CITY OF PARRAMATTA COUNCIL

Draft Melrose Park North Site-Specific Development Control Plan

Public Exhibition Version

Date Adopted: xx 2021

CITY OF PARRAMATTA

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INTRODUCTION

APPLICATION

The provisions of this section of the DCP apply to development in Melrose Park North as shown in Figure 1 and will prevail where there is any inconsistency with other sections of this DCP.

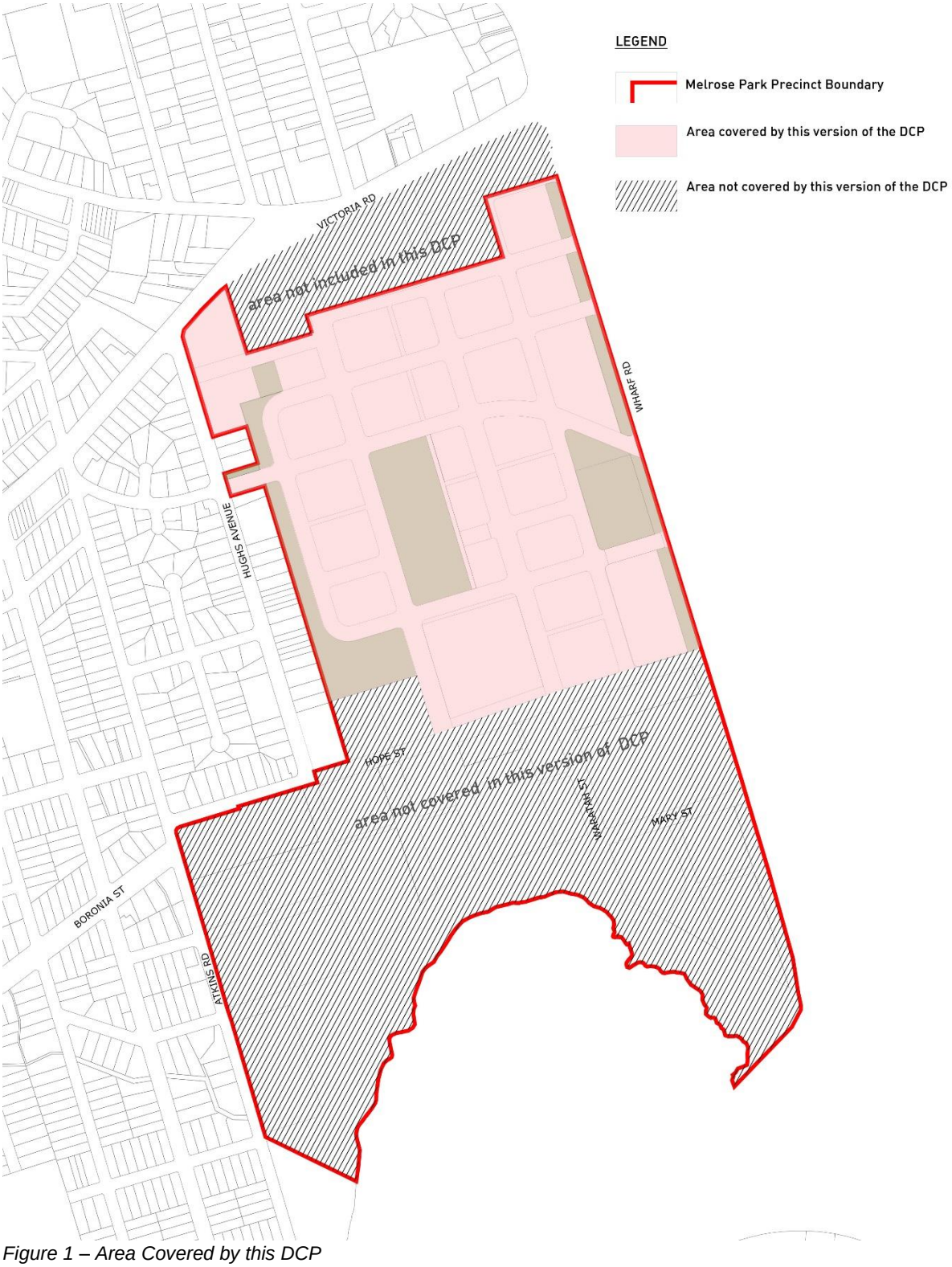

Figure 1 – Area Covered by this DCP

THE DCP

This DCP includes the written document and the Masterplan.
The Masterplan describes the intended physical outcome for Melrose Park.
The Public Domain Plan and associated Public Domain Guidelines and Water Management Strategy will also inform the outcome.

MASTERPLAN

The Masterplan for the Northern Melrose Park precinct consists of the following:

Street, Block, Open Space and Building Layout identifies the street layout including the pedestrian connections; the open space; development lot locations and the building footprints.

Setbacks from the Public Domain identifies the setbacks to the buildings from the street and public domain.

GFA by Lot identifies the gross floor area (GFA) generally permitted for each lot and across the site.

Heights by Lot identifies the number of storeys generally permitted on each building

See Appendix 1.

PUBLIC DOMAIN PLAN and PUBLIC DOMAN GUIDELINES

Public Domain Plan includes:

Street Type Layout Plan identifies the location and width of all streets

Street Type Schedule identifies street arrangement in section in spreadsheet format

Public Domain Guidelines includes:

Pavement Strategy and Materials Palette; Street Tree Strategy (species, tree surrounds), Materials Palette and Tree Surround Finishes Strategy; Furniture Strategy and Materials Palette; Pedestrian and Vehicle Lighting Level Strategy, and Light Pole Strategy for streets, plazas, pedestrian connections and parks, plus other special details that may be required.

WATER MANAGEMENT STRATEGY AND MASTERPLAN

The Water Management Strategy and Masterplan will include details of:

- Overland flow management of management of low flows;
- Floodwater and stormwater detention; and
- Water Sensitive Urban Design

Refer to Appendix 2.

OTHER DOCUMENTS

Council documents also used for reference:

- City of Parramatta LEP 2011
- Parramatta DCP 2011
- Development Engineering Design Guidelines
- Water Sensitive Urban Design Policy
- Council's Standard Construction details
- General requirements of the Parramatta Public Domain Guideline

GENERAL OBJECTIVES

The City of Parramatta Council aims to foster the development of a lively, diverse, and healthy LGA, one which celebrates a sense of place and local character in both the public and private realms. To the east of the Parramatta CBD Melrose Park is being developed on ex-industrial land located between Victoria Road and the Parramatta River. There are three precincts The Wharf Road Precinct located on Victoria Road is the most northerly precinct. North Melrose Park extends from the Wharf Road Precinct to Hope Street and South Melrose Park from Hope Street to the Parramatta River. The Wharf Road Precinct has been rezoned and is not the subject of this DCP. This DCP applies to the North Melrose Park Precinct. This DCP will be amended to include South Melrose Park Precinct and its related masterplan. The overall site slopes south to the river and is surrounded by low density detached housing on the east and the west .On completion, the new suburb will be home to approximately 25,000 people, provide retail and entertainment facilities, schools and parks.

The amenity and quality of Melrose Park for its residents and their neighbours is the underlying consideration for all the objectives and controls in the DCP. The DCP is underpinned by and relates to the Masterplan. The Masterplan has been prepared by City of Parramatta. The masterplan responds to the topography and the street context of the precinct. The streets are organized to optimize connectivity for people and vehicles, minimize perceived densities, address water management, enable canopy planting and support the proposed built form. Buildings are organised to define the streets and open spaces, provide deep soil and create a legible public domain with amenity and spatial complexity. The building envelopes provide the opportunity for high quality architectural resolution.

The clarity and quality of public spaces are essential to this conception of a place centered on people. The public spaces – streets, and parks – will be the basic and enduring structuring spaces of Melrose Park, of which streets are the most prevalent. The interaction of buildings and public spaces is critical in shaping the way the place is experienced particularly at the lower levels where detail design plays an important part in the creation of a stimulating pedestrian environment.

General Objectives

O.01 Create a legible, coherent, and attractive suburb characterised by generous diverse streets and public spaces reinforced by the built form and vegetation.

O.02 Organise the buildings so that they form a coherent outcome, address, and define the streets, pedestrian connections, courtyards, and special places.

O.03 Ensure that the spaces of the public domain - streets, squares and parks are of high quality and amenity.

O.04 Facilitate sustainable resilient buildings that address climate, topography, energy consumption, urban heat, pedestrian scale, and internal amenity.

O.05 Protect and improve the natural environment.

O.06 Provide sufficient detail of Council requirements and expectations to enable Development Applications to be easily assessed

O.07 Safely manage overland flow and stormwater through the site and broader precinct and design buildings and landscape in response.

DESIGN QUALITY

The promotion of good design in the built environment is an objective in the Environmental Planning and Assessment Act, and good design is a central aim for all development in the LGA.

Design is a complex synthesis of multiple factors - technical, social, environmental, historic, aesthetic, and economic. It responds to the context, physical as well as cultural, and generates sustainable living and working environments. It is concerned not only with how buildings look but includes fundamental considerations of amenity for occupants and how buildings contribute to the development of quality urban places.

Good design generates spaces with a sense of appropriateness in which people naturally feel comfortable. It has detail and material quality, is long lasting, and it creates financial return through the making of places that people value.

Good design also incorporates an understanding that individual buildings should relate to each other as well as contribute to a larger whole. This conception of the importance of collective urban form is an underlying principle of the DCP and informs design quality processes in the LGA.

Design quality procedures in the City of Parramatta include the Design Excellence process in the City Centre led and coordinated by the City Architect, and the LGA-wide Design Excellence Review Panel (DEAP).

In Melrose Park, under the Design Excellence process, design competitions are required for buildings on sites nominated with a height exceeding 55 metres in this DCP must exhibit design excellence. Bonuses in floor space and height are not applicable.

In addition, the Urban Design Unit within Council provides guidance and advice on design in all relevant matters within the LGA.

These procedures aim to embed design quality as an integral part of development in the City of Parramatta. An important aspect of this is to ensure that design intent is documented in detail and carried through all stages of projects to completion.

Melrose Park North is being developed by one developer and will be home to approximately12000 people. Design quality is therefore paramount. Quality is not just of the individual buildings but how the buildings relate one to another. ‘Cookie cutter’ buildings will create a monotonous outcome; ‘look at me‘ buildings will create a high ‘perceived’ density and a building dominant outcome. Careful definition of the spaces between the buildings in plan and section; preservation of all views to the sky and discrete modulation of the buildings are required to ensure variety and interest in the public domain and amenity in the apartments.

Objectives

O.01 Ensure that development individually and collectively contributes to the architectural and overall urban design quality of Melrose Park

O.02 Incorporate design quality in public and private development as a central consideration through all stages of the process from design to completion.

O.03 Ensure that the integrity of design quality is carried through to the construction and completion of developments.

O.04 Encourage the use of a range of architects with a common sensibility across the precinct as practical.

Controls

C.01 All Design Competition briefs should contain a reference to the objectives and controls contained within this DCP.

C.02 All Architectural Reference Designs developed as part of a Design Competition brief should use this DCP as the basis for building envelopes.

C.03 This DCP should form the primary basis of assessment of all Design Excellence winning schemes.

C.04 For all Development Applications in Melrose Park that are not subject to a Design Competition, the Architect should provide sufficient detailed documentation for the building facades and external areas to form part of the consent documents. These should include fully annotated 1:20 scale cross sections and partial plans of facades, details of typical and important junctions, and details and materials specification of all external works.

C.05 The Landscape Architect and Civil Engineer for all Development Applications should liaise closely to prepare fully coordinated Public Domain Alignment Drawings. The detailed design considerations and documentation requirements for this submission are outlined in the Parramatta Public Domain Guidelines.

C.06 Different Architects are to be used across the Precinct. Allocation of sites to different architects should be based on the lots being dispersed along the street network or relate to particular intersections rather than different architects being allocated to a 'group' of street blocks.

SITE PLANNING

Melrose Park is located on developed industrial land with some existing buildings benched for large floorplates. These buildings will be demolished, and the shape of the land will be changed to accommodate new streets, residential buildings, and the town centre. Careful preparation of the site is required to deal with preparation of the site for the proposed new uses.

Matters Covered by the Parramatta DCP 2011

- Soil Management
- Land Contamination
- Biodiversity

WATER MANAGEMENT STRATEGY

Note 1: See Water Management Masterplan below for more detail.
Note 2: When referring to PDCP 2011, should any inconsistency arise between PDCP 2011 and this DCP, then this DCP takes precedence.

Due to development, the overland flow paths have been considerably altered from their natural state. Water management aims to reverse any negative environmental impacts that have arisen because of these changes so that a sustainable water environment can be recreated.

Despite the precinct being located within close proximity to Parramatta River, it is not affected by riverine flooding, however still considered to be at high risk of potentially polluting the river. The precinct is subject to overland flow flooding reflecting the two historical watercourses that once traversed the precinct from north to south-eat (Wharf Road) and from north-west to south (Hope Street).

The Upper Parramatta River Catchment Trust (URPCT) Edition 4 is to be applied, where relevant.

Refer to the Water Management Strategy for full requirements

Refer to Sustainability section for Water Sensitive Urban Design (WSUD) requirements.

Objectives

O.01 Ensure pre-development (natural) overland flow paths are restored.

O.02 Ensure that run-off does not impact on surrounding properties or the environment resulting in damage to public and private assets, reduced property values or require additional expenditure on

flood mitigation or drainage works for properties outside the precinct.

O.02 Ensure that sustainable water management practices are applied, where practicable.

Controls

C.01 Manage water flows across the precinct within the roads reserves and identified public open space areas.

C.02 Excess peak flows are to be detained in both on-site and collective detention systems.

C.03 Lower flows to be directed through landscape water quality treatment systems (Water Sensitive Urban Design)

C.04 Peak flows are to be limited throughout the catchment in a 1% AEP storm event to estimated peak flows under 1999 conditions, regardless of whether future redevelopment within the catchment occurs which improves the quantity of overland flow entering the precinct.

C.05 In 50%AEP storm events, post-development peaks are to be reduced to or as close as possible to natural levels.

C.06 On-site detention (OSD) systems are to be integrated into a sustainable overall water management plan for the site, where possible.

C.07

DEMOLITION

Objectives

O.01 Ensure that the maximum amount of material on the site is recycled.

Controls

C.01. All materials that are suitable for recycling from the demolition of buildings and structures, and from the removal or relocation of soil should be recycled

1. BUILT FORM

1.1 GUIDING PRINCIPLES

The LEP controls for Melrose Park envisage a town form that is broadly made up of two components: a lower stratum of defined streets and public and private spaces, and an upper one of towers. The residential perimeter block development punctuated by courtyards and edged by gardens contrast with the full perimeter block of the town centre and the towers. Together they create the collective architectural component that defines the street and forms its character. Where the buildings are set back from the street, in a more fragmented built form the role of landscape takes on added importance in defining the street, enriching its character, and ensuring long term amenity

The town centre buildings are built to boundary and are required to have active frontages at ground.

The following principles apply to all development in Melrose Park

P.01 The GFA is to be generally consistent with the overall gross floor area (GFA); height and setbacks as generated within by the Masterplan

P.02 Building depth, bulk and separation is to create a precinct that protects amenity, daylight penetration, views to the sky and privacy between adjoining developments and minimises the negative impacts of buildings on the amenity of the public domain.

P.03 Building depth, bulk and separation should assist to create a precinct that protects amenity, daylight penetration, views to the sky and privacy between adjoining developments and minimises the negative impacts of buildings on the amenity of the public domain.

P.04 Buildings should align with the streets so that positive spaces are formed within the streets and the lots

P.05 Podia are to be set back from the street to comply be generally consistent with the master plan to enable deep soil planting, reinforce the human scale of the streets, mitigate wind impacts and enable views to the sky in streets and public places.

P.06 Towers are to be appropriately proportioned and maximise their slender form.

P.07 The design and materials selection of buildings and the public domain are to contribute to a high quality, durable and sustainable urban environment.

P.08 In the town centre where the streets have active ground floor frontages, street walls are to be designed at appropriate heights to create spatially defined streets that are well proportioned, comfortable, safe, functional, and attractive.

P.09 Towers in the town centre are to be set back above street walls to re-enforce the human scale of the streets, mitigate wind impacts, and enable views to the sky in streets and public places.

P.10 The collective built form reinforces the variety evidenced in the topography and the spatial organisation of the streets and open spaces

P.11 The variety within the precinct is derived from the detail resolution of the buildings and not from excessive differences in the form of the buildings and / or the selection of materials.

1.2 ALLOCATION OF GROSS FLOOR AREA

Objectives

O.01 Regulate the density of development identifying a maximum GFA for lots, resulting from the maximum floor space ratio in the PLEP 2011.

O.02 Ensure development floor plate sizes and building footprints are not excessive.

Controls

C.01. The maximum GFA for any development lot is not to exceed the GFA detailed in Figure A. The lot GFA result from the FSR controls in the PLEP 2011 or as otherwise nominated in a Notice of Development Consent granted by a relevant consent authority.

C.02. The maximum GFA for each lot shall include all buildings accommodated on a development lot.

C.03. Development applications must submit supporting plans that demonstrate the GFA outcome on the development lot is consistent with PLEP 2011 or as otherwise nominated in a Notice of Development Consent granted by a relevant consent authority.

C.04. Should a maximum GFA not be able to be achieved for a development lot, that amount of GFA can be transferred to any other development lot subject to consideration against the relevant provisions in this DCP and maintaining the gross FSR of 1.85:1 across the Precinct

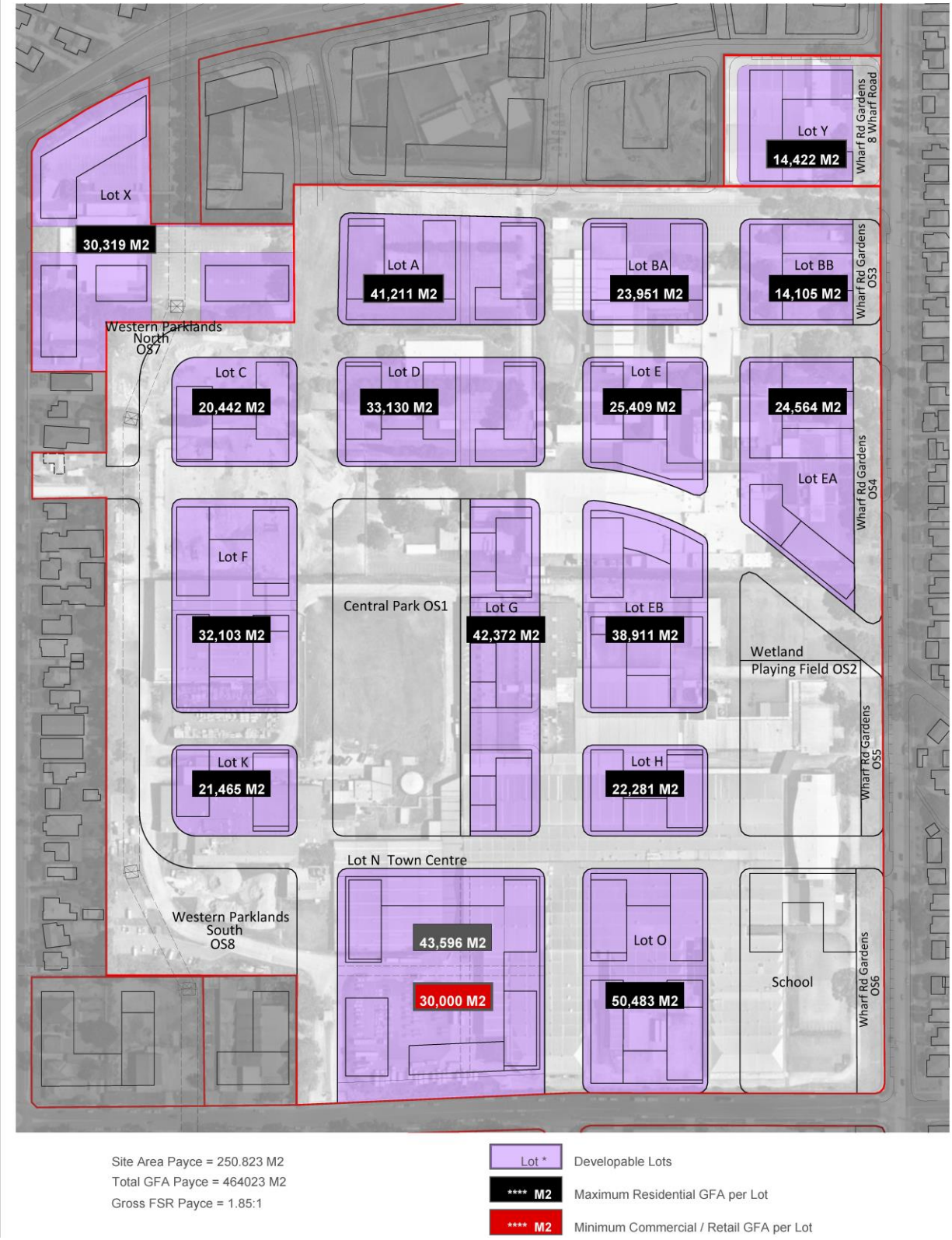

Figure 2 - GFA Plan per Lot

1.3 STREET, BLOCK, OPEN SPACE and BUILDING LAYOUT

Objectives

O.01 Layout the street network as shown in the Masterplan and Public Domain Plan so that:

a) internal and external connectivity is optimised
b) all streets provide views to sky and views are not blocked by buildings
c) streets in plan and section 'reveal' the topography
d) 'perceived' density is minimised
e) the streets form a hierarchy derived from the relationship of the landform, differences in width and differences in the way they are defined by the building form.
f) generous canopy tree planting is accommodated in the streets and on the lots
g) all road users can move safely
h) where possible, access to parking basements is provided from the lowest point on the lots and from the least busy streets, subject to the need to exclude floodwaters from the basements for all floods.
i) pedestrian connections are incorporated to augment the main street network
j) streets are on the ground and can be dedicated to Council

O.02 Ensure that the public and privately owned open spaces that are defined in the Masterplan form the basis of the open space network and can accommodate:

a) passive and active recreational needs of the residents and workers
b) management of overland floodwater as well as local stormwater drainage, water sensitive urban design and ground water
c) pervious ground plane treatments
d) canopy trees

O.03 Ensure that the lots that are defined in the Masterplan and have been tested form the basis of the development. They are of sufficient dimensions and appropriate shape to achieve:

a) the necessary standard of amenity in relation to privacy, building separation, solar access, ventilation, and outlook.
b) adequate building separation with regard to the ADG and this DCP.
c) street activation to the required extent.
d) safe and efficient access and servicing.
e) optimum accessibility around the precinct
f) deep soil and landscaping

O.04 Locate the buildings on the development lots as identified in the Masterplan to ensure that:

a) all buildings achieve reasonable setbacks, solar access, and separation requirements
b) the amenity of the apartments in terms of outlook, landscaping is optimised
c) the public domain is strongly defined
d) perceived density is minimised

Controls

C.01. The street network and pedestrian connections should generally be consistent with layout, dimensions and sections in the Masterplan and Public Domain Plan

C.02. All streets are to be at ground and public streets be dedicated to Council

C.03. C.03The pedestrian connections are above basement and privately owned but should be publicly accessible 24/7 (except the Mall). The development lots, location and dimensions should generally comply with the Masterplan

C.04. All subdivision plans should comply with the Masterplan

C.05. The locations of all buildings, tower and perimeter block should comply with the Masterplan

C.06. Deep soil and landscaping should be consistent with the ADG and Part 4 Melrose Park of the PDCP 2011. Deep soil zone under which there is no development is a minimum of 7% of the site and minimum dimension of 6 metres. Additional deep soil is be provided where the minimum dimension is 3 metres or greater. Deep soil with a minimum dimension of less than 3 metres does not contribute to the 7% deep soil calculation.

