	Store rooms	300mm
Detention facility	Show rooms	300mm

***Important Note:** Refer to Clause **SW25** and the Flooding Control Section of Council's **Development Control Plan** for freeboard requirements in flood prone land.

All proposed developments are generally prohibited in known flood areas, flood ways and flood zones unless it can be demonstrated that a fail safe emergency evacuation route can be provided for occupants and that the proposed development will not cause an increase of the flood waters both upstream and downstream of the proposed development.

Council's Stormwater Policy is for the removal of such flood affected developments from known flood ways and the prohibition of future developments in such floodways, wherever possible, to protect life and amenity.

Discharge Points

OSD71 Maximum Concentrated Stormwater Runoff - The maximum concentrated stormwater runoff allowed to be discharged to the kerb and gutter at any single point is 25L/s even if the permissible site discharge exceeds this rate.

If more than 25L/s must be discharged, the following alternatives may be considered:

- Alternative 1 - Discharge made directly to the nearest Council piped drainage system, or to an approved piped drainage system or lay a new pipe and pit system to connect into the existing drainage infrastructure. This new line shall be designed and installed to Council's standards and will become a public system. Note: Approval under Section 138 of the Roads Act 1997 will be required
- Alternative 2 - The detention system is upsized (where on-site detention is required) to accept additional flows such as to limit the outflow to 25 L/s
- Alternative 3 - If there is sufficient property frontage width to enable split flows to the kerb at a minimum distance of 15 metres apart between kerb outlets
- Alternative 4 - Discharge directly into a watercourse or channel or to a stormwater channel or to the Bay, subject to joint approval from Council and other relevant governing authority. Adequate protection against scour and erosion at the point of discharge must be provided

OSD72 Maximum Discharge Velocity - The maximum discharge velocity into an unlined, that is, other than concrete channel shall be in accordance with the Department of Sustainable Natural Resources document ***Managing Urban Stormwater, Soils and Construction***, table 5.1 maximum discharge flow velocities in waterways.

OSD73 Approval for Connection into Existing Council Piped Drainage System - Connection into an existing Council piped drainage system may be permitted subject to Council approval.

OSD74 Construction of New Piped System - If direct connection outside of the property frontage cannot be obtained, for example, the nearest piped system is more than 10 metres or one property frontage away (whichever is the smaller distance), this will require the construction of new inlet pits and the laying of a new pipeline, to Council standards, to connect into the existing line. Minimum Council design standards are given in Section under ***Stormwater Drainage Systems***.

OSD75 Minimum Drainage Infrastructure - Council encourages minimising the number of pits, junctions and pipe lengths in the road reserve. However, pits are preferable over bend joins to eliminate blind junctions such that ease of maintenance can be achieved.

OSD76 Private Stormwater Drainage System - Any private stormwater pipe leaving the site, must be laid at an angle of not less than 45 degrees to the front boundary line. If the pipe needs to be laid at a more acute angle or must run parallel with the kerb line in order to achieve gravity discharge to the kerb or connection into an under-ground system, then it must be taken to the kerb at 45 degrees and then a minimum 375-dia RCP is to be laid parallel to the kerb line connecting into the nearest downstream underground public drainage system. Standard gully inlet pits with minimum 1.2 metre long kerb lintels (subject to required inlet capacities) will need to be constructed at all bends, junctions and minimum distances between pits as described in ***Australian Rainfall and Runoff, volume 1***.

OSD77 Equivalent Conduit Sizes - Conduits laid to the kerb face must be sized to cope with the design flow and with at least 50mm cover. Where cover is inadequate, the following pipe equivalencies shall be used:

- 100mm-dia equivalent to one (1) 100mm x 100mm x 6mm thick RHS
- 150mm-dia equivalent to one (1) 200mm x 100mm x 6mm thick RHS
- 225mm-dia equivalent to two (2) 200mm x 100mm x 6mm thick RHS

OSD78 Outlets through Sandstone Kerbing - Outlets laid through existing sandstone kerbing will require drilling through sandstone kerb subject to Council approval.

OSD79 Pipe Class - The pipe class must be adequate to withstand proposed traffic loads.

OSD80 Rectangular Hollow Sections - All Rectangular Hollow Sections (RHS) are to be hot-dipped galvanised or stainless steel material.

Discharge to Different Catchment

OSD81 Gravity Drainage - Stormwater is to be drained in the same direction as the natural fall of the land by gravity means.

OSD82 Diversion of Stormwater to Different Catchment - Diverting stormwater runoff from one catchment (or sub-catchment) to another catchment (or sub-catchment) is generally prohibited.

OSD83 Approval for Drainage to Different Catchment - Approval for drainage "against the natural fall of the land" is only permitted in the following circumstances:

- Adjacent downstream property owner/s have indicated that they are not prepared to grant easement/s to permit the drainage of the low lying property to follow the natural fall of the land. Proof of genuine attempt at easement acquisition in the form of correspondence will be required
- An assessment of the receiving drainage system confirms that it can adequately cope with the additional runoff proposed to be discharged

OSD84 Drainage "Against Fall of Land" - Where drainage "against the fall of the land" is permitted, On-site stormwater Detention will be required, regardless of the development type. The volume and discharge is to be calculated on the area being directed to the outlet.

OSD85 Low-Lying Property Drainage - For low lying properties, on-site absorption (OSA) may be used for the disposal of runoff from on-ground paved or roof areas that are unable to be collected and taken to the street frontage.

Legal Obligations

OSD86 Positive Covenant and Restriction on the Use of Land – All OSD facilities other than those located in single residential dwellings and type – 2 alteration & additions developments will require a Positive Covenant and Restriction on the use of land, in favour of the City of Canada Bay Council on the Title.

OSD87 Purpose of Positive Covenant - The purpose of the Covenant is to ensure that the registered proprietor of the land is made aware and takes responsibility for the control, care and maintenance of the OSD system.

OSD88 The Purpose of Restriction on the Use of Land - The purpose of the Restriction ensures that the system cannot be altered in any manner, shape or form.

OSD89 Newly Created Allotments - For newly created parcels of land, these terms shall be created under Section 88B of the Conveyancing Act 1919.

OSD90 Existing Land - For existing titles, the terms of Positive Covenant and Restriction on the use of land shall be created by an application to the Land Titles Office using Forms 13PC and 13RPA.

OSD91 Standard Wording - Standard wording for Positive Covenant and Restriction on the use of

land are given in the Appendix.

On-site Stormwater Absorption Systems

General

OSA1 Application - On-site stormwater absorption (OSA) systems may be used for disposal of the site's stormwater runoff. Refer to the Section under ***Controls*** for when it can be applied.

OSA systems can be used to dispose of stormwater on the site subject to the suitability of soil conditions and site constraints. Typical OSA systems include rubble drains, rubble trenches, and on-ground infiltration systems.

OSA can be used as an alternative method of stormwater disposal for 'low lying' properties where an easement through adjoining downstream properties cannot be obtained.

Design Principles

OSA2 Standard Design Methodology - The OSA system shall be appropriately sized, based on the area to be captured, using the methodology as given in the following table:

Total Impervious Area to be captured (sqm)	OSA Design Methodology*
≤ 50	Standard trench detail - 'Jumbo 410' type or equivalent material (refer to Appendix). The trench length is to be 4 metres for every 25sqm of catchment (hard stand, roof) area draining to it.
>50	Geotechnical Report to be prepared by a Geotechnical Engineer. Trench area and volume calculated from soil infiltration rate and Report recommendations. Mass Curve Method can be used.

***Important Note:** Design Constraints apply

OSA3 Location - OSA systems are to be located in 'soft' landscape areas, such as in the garden and vegetated on-ground areas. In 'hard' landscape areas, the use of porous pavement (pervious paving) is preferred.

Absorption systems shall not be located under or over any sewer service without Sydney Water approval.

Absorption systems are not to be located in rock (most non-sedimentary rocks and some sedimentary rocks such as shale) which has zero or near-zero permeability. Where rock is encountered, the base of any proposed gravel filled trench shall be set at least 500mm above the rock.

OSA systems are not permitted in shallow soil over bedrock.

Absorption trenches must follow the line of contours.

OSA4 Access - For routine inspections and maintenance, an access chamber is to be provided at either end of the OSA system.

OSA5 Water Sensitive Urban Design (WSUD) - OSA systems may be used in combination with WSUD systems and integrated as part of its performance principals.

OSA6 Design Storm Event - Runoff generated from the development must be fully catered for by the absorption system, for all storm events up to and including the 100-yr ARI storm event.

OSA7 Soil Type - Soils to be used for OSA systems **must not** be predominantly loose aeolian sands or clay soils.

Suitable soils must have a uniform thickness of at least 3.0 metres.

A soil assessment and permeability test is required from a qualified Geotechnical Engineer where runoff is collected from an area greater than 50sqm.

Suitable soils must have hydraulic conductivity values greater than 1×10^{-6} m/s and the minimum absorption rate to be adopted shall be limited to 1.0 L/sqm per second irrespective of the absorption rate achieved by any

geotechnical testing.

OSA8 Minimum Clearance from Structures and Buildings - Clearance distance between all buildings, footings, structures and downstream boundaries are to be at least 3.0 metres from the proposed OSA system.

Minimum clearances are not to be reduced without a supporting Geotechnical Report.

The minimum clearance distance between sewer mains and the proposed absorption system is to be at least 1.0 metre unless approved by Sydney Water. Where clearance between buildings or structures to the OSA system cannot be provided, the structure is to be supported on a pier and beam system to a minimum 300mm below the base of the OSA system, which must be certified by a Structural Engineer.

OSA9 Steep Sites - Absorption systems will not be permitted on 'steep' sites with slopes greater than 5%, unless there is a supporting Geotechnical Report.

OSA10 High Water Table - Absorption systems will not be permitted where there is the presence of a high water table or the location of the OSA system would likely cause the water table to rise.

Where a high water table is encountered, the base of any proposed gravel filled trench shall be set at least 500mm above the water table.

OSA11 Sediment Traps and Trash Screens - Runoff directed into the OSA system must pass through an approved silt trap and filter system to remove all debris, silts, sands, etc. prior to absorption.

OSA12 Dispersion System - To ensure any overflows from the OSA system are not concentrated onto adjoining downstream properties, a dispersion system shall be provided at the overflow outlet.

Charged Systems

General

CH1 Application - 'Charged Systems' refers to a network of sealed or watertight stormwater drainage pipes which convey stormwater under constant pressure, requiring sufficient hydraulic head to move water.

Where a site naturally falls to the rear and the property is not benefited by any stormwater drainage easement and following unsuccessful attempts at obtaining a drainage easement and other drainage disposal methods such as OSA, have been found to be inappropriate for the site, then charged systems may be considered, to convey stormwater to the street frontage. Refer to Section ***Controls***, for when it can be applied.

Charged systems are generally not to be used if a gravity feed system is available to dispose of stormwater off the site to the nearest downstream Council drainage system.

Important Note: Charged systems are only permitted when used in combination with rainwater re-use facilities.

CH2 Permissibility - Charged systems may only be used if:

- Genuine attempt at easement acquisition has been undertaken and the downstream property owner/s have indicated that they are not prepared to grant easement/s to permit the drainage of the property to follow the natural fall of the land - written evidence is to be submitted as proof
- The soil absorption characteristics and other physical constraints indicate that an OSA system is not feasible to cater for the development. A Geotechnical Report, indicating that the soil has very poor absorption rate, may be submitted as proof
- The existing street drainage system and gutter capacity must have sufficient capacity to cope with the additional runoff and not result in nuisance or flooding to 'low level' property/s. A check of the gutter capacity is required to

ensure stormwater does not overtop the kerb into low lying property/s

Design Principles

CH3 Permissible Site Discharge - The rate of runoff discharged to the street must not exceed the Permissible Site Discharge (PSD) calculated from Section ***On-site Stormwater Detention Systems***.

The PSD is 180L/s per ha and calculated only on the area being discharged/directed to the outlet.

CH4 Combination of OSD, OSA and Charged Systems - The design of a charged system may be used in combination with an OSD and/or OSA system to minimise the runoff to the street.

CH5 Watertight System - Charged lines may be taken directly from the roof gutter to the street and must be fully watertight.

CH6 Rainwater Re-use Overflows - Overflows from the rainwater re-use system are to be drained to the external drainage system, OSD or OSA system if these have been designed to accommodate the runoff.

CH7 Directing runoff to the street - If the charged system is to be directly taken to the street, details and supporting calculations need to be provided showing that sufficient pressure head can be generated to direct flows to the street.

CH8 Outflows from OSD systems under pressure -Outflows from OSD systems are generally to be by gravity feed ('free outlet' control). However, 'drowned outlets' may be permitted if supporting calculations can be provided showing that sufficient pressure head can be generated to direct flows to the street via a charged system and that the permissible discharge for the site can be maintained. A suitable hydrological program such as DRAINS can be used to model such situations.

CH9 Design Storm Event - The charged drainage system including roof gutters pipes and pits is to be designed for the 1 in 100-year ARI storm event.

CH10 Minimum Height of Pressure Head - The minimum height difference between the roof gutter level and the discharge pit must be at least 2.0 metres unless supporting calculations showing a hydraulic grade line for the 1 in 100-year ARI storm event indicates that the system can drain to the street with a 300mm free board to the gutter line.

CH11 Gravity Feed to Street - The charged line must discharge to a sump within the property boundary and then gravity fed to the street or receiving drainage system.

Where gravity feed to the street is not achievable, a non-return valve must be installed over the inlet pipe to the sump.

CH12 Location of Surcharge Pits - Surcharge pits are to be located such that any likely overflow is safely directed to the street or away from structures and buildings.

CH13 Minimum Pipe Sizes for Pressure Application - Pipes must be minimum 150mm-dia in size for pressure applications and solvent welded unless hydraulic calculations support that a smaller pipe can be used. Pipes less than 80mm-dia will not be acceptable.

CH14 Cleaning Eyes - Cleaning eyes within a sump must be installed at the lowest point in the system.

CH15 Gutter Guards - Gutter guards are to be installed to minimise debris entering the charged system.

Mechanical Pump-out Systems

General

MP1 Application - Mechanical pumps are to be used generally to convey sub-surface, or seepage water in a basement (sub-floor) area or to drain minor surface runoff collected from weather exposed areas (e.g. vehicular ramp) of less than 50m^2 or 100m^2 for development Types 5, 6 and 7.

MP2 Pumping of Stormwater - The pumping out of stormwater runoff in general is only permitted if:

- Gravity drainage cannot be achieved
- Genuine attempt at easement acquisition has been undertaken and the downstream property owner/s have indicated that they are not prepared to grant easement/s to permit the drainage of the property to follow the natural fall of the land - written evidence is to be submitted as proof.
- A 'charged system' cannot be installed because it does not satisfy Charged System Design Principles
- An OSA system cannot be installed because it does not satisfy OSA Design Principles
- There is no possibility of nuisance or flooding or damage to adjoining buildings and structures in the event of pump failure.
- The capacity of the receiving drainage system or kerb/gutter is capable of carrying/containing the flows. Council may request for gutter or system capacity calculations to support the proposal.

MP3 Disposal of Sub-surface Water – Because it is a relatively constant source that promotes algal growth and constant wetness, draining of sub-surface water, whether by pumping or by gravity; either directly or indirectly, to the kerb is not permitted except by way of a controlled release specifically and separately approved under Section 138.1(d) of the Roads Act 1993. Generally it is preferable to connect such sources to the nearest public underground drainage system. If that is not feasible and a thorough investigation has exhausted all acceptable alternatives then Council will consider an application for controlled release to the kerb.

Alternative methods of seepage water disposal and controlled release parameters are given in Section ***Subsurface Water***.

MP4 Where Council determines that mechanical pump out system (subsurface inflow or surface runoff) can negatively impact on the Council's infrastructure assets or is likely to cause nuisance flooding to adjacent properties, the applicant/the owner will need to adopt one or more the requirements below;

- Extension of the existing drainage system to enable a direct connection to underground drainage system.
- Acquisition of drainage easement to drain the subject property towards the fall of the land.

Design Principles

MP5 Minimum requirements for Mechanical Pump-out Systems - The minimum requirements for mechanical pump-out systems for stormwater apply as follows:

- The pump-out system shall consist of two (2) mechanical pumps, connected in parallel, with each pump being capable of emptying the holding tank at a rate equal to the peak 100-year ARI, 5 minute duration storm event. Any subsurface inflow rate during wet weather determined by an approved test procedure or estimated value is to be included
- The mechanical pump must be capable of draining the surface runoff collected from weather exposed areas of not less than $50m^2$ or $100m^2$ for Types 5, 6 and 7
- The capacity of the holding tank shall be calculated as above the level at which all pumps are automatically brought into operation
- The minimum capacity (volume) of the holding tank well shall be adequately sized in accordance with **AS/NZS3500.3.2 - 1998, National Plumbing and Drainage, Part 3.2: Stormwater drainage - acceptable solutions**, but based on the 100-year ARI, 5 hours design storm.
- A silt trap shall be provided on the inlet side of the holding tank
- The rising main from the pump system shall be designed and installed in accordance with the pump manufacturer's specification
- The rising main from the pump system shall discharge to a stilling sump within the property boundary and then gravity fed to the underground receiving drainage system or to an OSD system if the OSD system is piped to an underground receiving drainage system
- A one-way valve is to be installed on the rising main outlet. The stilling sump is to be located such that any likely overflow is safely directed to the street and away from adjoining buildings and structures
- The switching of the pumps shall be arranged so that they operate alternately
- The pumps shall be provided with automatic level switches so that they operate simultaneously should the capacity of the tank be exceeded
- An automatic alarm system shall be provided to warn of failure of any part of the pump system
- The alarm shall have visual indicators and an audible alarm siren
- A rechargeable battery back-up system for the alarm is to be provided in the event of power failure

Legal Obligations

MP6 Positive Covenant and Restriction on the Use of Land - Mechanical pump-out systems regardless of whether or not used as OSD systems shall require the creation of a Positive Covenant and Restriction on the Use of Land affixed to the title requiring the owner of the property to maintain the system, not tamper with the system and indemnifying Council against liability in respect of any damage sustained as a result of the failure of the pump system and damage to neighbouring property or any other cause not in Council's control, and providing for regular inspection by the proprietor. Refer to Section **On-site Stormwater Detention Systems**, Section under **Legal Obligations**.

Scouring, Erosion and Water Quality Control

General

SC1 Application - Where discharge of stormwater is to a natural watercourse, into bushland/ reserve, property or water way, adequate controls are required to protect these adjoining properties, bushland, roadways and receiving waters from erosion and degradation due to pollution, silt laden stormwater runoff and/or high concentration of runoff.

SC2 Scour and Erosion Control Devices - Notwithstanding other stormwater controls that may be required such as OSD (flow attenuating devices) or OSA, appropriate scour and erosion control devices are to be installed at the outflow to the system.

Minimum Requirements

SC3 Application - The installation of scour and erosion control devices and other stormwater management measures are required as follows:

- Appropriate scour protection devices installed at all outlets to stormwater conduits
- Additional installation of pollution control devices at the source, on-line*, off-line or at the end of the line to control sediment laden overland stormwater flows
- Stormwater management measures shall not be located on-line in water courses or within riparian zones or areas of remnant native vegetation
- Where the volume of runoff is considered high, it may be appropriate to include an OSD (for sites larger than 1200 sqm) and/or OSA system/s to reduce runoff into the receiving waterway
- The type of available control or treatment required for each development type that drains directly into a natural watercourse, bushland/ reserve, or water way are tabled below:

Development Type	Control Type
1	E*
2, 3, 4, 4a, 6, 8	A, B, E*, F, H
5, 7	A, B, E*, F, G*, H

Key:

Development Type

1 - Demolition only
2 - Alterations and additions
3 - New dwelling with existing footpath along frontage
4 - New dwelling with no existing footpath
4a - Dual occupancy, town homes etc.
5 - Residential Flat Building (RFB), commercial and mixed developments
6 - Development under SEPP Housing for Senior Citizens or People with a Disability
7 - Substantial development
8 - Sub-division of one into two allotments

Water Quality Treatment System

A - On-site Stormwater Detention System (OSD)
B - On-site Retention System or Absorption System (OSA)
C - "Charged" System
D - Mechanical Pump-out System
E - Scour and Erosion Control System/Devices
F - Rainwater Re-use System
G - Sediment Pond/Water Quality Device
H - Water Sensitive Urban Design (WSUD)
* denotes mandatory requirement

SC4 Pollutant Load to be Retained - Water quality treatment systems or pollution control devices such as sediment ponds where required to be installed are to ensure the following pollutant loads are retained on the site:

Pollutant Type	Percentage Retention of Post-development Loads
Total suspended solids (TSS)	80%
Total phosphorus (TP)	45%
Total Nitrogen (TN)	45%
Gross Litter	All Litter - 70% Material (>50mm) - 70%

SC5 Monitoring Water Quality - Water quality treatment systems or pollution control devices are to be installed and monitored regularly to ensure that they achieve their treatment objectives and that their performance meets the above criteria. If they fail to meet these targets, or if so required by the Appropriate Regulatory Authority (ARA), it shall be modified to achieve them and the system upgraded.

SC6 Ease of Maintenance - Water quality treatment systems or pollution control devices are to be designed to ensure ease of maintenance.

SC7 Scour Protection - Scour protection devices shall include embankment stabilisation e.g. rock walls, concrete aprons, gabions, turfing, jute mesh, energy dissipating units, or other more appropriate erosion control devices approved by Council. Preference is for 'soft engineering' solutions.

SC8 Control Devices near Creeks - Stormwater pollution control devices may not be appropriate within or adjacent to creek locations. In this regard, The Department of Planning and NSW Fisheries shall be contacted for advice about suitable erosion control measures here.

SC9 First Flush - Stormwater pollution control devices to remove pollutants during the 'first flush', shall be installed within the site. These include proprietary items such as Humeceptors or CDS units, silt and grease arrestors. Installation of these devices shall be in accordance with the manufacturer's specification.

SC10 Large Scale Control Devices - Other sediment control devices such as stilling basins and constructed wetlands shall be required for large-scale or substantial developments. These include land and community title subdivisions. Design of these devices shall be in accordance with the ***Managing Urban Stormwater, Soils and Construction Manual*** issued by the NSW Department of Housing.

SC11 Silt Traps - Silt traps are to be installed in all stormwater pits to contain silt and debris. Silt traps shall be installed at the bottom of pits at a depth of 200mm to capture silts and fines. Weep holes shall be drilled into the base of the pit to ensure that it does not permanently hold water and create a breeding ground for insects. Where the pit is located over impervious material, a 100mm layer of gravel bedding with subsoil drains will also need to be laid.

Soil and Water Management

SC12 Soil and Water Management Plan - A soil and water management plan is required for all development types, except for minor developments, for example extension to an existing dwelling of less than 50sqm.

Minimum guidelines shall be in accordance with the ***Managing Urban Stormwater, Soils and Construction Manua***l by the NSW Department of Housing, August 1998.

SC13 Installation and Maintenance - All sediment control devices are to be installed prior to any commencement of clearing and earthworks on the site. Ongoing maintenance of these devices during construction will be required.

SC14 Maintenance Schedule - For large scale developments, residential flat buildings and mixed used developments, a maintenance schedule is to be kept on site to ensure that the devices are cleaned on a regular basis.

Rainwater Re-use

General

RR1 Application - Notwithstanding BASIX water conservation targets, the collection of rainwater for non-potable use is encouraged. Non-potable water usage shall include watering of the garden, irrigation, washing machine and toilet flushing.

Minimum Requirements

RR2 BASIX Certificate Requirements - Rainwater re-use shall be provided in accordance with BASIX Certificate requirements.

BASIX is a web-based planning tool designed and developed by Department of Planning in association with other government agencies and utilities to assess the water and energy efficiency of new residential developments.

The NSW Government introduced BASIX into the development approval system on 1 July 2004.

RR3 Rainwater Re-use - Part of BASIX requires the installation of rainwater re-use facilities. The volume of storage required depends on the size of the dwelling, the number of amenities and other site factors. Further details can be obtained at www.basix.nsw.gov.au.

RR4 Council's Rainwater Re-use Volume - Council requires a minimum volume of 3,000L for residential developments (Development Types 2 and 3 only) and 5,000L for the other developments (Development Types 4a, 5, 6, and 7).

RR5 Minimum Rainwater Re-use Volume to be provided - The minimum re-use volume to be provided shall be the greater of the volume determined from the BASIX Certificate and Council's minimum Rainwater Re-use volume.

Additional storage is also encouraged but is subject to Council's planning requirements.

RR6 Submission of a Development Application - Where it is proposed to install a rainwater tank only, a Development Application (DA) would need to be lodged if the volume of the proposed rainwater tank exceeds 10,000 L. No DA would be required if the proposed rainwater re-use volume is less than 10,000 L or if the rainwater harvesting proposal forms part of a DA for Development Types 2, 3, 4, 4a, 5, 6 and 7.

On-site Stormwater Detention Offset

RR7 Exemption from OSD - The provision of a rainwater re-use system does not negate the requirements for OSD, if required, as stipulated in Section ***On-site Detention System, Controls***.

RR8 Reduction of OSD from Rainwater Re-use - The calculated basic OSD storage volume (ref. Section ***On-site Detention System***) can be reduced by a portion of the rainwater re-use volume as calculated from the BASIX Certificate or Council's Rainwater Re-use volume.

A maximum of fifty percent (50%) of the required volume (BASIX Certificate minimum volume or Council's Rainwater Re-use volume) can be deducted from the basic OSD calculated site storage volume. Additional storage deduction or volume beyond what has been determined from the BASIX Certificate or Council's Rainwater volume **will not be permitted**.

The re-use volume shall be deducted from the calculated OSD volume by straight subtraction of the volumes.

The permissible site discharge (PSD) is not required to be adjusted.

RR9 Dual Usage - Dual usage for both OSD and re-use in the same tank is permitted. However it must be noted that stormwater collected for re-use must not include runoff collected from on-ground areas, balconies and sub-floor areas (sub-surface water). Only stormwater collected from roof areas can be stored for re-use.

RR10 Permitted Use - Rainwater collected for re-use is classified as non-potable and is only permitted for use in the flushing of toilets, laundry clothes washing, irrigation systems including watering the garden and must not be used for human consumption in accordance with Sydney Water guidelines.

RR11 When designing dual-purpose tanks, consideration must be made for the collection of rainwater from the site, noting that OSD control generally applies to the total site area but stormwater collected for the re-use component can only be collected from the roof of dwellings. A dual-purpose OSD/re-use system that collects only rainwater from the roof may result in much of the stormwater from the site area to bypass the OSD system. Therefore the design must take into consideration of the majority of the site's runoff, especially the roofed and impervious areas, to ensure that it can be controlled through the OSD system.

Stormwater Drainage Design

General

SW1 Application - This Section provides the minimum design guidelines for both private and public stormwater drainage systems.

Stormwater drainage systems referred to herewith are the systems which are designed to convey stormwater runoff. This includes property drainage, street drainage (both piped and surface flow paths), and trunk drainage (larger conduits, open channels) and receiving waters (rivers, creeks, groundwater storage, sea and ocean).

SW2 Purpose - Stormwater drainage systems are to be designed to collect and convey stormwater runoff from a site to a receiving waterway with minimal nuisance, danger to life or damage to properties.

Minimum Requirements

SW3 Australian Rainfall and Runoff Handbook - Stormwater drainage systems shall be designed in accordance with the Australian Rainfall and Runoff Handbook utilising the "major" and "minor" system design criteria.

SW4 Gravity Drainage - Stormwater runoff shall be conveyed to follow the natural fall of the land, by gravity means, wherever possible. The design of "Charged Systems" is not covered in this Section. Charged systems are not acceptable for public drainage systems.

SW5 Re-directing Stormwater - Re-directing stormwater runoff from one catchment (or sub-catchment) to another catchment (or sub-catchment) is generally prohibited.

SW6 Public Drainage systems - Public stormwater drainage systems must be designed as gravity systems. For private stormwater drainage systems, an alternative to gravity drainage will only be considered where easement acquisition is unsuccessful and on-site disposal such as OSA is not possible.

SW7 Minimising the Quantity and Improving the Quality of Stormwater Runoff - Stormwater quantity and quality (pollutants) shall be minimised by designing the system with the following criteria:

- Have adequate sub-surface drainage to provide protection to structures, and prevent long term water ponding
- Have adequate inlets to collect and convey surface stormwater runoff to prevent water from entering buildings or damage structures, minimise nuisance and danger to persons and vehicular traffic, prevent long term surface water ponding, prevent erosion, and protect adjoining and downstream properties from any adverse impacts as a result of stormwater runoff from proposed developments
- Include a system of overland flowpaths, where possible, to provide fail-safe protection to buildings, structures, adjoining and downstream properties in the event of pipe blockage or storm events that generate greater runoff than the capacity of the piped drainage system
- Include sediment and silt traps and trash screens strategically located in catch drains and inlet pits to capture pollutants
- This can be achieved by:
  - The construction of surface flow routes to convey floodwaters away from private and public properties and, in flood prone land, the velocity and depth of flows are controlled to an acceptable level.
  - The provision of surface flow routes and piped drainage systems to direct/control frequent runoff, so that convenience and safety for pedestrians and vehicle traffic can be provided.
  - The provision of both piped drainage and surface flowpaths for new developments, re-developments and new subdivisions.
  - The installation of water quality control devices such as gross pollutant traps, stilling basins, baskets and the like to collect pollutants present in the stormwater runoff.

Minor and Major System Design

SW8 "Dual Drainage" System - The method of stormwater drainage design used to size pipe networks and trunk drainage systems to convey stormwater runoff to the receiving water is known as the "dual drainage" system approach or minor/ major design concept, as described in the Australia Rainfall and Runoff Handbook. This method has been adopted by Council and a summary of the design criteria are set out below.

Minor System Design

SW9 Definition - The gutter and pipe network capable of conveying stormwater runoff during minor storm events is known as the "minor system".

SW10 Widths of Flows - When designing the minor system, adequate inlet pits are to be installed such that the maximum gutter flow widths shall not exceed the lesser of 2.5 metres or one-quarter of the road carriageway width.

Wider flow widths may be accepted on roads whose cross-sectional gradients are less than 1.0%. This is subject to Council approval.

For private stormwater drainage systems, the minor system must be capable of capturing or containing the runoff produced from the average rainfall recurrence interval as stipulated in ***SW21 Average Recurrence Interval for Public Drainage Systems***.

SW11 Minimum Conduit Size - The minimum conduit sizes for the minor system design shall be as follows:

- Public system - pipes, 375mm-dia
- Public system - box culverts, 600mm wide x 450mm high
- Private system - pipes, 90mm-dia for roof runoff only
- Private system - pipes, 100mm-dia for surface runoff within the property only
- Roads - pipes, 375mm-dia
- Roads - conduits, equivalency to 375mm-dia

SW12 Minimum Pipe Gradient - The minimum pipe gradient shall be as follows:

- For pipes less than or equal to 225mm-dia: 3%
- For pipes greater than 225mm-dia: 1.0%
- For concrete lined box culverts poured in-situ: 0.5%

SW13 Anchor Blocks - Pipes which are to be laid at a slope greater than 20% will require anchor blocks at the top and bottom of the section and at intervals of not more than 3.0 metres in between. Bulkheads shall be provided on steep gradients where soil instability is likely. To retain backfill material, bulkheads shall be installed at intervals of not more than 5.0 metres.

SW14 Pipe Material and Jointing Type - Type of pipe material and jointing to be used for the minor system design shall be as follows:

- Public system - reinforced or fibre reinforced concrete*, rubber ring jointed
- Private system - up to 300mm-dia uPVC, solvent welded joints; 300mm-dia and larger reinforced or fibre reinforced concrete*, rubber ring jointed

SW15 Alternative Material - Subject to Council approval, other types of material such as plastic pipes may be used for larger conduits, if it can be demonstrated that the substitute material has the same, if not better, structural and durability qualities when compared to reinforced concrete.

SW16 Depth of Cover - Depth of cover to the conduit obvert shall be as follows:

- Public system not subject to vehicle loads - 450mm
- Pubic system subject to vehicle loads - 600mm
- Private system not subject to vehicle loads - 300mm
- Private system subject to vehicle loads - 600mm

SW17 Less than Minimum Cover - If it is not practical to provide for the minimum cover requirements specified above, then at least 50mm thick granular overlay shall be provided over the obvert of the conduit with a 150mm thick reinforced concrete slab constructed over it or conduit is to be mass concrete surrounded.

SW18 Pipe Class - The appropriate class of pipe to be used shall depend on the minimum cover provided and the loading onto the pipe in accordance with ***AS3725 - 1989, loads on buried concrete pipes***.

SW19 Design Velocity of Flows - Design velocity of flows shall be as follows:

- Conduits - 0.6 m/s minimum, 6.0m/s maximum
- Surface flow - 2.0m/s maximum

Where these values are exceeded, appropriate erosion control and scour protection measures are to be provided at the outlet.

SW20 Maximum Depth of Flows - Maximum permitted depth of surface flow shall be:

- Road carriageway, driveways, footpaths and carparks - 150mm
- Landscaped areas - 300mm

SW21 Average Recurrence Interval for Public Systems - The average recurrence interval to be adopted for the design of the public drainage system is tabulated below:

Location	ARI (years)
Local Roads	10
Collector roads	10
Sub-arterial roads	10
Arterial roads	20
State roads	50
Access to emergency facilities	100
At a depression (low point) in road	100
Public system passing through private property	100

SW22 Average Recurrence Interval for Private Systems - The average recurrence interval to be adopted for private drainage systems (minor system design) is tabulated below:

Location	ARI* (years)
Residential - low density	10
Residential - medium to high density	20
Commercial	50
Industrial	50
Hospitals and Emergency Facilities	100

*** Important Note:** The underground drainage system (includes pipes, conduits and pits) is to be designed for the 1 in 100-year ARI where major system flows (e.g. along a drainage easement) are likely to surcharge across private property or cause localised flooding. A surcharge path must also be provided to safely convey surface stormwater across private property within easements. The minimum design ARI for surcharge paths shall be the 1 in 100-years.

Major System Design

SW23 Definition - The "major system" comprises the drainage route, which conveys the runoff for the major storm events. This may be a series of trunk drainage systems and overland surface routes including open channels, creeks, and river systems.

SW24 Provision of Overland Flow Routes - Overland flow routes are to be provided at the following locations:

- Within the road carriageway excluding footpaths and the footway reserve. Flows across footpaths will only be permitted where this will not cause flooding to property or create danger to pedestrians and is subject to Council approval
- Within drainage easements. Where it is not practical to provide an overland flow route over the easement, the piped drainage system shall be sized to accept the runoff for the major storm event i.e. the 100-year ARI
- Within a known and designated floodway
- Within creeks and river systems.

SW25 Minimum Freeboard Requirement for Flood Prone Land - Freeboard can vary according to parameters such as the size of the upstream catchment, the local terrain, the difference between the 1% AEP (Annual Exceedance Probability) level and the PMF (Probable Maximum Flood) level and the proposed use.

In some cases the determination of an appropriate freeboard will be best done on the merits of the individual case through the Development Application process. However the minimum freeboard requirement unless overridden by a Flood Study, Draft Flood Study, Floodplain Risk Management Study, Floodplain Risk Management Plan or the DCP (Development Control Plan) shall be as follows:

Freeboard requirements above 1% AEP water surface level				
	Maximum Water Level in (A)			
Finished Floor Level (B)	Adopted Flood planning area	Overland flow path identified by Council as "Minor"	Overland flow paths other than ones identified by Council as "Minor	Mainstream flooding
Residential – Habitable rooms	As per the adopted Plan	300mm	500mm	500mm
Residential – Non-habitable rooms	As per the adopted Plan	300mm	300mm	500mm
Commercial or Industrial – All internal areas	As per the adopted Plan	300mm	500mm	500mm
Carport open on 3 or 4 sides (At Ground Level)	As per the adopted Plan	150mm*	150mm	300mm
Entrance to Basement	As per the adopted Plan	300mm*	Difference between the 100-yr ARI Level and the PMF Level	Difference between the 100-yr ARI Level and the PMF Level
Critical Infrastructure	As per the adopted Plan	300mm	Difference between the 100-yr ARI Level and the PMF Level	Difference between the 100-yr ARI Level and the PMF Level

* **Note**: At Council's discretion, may be reduced

SW26 Design Velocities and Depths of Flow - Design velocities and depths of surface flows shall be in accordance with Figures G1 and G2 of the ***New South Wales Government Floodplain Management Manual: The management of flood liable land***, with hazard category classed as "low hazard".

SW27 Average Recurrence Interval - The average recurrence interval to be adopted for the major system design is tabulated below:

Location	ARI (years)
Private	100
Public	100

Catchment Area

SW28 Definition - The catchment area is defined by the limits from where surface runoff will make its way, either by man-made or natural paths, to the point of exit.

Catchment Runoff

SW29 Catchment Runoff - Catchment runoff shall be determined using a suitable hydrological method depending on the level of accuracy required and the extent and shape of the catchment. Limitations of each method are given in the Australian Rainfall & Runoff Handbook.

SW30 Determination of Catchment Runoff - Catchment runoff is to be calculated using the following methods:

Method	Application
Rational Method	For catchments areas < 1200 sqm
Hydrological Method	For catchment areas > 1200 sqm

SW31 Rational Method Approach - The Rational Method for the estimation of peak flows will be acceptable for small catchments. This method is best suited to catchments with uniform slope and roughness characteristics and where the level of accuracy is not critical. This would include site discharge calculations and roof runoff.

SW32 Hydrological Computer Model Approach - The use of hydrological computer models is best suited to medium to large catchments and where a reasonable level of accuracy is required.

Acceptable computer models include ILSAX, DRAINS, RAFTS and RORB.

SW33 Impervious Areas - The impervious area percentages to be adopted for determining runoff are tabulated as follows:

Public System (trunk drainage)	
Location	**Percentage**
Residential Areas	80
Commercial	100
Road Reserves	80

Private System (inter-allotment drainage)	
Location	**Percentage**
Road Reserves	80
Residential Single	80
Residential Medium Density	90
Residential High Density	100
Industrial	100
Commercial	100

SW34 Roughness coefficients - Roughness Coefficients are to be used to calculate free surface flow.

For the purpose of determining stormwater runoff into open channels and free surface hydraulics, Manning's roughness coefficients shall be used. Typical values are given in appendix and the Australian Rainfall and Runoff Handbook.

For sections with composite roughness values, Horton's Equation may be used to convert to an equivalent roughness value for simplicity in calculations.

Horton's Equation is given as:
$n = \{\Sigma (Pi.ni^{3/2}) / \Sigma Pi \}^{2/3}$

Where ni = is the Manning's Roughness Coefficient for section i and
Pi = is the wetted perimeter or length of the section with a roughness value ni

Hydraulic Grade Line

SW35 Analysis - Hydraulic grade line calculations are to be performed in accordance with the ***Australian Rainfall and Runoff***, and shall be undertaken by a qualified person with experience in hydrology and hydraulic design.

SW36 Full Hydraulic Calculations - Full hydraulic calculations must be submitted for all public and major piped systems (375mm-dia and larger), drainage lines through easements and flood assessment to ascertain flood levels or where Council deems it necessary to determine the feasibility of the proposal.

SW37 Reduction of Losses - Drainage lines shall be designed with minimal bends to avoid bend losses. Where this is unavoidable, junction pits shall be provided at the location of bends or changes in direction.

SW38 Avoidance of Chokes - Pipes will not be permitted to be laid such that a larger pipe joins into a smaller pipe downstream, to avoid potential chokes in the system. However, this may be unavoidable when the new line is connected into an existing system. In this circumstance, the starting hydraulic control shall be adopted at the ground level at the point of connection.

SW39 Water Surface Profiles – For determination of flood profiles and surface drainage systems (e.g. channels, open drains and the like), hydraulic calculations are to include determination of water surface profiles and backwater effect using suitable computer models such as DRAINS and HEC-RAS.

SW40 Frictional Losses - Frictional losses in closed conduits of circular shaped cross-section (e.g. pipes), shall be determined using the Darcy-Weisbach Formula. This Formula may be applied to rectangular sections (e.g. box culverts), by converting the product of the area and hydraulic radius to the power of two-thirds (A.R2/3) to an equivalent circular section.

SW41 Colebrook-White Roughness Values - Colebrook-White roughness parameters used for pipes are as tabulated:

Conduit Material	K value (mm)
uPVC pipe	0.03
Reinforced concrete pipe	0.06
Fibre reinforced concrete pipe	0.06

SW42 Pit Energy Losses - Pit energy losses and pressure changes at junctions, bends, transition structures, slope junctions, inlet pits, junction pits, drops and outlets must be considered in the hydraulic assessment.

Pressure head coefficients for determining these "head losses" are to be obtained from the following sources:

- Missouri Charts
- Hare Equations
- U S Corp of Engineers mitre bend charts
- AR&R 1987 Handbook or later editions

SW43 Downstream Hydraulic Controls - The following downstream water surface level or controls are to be adopted:

- Where the hydraulic grade line level downstream of the proposed works, including the upstream pit losses at the starting pit is known (corresponding to the design storm recurrence interval as adopted), this level is to be used
- Where the downstream starting point is at a pit and its hydraulic grade line is unknown, a level of 150mm below the surface level of this pit is to be adopted
- Where the outlet is to an open channel, the water surface level is to be determined using Manning's Equation or an appropriate hydraulic model. The water level shall be adopted as the normal depth calculated using an appropriate method, or the top of the outlet pipe, whichever is the greater
- Where the outlet is to an open channel, and downstream flood levels are known, the water surface level to be adopted shall be the 1% AEP flood level

- Where the outlet is affected by tidal or wave action, the resulting tide water level shall be adopted
- Where the outlet is to an existing pipe or conduit, the hydraulic grade line of the conduit shall be determined downstream to a pit where its water level is known (e.g. at a grate in the gutter where the maximum free surface ponding is at the top of kerb)
- Where the outlet is at the invert of the k erb, the water surface level shall be adopted at the top of the kerb

Stormwater Drainage Pits

SW44 Pit Types - Standard Council kerb inlet pits with kerb lintel openings, junction pits and letter box type pits are to be installed for all public drainage systems. Pits for private drainage systems are to be inlet and junction pit types with grates or solid covers.

SW45 Material - Public drainage pits are to be precast concrete, fibre reinforced concrete or insitu poured concrete.

Private drainage pits may be constructed from pre-fabricated high density poly-plastic of appropriate load class as specified by the Manufacturer.

The bases of pits shall be concrete benched to minimise hydraulic losses.

Pits constructed of brick or blockwork will not be acceptable unless they are designed and constructed to withstand structural loading and fully waterproofed to prevent leakage.

SW46 Minimum Dimensions - Minimum internal dimensions of pits are tabulated below:

Pit Type	Dimension (mm)
Kerb Inlet with Lintel and Grate	600 x 900
Inlet Pits in Landscaped Areas	600 x 600
Junction Pits	600 x 600
Private Grated Inlet Pit < 1.2m deep	300 x 300
Private Grated Inlet Pit > 1.2m deep	450 x 450
Private Junction Pit < 1.2m deep	300 x 300
Private Junction Pit > 1.2m deep	450 x 450

SW47 Private Stormwater Drainage Pit Location - Private pits are to be located wholly within property boundaries. If any private pit is required to be located external to the property, then it shall be constructed to a public standard and becomes the property of Council.