C.07. Tree Planting and landscaping located on a slab is to be set down into the slab a minimum 1 metre plus drainage for trees and a lessor amount appropriate for other planting. All soil in the street frontage setbacks is to comply with the Soil Profile Strategy Report recommendations. The minimum number of trees to be provided in landscaped areas is 1 tree per $80m^2$ or as agreed by Landscape Management Officer.

C.08. Where possible, stormwater must be managed as an integral part of the land scape and discharge water quality must be achieved through WSUD measures.

1.4 THE BUILDING ENVELOPE

The building envelopes resulting from the setbacks, floorplate and height outlined in the Masterplan constitute a three-dimensional volume within which, together with all other applicable controls, should result in a coherent built form being designed. The envelope heights in the masterplan are generous and designed to enable a well-considered architectural response rather than 'filling' the envelope. The building envelopes have been tested for separation distances and overshadowing of public parks.

1.5 STREET SETBACKS

The purpose of establishing street setbacks relates to interface with the street, ground floor usage and building separation.

There are two principal categories for the ground floor:

- The buildings that have a residential ground floor frontage; and
- The buildings that have an active ground floor frontage with an attached street wall

In areas with residential ground floors, the building should be set back from the street alignment allowing an arrangement which balances the need for resident privacy as well as engagement with the street, and also provides the necessary space for deep soil; landscaping and amenity, both for residents and the street.

Due to the sloping topography of the precinct, issues of resident amenity may also be addressed by raising the building ground floor levels relative to the site topography where residential uses are located adjacent to a pedestrian connection or public boundary.

Raised floor levels, appropriate location of windows and courtyard planting can be used to address privacy and surveillance

In lots where ground floor usage is uncertain, such as at key intersections where it is desirable to have some retail uses, setbacks and public domain design should be considered together.

In the town centre the street wall is the part of the development that has most impact on the street and public domain experience as it defines and articulates the street with appropriate scale and detail.

Above the town centre street wall, towers should be set back.

Objectives

O.01 Reinforce the appropriate spatial definition of streets and public spaces.

O.02 Emphasise the importance of the street as a distinct spatial entity and design the street interface and street wall with an appropriate human scale and sense of enclosure for the street.

O.03 Ensure consistent street frontages with buildings having common setbacks and alignments.

O.04 Recognise the variation in street frontage heights throughout the site driven by topographical features and allow flexibility to respond to context.

O.05 Protect daylight access at street level and permit views of sky from the street by providing setbacks above street frontage height that promote separation between buildings.

O.06 Ensure that building form achieves comfortable public domain conditions for pedestrians, with adequate daylight, appropriate scale, and adequate mitigation of wind effects of tower buildings.

O.07 Create a clear delineation between public and private space.

O.08 Provide for landscape areas and street trees as shown on the Masterplan and Public Domain Plan.

O.09 Enable lots with courtyards that are open to the street setbacks to have deep soil landscaping that is contiguous with the courtyard landscaping.

O.10 Reinforce important elements of the local context including public spaces, key intersections, public and heritage buildings, and landscape elements.

O.11 Provide space on residential sites for ground level residents to engage appropriately with the street and for landscape that contributes to the public domain

Controls

C.01 For the town centre and all developments that have an active ground floor street frontage:

a) Street setbacks and heights should generally comply with the Masterplan

b) setbacks to towers in the town centre above the street wall / podium should vary to suit final design but are generally a minimum of 2m, 5m or 6m from the street boundary, refer Fig 1

c) where active uses are proposed at ground on the key important intersections (NSR 2 and EWR 4 Highest Priority and NSR 3 and EWR 4 Second Highest Priority) the ground floor, first and second floors of the podium may extend into the setback zone for a distance of 3 metres from the building line, refer Fig 2. In plan the decreased street setback can extend for a distance of up to 25 metres along each street, refer Fig 3

d) The podia on the key intersections where retail is proposed should incorporate a splayed setback on the corner for the height of the projection, refer Fig 2 and Fig 3.

e) street wall and podia heights should be consistent with the Masterplan. Development Applications should be accompanied by a streetscape analysis to determine the most appropriate relationships along and across the street.

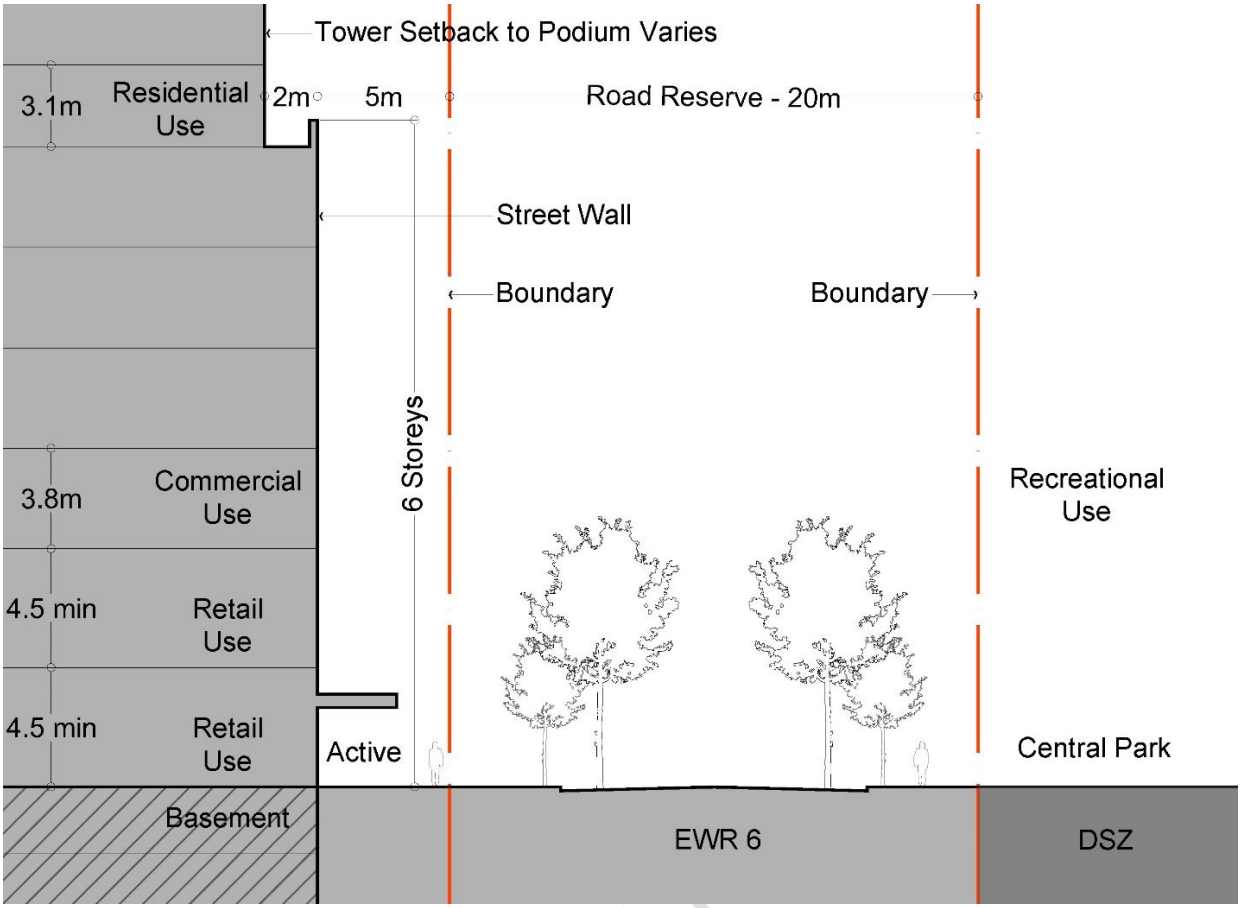

Figure 3 – Street Wall Height in Town Centre

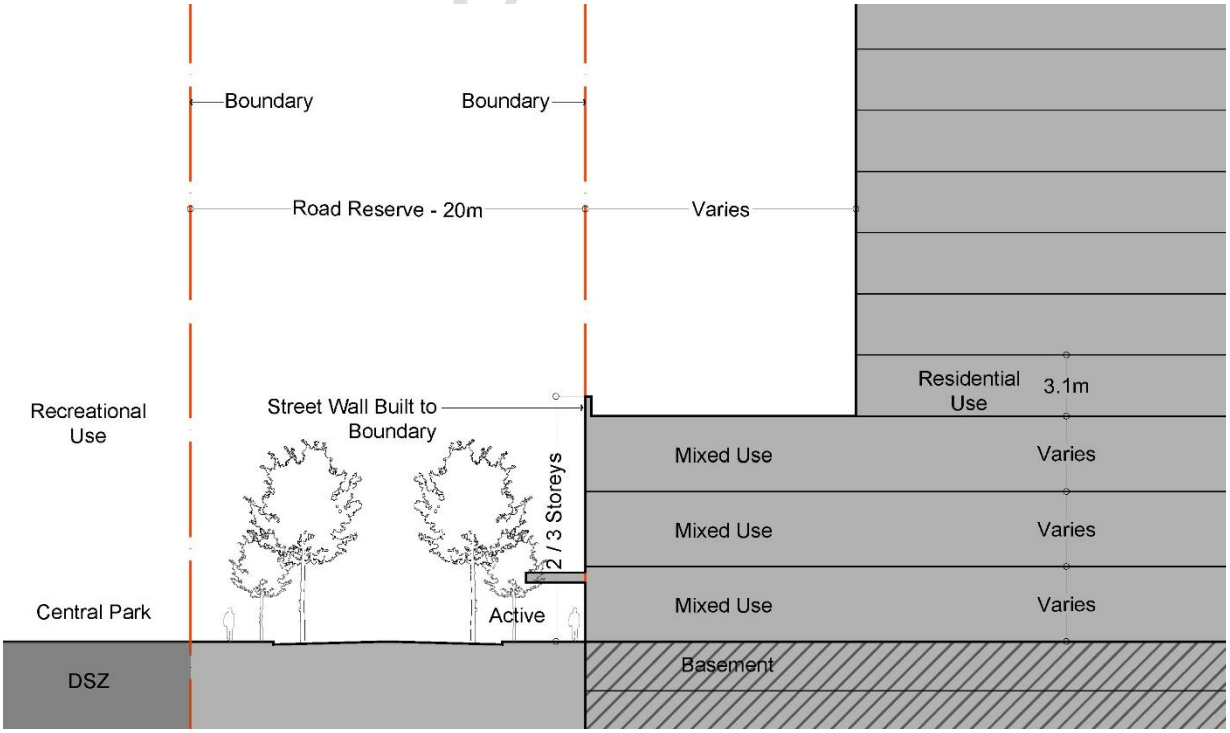

Figure 4 - Street Wall Height at Key Intersection

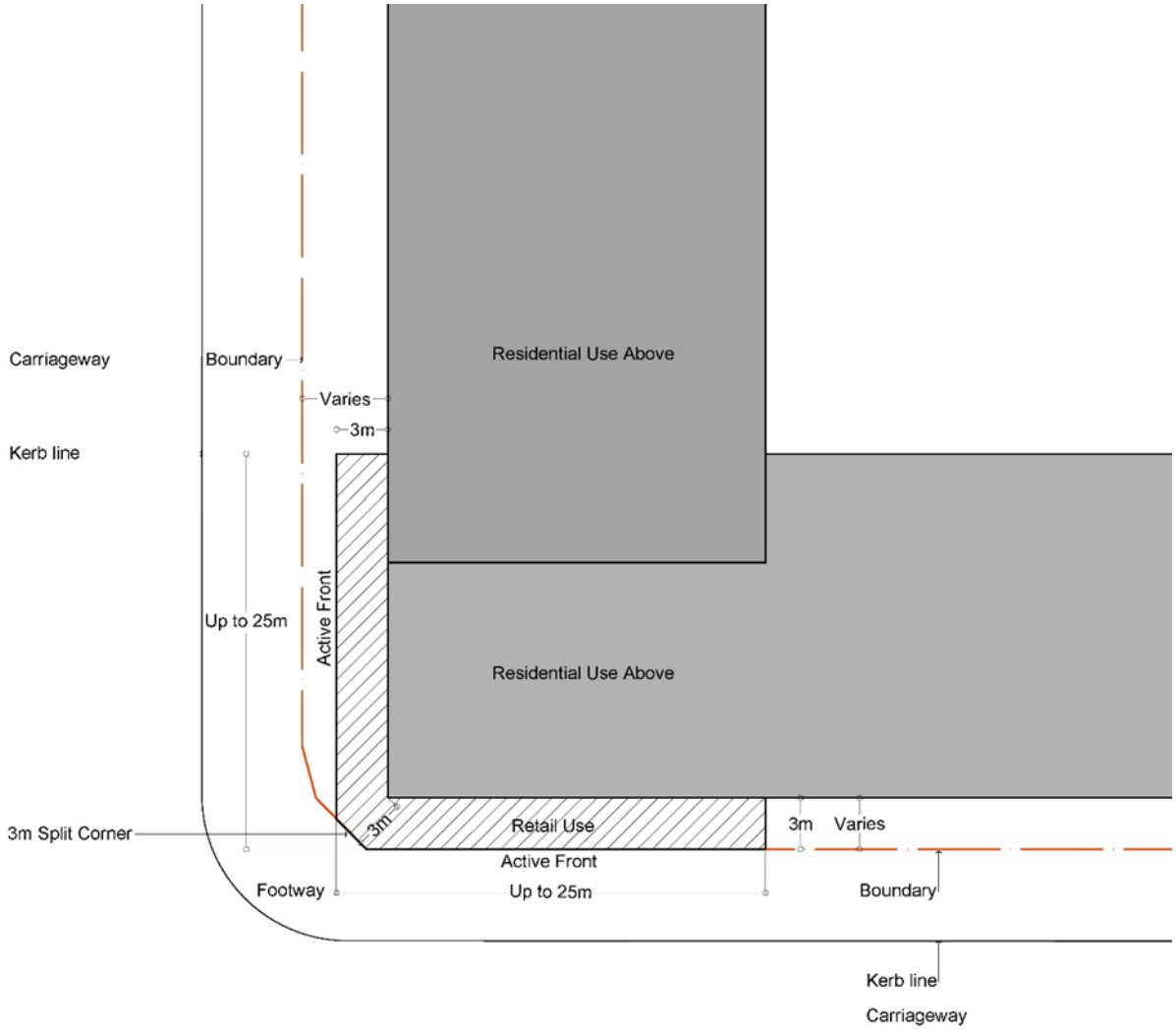

Figure 5 –Indicative Corner Activation at Key Intersections, Plan (NSR 2 and EWR 4 Highest Priority and NSR 3 and EWR 4 Second Highest Priority) NTS

C.02 For all developments that have a residential ground floor street frontage:

a) Street setbacks should comply with the Masterplan. A 400mm articulation zone is permitted forward of the setback, in which building elements may occupy a maximum of one third of the area of the façade. Services or lift shafts are not permitted in the articulation zone.

C.03 Setbacks should be measured perpendicular to the boundary to the outer faces of the building, refer Fig 4. Elements in the articulation zone are excluded.

C.04 The separation distance between buildings where the east west pedestrian connections are located is to be 12 metres, refer Fig 5. Within this space a straight pedestrian path minimum 4 metres wide is to be located. Private gardens and entrances to apartments are permitted.

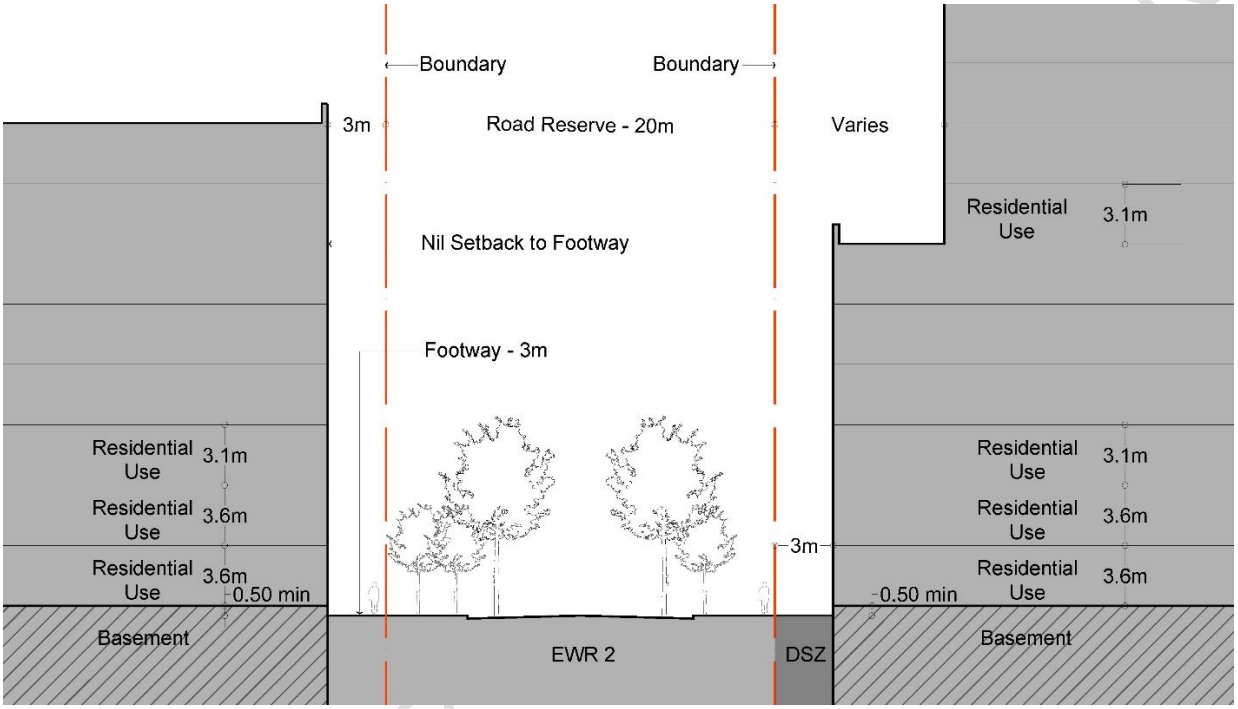

Figure 6 - –Street Wall Height at Typical East West Street, NTS

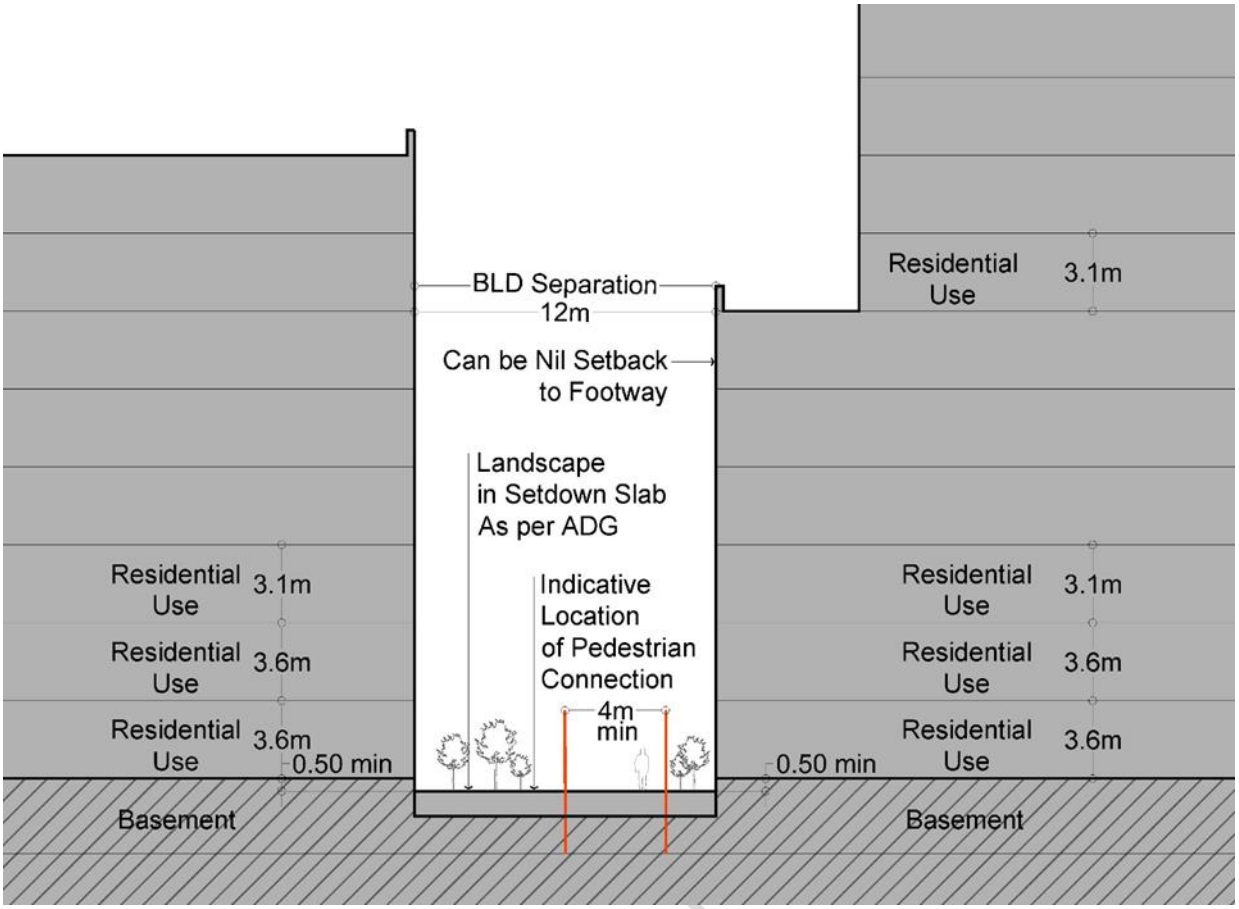

Figure 7 – Street Wall Height at Pedestrian Connection, NTS

1.6 BUILDING SEPARATION

The controls relating to building separation for residential buildings make minor changes to the standards of the Apartment Design Guide (ADG). The separation distances for towers are to meet the ADG requirements but where buildings face the pedestrian connections issues of privacy and surveillance are to be resolved in the architectural resolution.