SW48 Grates - Grates over public pits are to be galvanised and hinged to frame. Private pits may have grates made from pre-fabricated high density poly-plastic of appropriate load class as specified by Manufacturer.

SW49 Load Class of Grates and Covers - Stormwater drainage pit grates and covers shall be provided to support the required load classification at the following locations:

Location	Load Class Required*
Driveways including access handles	Heavy Duty
Car parks	Heavy Duty
Road Carriageways	Heavy Duty
Footways	Heavy Duty
Reserve, landscaped areas with pedestrian traffic only	Medium Duty
Reserve, landscaped areas with no traffic	Light Duty

*** Important Note**: Light duty is equivalent to 1 tonne wheel load, medium duty is equivalent to 3.5 tonne wheel load and heavy duty is equivalent to 9 tonne wheel load.

All public grates shall be hinged to frame and lockable.

Private grates are to be hinged to frame and lockable where it is designed to surcharge or where upwelling is likely.

SW50 Liftable Lids - All lids over pits must be liftable for routine inspections and maintenance.

SW51 Junction Pits - Junction pits are not to be designed as pressurised systems.

SW52 Step Irons - Where pits are 1.2 metres or greater in depth, step irons in accordance with ***AS1657*** are to be provided to one side of the pit wall to allow access for inspections and cleaning.

SW53 Letterbox Type Pits - Letterbox type pits may be used for collection of surface water. However, they are not permitted at or near kerb locations where there is likely pedestrian and/or vehicular traffic. In these locations, pits with butterfly type grates flush with the surrounding ground level are preferred.

SW54 Lintels - Lintels over kerb openings shall be provided at the kerb side with the opening length dependent on its design capture rate, but not less than 1.2 metres and not greater than 4.0 metres.

SW55 Pit Locations - Stormwater drainage inlet pits shall be positioned at the following locations:

- Spaced such that the gutter flow width is limited to 2.5 metres maximum width for the minor system design.
- Located at the upstream side of allotments to minimise runoff flowing across the road.
- Located at sag points and at road depressions.
- Located where access for inspections and maintenance is readily available.
- Provided at changes in direction, grade, conduit level, size, or class of conduit.
- Provided at junctions.
- Spaced at a distance of no greater than 50 metres apart.

SW56 Inlet Capacities - The inlet capacity of pits shall be determined in accordance with the Australian Rainfall and Runoff Handbook.

Inlet capacities are to be restricted with the following blockage factors:

Location	Inlet Type	Capacity Allowed (%)
sag	side entry only	80
sag	grate only	80
sag	combination	100 side 0 grate
sag	letterbox	50
on-grade	side entry only	80
on-grade	grate only	50
on-grade	combination	80

Open Channels

SW57 Preferences - Piped drainage systems are preferred over open channel systems.

Open channels will only be permitted if they form part of the major drainage system and where permitted, shall be designed to have smooth transitions, with adequate access provisions available for inspections, general maintenance and adequate safety measures installed to protect persons and vehicles.

These include perimeter fences, bollards, and grills over outlet pipes. Step irons shall be installed and flow velocities and depths are to be reduced at nominated access points.

SW58 Design - Open channels shall be designed in accordance with the Australian Rainfall and Runoff Handbook and the NSW Government Floodplain Management Manual and must be able to contain the major system runoff. Open channels shall be designed to avoid hydraulic jumps or generate supercritical flow conditions. Side slopes must not exceed 1 in 3, unless fully fenced off.

Wherever possible, low flows shall be contained within a piped system or contained within a concrete lined channel at the invert of the channel.

SW59 Manning's Roughness Coefficient – Manning's roughness coefficients for open channel sections applicable to specific channel types can be obtained from the Australian Rainfall and Runoff Handbook.

Typical values are given below:

Surface Finish	n value
Concrete pipes or box sections	0.012
Concrete trowel finish	0.015
Concrete formed without finishing	0.016
Sprayed concrete, granite	0.018
Bitumen, smooth finish	0.016
Bricks or pavers	0.016
Pitchers or dressed stone in mortar	0.016
Rubble masonry or random stone in mortar	0.028
Rock lining or rip-rap	0.028
Earth, clean	0.027
Corrugated metal	0.027
Earth, weed and gravel	0.022
Rock cut	0.028
Short grass	0.033
Long grass	0.035
Medium to dense brush	0.150

Building Adjacent to Stormwater Drainage Systems

SW60 Location of Structural Supports - Where structural supports such as foundations, piers, and footings are to be located adjacent to the drainage system, they are to be located outside of the drainage easement and must not load bear onto the underlying drainage structure. In general, where a drainage structure is parallel or adjacent to foundations, piers or footings, the base of the footing shall be located outside the influence zone created by an angle of 45 degrees to the horizontal extended from the invert of the drainage structure.

Stormwater Connections

SW61 Under Buildings - shall be carried out in accordance with ***AS/NZS3500.3, Section 3***.

SW62 Above ground pipe work - Shall be carried out in accordance with ***AS/NZS3500.3, Section 6*** and this Document.

Non-return valves are not permitted to be installed in Council maintained (public) systems.

SW63 Connection Detail - If the ratio of the private pipe size to the Council (public) pipe size is more than one third, a standard stormwater gully pit at the connection point, will be required.

Avoid Conflict with Utility Services

SW64 General - Care shall be taken to ensure that the proposed stormwater drainage system will not conflict with utility services. In this regard, all utility services shall be located prior to final drainage system design. Stormwater drainage conduits crossing over or under sewer lines must be laid in accordance with Sydney Water requirements. This may require support trenching and concrete encasement of sections that traverse the utility.

SW65 Location of Drainage Lines in Road Reserve - Public drainage lines laid in the road reserve, shall be located under the kerb line or within the road carriageway, to avoid conflict with the utility services in the footway.

For private drainage lines which must cross the footway reserve, they shall be laid across the footway perpendicular to or at a maximum angle of 45 degrees to the kerb face to minimise conflict with services.

Easements

SW66 Requirement - Where the site grades to the rear, the creation of formal drainage easements will be necessary. Evidence in the form of a Legal Agreement between affected parties or copies of titles showing the creation or intention to create easements must be provided to Council in support of the Development Application. This is essential for DA approval. Where easements cannot be negotiated, signed documents by all affected parties or acceptable documentation provided as evidence shall be submitted to support the case for alternative solutions.

Easements shall be required over constructed public drainage systems within private properties, to **ensure** that Council has full rights of access to such drainage systems for the purpose of inspection, maintenance or upgrade.

Stormwater drainage easements shall be required over all private inter-allotment drainage lines.

Stormwater drainage easements will not be required within or over natural drainage systems such as creeks and watercourses.

Council does not favour or encourage the piping, construction within or over, or interference with natural drainage systems. Any proposal to carry out such works will be subject to an assessment pursuant to other relevant Council policies and joint approval from other relevant authorities.

SW67 Easement Acquisition - Council will take the opportunity to acquire drainage easements over existing constructed public drainage systems within private property whenever a development occurs by Condition of Consent.

When a developer, property owner or Council proposes to relocate or reconstruct a public drainage system within the site, a drainage easement in Council's favour must be created to suit the relocated or reconstructed drainage system at the cost to the developer.

A sub-division **will not** be approved where a formal drainage easement cannot be provided to drain a newly created allotment in the same direction as the natural fall of the land.

SW68 Prohibition of Building over Easements - Any construction of buildings or other permanent structures over a public drainage easement is not permitted.

Easements allow Council reasonable access for the purpose of construction, maintenance and upgrade of the stormwater drainage system.

Encroachments impede or re-direct overland flows away from the easement, and may load bear onto the underlying drainage structure.

Council may require the relocation of an existing pipe to avoid encroachment. Where encroachment is necessary to achieve reasonable development, then the conduit and easement may be relocated subject to Council approval.

SW69 Load bearing Structures adjacent to Drainage Easements - Any structural support such as footings and piers will only be permitted to be located adjacent to an easement if they do not load bear onto the underlying drainage structure, and that the built structure will not be undermined by any future maintenance work necessary within the easement.

SW70 Planting of Significant Trees - The planting of trees or large shrubs, particularly those with extensive root systems will not be permitted in or within proximity of drainage easements.

SW71 Construction over Public Drainage Easements - Construction over a public drainage easement is generally prohibited. Public drainage easements must be free of all encroachments with a minimum vertical clearance from the surface/ground level over the drainage structure to a height of 5.0 metres above.

Paved surfaces over the public drainage easement are permitted provided that construction joints along each longitudinal edge of the easement are installed to facilitate access to the drainage structure.

SW72 Public Easement Widths - Public easement width shall be a minimum width equal to the external width of the conduit plus 1.0 metre, rounded to the nearest 0.1 metre.

Inter-allotment Drainage

SW73 Application - Inter-allotment drainage shall be provided for property/s that does not drain directly to its street frontage by gravity means, or directly by gravity means to an existing stormwater drainage system (public or legally private) or by gravity means to a natural watercourse.

Easements shall be created over all inter-allotment drainage systems on private property/s in favour of all upstream properties to be benefited by it.

SW74 Inter-allotment Easement Widths – Inter-allotment easement widths (private) shall be a minimum width equal to the external width of the conduit plus 300mm. However these widths may be varied where there are site constraints.

SW75 Sizing of Inter-allotment Drainage Systems - Inter-allotment conduits shall be sized on the total site area of the benefitted allotments with a minimum impervious area as given in Section ***Impervious Areas***.

SW76 Material - Inter-allotment drainage pits and pipes shall be of reinforced concrete, fibre reinforced concrete or uPVC material. All pipes/conduits are to be rubber ring jointed or solvent welded as specified by the manufacturer and in accordance with ***AS4058***, ***AS4139*** and ***AS1254*** respectively.

Subsurface Water

SW77 Definition - Subsurface or groundwater is water held in the soil or in pores and crevices in rock and is generally present behind basement walls or subfloor areas which are below the natural ground level.

SW78 Minimum Information to be Provided – Where a proposal is for the installation of a basement or below ground area or the development will require cutting into the existing ground level, a Geotechnical Report must be submitted to Council for assessment. This Report shall detail an investigation of subsurface conditions including groundwater levels, the likelihood or indication of a high water table or seepage water, the soil type encountered and the soil infiltration rate.

SW79 Disposal – Generally subsurface water is collected by sub-soil drainage pipes and collected in a holding tank which is either pumped or gravity fed into an approved disposal point. Subsurface water is not permitted to be discharged to the kerb either directly or indirectly except in a controlled manner specifically approved by Council under **S138.1(d) of the Roads Act 1993** (refer ***SW80*** below). It must be drained directly into an underground public drainage system or other disposal point approved by Council.

SW80 Direct Connection into an Underground Public Drainage System – This is the preferred method of subsurface water disposal. The subsurface water is conveyed across the public footway by gravity means and drained into the nearest public underground piped drainage system.

A junction pit is to be installed within the property boundary with a non-return valve on the upstream pipe to prevent water back flowing into the site.

If there is no existing underground drainage system in the vicinity of the source, a new underground (piped) drainage system shall be installed and connected into the nearest downstream underground drainage system. The new drainage system other than the line that crosses the footway shall be designed to a public drainage system standard and shall become part of the public drainage system.

SW81 On-site Disposal of Subsurface Water – Subsurface water may be disposed of via on-site absorption in combination with a level spreader. However, this is subject to the same constraints as for the disposal of stormwater runoff from an On-site Stormwater Absorption (OSA) system design.

OSA may not be suitable where a high water table exists or for low lying properties or sites which have limited space for disposal.

SW82 Waterproofing Subfloor Areas – Basement walls and subfloor areas may be waterproofed to minimise the collection of seepage water, in particular where Type 2 acid sulphate soils or high water tables are encountered.

Water proofing has its limitations and subsoil water ingress may still exist as there would be high pore pressures exerted on the walls and floors of the “tanked” structure. Pore pressures and floatation forces mean these types of structures require specialized design and certification by a Qualified Structural Engineer.

SW83 High Water Table – In the case of a high water table, the draw down effect of the water table when subsurface water is collected and disposed would necessitate a statement from a Geotechnical Engineer that nearby structures will not be affected by the development. It may be necessary to obtain licence for the drawing down of groundwater from the Department of Primary Industries.

SW84 Controlled Disposal – If all alternative acceptable solutions have been exhausted, Council will consider separate specific approval of controlled release to the kerb under **Section 138.1(d) of the Roads Act**. In this circumstance subsurface water may be disposed to the kerb and gutter in a controlled rate, period and duration. This will necessitate the following:

- Provision of a sump or holding tank which can store collected seepage water for a minimum duration of 24 hours.
- The soil infiltration rate shall be determined by geotechnical investigation but shall not be less than 0.001 L/s per m^2.
- The holding tank shall be sized for the collected seepage water based on the area of exposed wall to the soil. For example, for typical double garage and an infiltration rate of 0.001 L/s per sqm and a wall height of 2.4m with subsoil drainage install around its perimeter say 25m long, the volume of the holding tank required will be 2.4 x 25 x (0.001/1000) x 24 x 60 x 60 = 5.2 cum or 5200 L required. Note this is in addition to the volume required for collected stormwater from weather exposed areas.
- Dual pumps to be installed and shall be designed to operate to discharge a maximum of 5L/s and restricted to pumping between 11pm and 3am only.

Stormwater Pollution and Erosion Control

Soil and Water Management

SPE1 Soil and Water Management Plan - A soil and water management plan shall be submitted and must be approved by Council prior to the commencement of any construction or demolition activity.

SPE2 Guidelines - Guidelines shall be in accordance with the ***Managing Urban Stormwater, Soils and Construction Manual, NSW Department of Housing*** or later editions.

SPE3 Sediment Control Devices - All sediment control devices are to be installed prior to any commencement of clearing and earthworks on the site. Ongoing maintenance of these devices during construction will be required.

A maintenance schedule is to be provided with the Soil and Water Management Plan for large scale developments and works within public land.

SPE4 Soil Erosion Control - Soil erosion control is required to protect adjoining properties, bushland, roadways and receiving waters from degradation due to silt laden stormwater runoff as a result of development and/or concentration of runoff. Soil erosion control shall be provided as follows:

- Appropriate scour protection installed at the outlet to stormwater conduits, and
- Installation of pollution control devices at the source, on-line, off-line or at the end of the line to control sediment laden overland stormwater flows.

SPE5 Scour Protection Devices - Scour protection devices shall include embankment stabilisation e.g. rock walls, concrete aprons, gabions, turf, jute mesh, energy dissipating units, or other more appropriate erosion control devices approved by Council.

Please note that some types of scour protection devices may be inappropriate along certain creek locations.

SPE6 Silt and Sediment Control - Silt and Sediment Control devices are required as part of a development to remove pollutants during the "first flush".

These units shall be installed on line or within the site and may include proprietary items such as “Humeceptor” devices or CDS units, silt and grease arrestors approved by Council. Installation of these devices shall be in accordance with the manufacturer's specification.

Other sediment control devices such as stilling basins and constructed wetlands shall be required for large-scale developments and include land and community title subdivisions.

Design of these devices shall be in accordance with the ***Managing Urban Stormwater, Soils and Construction Manual, NSW Department of Housing, August 1998*** or later editions.

Integrated Developments

SPE7 Part 3A Permit for Development near Water Bodies - Any development within 40m of a water body such as a stream, creek, lagoon, or river may require a Part 3a Permit under the Department of Lands Guidelines and The Rivers and Foreshores Improvement Act 1948.

Water Sensitive Urban Design

Objectives

WSUD1 Principles of Water Sensitive Urban Design - All developments are encouraged to implement the principles of Water Sensitive Urban Design (WSUD) in order to minimise the impact of the development on the water cycle and achieve more sustainable forms of urban development.

WSUD2 Aim of WSUD - The aim of WSUD is to integrate stormwater management systems into the landscape component of the site in a manner that provides benefits that incorporate stormwater detention, retention, re-use and water efficiency whilst addressing issues such as nuisance flooding, protection from pollution of the receiving waterways and groundwater and improving visual amenity.

Design Principles

WSUD3 How Design Principles are achieved - In addition to those control systems already identified in ***Stormwater Management*** such as On-site Stormwater Detention, infiltration or absorption systems and rainwater harvesting, the aim of WSUD is to combine these options together with the proposed landscaping to achieve integration rather than relying on 'end of pipe' devices prior to discharge. These are achieved by:

- Operating practices and technologies which would prevent contamination of stormwater
- Locate the development such as to minimise disturbance of the natural drainage system
- Minimise impervious surfaces and encouraging soft landscaping to promote infiltration and reduce stormwater runoff
- WSUD elements are to be located and configured such that impervious areas to be treated can be maximised

WSUD4 Water Sensitive Urban Design Measures - Where WSUD principles are to be applied, the following table lists measures, which can be used to achieve water quality and water quantity targets. Note their uses may be complementary to other 'hard' engineering solutions.

WSUD Measure	Comments
Constructed Wetlands	To be considered for medium to large scale subdivisions
Sedimentation Basins	To be considered for medium to large scale subdivisions
Vegetated Filter Strips	Can be incorporated into new developments
Sand Filters	Used in combination with absorption system design
Bio-retention Systems	Used in combination with absorption system design or for water quality improvement targets in lieu of straight discharge into the waterways. Alternative Gross Pollutant Traps may be considered (mechanical system) for screening silts, sands and debris, may be considered
Permeable Pavers	As a complementary system to absorption trench to minimise on-ground impervious areas
Infiltration Trenches	Absorption trench design as described above
Rainwater Harvesting	Re-use is encouraged. Offset provision allowable from OSD

WSUD5 Water Sensitive Urban Design Modelling – Modelling of WSUD using a suitable program such as MUSIC (Model for Urban Stormwater Improvement Conceptualisation) will be acceptable to Council.

Document Submission

General

DS1 Minimum Requirements - At the lodgement of a Development Application, minimum submission of documentation is required to support the proposed development. Usually conceptual plans would suffice unless the proposed development would impact on public land or Council considers that there may be site constraints which may result in non-compliance to standards.

DS2 Stormwater Drainage Conceptual Plan - a stormwater drainage concept plan (SDCP) must be submitted with the Development Application.

DS3 Detailed Design Drawings - Detailed design drawings and supporting calculations are generally required at Construction Certificate submission and not required at DA stage except in the following circumstances:

- The proposed works include activities on Council property. A separate approval under Section 138 of the Roads Act may be necessary. It is important the Applicant contact Council in this case to ensure that approval can be granted.

  Important Note: Works in the road reserve can only be approved under Section 138 of the Roads Act. Approval under Part 4 of the Environmental Planning and Assessment Act does not grant automatic approval for works on public land.
- The proposed development is a new dwelling, residential flat building, mixed development, commercial or industrial development and the land falls to the rear and does not benefit from a formal drainage easement.
- A Stormwater Assessment Report is required due to likely flood affectation to ascertain design floor levels or if there is a proposed subfloor level which may be likely to be affected by stormwater inundation or disposal of seepage water is difficult.

  Where detailed design drawings are required, they must be submitted and approved by Council prior to the issue of the Construction Certificate.

Development Application

DS4 Submission of Conceptual Drawings - Engineering conceptual drawings shall be submitted at the lodgement of the Development Application containing the following information:

- A3 or A1 size drawing sheets at an appropriate scale of 1:100, 1:200 or 1:500.
- Showing the layout of the proposed drainage system and structures including the location of all downpipes, kerbs, channels, open drains, pits, pipes, retaining walls etc.
- Showing the nominal size of all stormwater conduits, grades, and pit dimensions.
- Showing conduit gradients.
- Showing the finished surface levels of any open channels, drains, or swales.
- Showing the location of all buildings, driveways, retaining walls, and other impervious and pervious surfaces.
- Showing the finished surface levels of paved areas, unpaved areas, building floors and garages
- Showing typical cross sectional details of any open channels, drains, or swales
- Where drainage easements are required, the location of the proposed easement for stormwater drainage and legal agreements attached
- Showing details of the proposed On-site Stormwater Detention (OSD) or On-site Absorption (OSA) System, or dispersion trenches, if required
- Include basic supporting computation or information
- Showing the location of any utility services, structures, trees, etc., which might affect the proposed development

  Important Note: It is the responsibility of the applicant to submit sufficient details of all relevant services, which may conflict with the proposed design. The exact locations of any crossings or connections are to be shown.

Construction Certificate

DS5 Submission of Construction Certificate Drawings - Detailed construction drawings are to be submitted as required, either to Council or to a nominated Principal Certifying Authority (PCA) and must include the following information:

- Drawings to be issued on standard A3 or A1 size drawing sheets at an appropriate scale of 1:100, 1:200 or 1:500.
- Drawings must clearly show the layout of the proposed engineering works, including the location of all retaining walls, downpipes, pits and pipes and labelled with their pipe sizes, gradients, existing and finished surface and invert levels, dimensions of all OSD, OSA and pump-out systems, including the proposed storage volumes, surcharge/overflow paths, permissible site discharge, and other relevant information sufficient for construction.
- All supporting calculations are to be supplied on computer disc (where applicable) with relevant hydrologic and hydraulic information.

DS6 Minimum Information - the minimum information to be provided on the drawings are as follows:

- Total site area in m^2.
- Total impervious area (roof and paved) in m^2.
- Area draining into the proposed stormwater (OSD or OSA) facility.
- Dimensions (mm), volume (cum), and discharge rate from the OSD or OSA system.
- Maximum water depth (mm) from centreline of outlet to top water level.
- Maximum depth of ponding for above ground OSD systems.
- Type and size of orifice (mm-dia), outlet pipe (mm-dia) and PSD (L/s).
- Details of the OSD control device(s) used including size and shape, outlet pipe diameter and invert level.
- For underground systems, at least one (1) detailed section through the OSD or OSA facility sufficient for construction.
- For above ground systems, at least two (2) detailed sections through the OSD facility, which shall include the maximum water level, gradients and overflow weir, sufficient for construction.
- Existing and proposed levels and details of adjoining structures and buildings shall be shown on the sections through the OSD or OSA facility.
- Overland flow path and PSD from the site.
- Plan showing the location of OSA or OSD facilities including dimensions, pervious (landscape) and paved (existing and proposed roof and paved) areas, and all existing and proposed surface levels.
- For pump-out systems, the pump type and rate, and holding tank volume.
- Location of any utility services, structures, trees, etc., which may affect the proposed drainage system.
- Full details of all relevant services, which may conflict with the proposed design, including invert levels and size of the service are to be shown.
- Structural details of retaining walls including sub-soil drainage, reinforcement details, dimensions and concrete strength.
- Where an inter-allotment drainage line is to be laid, a longitudinal section of the proposed pipe from the point of connection to the discharge point is to be provided. This must include pipe sizes, gradients, flowrates and a hydraulic grade line.

DS7 Certification - For residential flat buildings, dual occupancies, commercial, industrial, mixed developments, multi-residential developments, and similar type developments, the construction drawings must be certified by a qualified practising Civil Engineer, with membership with the Institution of Engineers, Australia, practising in the relevant competency category (civil, geotechnical, structural) and on the National Professional Engineers Register (NER).

For single residential developments, residential extensions, and small scale developments such as car ports, garages, sheds, etc, certification can be provided by a draftsperson, surveyor, or plumber with appropriate and relevant experience.

DS8 Drainage Easements - Where drainage easements are required, evidence in the form of a legal agreement between the affected parties or copies of titles showing the created easements shall be submitted with the drawings.

Occupation (Final) Certificate

DS9 Minimum Information - the minimum information to be provided to Council or a nominated Principal Certifying Authority (PCA) are as follows:

- **Works-as-executed drawings:** an engineering survey of the final works is to be submitted on one (1) set of the approved plans. This plan is to include finished levels, dimensions and volume of the built OSA, OSD facility, the location of all drainage pipes, sizes and levels, etc., and signed by a Registered Surveyor
- **Copies of titles** showing the creation of Positive Covenants and Restriction on the use of land
- **Certification** of the constructed drainage system by a suitably qualified and experienced Chartered Professional Engineer, on the National Engineers Register (NER) with the Australian Institute of Engineers for residential flat buildings, dual occupancies, commercial, industrial, mixed developments, multi-residential developments, and the like. For single residential developments, residential extensions, and small scale developments, a Compliance Certificate from a Surveyor or plumber with experience in stormwater design would be acceptable. The Compliance Certificate must certify that the works have been installed in accordance with the relevant Australian standards ***(AS3500)*** and Council's relevant specifications and DCP.
- **Identification Plate:** an identification plate of not less than 110mm wide x 80mm high, is to be fixed near or onto the control structure of the OSD system, this is to advise the registered proprietor of their responsibility to maintain the OSD facility and not to tamper with it in any manner without written consent. This plaque shall read 'This is an On-site Stormwater Detention System. It is an offence to reduce the volume of the system (tank or basin) or to remove the orifice that controls the outflow. The base of the outlet control pit and the debris screen must be cleared of debris and silt on a regular basis. This plate must not be removed.'

  Identification plates can be purchased from Council's Customer Services Centre

DS10 Where Onsite Detention system or a mechanical pump out system is proposed on site, the following documents must be submitted to Council or Principal Certifying Authority prior to occupation:

a) A Certificate from a Chartered Professional Engineer with Institution of Engineers, Australia Corporate Membership and registered on the National Engineers Register (NER) under the appropriate professional Category certifying the intended function of constructed stormwater drainage system including Onsite Detention (OSD) system, Onsite absorption system, Mechanical Pump out system, Stormwater retention system (OSR) etc, and

b) "Work - As - Executed" drawings of constructed stormwater drainage system prepared by a Registered Surveyor or equivalent.

- Where Council is not the Principal Certifying Authority, two (2) copies of the above documents are to be provided to Council prior to the issue of any Occupation Certificate. These documents are to be retained on Council's Construction Certificate files.

Section 138 Consent under the Roads Act

DS11 General - Development Approval does not give automatic approval for external works to the site, that is, in public domain areas.

Important Note - Private Certifiers cannot issue Consent under the Roads Act. The Road Authority which can issue Consent under the Roads Act will generally be either Council or the RMS. In some cases where Council or RMS is the Road Authority, the consent of both Council and the RMS will be required due to traffic or maintenance impacts.

Council is the Consent Authority for all works within the footway area, regardless of RMS approval for road pavement works or activities. This may be in the form of a **Road Opening Permit** (for minor works such as the laying of a private stormwater pipe across the footpath), **Driveway Application** (for driveway and footpath construction) or a ***Section 138 Application for Major Works*** (such as laying a stormwater drainage line under the kerb or road pavement construction). All these activities require approval from Council under Section 138 of the Roads Act 1993.

DS12 External works - Pursuant to Section 138 of the Roads Act 1993, written approval from the Appropriate Road Authority (Council or RMS), must be sought for proposed works external to the site. External works include the following:

- Closure of a carriageway on a State Road
- Closure of a carriageway on a Regional Road
- Works which may impact the traffic flow on a State Road or Regional Road
- Works within 100m of a Traffic Facility (e.g. Signalized Traffic Lights)
- Closure of a lane for the purpose of standing a crane, concrete pump or waste bin

DS13 Types of External Works cover by a Section 138 Approval - The types of works requiring Section 138 approval include but not limited to:

- Road works in general
- Stormwater drainage works
- Traffic devices or local area traffic management (LATM) schemes
- Footpath construction
- Water quality control devices on public land
- Driveway construction
- Any related works within an adjacent road reserve (path, verge or carriageway)

DS14 Road Occupancy License - Any works within the road reserve, for a State or Regional classified road, will require a Road Occupancy License to be obtained from the Planned Incidents Unit of the Traffic Management Centre of the RMS.

The Application must include details of a Traffic Management Plan.

DS15 Other Consents under Section 138 of the Roads Act - ***An Application for Driveway Construction and Ancillary Works, Road Opening Permit*** or a ***Consent Letter*** from Council is required for all other types of works within the road reserve.

Appendices

a. Terms of Positive Covenant, and b. Restriction on the Use of Land

Existing Allotments

A1 The Terms of Restriction on the Use of Land - Where there is no land sub-division (no Section 88B instrument required) then the following standard wording is to be used for the "The Terms of Restriction on the Use of Land" and attached with the standard NSW Department of Lands form 13RPA.

Terms of Restriction on the Use of Land

(Show full details of the Restriction)

The registered proprietors covenant with the City of Canada Bay Council (Council) that they will not:

I. Do any act, matter or thing which would prevent the structure and works from operating in an efficient manner.

II. Make any alterations or additions to the structure and works or allow any development within the meaning of the Environmental Planning and Assessment Act 1979 to encroach upon the structure and works without the express written consent of the authority.

III. This covenant shall bind all persons who claim under the registered proprietors as stipulated in Section 88E(5) of the Act.

For the purposes of this covenant:

Structure and Works shall mean the on-site stormwater detention (OSD) system constructed on the land as set out in the plan annexed hereto and marked with the letter "A" or alternatively as detailed on the plans approved by the Principal Certifying Authority: {INSERT DA NUMBER, DRAWING NUMBER, DATE, REVISION NUMBER AND DESIGNER DETAILS} including all gutters, pipes, drains, walls, kerbs, pits, grates, tanks, chambers, basins and surfaces designed to temporarily detain stormwater on the land. The Act means the Conveyancing Act 1919.

A2 The Terms of Positive Covenant - Where there is no land sub-division (no Section 88B instrument required) then the following standard wording for the "The Terms of Positive Covenant" is to be used and attached with the standard NSW Department of Lands form 13RPC.

Terms of Positive Covenant

(Show full details of Positive Covenant)

The registered proprietors covenant with the City of Canada Bay Council (Council) that they will maintain and repair the structure and works on the land in accordance with the following terms and conditions:

I. The registered proprietor will:

i. keep the structure and works clean and free from silt, rubbish and debris

ii. maintain and repair at the sole expense of the registered proprietors the whole of the structure and works so that it functions in a safe and efficient manner.

II. For the purpose of ensuring observance of the covenant the Council may by its servants or agents at any reasonable time of the day and upon giving to the person against whom the covenant is enforceable not less than two days notice (but at any time without notice in the case of an emergency) enter the land and view the condition of the land and the state of construction maintenance or repair of the structure and works on the land.

III. The registered proprietors shall indemnify the Council and any adjoining land owners against any claims for damages arising from the failure of any component of the OSD system, or failure to clean, maintain and repair the OSD system.

IV. By written notice the Council may require the registered proprietors to attend to any matter and to carry out such work within such time as the Council may require to ensure the proper and efficient performance of the structure and works and to that extent Section 88F(2) (a) of the Act is hereby agreed to be amended accordingly.

V. Pursuant to Section 88F(3) of the Act the authority shall have the following additional powers pursuant to this covenant:

i. In the event that the registered proprietor fails to comply with the terms of any written notice issued by the Council as set out above the Council or its authorised agents may enter the land with all necessary equipment and carry out any work which the Council in its discretion considers reasonable to comply with the said notice referred to in I hereof.

ii. The Council may recover from the registered proprietor in a Court of competent jurisdiction:

(a) Any expense reasonably incurred by it in exercising its powers under sub-paragraph i hereof. Such expense shall include reasonable wages for the Council's own employees engaged in effecting the said work, supervising the said work and administering the said work together with costs, reasonably estimated by the Council, for the use of machinery, tools and equipment in conjunction with the said work.

(b) Legal costs on an indemnity basis for issue of the said notices and recovery of the said costs and expenses together with the costs and expenses of registration of a covenant charge pursuant to Section 88F of the Act or providing any certificate required pursuant to Section 88G of the Act or obtaining any injunction pursuant to Section 88H of the Act.

VI. This covenant shall bind all persons who claim under the registered proprietors as stipulated in Section 88E(5) of the Act.

For the purposes of this covenant:

Structure and Works shall mean the on-site stormwater detention (OSD) system constructed on the land as set out in the plan annexed hereto and marked with the letter "A" or alternatively as detailed on the plans approved by the Principal Certifying Authority: {INSERT DA NUMBER, DRAWING NUMBER, DATE, REVISION NUMBER AND DESIGNER DETAILS} including all gutters, pipes, drains, walls, kerbs, pits, grates, tanks, chambers, basins and surfaces designed to temporarily detain stormwater on the land. The Act means the Conveyancing Act 1919.

Land Sub-division

A3 The Terms of Restriction on the Use of Land - Where a sub-division has been lodged and a Section 88B instrument created, then the following standard wording for the "The Terms of Restriction on the Use of Land" shall be used.

Terms of Restriction on the Use of Land referred to in the above-mentioned Plan

The registered proprietor covenant with the City of Canada Bay Council (Council) in respect to the structure erected on the land described as "on-site stormwater detention system" (which expression includes all ancillary gutters, pipes, drains, walls, kerbs, pits, grates, tanks, chambers, basins and surfaces designed to temporarily detain stormwater) shown on plans approved by the Principal Certifying Authority: {INSERT DA NUMBER, DRAWING NUMBER, DATE, REVISION NUMBER AND DESIGNER DETAILS} (hereinafter called "the system").

The registered proprietors covenant with the City of Canada Bay Council (Council) that they will not:

I. Do any act, matter or thing which would prevent the structure and works from operating in an efficient manner.

II. Make any alterations or additions to the structure and works or allow any development within the meaning of the Environmental Planning and Assessment Act 1979 to encroach upon the structure and works without the express written consent of the authority.

III. This covenant shall bind all persons who claim under the registered proprietors as stipulated in Section 88E(5) of the Act.

For the purposes of this covenant:

Structure and Works shall mean the on-site stormwater detention system constructed on the land as set out in the plan annexed hereto and marked with the letter "A" or alternatively as detailed on the plans approved by the Principal Certifying Authority: {INSERT DA NUMBER, DRAWING NUMBER, DATE, REVISION NUMBER AND DESIGNER DETAILS} including all gutters, pipes, drains, walls, kerbs, pits, grates, tanks, chambers, basins and surfaces designed to temporarily detain stormwater on the land.

The Act shall mean the Conveyancing Act 1919.

A4 The Terms of Positive Covenant - Where a sub-division has been lodged and a Section 88B instrument created, then the following standard wording for the "The Terms of Positive Covenant" shall be used.

Terms of Positive Covenant referred to in the above- mentioned Plan

The registered proprietors covenant with the City of Canada Bay Council (Council) that they will maintain and repair the structure and works on the land in accordance with the following terms and conditions:

I. The registered proprietor will:

i. keep the structure and works clean and free from silt, rubbish and debris

ii. maintain and repair at the sole expense of the registered proprietors the whole of the structure and works so that it functions in a safe and efficient manner.

II. For the purpose of ensuring observance of the covenant the Council may by its servants or agents at any reasonable time of the day and upon giving to the person against whom the covenant is enforceable not less than two days notice (but at any time without notice in the case of an emergency) enter the land and view the condition of the land and the state of construction maintenance or repair of the structure and works on the land.

III. The registered proprietors shall indemnify the Council and any adjoining land owners against any claims for damages arising from the failure of any component of the OSD, or failure to clean, maintain and repair the OSD.

IV. By written notice the Council may require the registered proprietors to attend to any matter and to carry out such work within such time as the Council may require to ensure the proper and efficient performance of the structure and works and to that extent Section 88F(2) (a) of the Act is hereby agreed to be amended accordingly.

V. Pursuant to section 88F(3) of the Act the authority shall have the following additional powers pursuant to this covenant:

i. In the event that the registered proprietor fails to comply with the terms of any written notice issued by the Council as set out above the Council or its authorised agents may enter the land with all necessary equipment and carry out any work which the Council in its discretion considers reasonable to comply with the said notice referred to in I hereof.

ii. The Council may recover from the registered proprietor in a Court of competent jurisdiction:

(a) Any expense reasonably incurred by it in exercising its powers under sub-paragraph i hereof. Such expense shall include reasonable wages for the Council's own employees engaged in effecting the said work, supervising the said work and administering the said work together with costs, reasonably estimated by the Council, for the use of machinery, tools and equipment in conjunction with the said work.

(b) Legal costs on an indemnity basis for issue of the said notices and recovery of the said costs and expenses together with the costs and expenses of registration of a covenant charge pursuant to Section 88F of the Act or providing any certificate required pursuant to Section 88G of the Act or obtaining any injunction pursuant to Section 88H of the Act.

VI. This covenant shall bind all persons who claim under the registered proprietors as stipulated in Section 88E(5) of the Act.

For the purposes of this covenant:

Structure and Works shall mean the on-site stormwater detention system constructed on the land as set out in the plan annexed hereto and marked with the letter "A" or alternatively as detailed on the plans approved by the Principal Certifying Authority: {INSERT DA NUMBER, DRAWING NUMBER, DATE, REVISION NUMBER AND DESIGNER DETAILS} including all gutters, pipes, drains, walls, kerbs, pits, grates, tanks, chambers, basins and surfaces designed to temporarily detain stormwater on the land.

The Act means the Conveyancing Act 1919.

Generic Letter for Seeking Easement on Adjoining Land

B1 The following generic letter can be used to seek easement/s from adjoining downstream properties.

Dear . . . . . .

I/we are proposing to redevelop our property at

. . . . . .

Before we can proceed with this proposal, Council has advised us that we need to seek a formal drainage easement (Council's preferred option) to convey the stormwater runoff from our property to the nearest downstream public stormwater drainage infrastructure or to a Council approved discharge point, being (street)

. . . . . .

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/agreement to this form)

The other alternative is to have the development of our site limited to a discharge rate nominated by Council to allow sufficient area between the house and our rear/side boundary next to your property to install an underground absorption system (if appropriate for this site) to spread and disperse the stormwater flows into the ground. Discharging our stormwater to the street frontage is not a preferred option for Council as this could severely impact on the capacity of the existing drainage system in the street.

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 to (street)

. . . . . .

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/are not willing to grant you a drainage easement.

NO I/we are not willing to grant you a drainage easement.

Signed . . . . . Dated . . . . . .