Objectives

O.01 Protect and manage the impact of development on the public domain and neighbouring sites.

O.02 Protect the amenity of streets and public places by providing a healthy environment for street trees and allowing adequate daylight and views to the sky.

O.03 Ensure a pattern of built form and spatial definition that contributes to the character of the suburb.

O.04 Provide access to light, air, and outlook for the occupants of buildings, neighbouring properties and future buildings.

Controls

C.01 The towers (residential and commercial) should be generally consistent with the Masterplan.

C.02 For residential towers, building separation should be generally consistent with the Masterplan and the ADG.

C.03 Perimeter block buildings/ podia that have residential apartments on the ground floor and that face pedestrian connections are to comply with the separation distances as shown on the Masterplan. Issues of visual and noise privacy are to be addressed in the design of the buildings.

C.04 Towers are to be sufficiently separated so that tower buildings appear 'in the round'; minimise overshadowing to public spaces and minimise urban heat.

C.05 Setbacks should be measured perpendicular to the boundary to the outer faces of the building.

C.06 For purposes of these controls, serviced apartments should be treated as a residential building

1.7 TOWER DESIGN AND SLENDERNESS

The overarching objective of the DCP is to generate an urban form with well-defined streets of high amenity.

The slenderness of towers is important both to achieve elegance of form as well as to minimise the perceived density, maximise amenity and environmental performance. Plan area, plan proportion, alignment and height are contributing factors in the perception of slenderness.

Objectives

O.01 Generate towers of slender proportions.

O.02 Design towers to be well-proportioned, reflect their orientation and address the public domain.

O.03 Mitigate the potential adverse effects that buildings may have on the public domain

O.04 Achieve living and working environments with good internal amenity.

O.05 Minimise the need for artificial heating, cooling, and lighting.

Controls

C.01 The maximum floorplate for a residential tower over 8 storeys should be 1000m^2:

C.02 The maximum floorplate for a commercial tower should be 1,500m^2.

C.03 The GFA should be measured from the internal face of external walls, or from the internal face of walls separating the building from any other building, consistent with the definition of Gross Floor Area (GFA) as per the PLEP 2011.

C.04 The maximum length of tower façade should be 50 m.

C.05 Tower forms that are attached are not permitted.

C.06 Upper levels of towers should not extend over the lower levels

C.07 Tower floorplates and sections should define positive spaces for streets, open spaces, and courtyards

1.8 BUILDING HEIGHTS

Objectives

O.01 Arrange the building heights across the precinct to:

a) clearly differentiate the street wall, podia lower height component of the buildings from the towers

b) reinforce the street hierarchy and open space with the taller buildings being located as shown on the Masterplan

c) minimise solar impacts on Melrose Park South and the existing residential areas

d) minimise adverse wind, reflectivity, glare, and urban heat impacts

e) provide adequate solar access to streets, open spaces and neighbouring buildings.

f) form a balanced composition when viewed from neighbouring areas and the River

Controls

C.01. Heights should be generally consistent with the maximum heights as shown in the Masterplan

1.9 FLOOR TO FLOOR HEIGHTS

Objectives

O.01 Provide adequate amenity for buildings.

O.02 Ensure that floor heights support a range of uses and enable a change of use over time.

Controls

C.08 Minimum floor to floor heights should be as follows:

USE	MINIMUM FLOOR TO FLOOR HEIGHT
Commercial	3.6m
Residential floor to floor heights from level 2 and above. Floor to ceiling heights greater than the minimum 2.7metres are encouraged.	3.1m
Ground floor active street frontage	4.5m
Residential floor to floor heights for ground and first floor	3.6m

1.10 THE STREET WALL, PODIA AND PERIMETER BLOCK BUILDINGS

Together with the public domain, the podia of the residential buildings and the retail street wall with active ground floor are the built elements that shape the way most of Melrose Park is experienced. As the primary means of providing definition and spatial enclosure to the streets and other public spaces, it is the principal architectural component of collective civic intent. That is, it should operate in concert with other buildings to form a satisfyingly rich experience for the public spaces of the town, and its modulation, articulation and character should be guided by this understanding of its role. Its design should be derived from the attributes that generate successful streets – human scale, expressed detail, and tactile material quality.

Seen this way, the street wall, podia, and perimeter block buildings can be thought of as a separate project to the design of the tower and can be distinct and different in character from the tower. The lower levels of all buildings should complement each other. The lower level buildings act as a mitigating element for the tower building, able to define the street at the appropriate height and protect the street from the wind effects of the tower. The perimeter buildings, podia and the street wall heights are set to address the street setbacks, building separation, and the proportions of the street and overshadowing.

The towers while to some degree are a separate entity to the lower levels, in Melrose Park they are numerous, and they have a minimal set back to the lower levels. For this reason, towers need to make a positive spatial relationship with neighbouring towers and the public domain. Their design needs to respond to context, climate, and views and to provide a continuity of built form but with subtle differences.

Erosions of the street wall in the form of undercrofts are not permitted.

Where U shaped buildings with the north facing courtyards are located with the ends of the U to the street, the landscaping in the courtyard is to relate to the street interface but to allow for a reading of the built form and open space from the street.

Objectives

O.01 Define the space of the street and public spaces and articulate their edges.

O.02 Create visual interest and variety in the streetscape within an overall framework of consistency in the definition of the street and its character.

O.03 Design the street wall, podia, and perimeter block buildings to provide appropriate scale and detail.

O.04 Design the street wall and perimeter block to achieve fine grain modulation in the street.

O.05 Encourage walkability by providing:

a) a direct north/south connection through the town centre mall to Hope Street and locating active uses in the town centre.

b) an east / west connection to and from the town centre

c) pedestrian connections as shown on the Masterplan

O.06 Provide comfort and shelter for pedestrians.

O.07 Minimise large expanses of inactive frontage in the town centre.

O.08 Use durable materials and detailing that are appropriate for their location and climate and reflect the local context.

Controls

C.01 The street wall, podia and the perimeter block buildings should:

a) be built to align with the street along their full frontage at all levels without or without a setback as shown on the Masterplan. Minor recesses in the profile for modulation and articulation, entrances are permissible.

b) be modulated in vertical increments to provide rhythm to the street.

c) be articulated horizontally so that the proportions of the perimeter block buildings that are above 6 storeys in height are proportioned at approximately 1/3 to 2/3rds.

d) be of predominantly masonry character with no lightweight panel construction or curtain walling.

e) be articulated with depth, relief, and shadow on the street façade. A minimum relief of 150mm between the masonry finish and glazing face should be achieved.

f) utilize legible architectural elements and spatial types - doors, windows, loggias, reveals, pilasters, sills, plinths, frame, and infill, etc. - not necessarily expressed in a literal traditional manner. Horizontal plinths are particularly encouraged in Melrose Park so that the topography is emphasised

g) include an awning in accordance with Section AWNINGS in the town centre

h) include a ground floor facade design which intensifies the walking experience with particular richness in detail, refer to Section THE GROUND FLOOR FRONTAGE.

C.02 Under-crofts or other interruptions of the street wall that expose the underside of towers and amplify their presence on the street are not encouraged.

C.03 -Above ground car parking is only permitted for 2 levels in the Town Centre. It is to be sleeved by other uses on the East / West frontages EWR 6 and Hope Street. On the North / South frontages it is to be screened.

C.04 All development applications should include a streetscape analysis and provide details of the street wall and perimeter block. Submissions should include:

a) the street wall elevation at 1:200 scale in context showing existing buildings on the block.

b) a detailed street wall elevation at 1:100 scale including immediately adjacent buildings accurately drawn.

c) sections through the street wall and awning at 1:50 scale including the public domain.

d) detail facade plans/sections at 1:20 scale including ground floor active frontage and awning details.

1.11 THE GROUND FLOOR

The ground floor of the street wall is the part of a building that interfaces directly with the street or public domain. As such, it has the most impact on the pedestrian experience, and requires a design that responds to the need for a lively, interesting, and comfortable environment. Much of the success of this frontage, also critical to the success of the precinct relies on a considered level of detail design and realization.

In the case of residential frontage at the ground floor, a different set of parameters applies, but its success is equally reliant on detailed consideration and treatment. Here, the building is set back from the street frontage or set at a different level to afford a balance of privacy as well as engagement with the street for ground level residents, at the same time allowing space for a generous tree canopy providing amenity for the street and residents.

Ground floor design and detail should be considered and integrated with public domain requirements,

1.12 ACTIVE GROUND FLOOR FRONTAGE TOWN CENTRE

The factors that make for a thriving active ground floor street environment are well acknowledged and include: a detailed scale appropriate to the pedestrian, narrow shop fronts and many doors; a mix of tenancy types, good transparency to the inside, quality materials with expressed detail, vertically articulated facades (which make distances along the street appear shorter, and a well-designed plinth for street frontages.

Shelter and weather protection for pedestrians on footpaths is provided by awnings. Colonnades are not encouraged.

Objectives

O.01 Provide for the amenity, interest, and liveliness of the street environment.

O.02 Ensure a positive experience for pedestrians with the necessary fine grain environment of the street.

O.03 Enable sensory engagement with the street.

O.04 Integrate an interesting and permeable street wall interface with the design of the public domain.

O.05 Optimise the extent of active frontages in the town centre and at key intersections.

O.06 Ensure appropriate scale and proportion of foyers and lobbies in relation to site frontage.

O.07 Maintain the number of safe routes of travel throughout Melrose Park as shown in the Masterplan

O.08 Enable passive surveillance of the street and open spaces.

O.09 Ensure security measures do not inhibit passive surveillance of the street

O.10 Acknowledge and safely accommodate with design, the overland flow modelling and stormwater conveyance in ground floor treatments and active frontages.

Controls

C.01 An appropriate freeboard at ground floor level within the Town Centre is to be provided, where required.

C.02 Active ground floor uses should occupy the ground floor frontage. Services should be minimised on the ground floor.

a) the internal tenancy widths are to create a fine grain frontage.

b) foyers and lobbies to the towers in the town centre should reinforce the fine grain.

C.03 The active ground floor frontage should be considered in detail and the following should be incorporated in its design:

a) a nominal 500mm interface zone at the frontage should be set aside to create interest and variety in the streetscape, to be used for setbacks for entries, opening of windows, seating ledges, benches,

and general articulation.

b) the ground floor levels, and facade masonry frame should allow for fine grain tenancy widths.

c) the facade should have a high level of expressed detail and tactile material quality.

d) the articulation of the facade should include a well resolved meeting with the ground that also takes account of any slope. A horizontal plinth, integrated in the design, should be incorporated at the base of glazing to the footpath. Where required an appropriate freeboard is to be provided.

e) the frontage should take account of the need to provide a clear path of travel for disabled access.

f) legible entrances should be formed in the frontage.

g) fire escapes and service doors should be seamlessly incorporated into the facade with quality materials.

h) colonnades are not encouraged

i) all required major services should be incorporated in the design of the ground floor frontage at DA stage, refer Section SERVICING AND UTILITIES.

j) security doors or grilles should be designed to be fitted internally behind the shopfront, fully retractable and a minimum 50% transparent when closed.

1.13 TOWN CENTRE MALL DESIGN

Objectives

O.01 Improve connectivity where appropriate.

O.02 Maximize frontage for retail activity.

O.03 Maintain the extent and variety of the pedestrian network as shown in the Masterplan.

Controls

C.01 Direct access should be provided through the town centre mall at the end of:

a) the north /south pedestrian connection from EWR2 to Hope Street.

b) the east/ west connection from Hughes Avenue to the Mall

C.02 The north / south connection through the mall is to allow for pedestrian access to Hope Street during the hours of operation of the Light Rail

C.03 Be consistent with the relevant controls relating to active ground floor frontage.

1.14 RESIDENTIAL GROUND FLOOR FRONTAGE

Residential buildings should be set back from the street boundary or set at a different level to the street / pedestrian connection to provide amenity for ground floor residents. Setbacks are to enable a landscaped setting for buildings.

The area between the façade and the street boundary should receive attention both in design and in its material quality. The subtleties involved in the design of ground level entries, private terraces or balconies, fences, walls, level changes and planting play an important part in the articulation of the street. A detailed resolution of these elements is essential in contributing to an unambiguous definition of public space, good street form, pedestrian scale, clarity of access and address, and a balance of privacy and passive surveillance. These details should all be designed with the same level of care given to the building.

Existing and possible future context must be considered in determining the optimum built form.

Objectives

O.01 Appropriately define and design the street alignment and setback area to achieve amenity and privacy for residents as well as engagement with and passive surveillance of the street.

O.02 Establish canopy trees in the setbacks that are 5 metres or greater in the 2metres adjacent to the street that contribute to the landscape character of the street and residential amenity.

O.03 Establish lower scale planting including hedges at street boundary for a minimum of 1 metre in street set back zone

O.04 Establish canopy planting in courtyards to achieve amenity and privacy for residents as well as contributing to the street.

O.05 Co-locate the deep soil planting with the courtyard planting where the courtyards face the street setback

O.06 Use the design of the ground floor including variations to floor levels to address privacy and articulation of the pedestrian connections where the buildings have no set back from the public domain boundary.

O.07 Ensure that apartments that are located below street level have appropriate amenity

O.08 Locate the disability access so that it relates seamlessly to the building design.

O.09 Design the fences to:

a) relate to and reveal the fall of the land,

b) relate to the scale of the buildings

c) provide solidity and openness

O.10 Ensure that fences combine elements of porosity sitting on and framed by elements of a solid foundation.

O.11 Acknowledge and safely accommodate with design, the overland flow flooding and stormwater conveyance in residential and ground floor frontage treatments

Controls

C.01 The following parameters apply to residential ground floor street frontage, refer Figures XXX and XXX:

d) basements are to be located under the footprints of the buildings. They can extend under courtyards but not into the street setbacks, refer Fig 6.

e) the setback area should be designed to relate to the footpath and as common property for landscaping. Canopy trees should be planted in this area, a minimum 3.5 metres from any structure. Tress are to achieve greater than 13 metres mature height and spread, at the rate of 1 canopy tree for every 15 lineal metres of frontage.

C.02 Generally ground floor apartment levels should be a minimum of 500mm and maximum of 1500mm above footpath level except where the buildings front the pedestrian connections or additional height above the ground should be provided for privacy and / or to address the slope, refer Fig 7.

C.03 Where individual apartment entries from the street serve as a primary address, separation between the entry and private open space, and a front door with a distinct entry space within the apartment, should be provided. If the entries are only for the use of residents they should be understated, with post boxes and street numbers located at the common entry. Individual entries are permitted from the Pedestrian Connections

C.04 Unless easy ramp access can be provided without compromising the entrance to the building or the ground floor apartments, disability access should be provided within the building.

C.05 Apartments cannot be located below the street level except in the following situations at Council's discretion:

a) Where the adjacent public road or public land is not an overland flow flood path as shown in approved flood maps included in the Water Management Strategy, or in any other flood study approved by Council.

b) Where the proposed apartment will not be subject to flooding in a 1%AEP flood plus 500mm freeboard as identified by Council.

c) Where the orientation is not south

d) The distance of the apartment front wall is a minimum of 5 metres from the street boundary

e) Where the finished floor level of the lowest apartment is not more than 1500mm below the level of the street

C.06 The floor to floor height is to be a minimum of 3.6 metres and the head height of the windows is not less than 300mm from the underside of the slab above.

C.07 Minimum floor levels of all habitable room/floors in the proposed apartment, and all floors needed for access to the proposed apartment, must be 500mm above the adjacent 1%A EP flood level as shown on Council-approved flood maps or any other flood study approved by Council.

C.08 The fences are:

f) to be located at the street boundary provide a masonry base/plinth with open detailing above the base

g) to consider masonry pillars between the open panels of fencing

h) to address the slope by taking up the height differential in a masonry or similar plinth.

i) the minimum height of the plinth is to be approximately 300mm and the maximum approximately 1000mm from the ground. The tops of any plinth and/ or fence are to be horizontal Masonry pillars may be considered between panels of fencing

j) fencing to private terraces where ground floor units extend into the street setback they are to be designed to relate to any external fencing,

C.09 Impervious surface at ground level should be minimised in the setback area and not encroach on deep soil at the boundary reserved for canopy tree planting.

C.10 All required major services should be incorporated in the design of the ground floor frontage at DA stage, refer Section SERVICING AND UTILITIES

C.11 A fully illustrated and coordinated ground floor design, showing all the necessary levels and detail, should accompany applications. Drawings should include the following:

a) a detail ground level plan and sections as part of the architectural submission which illustrates the relationships between the interior and the exterior spaces of the setback area, including the landscape and hydraulic detail, and extends into the public domain.

b) any required services should be discreetly integrated into the frontage design.

c) the architectural drawings should be fully coordinated with the landscape and hydraulic drawings.

d) elevations and sections at minimum 1:50 scale of all built elements in the setback area should be provided and should illustrate Floor to Floor heights of 3.6 m and Floor to Ceiling heights of 2.9m.

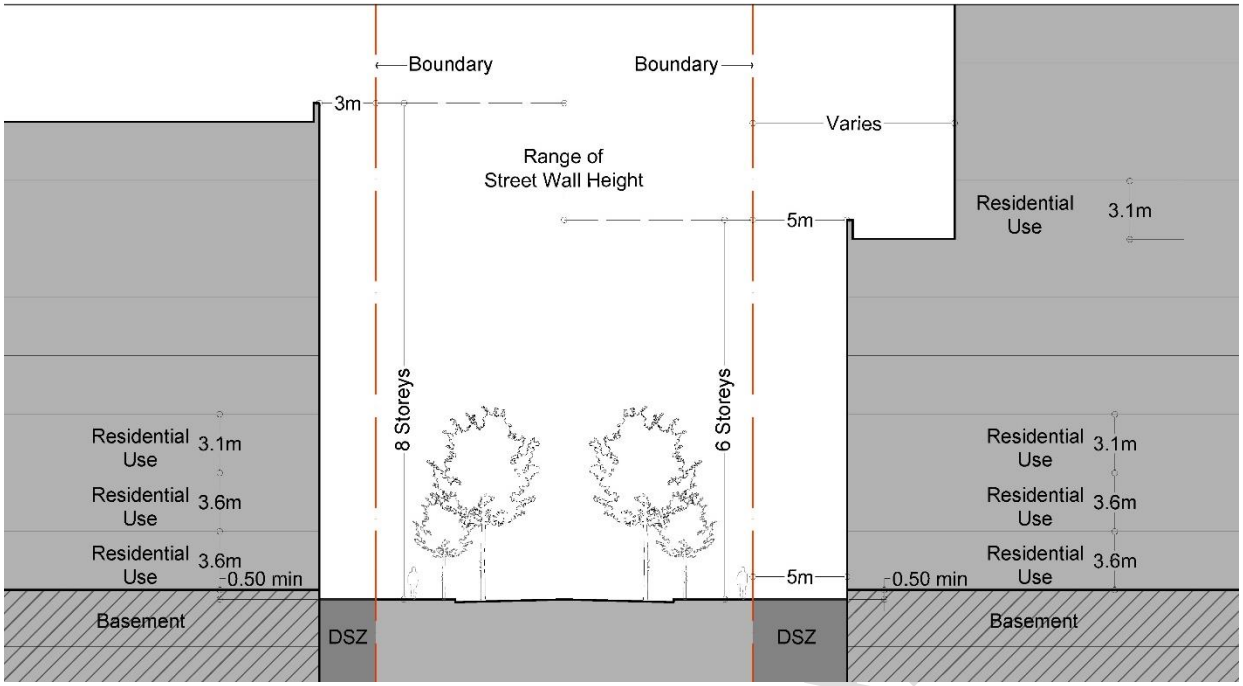

Figure 8 –-Podium / Street Wall Height with Setback, NTS

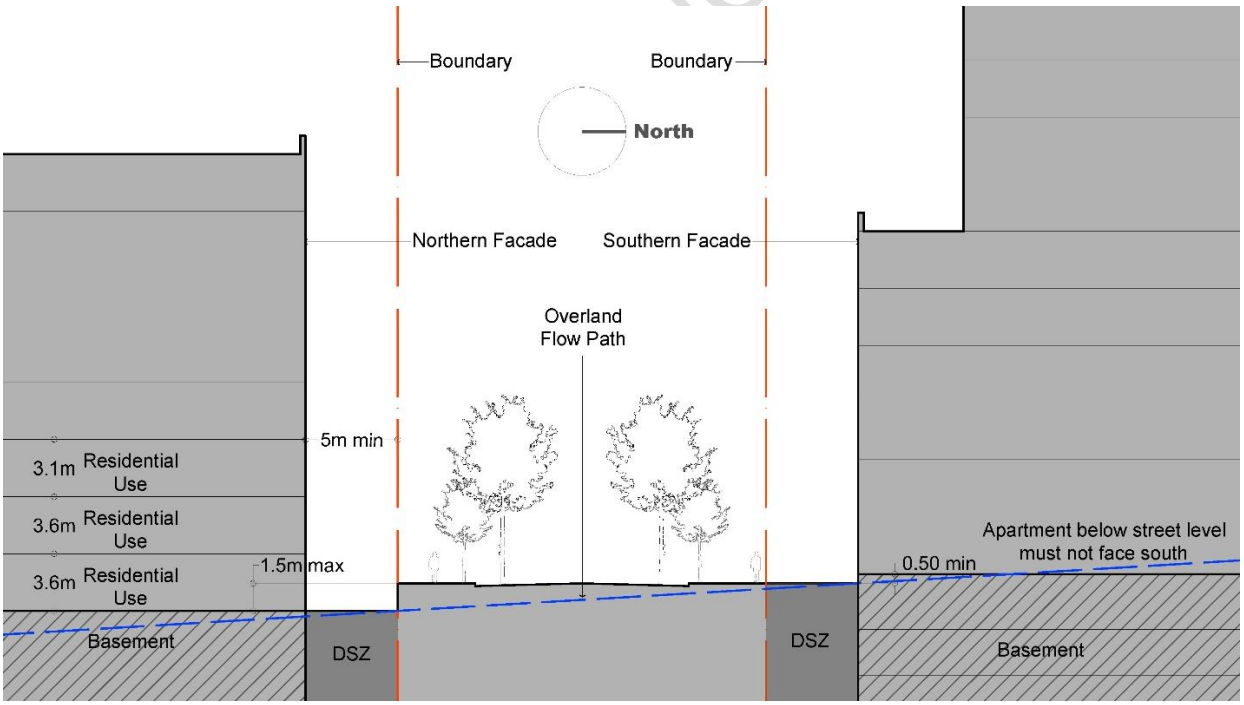

Figure 9 – Apartment below Street Level, NTS

1.15 RESIDENTIAL APARTMENT DESIGN QUALITY

Objectives

O.01 Development is to be generally consistent with SEPP 65 and the ADG.