Intensity-Frequency-Duration Charts

Rhodes

Parameters Used		
2 year I 1 hr: 35.87 I 12 hr: 7.57 I 72 hr: 2.39		
50 year I 1 hr: 70.00 I 12 hr: 16.00 I 72 hr: 5.22		
Co-efficient G: 0.00	F2: 4.29	F50: 15.84

Average Recurrence Interval (ARI) in mm/hour

	Years								
Time	1	2	5	10	20	50	100	200	500
5 min	89.7	115	145	162	186	216	238	261	292
6 min	84.0	108	136	153	174	203	224	246	274
7 min	79.4	102	129	144	165	192	212	233	260
8 mins	75.4	96.5	122	137	157	182	202	221	247
9 mins	71.9	92.1	117	131	150	174	193	212	237
10 mins	68.8	88.2	112	126	144	167	185	203	227
12 mins	63.7	81.6	104	116	133	155	172	188	211
14 mins	59.4	76.2	96.9	109	125	145	161	176	197
15 mins	57.6	73.8	94.0	106	121	141	156	171	192
16 mins	55.9	71.7	91.2	102	117	137	151	166	186
18 mins	52.8	67.8	86.4	97.0	111	130	144	158	177
20 mins	50.2	64.4	82.1	92.3	106	123	137	150	168
25 mins	44.9	57.6	73.6	82.8	95.0	111	123	135	151
30 mins	40.8	52.5	67.1	75.5	86.6	101	112	123	138
40 mins	35.0	45.0	57.6	64.9	74.6	87.1	96.7	106	119
50 mins	30.9	39.8	51.0	57.5	66.1	77.3	85.9	94.5	106
1 hour	27.9	35.9	46.1	52.0	59.8	70.0	77.7	85.6	96.1
1.5 hours	21.7	28.0	36.2	40.9	47.2	55.4	61.6	67.9	76.4
2 hours	18.1	23.4	30.4	34.4	39.7	46.7	52.0	57.4	64.7
3 hours	14.0	18.1	23.7	26.9	31.1	36.7	40.9	45.2	51.1
4.5 hours	10.8	14.0	18.4	21.0	24.3	28.8	32.1	35.6	40.3
6 hours	9.0	11.7	15.4	17.6	20.4	24.2	27.1	30.0	34.0
9 hours	7.0	9.1	12.0	13.7	16.0	19.0	21.3	23.6	26.8
12 hours	5.8	7.6	10.0	11.5	13.5	16.0	18.0	20.0	22.7
15 hours	5.1	6.6	8.8	10.1	11.8	14.0	15.8	17.5	19.9
18 hours	4.5	5.9	7.9	9.1	10.6	12.6	14.2	15.8	17.9
24 hours	3.8	5.0	6.6	7.6	8.9	10.6	11.9	13.3	15.1
30 hours	3.3	4.3	5.8	6.7	7.8	9.3	10.4	11.6	13.2
36 hours	2.9	3.8	5.1	5.9	6.9	8.3	9.3	10.4	11.8
48 hours	2.4	3.2	4.3	4.9	5.8	6.9	7.8	8.7	9.9
72 hours	1.8	2.4	3.2	3.7	4.4	5.2	5.9	6.6	7.5

Concord West

Parameters Used		
2 year I 1 hr: 35.91 I 12 hr: 7.48 I 72 hr: 2.37		
50 year I 1 hr: 72.50 I 12 hr: 15.83 I 72 hr: 5.00		
Co-efficient G: 0.00	F2: 4.29	F50: 15.84

Average Recurrence Interval (ARI) in mm/hour

	Years								
Time	1	2	5	10	20	50	100	200	500
5 min	89.5	115	146	165	189	220	244	268	300
6 min	83.9	108	138	155	177	207	229	252	283
7 min	79.2	102	130	146	168	198	217	239	268
8 mins	75.2	96.6	124	139	160	187	207	228	255
9 mins	71.7	92.2	118	133	153	178	198	218	244
10 mins	68.7	88.3	113	127	146	171	190	209	235
12 mins	63.5	81.7	105	118	136	159	176	194	218
14 mins	59.3	76.3	98.0	111	127	149	165	182	205
15 mins	57.4	73.9	95.0	107	123	144	161	177	199
16 mins	55.7	71.7	92.3	104	120	140	156	172	193
18 mins	52.7	67.9	87.4	98.7	114	133	148	163	183
20 mins	50.1	64.5	83.1	93.9	108	127	141	155	175
25 mins	44.8	57.7	74.5	84.3	97.2	114	127	140	157
30 mins	40.7	52.5	68.0	77.0	88.8	104	116	128	144
40 mins	34.9	45.0	58.4	66.3	76.5	90.0	100	111	125
50 mins	30.8	39.8	51.8	58.8	67.9	80.0	89.2	98.5	111
1 hour	27.8	35.9	46.8	53.2	61.5	72.5	80.9	89.4	101
1.5 hours	21.6	28.0	36.6	41.6	48.2	56.9	63.6	70.3	79.5
2 hours	18.0	23.4	30.6	34.9	40.4	47.8	53.4	59.1	66.9
3 hours	13.9	18.1	23.7	27.1	31.5	37.2	41.6	46.2	52.3
4.5 hours	10.7	13.9	18.4	21.0	24.4	29.0	32.4	36.0	40.8
6 hours	8.9	11.6	15.3	17.6	20.4	24.3	27.2	30.2	34.2
9 hours	6.9	9.0	11.9	13.6	15.9	18.9	21.2	23.5	26.7
12 hours	5.7	7.5	9.9	11.4	13.3	15.8	17.8	19.8	22.5
15 hours	5.0	6.5	8.7	10.0	11.6	13.8	15.5	17.3	19.6
18 hours	4.5	5.9	7.8	8.9	10.4	12.4	13.9	15.5	17.6
24 hours	3.8	4.9	6.5	7.5	8.7	10.4	11.7	13.0	14.7
30 hours	3.3	4.3	5.7	6.5	7.6	9.0	10.1	11.3	12.8
36 hours	2.9	3.8	5.1	5.8	6.8	8.0	9.0	10.0	11.4
48 hours	2.4	3.2	4.2	4.8	5.6	6.7	7.5	8.3	9.4
72 hours	1.8	2.4	3.1	3.6	4.2	5.0	5.6	6.2	7.1

North Strathfield

Parameters Used		
2 year I 1 hr: 37.60 I 12 hr: 7.71 I 72 hr: 2.45		
50 year I 1 hr: 77.00 I 12 hr: 16.20 I 72 hr: 5.03		
Co-efficient G: 0.00	F2: 4.29	F50: 15.85

Average Recurrence Interval (ARI) in mm/hour

	Years								
Time	1	2	5	10	20	50	100	200	500
5 min	93.3	120	152	171	196	228	252	277	310
6 min	87.5	112	143	161	184	215	238	261	293
7 min	82.6	106	135	152	175	204	226	248	278
8 mins	78.4	101	129	145	166	194	215	236	265
9 mins	74.8	96.1	123	138	159	186	206	227	254
10 mins	71.6	92.1	118	133	153	178	198	218	244
12 mins	66.3	85.2	109	123	142	166	184	203	228
14 mins	61.8	79.6	102	116	133	156	173	190	214
15 mins	59.9	77.2	99.3	112	129	151	168	185	208
16 mins	58.2	74.9	96.4	109	125	147	163	180	202
18 mins	55.0	70.9	91.4	103	119	140	155	171	192
20 mins	52.3	67.4	87.0	98.4	113	133	148	163	184
25 mins	46.7	60.3	78.1	88.5	102	120	134	147	166
30 mins	42.5	54.9	71.3	80.8	93.4	110	122	135	152
40 mins	36.4	47.1	61.4	69.8	80.7	95.1	106	117	132
50 mins	32.2	41.7	54.5	62.0	71.8	84.8	94.7	105	118
1 hour	29.0	37.6	49.3	56.2	65.2	77.0	86.1	95.3	108
1.5 hours	22.5	29.2	38.4	43.8	50.8	60.1	67.2	74.5	84.3
2 hours	18.8	24.4	32.0	36.5	42.4	50.2	56.2	62.3	70.5
3 hours	14.5	18.8	24.7	28.3	32.8	38.9	43.5	48.3	54.7
4.5 hours	11.1	14.5	19.1	21.8	25.4	30.1	33.7	37.4	42.4
6 hours	9.2	12.0	15.9	18.2	21.1	25.1	28.1	31.2	35.4
9 hours	7.1	9.3	12.3	14.0	16.4	19.4	21.8	24.2	27.4
12 hours	5.9	7.7	10.2	11.7	13.6	16.2	18.2	20.2	22.9
15 hours	5.2	6.7	8.9	10.2	11.9	14.1	15.8	17.6	20.0
18 hours	4.6	6.0	8.0	9.1	10.6	12.6	14.2	15.7	17.8
24 hours	3.9	5.1	6.7	7.7	8.9	10.6	11.8	13.1	14.9
30 hours	3.4	4.4	5.8	6.7	7.7	9.2	10.3	11.4	12.9
36 hours	3.0	3.9	5.2	5.9	6.9	8.2	9.1	10.1	11.5
48 hours	2.5	3.3	4.3	4.9	5.7	6.7	7.5	8.3	9.5
72 hours	1.9	2.4	3.2	3.7	4.3	5.0	5.6	6.2	7.1

Mortlake - Breakfast Point - Cabarita

Parameters Used		
2 year I 1 hr: 37.17 I 12 hr: 7.61 I 72 hr: 2.43		
50 year I 1 hr: 72.50 I 12 hr: 16.00 I 72 hr: 5.15		
Co-efficient G: 0.00	F2: 4.29	F50: 15.85

Average Recurrence Interval (ARI) in mm/hour

	Years								
Time	1	2	5	10	20	50	100	200	500
5 min	92.7	118	149	167	190	220	243	266	297
6 min	86.9	111	140	157	179	207	229	250	279
7 min	82.1	105	132	148	169	196	217	237	265
8 mins	78.0	99.7	126	141	161	187	206	226	252
9 mins	74.4	95.1	120	135	154	179	197	216	241
10 mins	71.2	91.1	115	129	147	171	189	207	232
12 mins	65.9	84.3	107	120	137	159	176	193	215
14 mins	61.5	78.8	99.9	112	128	149	165	181	202
15 mins	59.6	76.3	96.9	109	124	145	160	175	196
16 mins	57.8	74.1	94.1	105	121	140	155	171	191
18 mins	54.7	70.1	89.1	99.9	114	133	147	162	181
20 mins	52.0	66.6	84.8	95.1	109	127	140	154	173
25 mins	46.5	59.6	76.0	85.4	97.9	114	126	139	155
30 mins	42.3	54.3	69.3	77.9	89.4	104	116	127	142
40 mins	36.2	46.6	59.6	67.1	77.1	90.0	99.8	110	123
50 mins	32.0	41.2	52.8	59.5	68.4	80.0	88.8	97.7	110
1 hour	28.9	37.2	47.7	53.9	61.9	72.5	80.5	88.6	99.6
1.5 hours	22.4	28.9	37.3	42.2	48.6	57.0	63.4	69.9	78.7
2 hours	18.6	24.1	31.2	35.3	40.8	47.9	53.4	58.9	66.4
3 hours	14.3	18.6	24.2	27.4	31.7	37.4	41.7	46.1	52.0
4.5 hours	11.0	14.3	18.7	21.3	24.7	29.2	32.6	36.1	40.8
6 hours	9.1	11.9	15.6	17.8	20.7	24.4	27.3	30.3	34.3
9 hours	7.0	9.2	12.1	13.8	16.1	19.1	21.4	23.7	26.9
12 hours	5.8	7.6	10.1	11.6	13.5	16.0	17.9	19.9	22.6
15 hours	5.1	6.7	8.8	10.1	11.8	14.0	15.7	17.5	19.8
18 hours	4.6	6.0	7.9	9.1	10.6	12.6	14.1	15.7	17.8
24 hours	3.9	5.0	6.7	7.6	8.9	10.6	11.9	13.2	15.0
30 hours	3.4	4.4	5.8	6.7	7.8	9.2	10.3	11.5	13.1
36 hours	3.0	3.9	5.2	5.9	6.9	8.2	9.2	10.3	11.7
48 hours	2.5	3.2	4.3	4.9	5.7	6.8	7.7	8.5	9.7
72 hours	1.9	2.4	3.2	3.7	4.3	5.1	5.8	6.4	7.3

Concord East - Canada Bay

Parameters Used		
2 year I 1 hr: 37.27 I 12 hr: 7.70 I 72 hr: 2.40		
50 year I 1 hr: 75.00 I 12 hr: 16.00 I 72 hr: 5.00		
Co-efficient G: 0.00	F2: 4.29	F50: 15.85

Average Recurrence Interval (ARI) in mm/hour									
	Years								
Time	1	2	5	10	20	50	100	200	500
5 min	92.7	119	151	169	193	225	248	272	305
6 min	86.9	111	141	159	182	211	234	257	287
7 min	82.1	105	134	150	172	200	222	243	272
8 mins	77.9	99.9	127	143	164	191	211	232	260
9 mins	74.3	95.4	122	137	157	183	202	222	249
10 mins	71.2	91.3	117	131	150	175	194	213	239
12 mins	65.8	84.5	108	122	139	163	181	198	223
14 mins	61.4	79.0	101	114	131	153	169	186	209
15 mins	59.5	76.5	98.0	110	127	148	164	181	203
16 mins	57.8	74.3	95.2	107	123	144	160	176	197
18 mins	54.6	70.3	90.2	102	117	137	152	167	188
20 mins	51.9	66.8	85.8	96.8	111	130	145	159	179
25 mins	46.4	59.8	77.0	87.0	100	117	130	144	162
30 mins	42.2	54.4	70.3	79.4	91.5	107	119	132	148
40 mins	36.2	46.7	60.5	68.5	79.0	92.9	103	114	129
50 mins	32.0	41.3	53.6	60.8	70.3	82.7	92.1	102	115
1 hour	28.8	37.3	48.5	55.1	63.7	75.0	83.6	92.4	104
1.5 hours	22.4	29.0	37.8	43.0	49.8	58.7	65.5	72.4	81.8
2 hours	18.7	24.2	31.6	35.9	41.6	49.1	54.8	60.7	68.5
3 hours	14.4	18.7	24.4	27.8	32.3	38.1	42.6	47.1	53.3
4.5 hours	11.1	14.4	18.9	21.5	25.0	29.5	33.0	36.6	41.4
6 hours	9.2	12.0	15.7	18.0	20.9	24.7	27.6	30.6	34.6
9 hours	7.1	9.2	12.2	13.9	16.2	19.1	21.4	23.8	26.9
12 hours	5.9	7.7	10.2	11.6	13.5	16.0	17.9	19.9	22.5
15 hours	5.2	6.7	8.9	10.1	11.8	14.0	15.6	17.4	19.7
18 hours	4.6	6.0	7.9	9.1	10.5	12.5	14.0	15.5	17.6
24 hours	3.9	5.0	6.6	7.6	8.8	10.5	11.7	13.0	14.7
30 hours	3.4	4.4	5.8	6.6	7.7	9.1	10.2	11.3	12.8
36 hours	3.0	3.9	5.1	5.9	6.8	8.1	9.1	10.0	11.4
48 hours	2.5	3.2	4.2	4.8	5.6	6.7	7.5	8.3	9.4
72 hours	1.8	2.4	3.2	3.6	4.2	5.0	5.6	6.2	7.0

Five Dock - Rodd Point

Parameters Used		
2 year I 1 hr: 38.64 I 12 hr: 7.78 I 72 hr: 2.43		
50 year I 1 hr: 77.50 I 12 hr: 16.20 I 72 hr: 5.00		
Co-efficient G: 0.00	F2: 4.29	F50: 15.85

Average Recurrence Interval (ARI) in mm/hour									
	Years								
Time	1	2	5	10	20	50	100	200	500
5 min	95.9	123	155	173	197	229	253	277	309
6 min	89.9	115	145	163	186	216	238	261	291
7 min	84.9	109	138	154	176	204	226	248	277
8 mins	80.7	103	131	147	168	195	215	236	264
9 mins	77.0	98.6	125	140	160	187	206	226	253
10 mins	73.7	94.4	120	134	154	179	198	217	243
12 mins	68.2	87.4	111	125	143	167	185	203	227
14 mins	63.6	81.7	104	117	134	156	173	190	213
15 mins	61.7	79.2	101	114	130	152	168	185	207
16 mins	59.8	76.8	98.1	110	127	148	164	180	202
18 mins	56.6	72.7	93.0	105	120	140	155	171	192
20 mins	53.8	69.1	88.5	99.7	114	134	148	163	183
25 mins	48.1	61.9	79.5	89.6	103	121	134	147	165
30 mins	43.8	56.4	72.6	81.9	94.3	110	123	135	152
40 mins	37.5	48.4	62.5	70.7	81.5	95.7	106	117	132
50 mins	33.2	42.8	55.5	62.9	72.6	85.3	95.0	105	118
1 hour	29.9	38.6	50.2	57.0	65.8	77.5	86.4	95.4	108
1.5 hours	23.2	30.0	39.0	44.3	51.3	60.4	67.4	74.5	84.1
2 hours	19.2	24.9	32.5	37.0	42.8	50.5	56.3	62.3	70.4
3 hours	14.8	19.1	25.0	28.5	33.1	39.0	43.6	48.3	54.6
4.5 hours	11.3	14.7	19.3	22.0	25.5	30.2	33.7	37.4	42.3
6 hours	9.4	12.2	16.0	18.3	21.2	25.1	28.1	31.1	35.3
9 hours	7.2	9.4	12.3	14.1	16.4	19.4	21.8	24.1	27.3
12 hours	6.0	7.8	10.3	11.7	13.7	16.2	18.1	20.1	22.8
15 hours	5.2	6.8	9.0	10.2	11.9	14.1	15.8	17.5	19.9
18 hours	4.7	6.1	8.0	9.2	10.6	12.6	14.1	15.7	17.8
24 hours	3.9	5.1	6.7	7.7	8.9	10.5	11.8	13.1	14.8
30 hours	3.4	4.4	5.8	6.6	7.7	9.1	10.2	11.4	12.9
36 hours	3.0	3.9	5.2	5.9	6.9	8.1	9.1	10.1	11.4
48 hours	2.5	3.2	4.3	4.9	5.7	6.7	7.5	8.3	9.4
72 hours	1.9	2.4	3.2	3.6	4.2	5.0	5.6	6.2	7.0

Drummoyne - Chiswick - Abbotsford - Wareemba - Russell Lea

Parameters Used		
2 year I 1 hr: 39.13 I 12 hr: 8.00 I 72 hr: 2.50		
50 year I 1 hr: 80.00 I 12 hr: 16.83 I 72 hr: 5.35		
Co-efficient G: 0.00	F2: 4.29	F50: 15.86

Average Recurrence Interval (ARI) in mm/hour									
	Years								
Time	1	2	5	10	20	50	100	200	500
5 min	96.9	124	157	176	201	233	258	283	316
6 min	90.8	116	148	165	189	220	243	267	298
7 min	85.8	110	140	157	179	209	231	253	283
8 mins	81.5	104	133	149	171	199	220	242	271
9 mins	77.7	99.7	127	143	163	191	211	232	260
10 mins	74.4	95.5	122	137	157	183	203	223	250
12 mins	68.8	88.4	113	127	146	170	189	208	233
14 mins	64.3	82.6	106	119	137	160	178	195	219
15 mins	62.3	80.1	103	116	133	155	173	190	213
16 mins	60.4	77.8	99.8	112	129	151	168	185	208
18 mins	57.2	73.6	94.6	107	123	144	160	176	197
20 mins	54.3	70.0	90.1	102	117	137	152	168	189
25 mins	48.6	62.7	80.9	91.5	106	124	138	152	171
30 mins	44.2	57.1	73.9	83.7	96.6	114	126	140	157
40 mins	37.9	49.0	63.7	72.4	83.7	98.5	110	121	137
50 mins	33.5	43.3	56.6	64.4	74.6	88.0	98.2	109	123
1 hour	`30.2	39.1	51.2	58.4	67.7	80.0	89.4	99.0	112
1.5 hours	23.4	30.4	39.9	45.5	52.8	62.4	69.8	77.4	87.5
2 hours	19.5	25.3	33.3	38.0	44.1	52.2	58.4	64.7	73.3
3 hours	15.0	19.5	25.7	29.4	34.1	40.4	45.2	50.2	56.8
4.5 hours	11.6	15.0	19.8	22.7	26.4	31.3	35.0	38.8	44.0
6 hours	9.6	12.5	16.5	18.9	22.0	26.1	29.2	32.4	36.8
9 hours	7.4	9.6	12.7	14.6	17.0	20.2	22.6	25.1	28.5
12 hours	6.1	8.0	10.6	12.2	14.2	16.8	18.9	21.0	23.8
15 hours	5.4	7.0	9.3	10.6	12.4	14.7	16.5	18.4	20.9
18 hours	4.8	6.2	8.3	9.5	11.1	13.2	14.8	16.5	18.7
24 hours	4.0	5.2	6.9	8.0	9.3	11.1	12.4	13.8	15.7
30 hours	3.5	4.5	6.0	6.9	8.1	9.6	10.8	12.0	13.7
36 hours	3.1	4.0	5.4	6.2	7.2	8.6	9.6	10.7	12.2
48 hours	2.6	3.3	4.4	5.1	6.0	7.1	8.0	8.9	10.1
72 hours	1.9	2.5	3.3	3.8	4.5	5.3	6.0	6.7	7.6

Rhodes Peninsula Site Specific Requirements

Minimum Standards

MS1 General - The minimum engineering standards given in this Appendix applies to all proposed developments in the Rhodes Peninsular area.

The general standards given in the main body of this Engineering Development Control Plan will still apply where no reference or detail is given in this Appendix.

Shared Paths

SP1 Shared cycle ways and footpaths - shared cycle ways and footpaths shall be provided in all public domain areas. They shall be constructed to the following standards:

- Wearing surface material shall be of concrete 100mm thick, 32MPa compressive strength and reinforced with F72 mesh placed centrally.
- Concrete pavement shall be of uniform colour to match existing area. Coloured black oxide may be used.
- Concrete pavement to have keyed or dowelled joints at 12 metre centres. Control joints shall be saw cut at 3 metre intervals as soon as the concrete has set sufficiently as to not pull stones when cutting.
- Concrete pavement shall be laid on a 20mm sand blinding layer on a compacted sub-grade in accordance with the ***AUSPEC*** specification.
- Concrete pavement shall be finished with a coving trowel.

Seawalls

SE1 Serviceability Level - Seawalls shall be constructed to a serviceable level in accordance with the Australian Standards for Marine Structures.

SE2 Sea Level Rise - Seawalls shall be designed and constructed to withstand a 1 in 100 year ARI storm event with no overtopping inclusive of additional height of 900mm to account for sea level rise.

Jetty

JE1 Prohibited - Jetties or similar structures are prohibited.

Council is unable to maintain and renew jetties due to financial constraints.

Street Lighting

ST1 Design Requirements - All street lights shall be designed and installed to the requirements, specification and approval of Energy Australia.

All street lights are to be connected to the Energy Australia street lighting network.

ST2 Maintenance - All lighting and associated electrical components shall be designed to a public standard.

Energy Australia shall be responsible for the maintenance and continual future maintenance of all street lights.

ST3 Meters and Switch Boards - meters, switch boards and the like shall be separate from any private system and located wholly within land proposed to be dedicated as public domain in the future.

Park Lighting

PL1 Lighting Type - 'Bega Pole 8682 Lights' or equivalent are acceptable.

PL2 Prohibited - Bollard lighting, solar lighting or similar will not be acceptable.

Council has found that the high vandalism and unreliability of these lights makes them unsustainable.

Tree Planting

TP1 General - Refers to tree planting in road carriageways and footways in general.

TP2 Street Trees - Street trees generally shall be planted within a square reinforced concrete cut-off wall as a structural root barrier. Approved synthetic root barrier systems or equivalent may be used in footway areas (pedestrian access areas only).

Where street trees are to be planted in road carriageways (pavement area subject to vehicular loads), it shall be planted within a square reinforced concrete cut-off wall only.

The root barriers shall be extended 300mm below the road pavement. The purpose of the root barriers is to protect the road pavement from moisture and root ingress.

Design Life of all Structures

DL1 General - All public infrastructure shall be designed and selected to provide the least lifecycle costs with respect to maintenance and renewal of the infrastructure throughout its entire serviceable life.

DL2 Seawalls - Seawalls shall be designed and constructed for a minimum design life of 100 years in accordance with the Australian Standards for Marine Structures.

DL3 Road Pavements - All new road pavements shall be designed for a service life of not less than 40 years. Refer Section ***Road Carriageway***

Civic Signage

SG1 General - All signage shall be designed and installed in accordance with Canada Bay Council's Signage Manual.

Garbage Bins

GR1 General - All garbage bins shall be minimum 240 Litres wheelie bin type and housed in stainless steel and timber surround (model no. EM235 Bennelong Bin Enclosures by Emerdyn Pty Ltd).

Stormwater Drainage

SD1 General - Stormwater drainage systems shall be designed generally in accordance with Section ***Stormwater Management***.

SD2 On-site Stormwater Detention - On-site stormwater detention (OSD) shall be required for all proposed development allotments unless drainage from the developed site is discharged directly into the Bay, or that the street trunk drainage system has been designed to cater for the 1 in 100 year ARI storm event.

Where OSD is required, the permissible site discharge shall be based on a "greenfields" site with an impervious area of 0%.

SD3 Sub-surface Water - Sub-surface water collected from basements and all lowered floor areas shall not be discharged directly to the kerb. Refer to Section 3 ***Stormwater Management***, ***Sub-surface Water*** for further guidelines.

SD4 Scour and Erosion Control - Refer to Section 3 ***Stormwater Management*** for further guidelines.

Road Pavement

RP1 General - All new road pavements shall be designed for a minimum 2.5 x 10^6 ESA.

RP2 California Bearing Ratio - Testing shall be undertaken to obtain CBR values for pavement design.

The CBR value shall be obtained using the four (4) day soak test with the standard procedure adopted by the RMS.

RP3 Wearing Surface - Road pavement wearing surface shall be constructed as flexible or rigid to match existing pavements or as approved by Council.

Works as Executed Drawings and Asset Data

WAE1 Works-As-Executed Drawings - Prior to handing over land or assets to Council, the developer is to provide Works-As-Executed drawings prepared and certified by a registered surveyor.

The plans are to be provided in the form of:

- A1 size pdf drawings suitable for archiving (vector based, not raster) and
- A vector format suitable for importing into Council's Land Information Systems (MapInfo) or Cad systems (AutoCAD).

WAE2 Detailed Asset Data - Prior to handing over land or assets to Council, the developer is to provide detailed asset data at a component level for importation into Council's Asset Management System.

Information required will depend on the components and the developer should submit a component list to Council for further advice.

The following list is representative of what would be required:

- A vector representation of the component and its location on MGA94 coordinates linked to:
  - Description.
  - Material details.
  - Design life.
  - Installation date.
  - Acquisition date.
  - Dimensional and quantity information where it is not defined by the graphic object (e.g. The length of a pipe can be represented by the length of a line object on the plan. A data value representing the diameter needs to be attached to that line object. The area of a segment of road can be defined by a polygon. A data value representing the pavement depth needs to be attached to the polygon.)
  - Valuation at installation date.

It is recommended that these requirements be considered at the design documentation stage.

For more complex and proprietary items, for example pumps or lighting systems, the developer shall provide to Council's satisfaction details of Brand, Model, Supplier, Warranty, Installation Guide, User Guide, Safety Instructions, Servicing Record, Maintenance Manual, Keys etc as appropriate.

Community Land

CL1 Plan of Management - This Section provides a guideline for the preparation of a Plan of Management for open space land which will be transferred to Council as community land.

CL2 The Local Government Act - The ***Local Government Act 1993*** emphasises that Plans of Management should be prepared for all community land for which Council will be responsible to ensure land it owns or controls is actively and effectively managed.

CL3 Description of Use - The Plan of Management should describe how public land will be managed, maintained and utilised, who is responsible for its management, its facilities and the uses and activities that occur there.

CL4 Status - The plan should show the status of each park or reserve and the planning of each, meet the other requirements of the Act pertaining to community land management, have informed the community based on a consultative process and establish a framework for meeting community needs regarding open space.

CL5 Strategic Document - The plan would be a strategic document with prioritised actions which give Council flexibility to develop strategies consistent with the objectives identified in its Management Plan.

CL6 Development of Opportunities - The plan should also enable Council to take advantage of any opportunities that arise during the life of the plan that enable implementation of the strategies in ways that may be more cost-effective, more time efficient, or in some other way provide benefits that were unavailable or not recognised during preparation of the plan.

Strathfield Triangle Site Specific Requirements

Minimum Standards

MS1 General - The minimum engineering standards given in this Appendix applies to all proposed developments in the North Strathfield area otherwise known as the Strathfield Triangle.

The general standards given in the main body of this Engineering Specification will still apply where no reference or detail is given in this Appendix.

STRATHFIELD TRIANGLE

GENERAL NOTES

1. Contractor must verify all dimensions and existing levels on site prior to commencement of works. Any discrepancies to be reported to the Engineer
2. Strip all topsoil from the construction area. All stripped topsoil shall be disposed of off-site unless directed otherwise.
3. Make smooth connection with all existing works.
4. Compact subgrade under buildings and pavements to minimum 98% standard maximum dry density in accordance with AS 1289 5.1.1. Compaction under buildings to extend 2m minimum beyond building footprint.
5. All work on public property, property which is to become public property, or any work which is to come under the control of the Statutory Authority is to be carried out in accordance with the requirements of the relevant Authority. The Contractor shall obtain these requirements from the Authority. Where the requirements of the Authority are different to the drawings and specifications, the requirements of the Authority shall be applicable.
6. For all temporary batters refer to geotechnical recommendations.

REFERENCE DRAWINGS

1. These drawings have been based from, and to be read in conjunction with the following Consultants drawings. Any conflict to the drawings must be notified immediately to the Engineer.

Consultant	Dwg Title	Dwg No	Rev	Date
BYRNE	SURVEY	1021705	E	27.11.15
SILK	LANDSCAPE	L-001	C	17.06.16
STONE	STRATHFIELD_20160621	–	–	21.06.16
TTPA	w_strathfield	DS0000	A	16.02.16

STORMWATER DRAINAGE NOTES

1 Stormwater Design Criteria :
- (A) Average recurrence interval –
  1:100 years for roof drainage to first external pit
  1:20 years for paved and landscaped areas
- (B) Rainfall Intensities –
  Time of concentration: 6 minutes
  1:100 years = 233 mm/hr
  1:20 years = 181 mm/hr
- (C) Runoff coefficients –
  Roof areas: Cxx = 1.00
  Roads and paved areas: Cxx = 0.95
  Landscaped areas: Cxx = 0.68

2. Pipes 300 dia and larger to be reinforced concrete Class "2" approved spigot and socket with rubber ring joints U.N.O.
3. Pipes up to 300 dia shall be sewer grade uPVC with solvent welded joints.
4. Equivalent strength VCP or FRP pipes may be used subject to approval.
5. Enlargers, connections and junctions to be manufactured fittings where pipes are less than 300 dia.
6. Where subsoil drains pass under floor slabs and vehicular pavements, unslotted uPVC sewer grade pipe is to be used.
7. Grates and covers shall conform with AS 3996–2006, and AS 1428.1 for access requirements.
8. Pipes are to be installed in accordance with AS 3725. All bedding to be type H2 U.N.O.
9. Care is to be taken with levels of stormwater lines. Grades shown are not to be reduced without approval.
10. All stormwater pipes to be 150 dia at 1.0% min fall U.N.O.
11. Subsoil drains to be slotted flexible uPVC U.N.O. class 1000
12. Adopt invert levels for pipe installation (grades shown are only nominal).

SITEWORKS NOTES

1. All basecourse material to comply with RMS specification No 3051 and compacted to minimum 98% modified dry density in accordance with AS 1289 5.2.1.
2. All trench backfill material shall be compacted to the same density as the adjacent material.
3. All service trenches under vehicular pavements shall be backfilled with an approved select material and compacted to a minimum 98% standard maximum dry density in accordance with AS 1289 5.1.1

BOUNDARY AND EASEMENT NOTE

The property boundary and easement locations shown on Taylor Thomson Whitting drawing's have been based from information received from : BYRNE & ASSOCIATES
Al–1021705

Taylor Thomson Whitting makes no guarantees that the boundary or easement information shown is correct.
Taylor Thomson Whitting will accept no liabilities for boundary inaccuracies. The contractor/builder is advised to check/confirm all boundaries in relation to all proposed work prior to the commencement of construction. Boundary inaccuracies found are to be reported to the superintendent prior to construction starting.

SURVEY AND SERVICES INFORMATION

SURVEY

Origin of levels : SSM 91103 RL 16.66
Datum of levels : A.H.D. AUSTRALIAN HEIGHT DATUM
Coordinate system : MGA
Survey prepared by : BYRNE & ASSOCIATES
Setout Points : CONTACT THE SURVEYOR

Taylor Thomson Whitting does not guarantee that the survey information shown on these drawings is accurate and will accept no liability for any inaccuracies in the survey information provided to us from any cause whatsoever.

UNDERGROUND SERVICES - WARNING

The locations of underground services shown on Taylor Thomson Whittings drawings have been plotted from diagrams provided by service authorities. This information has been prepared solely for the authorities own use and may not necessarily be updated or accurate.

The position of services as recorded by the authority at the time of installation may not reflect changes in the physical environment subsequent to installation.

Taylor Thomson Whitting does not guarantee that the services information shown on these drawings shows more than the presence or absence of services, and will accept no liability for inaccuracies in the services information shown from any cause whatsoever.

The Contractor must confirm the exact location and extent of services prior to construction and notify any conflict with the drawings immediately to the Engineer/Superintendent.

The contractor is to get approval from the relevant state survey department, to remove/adjust any survey mark. This includes but is not limited to; State Survey Marks (SSM), Permanent Marks (PM), cadastral reference marks or any other survey mark which is to be removed or adjusted in any way.
Taylor Thomson Whitting plans do not indicate the presence of any survey mark. The contractor is to undertake their own search.

PAVEMENT LEGEND

NOTES
1. Asphaltic concrete shall conform to AS2150 and the specification
2. Pavement based on geotechnical report by J&K GEOTECHNICS 28855rpt 17.12.15

P1 — 50mm Thickness asphaltic concrete (AC10) with AMC1 binder on 150mm Compacted thickness fine crushed rock (DGB20) on 350mm Compacted thickness fine crushed rock (DGS40)

P2 — 50mm mill existing pavement and replace with 50mm Thickness asphaltic concrete (AC10) with AMC1 binder TO RMS SPECIFICATION

P3 — 100mm Thickness concrete (f'c=32MPa) with SL62 fabric and expansion joints at max 6.0m centres and weakened plane joints at max 1.5m centres on 100mm Compacted thickness fine crushed rock (DGB20)

P4 — 150mm Thickness concrete (f'c=32MPa) with SL82 fabric (40 top cover) on 100mm Compacted thickness fine crushed rock (DGB 20)

P5 — 80mm ECOTHREK Pavers with 3mm stone in voids on 30mm Sandbedding on 200mm Filter material (crushed hard rock or natural gravel) with grading in accordance with the specification section 5.3.5 – subsoil drains on 100mm Lean mix concrete on 100mm Compacted thickness fine crushed rock (DGB20) on Subgrade compacted to 98% SMDD

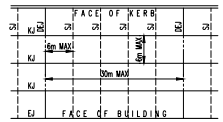
P6 — 100mm Thickness concrete (f'c=32MPa) with SL62 fabric finished to SILK drawings with expansion joints at max 6.0m centres and weakened plane joints at max 1.5m centres on 100mm Compacted thickness fine crushed rock (DGB20)

P7 — Pavers as per SILK drawings on 30mm Thickness mortar on 100mm Thickness concrete (f'c=32MPa) with SL62 fabric and expansion joints at max 6.0m centres and weakened plane joints at max 1.5m centres on 100mm Compacted thickness fine crushed rock (DGB20)

JOINTING NOTES

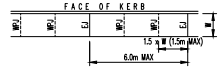
Vehicular Pavement Jointing

1. Keyed construction joints should generally be located at a maximum of 6m centres.
2. Saw joints should generally be located at a maximum of 6m centres or 1.5 x the spacing of keyed joints, where key joint spacing is less than 4m, with dowelled expansion joints at maximum of 30m centres.
3. Provide 10mm wide full cork depth expansion joints between buildings and all concrete or unit pavers.
4. The timing of the saw cut is to be confirmed by the contractor on site. Site conditions will determine how many hours after the concrete pour before the saw cuts are commenced. Refer to the specification for weather conditions and temperatures required.
5. Vehicular pavement jointing as follows.



Pedestrian Footpath Jointing

1. Expansion joints are to be located where possible at tangent points of curves and elsewhere at max 6.0m centres.
2. Weakened plane joints are to be located at a max 1.5 x width of the pavement.
3. Where possible joints should be located to match kerbing and / or adjacent pavement joints.
4. All pedestrian footpath jointings as follows (uno).



CONCRETE NOTES

EXPOSURE CLASSIFICATION : External : B1

CONCRETE

Place concrete of the following characteristic compressive strength f'c as defined in AS 1379.

Location	AS 1379 f'c MPa at 28 days	Specified Slump	Nominal Agg. Size
FOOTPATHS	N25	80	20
KERBS	N20	80	20
VEHICLE PAVEMENTS	SF25 (4.0MPa at 10 days)	80	20

1. Use Type "GP" cement, unless otherwise specified.
2. All concrete shall be subject to project assessment and testing to AS 1379.
3. Consolidate by mechanical vibration. Cure all concrete surfaces as directed in the Specification.
4. For all fails in slab, drip grooves, regiets, chamfers etc. refer to Architects drawings and specifications.
5. Unless shown on the drawings, the location of all construction joints shall be submitted to Engineer for review.
6. No holes or chases shall be made in the slab without the approval of the Engineer.
7. Conduits and pipes are to be fixed to the underside of the top reinforcement layer.
8. Slurry used to lubricate concrete pump lines is not to be used in any structural members.

FORMWORK

1. The design, certification, construction and performance of the formwork, falsework and backpropping shall be the responsibility of the contractor. Proposed method of installation and removal of formwork is to be submitted to the superintendent for comment prior to work being carried out.

KERBING NOTES

Includes all kerbs, gutters, dish drains, crossings and edges.

1. All kerbs, gutters, dish drains and crossings to be constructed on minimum 75mm granular basecourse compacted to minimum 98% modified maximum dry density in accordance with AS 1289 5.2.1.
2. Expansion joints (EJ) to be formed from 10mm compressible cork filler board for the full depth of the section and cut to profile. Expansion joints to be located at drainage pits, on tangent points of curves and elsewhere at 12m centres except for integral kerbs where the expansion joints are to match the joint locations in slabs.
3. Weakened plane joints to be min 3mm wide and located at 3m centres except for integral kerbs where weakened plane joints are to match the joint locations in slabs.
4. Broomed finished to all ramped and vehicular crossings, all other kerbing or dish drains to be steel float finished.
5. In the replacement of kerbs –
   Existing road pavement is to be sawcut 500mm from lip of gutter. Upon completion of new kerbs, new basecourse and surface is to be laid 500mm wide to match existing materials and thicknesses.
   Existing allotment drainage pipes are to be built into the new kerb with a 100mm dia hole.
   Existing kerbs are to be completely removed where new kerbs are shown.

SAFETY IN DESIGN

Contractor to refer to Appendix B of the Civil Specification for the Civil Risk and Solutions Register.

EXISTING SERVICES

Contractor to be aware existing services are located within the site. Location of all services to be verified by the Contractor prior to commencing works. Contractor to confirm with relevant authority regarding measures to be taken to ensure services are protected or procedures are in place to demolish and/or relocate.

EXISTING STRUCTURES

Contractor to be aware existing structures may exist within the site. To prevent damage to existing structure(s) and/or personnel, site works to be carried out as far as practically possible from existing structure(s).

EXISTING TREES

Contractor to be aware existing trees exist within the site which need to be protected. To prevent damage to trees and/or personnel, site works to be carried out as far as practically possible from existing trees. Advice needs to be sought from Arborist and/or Landscape Architect on measures required to protect trees.

GROUNDWATER

Contractor to be aware ground water levels are close to existing surface level. Temporary de-watering may be required during construction works.

EXCAVATIONS

Deep excavations due to stormwater drainage works is required. Contractor to ensure safe working procedures are in place for works. All excavations to be fenced off and batters adequately supported to approval of Geotechnical Engineer.

GROUND CONDITIONS

Contractor to be aware of the site geotechnical conditions.
Refer to geotechnical report by J&k GEOTECHNICS 17.12.15 for details.

HAZARDOUS MATERIALS

Existing asbestos products & contaminated material may be present on site. Contractor to ensure all hazardous materials are identified prior to commencing works. Safe working practises as per relevant authority to be adopted and appropriate PPE to be used when handling all hazardous materials. Refer to geotechnical/environmental report by J&k GEOTECHNICS 17.12.15 for details.

CONFINED SPACES

Contractor to be aware of potential hazards due to working in confined spaces such as stormwater pits, trenches and/or tanks. Contractor to provide safe working methods, use appropriate PPE when entering confined spaces and be licenced.

MANUAL HANDLING

Contractor to be aware manual handling may be required during construction. Contractor to take appropriate measures to ensure manual handling procedures and assessments are in place prior to commencing works.

WATER POLLUTION

Contractor to ensure appropriate measures are taken to prevent pollutants from construction works contaminating the surrounding environment.

SITE ACCESS/EGRESS

Contractor to be aware site works occur in close proximity to footpaths and roadways. Contractor to erect appropriate barriers and signage to protect site personnel and public.

VEHICLE MOVEMENT

Contractor to supply and comply with traffic management plan and provide adequate site traffic control including a certified traffic marshall to supervise vehicle movements where necessary.

SIGNS AND LINE MARKING NOTES

1. Pavement marking and sign posting to be in accordance with RMS. 'Interim Guide to Signs and Markings'.
2. Contractor is to provide guide posts, spaced in accordance with AS1742.2. They are to be located near all head walls and pipe outlets.
3. Raised pavement markers to be in accordance with AS1742.2
4. Where existing pavement marking conflicts with proposed, it is to be removed.
5. Line marking plan does not define boundaries.
6. Erect temporary sign 'changed traffic conditions ahead' 120m ahead of new work in both directions.
7. Establish the location of existing utility services and locate new signs clear of these installations.
8. The sloped face of the SF median kerbs which adjoin through lanes, are to be painted white in lieu of an E3 edge line. The reflective pavement markers normally associated with an E3 edge line are to be located on the pavement adjacent to the SF kerb.
9. Bicycle pavement markings and sign posting to be in accordance with Austroads Standards.
10. The design of major directional sign posting to be prepared and assessed by the RMS.

CONCRETE FINISHING NOTES

1. All exposed concrete pavements are to be broomed finished.
2. All edges of the concrete pavement including keyed and dowelled joints are to be finished with an edging tool.
3. Concrete pavements with grades greater than 10 % shall be heavily broomed finished.
4. Carborundum to be added to all stair treads and ramped crossings U.N.O.

BULK EARTHWORKS NOTES

1. All bulk earthworks setout from grid lines U.N.O.
2. All batters at a slope of 3 (H) : 1 (V) U.N.O.
3. Excavated material may be used as structural fill provided,
   (i) It complies with the specification requirements for fill material,
   (ii) the placement moisture content complies with the Geotechnical Consultants requirements, and allows filling to be placed and proofrolled in accordance with the specification. Where necessary the Contractor must moisture condition the excavated material to meet these requirements.
4. Compact fill areas and subgrade to not less than:

Location	Standard dry density (AS 1289 5.1.1.)	Moisture (OMC)
Under building slabs on ground:	98%	±2%
Under roads and carparks:	98%	±2%
Landscaped areas:	95%	±2%

5. Before placing fill, proof roll exposed subgrade with a 10 tonne minimum roller to test subgrade and then remove soft spots (areas with more than 3mm movement under roller).
   Soft spots to be replaced with select fill U.N.O.
6. Contractor shall place safety barriers around excavations in accordance with relevant safety regulations.
7. For interpretation of bulk earthworks foot print line shown on the bulk earthworks drawings refer to the bulk earthworks construction legend.
8. Bulk earthwork drawings are not to be used for detailed excavation.
9. Refer to Geotechnical Report prepared by – J&k GEOTECHNICS 28855rpt 17.12.15

REINFORCEMENT NOTES

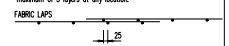
1. Fix reinforcement as shown on drawings. The type and grade is indicated by a symbol as shown below. On the drawings this is followed by a numeral which indicates the size in millimetres of the reinforcement.

N. Hot rolled ribbed bar	grade D500N
R. Plain round bar	grade R250N
SL. Square mesh	grade 500L
RL. Rectangular mesh	grade 500L

2. Provide bar supports or spacers to give the following concrete cover to all reinforcement unless otherwise noted on drawings.

Footings – 75 top, 75 bottom, 75 sides.
Slabs – 40 top, 40 bottom,
Cover to reinforcement ends to be 50 mm u.n.o.

3. Provide N12–450 support bars to top reinforcement as required, Lap 500 U.N.O.
4. Maintain cover to all pipes, conduits, regiets, drip grooves etc
5. All cogs to be standard cogs unless noted otherwise.
6. Fabric end and side laps are to be placed strictly in accordance with the manufacturers requirements to achieve a full tensile lap. Fabric shall be laid so that there is a maximum of 3 layers at any location.