O.02 Ensure development achieves good amenity standards for residents.

Controls

C.01 Upper levels of buildings should not extend over the lower levels

C.02 Building floorplates and sections should define positive spaces for streets, open spaces, and courtyards

C.03 Building indentations providing light and ventilation to apartments should have a minimum width to depth ratio of 2:1.

C.04 High-level windows should not be used as the primary source of light and ventilation for habitable rooms.

C.05 Daylight and natural ventilation should be provided to all common circulation spaces and windows should be visible from lift cores as well as the ends of corridors.

C.06 Where practicable, balconies should be orientated with the longer side facing outwards.

C.07 Divisions between apartment balconies should be of solid construction and extend from floor to ceiling.

C.08 Common open space should include a unisex WC, seating, solid sun shading, and a BBQ and food preparation area with a sink.

C.09 Balustrades should take account of sightlines to balance the need for privacy within apartments and views out of apartments. A proportion of solid or translucent material should be used, which will vary according to outlook and height relationships.

C.10 The following details should be resolved in principle and shown on drawings at DA stage so as not to compromise amenity, built form and aesthetics at a later stage:

a) HVAC equipment should be grouped within designated plant areas either on typical floors or on roof tops. If HVAC equipment is located on roof tops of lower buildings, it is to be screened as necessary to minimise impacts of heat buildup and noise to neighbouring units.

b) where HVAC units are located on balconies, they are to be screened

c) wall mounted equipment (e.g. instantaneous gas hot water heaters) and associated pipe work should be concealed into wall cabinets and ducts.

d) the above items should be positioned so that they are not visible from common areas or the public domain adjacent to the development.

e) if equipment is located on private balconies, additional area above ADG minimums should be provided.

f) rainwater downpipes should be integrated into the building fabric and coordinated with stormwater drawings

1.16 SOLAR ACCESS (RESIDENTIAL)

Objectives

O.01 To ensure that development:

a. does not unreasonably diminish sunlight to neighbouring properties and within the development site.

b. enables sunlight access to private open space and

c. enables sunlight access to private open space and habitable rooms to improve amenity and energy efficiency.

Controls

C.01 Residential components of a development should generally comply with the solar and daylight access design criteria and guidance prescribed under the Apartment Design Guide.

C.02 Where residential development cannot strictly comply with the design criteria of the ADG as outlined in C.01, it should demonstrated how site constraints and orientation preclude meeting the design criteria and how the development meets the Objectives and Design Guidance 4A-1 of the Apartment Design Guide

1.17 WINTERGARDENS

Objectives

C.02. Improve amenity of balconies in high rise apartments above 8 storeys and apartments fronting noisy environments.

C.03. Provide acoustic attenuation for internal living areas.

C.04. Improve thermal environment of the wintergarden

C.05. Balance ventilation and wind impacts in high rise apartment balconies

C.06. Maximise daylight access, views, and comfort of balconies.

Controls

C.01 Wintergardens are only permitted above 8 storeys or where there are negative external impacts such as high levels of noise

C.02 Wintergardens should:

a) be designed and constructed as a private external balcony with drainage, natural ventilation and finishes acceptable to an outdoor space and should not be treated as a conditioned space or weatherproof space.

b) have 75% of the external wall (excluding balustrade) fully operable louvres or sliding glass panels. Casement or awning windows are not permitted.

c) All wintergardens are to have a balustrade less than 1.4m above finished floor level and a contiguous and permanently openable area between the balustrade and the ceiling level of not less than 25% of this area. This restriction shall apply to both elevations if the wintergarden has multiple elevations.

C.03 A generous opening should be provided between the wintergarden and any adjacent living area to allow connection of the spaces when ambient conditions are suitable.

C.04 Acoustic control for living areas and bedrooms should be provided on the internal façade line between the wintergarden and the living area or bedroom

C.05 Glazing in the external façade of a wintergarden should have a solar absorption of less than 10% glass to have solar heat absorption not greater than a clear float glass of the same composition.

C.06 The flooring of the wintergarden should be an impervious finish and provide exposed thermal mass.

C.07 Air conditioning units should not be located on wintergarden balconies.

C.08 Wintergarden areas able to be excluded from Gross Floor Area should be limited to depth of 3 metres.

1.18 CLIMATE CONTROL AND PRIVACY

The precinct of Melrose Park experiences high temperatures and will be subject to urban heat impacts resulting from the density of buildings. Most towers and many of the perimeter block buildings have east and west facing facades so it is essential that climate control measures are included on the facades where those facades will not be overshadowed by neighbouring buildings.

Climate control devices should also be used to assist in protecting both visual and noise privacy.

Objectives

O.01 Design climate control devices to enhance the:

a) amenity of the balcony and interior spaces

b) design of the building facades

O.02 Provide:

a) individual apartment owners with the ability to moderate external impacts from climate, noise and overlooking

b) commercial tenants with the ability to moderate external impacts from climate, noise and overlooking

O.03 Ensure that the design of climate control devices can:

a) provide optimum control

b) be easily cleaned

c) assist in providing both visual and noise privacy

Controls

C.01 Climate control devices such as louvers or blinds should be:

a) used on balconies

b) used where apartment facades are subject to solar loads and there are no other mechanisms that assist in climate moderation such as green walls

c) designed as an integral part of the building facade

d) fully operable i.e. they must have the capacity to be adjusted to suit sun access angles and allow the passage of air

e) fully maneuverable i.e. they should be able to be positioned to the direction of sun, wind, or noise

f) constructed in materials that meet the sustainability objectives

g) able to be cleaned from the apartment balcony.

C.02 Climate control devices should:

a) have the ability to act as visual and noise privacy screens

1.19 DWELLING MIX AND FLEXIBLE HOUSING

Objectives

O.01 Ensure a range of dwelling types and size.

O.02 Promote the design of buildings that are adaptable and incorporate flexible apartments to suit the changing lifecycle housing needs of residents over time

Controls

C.01 The following dwelling mix is to be used as a guide for the apartments in Melrose Park:

Dwelling Type	Dwelling Mix
1 Bedroom	10 – 20% of total dwellings
2 Bedroom	60 - 75% of total dwellings
3 Bedrooms	10 - 20% of total dwellings

C.02 A maximum 10% of 3- and 4-bedroom apartments can be split into a pair of 'dual key apartments' consisting of a 2-bedroom apartment and a studio apartment; a 2-bedroom apartment and a 1 Bedroom apartment. In all combinations the size and amenity should be consistent with the ADG.

C.03 Consider apartment designs in sole occupancy units that are fully serviced but that have internal moveable walls

1.20 MATERIALS

Melrose Park proposes very high densities with towers and perimeter block buildings in close proximity.

Because only the town centre has a full street wall condition resolution of the architecture must provide both variety and continuity. A street wall condition can accommodate a greater difference in the detail resolution of buildings because only the frontage to the street is visible from the public domain and buildings are not seen in the round. Where this is not the case, as with podia, U shaped buildings and towers, greater consistency should be required in the selection of materials so there is an overall continuity of built form throughout the precinct.

Objectives

O.01 Ensure that:

a) materials contribute to the continuity of the precinct so that one building does not stand out from another

b) the collective built form reinforces the variety evidenced in the topography and the spatial organisation of the streets and open spaces

c) the variety within the precinct is derived from the detail resolution of the buildings and not from excessive differences in the form of the buildings and / or the selection of materials.

O.02 Use materials that meet sustainability objectives and requirements

O.03 Select a palette of materials for the buildings that enable a complementary response with the finishes in public domain

O.04 Employ materials that are durable, of an appropriate scale and easily maintained

Controls

C.01 A selected palette of materials for buildings, fencing and retaining walls are to be agreed in consultation with Council

C.02 Materials should:

a) Ensure buildings do not stand out from another

b) meet sustainability requirements of embodied energy

c) be durable, of an appropriate scale and easily maintained

d) complement the materials in the public domain

1.21 RETAINING WALLS and FENCING

Melrose Park is located on sloping terrain. Many of the development lots and the open space and school sites will require retaining walls. The retaining walls may occur adjacent to the street boundary of a lot or within the lot depending on the topographical conditions and / or the specific lot design. Because of their highly visible location adjacent to streets and pedestrian connections the design of retaining walls should provide continuity across the precinct and a sensitive interface with the public domain.

Objectives

O.01 Ensure that the retaining walls are designed to provide continuity across the precinct

O.02 Use retaining walls as an integral element in the design character of the precinct

O.03 Employ construction details and materials that are durable and appropriate for the public domain interface.

O.04 Provide opportunities for casual seating

O.05 Ensure fencing define the public edge to the property and reinforces the edge to the public domain.

O.06 The privacy fences and gates should be articulated at the gates and visually permeable in part to enhance the feeling of address and passive surveillance along this edge of the development.

Controls

O.01 Retaining walls should:

a) be located within the lot boundaries on all development lots

b) use a design and profile to meet PDG in consultation with Council.

c) select a limited palette of durable materials in consultation with Council

d) enable casual seating where appropriate

e) have horizontal tops but minimal stepping

O.02 The palisade fencing is to be on a substantial masonry base that forms a horizontal plinth with minimal stepping

O.03 Masonry pillars are to be introduced to suit the steps and the run of palisade fencing

O.04 The height of the plinth is to vary to suit the topography. The minimum height is to be approximately 300mm and the maximum approximately 1000mm.

O.05 The height of the fence can vary from approximately 1200 mm to approximately 2000mm.

O.06 The top of the plinth and the top of the fencing are to be horizontal

O.07 The height differential is to be taken up in the base of the masonry plinth.

O.08 The fences can be located on the boundaries on the site.

O.09 Planting is to be provided within the site

O.10 Direct access to the RE 1 link, the Park and Shirley Street is to be provided.

O.11 The ground floor lobby should have a secondary access from the RE1 Link also.

1.22 COURTYARDS

Courtyards provide communal open space for residents at ground level associated with deep soil supporting large crown canopy trees. Courtyards provide alternative, secondary entry points to the building linked to the pedestrian connections and public domain. Courtyards provide visual extension to the public domain. Courtyards provide relief to the overall physical and visual bulk of the built form and perceived density.

Objectives

O.01 Expand and enhance the public domain by visually and physically linking courtyards to pedestrian connections.

O.02 Provide passive surveillance opportunities to ensure safe use of pedestrian connections

O.03 Enable some canopy planting

Controls

C.01 Courtyards should be integrated with pedestrian connections.

C.02 Courtyards should visually extend the public domain.

C.03 Courtyards should be delightful outdoor rooms and should be well considered with regard to aspect and height to width, and depth to width proportions.

C.04 Courtyards should generally be the same level as the street to facilitate access and integration with the public domain. Where they are not level access stairs and ramps are to be located on the private lot.

C.05 Basement carparks should be contained predominantly within building footprints and allow for deep soil beneath forecourts for large canopy tree planting, refer Fig 8.

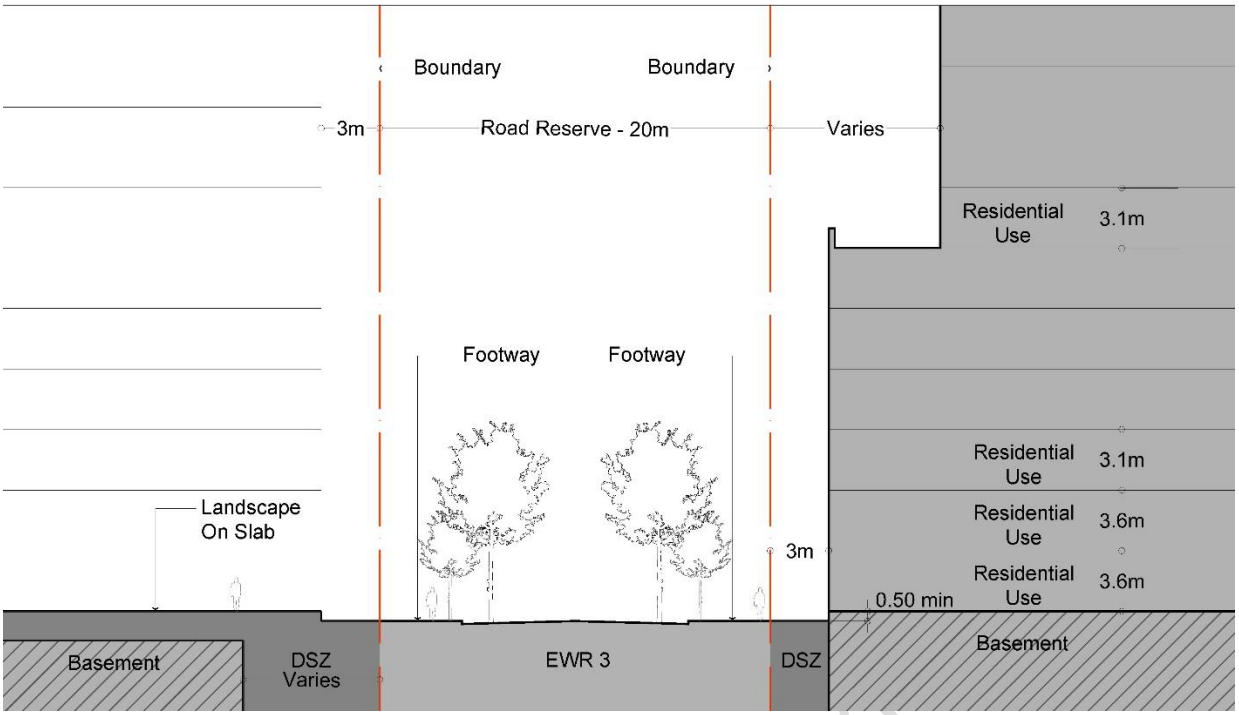

Figure 10 - Courtyard Basement – Interface with Street

1.23 SERVICING AND UTILITIES

The location of utilities and services can adversely affect the ground floor street frontage if not properly taken account of in the initial design stage. It is also essential that building services are located and designed to be free from flooding impacts.

Objectives

O.01 Minimise the extent of space and blank walls occupied by services, including electricity substations, fire boosters, fire doors, plant, and equipment hatches.

O.02 Locate building services so that they are free from flooding impacts.

O.03 Encourage design and location solutions for services and utilities that minimise adverse visual, environmental and access impacts.

O.04 Organise garbage collection and recycling facilities to have minimum impact on the development and public domain

Controls

C.01 Development Applications should submit plans that clearly identify the location of all services and utilities at Design Competition, pre-lodgement application and Development Application stages.

C.02 Wherever possible, services and utilities should be located on secondary street frontages, or non- active street frontages.

C.03 Substations are to be designed within the building.

Services and utilities should be designed and located to minimise the length of ground floor frontage occupied.

2. PUBLIC DOMAIN

The Masterplan, and the Public Domain Plan and the Public Domain Guidelines, indicate intended public domain for Melrose Park.

Public spaces – streets, squares, and parks – are the most enduring spaces of the city, the shared social and cultural domain that make up the organising framework of the city. Their clarity, quality and amenity contribute in a fundamental way to the experience and identity of Melrose Park.

This section details aspects of the design of the public domain and should be read in conjunction with the Masterplan, the Public Domain Plan, and the latest publicly available version of Public Domain Guidelines, with particular reference to Melrose Park, which sets out the process, design guidelines and submission requirements for all new public domain assets in the City of Parramatta LGA.

The Public Domain Plan and the Public Domain Design Guidelines for Melrose park are being developed in conjunction with Payce.

Street tree form shown in the public domain cross sections, Fig 9-Fig 16, are indicative. For final street tree arrangements refer to the latest Public Domain Plan and the Public Domain Design Guidelines.

2.1 STREET NETWORK AND FOOTPATHS

The streets and footways in Melrose Park are generally accessible to the public. The elements in the street such as footpaths and paving widths, parking lanes, tree planting and cycle ways should be designed to suite the determined street hierarchies as per the Masterplan.

Objectives

O.01 Provide a safe, efficient, and generous network of pedestrian, bicycle, and vehicular movements for a precinct of this density.

O.02 Organise the roads based on a street hierarchy and precinct connectors, which connect to the overarching bicycle network and surrounding street network.

Controls

C.01 The streets network, hierarchies and widths are to be laid out as per the Masterplan

C.02 Streets, footways and footpath layout and widths vary for each street type and should be laid out as per the Masterplan and the Public Domain Plan

C.03 Materials for the footpath shall be as per the Public Domain Plan and Public Domain Guidelines - Melrose Park.

C.04 Street Trees are to be planted as per latest version of Public Domain Plan and Public Domain Guidelines - Melrose Park

C.05 Street trees are to be planted in the parking lanes and the footway as per the Public Domain Plan. The spacing of trees in the parking lanes should aim to achieve a closed tree canopy at tree maturity – selected tree species as per latest version of Parramatta Public Domain Guidelines - Melrose Park.

C.06 Street tree planting to use best practice water sensitive urban design (WSUD) measures that provide best long-term sustainability to support that tree. The planter pit length should be no less than the min car parking bay width, preferably larger, and the soil profile will be as per the Soil Profile Strategy and should be detailed prior to DA approvals to the satisfaction of Council.

Melrose Park Street Type Cross-Sections

LEGEND:

F - FOOTPATH
SHP - SHARED PATH
B- BIKE PATH
L- LANDSCAPE
BR TP - BIORETENTION TREE PIT
SW/RG- SWALE / RAIN GARDEN
P - PARKING
V - VEHICULAR LANE
B/V- LANE ABLE TO PLY BUSES

Note:

a. Level changes to be managed within the building footprint.
b. Light Poles are indicative and for locations only. Light pole design and type to be confirmed.
c. Upper levels of buildings are not to extend into street setbacks
d. 400 mm articulation zone

Type 1 – Major Road / Boulevard (typical to NSR 2)

- 25 m wide road corridor as typical
- 3.5m wide footpaths both sides
- Trees in parking Lanes
- WSUD details to be applied.
- Trees in deep soil in the 5m front setbacks

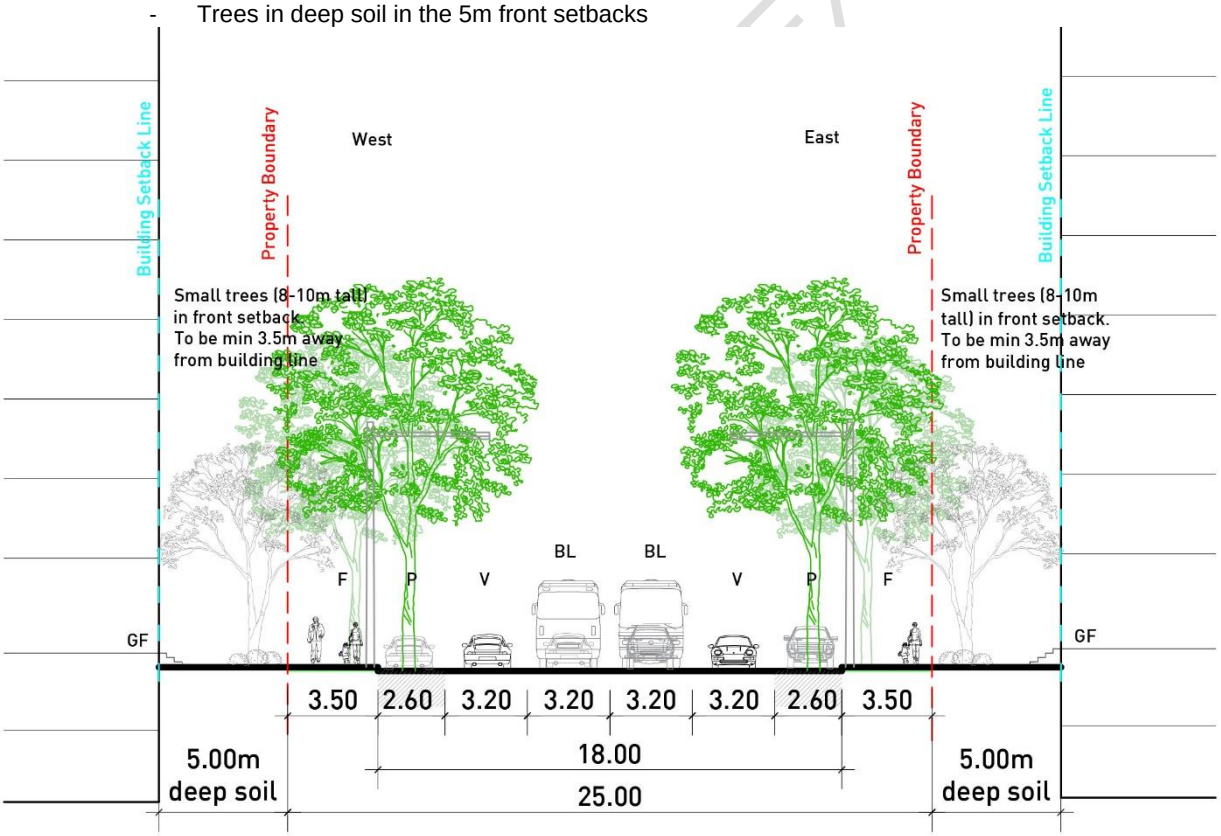

Figure 11 – Type 1 Major Road / Boulevard Building to Building (NSR 2)

Type 1b – Major Road / Boulevard (typical to NSR 2) between EWR 4 and EWR 6

- 22 m wide road corridor
- Minimum 3.4m wide footpaths both sides
- Trees in footpath and/or verge
- WSUD details to be applied.
- Trees in deep soil in the 5m front setbacks

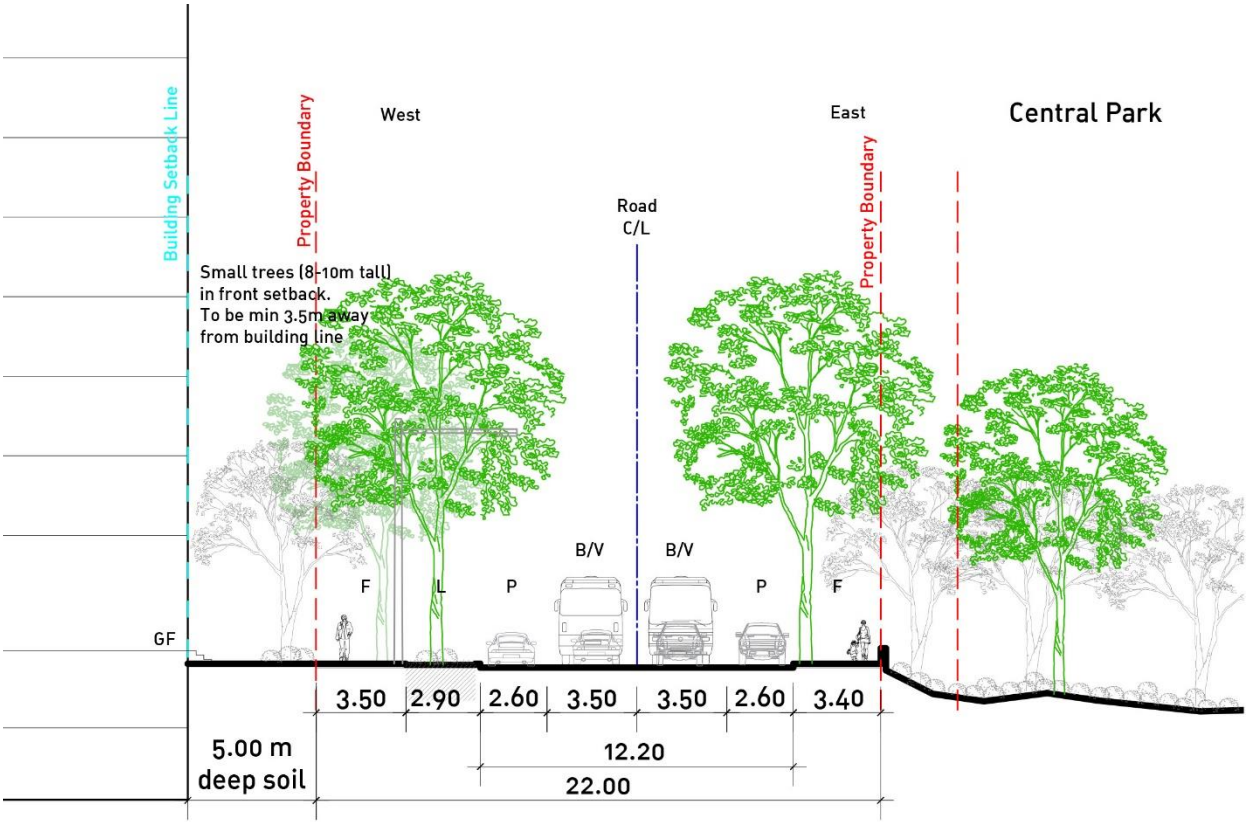

Figure 12 - Type 1b Major Road / Boulevard Central Park Interface (NSR 2 between EWR 4 and EWR 6)

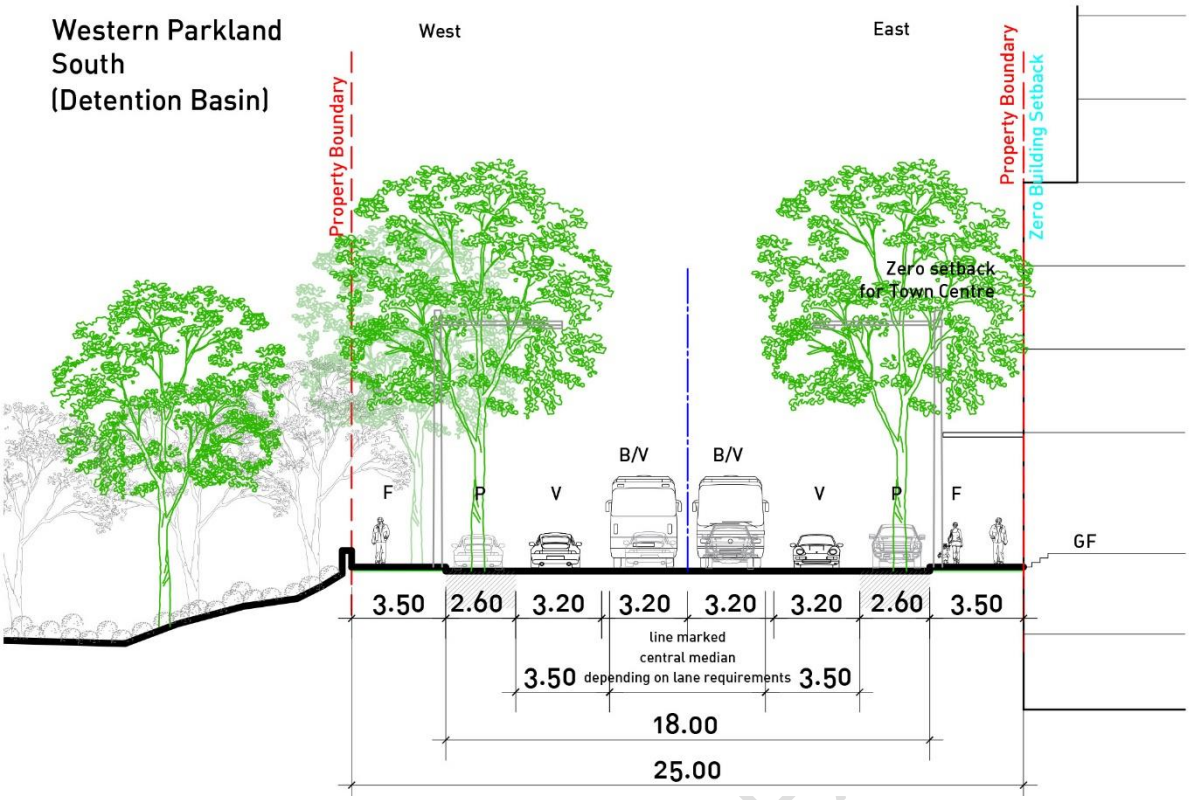

Figure 13 - Type 1 Major Road / Boulevard Town Centre and Western Park Interface (NSR 2)

Type 2 – Main Road with Cycle Tracks (typical to NSR 3)

- 23.5 m wide road corridor
- 1.8 m wide footpaths both sides
- One-way Paired, separated bicycle paths: 1.5m wide with an additional 1m buffer with parking lane, on both sides (2.5m corridor each side)
- Trees in parking Lanes.
- WSUD details to be applied.
- Trees in open planted beds between the footpath and cycle track.
- Trees in 5m front setback

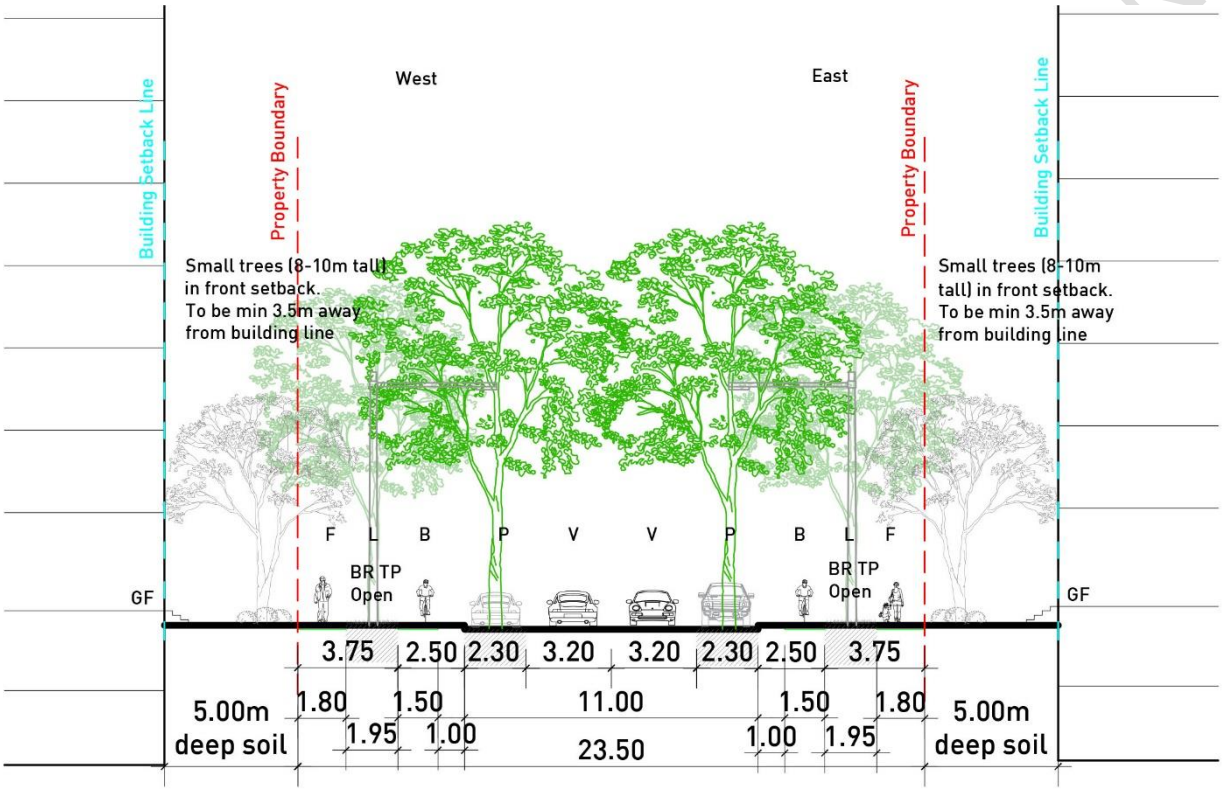

Figure 14 – Type 2 Main Road with Cycle Tracks (NSR 3)

Type 2d – Main Road with Cycle Tracks (typical to NSR 3) between EWR 4 and EWR 6

- 26.5 m wide road corridor
- 2m wide footpath on western side and 1.8 m wide on eastern side
- One-way Paired, separated bicycle paths: 1.5m wide with an additional 1m buffer with parking lane, on both sides (2.5m corridor each side)
- Trees in parking Lanes.
- WSUD details to be applied.
- Trees in open planted beds between the footpath and cycle track.
- Possible linear park in the wider public domain on western side
- Trees in 5m front setback

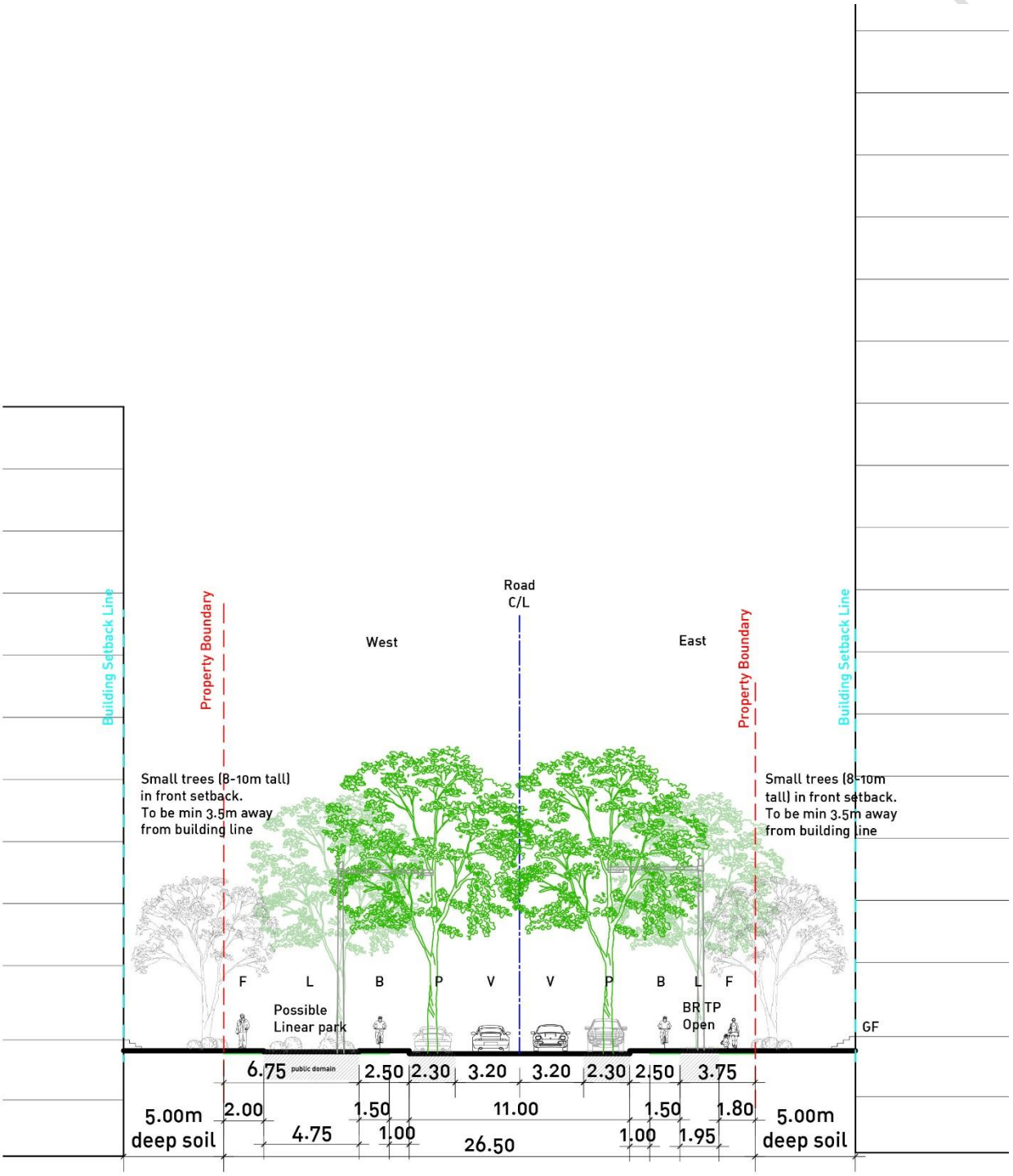

Figure 15 – Type 2d Main Road with Cycle Tracks between EWR 4 and EWR 6 (NSR 3)

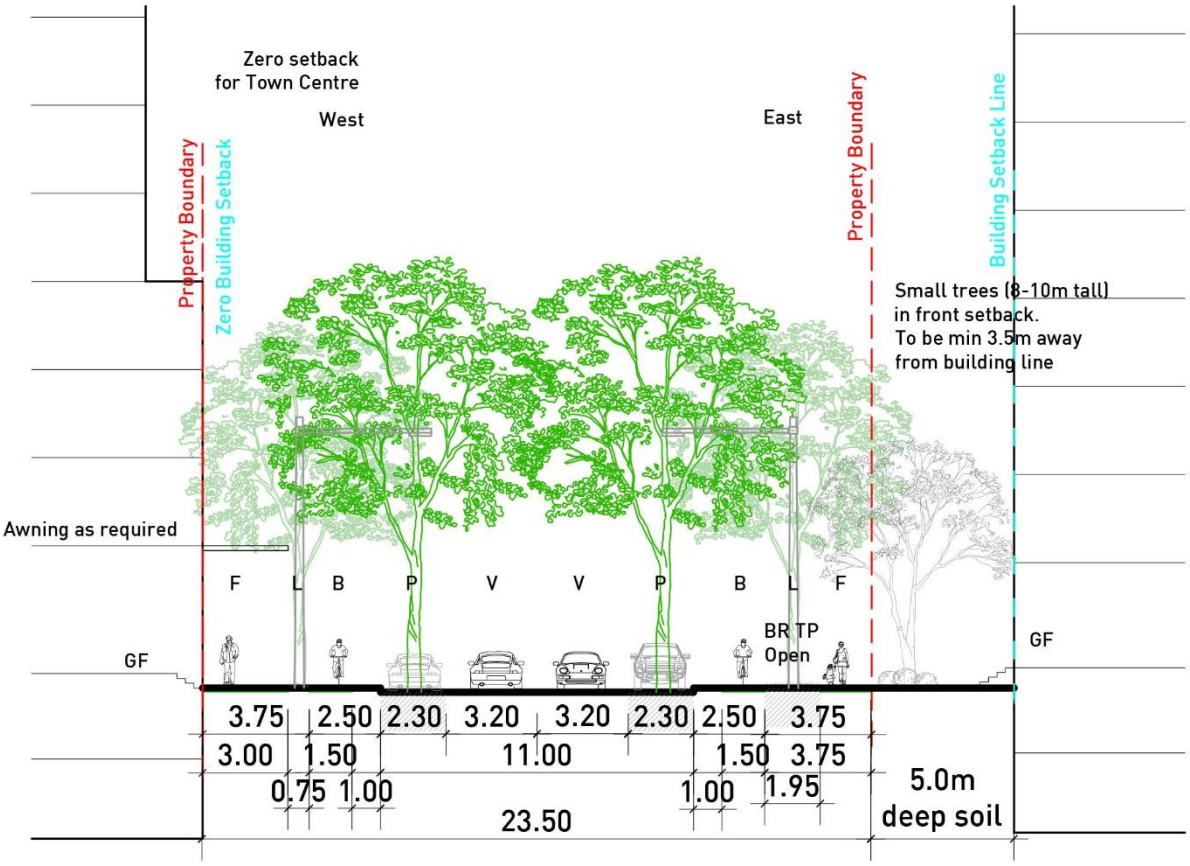

Figure 16 – Type 2 Main Road with Cycle Tracks Town Centre Interface (NSR 3)

Type 3 – Main East West Connector road (typical to EWR 4)

- 20 m wide road corridor
- 3 m wide shared path on northern side of the road
- 2m wide footpath on south side next to swale / rain garden
- WSUD treatment via the continuous Swale / Rain garden
- Trees in parking lanes.
- WSUD details to be applied.
- Trees in deep soil, in the 5m front setback on southern side of the road

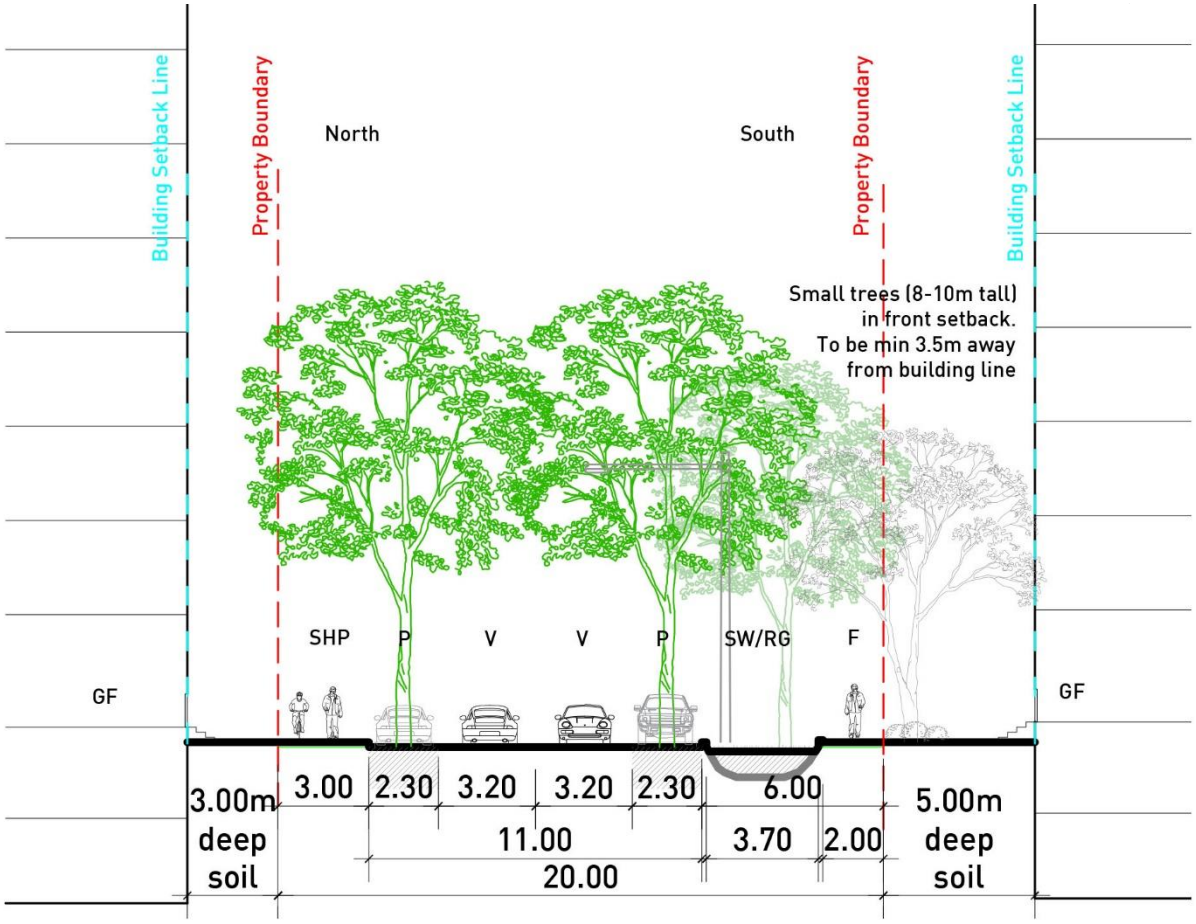

Figure 17 – Type 3 Main East West Connector road (EWR 4)

Type 4 – Local Street (typical to EWR 3, 5, 6 and NSR 1 and 4)

- 20 m wide road corridor
- 2 m wide footpaths both sides
- Trees in parking lanes
- WSUD details to be applied.
- Trees in open planted beds in the verge.