PIT SCHEDULE

Note: Grate size does not necessarily reflect pit size, refer pit type details, shown on detail sheet – C11
Final internal pit dimensions are to comply with AS3500

Type	Description	Cover (Clear Opening)	Number
A	Kerb inlet pit 1800 lintel	600 x 900 Class D galvanised mild steel grate hinged to frame	1,2,16,17,18, 19,21,22,23, 24,25,26,27, 28,29,30,31 32,33,36
B	Surface inlet pit	900 x 900 Class D galvanised mild steel grate hinged to frame	3,4,5,6,7,9 10,11,13,14 34
C	Surface inlet pit	900 x 900 Class D galvanised mild steel grate hinged to frame	12
		900 x 900 Class D galvanised mild steel grate with concrete infill	35
D	Surface inlet pit	900 x 900 Class D galvanised mild steel 'V' grate hinged to frame	8,20
E		Adjust existing pit to suit proposed works	37,38,39,40
F		Existing pit to remain	15

SITEWORKS LEGEND

- F22.20 — Finished surface level
- *F22.20 — Level to be confirmed on site
- F22.00 — Finished contour
- K&G — Kerb and gutter
- KO — Kerb only
- DD — Dish drain
- RK&T — Roll kerb and toe
- SA — RMS Kerb (SA)
- CE — Concrete edge
- Stormwater pit, flow direction and line with
- IR — Intermediate riser with subsoil drainage line (100 dia)
- FP — Flushing point with subsoil drainage line (100 dia)
- Proposed boundary
- Proposed conduits
- W — TAP — Tap with proposed water line connection

EXISTING SEVICES LEGEND

- S — Existing sewer
- W — Existing water
- EU — Existing underground electrical
- OH — Existing aerial electrical
- T — Existing communications
- G — Existing gas
- SW — Existing stormwater

SURVEY LEGEND

- +18.48 — Surface level
- 19 — Contour
- Kerb line
- Batter
- Retaining wall
- EASEMENT FOR ____(__m WIDE) — Easement
- Fence
- Tree to be removed/be retained
- Boundary

DRAWING LIST	
Drawing Number	Drawing Title
C00	NOTES AND LEGENDS SHEET
C01	SOIL AND EROSION CONTROL PLAN
C02	SITEWORKS PLAN SHEET 1
C03	SITEWORKS PLAN SHEET 2
C04	SITEWORKS PLAN SHEET 3
C05	SITEWORKS PLAN SHEET 4
C06	COOPER STREET LONGITUDINAL SECTION
C07	HILTS ROAD AND LEICSTER LANE LONGITUDINAL SECTION
C08	CLARENCE STREET LONGITUDINAL SECTION
C09	NOT USED
C10	DETAILS SHEET 1
C11	DETAILS SHEET 2
C12	SECTIONS SHEET 1
C13	SECTIONS SHEET 2
C14	SECTIONS SHEET 3
C15	KERB RETURNS SHEET
C16	COOPER STREET CROSS SECTIONS SHEET 1
C17	COOPER STREET CROSS SECTIONS SHEET 2
C18	HILTS ROAD AND LEICSTER LANE CROSS SECTIONS SHEET 1
C19	HILTS ROAD AND LEICSTER LANE CROSS SECTIONS SHEET 2
C20	CLARENCE STREET CROSS SECTIONS
C21	STORMWATER LONGITUDINAL SECTIONS SHEET 1
C22	STORMWATER LONGITUDINAL SECTIONS SHEET 2
C23	STORMWATER LONGITUDINAL SECTIONS SHEET 3
C24	STORMWATER LONGITUDINAL SECTIONS SHEET 4
C25	STORMWATER LONGITUDINAL SECTIONS SHEET 5

STEP IRONS REQUIRED FOR PITS DEEPER THAN 900mm

FOR WATER SUPPLY/MODIFICATION/AUGMENTATION WORKS CONTRACTOR IS TO ENGAGE SYDNEY WATER SERVICES COORDINATION AND ACHIEVE WORK APPROVAL

Rev	Description	Eng	Draft	Date
P5	ISSUE FOR TENDER	KH	PW	12.09.16
P4	PRELIMINARY	KH	PW	01.07.16
P3	ISSUE FOR APPROVAL	KH	PW	12.05.16
P2	ISSUE FOR REVIEW	KH	PW	18.02.15
P1	ISSUE FOR REVIEW	KH	PK	23.12.15

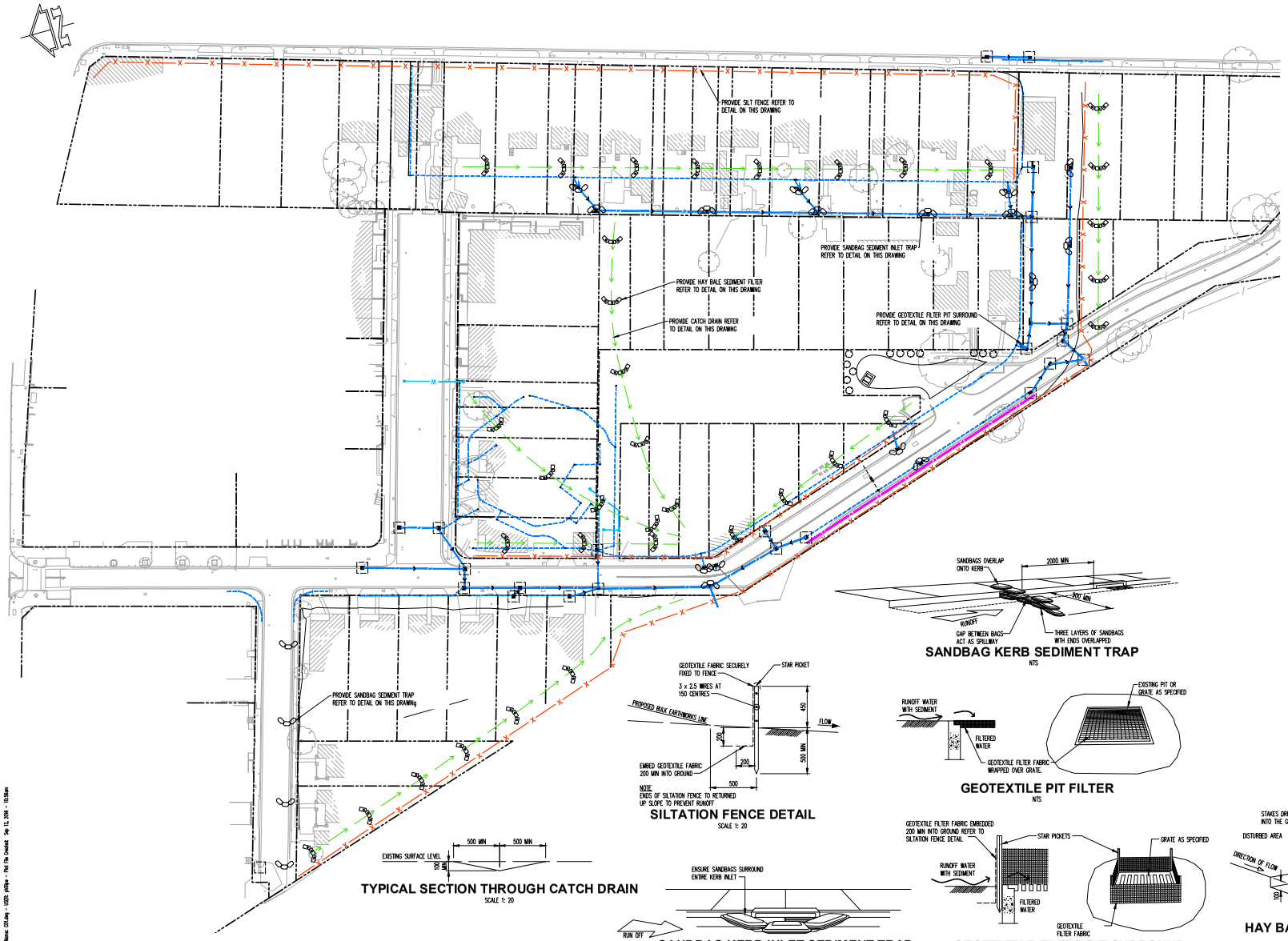
Client: City of Canada Bay Council

TaylorThomsonWhitting
Consulting Engineers
48 Chandos Street St.Leonards NSW 2065
T: +61 2 9439 7288 F: +61 2 9439 3946 ttwsyd@ttw.com.au
Taylor Thomson Whitting (NSW) Pty Ltd A.C.N. 113 578 377

Project: STRATHFIELD TRIANGLE

Sheet Subject: NOTES AND LEGENDS SHEET

Scale: A1 -
Drawn: PK
Authorised:
Job No: 131373
Drawing No: C00
Revision: P5
Plot File Created: Sep 12, 2016 - 10:57am



SANDBAG KERB SEDIMENT TRAP
NTS

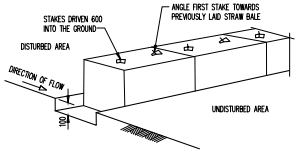
SILTATION FENCE DETAIL
SCALE 1: 20

GEOTEXTILE PIT FILTER
NTS

TYPICAL SECTION THROUGH CATCH DRAIN
SCALE 1: 20

SANDBAG KERB INLET SEDIMENT TRAP
NTS

GEOTEXTILE FILTER PIT SURROUND
NTS



HAY BALE SEDIMENT FILTER
NTS
NOTE: STAKE TO BE EITHER TAR COATED STAR OR 50 x 50 HARDWOOD

EROSION AND SEDIMENT CONTROL NOTES

1. All work shall be generally carried out in accordance with
   (A) Local authority requirements,
   (B) EPA – Pollution control manual for urban stormwater,
   (C) LANDCOM NSW – Managing Urban Stormwater: Soils and Construction ("Blue Book").
2. Erosion and sediment control drawing and notes are provided for the whole of the works. Should the Contractor stage these works then the design may be required to be modified. Variation to these details may require approval by the relevant authorities. The erosion and sediment control plan shall be implemented and adapted to meet the varying situations as work on site progresses.
3. Maintain all erosion and sediment control devices to the satisfaction of the superintendent and the local authority.
4. When stormwater pits are constructed prevent site runoff entering the pits unless silt fences are erected around pits.
5. Minimise the area of site being disturbed at any one time.
6. Protect all stockpiles of materials from scour and erosion. Do not stockpile loose material in roadways, near drainage pits or in watercourses.
7. All soil and water control measures are to be put back in place at the end of each working day, and modified to best suit site conditions.
8. Control water from upstream of the site such that it does not enter the disturbed site.
9. All construction vehicles shall enter and exit the site via the temporary construction entry/exit.
10. All vehicles leaving the site shall be cleaned and inspected before leaving.
11. Maintain all stormwater pipes and pits clear of debris and sediment. Inspect stormwater system and clean out after each storm event.
12. Clean out all erosion and sediment control devices after each storm event.

Sequence Of Works

1. Prior to commencement of excavation the following soil management devices must be installed.
1.1. Construct silt fences below the site and across all potential runoff sites.
1.2. Construct temporary construction entry/exit and divert runoff to suitable control systems.
1.3. Construct measures to divert upstream flows into existing stormwater system.
1.4. Construct sedimentation traps/basin including outlet control and overflow.
1.5. Construct turf lined swales.
1.6. Provide sandbag sediment traps upstream of existing pits.
2. Construct geotextile filter pit surround around all proposed pits as they are constructed.
3. On completion of pavement provide sand bag kerb inlet sediment traps around pits.
4. Provide and maintain a strip of turf on both sides of all roads after the construction of kerbs.

WATER QUALITY TESTING REQUIREMENTS

Prior to discharge of site stormwater, groundwater and seepage water into council's stormwater system, contractors must undertake water quality tests in conjunction with a suitably qualified environment consultant outlining the following:

- Compliance with the criteria of the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000)
- If required subject to the environmental consultants advice, provide remedial measures to improve the quality of water that is to be discharged into Councils storm water drainage system.This should include comments from a suitably qualified environmental consultant confirming the suitability of these remedial measures to manage the water discharged from the site into Councils storm water drainage system. Outlining the proposed, ongoing monitoring, contingency plans and validation program that will be in place to continually monitor the quality of water discharged from this site. This should outline the frequency of water quality testing that will be undertaken by a suitably qualified environmental consultant.

EROSION AND SEDIMENT CONTROL LEGEND

- Siltation fence
- Stormwater pit with Geotextile filter surround
- Hay bale barriers
- Sandbag sediment trap
- Catch drain

Rev	Description	Eng	Draft	Date
P2	ISSUE FOR TENDER	KH	PW	12.09.16
P1	PRELIMINARY	KH	PW	01.07.16

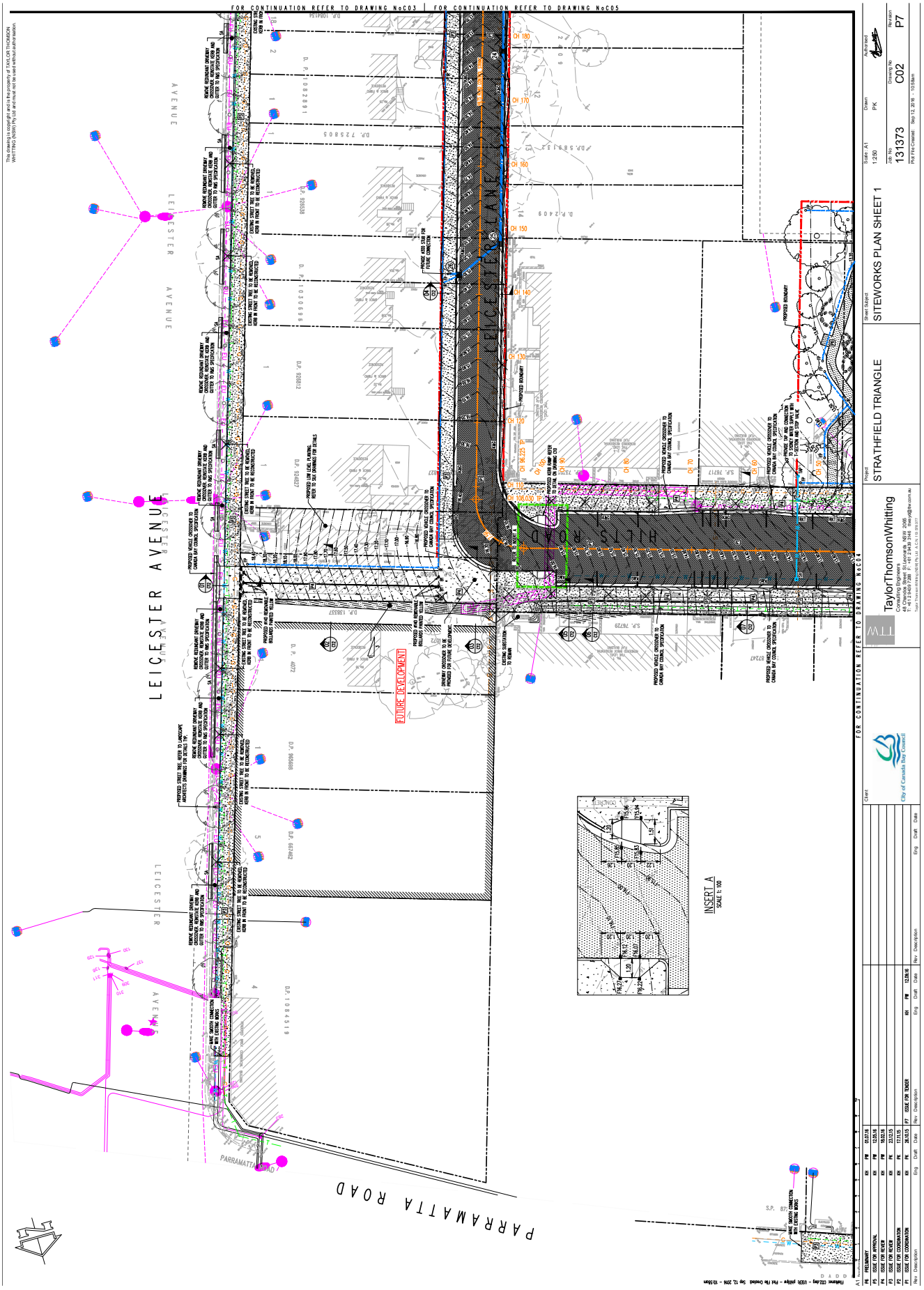
Client: City of Canada Bay Council

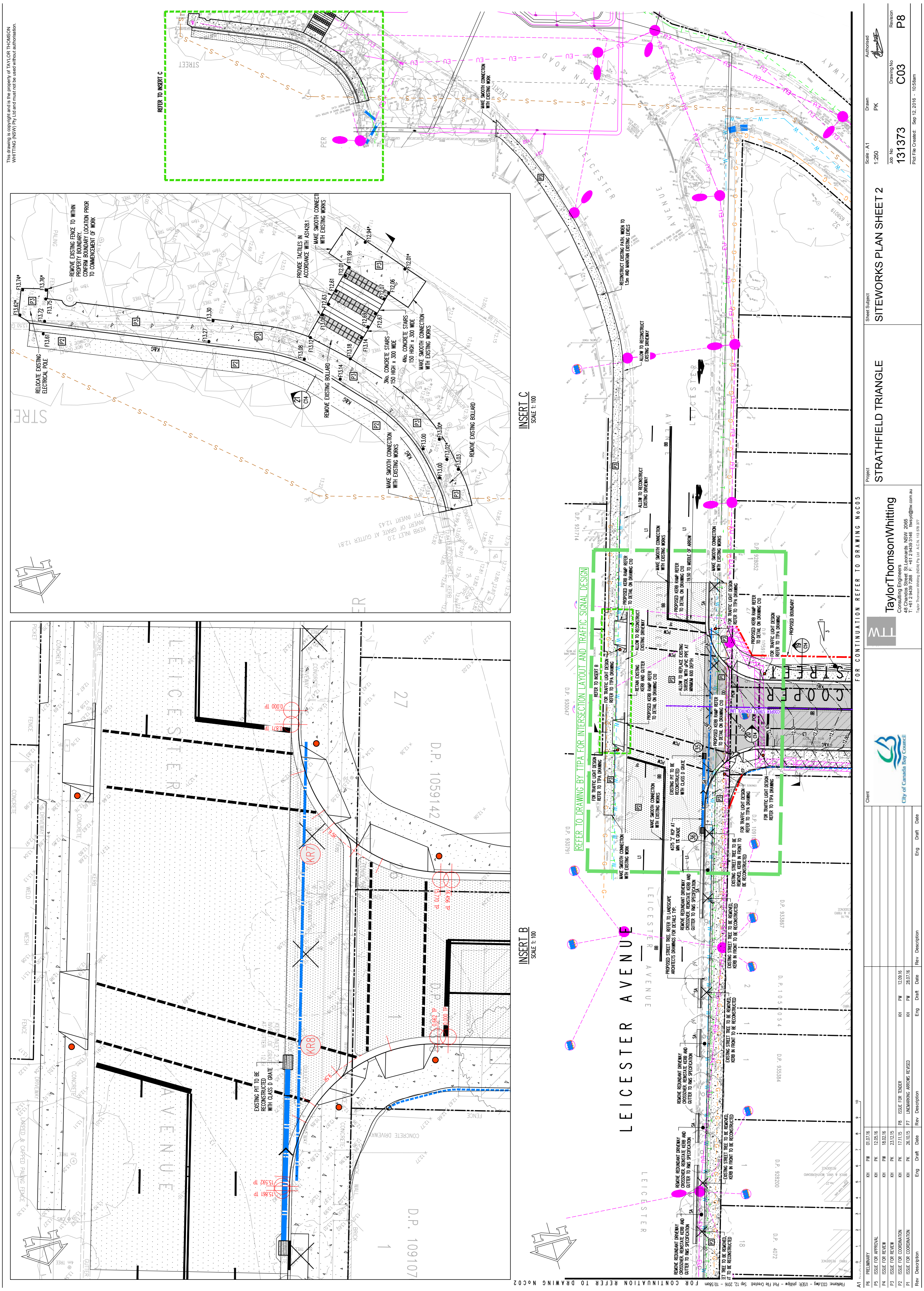
TaylorThomsonWhitting
Consulting Engineers
48 Chandos Street St Leonards NSW 2065
T: +61 2 9439 7288 F: +61 2 9439 3146 tnwyd@ttw.com.au
Taylor Thomson Whitting (NSW) Pty Ltd A.C.N. 113 578 377

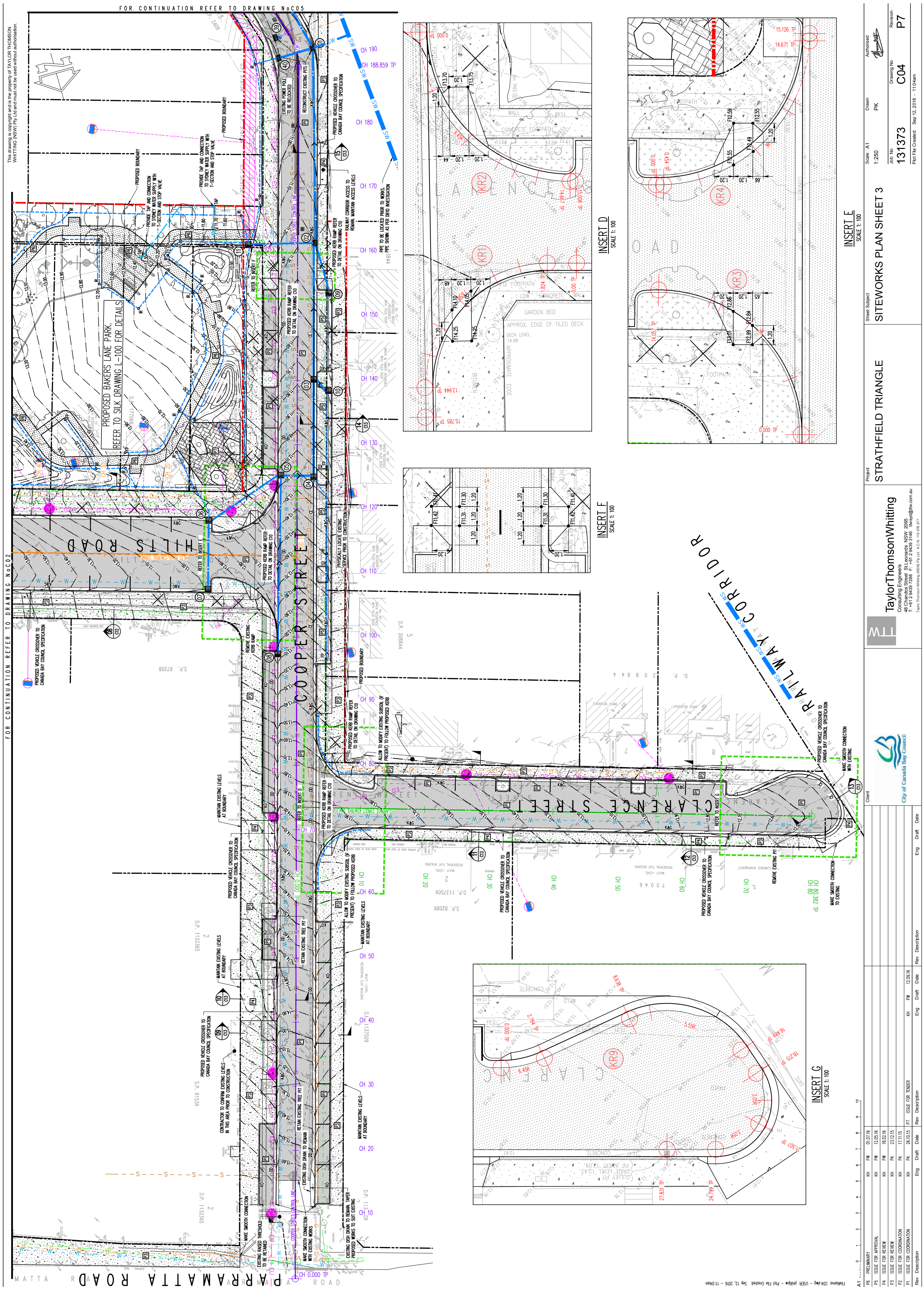
Project: STRATHFIELD TRIANGLE

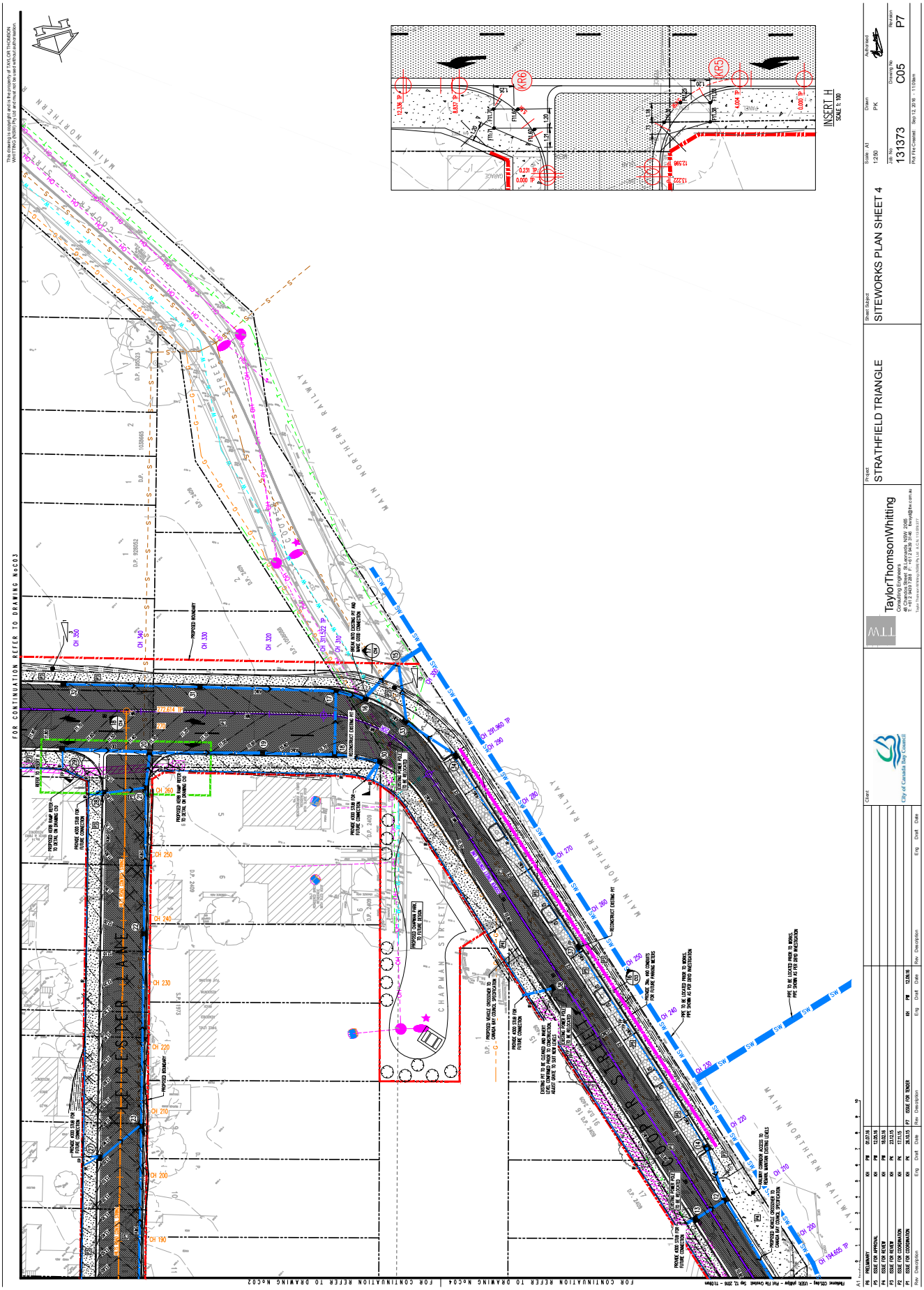
Sheet Subject: EROSION AND SEDIMENT CONTROL PLAN

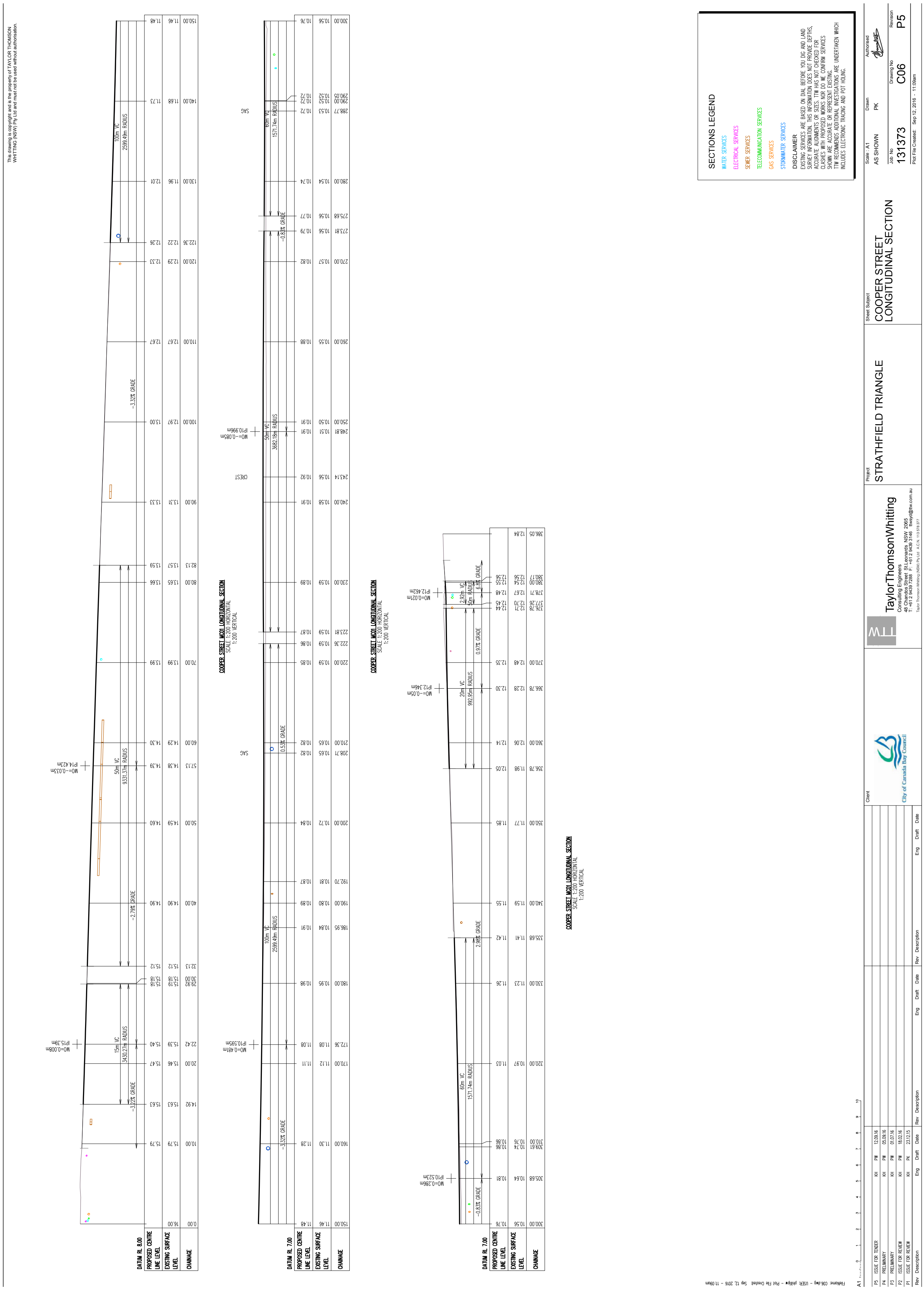
Scale: A1 1:500 | Drawn: PW | Authorised:
Job No: 131373 | Drawing No: C01 | Revision: P2
Plot File Created: Sep 12, 2016 - 10:56am

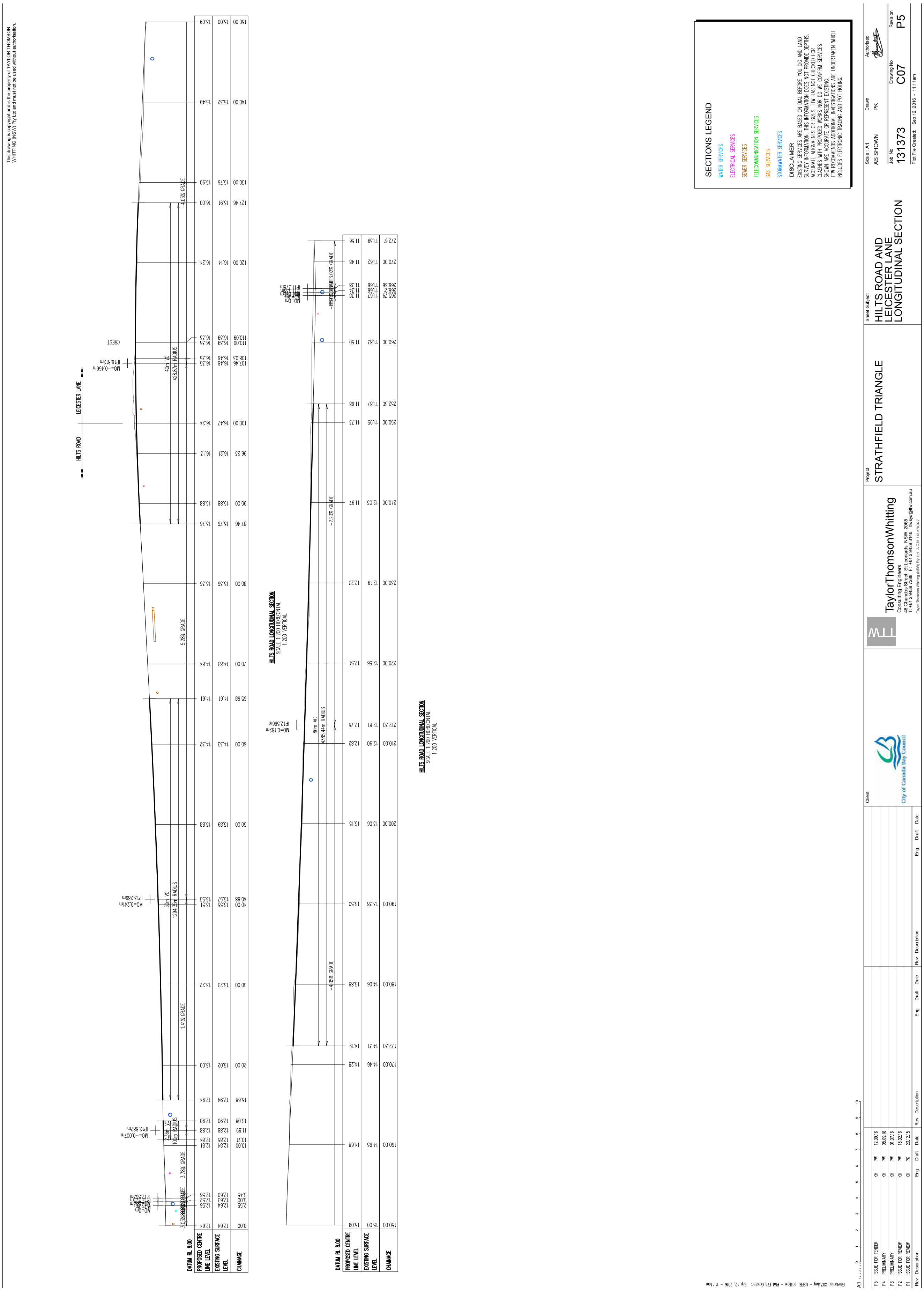

FOR CONTINUATION REFER TO DRAWING No.C03
FOR CONTINUATION REFER TO DRAWING No.C05
FOR CONTINUATION REFER TO DRAWING No.C04
LEICESTER AVENUE
HILTS ROAD
PARRAMATTA ROAD
FUTURE DEVELOPMENT
INSERT A
SCALE 1: 100
SITEWORKS PLAN SHEET 1
STRATHFIELD TRIANGLE
TaylorThomsonWhitting
City of Canada Bay Council
Job No. 131373
Drawing No. C02
Revision P7
Scale: A1 1:250
Drawn PK
Authorised
Plot File Created: Sep 12, 2016 - 10:58am

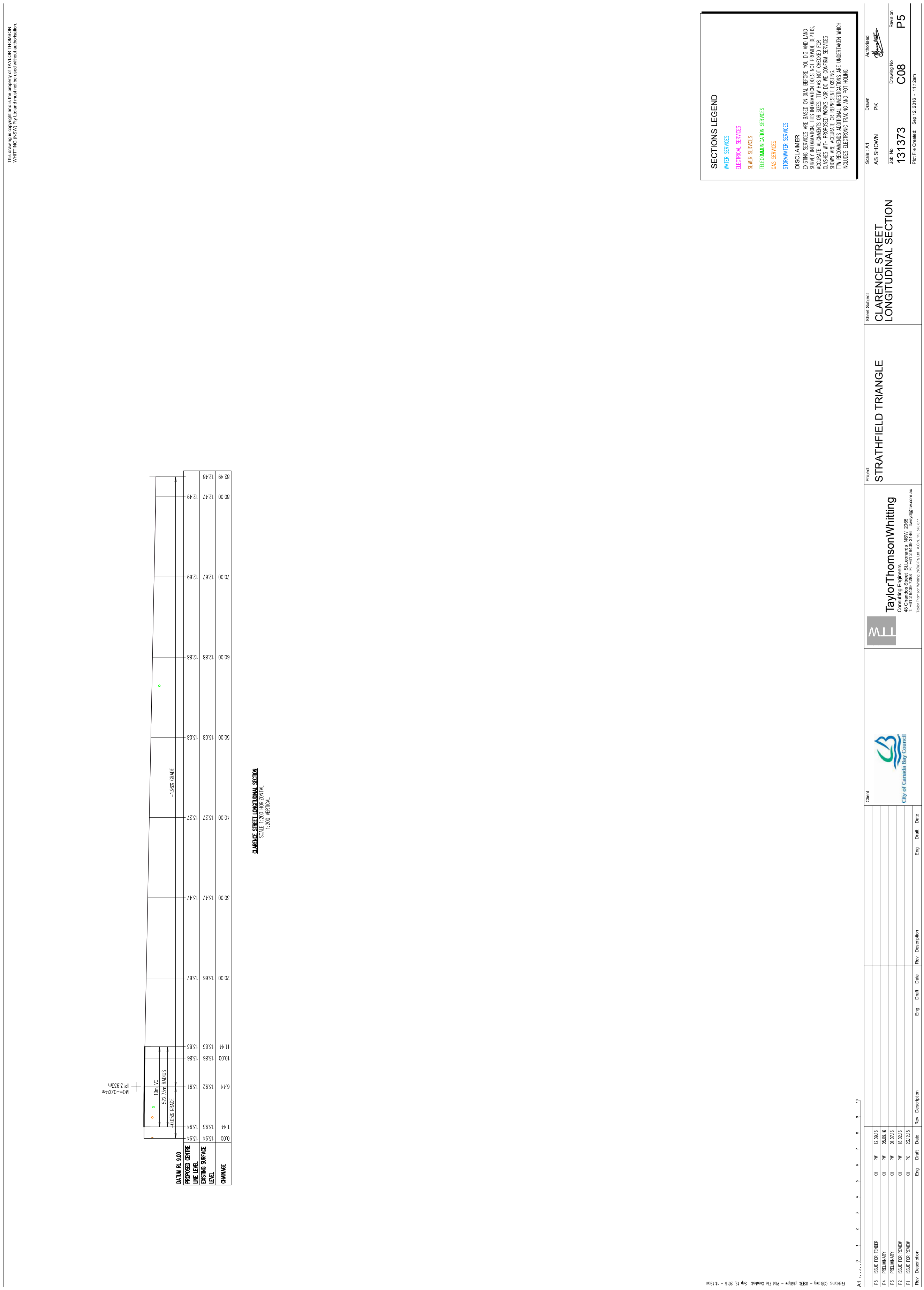

SITEWORKS PLAN SHEET 2
STRATHFIELD TRIANGLE
TaylorThomsonWhitting
131373
C03
P8
INSERT B
INSERT C
LEICESTER AVENUE
COOPER STREET

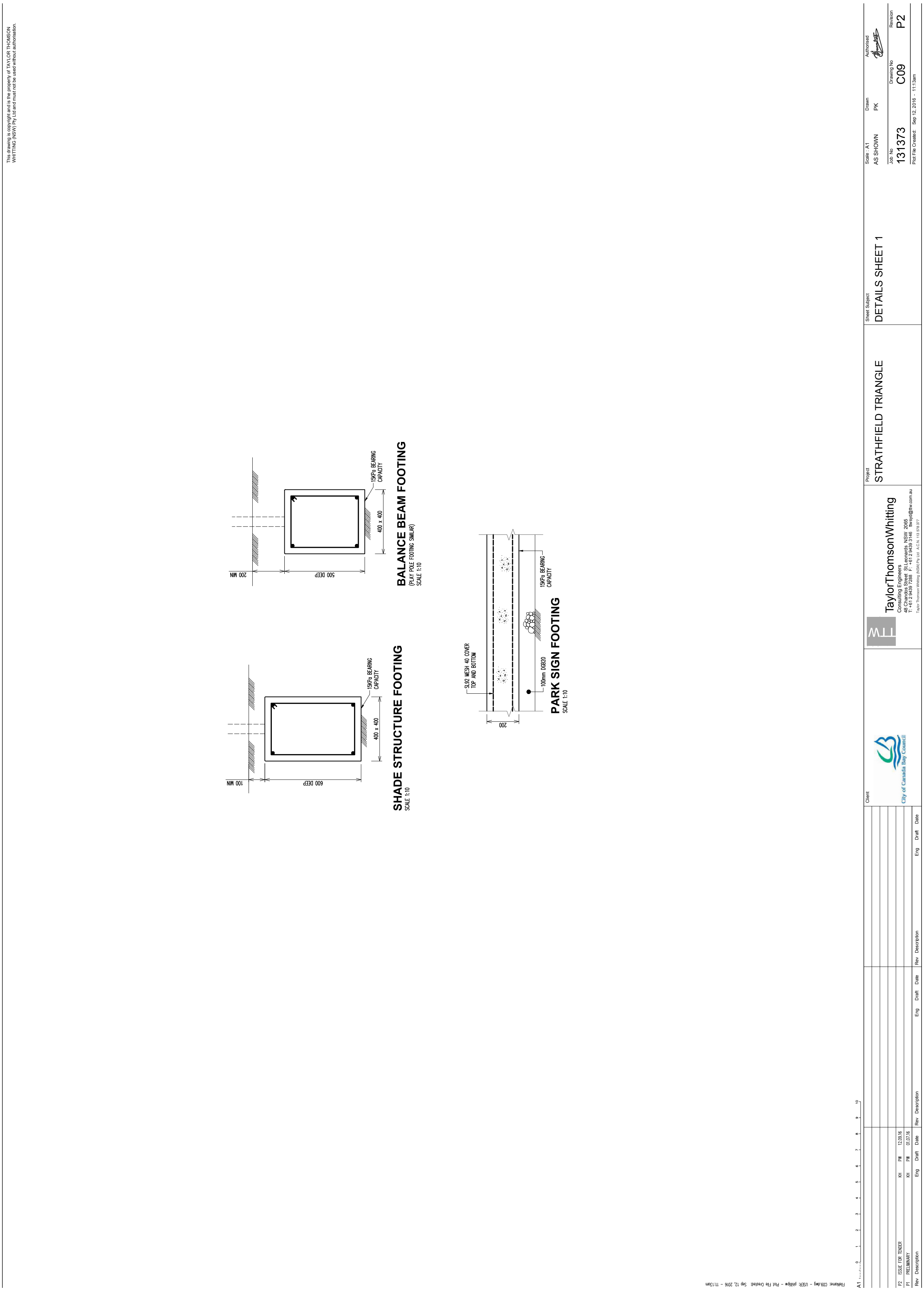

FOR CONTINUATION REFER TO DRAWING No.C05
FOR CONTINUATION REFER TO DRAWING No.C02
COOPER STREET
CLARENCE STREET
HILTS ROAD
PARRAMATTA ROAD
RAILWAY CORRIDOR
PROPOSED BAKERS LANE PARK. REFER TO SILK DRAWING L-100 FOR DETAILS
INSERT D
SCALE 1:100
INSERT E
SCALE 1:100
INSERT F
SCALE 1:100
INSERT G
SCALE 1:100
TaylorThomsonWhitting
STRATHFIELD TRIANGLE
SITEWORKS PLAN SHEET 3
131373
C04
P7
City of Canada Bay Council