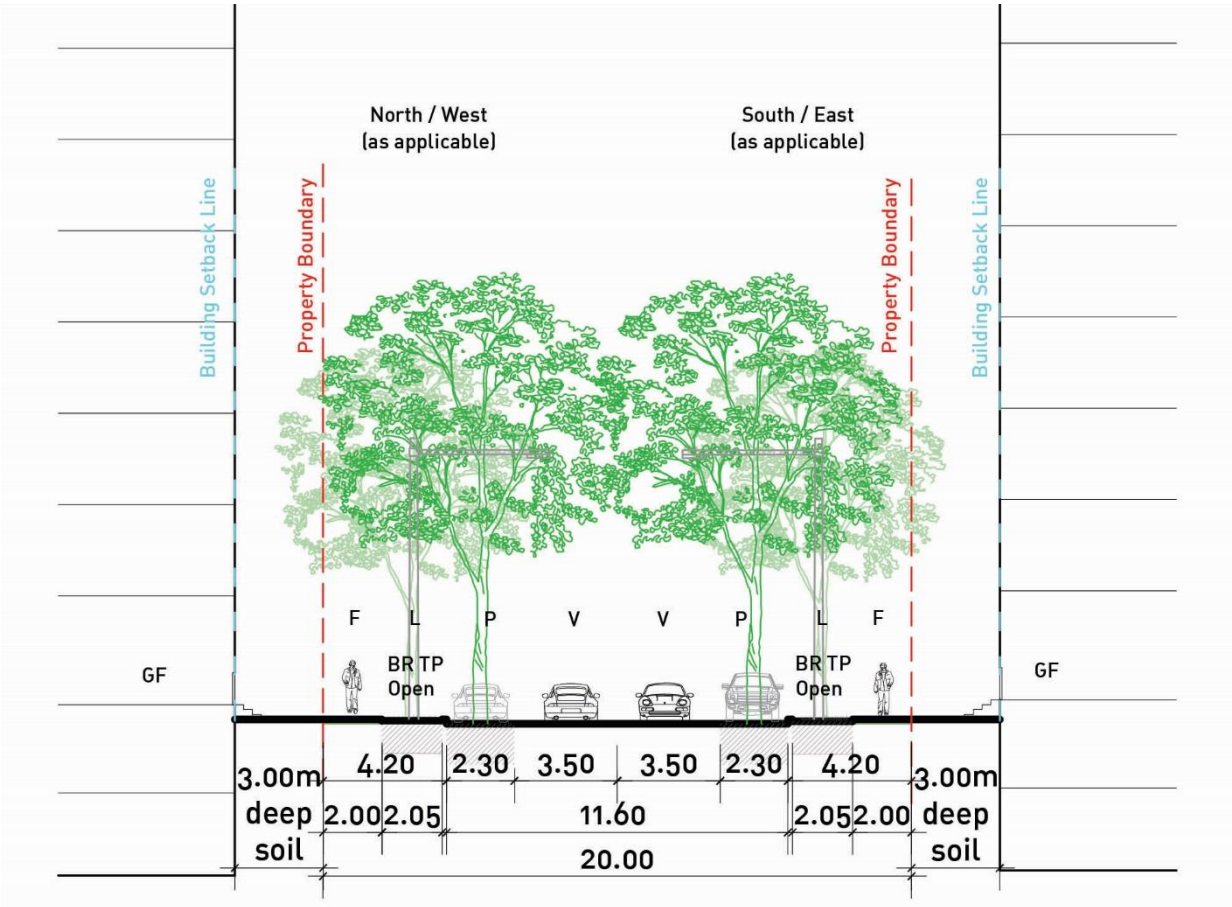

Figure 18 – Type 4 Local Street (EWR 3, 5, 6 and NSR 1 and 4)

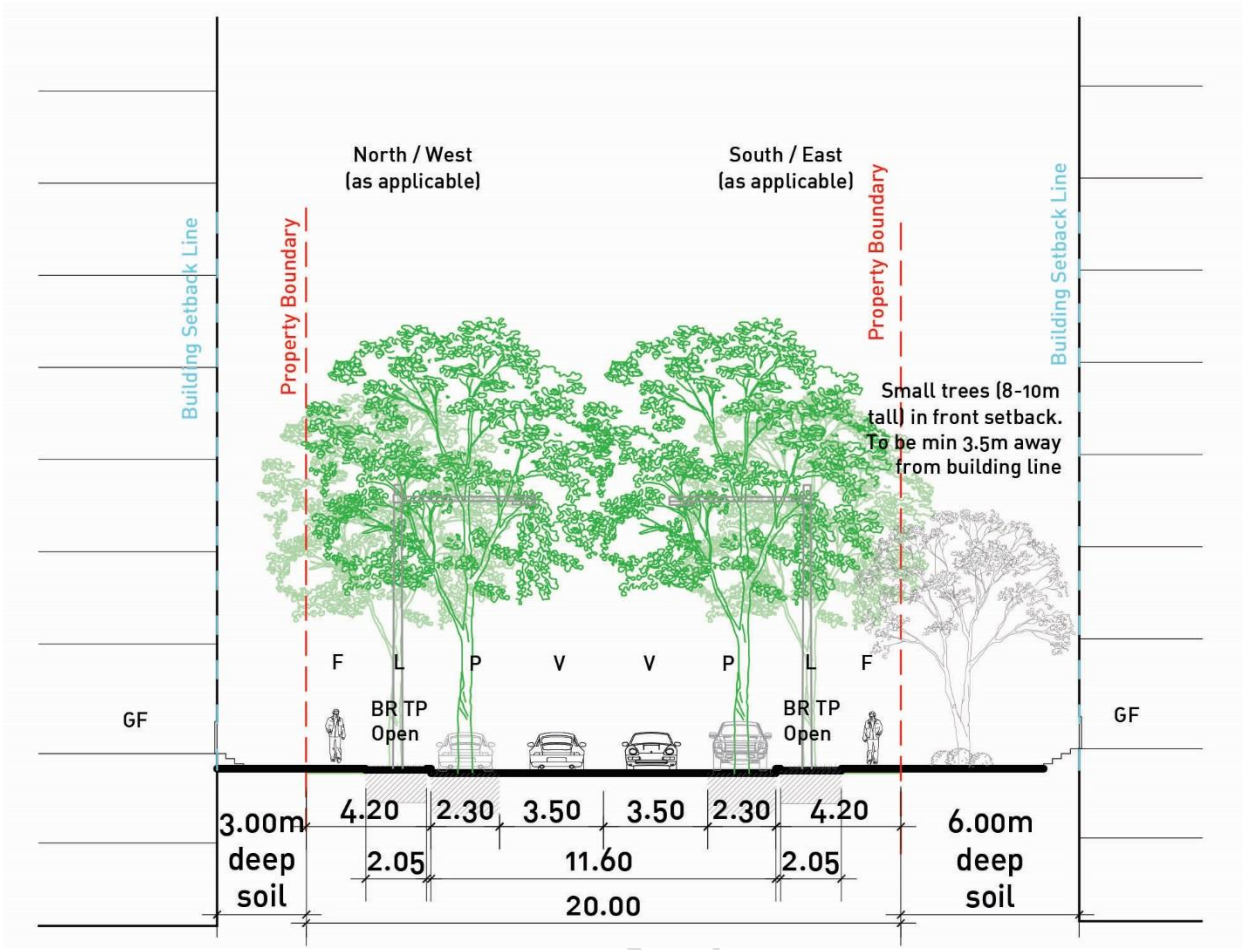

Figure 19 - Local Street (EWR 2A and NSR 4)

2.2 PEDESTRIAN CONNECTIONS

The benefits of a finer network of connections are numerous: greater connectivity, increased frontage for entries and business opportunities, and a spatial intimacy and variety in the public domain.

Pedestrian connections are non-trafficable and can be narrower in width than those with vehicular access. Pedestrian connections can be shared with service vehicles and have pedestrian priority over vehicle movement and typically have a flush surface for the full width of the lane.

Refer Council's *Public Domain Guidelines sub-section Melrose Park* for site specific guidance for the materials, finishes and treatment of the pedestrian connections.

Refer Masterplan Drawing, Street Type Schedule, and Public Domain Plan

Objectives

O.01 Pedestrian connections have been introduced to:

a) Increase connectivity in the public domain and variety in the street network.

b) Break up built form and long street walls with fine grain pedestrian connections at street level

c) Provide connectivity and direct path of access to Public Amenities, Parks, and modes of Transport.

d) Encourage pedestrian amenity and safety by encouraging passive surveillance and secondary building access to pedestrian connections via the courtyards.

O.02 Ensure all proposed privately owned pedestrian connections have a fully public nature equivalent to the public domain.

Controls

C.01 The pedestrian connections should be -

a) consistent with the Masterplan

b) 24/7 publicly accessible (except at the mall)

c) Extend from street to street or street to park

d) Open to sky (except at the mall)

e) All pedestrian connections are located on basements except the E/W connection from Hughes Avenue

f) Available for controlled access for light weight maintenance/service vehicles

g) Fully accessible using, in order of preference:

- graded walkways (no steeper than 1:20);
- limited use of ramp system as per DDA;
- 24/7 clearly visible publicly accessible lift service within the building structure; or
- alternative options for approval.

C.02 The Pedestrian Connections should have:

a) view lines along pedestrian connections to align across all blocks

b) building to building separation generally as shown on the masterplan

c) a public connection with a minimum width of 4 metres is to be located in the 12 metre separation between buildings

d) a low masonry wall, min 300 to 1000mm high, at the path edge, with breaks at entry points into the park

e) Trees in deep soil (preferably) or in set down slabs and planters to encourage and sustain large canopy trees generally consistent with the ADG requirements including soil volumes, soil

depth, irrigation, and sub-soil drainage

f) Pedestrian lighting to provide safe 24/7 access using without reflecting into residential properties.

C.03 Materials as per the PDG

C.04 The Pedestrian Connections can provide secondary entry to the buildings and courtyards

C.05 Park edge north/south connection, refer Fig 17, is to have:

a) A minimum 3 m wide path

b) A low wall located on the park edge, as required, within the 6m boundary.

c) The wall is to be masonry, a minimum of 450mm high and wide and a suitable option for sitting.

d) Canopy trees within the pathway corridor

C.06 The north south connection is to align with shopping mall entrance as per the Master plan and provide direct access to Hope Street through the mall as per the master plan.

C.07 Landscaping, lighting, and street furniture elements such as seating (formal and incidental) is to be developed as an overall design, and be strategically located, with recognition of the grades and sight lines across the site.

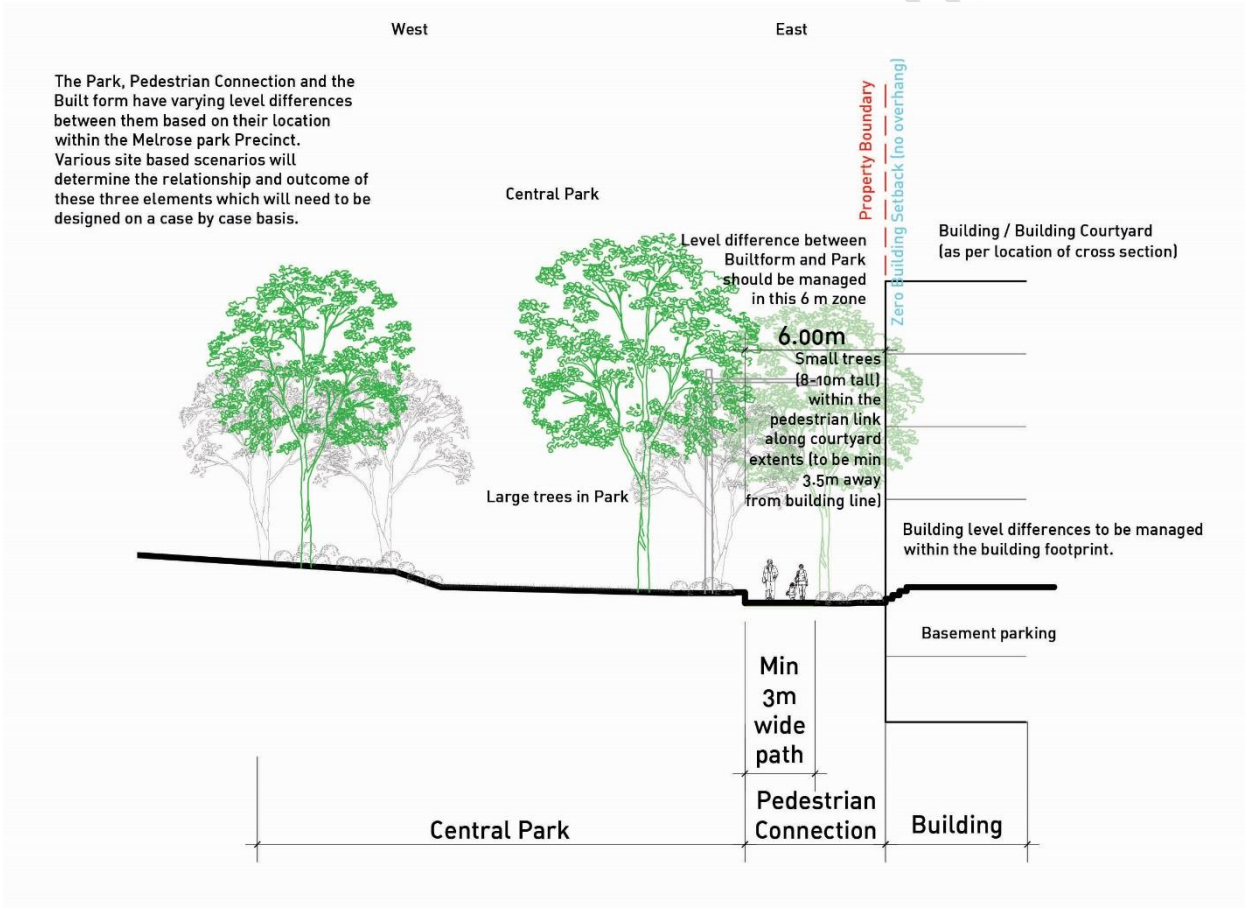

Figure 20 - Pedestrian connection – interface with Central Park

2.3 STREET TREES

Street trees help improve the quality of environment for the residents with reducing temperatures, providing shade, attracting fauna, and providing quality views. Street trees will be the elements in public domain which will provide the necessary respite from the scale of buildings in Melrose Park. For an area of this density, trees should have priority.

Refer to the latest version for each of the documents available from Council.

Objectives

O.01 Maintain existing and plant additional street trees within the public domain.

O.02 Improve and enhance environmental biodiversity and mitigate temperature at ground level.

O.03 Select tree species and planting regime to maximise connected street tree crown

O.04 Improve visual amenity of the public domain and from the buildings.

Controls

C.01 C1. Street trees should be provided along those streets where identified in latest version of Parramatta Public Domain Guidelines - Melrose Park.

C.02 The location of trees in public domain should be as per the Public Domain Plan.

C.03 Street trees in the footway should be 10-12 m high mature height, at 8-10m centres and planted generally in accordance with the Public Domain Guidelines and Council Design Standards.

C.04 Street trees in the street parking lanes should have a mature height of more than 15m are to be installed as per the Public Domain Plan and street cross sections above and latest version of Parramatta Public Domain Guidelines, - Melrose Park. Spacing of the trees to ensure tree crown touching at maturity.

C.05 DA's should be consistent with the Public Domain Plan.

C.06 Public domain documentation indicating the street tree locations as detailed in the Public Domain Guidelines should be submitted prior to Development Applications and Construction Certificate Applications approval.

2.4 OVERHEAD POWER LINES

Objectives

O.01 Ensure the appropriate location of all power lines within the precinct to provide an aesthetic appeal and necessary function.

Controls

C.01 All new powerlines are to be undergrounded for all new streets (excluding the high voltage power lines) of Melrose Park for full lengths of the development site street frontages and should be in accordance with the Public Domain Guidelines.

2.5 AWNINGS & DESIGN OF AWNINGS

Awnings assist in encouraging pedestrian activity along streets by providing comfortable conditions at footpath level and, in conjunction with active ground floor frontages, contribute to the vitality of the streets.

On public footpaths with active frontages, awnings are preferred to provide shelter and weather protection for pedestrians.

Well-designed awnings provide a sheltered, humanly scaled space on the footpath that creates an accommodating pedestrian environment for shopping, dining, walking and lingering. They also provide weather protection for the doorways, openings, and display areas of the active ground floor frontage of the building.

As an architectural element that is both part of the building as well as the public space of the street, the awning should integrate both with the characteristics of the building as well as existing and possible future adjacent awnings. In Melrose Park awnings are encouraged only at the town centre / mall and activated street frontages.

Objectives

O.01 Increase amenity in areas of high pedestrian volume by providing continuous protection from rain, sun, and wind down draft.

O.02 Design awnings to provide protection from rain, sun, and wind down draft.

O.03 Maintain complementary architectural detail between awnings

Controls

C.01 Awnings in Melrose park are allowed only at the town centre and at important intersections with activated shop frontages as per the Public Domain Plan in accordance with Typical Awning with Street Trees, Fig 18

C.02 New awnings should align with adjacent existing awnings and complement building facades

C.03 Wrap awnings around corners where a building is sited on a street corner.

C.04 Where a proposed building is located on a street corner and an awning is not required on one frontage, the awning should extend around the corner by a minimum of 6m.

C.05 Awning dimensions should generally be:

a) Minimum soffit height of 3.3 metres.

b) Low profile, with slim vertical fascias or eaves (generally not to exceed 300mm height)

c) Setback a minimum of 600mm from the face of the kerb. Minimum of 3.0 metres deep unless street trees are required.

d) Where street trees are required the entire length of the awning should be set back from the kerb by 1.2 metres. Cut outs for trees and light poles in awnings are not acceptable.

e) Dimensions of awnings should be in accordance with Typical Awning with Street Trees, Fig 18

C.06 Double height awnings are not permitted

C.07 All awnings are to have non-reflective surfaces

C.08 Awnings should not be constructed of glass and should comply with the controls outlined in Section SUSTAINABILITY

C.09 The awning roof should be designed so that all gutters are concealed, and downpipes incorporated in the building fabric.

C.10 Lighting and other fixtures should be recessed and integrated into the design of the soffit.

Figure 21 - Typical Awning Condition with Street Trees

2.6 PEDESTRIAN ACCESS AND MOBILITY

Objectives

O.01 Enable access and use of all spaces, services, and facilities through the creation of a barrier free environment in all public spaces, premises, and associated spaces.

O.02 Provide a safe and easy access to buildings to enable better use and enjoyment by people regardless of age and physical condition, whilst also contributing to the vitality and vibrancy of the public domain.

Controls

C.01 Main building entry points should be clearly visible from primary street frontages and enhanced as appropriate with awnings, building signage or high-quality architectural features that improve clarity of building address and contribute to visitor and occupant amenity.

C.02 Access to public areas of buildings and dwellings should be direct and without unnecessary barriers. Avoid obstructions, which cause difficulties including:

a) uneven and slippery surfaces;

b) steep stairs and ramps;

c) narrow doorways, paths and corridors;

d) devices such as door handles which require two hands to operate.

C.03 The design of facilities (including car parking requirements) for disabled persons should comply with the relevant Australian Standards, the Disability Discrimination Act 1992 (as amended) and the BCA including Section D.

C.04 The development should provide continuous paths of travel from all public roads and spaces as well as unimpeded internal access.

C.05 Pedestrian access ways, entry paths and lobbies should use durable materials commensurate with the standard of the adjoining public domain (street) with appropriate slip resistant materials, tactile surfaces and contrasting colours.

2.7 SOLAR ACCESS & OVERSHADOWING TO SIGNIFICANT PUBLIC SPACES

The provision of solar access throughout the year is critical to the success of public open space. In a densely occupied precinct, public open spaces with good solar access provide a respite and resource for residents, workers, and visitors. In addition, sunlight is important to ensure the necessary conditions for the health of trees and vegetation, another essential ingredient for public open space.

Public spaces have been identified in the Master Plan these provide valuable opportunities to maintain and to maximise use of solar access at ground level.

Objectives

O.01 Maximise solar access to the significant public parks and public spaces and streets during periods in the day when they are most used throughout the year.

O.02 Support the successful growth and survival of trees and vegetation within the streets, parks, and open spaces.

Controls

C.01 Development should demonstrate how built form massing, orientation and distribution of height will provide adequate sunlight to parks and public spaces identified in the Masterplan. In particular, at least 50% of the areas of the Central Park, Playing Field, both Detention Basins and wetland area should receive sunlight between 10am and 3pm on June 21.

2.8 PUBLIC OPEN SPACE

Objectives

O.01 Create a strong definition of the public domain and maintain the range of public open spaces as shown in the Masterplan to support the new residential community to meet, walk and recreate. These are

a) Central Park

b) Playing Field including Lot EC

c) Western Parklands

d) Wharf Road Gardens and

e) The Wetlands

O.02 Ensure that the public open spaces are capable of:

a) accommodating a range of uses and events, experiences, and activities

b) encouraging social interaction and use by people of different ages and abilities

c) including key user groups needs including children, young people, the elderly, low income earners and people with a disability

O.03 Provide public open spaces that are attractive and memorable with high levels of amenity that consider safety, climate, activity, circulation, seating, lighting, and enclosure

O.04 Contribute to the management of stormwater and enhancement of ecological values.

Controls

C.01 Public open space is to be provided as identified in the Masterplan, Public Opens Space Plan and Public Open Space Key Characteristics, Table 1.

C.02 The designs for the public open spaces and the wetlands are to be developed in consultation with Council. They are to be designed to:

a) incorporate a palette of high quality and durable materials, robust and drought tolerant landscaping species,

b) include clear, accessible, safe, and convenient linkages to each other and to the surrounding public open space network

c) integrate stormwater management and urban tree canopy

d) include design elements, furniture, and infrastructure to facilitate active and passive recreation, community gatherings

e) maximise the safety and security of users consistent with ‘Safety by Design’ principles

f) provide deep soil throughout (no car parking or infrastructure underneath unless agreed to by Council)

g) encourage pedestrian use through the design of open space pathways and entrances

h) clearly delineate private and publicly accessible open space

i) provide access to both sunlight and shade

j) incorporate appropriate levels of lighting to maximise hours of use

k) accommodate high levels of use

l) be accessible 24/ 7

m) be capable of being well maintained within reasonable costs

C.03 All public open space is to be dedicated and then maintained by Council.

C.04 Landscaping and materials palette should respond to the character and environmental conditions of each space and should unite and relate to the other public open spaces throughout the precinct

C.05 Vehicular movement through public open space should be restricted except for emergency vehicles, servicing, and special events.

C.06 Landscaping, plant species and structures such as retaining walls should be compatible with flood risk and not located on a flow path. Also see Retaining Walls in section Built Form,

C.07 Soil profile to be consistent with the Soil Profile Strategy – fill within the public domain and open spaces should not occur prior to undertaking a Soil Profile Strategy which has been agreed by Council.