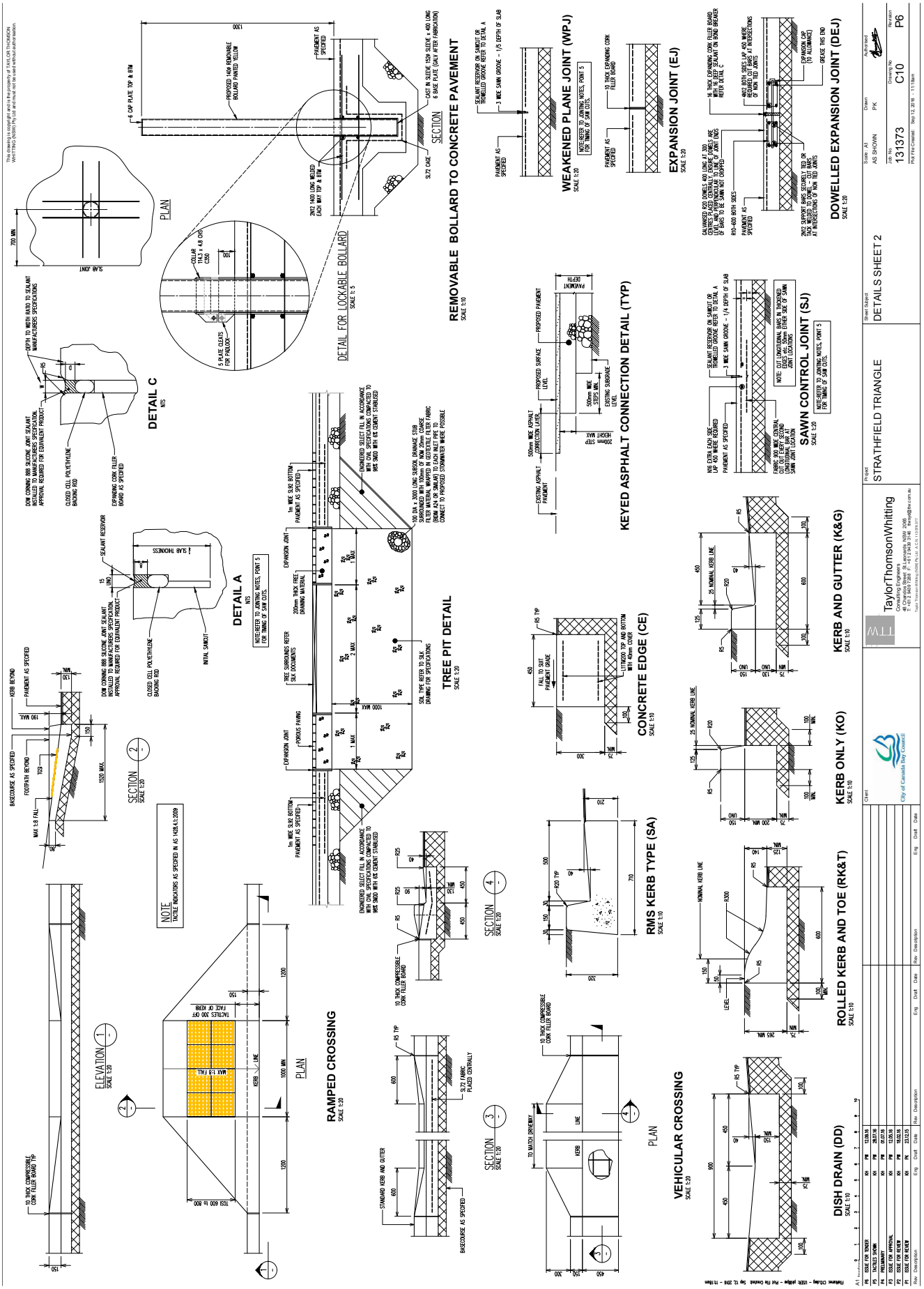

INSERT H
SCALE 1: 100
MAIN NORTHERN RAILWAY
CHAPMAN STREET
TRIGESTER LANE
FOR CONTINUATION REFER TO DRAWING No:C03
FOR CONTINUATION REFER TO DRAWING No:C04 | FOR CONTINUATION REFER TO DRAWING No:C02
TaylorThomsonWhitting
Consulting Engineers
STRATHFIELD TRIANGLE
SITEWORKS PLAN SHEET 4
City of Canada Bay Council
Job No 131373
Drawing No C05
Revision P7
Scale: A1 1:200
Drawn PK
Authorised
Plot File Created: Sep 12, 2018 - 11:08am
PRELIMINARY
ISSUE FOR APPROVAL
ISSUE FOR REVIEW
ISSUE FOR COORDINATION
ISSUE FOR TENDER

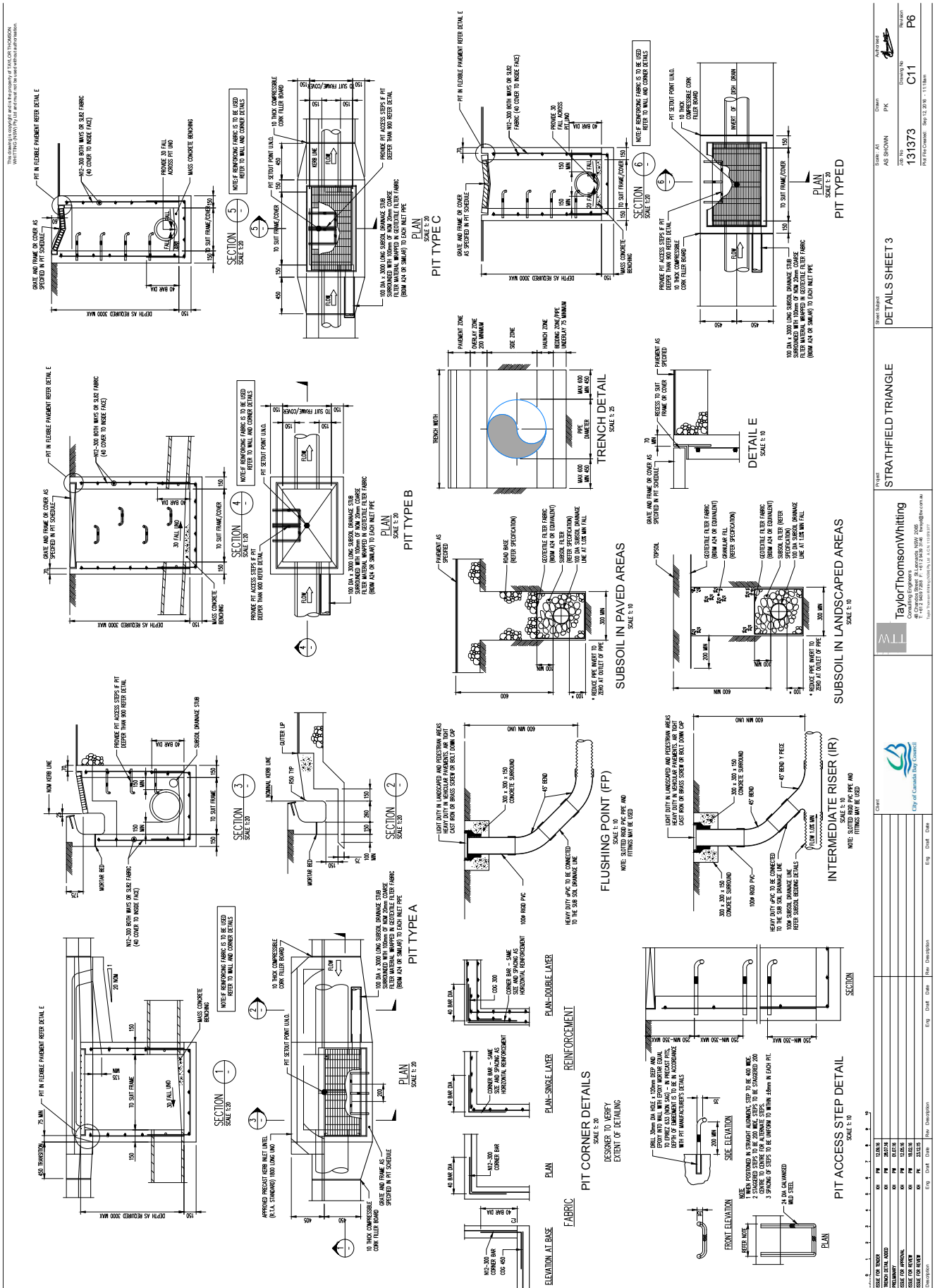

SECTIONS LEGEND
WATER SERVICES
ELECTRICAL SERVICES
SEWER SERVICES
TELECOMMUNICATION SERVICES
GAS SERVICES
STORMWATER SERVICES
COOPER STREET MC01 LONGITUDINAL SECTION
SCALE 1:200 HORIZONTAL
1:200 VERTICAL
STRATHFIELD TRIANGLE
COOPER STREET
LONGITUDINAL SECTION
TaylorThomsonWhitting
AS SHOWN
PK
131373
C06
P5

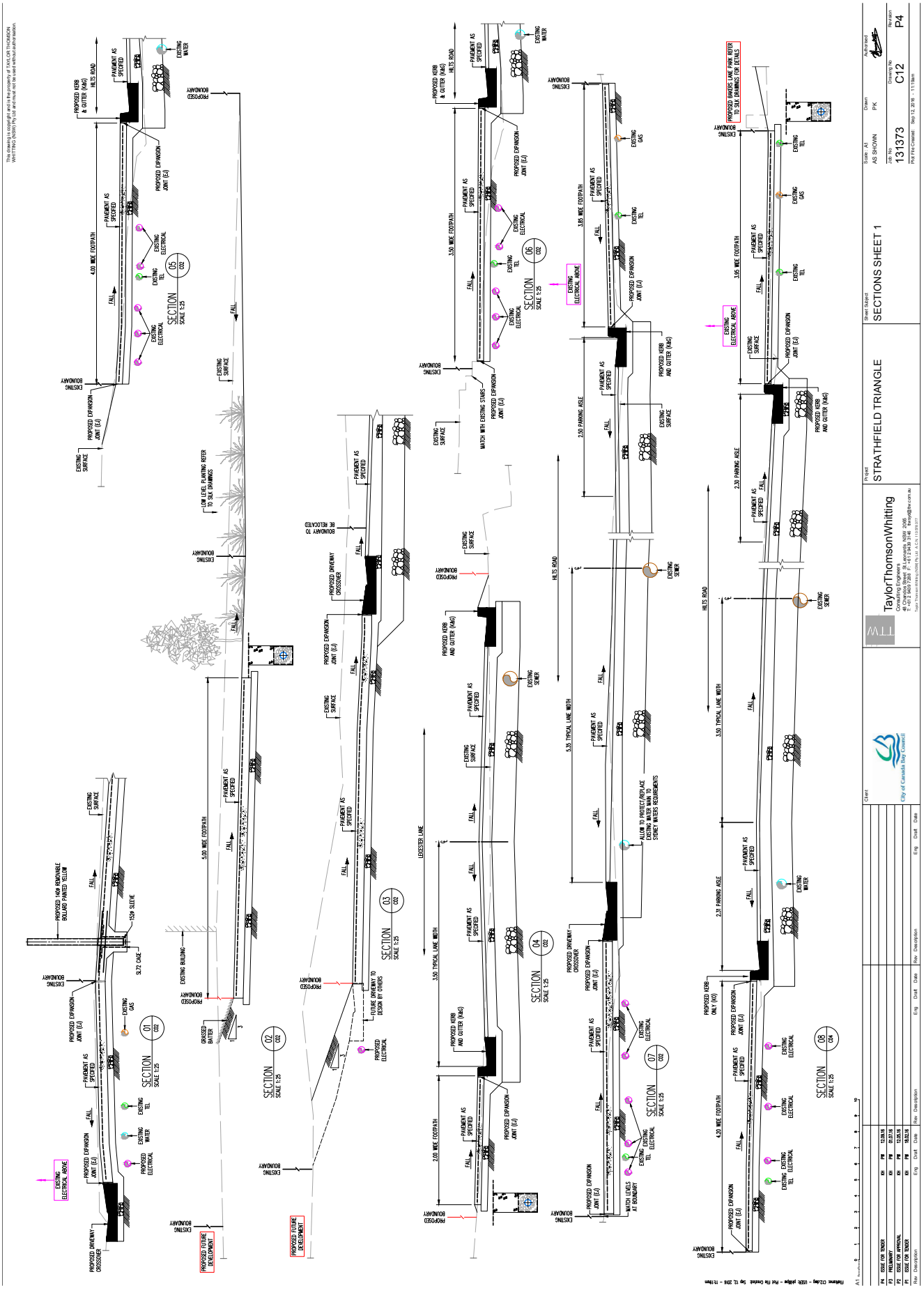

SECTIONS LEGEND
WATER SERVICES
ELECTRICAL SERVICES
SEWER SERVICES
TELECOMMUNICATION SERVICES
GAS SERVICES
STORMWATER SERVICES
DISCLAIMER
TaylorThomsonWhitting
STRATHFIELD TRIANGLE
HILTS ROAD AND LEICESTER LANE LONGITUDINAL SECTION
AS SHOWN
PK
131373
C07
P5
HILTS ROAD LONGITUDINAL SECTION
HILTS ROAD
LEICESTER LANE
CREST
DATUM RL 9.00
DATUM RL 8.00
PROPOSED CENTRE LINE LEVEL
EXISTING SURFACE LEVEL
CHAINAGE

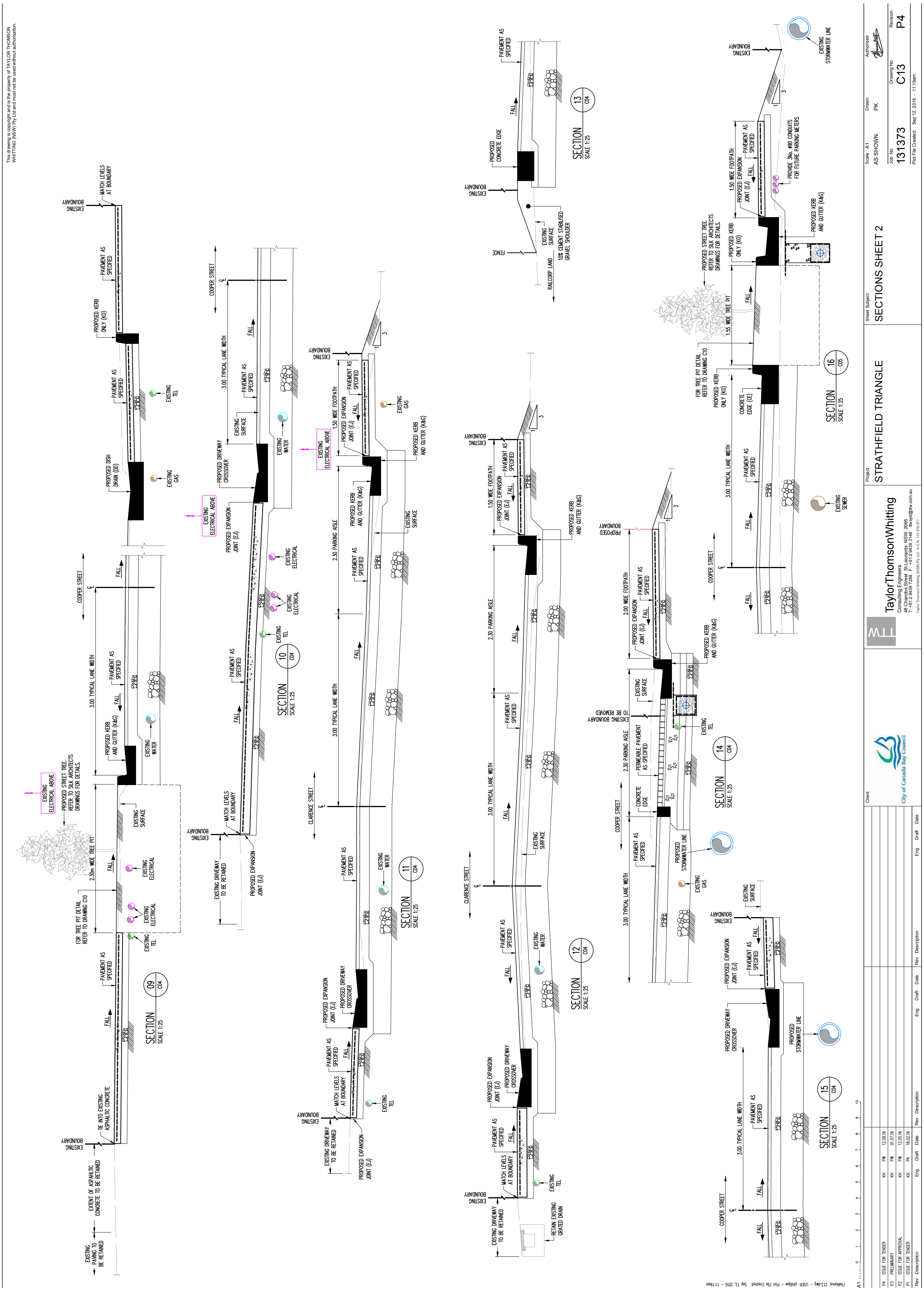

SECTIONS LEGEND
WATER SERVICES
ELECTRICAL SERVICES
SEWER SERVICES
TELECOMMUNICATION SERVICES
GAS SERVICES
STORMWATER SERVICES
DISCLAIMER
CLARENCE STREET LONGITUDINAL SECTION
STRATHFIELD TRIANGLE
TaylorThomsonWhitting
Consulting Engineers
City of Canada Bay Council
AS SHOWN
PK
131373
C08
P5
DATUM RL 9.00
PROPOSED CENTRE LINE LEVEL
EXISTING SURFACE LEVEL
CHAINAGE
-1.96% GRADE
-0.05% GRADE
522.73m RADIUS
10m VC

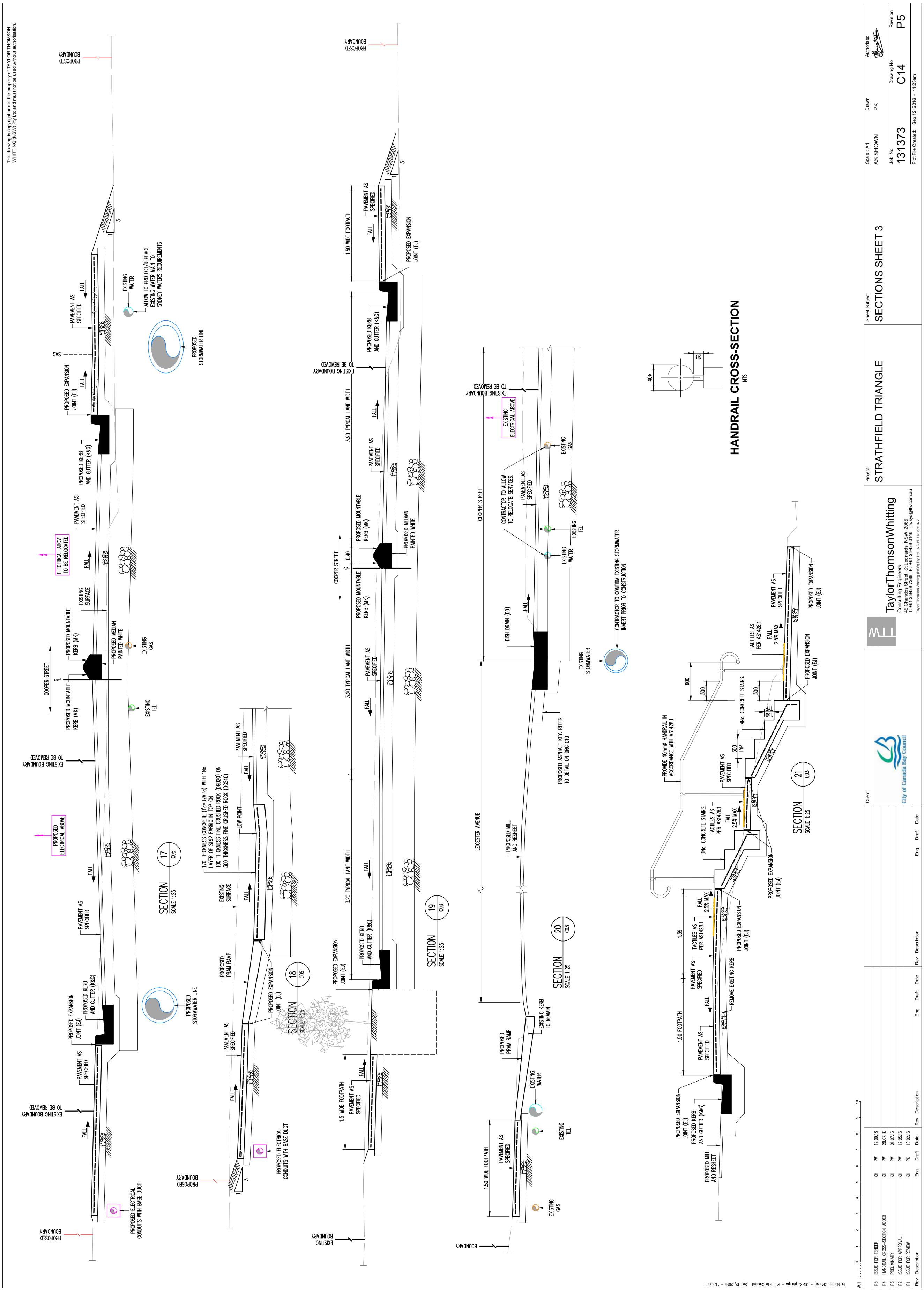

SHADE STRUCTURE FOOTING
SCALE 1:10
BALANCE BEAM FOOTING
(PLAY POLE FOOTING SIMILAR)
SCALE 1:10
PARK SIGN FOOTING
SCALE 1:10
15KPa BEARING CAPACITY
400 x 400
600 DEEP
500 DEEP
100 MIN
200 MIN
SL92 MESH 40 COVER TOP AND BOTTOM
100mm DGB20
200
TaylorThomsonWhitting
STRATHFIELD TRIANGLE
DETAILS SHEET 1
AS SHOWN
PK
131373
C09
P2
P2 ISSUE FOR TENDER
P1 PRELIMINARY

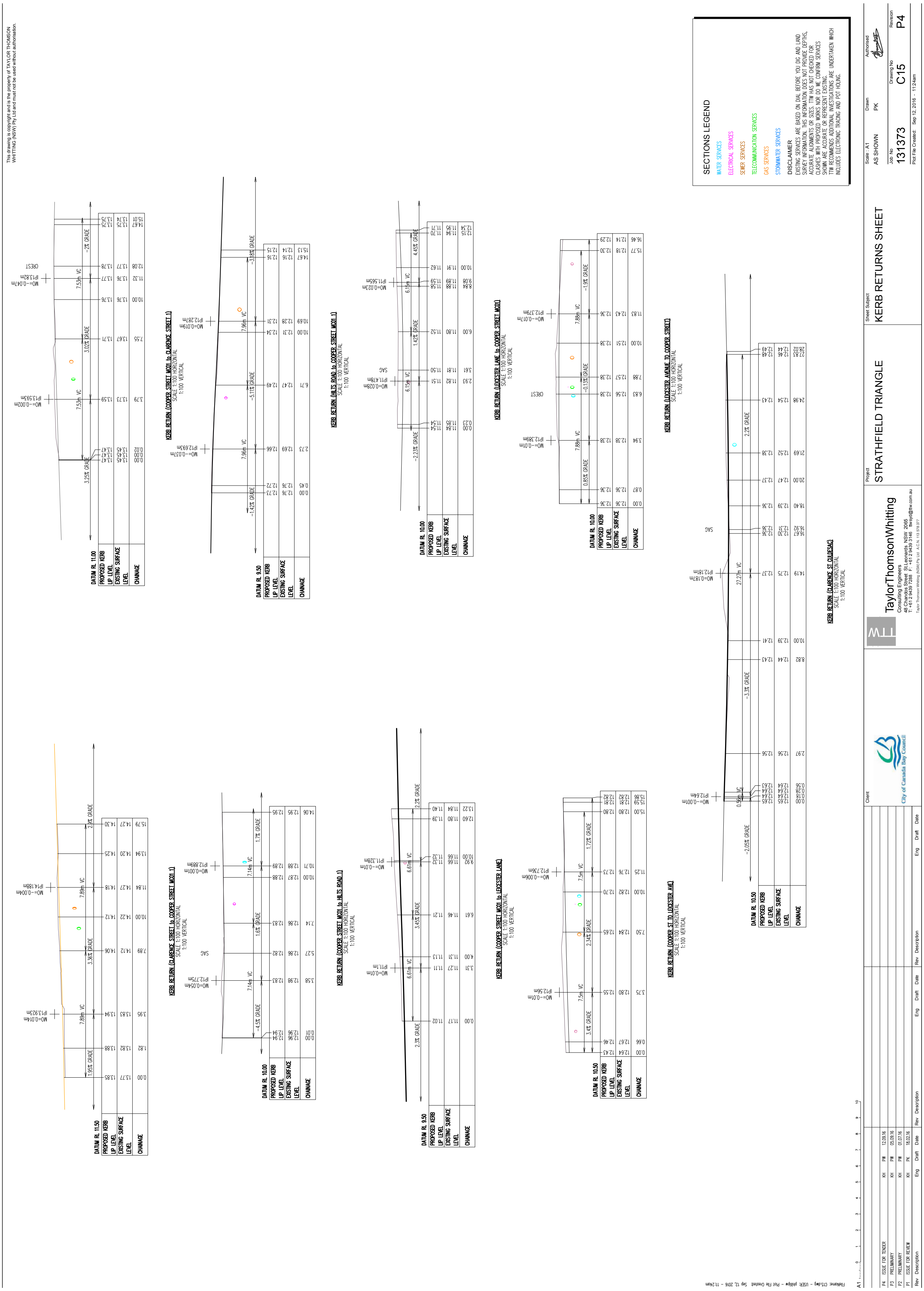

REMOVABLE BOLLARD TO CONCRETE PAVEMENT
SCALE 1:10
DETAIL FOR LOCKABLE BOLLARD
SCALE 1:5
WEAKENED PLANE JOINT (WPJ)
SCALE 1:20
EXPANSION JOINT (EJ)
SCALE 1:20
DOWELLED EXPANSION JOINT (DEJ)
SCALE 1:20
DETAIL C
NTS
DETAIL A
NTS
TREE PIT DETAIL
SCALE 1:20
KEYED ASPHALT CONNECTION DETAIL (TYP)
SCALE 1:10
SAWN CONTROL JOINT (SJ)
SCALE 1:10
CONCRETE EDGE (CE)
SCALE 1:10
RMS KERB TYPE (SA)
SCALE 1:10
KERB AND GUTTER (K&G)
SCALE 1:10
KERB ONLY (KO)
SCALE 1:10
ROLLED KERB AND TOE (RK&T)
SCALE 1:10
DISH DRAIN (DD)
SCALE 1:10
RAMPED CROSSING
SCALE 1:20
VEHICULAR CROSSING
SCALE 1:20
NOTE
TACTILE INDICATORS AS SPECIFIED IN AS 1428.4.1:2009
DETAILS SHEET 2
STRATHFIELD TRIANGLE
TaylorThomsonWhitting
City of Canada Bay Council
131373
C10
P6

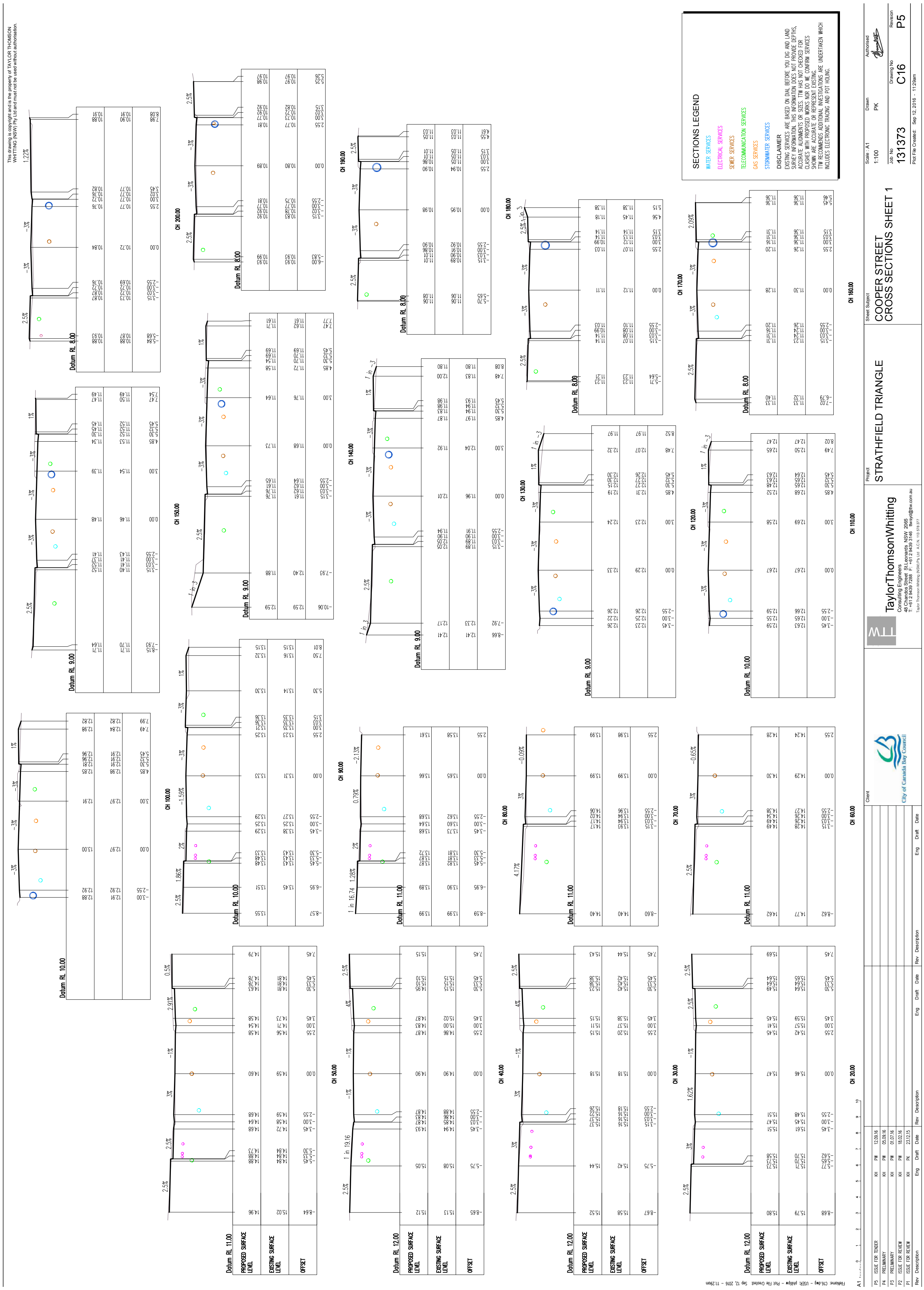

PIT TYPE A
PIT TYPE B
PIT TYPE C
PIT TYPED
TRENCH DETAIL
DETAIL E
SUBSOIL IN PAVED AREAS
SUBSOIL IN LANDSCAPED AREAS
FLUSHING POINT (FP)
INTERMEDIATE RISER (IR)
PIT ACCESS STEP DETAIL
PIT CORNER DETAILS
DESIGNER TO VERIFY EXTENT OF DETAILING
REINFORCEMENT
FABRIC
PLAN-SINGLE LAYER
PLAN-DOUBLE LAYER
ELEVATION AT BASE
SECTION
PLAN
SIDE ELEVATION
FRONT ELEVATION
TaylorThomsonWhitting
Consulting Engineers
STRATHFIELD TRIANGLE
DETAILS SHEET 3
City of Canada Bay Council
Scale: A1 AS SHOWN
Drawn: PK
Job No: 131373
Drawing No: C11
Revision: P6
Authorised
Plot File Created: Sep 12, 2016 - 11:18am
P6 ISSUE FOR TENDER
P5 TRENCH DETAIL ADDED
P4 ISSUE FOR APPROVAL
P3 ISSUE FOR REVIEW
P2 ISSUE FOR REVIEW
P1 ISSUE FOR REVIEW

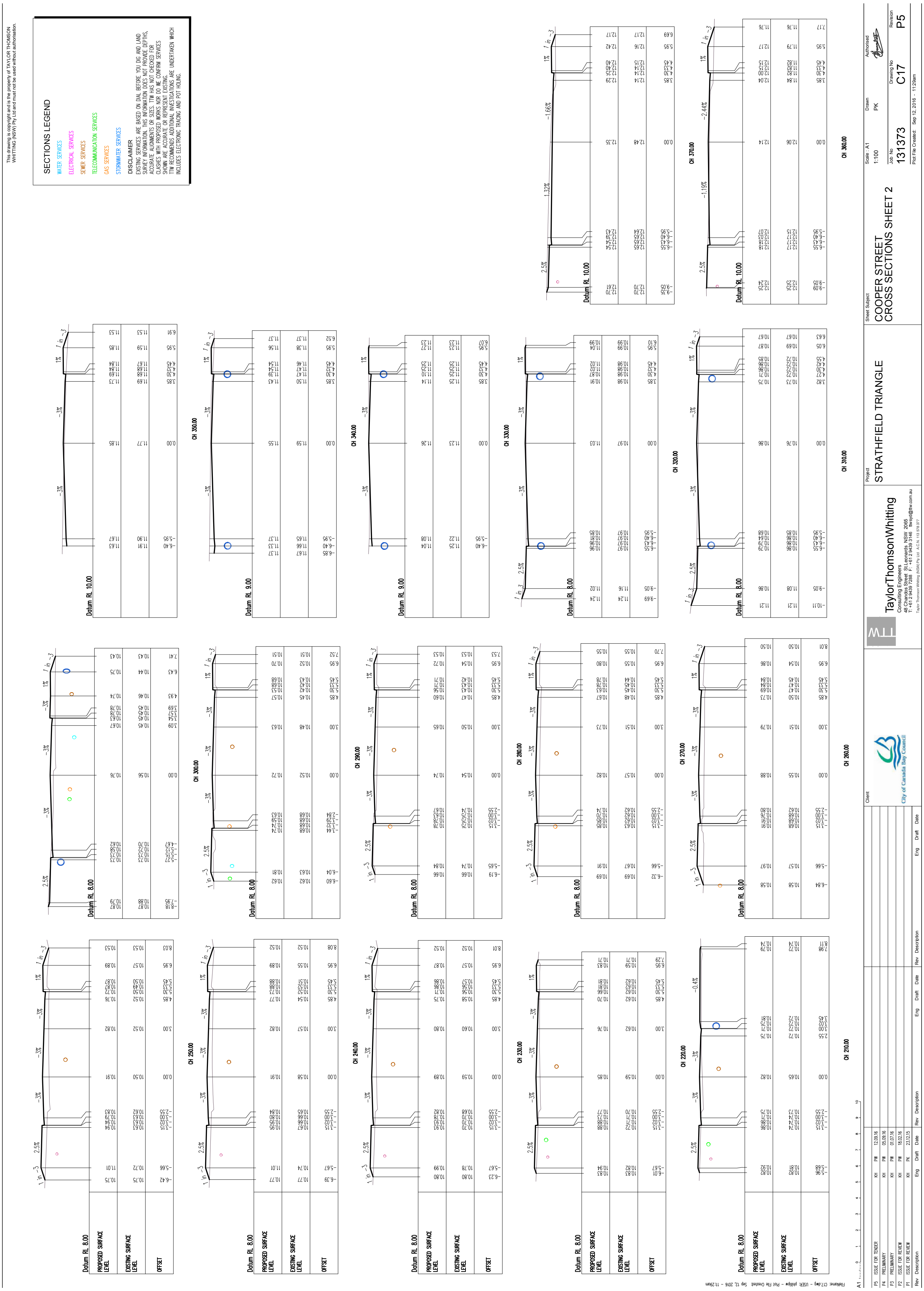

This drawing is copyright and is the property of TAYLOR THOMSON WHITTING (NSW) Pty Ltd and must not be used without authorisation.
HELTS ROAD
PROPOSED KERB & GUTTER (KAG)
PAVEMENT AS SPECIFIED
EXISTING WATER
EXISTING BOUNDARY
PROPOSED EXPANSION JOINT (EJ)
4.00 WIDE FOOTPATH
EXISTING ELECTRICAL
EXISTING TEL
SECTION 05 SCALE 1:25
EXISTING SURFACE
FALL
LOW LEVEL PLANTING REFER TO L&A DRAWINGS
5.00 WIDE FOOTPATH
SECTION 02 SCALE 1:25
EXISTING BUILDING
PROPOSED BOUNDARY
GRASSED BATTER
PROPOSED FUTURE DEVELOPMENT
PROPOSED HDA REMOVABLE BOLLARD PAINTED YELLOW
S59 SLEEVE
S.72 CAGE
EXISTING GAS
SECTION 01 SCALE 1:25
EXISTING ELECTRICAL ABOVE
PROPOSED DRIVEWAY CROSSOVER
BOUNDARY TO BE RELOCATED
PROPOSED DRIVEWAY CROSSOVER
FUTURE DRIVEWAY TO DESIGN BY OTHERS
SECTION 03 SCALE 1:25
LOCHIESTER LANE
3.50 TYPICAL LANE WIDTH
2.00 WIDE FOOTPATH
SECTION 04 SCALE 1:25
MATCH WITH EXISTING STAIRS
3.50 WIDE FOOTPATH
SECTION 06 SCALE 1:25
1.85 WIDE FOOTPATH
2.50 PARKING AISLE
5.35 TYPICAL LANE WIDTH
ALLOW TO PROTECT/REPLACE EXISTING MH TO SYDNEY WATERS REQUIREMENTS
MATCH LEVELS AT BOUNDARY
SECTION 07 SCALE 1:25
PROPOSED BIKERS LANE PARK REFER TO L&A DRAWINGS FOR DETAILS
1.95 WIDE FOOTPATH
2.30 PARKING AISLE
3.50 TYPICAL LANE WIDTH
4.20 WIDE FOOTPATH
PROPOSED KERB ONLY (KO)
SECTION 08 SCALE 1:25
EXISTING SEWER
Rev Description Eng Draft Date
P4 ISSUE FOR TENDER KH PM 13.09.16
P3 PRELIMINARY KH PM 01.07.16
P2 ISSUE FOR APPROVAL KH PM 12.05.16
P1 ISSUE FOR TENDER KH PM 18.02.16
Client
City of Canada Bay Council
TaylorThomsonWhitting
Consulting Engineers
49 Chandos Street St Leonards NSW 2065
Ph: (02) 9439 4439 Fax: (02) 9439 5866 Email: tsw@tsw.com.au
Project
STRATHFIELD TRIANGLE
Sheet Subject
SECTIONS SHEET 1
Scale: A1 AS SHOWN
Drawn PK
Authorised
Job No 131373
Drawing No C12
Revision P4
Plot File Created: Sep 12, 2016 - 11:18am


STRATHFIELD TRIANGLE
SECTIONS SHEET 2
TaylorThomsonWhitting
131373
C13
P4

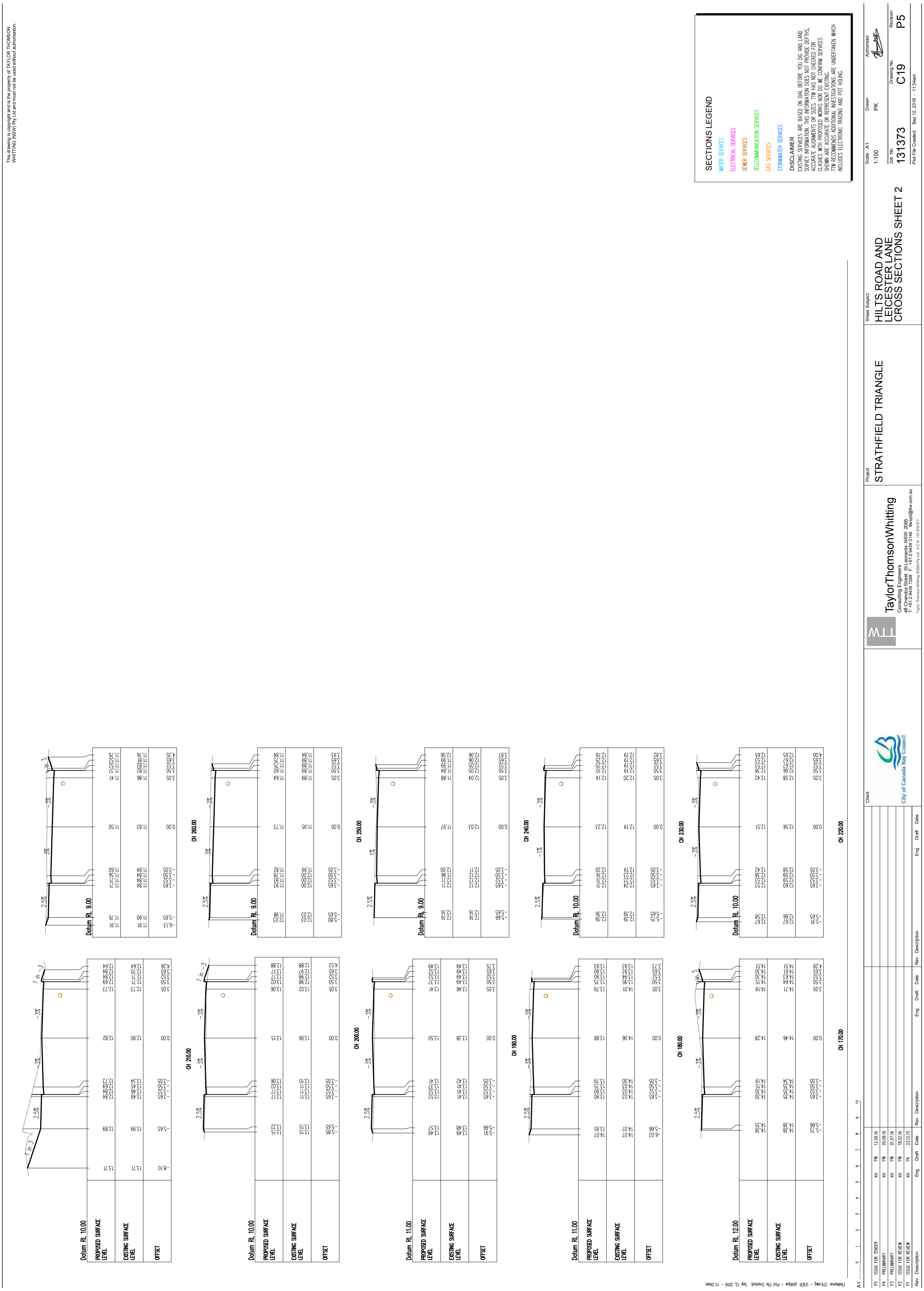

SECTION 17
SECTION 18
SECTION 19
SECTION 20
SECTION 21
HANDRAIL CROSS-SECTION
COOPER STREET
LEICESTER AVENUE
TaylorThomsonWhitting
STRATHFIELD TRIANGLE
SECTIONS SHEET 3
131373
C14
P5