C.08 Where open space performs dual recreation and stormwater detention functions, the design of the detention basin should:

a) provide an appropriate balance between stormwater management and recreation functions

b) include appropriate measures to restrict gross pollutants from entering the basin

c) allow the release of detained water within 24 hours of a significant rainfall event to protect landscaping within the basin

d) have one or more embankment batters of a maximum 1 in 3 gradient to provide for the safe exit of persons from the basin following a significant rainfall event

e) accommodate plant species and structures that can tolerate temporary flood inundation

Table 1 - Public Open Space Key Characteristics

Site	Purpose/s	Use/s
Central Park	District Park	Play, Passive Recreation, Community Events and Gatherings
Playing Field	Sport, WSUD	Active Recreation, Wetland
Western Parklands	Green Link, WSUD	Pedestrian / Cycle Connections, Dog Off-leash, Multi-use courts, Stormwater Detention
Wharf Road Gardens	Landscape Buffer	Passive Recreation
The Wetlands	Stormwater Management	Passive recreation

I. Central Parklands

A district park with a minimum size of approximately 79 metres by 278 metres and an approximate area of 17,600m^2 is to be provided in the location identified in the Masterplan and should:

- function as the key open space and principal gathering space for the Melrose Park precinct
- accommodate a range of experiences and activities, including space for outdoor performances and temporary events
- be edged by a 6m north / south pedestrian walkway on the eastern edge between the park and the development
- have a diverse mix of hard and soft landscaping and deep soil planting utilizing indigenous, native and exotic species to suit park environmental conditions
- should provide:
  - a variety of outdoor spaces including, sheltered, sunny, shaded, intimate, expansive
  - informal seating areas, public amenities, BBQ, and shade structures, drinking fountains
  - a district level playground for children that is to:
    - physically and visually integrate into the surrounding park
    - maximise play value, accessibility, and inclusiveness for children of all ages and abilities
    - incorporate nature play to provide opportunities for exploration, imagination, and creativity
- utilize durable materials to resist vandalism and graffiti
- include gathering spaces and play elements integrated into the landscape design
- provide opportunities and infrastructure to support small scale events
- facilitate cross-site and internal pedestrian connections that are sympathetically integrated to maintain the overall landscape character

- provide new street trees to define the boundary of the park
- achieve direct sunlight to a minimum of 50% of the park between 10am and 3pm on 21 June

II. Playing Field

An active recreation park with a minimum size of approximately 75 metres by 108 metres and an approximate area of 8000m^2 is to be provided in the location identified in the Masterplan and should:

- achieve an appropriate balance between active recreation and stormwater detention functions
- provide a multi-use field
- incorporate appropriate
  - floodlighting to maximise capacity and
  - perimeter fencing to minimise potential conflict with pedestrians and vehicles Flood Lighting
- achieve direct sunlight to a minimum of 50% of the playing field between 10am and 3pm on 21 June
- integrated stormwater and floodwater management

III. Western Parklands

A linear park with a minimum size of approximately 20 metres and an approximate area of 12,600m^2 should be provided along the western boundary of the precinct in the location identified in the Masterplan and should:

- provide for passive and active recreation including multi-use courts, outdoor fitness equipment and skateable elements,
- incorporate a north-south shared pedestrian / cycle connection
- include soft landscaping and deep soil planting utilising indigenous, native and exotic species
- incorporate shade and some formal and informal seating
- provide fenced dog off-leash exercise area
- dual recreation and stormwater detention function

IV. Wharf Road Gardens

A linear park with a minimum width of approximately 17 metres and an approximate area of 7,500m^2 should be provided along the eastern boundary of the precinct as identified in the Masterplan and should:

- explore opportunities to integrate references to the agricultural / pharmaceutical heritage
- provide a green buffer of soft landscaping to protect significant trees
- include deep soil planting utilising indigenous, native and exotic species
- incorporate shade and some formal and informal seating

V. Wetlands – (buildable area with zero height)

A triangular park with an approximate area of 2260m^2 should be provided along the eastern boundary of the precinct as identified in the Masterplan and should:

- assist in the management of stormwater
- increase the provision of deep soil
- be accessible to the public 24/7 through a formalised path separated from the stormwater management function
- designed to safe guarded against in appropriate use
- not have underground structures, such as car parking, unless approved by Council

2.9 LANDSCAPE DESIGN

Objectives

C.01 To create a landscape that:

a) is fully integrated into the design of development.

b) uses landscaping to ameliorates urban heat effects

c) uses tree canopy to enhance the street character.

Controls

C.01 A landscape concept plan should be provided for all landscaped areas. The plan should outline how landscaped areas are to be maintained for the life of the development.

C.02 Canopy trees should be provided in the street frontage setback deep soil to complement tree canopy species in Public Domain Plan and the Public Domain Design Guidelines.

C.03 Landscape requirements should be as per Section 3.3.1 Landscaping, and 3.3.2 Private and Communal Open Space of the Parramatta DCP 2011 and where there is a conflict, this DCP shall prevail.

2.10 PLANTING ON STRUCTURES

Constraints on the location of car parking structures may mean that landscaping within the site and not in the setbacks might need to be provided over parking structures on roof tops or on walls. The following controls apply in these conditions.

Objectives

O.01 Contribute to the landscape quality and amenity of buildings.

O.02 Encourage the establishment and healthy growth of landscaping in urban areas on structure.

O.03 Ensure that A grade soil profile appropriate for the proposed planting in the deep soil zones and for the landscaping on slab is provided.

Control

C.01 Design for optimum growing conditions and sustained plant growth and health by providing minimum soil depth and, soil volume as per Table 2, and soil area appropriate to the size of the plants to be established,

C.02 Providing appropriate soil conditions including irrigation (where possible using recycled water) and suitable drainage.

C.03 Providing square or rectangular planting areas rather than narrow linear areas.

C.04 For soil on slab, provide a soil profile report that specifies A grade soil that meets the specific requirements for the proposed planting for 1metre above drainage in landscape planting on slab

Table 2 - Minimum soil depth for plant establishment (in addition to drainage layer)

Plant type	Min soil depth	Min soil volume
Large trees (over 12m high, p to 16m crown spread at maturity or to connect with other tree crowns)	1.3m	150 cu m
Medium trees (8-12m high, up to 8m crown spread at maturity)	1.0m	35 cu m
Small trees (6-8m high, up 4m crown spread at maturity)	800 mm	9 cu m
Shrubs and ground cover	500 m	n/a

3. VEHICULAR ACCESS, PARKING, SERVICING

3.1 ACCESS AND PARKING

Vehicle Footpath Crossings - The design and location of vehicle access to developments should minimise both conflicts between pedestrians and vehicles on footpaths, particularly along pedestrian priority places and visual intrusion and disruption of streetscape continuity.

Objectives

O.01 Make vehicle access to buildings compatible with pedestrian movements and the public domain

O.02 Ensure vehicle entry points are integrated into building design and contribute to high quality architecture and streetscapes.

Controls

C.05 Where practicable provide one entry point to each lot for service vehicles and residential vehicles

C.06 Where practicable, vehicle access is to be from lanes and minor streets rather than primary street fronts or streets with major pedestrian activity.

C.07 Where practicable, adjoining buildings are to share or amalgamate vehicle access points. Internal on-site signal equipment should be used to allow shared access. Where appropriate, new buildings should provide vehicle access points so that they are capable of shared access at a later date.

C.08 Vehicle access ramps parallel to the street frontage will not be permitted.

C.09 Doors to vehicle access points should be fitted behind the building façade and to be of materials that integrate with the design of the building and contribute to a positive public domain.

C.10 Vehicle entries should have high quality finishes to walls and ceilings as well as high standard detailing. No service ducts or pipes are to be visible from the street.

3.2 VEHICULAR DRIVEWAYS AND MANOEUVRING AREAS

Objectives

O.01 Minimise the impact of vehicle access points and driveway crossovers on streetscape amenity, pedestrian safety, and the quality of the public domain by:

a) designing vehicle access to required safety and traffic management standards,

b) integrating vehicle access with site planning, streetscape requirements, traffic patterns

c) minimising potential conflict with pedestrians.

d) limiting street crossings.

O.02 Minimise the size and quantity of vehicle and service crossings to retain streetscape continuity and reinforce a high-quality public domain. Where possible limit vehicle entries to basement to one for each lot.

Controls

C.01 Driveways should be:

a) provided from lanes and secondary streets rather than the primary street, wherever practical

b) located taking into account any services within the road reserve, such as power poles, drainage inlet pits and existing or proposed street trees. *f*

c) located a minimum of 10 metres from the perpendicular of any intersection of any two roads.

d) located on the southern frontage of buildings and generally align with those shown in the Masterplan.

C.02 The number of street crossings and entrances to basement car parking should be minimised

a) Vehicle access should be designed to:

b) minimise the visual impact on the street, site layout and the building design,

c) integrated into the building design.

C.03 All vehicles should be able to enter and leave the site in a forward direction without the need to make more than a three-point turn.

C.04 Pedestrian and vehicle access should be separate and be clearly differentiated.

C.05 Vehicle access should be a minimum of 3 metres from pedestrian entrances.

C.06 Vehicular access should not ramp along boundary alignments edging the public domain, streets, lanes parks, water frontages and the like.

C.07 Driveway crossings should be designed in accordance with Council's standard Vehicle Entrance Designs, with any works within the footpath and road reserve subject to a Section 138 Roads Act approval.

C.08 Driveway entries and vehicle crossings should be maximum 6m wide excluding the Town Centre

C.09 . Vehicle entries visible from the street when doors are open should have a high-quality finish to walls and ceilings as well as a high standard of detailing. No service ducts or pipes are to be visible from the street.

C.10 Loading docks and waste collection should be incorporated within the basement with one entry where possible

C.11 Car space dimensions should comply with the relevant Australian Standards.

C.12 Driveway grades, vehicular ramp width/ grades and passing bays and sight distance for driveways should be in accordance with the relevant Australian Standard, (AS 2890.1).

C.13 Vehicular ramps less than 20 metres long within developments and parking stations should have a maximum grade of 1 in 5 (20%). Ramp widths should be in accordance with AS 2890.

C.14 Access ways to underground parking should not be located adjacent to doors of the habitable rooms of any residential development.

C.15 Semi-pervious materials should be used for all uncovered parts of driveways/spaces to provide for some stormwater infiltration.

C.16 Entrances to basement facilities should not terminate the view at the ends of any streets or pedestrian connections

C.17 Entrance doors to basements should be:

a) located behind the façade of the building by a minimum of 500mm: or

b) designed to be recessive

c) be of materials that integrate with the design of the building and that contribute positively to the public domain.

C.18 Where practicable, vehicle access points should be from minor streets rather than primary street fronts or streets with major pedestrian activity as per the Masterplan or agreed by Council.

C.19 Vehicle slip lanes in public streets for private use are not permitted.

C.20 Vehicular access, egress and manoeuvring should be provided in accordance with the NSW Fire Brigades Code of Practice – Building Construction – NSWFB Vehicle Requirements.

C.21 Generally, provision should be made for NSW Fire Brigade vehicles to enter and leave the site in a forward direction where:

a) NSW Fire Brigade cannot park their vehicles within the road reserve due to the distance of hydrants from the building or restricted vehicular access to hydrants; or
b) The site has an access driveway longer than 15m.

3.3 ON-SITE PARKING

Car parking should be provided on site in discreetly located basements for all development. On-street car parking is to be optimised for casual car parking.

Car parking rates for Melrose Park as per the rates for Town Centres as detailed in the Parramatta DCP 2011. These rates are maximums rates and should not be exceeded.

Objectives

O.01 To facilitate an appropriate level of on-site parking provision in Melrose Park

O.02 To minimise the visual impact of on-site parking.

O.03 To provide adequate space for parking and manoeuvring of vehicles (including service vehicles and bicycles).

O.04 To recognise the complementary use and benefit of public transport and non-motorised modes of transport such as bicycles and walking.

O.05 To enable car parking to be utilised most efficiently.

Controls

C.01 Car parking should be generally provided in basements, and semi-basements.

C.02 Car parking should be consolidated in basement areas under building footprints to maximise the area available for deep soil planting beneath setbacks.

C.03 Maximise the efficiency of car park design with predominantly orthogonal geometry and related to circulation and car space sizes.

C.04 Accessible parking spaces designed and appropriately signed for use by people with disabilities are to be provided to meet Australian Standards.

C.05 Separate motorcycles parking is to be provided r at 1 car parking space, as a minimum, for every 50 car parking spaces provided, or part thereof. Motorcycle parking does not contribute to the number of parking spaces for the purpose of complying with the maximum number of parking spaces permitted.

C.06 On-site parking should meet the relevant Australian Standard (AS 2890.1 2004 – Parking facilities, or as amended).

C.07 Pedestrian pathways to car parking areas are to be provided with clear lines of sight and safe lighting especially at night.

C.08 If excavation is required management procedures as set out in the Parramatta Historical Archaeological Landscape Management Study-is to be undertaken

C.09 Provide greater flexibility in the use of car parking by separating the title of car parking from the title of the apartments for sale.

C.10 Natural ventilation should be provided to underground parking areas where possible, with ventilation grilles and structures:
a) integrated into the overall façade and landscape design of the development,
b) not located on the primary street façade, oriented away from windows of habitable rooms and private open spaces areas.

3.4 BICYCLE PARKING

Controls

C.01 Secure bicycle parking should be provided in residential and town centre buildings

in compliance with section 3.6.2 of this DCP.

C.02 Bicycle parking in public car parks-should achieve safe, easy, and convenient access from the building to public streets.

C.03 Adequate change and shower facilities for cyclists should be provided for commercial and retail development providing employment for 20 persons. Facilities should be conveniently located close to bike storage areas.

3.5 VEHICLE FOOTPATH CROSSINGS

The design and location of vehicle access to developments should give priority to pedestrian movement to minimise conflicts between pedestrians and vehicles on footpaths, particularly along primarily pedestrian streets. Vehicle access should also be designed to minimise visual intrusion and disruption of the public domain.

Porte-cocheres are not encouraged as they disrupt pedestrian movement, do not contribute to active street frontage, and provide no public benefit.

Objectives

O.01 Enable pedestrian movement has priority when vehicles crossing the public domain.

O.02 Minimise the width of any vehicular crossing at the footpath.

Controls

C.01 Vehicle access ramps should be perpendicular to the street frontage to minimise the width of vehicle entry openings. Where driveway width exceeds the maximum dimension (typically) the driveway should be separated and coordinated with the street tree layout as per the Masterplan and Public Domain Plan.

C.02 Vehicle landings should comply with the relevant Australian Standards to maximise visual contact with oncoming pedestrians.

C.03 Vehicle crossings shall use Councils current standard vehicle crossing detail, as agreed by Council.

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4. SUSTAINABILITY

4.1 ENERGY AND WATER EFFICIENCY

Objectives

O.01 Promote sustainable development which uses energy efficiently and minimises non-renewable energy usage in the construction and use of buildings.

O.02 Ensure that the Melrose Park development contributes positively to an overall reduction in energy consumption and greenhouse gas emissions.

O.03 Reduce energy bills and the whole of life cost of energy services.

O.04 Reduce consumption of drinking water.

O.05 Harvest rainwater and urban stormwater runoff for use.

O.06 Reduce wastewater discharge.

Controls

C.01. The development should:

a) Seek to achieve a BASIX Energy score of

- BASIX 50 (+25) for buildings with 2-15 storeys
- BASIX 45 (+20) for buildings with 16-30 storeys

b) Seek to achieve a BASIX Water score of at least 55

Provide photovoltaics to each of the buildings if sufficient roof space is available

4.2 RECYCLED WATER

New developments must be connected to a source of recycled or reuse water.
Recycled/reuse water means treating and using water, such as sewage, stormwater, industrial wastewater, or greywater, for non-drinking purposes such as for industry, toilets, cooling towers and irrigation of gardens, lawns, and parks.

Objectives

O.01 Increase resilience and water security by providing an alternative water supply to buildings.

O.02 Reduce the technical and financial barriers to upgrading buildings to connect to future non-drinking water supply infrastructure.

O.03 Support the growth infrastructure requirements for the Greater Parramatta Olympic Peninsula.

Control

C.01. All development must install a dual reticulation system to support the immediate or future connection to a recycled water network. The design of the dual reticulation system is to be such that a future change-over to an alternative water supply can be achieved without significant civil or building work, disruption, or cost.

C.02. The dual reticulation system should have:

a) one reticulation system servicing drinking water uses, connected to the drinking water supply, and

b) one reticulation system servicing all non-drinking water uses, such as toilet flushing, irrigation and washing machines. The non-drinking water system is to be connected to the rainwater tank with drinking water supply backup, until an alternative water supply connection is available.

c) Metering of water services is to be in accordance with the current version of Sydney Water's *Multi-level individual metering guide. Individual metering of the nom-drinking water is optional.*

4.3 WATER SENSITIVE URBAN DESIGN

Water Sensitive Urban Design (WSUD) is an integral component of the Melrose Park Masterplan. WSUD is used to help manage and clean storm runoff water quality prior to it entering the river system. WSUD reduces dependency on potable water to sustain open space landscapes. WSUD help sustain large canopy street trees integrated with the road and stormwater runoff systems.

Objectives

O.01 Ensure the principles set out in the Water Management Strategy, Parramatta Development Control Plan 2011 are achieved.

O.02 Manage the quantity of stormwater run-off.

O.03 Protect and enhance existing natural or constructed drainage networks including channel bed and banks by controlling the magnitude and duration of erosive flows.

O.04 Ensure that downstream flora and fauna are protected from stormwater impacts during and post construction.

O.05 Minimise surcharge from the existing drainage systems.

O.06 Ensure that on-site stormwater management measures are operated and maintained in accordance with design specifications.

Controls

C.01 Prepare Water Sensitive Urban Design Strategy as per the Water Management Strategy, Parramatta Development Control Plan 2011

C.02. The development should:

a) integrate WSUD principles into the development through the design and use of 'green' stormwater systems, biological water retention and treatment and integration of water management into the landscape rather than relying on 'end of pipe' proprietary treatment devices prior to discharge.

b) employ operating practices that prevent contamination of stormwater.

c) maximise pervious surfaces and use soft landscaping and deep soil to promote infiltration and reduce stormwater run-off.

d) WSUD elements should be located and configured to maximise the impervious area that is treated through them as shown in the Masterplan and Public Domain Guidelines (PDG).

e) make adequate provision for the control and disposal of stormwater run-off from the site to ensure that stormwater has no adverse impact on Council's stormwater drainage systems, natural watercourses, the development itself, or adjoining properties.

C.03. Stormwater drainage design criteria should be in accordance with Council's Stormwater Disposal Policy and current Development Engineering Design Guidelines.

C.04. Stormwater, including overland flows entering and discharging from the site, should be managed. The site drainage network should provide the capacity to safely convey stormwater run-off resulting from design storm events listed in Council's Development Engineering and Guidelines.

C.05. The design and location of stormwater drainage structures, such as detention and rainwater tanks, should be in accordance with Council's Stormwater Disposal Policy and current Development Engineering and Design Guidelines,

C.06. Run-off entering directly to waterways i.e. the Parramatta River should be treated to reduce erosion and sedimentation, nutrient and seed dispersal.

C.07. The discharge of polluted waters from the site is not permitted. Discharges from premises of any matter, whether solid, liquid, or gaseous is required to conform to the Protection of the Environment Operations Act and its Regulations, or a pollution control approval issued by the NSW Office of Environment and Heritage for Scheduled Premises.

C.08. Prepare and implement a Site Stormwater Management Plan (SSMP) incorporating water sensitive urban design measures is required. The SSMP should:

a) identify the potential impacts associated with stormwater run-off for a proposed development and

provide a range of appropriate measures for water quantity, water quality and water efficiency and re-use; and

b) be developed in accordance with Council's Stormwater Disposal Policy and current Development Engineering and Design Guidelines.

c) to the maximum extent practical, achieve pollution reduction targets identified in Table 2 and consider measures including vegetated swales; vegetated filter strips; sand filters; bio-retention systems; permeable pavements; infiltration trenches; infiltration basins; landscape developments; Gross Pollutant Traps and filters;

d) utilise the MUSIC modelling tool (or equivalent) to determine pollution load reduction as defined in Table 3.

e) be prepared by a suitably qualified professional.

Table 3 - Stormwater Treatment Targets for Development

NOTE: Reductions in loads are relative to the pollution generation from the same development without treatment

Pollutant	**Performance Target reduction loads**
Gross Pollutants	95% reduction in the post development mean annual load of (greater than 5mm)
Total Suspended Solids	90% reduction in the post development mean annual load of Total Suspended Solids (TSS)
Total Phosphorus	85% reduction in the post development mean annual load of Total Phosphorus (TP)
Total Nitrogen	65% reduction in the post development mean annual load of Total Nitrogen (TN)
Hydrocarbons, motor oils, oil, and grease	No visible oils for flows up to 90% of the one-year ARI peak flow specific for service stations, depots, vehicle body repair workshops, vehicle repair stations, vehicle sales or hire premises, car parks associated with retail premises, places of public worship, tourist and visitor accommodation, registered clubs and pubs.

4.4 ELECTRIC VEHICLE CHARGING INFRASTRUCTURE

Terminology

The following Electric Vehicle (EV) technical terms are used:

EV Ready Connection is the provision of a cable tray and a dedicated spare 32A circuit provided in an EV Distribution Board to enable easy future installation of cabling from an EV charger to the EV Distribution Board and a circuit breaker to feed the circuit.

Private EV Connection is the provision of a minimum 15A circuit and power point to enable easy future an EV in the garage connected to the main switchboard.

Shared EV Connection is the provision of a minimum Level 2 40A fast charger and Power Supply to a car parking space connected to an EV Distribution Board.

EV Distribution Board is a distribution board dedicated to EV charging that is capable of supplying not less than 50% of EV connections at full power at any one time during off-peak periods, to ensure impacts of maximum demand are minimised. To deliver this, the distribution board will be complete with an EV Load Management System and an active suitably sized connection to the main switchboard. The distribution board must provide adequate space for the future installation (post-construction) of compact meters in or adjacent to the distribution board, to enable the body corporate to measure individual EV usage in the future.

Objectives

O.01 Recognise the positive benefits of increased electric vehicle adoption on urban amenity including air quality and urban heat.

O.02 Ensure that Melrose Park provides the necessary infrastructure to support the charging of electric vehicles.

O.03 Minimise the impact of electric vehicle charging on peak electrical demand requirements.

Controls

C.01 EV Load Management System is to be capable of:

- a) reading real time current and energy from the electric vehicle chargers under management
- b) determining, based on known installation parameters and real time data, the appropriate behaviour of each EV charger to minimise building peak power demand whilst ensuring electric vehicles connected are full recharged.
- c) being scaled to include additional chargers as they are added to the site over time.

C.02 All apartment residential car parking must:

a) provide an EV Ready Connection to at least one car space per dwelling.

b) provide EV Distribution Board(s) of sufficient size to allow connection of all EV Ready Connections and Shared EV connections.

c) Locate EV Distribution board(s) so that no future EV Ready Connection will require a cable of more than 50m from the parking bay to connect.

d) Identify on the plans submitted with the DA the future installation location of the cable trays from the EV Distribution Board to the car spaces allocated to each dwelling that are provided a future EV connection, with confirmation of adequacy from an electrical engineer. Spatial allowances are to be made for cable trays and EV Distribution Board(s) when designing in other services.

C.03 All car share spaces and spaces allocated to visitors must have a Shared EV connection.

C.04 All commercial building car parking must:

a) Provide 1 Shared EV connection for every 10 commercial car spaces distributed throughout the car park to provide equitable access across floors and floor plates.

C.05 The bicycle storage facility is to include 10A e-bike charging outlets to 10% of spaces with no space being more than 20m away from a charging outlet. Chargers are to be provided by the owner. (chargers excluded).

4.5 URBAN HEAT

Urban heat or the Urban Heat Island effect refers to the higher temperatures experienced in urban areas compared to rural or natural areas. Urban heat impacts our communities, businesses, and natural environment in many ways, including increase demand for electricity and water, a less comfortable public domain for pedestrians and associated health impacts. On average, Melrose Park experiences more frequent hotter days than Sydney average (Australian Bureau of Meteorology).

As more development occurs in the Parramatta Local Government Area, the build-up of heat in the environment occurs through increased hard surfaces, reduced vegetation, and heat rejection from buildings surfaces and air conditioning units. The build-up of heat is compounded as more dense urban environments reduce the amount of heat able to be removed by wind and re-radiation to the night sky, extending the period of discomfort.