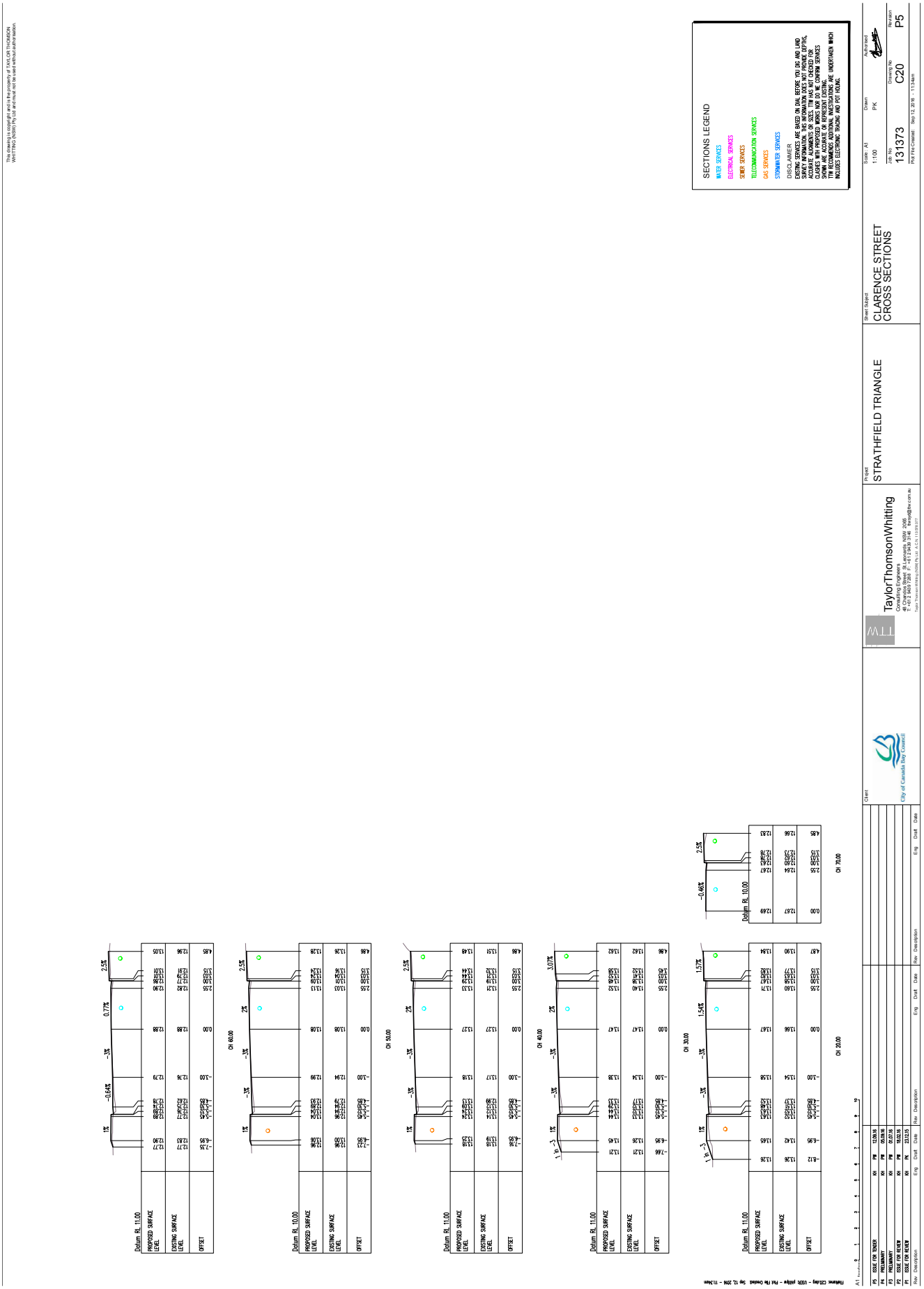

SECTIONS LEGEND
WATER SERVICES
ELECTRICAL SERVICES
SEWER SERVICES
TELECOMMUNICATION SERVICES
GAS SERVICES
STORMWATER SERVICES
TaylorThomsonWhitting
STRATHFIELD TRIANGLE
KERB RETURNS SHEET
AS SHOWN
PK
131373
C15
P4

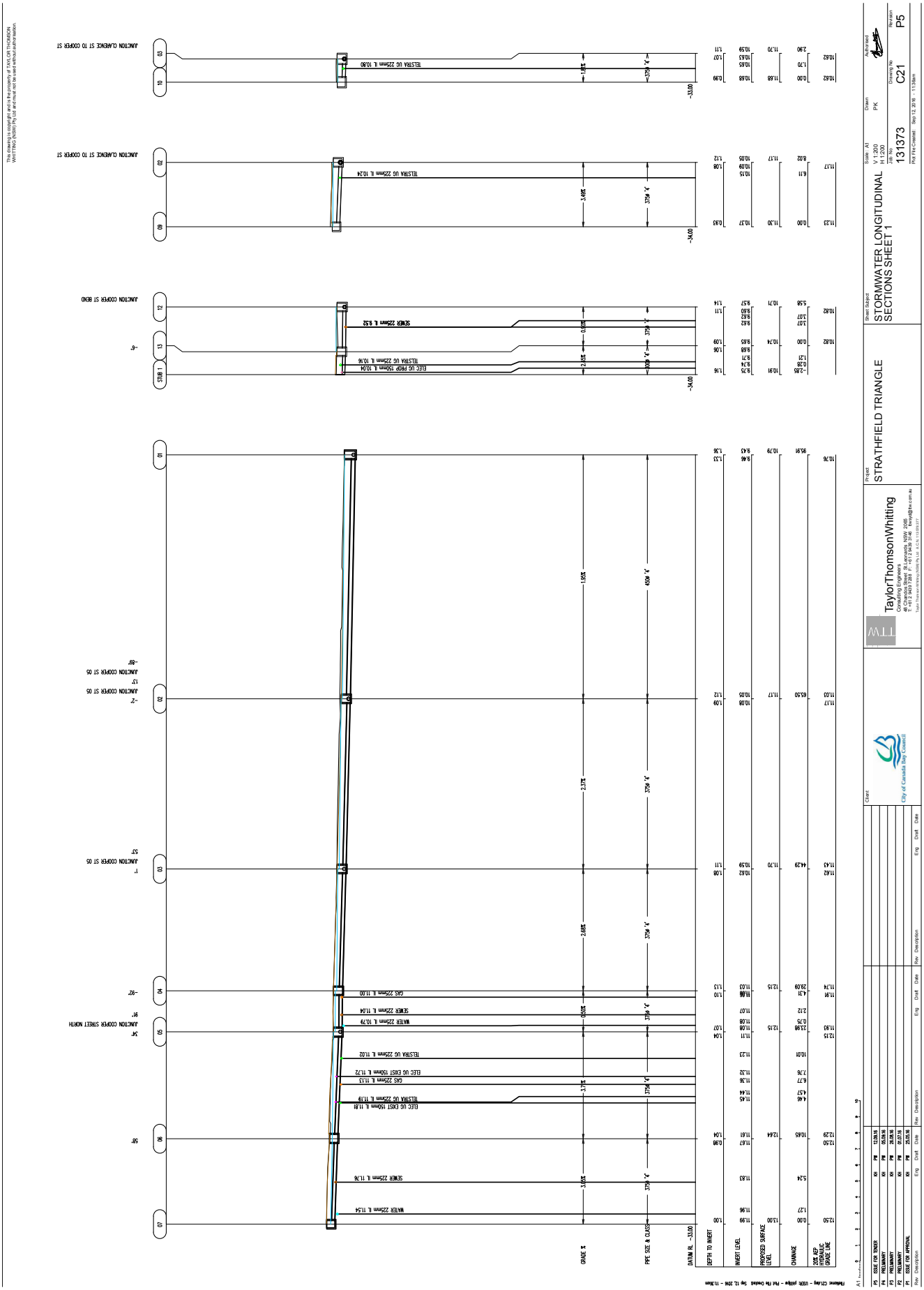

SECTIONS LEGEND
WATER SERVICES
ELECTRICAL SERVICES
SEWER SERVICES
TELECOMMUNICATION SERVICES
GAS SERVICES
STORMWATER SERVICES
DISCLAIMER
TaylorThomsonWhitting
Consulting Engineers
City of Canada Bay Council
STRATHFIELD TRIANGLE
COOPER STREET
CROSS SECTIONS SHEET 1
Scale: A1 1:100
Drawn PK
Job No 131373
Drawing No C16
Revision P5
P5 ISSUE FOR TENDER
P4 PRELIMINARY
P3 ISSUE FOR REVIEW
P2 ISSUE FOR REVIEW
P1 ISSUE FOR REVIEW
PROPOSED SURFACE LEVEL
EXISTING SURFACE LEVEL
OFFSET

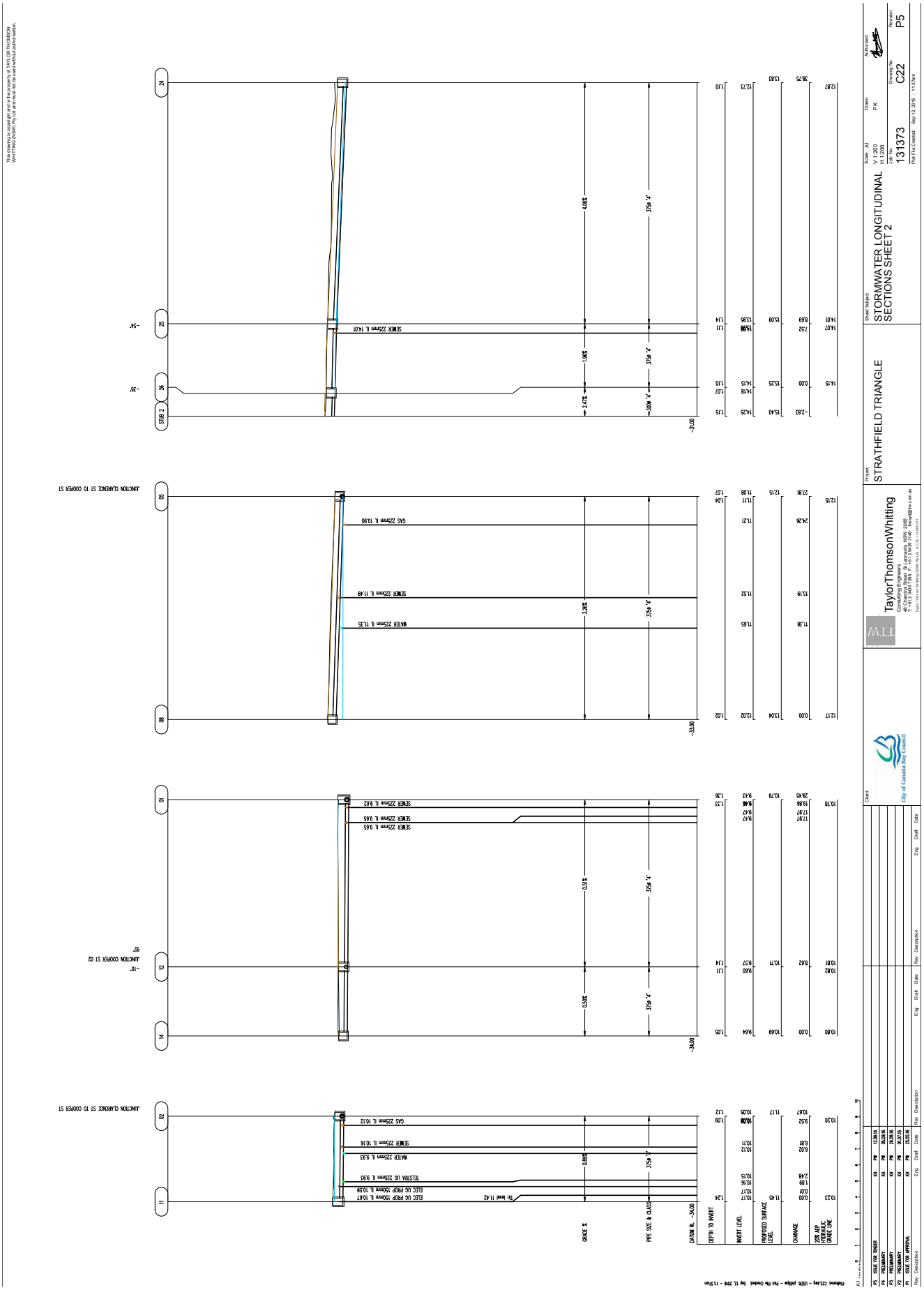

SECTIONS LEGEND
WATER SERVICES
ELECTRICAL SERVICES
SEWER SERVICES
TELECOMMUNICATION SERVICES
GAS SERVICES
STORMWATER SERVICES
DISCLAIMER
TaylorThomsonWhitting
STRATHFIELD TRIANGLE
COOPER STREET
CROSS SECTIONS SHEET 2
131373
C17
P5
PROPOSED SURFACE LEVEL
EXISTING SURFACE LEVEL
OFFSET

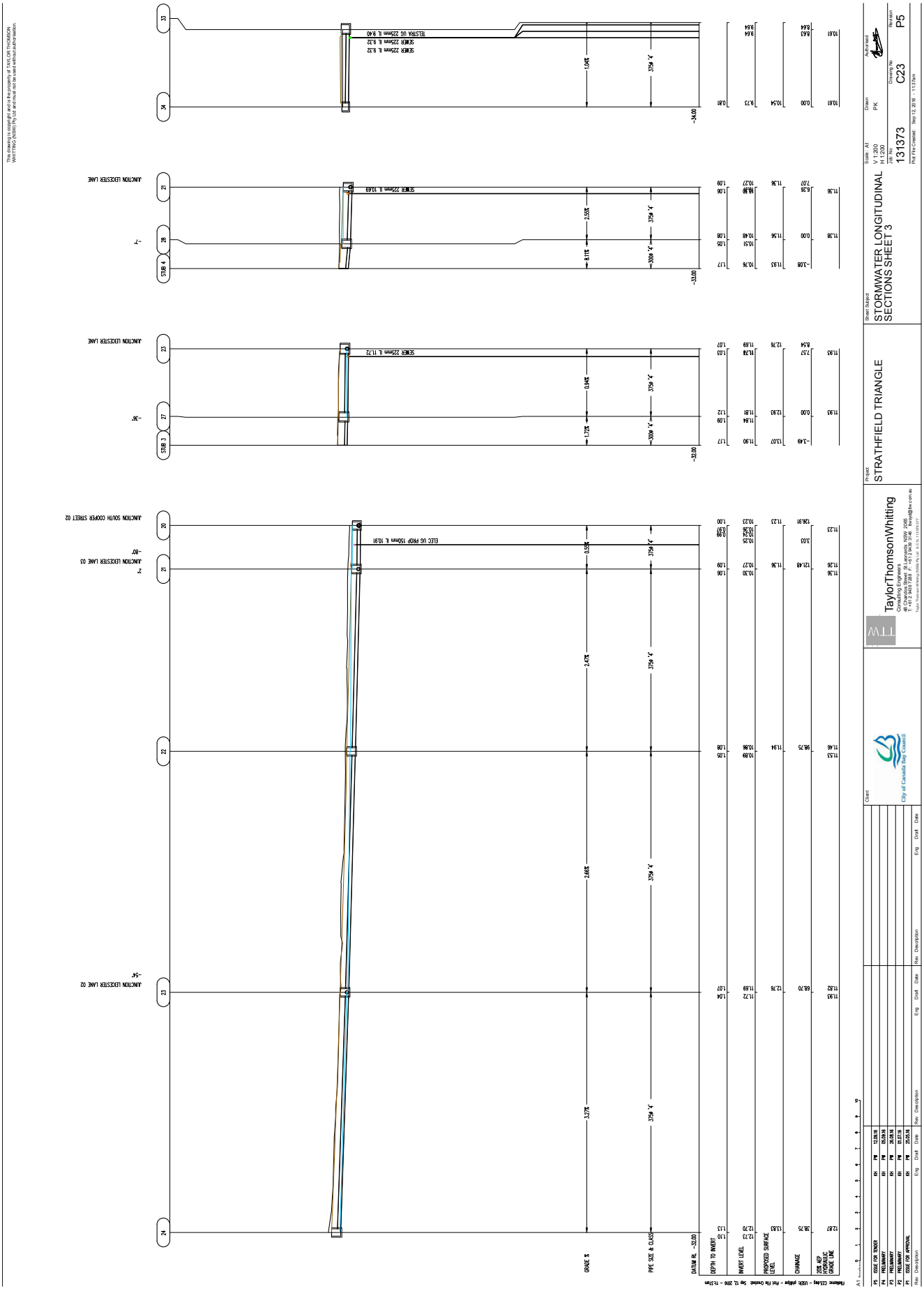

SECTIONS LEGEND
TaylorThomsonWhitting
STRATHFIELD TRIANGLE
HILTS ROAD AND LEICESTER LANE CROSS SECTIONS SHEET 1
131373
C18
P5

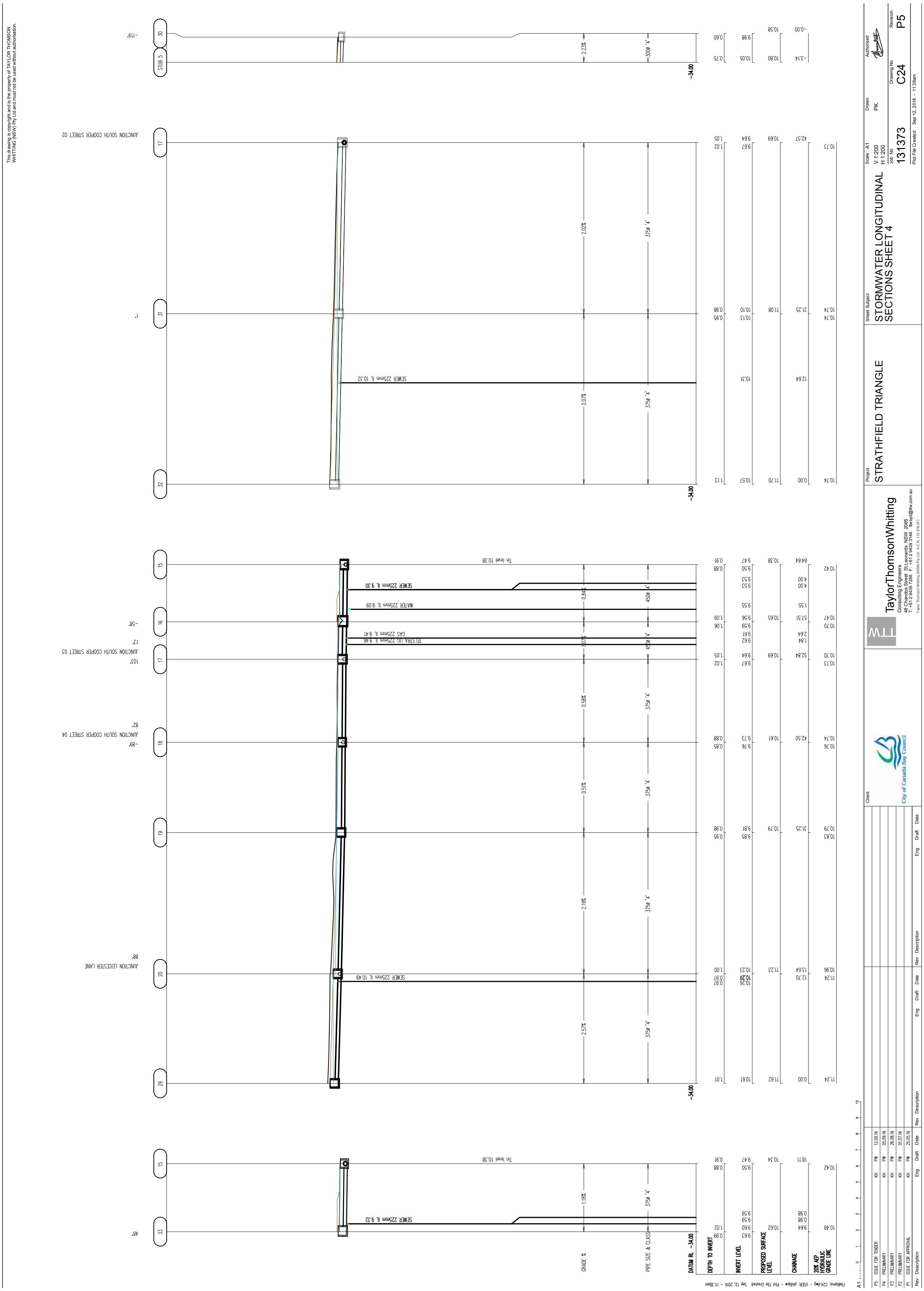

SECTIONS LEGEND
WATER SERVICES
ELECTRICAL SERVICES
SEWER SERVICES
TELECOMMUNICATION SERVICES
GAS SERVICES
STORMWATER SERVICES
DISCLAIMER
HILTS ROAD AND LEICESTER LANE CROSS SECTIONS SHEET 2
STRATHFIELD TRIANGLE
TaylorThomsonWhitting
City of Canada Bay Council
Scale: A1 1:100
Drawn PK
Job No 131373
Drawing No C19
Revision P5
CH 260.00
CH 250.00
CH 240.00
CH 230.00
CH 220.00
CH 210.00
CH 200.00
CH 190.00
CH 180.00
CH 170.00
PROPOSED SURFACE LEVEL
EXISTING SURFACE LEVEL
OFFSET

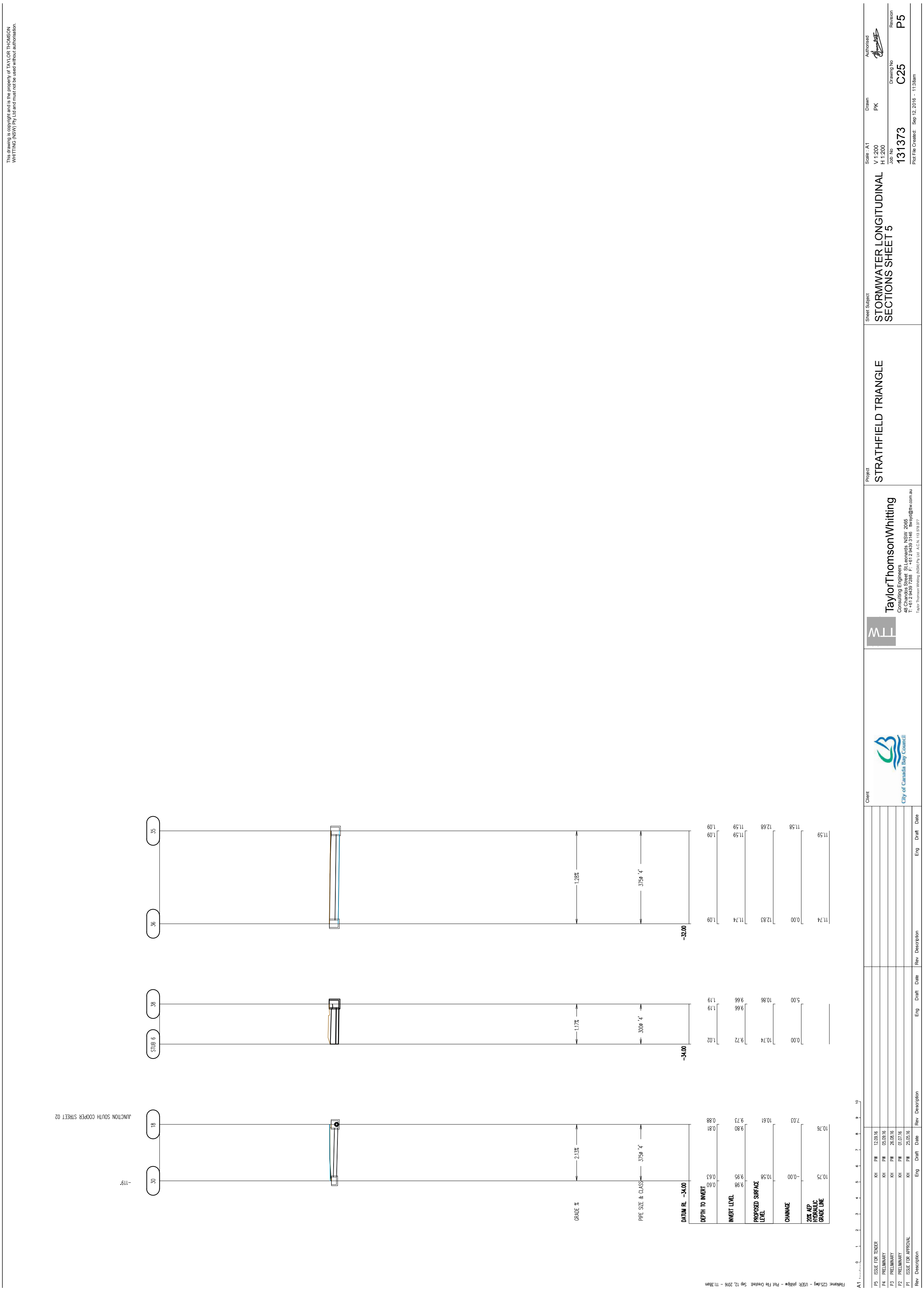

SECTIONS LEGEND
WATER SERVICES
ELECTRICAL SERVICES
SEWER SERVICES
TELECOMMUNICATION SERVICES
GAS SERVICES
STORMWATER SERVICES
DISCLAIMER
EXISTING SERVICES ARE BASED ON DIAL BEFORE YOU DIG AND LAND SURVEY INFORMATION. THIS INFORMATION DOES NOT PROVIDE ACCURATE ALIGNMENTS OR SIZES. TTW HAS NOT CHECKED FOR CLASHES WITH PROPOSED WORKS NOR DO WE CONFIRM SERVICES SHOWN ARE CLASH FREE WITH PROPOSED WORKS.
TTW RECOMMENDS ADDITIONAL INVESTIGATIONS ARE UNDERTAKEN WHICH INCLUDES ELECTRONIC TRACING AND POT HOLING.
TaylorThomsonWhitting
Consulting Engineers
City of Canada Bay Council
STRATHFIELD TRIANGLE
CLARENCE STREET
CROSS SECTIONS
Scale: A1 1:100
Drawn PK
Job No 131373
Drawing No C20
Revision P5
Authorised
Plot File Created: Sep 12, 2016 - 11:34am
P5 ISSUE FOR TENDER KH PM 02.09.16
P4 PRELIMINARY KH PM 30.08.16
P3 PRELIMINARY KH PM 01.07.16
P2 ISSUE FOR REVIEW KH PM 10.02.16
P1 ISSUE FOR REVIEW KH PK 23.12.15
Rev Description Eng Draft Date
Datum RL 11.00
PROPOSED SURFACE LEVEL
EXISTING SURFACE LEVEL
OFFSET
CH 60.00
CH 50.00
CH 40.00
CH 30.00
CH 20.00
Datum RL 10.00
CH 70.00

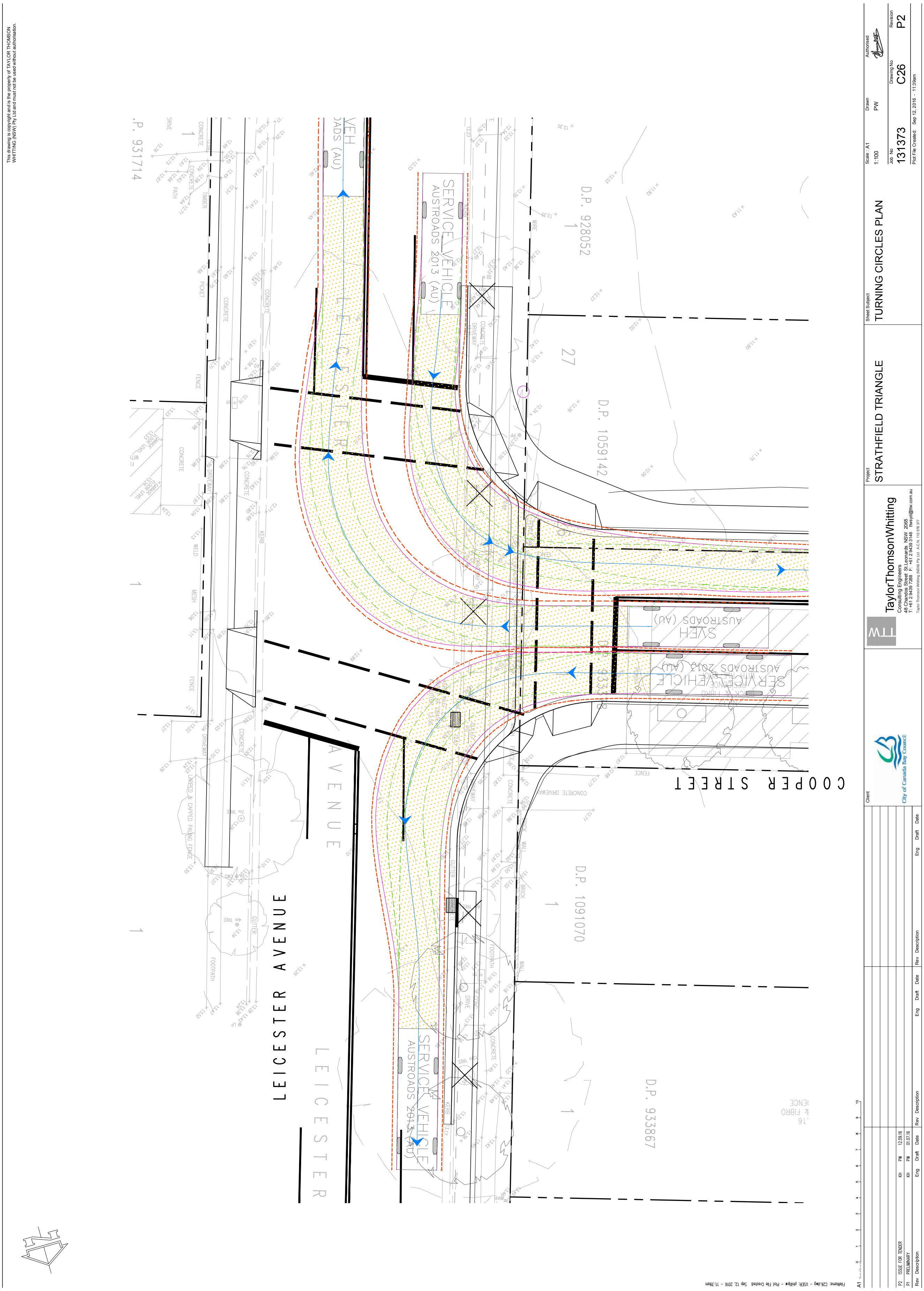




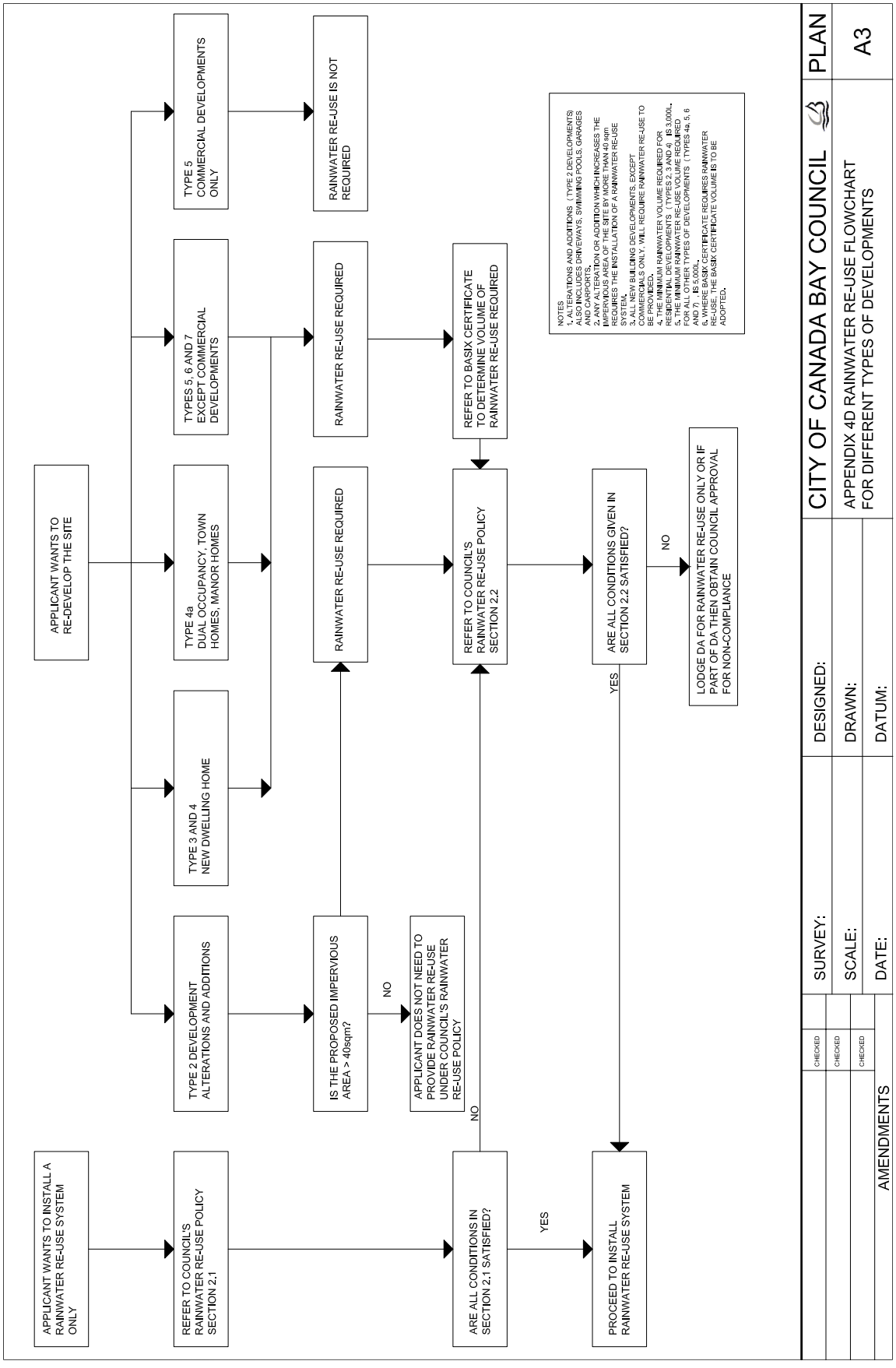



STRATHFIELD TRIANGLE
STORMWATER LONGITUDINAL SECTIONS SHEET 4
TaylorThomsonWhitting
Consulting Engineers
City of Canada Bay Council
131373
C24
P5

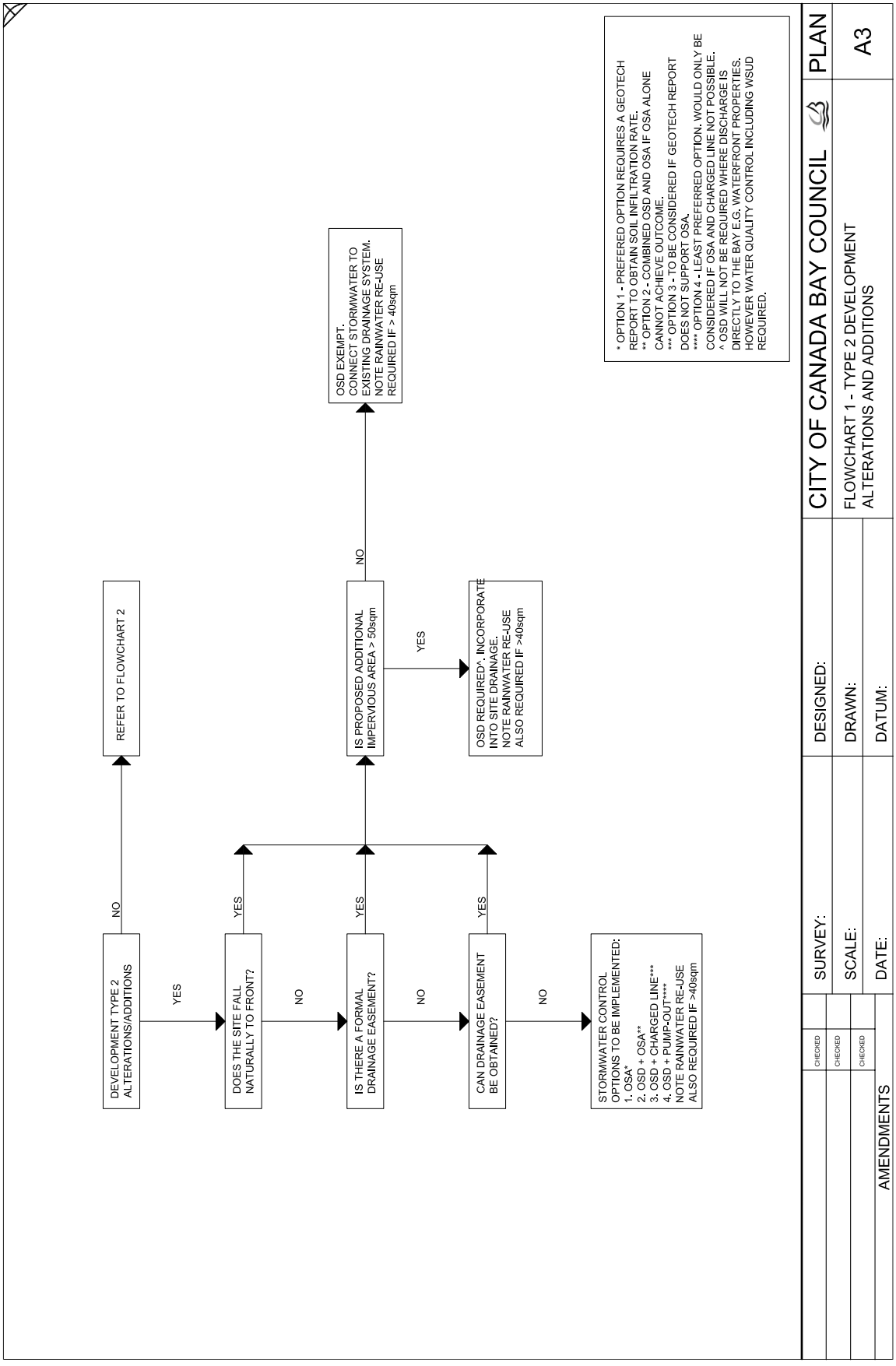

STORMWATER LONGITUDINAL SECTIONS SHEET 5
STRATHFIELD TRIANGLE
TaylorThomsonWhitting
Consulting Engineers
City of Canada Bay Council
Scale : A1 V 1:200 H 1:200
Drawn PK
Job No 131373
Drawing No C25
Revision P5
P5 ISSUE FOR TENDER
P4 PRELIMINARY
P3 PRELIMINARY
P2 PRELIMINARY
P1 ISSUE FOR APPROVAL
GRADE %
PIPE SIZE & CLASS
DEPTH TO INVERT
INVERT LEVEL
PROPOSED SURFACE LEVEL
CHAINAGE
20% AEP HYDRAULIC GRADE LINE
JUNCTION SOUTH COOPER STREET 02
STUB 6


TURNING CIRCLES PLAN
STRATHFIELD TRIANGLE
TaylorThomsonWhitting
131373
C26
P2
1:100
COOPER STREET
LEICESTER AVENUE
SERVICE VEHICLE
AUSTROADS 2013 (AU)
D.P. 928052
D.P. 1059142
D.P. 1091070
D.P. 933867
City of Canada Bay Council

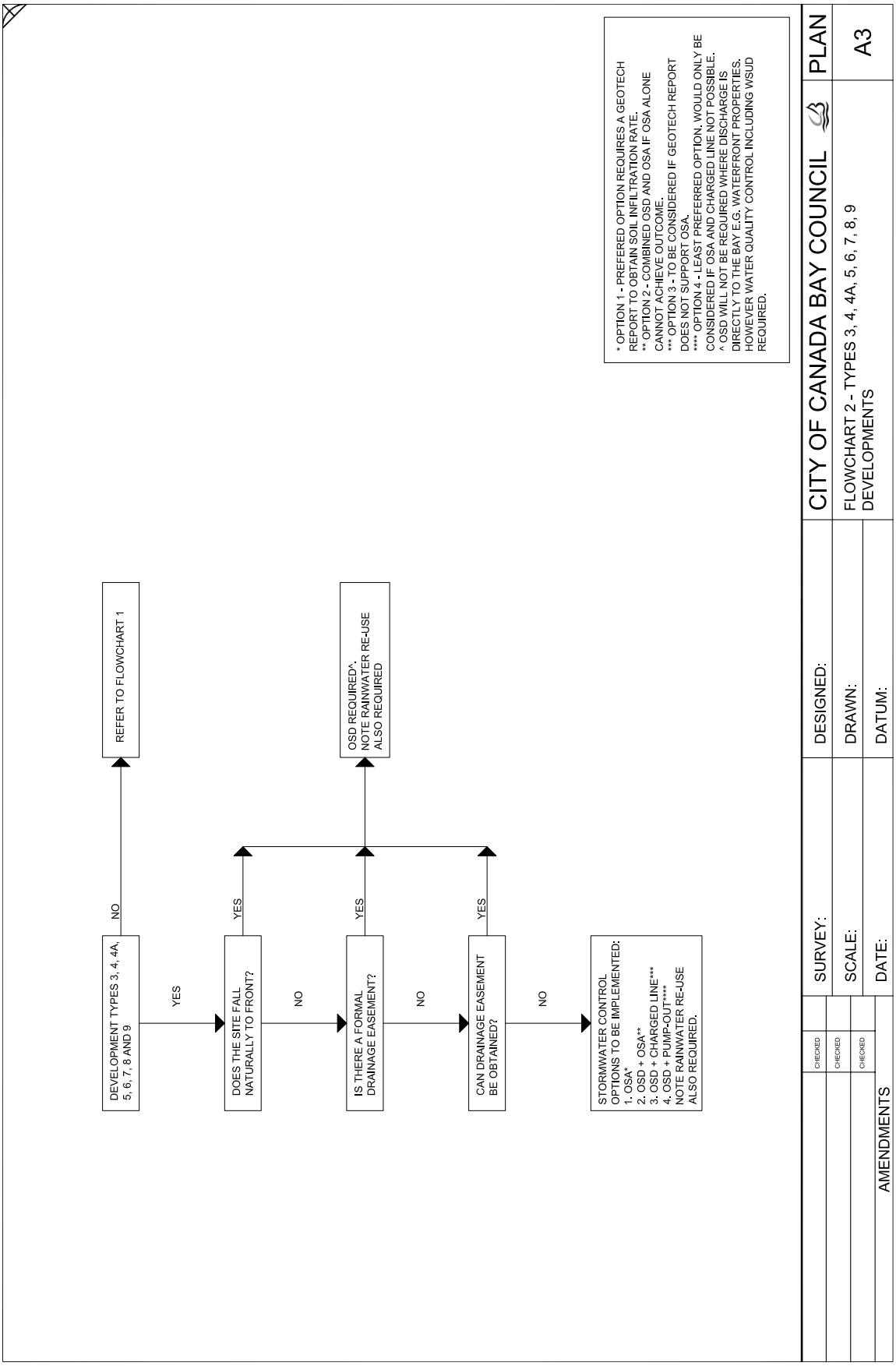
Flow Charts Rainwater Reuse



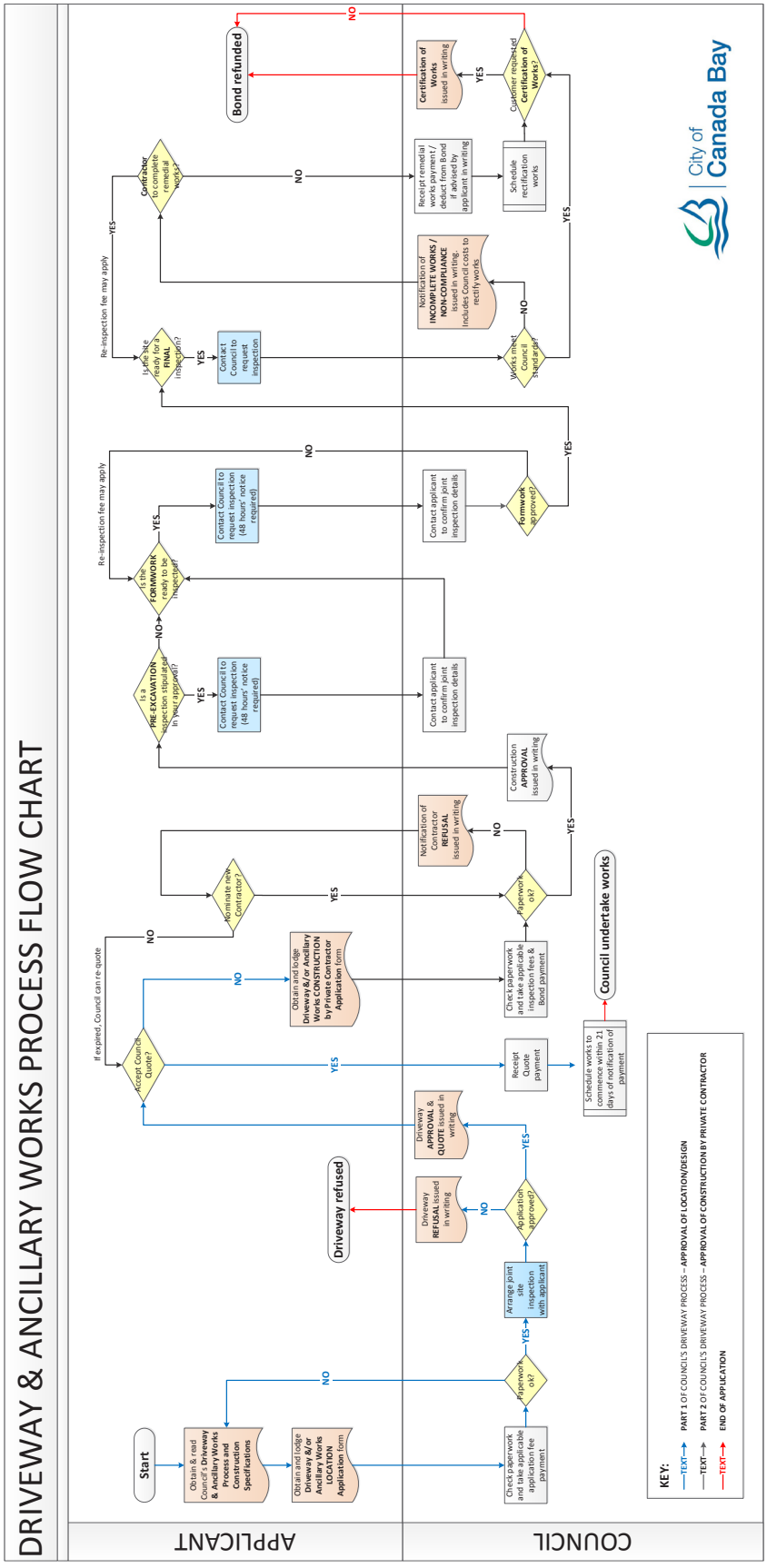
Stormwater Management Type 2 Developments



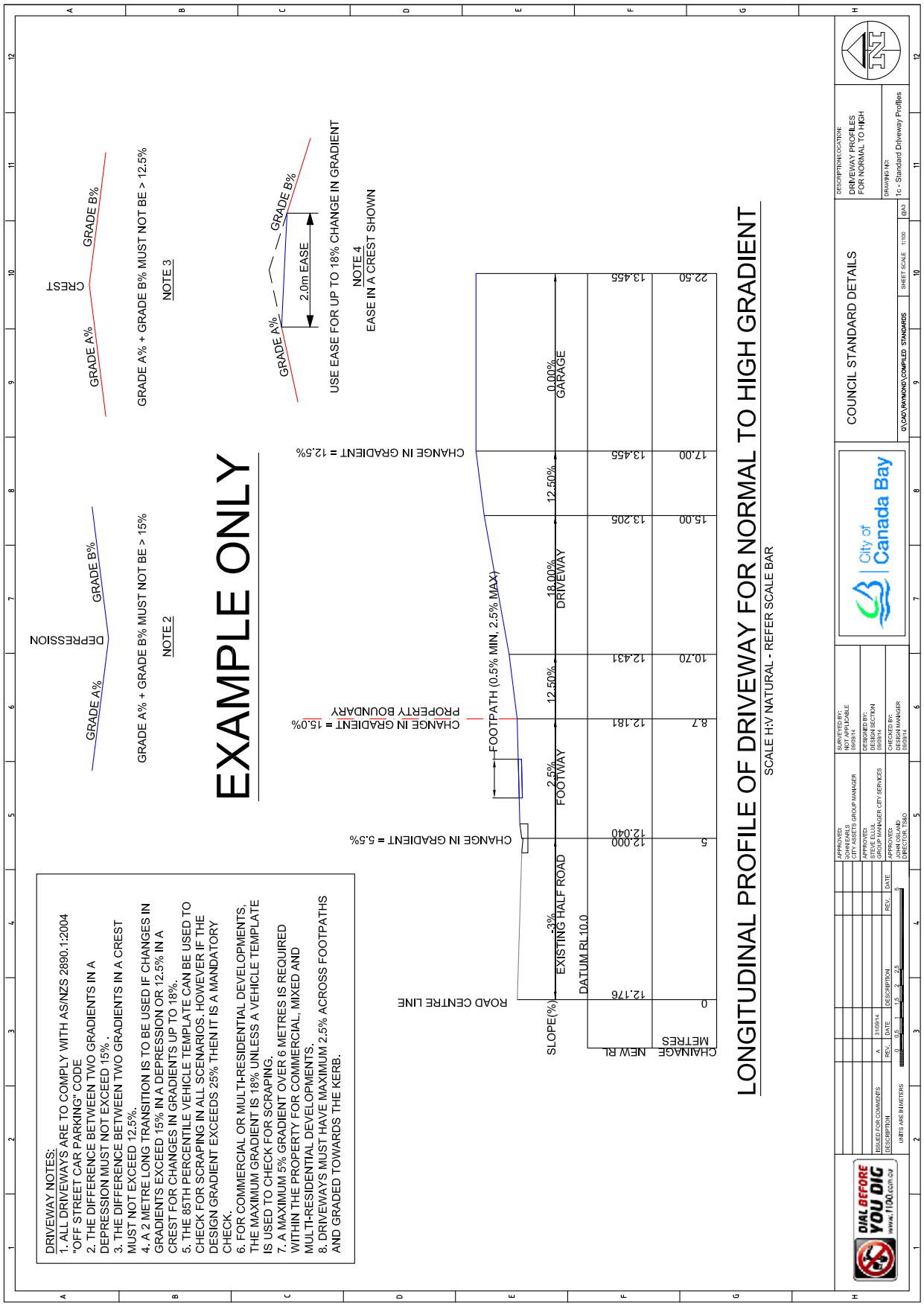
Stormwater Management Type 3 to 9 Developments

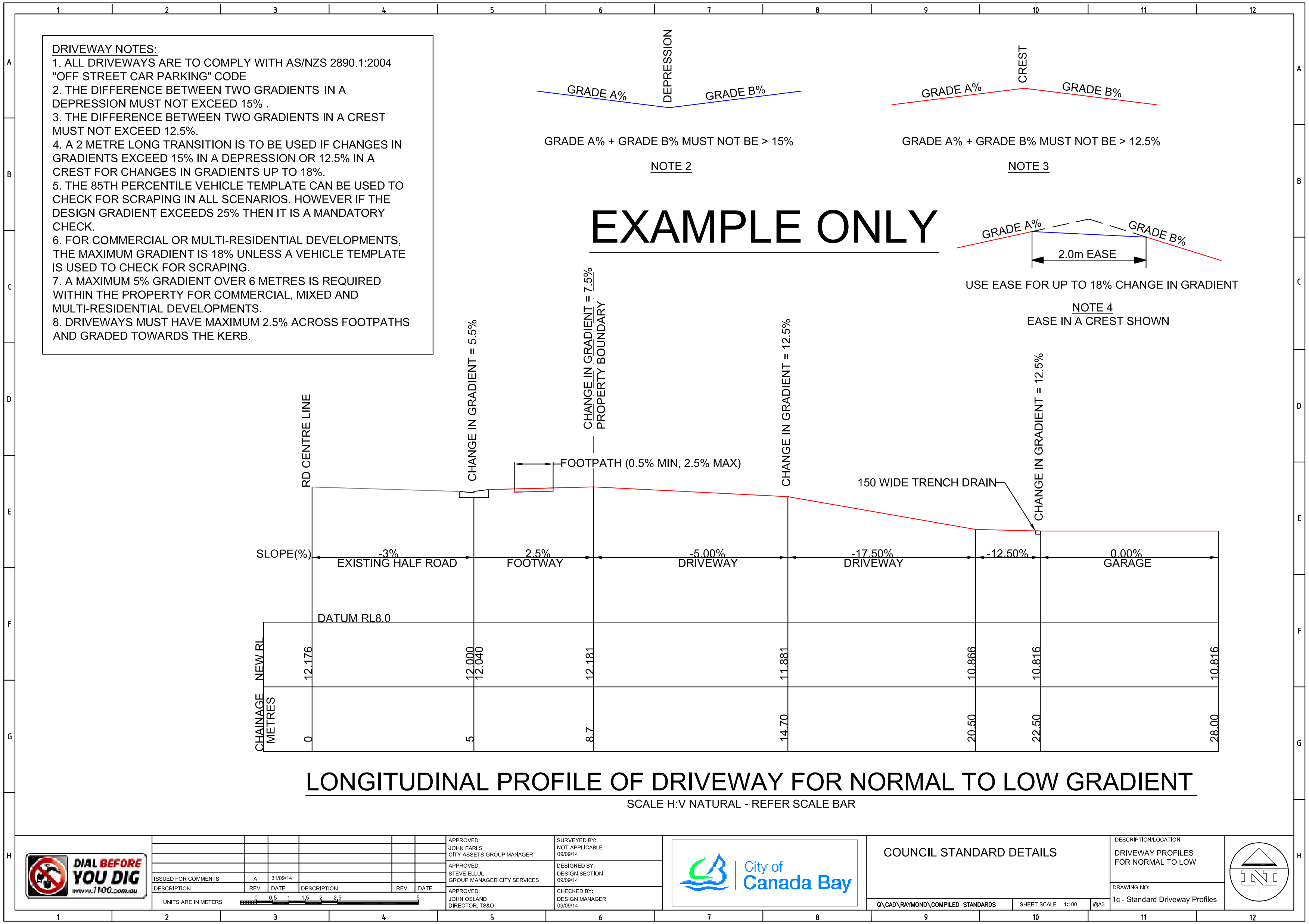


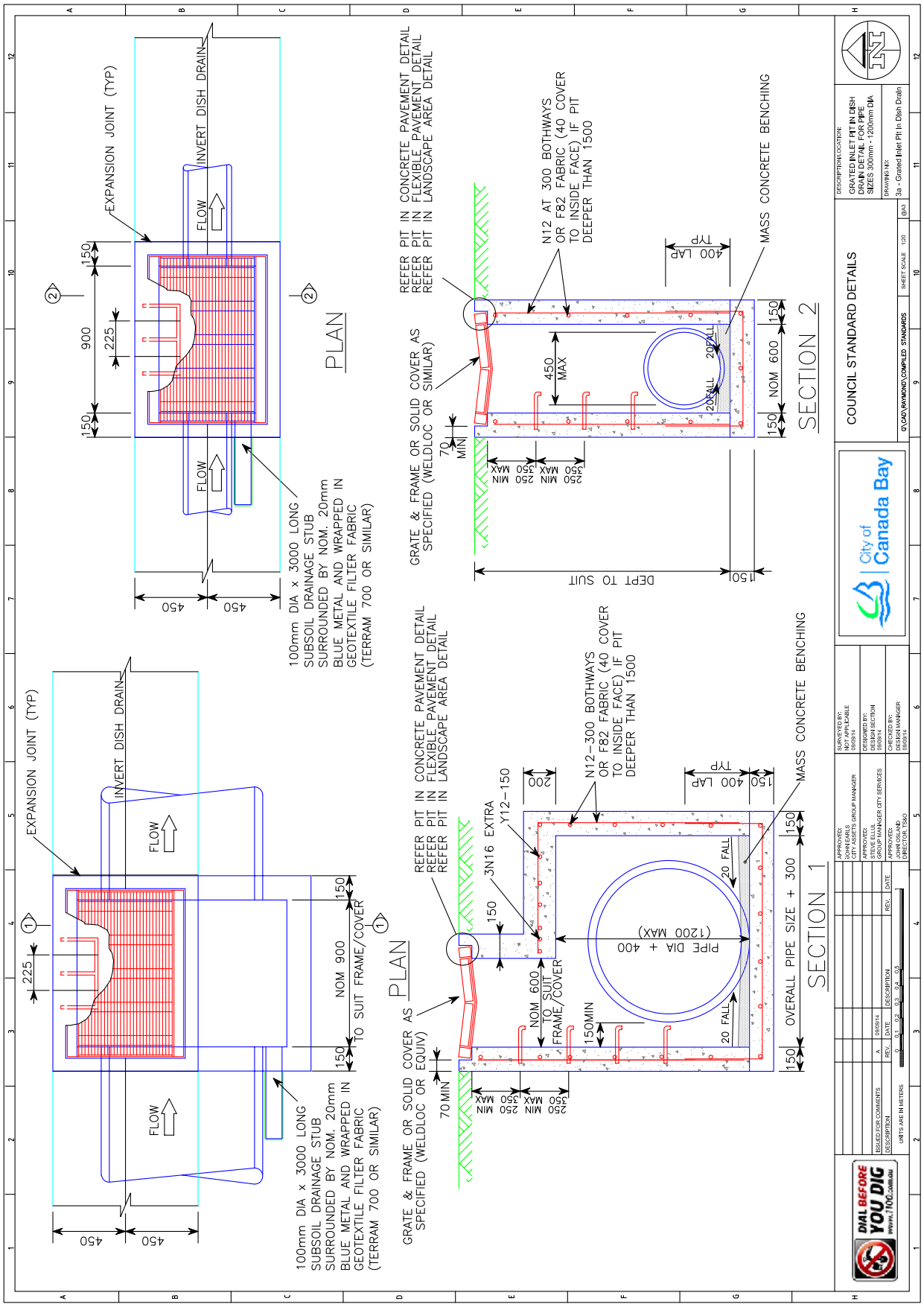
Driveway and Ancillary Works

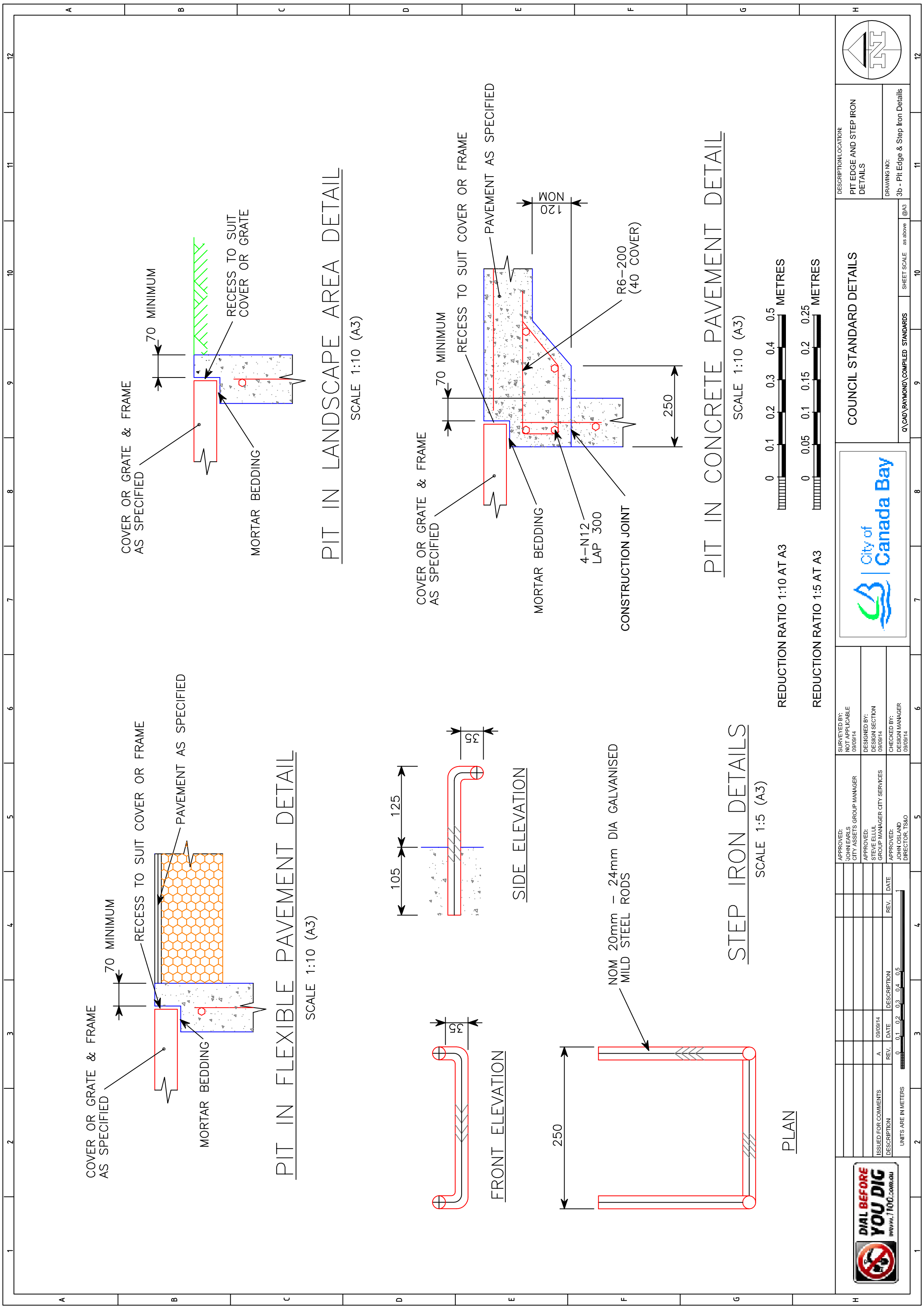


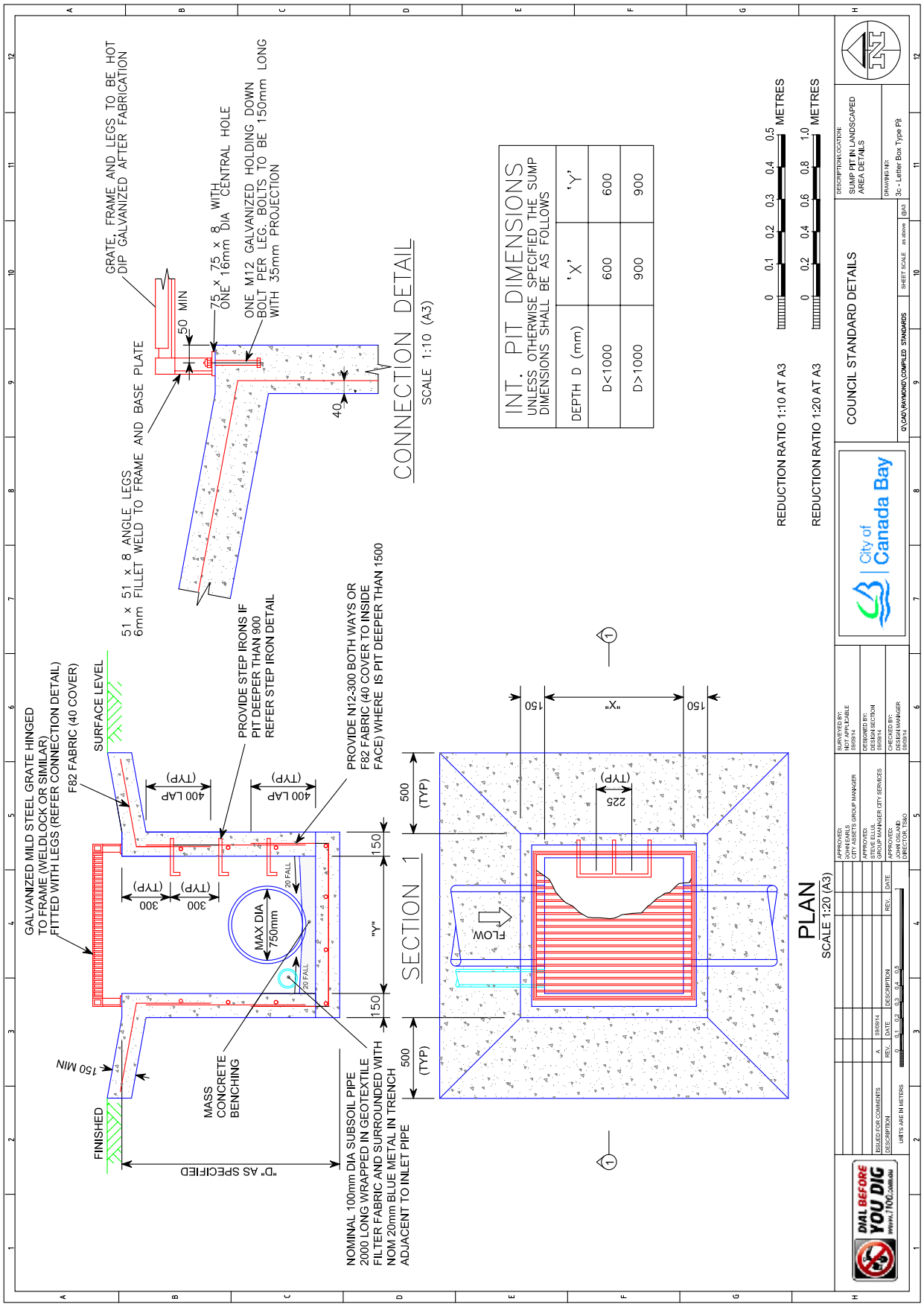
Standard Engineering Drawings

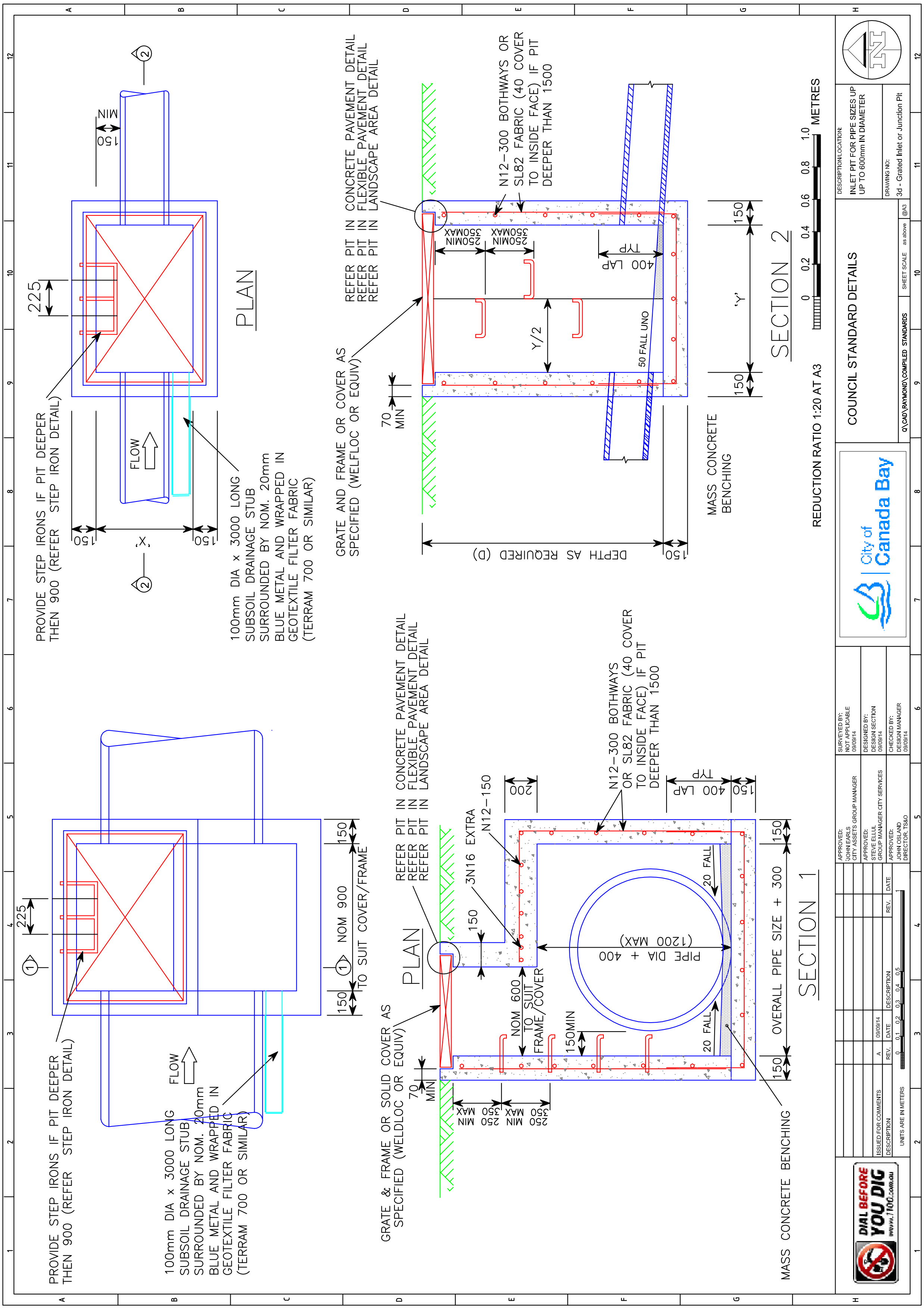


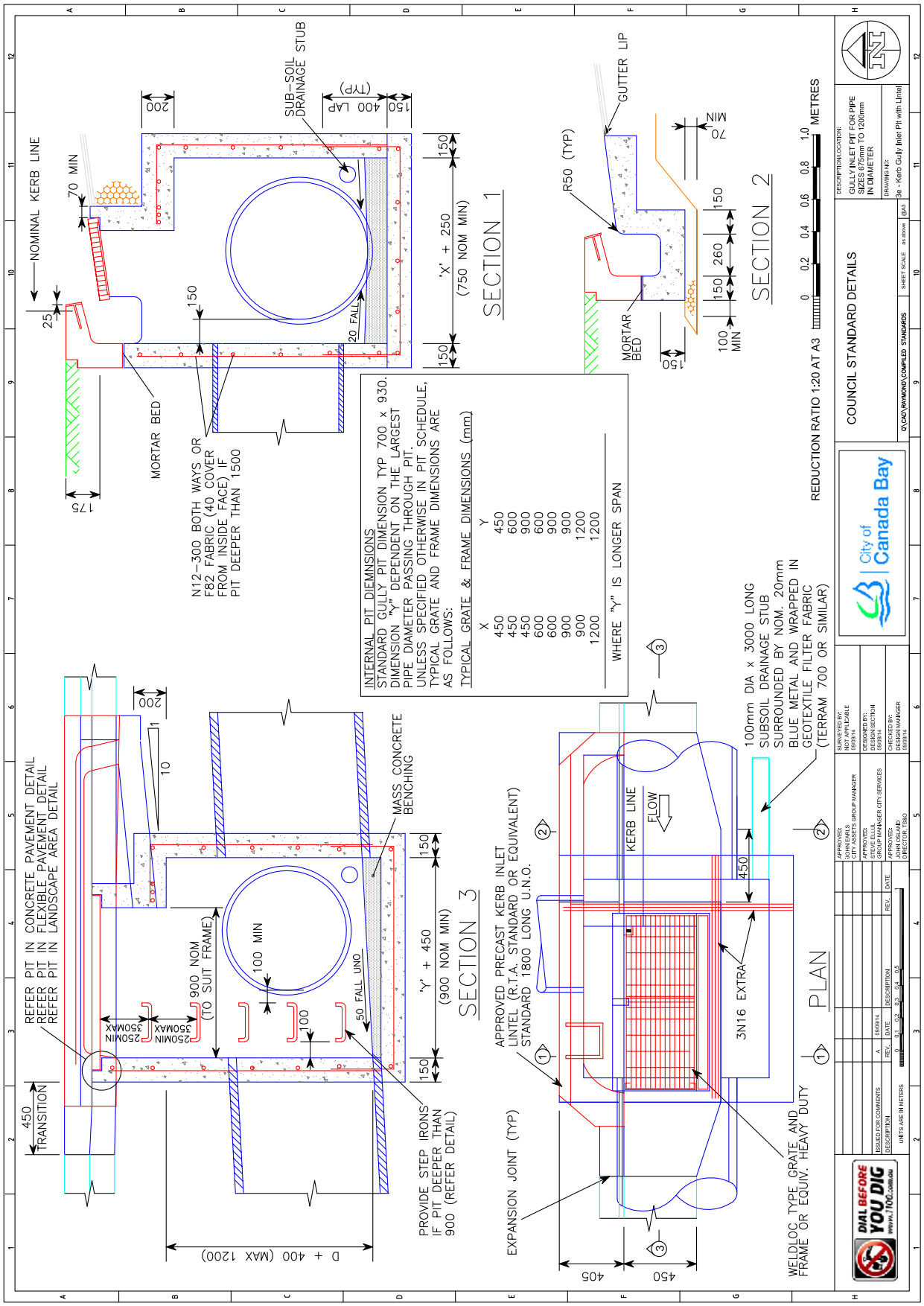

DRIVEWAY NOTES:
1. ALL DRIVEWAYS ARE TO COMPLY WITH AS/NZS 2890.1:2004 "OFF STREET CAR PARKING" CODE
2. THE DIFFERENCE BETWEEN TWO GRADIENTS IN A DEPRESSION MUST NOT EXCEED 15% .
3. THE DIFFERENCE BETWEEN TWO GRADIENTS IN A CREST MUST NOT EXCEED 12.5%.
4. A 2 METRE LONG TRANSITION IS TO BE USED IF CHANGES IN GRADIENTS EXCEED 15% IN A DEPRESSION OR 12.5% IN A CREST FOR CHANGES IN GRADIENTS UP TO 18%.
5. THE 85TH PERCENTILE VEHICLE TEMPLATE CAN BE USED TO CHECK FOR SCRAPING IN ALL SCENARIOS. HOWEVER IF THE DESIGN GRADIENT EXCEEDS 25% THEN IT IS A MANDATORY CHECK.
6. FOR COMMERCIAL OR MULTI-RESIDENTIAL DEVELOPMENTS, THE MAXIMUM GRADIENT IS 18% UNLESS A VEHICLE TEMPLATE IS USED TO CHECK FOR SCRAPING.
7. A MAXIMUM 5% GRADIENT OVER 6 METRES IS REQUIRED WITHIN THE PROPERTY FOR COMMERCIAL, MIXED AND MULTI-RESIDENTIAL DEVELOPMENTS.
8. DRIVEWAYS MUST HAVE MAXIMUM 2.5% ACROSS FOOTPATHS AND GRADED TOWARDS THE KERB.
DEPRESSION
GRADE A%
GRADE B%
GRADE A% + GRADE B% MUST NOT BE > 15%
NOTE 2
CREST
GRADE A%
GRADE B%
GRADE A% + GRADE B% MUST NOT BE > 12.5%
NOTE 3
EXAMPLE ONLY
GRADE A%
GRADE B%
2.0m EASE
USE EASE FOR UP TO 18% CHANGE IN GRADIENT
NOTE 4
EASE IN A CREST SHOWN
RD CENTRE LINE
CHANGE IN GRADIENT = 5.5%
CHANGE IN GRADIENT = 7.5%
PROPERTY BOUNDARY
FOOTPATH (0.5% MIN, 2.5% MAX)
CHANGE IN GRADIENT = 12.5%
150 WIDE TRENCH DRAIN
CHANGE IN GRADIENT = 12.5%
SLOPE(%)
-3%
EXISTING HALF ROAD
2.5%
FOOTWAY
-5.00%
DRIVEWAY
-17.50%
DRIVEWAY
-12.50%
0.00%
GARAGE
DATUM RL8.0
NEW RL
12.176
12.000
12.040
12.181
11.881
10.866
10.816
10.816
CHAINAGE METRES
0
5
8.7
14.70
20.50
22.50
28.00
LONGITUDINAL PROFILE OF DRIVEWAY FOR NORMAL TO LOW GRADIENT
SCALE H:V NATURAL - REFER SCALE BAR
DIAL BEFORE YOU DIG
www.1100.com.au
ISSUED FOR COMMENTS
A
31/09/14
DESCRIPTION
REV.
DATE
DESCRIPTION
REV.
DATE
UNITS ARE IN METERS
APPROVED:
JOHN EARLS
CITY ASSETS GROUP MANAGER
APPROVED:
STEVE ELLUL
GROUP MANAGER CITY SERVICES
APPROVED:
JOHN OSLAND
DIRECTOR, TS&O
SURVEYED BY:
NOT APPLICABLE
09/09/14
DESIGNED BY:
DESIGN SECTION
09/09/14
CHECKED BY:
DESIGN MANAGER
09/09/14
City of Canada Bay
COUNCIL STANDARD DETAILS
Q:\CAD\RAYMOND\COMPILED STANDARDS
SHEET SCALE 1:100 @A3
DESCRIPTION/LOCATION:
DRIVEWAY PROFILES FOR NORMAL TO LOW
DRAWING NO:
1c - Standard Driveway Profiles

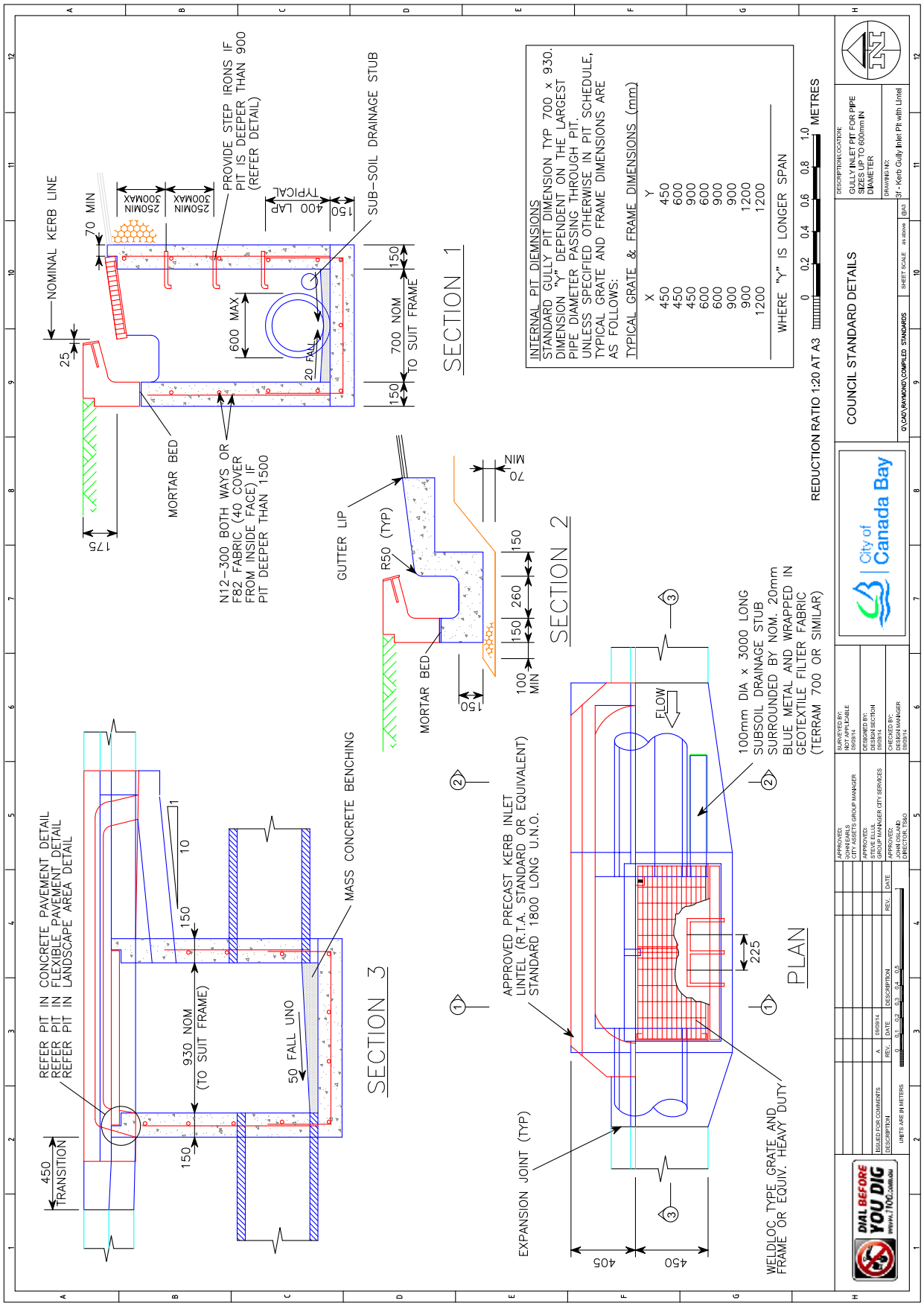

EXPANSION JOINT (TYP)
INVERT DISH DRAIN
FLOW
225
900
150
150
450
450
PLAN
100mm DIA x 3000 LONG SUBSOIL DRAINAGE STUB SURROUNDED BY NOM. 20mm BLUE METAL AND WRAPPED IN GEOTEXTILE FILTER FABRIC (TERRAM 700 OR SIMILAR)
NOM 900
TO SUIT FRAME/COVER
GRATE & FRAME OR SOLID COVER AS SPECIFIED (WELDLOC OR EQUIV)
70 MIN
REFER PIT IN CONCRETE PAVEMENT DETAIL
REFER PIT IN FLEXIBLE PAVEMENT DETAIL
REFER PIT IN LANDSCAPE AREA DETAIL
3N16 EXTRA Y12-150
N12-300 BOTHWAYS OR F82 FABRIC (40 COVER TO INSIDE FACE) IF PIT DEEPER THAN 1500
400 LAP TYP
MASS CONCRETE BENCHING
NOM 600 TO SUIT FRAME/COVER
150MIN
PIPE DIA + 400 (1200 MAX)
20 FALL
OVERALL PIPE SIZE + 300
SECTION 1
N12 AT 300 BOTHWAYS OR F82 FABRIC (40 COVER TO INSIDE FACE) IF PIT DEEPER THAN 1500
450 MAX
DEPT TO SUIT
SECTION 2
COUNCIL STANDARD DETAILS
GRATED INLET PIT IN DISH DRAIN DETAIL FOR PIPE SIZES 300mm - 1200mm DIA
3a - Grated Inlet Pit in Dish Drain
City of Canada Bay
DIAL BEFORE YOU DIG
www.1100.com.au

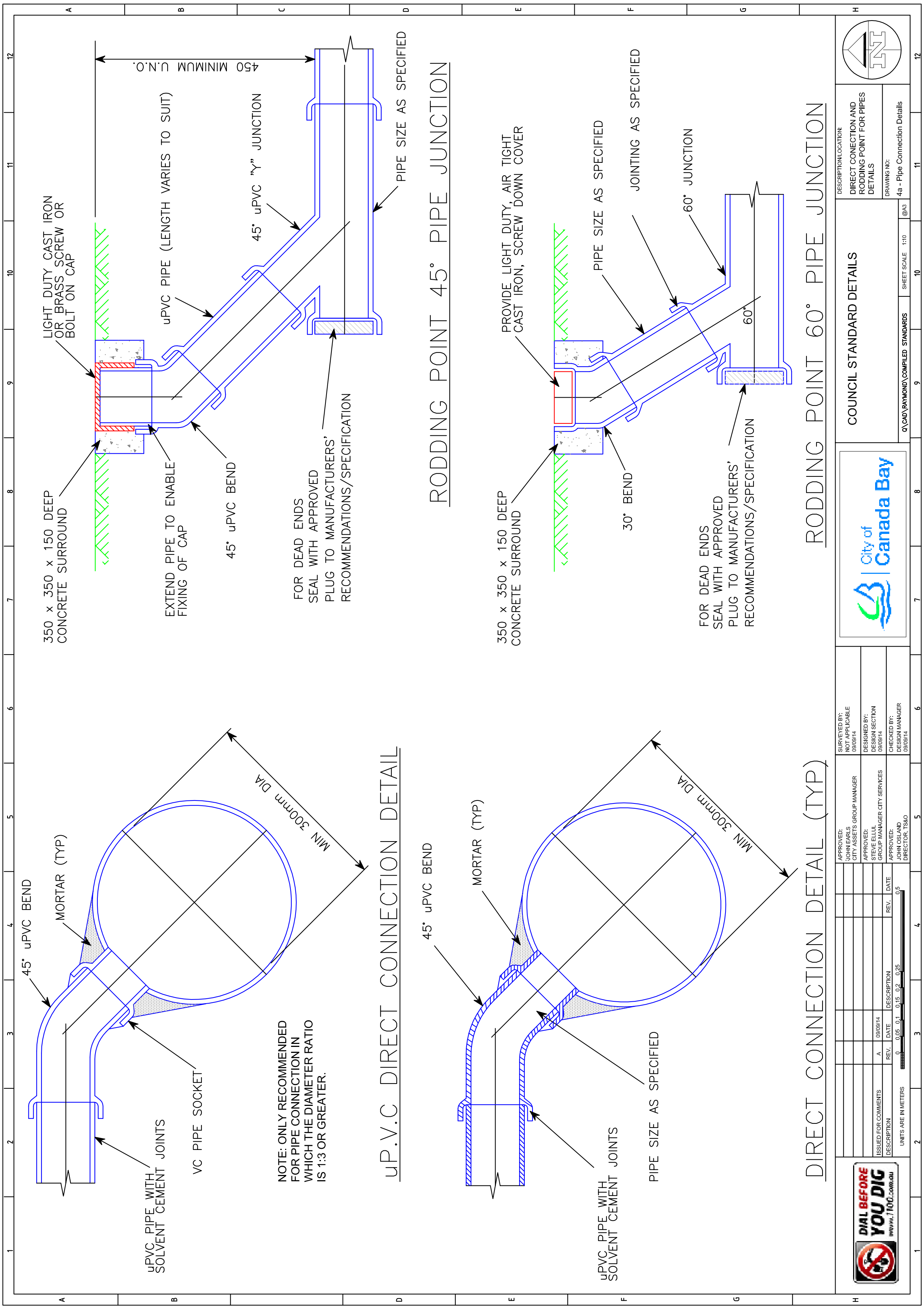

PIT IN FLEXIBLE PAVEMENT DETAIL
SCALE 1:10 (A3)
COVER OR GRATE & FRAME AS SPECIFIED
70 MINIMUM
RECESS TO SUIT COVER OR FRAME
PAVEMENT AS SPECIFIED
MORTAR BEDDING
PIT IN LANDSCAPE AREA DETAIL
SCALE 1:10 (A3)
RECESS TO SUIT COVER OR GRATE
PIT IN CONCRETE PAVEMENT DETAIL
SCALE 1:10 (A3)
120 NOM
R6–200 (40 COVER)
250
4–N12 LAP 300
CONSTRUCTION JOINT
STEP IRON DETAILS
SCALE 1:5 (A3)
FRONT ELEVATION
SIDE ELEVATION
PLAN
NOM 20mm – 24mm DIA GALVANISED MILD STEEL RODS
35
125
105
REDUCTION RATIO 1:10 AT A3
REDUCTION RATIO 1:5 AT A3
METRES
COUNCIL STANDARD DETAILS
City of Canada Bay
DESCRIPTION/LOCATION: PIT EDGE AND STEP IRON DETAILS
DRAWING NO: 3b - Pit Edge & Step Iron Details
DIAL BEFORE YOU DIG www.1100.com.au
UNITS ARE IN METERS

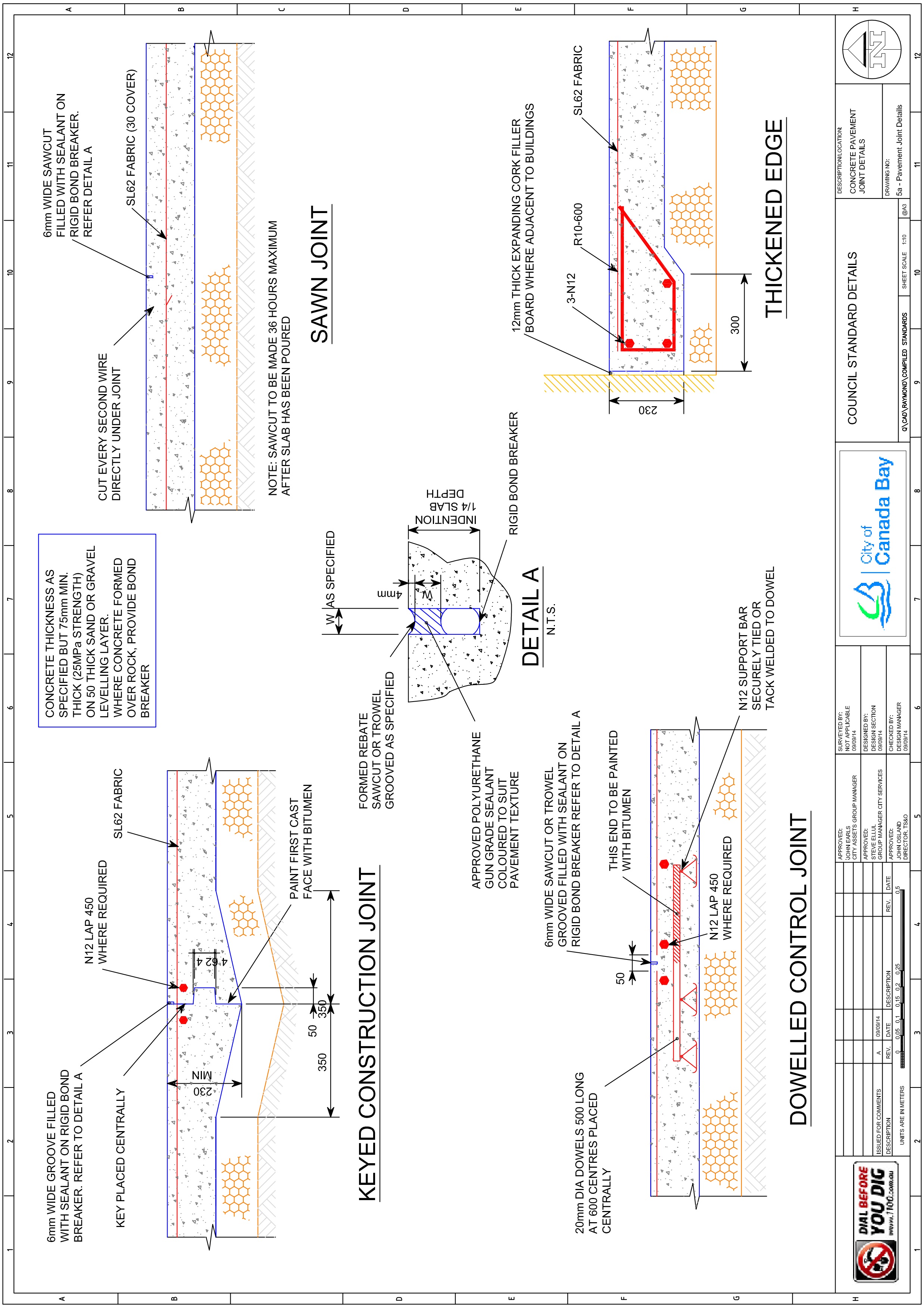

GRATE, FRAME AND LEGS TO BE HOT DIP GALVANIZED AFTER FABRICATION
50 MIN
75 x 75 x 8 WITH ONE 16mm DIA CENTRAL HOLE
ONE M12 GALVANIZED HOLDING DOWN BOLT PER LEG. BOLTS TO BE 150mm LONG WITH 35mm PROJECTION
51 x 51 x 8 ANGLE LEGS 6mm FILLET WELD TO FRAME AND BASE PLATE
40
CONNECTION DETAIL
SCALE 1:10 (A3)
INT. PIT DIMENSIONS
UNLESS OTHERWISE SPECIFIED THE SUMP DIMENSIONS SHALL BE AS FOLLOWS
DEPTH D (mm) | 'X' | 'Y'
D<1000 | 600 | 600
D>1000 | 900 | 900
REDUCTION RATIO 1:10 AT A3
REDUCTION RATIO 1:20 AT A3
METRES
GALVANIZED MILD STEEL GRATE HINGED TO FRAME (WELDLOCK OR SIMILAR) FITTED WITH LEGS (REFER CONNECTION DETAIL)
F82 FABRIC (40 COVER)
SURFACE LEVEL
PROVIDE STEP IRONS IF PIT DEEPER THAN 900 REFER STEP IRON DETAIL
PROVIDE N12-300 BOTH WAYS OR F82 FABRIC (40 COVER TO INSIDE FACE) WHERE IS PIT DEEPER THAN 1500
400 LAP (TYP)
300 (TYP)
MAX DIA 750mm
20 FALL
"Y"
150
150 MIN
FINISHED
MASS CONCRETE BENCHING
"D" AS SPECIFIED
NOMINAL 100mm DIA SUBSOIL PIPE 2000 LONG WRAPPED IN GEOTEXTILE FILTER FABRIC AND SURROUNDED WITH NOM 20mm BLUE METAL IN TRENCH ADJACENT TO INLET PIPE
SECTION 1
500 (TYP)
225 (TYP)
"X"
FLOW
PLAN
SCALE 1:20 (A3)
COUNCIL STANDARD DETAILS
City of Canada Bay
DESCRIPTION/LOCATION: SUMP PIT IN LANDSCAPED AREA DETAILS
DRAWING NO: 3c - Letter Box Type Pit
SHEET SCALE as above @A3
Q:\CAD\RAYMOND\COMPILED STANDARDS
DIAL BEFORE YOU DIG www.1100.com.au
ISSUED FOR COMMENTS
UNITS ARE IN METERS

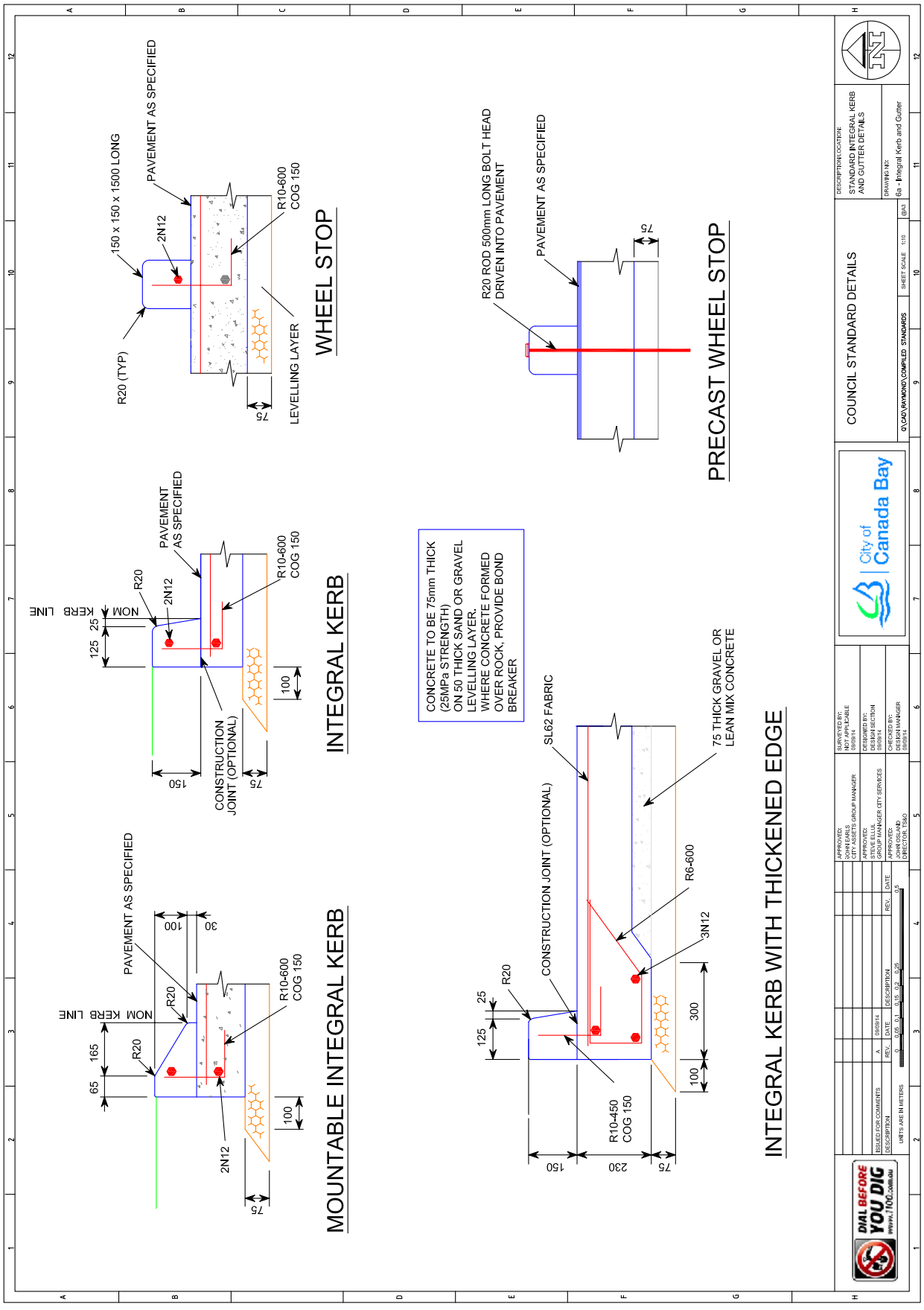

PROVIDE STEP IRONS IF PIT DEEPER THEN 900 (REFER STEP IRON DETAIL)
225
150 MIN
150
'X'
150
FLOW
100mm DIA x 3000 LONG SUBSOIL DRAINAGE STUB SURROUNDED BY NOM. 20mm BLUE METAL AND WRAPPED IN GEOTEXTILE FILTER FABRIC (TERRAM 700 OR SIMILAR)
PLAN
GRATE AND FRAME OR COVER AS SPECIFIED (WELFLOC OR EQUIV)
REFER PIT IN CONCRETE PAVEMENT DETAIL
REFER PIT IN FLEXIBLE PAVEMENT DETAIL
REFER PIT IN LANDSCAPE AREA DETAIL
70 MIN
250MIN 350MAX
250MIN 350MAX
N12-300 BOTHWAYS OR SL82 FABRIC (40 COVER TO INSIDE FACE) IF PIT DEEPER THAN 1500
400 LAP TYP
Y/2
50 FALL UNO
DEPTH AS REQUIRED (D)
150
MASS CONCRETE BENCHING
150
'Y'
150
SECTION 2
PROVIDE STEP IRONS IF PIT DEEPER THEN 900 (REFER STEP IRON DETAIL)
225
FLOW
100mm DIA x 3000 LONG SUBSOIL DRAINAGE STUB SURROUNDED BY NOM. 20mm BLUE METAL AND WRAPPED IN GEOTEXTILE FILTER FABRIC (TERRAM 700 OR SIMILAR)
150
NOM 900 TO SUIT COVER/FRAME
150
PLAN
GRATE & FRAME OR SOLID COVER AS SPECIFIED (WELDLOC OR EQUIV)
REFER PIT IN CONCRETE PAVEMENT DETAIL
REFER PIT IN FLEXIBLE PAVEMENT DETAIL
REFER PIT IN LANDSCAPE AREA DETAIL
70 MIN
250 MIN 350 MAX
250 MIN 350 MAX
150
3N16 EXTRA
N12-150
200
NOM 600 TO SUIT FRAME/COVER
150MIN
PIPE DIA + 400 (1200 MAX)
N12-300 BOTHWAYS OR SL82 FABRIC (40 COVER TO INSIDE FACE) IF PIT DEEPER THAN 1500
400 LAP TYP
150
20 FALL
20 FALL
150
OVERALL PIPE SIZE + 300
150
SECTION 1
MASS CONCRETE BENCHING
REDUCTION RATIO 1:20 AT A3
0 0.2 0.4 0.6 0.8 1.0 METRES
COUNCIL STANDARD DETAILS
City of Canada Bay
DESCRIPTION/LOCATION: INLET PIT FOR PIPE SIZES UP UP TO 600mm IN DIAMETER
DRAWING NO: 3d - Grated Inlet or Junction Pit
DIAL BEFORE YOU DIG

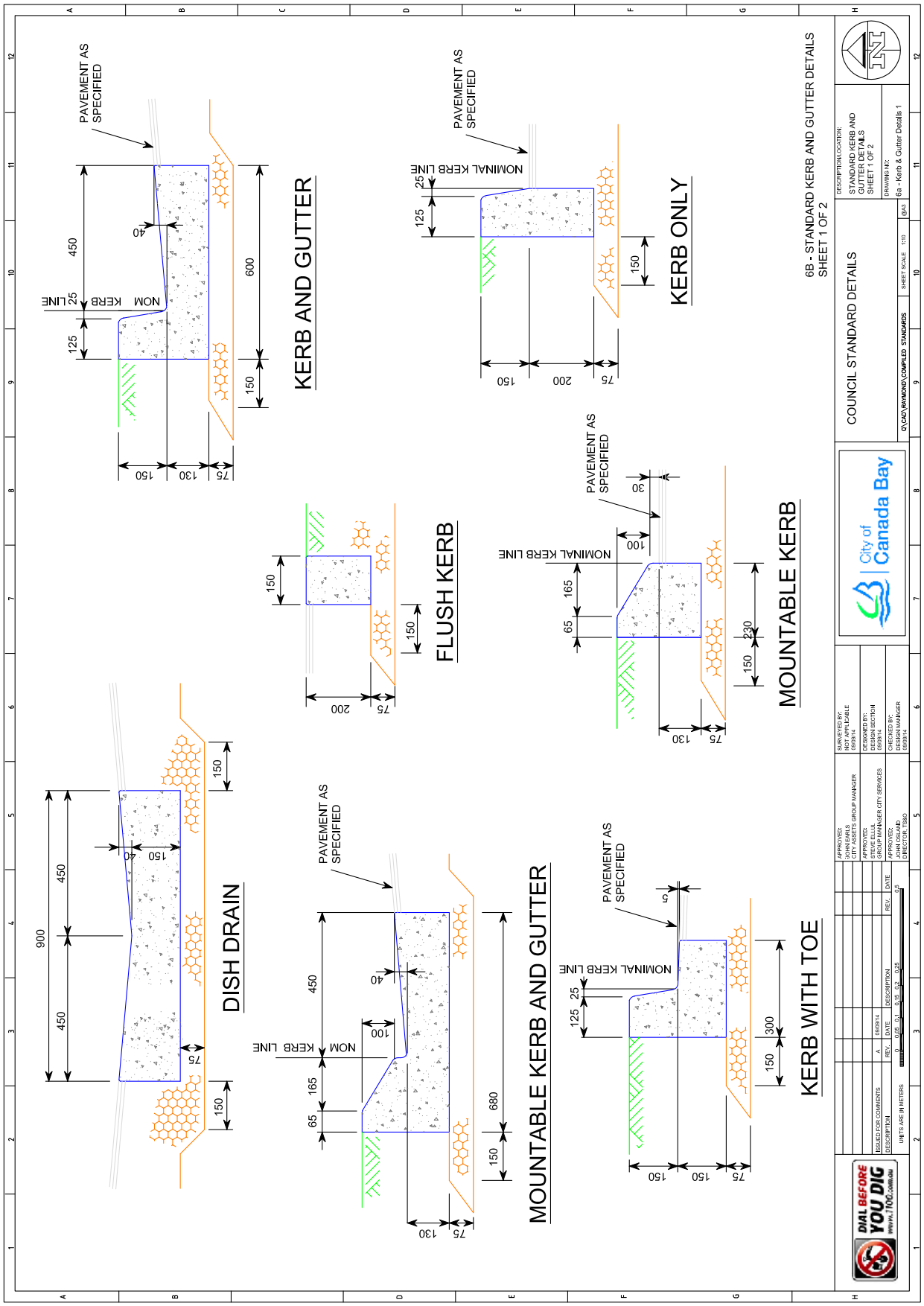

NOMINAL KERB LINE
70 MIN
25
200
SUB-SOIL DRAINAGE STUB
150
400 LAP (TYP)
150
'X' + 250 (750 NOM MIN)
150
SECTION 1
20 FALL
150
MORTAR BED
N12-300 BOTH WAYS OR F82 FABRIC (40 COVER FROM INSIDE FACE) IF PIT DEEPER THAN 1500
175
INTERNAL PIT DIEMNSIONS
STANDARD GULLY PIT DIMENSION TYP 700 x 930.
DIMENSION "Y" DEPENDENT ON THE LARGEST PIPE DIAMETER PASSING THROUGH PIT.
UNLESS SPECIFIED OTHERWISE IN PIT SCHEDULE, TYPICAL GRATE AND FRAME DIMENSIONS ARE AS FOLLOWS:
TYPICAL GRATE & FRAME DIMENSIONS (mm)
X Y
450 450
450 600
450 900
600 600
600 900
900 900
900 1200
1200 1200
WHERE "Y" IS LONGER SPAN
GUTTER LIP
R50 (TYP)
70 MIN
MORTAR BED
150
150
260
150
100 MIN
SECTION 2
0 0.2 0.4 0.6 0.8 1.0 METRES
REDUCTION RATIO 1:20 AT A3
REFER PIT IN CONCRETE PAVEMENT DETAIL
REFER PIT IN FLEXIBLE PAVEMENT DETAIL
REFER PIT IN LANDSCAPE AREA DETAIL
450 TRANSITION
200
1
10
250MIN 350MAX
250MIN 350MAX
900 NOM (TO SUIT FRAME)
100 MIN
100
50 FALL UNO
MASS CONCRETE BENCHING
150
'Y' + 450 (900 NOM MIN)
150
SECTION 3
PROVIDE STEP IRONS IF PIT DEEPER THAN 900 (REFER DETAIL)
D + 400 (MAX 1200)
APPROVED PRECAST KERB INLET LINTEL (R.T.A. STANDARD OR EQUIVALENT) STANDARD 1800 LONG U.N.O.
EXPANSION JOINT (TYP)
KERB LINE
FLOW
3N16 EXTRA
450
405
450
PLAN
100mm DIA x 3000 LONG SUBSOIL DRAINAGE STUB SURROUNDED BY NOM. 20mm BLUE METAL AND WRAPPED IN GEOTEXTILE FILTER FABRIC (TERRAM 700 OR SIMILAR)
WELDLOC TYPE GRATE AND FRAME OR EQUIV. HEAVY DUTY
COUNCIL STANDARD DETAILS
City of Canada Bay
DESCRIPTION/LOCATION:
GULLY INLET PIT FOR PIPE SIZES 675mm TO 1200mm IN DIAMETER
DRAWING NO:
3a - Kerb Gully Inlet Pit with Lintel
SHEET SIZE: A3
SHEET SCALE: as above
Q:\CAD\RAYMOND\COMPLIED STANDARDS
DIAL BEFORE YOU DIG www.1100.com.au
ISSUED FOR COMMENTS
DESCRIPTION
REV.
DATE
UNITS ARE IN METERS

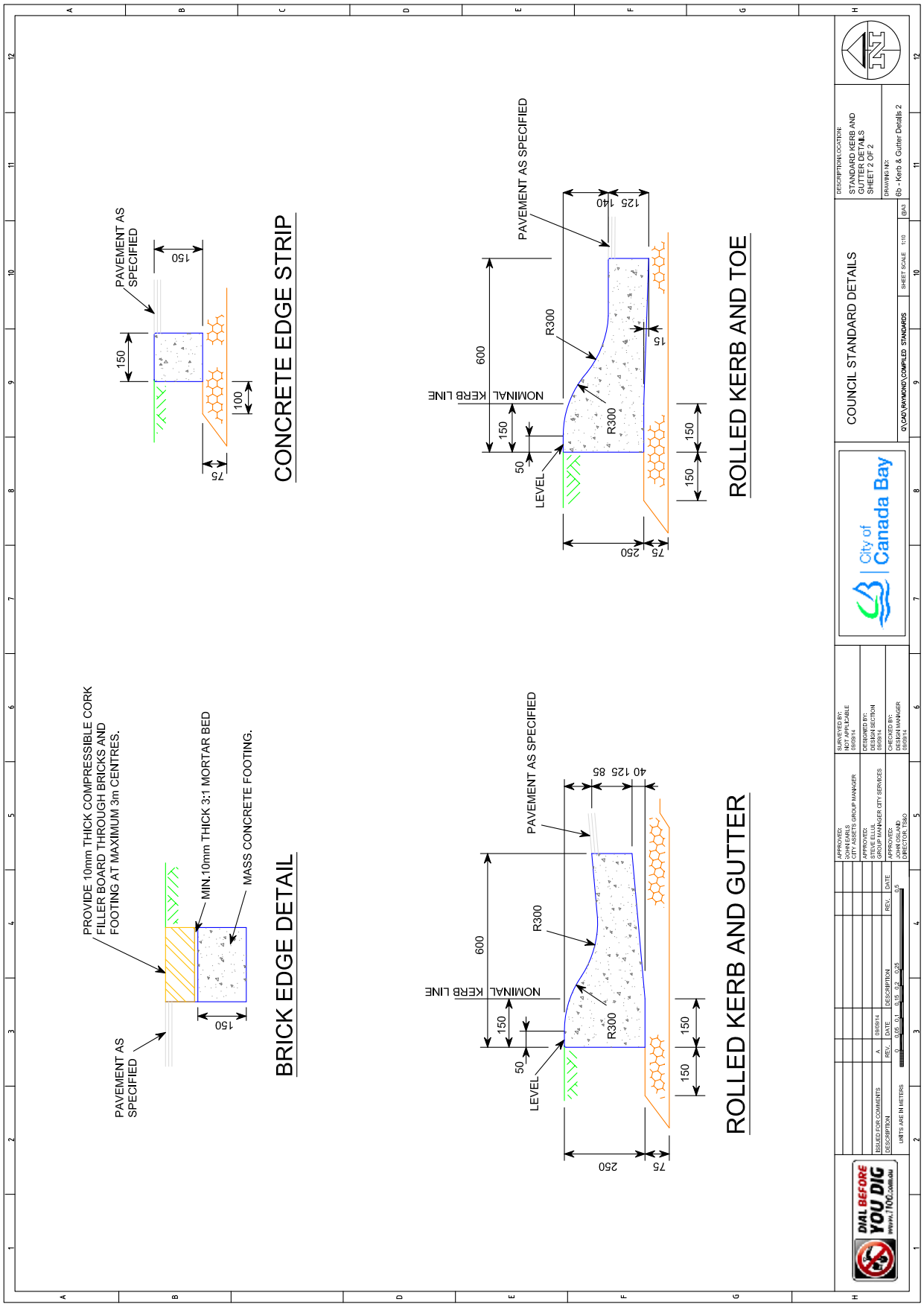

COUNCIL STANDARD DETAILS
GULLY INLET PIT FOR PIPE SIZES UP TO 600mm IN DIAMETER
3 - Kerb Gully Inlet Pit with Lintel
REDUCTION RATIO 1:20 AT A3
METRES
SECTION 1
SECTION 2
SECTION 3
PLAN
NOMINAL KERB LINE
SUB-SOIL DRAINAGE STUB
PROVIDE STEP IRONS IF PIT IS DEEPER THAN 900 (REFER DETAIL)
MORTAR BED
N12-300 BOTH WAYS OR F82 FABRIC (40 COVER FROM INSIDE FACE) IF PIT DEEPER THAN 1500
GUTTER LIP
R50 (TYP)
APPROVED PRECAST KERB INLET LINTEL (R.T.A. STANDARD OR EQUIVALENT) STANDARD 1800 LONG U.N.O.
100mm DIA x 3000 LONG SUBSOIL DRAINAGE STUB SURROUNDED BY NOM. 20mm BLUE METAL AND WRAPPED IN GEOTEXTILE FILTER FABRIC (TERRAM 700 OR SIMILAR)
EXPANSION JOINT (TYP)
WELDLOC TYPE GRATE AND FRAME OR EQUIV. HEAVY DUTY
FLOW
REFER PIT IN CONCRETE PAVEMENT DETAIL
REFER PIT IN FLEXIBLE PAVEMENT DETAIL
REFER PIT IN LANDSCAPE AREA DETAIL
MASS CONCRETE BENCHING
INTERNAL PIT DIEMNSIONS
STANDARD GULLY PIT DIMENSION TYP 700 x 930.
DIMENSION "Y" DEPENDENT ON THE LARGEST PIPE DIAMETER PASSING THROUGH PIT.
UNLESS SPECIFIED OTHERWISE IN PIT SCHEDULE, TYPICAL GRATE AND FRAME DIMENSIONS ARE AS FOLLOWS:
TYPICAL GRATE & FRAME DIMENSIONS (mm)
X Y
450 450
450 600
450 900
600 600
600 900
900 900
900 1200
1200 1200
WHERE "Y" IS LONGER SPAN
DIAL BEFORE YOU DIG
www.1100.com.au
City of Canada Bay

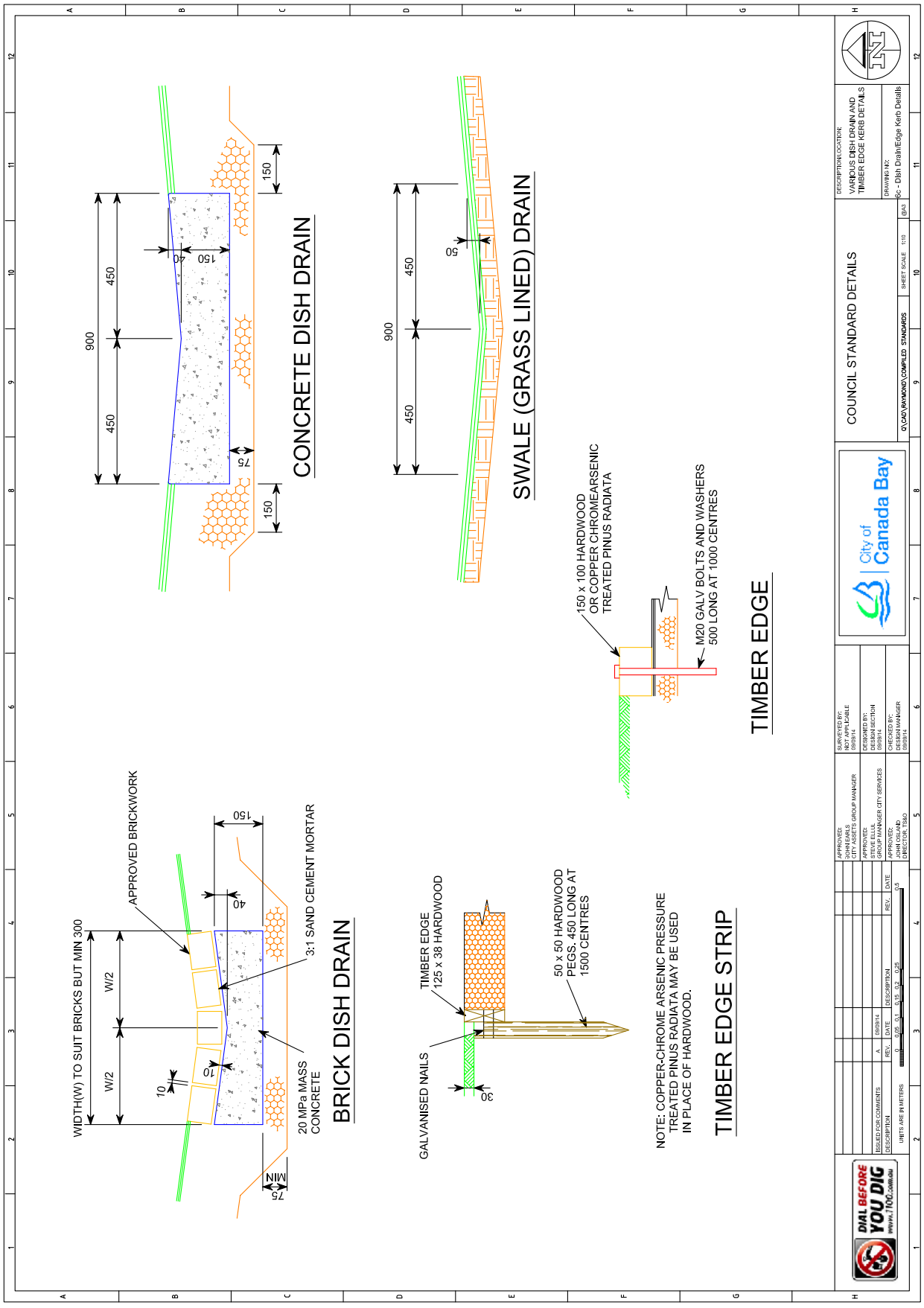

RODDING POINT 45° PIPE JUNCTION
450 MINIMUM U.N.O.
LIGHT DUTY CAST IRON OR BRASS SCREW OR BOLT ON CAP
uPVC PIPE (LENGTH VARIES TO SUIT)
45° uPVC "Y" JUNCTION
PIPE SIZE AS SPECIFIED
350 x 350 x 150 DEEP CONCRETE SURROUND
EXTEND PIPE TO ENABLE FIXING OF CAP
45° uPVC BEND
FOR DEAD ENDS SEAL WITH APPROVED PLUG TO MANUFACTURERS' RECOMMENDATIONS/SPECIFICATION
RODDING POINT 60° PIPE JUNCTION
PROVIDE LIGHT DUTY, AIR TIGHT CAST IRON, SCREW DOWN COVER
PIPE SIZE AS SPECIFIED
JOINTING AS SPECIFIED
60° JUNCTION
60°
350 x 350 x 150 DEEP CONCRETE SURROUND
30° BEND
FOR DEAD ENDS SEAL WITH APPROVED PLUG TO MANUFACTURERS' RECOMMENDATIONS/SPECIFICATION
uP.V.C DIRECT CONNECTION DETAIL
45° uPVC BEND
MORTAR (TYP)
MIN 300mm DIA
uPVC PIPE WITH SOLVENT CEMENT JOINTS
VC PIPE SOCKET
NOTE: ONLY RECOMMENDED FOR PIPE CONNECTION IN WHICH THE DIAMETER RATIO IS 1:3 OR GREATER.
DIRECT CONNECTION DETAIL (TYP)
45° uPVC BEND
MORTAR (TYP)
MIN 300mm DIA
uPVC PIPE WITH SOLVENT CEMENT JOINTS
PIPE SIZE AS SPECIFIED
COUNCIL STANDARD DETAILS
City of Canada Bay
DESCRIPTION/LOCATION: DIRECT CONECTION AND RODDING POINT FOR PIPES DETAILS
DRAWING NO: 4a - Pipe Connection Details
SHEET SCALE 1:10
@A3
DIAL BEFORE YOU DIG
www.1100.com.au
UNITS ARE IN METERS
ISSUED FOR COMMENTS

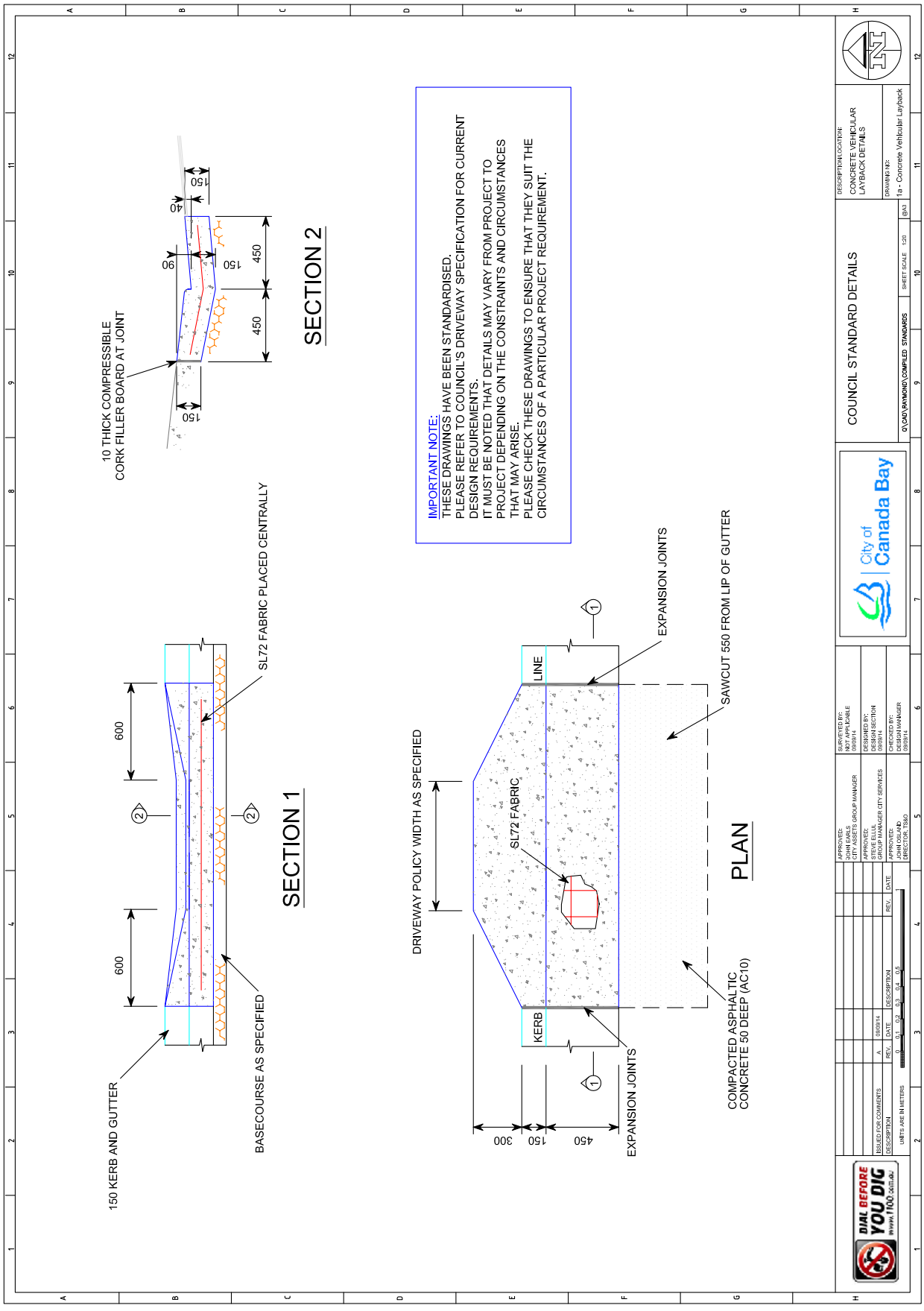

6mm WIDE SAWCUT FILLED WITH SEALANT ON RIGID BOND BREAKER. REFER DETAIL A
SL62 FABRIC (30 COVER)
CUT EVERY SECOND WIRE DIRECTLY UNDER JOINT
NOTE: SAWCUT TO BE MADE 36 HOURS MAXIMUM AFTER SLAB HAS BEEN POURED
SAWN JOINT
CONCRETE THICKNESS AS SPECIFIED BUT 75mm MIN. THICK (25MPa STRENGTH) ON 50 THICK SAND OR GRAVEL LEVELLING LAYER. WHERE CONCRETE FORMED OVER ROCK, PROVIDE BOND BREAKER
6mm WIDE GROOVE FILLED WITH SEALANT ON RIGID BOND BREAKER. REFER TO DETAIL A
KEY PLACED CENTRALLY
N12 LAP 450 WHERE REQUIRED
SL62 FABRIC
PAINT FIRST CAST FACE WITH BITUMEN
230 MIN
50
350
350
KEYED CONSTRUCTION JOINT
FORMED REBATE SAWCUT OR TROWEL GROOVED AS SPECIFIED
W AS SPECIFIED
4mm
W
INDENTION 1/4 SLAB DEPTH
RIGID BOND BREAKER
APPROVED POLYURETHANE GUN GRADE SEALANT COLOURED TO SUIT PAVEMENT TEXTURE
DETAIL A
N.T.S.
12mm THICK EXPANDING CORK FILLER BOARD WHERE ADJACENT TO BUILDINGS
3-N12
R10-600
SL62 FABRIC
230
300
THICKENED EDGE
N12 SUPPORT BAR SECURELY TIED OR TACK WELDED TO DOWEL
6mm WIDE SAWCUT OR TROWEL GROOVED FILLED WITH SEALANT ON RIGID BOND BREAKER REFER TO DETAIL A
THIS END TO BE PAINTED WITH BITUMEN
50
N12 LAP 450 WHERE REQUIRED
20mm DIA DOWELS 500 LONG AT 600 CENTRES PLACED CENTRALLY
DOWELLED CONTROL JOINT
COUNCIL STANDARD DETAILS
City of Canada Bay
DESCRIPTION/LOCATION: CONCRETE PAVEMENT JOINT DETAILS
DRAWING NO: 5a - Pavement Joint Details
SHEET SCALE 1:10 @A3
DIAL BEFORE YOU DIG www.1100.com.au
ISSUED FOR COMMENTS
UNITS ARE IN METERS


WHEEL STOP
150 x 150 x 1500 LONG
PAVEMENT AS SPECIFIED
2N12
R10-600
COG 150
R20 (TYP)
LEVELLING LAYER
75
INTEGRAL KERB
PAVEMENT
AS SPECIFIED
R20
2N12
R10-600
COG 150
NOM KERB LINE
25
125
100
150
CONSTRUCTION
JOINT (OPTIONAL)
75
MOUNTABLE INTEGRAL KERB
PAVEMENT AS SPECIFIED
100
30
R20
R10-600
COG 150
NOM KERB LINE
165
65
R20
2N12
75
PRECAST WHEEL STOP
R20 ROD 500mm LONG BOLT HEAD
DRIVEN INTO PAVEMENT
PAVEMENT AS SPECIFIED
75
CONCRETE TO BE 75mm THICK
(25MPa STRENGTH)
ON 50 THICK SAND OR GRAVEL
LEVELLING LAYER.
WHERE CONCRETE FORMED
OVER ROCK, PROVIDE BOND
BREAKER
INTEGRAL KERB WITH THICKENED EDGE
SL62 FABRIC
75 THICK GRAVEL OR
LEAN MIX CONCRETE
CONSTRUCTION JOINT (OPTIONAL)
R6-600
3N12
25
R20
125
300
100
R10-450
COG 150
150
230
75
COUNCIL STANDARD DETAILS
City of Canada Bay
STANDARD INTEGRAL KERB
AND GUTTER DETAILS
6a - Integral Kerb and Gutter
SHEET SCALE 1:10
@A3
Q:\CAD\RAYMOND\COMPILED STANDARDS
UNITS ARE IN METERS
ISSUED FOR COMMENTS
DESCRIPTION
REV.
DATE
DIAL BEFORE YOU DIG
www.1100.com.au


KERB AND GUTTER
PAVEMENT AS SPECIFIED
NOM KERB LINE
KERB ONLY
NOMINAL KERB LINE
FLUSH KERB
MOUNTABLE KERB
MOUNTABLE KERB AND GUTTER
KERB WITH TOE
DISH DRAIN
6B - STANDARD KERB AND GUTTER DETAILS
SHEET 1 OF 2
COUNCIL STANDARD DETAILS
City of Canada Bay
DIAL BEFORE YOU DIG


CONCRETE EDGE STRIP
PAVEMENT AS SPECIFIED
150
150
100
75
ROLLED KERB AND TOE
PAVEMENT AS SPECIFIED
125 140
R300
15
NOMINAL KERB LINE
600
150
50
LEVEL
R300
150
150
75 250
BRICK EDGE DETAIL
PROVIDE 10mm THICK COMPRESSIBLE CORK FILLER BOARD THROUGH BRICKS AND FOOTING AT MAXIMUM 3m CENTRES.
MIN.10mm THICK 3:1 MORTAR BED
MASS CONCRETE FOOTING.
PAVEMENT AS SPECIFIED
150
ROLLED KERB AND GUTTER
PAVEMENT AS SPECIFIED
40 125 85
R300
NOMINAL KERB LINE
600
150
50
LEVEL
R300
150
150
75 250
COUNCIL STANDARD DETAILS
City of Canada Bay
STANDARD KERB AND GUTTER DETAILS SHEET 2 OF 2
6b - Kerb & Gutter Details 2
DIAL BEFORE YOU DIG
ISSUED FOR COMMENTS
UNITS ARE IN METERS


CONCRETE DISH DRAIN
SWALE (GRASS LINED) DRAIN
TIMBER EDGE
BRICK DISH DRAIN
TIMBER EDGE STRIP
NOTE: COPPER-CHROME ARSENIC PRESSURE TREATED PINUS RADIATA MAY BE USED IN PLACE OF HARDWOOD.
COUNCIL STANDARD DETAILS
City of Canada Bay
DIAL BEFORE YOU DIG


SECTION 2
10 THICK COMPRESSIBLE
CORK FILLER BOARD AT JOINT
150
40
90
150
450
450
150
SECTION 1
SL72 FABRIC PLACED CENTRALLY
600
600
150 KERB AND GUTTER
BASECOURSE AS SPECIFIED
IMPORTANT NOTE:
THESE DRAWINGS HAVE BEEN STANDARDISED.
PLEASE REFER TO COUNCIL'S DRIVEWAY SPECIFICATION FOR CURRENT
DESIGN REQUIREMENTS.
IT MUST BE NOTED THAT DETAILS MAY VARY FROM PROJECT TO
PROJECT DEPENDING ON THE CONSTRAINTS AND CIRCUMSTANCES
THAT MAY ARISE.
PLEASE CHECK THESE DRAWINGS TO ENSURE THAT THEY SUIT THE
CIRCUMSTANCES OF A PARTICULAR PROJECT REQUIREMENT.
DRIVEWAY POLICY WIDTH AS SPECIFIED
EXPANSION JOINTS
SAWCUT 550 FROM LIP OF GUTTER
LINE
SL72 FABRIC
KERB
300
150
450
EXPANSION JOINTS
COMPACTED ASPHALTIC
CONCRETE 50 DEEP (AC10)
PLAN
COUNCIL STANDARD DETAILS
City of Canada Bay
CONCRETE VEHICULAR LAYBACK DETAILS
1a - Concrete Vehicular Layback
DIAL BEFORE YOU DIG
www.1100.com.au

City of Canada Bay