This section of the DCP provides controls which aim to reduce and remove heat from the urban environment at the city and local scale. These are innovative controls based on Australian and international evidence on cites and the urban heat island effect. The controls address the:

- reflectivity of building roofs, podiums, and facades; and
- reduce the impacts of heat rejection sources of heating and cooling systems.

The following complementary controls contained in the DCP assist with the reduction of urban heat:

- encouraging laminar wind flows and reducing turbulence through the setbacks above street wall and podia height controls as shown in the Masterplan
- vegetation and retention of soil moisture through Water Sensitive Urban Design
- street trees and vegetation in the public domain (PDG)
- well-designed landscaping and Green Roofs and Walls

Solar heat reflectivity should not be confused with solar light reflectivity, as these are distinctly different issues. Solar heat contributes to urban warming and solar light reflectivity can be the cause of glare, which is covered in 4.3.3.1.

These controls do not consider energy efficiency or thermal comfort within buildings. These important issues are dealt with in other controls, State Environmental Planning Policies and the National Construction Code.

Terminology

Solar heat reflectance is the measure of a material's ability to reflect solar radiation. A 0% solar heat reflectance means no solar heat radiation is reflected and 100% solar heat reflectance means that all the incident solar heat radiation is reflected. In general, lighter coloured surfaces and reflective surfaces such as metals will have typically higher solar heat reflectance, with dark coloured surfaces or dull surfaces will typically have lower solar heat reflectance. External solar heat reflectance measured at the surface normal (90 degrees) is used in these controls.

Solar transmittance is the percentage of solar radiation which can pass through a material. Opaque surfaces such as concrete will have 0% solar transmittance, dark or reflective glass may have less than 10%, whilst transparent surfaces such as clear glass may allow 80 to 90% solar transmittance.

Solar Reflectance Index (SRI) is a composite measure of a materials ability to reflect solar radiation (solar reflectance) and emit heat which has been absorbed by the material. For example, standard black paint has an SRI value of 5 and a standard white paint has an SRI value of 100.

Reflective Surface Ratio (RSR) is the ratio of reflective to non-reflective external surface on any given façade.

Reflective surfaces are those surfaces that directly reflect light and heat and for the purposes of this DCP are defined as those surfaces that have specular normal reflection of greater than 5% and includes glazing, glass faced spandrel panel, some metal finishes and high gloss finishes.

Non-reflective surfaces are those surfaces that diffusely reflect light and heat and for the purposes of this DCP are defined as those surfaces that have specular normal reflection of less than 5%.

Maximum External Solar Reflectance is the maximum allowable percentage of solar reflectance for the external face of a Reflective Surface. The percentage of solar reflectance is to be measure at a normal angle of incidence

PRINCIPLES

Reduce the contribution of development in Melrose Park to urban heat in the Parramatta Local Government Area.

Improve user comfort in Melrose Park (private open space and the public domain).

ROOF SURFACES

Objectives

O.01 Reflect and radiate heat from roofs and podium top areas.

O.02 Improve user comfort of roof and podium top areas.

Controls

C.06 Where surfaces on roof tops or podiums are used for communal open space or other active purposes, the development must demonstrate at least 50% of the accessible roof area complies with one or a combination of the following:

a) be shaded by a shade structure;

b) be covered by vegetation consistent with the controls on Green Roofs or Walls in Section 2.9 Landscaping;

c) provide shading through canopy tree planting, to be measured on extent of canopy cover 2 years after planting.

C.07 Where surfaces on roof tops or podiums are not used for the purposes of private or public open space, for solar panels or for heat rejection plant, the development must demonstrate the following:

a) Materials used have a minimum solar reflectivity index (SRI) of 82 if a horizontal surface or a minimum SRI of 39 for sloped surface greater than 15 degrees; or

b) 75% of the total roof or podium surface be covered by vegetation; or

c) A combination of (a) and (b) for the total roof surface.

4.6 VERTICAL FACADES

Objectives

O.01 Minimise the reflection of solar heat downward from the building façade into private open space or the public domain.

Controls

C.01 The extent of the vertical façade of street walls , podia , perimeter block development (or if no street wall, as measured from the first 12 metres from the ground plane) that comprise Reflective Surfaces should demonstrate a minimum percentage of shading as defined in Table 4 as calculated on 21 December on the east facing façade at 10am, northeast and southeast facing façade at 11.30am, north facing façade at 1pm, northwest and southwest facing façade at 2.30pm and the west facing faced at 4pm (as shown in Figure 1.2).

Table 4 - Minimum Percentage Shading

Reflective Surface Ratio (RSR)	<30%	30%-70%	>=70%
Minimum percentage shading (%)	0	1.5*RSR-45	75

Shadow diagrams must be submitted with the development application quantifying the extent of shading at 10am, 11.30am, 1pm, 2.30pm and 4pm on 21 December for each relevant façade. Shadows from existing buildings, structures and vegetation are not considered in the calculations. Refer to Table 5 for sun angles corresponding to shading reference times.

Calculation of RSR for each relevant façade must also be submitted with the development application.

Table 5 - Shading Sun Angles

Façade Orientation	Sun Angles
East ± 22.5°	Reference Time: 10am AEDT (UTC/GMT+11) Sun Elevation: 51° Sun Azimuth: 86°
Northeast/Southeast ± 22.5°	Reference Time: 11.30am AEDT (UTC/GMT+11) Sun Elevation: 69° Sun Azimuth: 66°
North ± 22.5°	Reference Time: 1pm AEDT (UTC/GMT+11) Sun Elevation: 80° Sun Azimuth: 352°
Northwest/Southwest ± 22.5°	Reference Time: 2.30pm AEDT (UTC/GMT+11) Sun Elevation: 67° Sun Azimuth: 290°
West ± 22.5°	Reference Time: 4pm AEDT (UTC/GMT+11) Sun Elevation: 48° Sun Azimuth: 272°

C.02 The extent of the vertical façade of the tower (above the street wall or if no street wall, as measured above the first 12 metres from the ground plane) that comprise Reflective Surfaces should demonstrate a minimum percentage of shading as defined in Table 6 as calculated on 21 December on the east facing façade at 10am, northeast and southeast facing façade at 11.30am, north facing façade at 1pm, northwest and southwest facing façade at 2.30pm and the west facing faced at 4pm (as shown in Figure 1.4).

Table 6 - Minimum tower percentage shading

	Reflective Surface Ratio (RSR)	<30%	30%-70%	>=70%
	Minimum percentage shading (%)	0	0.8*RSR-24	40

Calculation of RSR for each relevant façade must also be submitted with the development application.

C.03 Shading may be provided by:

a) external feature shading with non-reflective surfaces;

b) intrinsic features of the building form such as reveals and returns; and

c) shading from vegetation such as green walls that is consistent with the controls on Green Roofs or Walls in Section XXX Landscaping.

C.04 Non-reflective surfaces of vertical facades do not require shading and these areas can be excluded from the calculations.

C.05 Where it is demonstrated that shading cannot be achieved in accordance with the above controls, a maximum external solar reflectance as defined in Table 7 and as indicated in Figure 1.1 is generally acceptable.

Table 7 - Maximum solar reflectance of Reflective Surfaces

Reflective Surface Ratio (RSR)	**<30%**	**30%-70%**	>=70%
Maximum External Solar Reflectance (%)	**No Max.**	**62.5-0.75*RSR**	10

C.02 Where multiple reflective surfaces or convex geometry of reflective surface introduce the risk of focusing of solar reflections into the public spaces:

a) solar heat reflections from any part of a building must not exceed 1,000W/m2 in the public domain at any time;

b) a reflectivity modelling report may be required to qualify extent of reflected solar heat radiation.

4.7 HEATING AND COOLING SYSTEMS – HEAT REJECTION

Objectives

O.01 Reduce the impact of heat rejection from heating, ventilation and cooling systems in Melrose Park from contributing to the urban heat island effect in the Parramatta Local Government Area; and

O.02 Avoid or minimise the impact of heat rejection from heating, ventilation, and cooling systems on user comfort in private open space and the public domain.

Controls

C.01 Residential apartments within a mixed-use development or residential flat building should incorporate efficient heating, ventilation and cooling systems which reject heat from a centralised source on the upper most roof.

C.02 Where the heat rejection source is located on the upper most roof, these should be designed in conjunction with controls in this Section of the DCP relating to Roof Surfaces and the controls on Green Roofs or Walls.

C.03 No heat rejection units should be located on the street wall frontage on the primary street.

C.04 Heat rejection units are strongly discouraged from being located on building facades or on private open space, such as balconies and courtyards. However, where it is demonstrated that heat rejection cannot be achieved in accordance with the above controls C1 and C2 above and these units are installed, the HVAC system must demonstrate:

a) heating, ventilation, and cooling systems exceeds current Minimum Energy Performance Standard requirements; and

b) the heat rejection units are situated with unimpeded ventilation, avoiding screens and impermeable balcony walls; and

c) the area required by the heat rejection units is additional to minimum requirements for private open space.

4.8 GREEN ROOFS AND WALLS

Objectives

O.01 Ensure that green roofs or walls are integrated into the design of new development.

O.02 Design green walls or roofs to maximise their cooling effects.

O.03 Ensure green walls and roofs are designed and maintained to respond to local climatic conditions and ensure sustained plant growth.

Controls

C.01 Green roofs and wall structures are be assessed as a part of the structural certification for the building. Structures designed to accommodate green walls should be integrated into the building façade.

C.02 Waterproofing for green roofs and walls is to be assessed as a part of the waterproofing certification for the building.

C.03 Where vegetation or trees are proposed on the roof or vertical surfaces of any building, a Landscape Plan should be submitted which demonstrates:

a) adequate irrigation and drainage are provided to ensure sustained plant growth and health and safe use of the space;

b) appropriate plant selection to suit site conditions, including wind impacts and solar access; and

c) adherence to the objectives, design guidelines and standards contained in the NSW Department of Planning and Environment's Apartment Design Guide for 'Planting on Structures'.

C.04 Green roofs or walls, where achievable, should use rainwater, stormwater, or recycled water for irrigation.

C.05 Container gardens, where plants are maintained in pots, are not considered to be green roofs, however they are acknowledged as contributing to the reduction of urban heat.

C.06 Register an instrument of positive covenant to cover proper maintenance and performance of the green roof and walls on terms reasonably acceptable to the Council prior to granting of the Occupancy Certificate.

C.07 Green roof planting, structures and WC facilities are permitted to exceed the height plane

4.9 SOLAR LIGHT REFLECTIVITY (GLARE)

Objectives

O.04 To ensure that buildings in Melrose Park restrict solar light reflected from buildings to surrounding areas and other buildings.

O.05 To minimise the risk of bird collision due to high transparency, through treatment of external windows and other glazed building surfaces.

Controls

C.08 New buildings and facades must not produce solar light reflectivity that results in glare that is hazardous, undesirable or causes discomfort for pedestrians, drivers, and occupants of other buildings or users of public spaces.

C.09 Solar light reflectivity from building materials used on facades must not exceed 20%.

C.10 Subject to the extent and nature of glazing and reflective materials used, a Reflectivity Report that analyses potential solar light reflectivity from the proposed development on pedestrians, motorists, or surrounding areas may be required.

C.11 Buildings greater that 40m in height require a Reflectivity Report that includes the visualisation and photometric assessment of solar light reflected from the building on the surrounding environment. Analysis is to include:

d) the extent of solar light reflections resulting from the development for each day in 15-minute intervals;

e) a visual and optometric assessment of view aspects where solar light reflections may impact pedestrians, or drivers, occupants of other buildings or users of public spaces including assessment of visual discomfort and hazard**.**

C**.**12 Demonstrate that development will not significantly affect migratory or threatened bird species because of illumination or obstruction of flight pathways into Melrose Park. Consideration is to be given to the *National Light Pollution Guidelines for Wildlife* (Migratory Shorebirds) and the *Industry Guidelines for Avoiding, Assessing and Mitigating Impacts on EPBC Act Listed Migratory Shorebird Species*.

C.13 A report is to be prepared by a suitably qualified consultant at DA stage to determine appropriate treatments of building surfaces for buildings within close proximity to open space and water bodies.

4.10 BUILDING FORM AND WIND MITIGATION

Objectives

O.01 Ensure that building form enables the achievement of nominated wind standards to maintain safe and comfortable conditions in the city centre streets and lanes.

O.02 Wind mitigation methods not to enable full development of street tree canopy.

Controls

C.01 Ensure public safety and comfort the following maximum wind criteria are to be met by new buildings:

a) 10 metres/second in retail streets

b) 13 metres/second along major pedestrian streets, parks, and public places

c) 16 metres/second in all other streets

C.02 Site design for tall buildings (towers) should:

a) Set tower buildings back from lower structures built at the street frontage.

b) Protect pedestrians from strong wind downdrafts at the base of the tower.

c) C) Ensure that tower buildings are well spaced from each other to allow breezes to penetrate city centre.

d) Consider the shape, location, and height of buildings to satisfy wind criteria for public safety and comfort at ground level.

e) Ensure usability of open terraces and balconies.

C.02. Wind Effects Report is to be submitted with the DA for all buildings greater than 32m in height. Report recommendations cannot rely on or include street trees to assist to mitigate wind down draft effects on the public domain. For buildings over 50m in height, results of a wind tunnel test are to be included in the report

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5. VIEWS AND VIEW CORRIDORS

5.1 VIEWS AND VIEW CORRIDORS

Views contribute to wayfinding, the character and amenity while enhancing the sense of place and identity. The physical setting of Melrose Park and the adjacent Parramatta River provides for special views of this natural and landscape setting.

It is important that views within, into and out of the Melrose Park are maintained from as many points as possible. In the redevelopment of some sites, consideration should be given to opening new significant views.

The silhouettes of many buildings are significant and contribute to the identity of the place and its skyline. The massing and arrangement of the skyline and building silhouettes should be carefully considered and proposed development should be carefully designed so that its appearance complements the broader skyline.

Objectives

O.06 Maintain and enhance vies to open space and the river.

O.07 Enhance views along streets and ensure buildings do not encroach into the view corridor

O.08 Enhance views along streets providing visual connection to open space amenity and neighbouring suburbs.

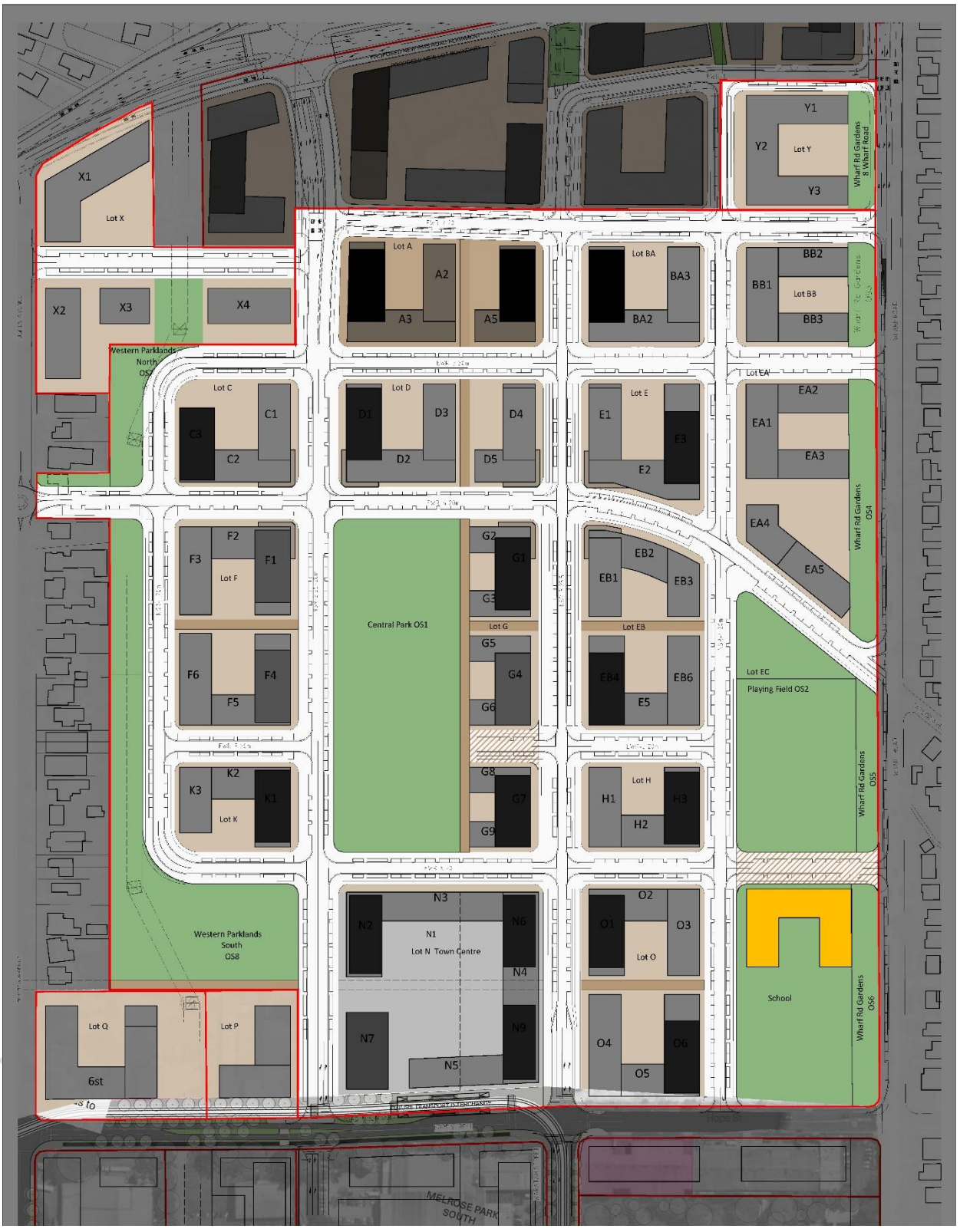
Controls

C.1 Align buildings to maximise and frame view corridors between buildings.

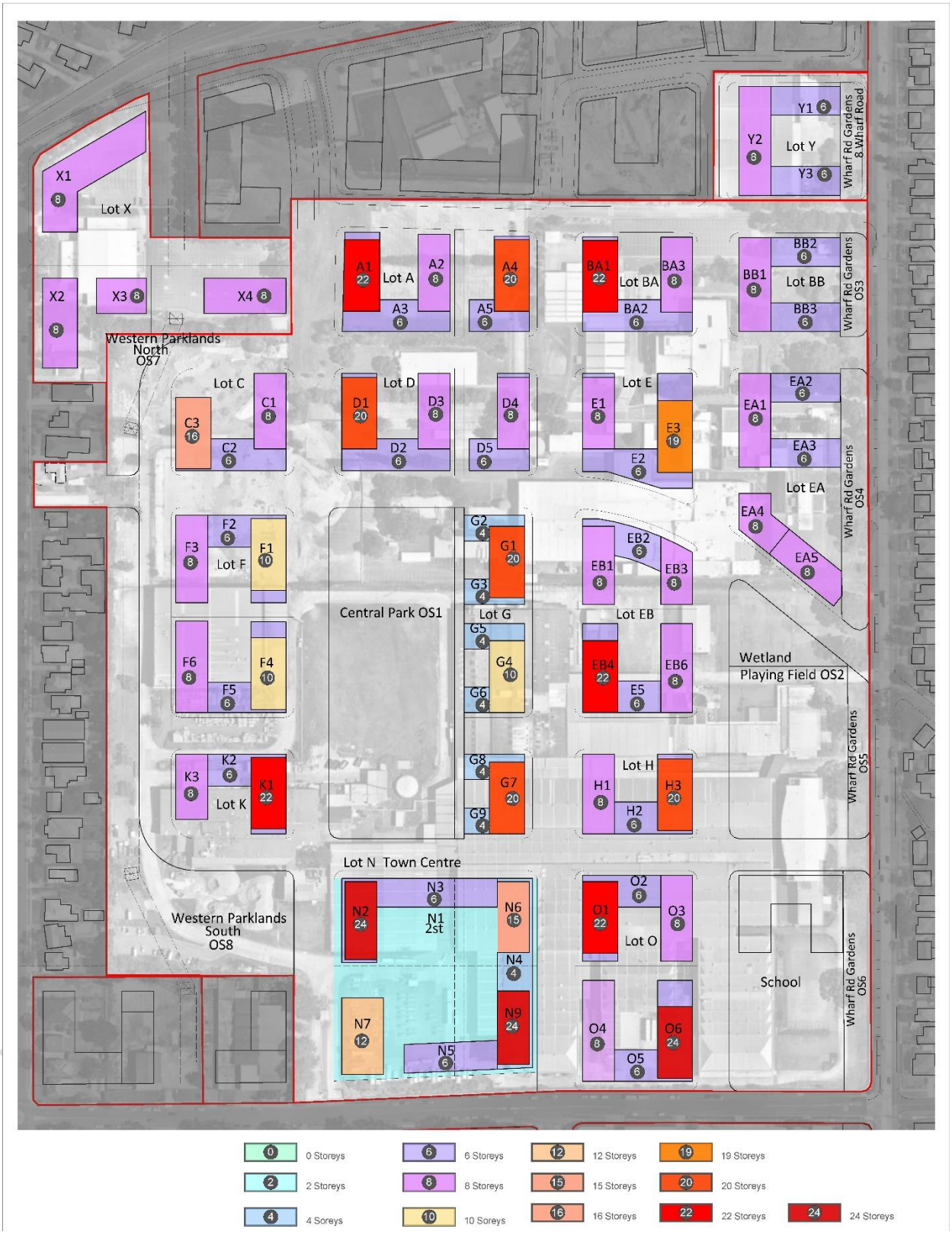
C.2 Carefully consider tree selection to provide views along streets and keep understory planting low where possible.

C.3 Site analysis should address views with the planning and design of building forms considering existing topography, vegetation, and surrounding development.

Appendix 1 – Melrose Park North Master Plan



Appendix 2 – Building Heights



Appendix 3 – Solar Access Plan

10am Sun Study			
Area	Area in Sun (sqm)	Total Area (sqm)	Percentage in Sun (%)
1	6100	16013	38
2	8990	16341	55
3	5016	5016	100
4	8600	11684	74

11am Sun Study			
Area	Area in Sun (sqm)	Total Area (sqm)	Percentage in Sun (%)
1	9480	16031	59
2	12912	16341	79
3	5016	5016	100
4	8830	11684	76

12pm Sun Study			
Area	Area in Sun (sqm)	Total Area (sqm)	Percentage in Sun (%)
1	12398	16013	77
2	14855	16341	91
3	5016	5016	100
4	10676	11684	91

1pm Sun Study			
Area	Area in Sun (sqm)	Total Area (sqm)	Percentage in Sun (%)
1	13173	16031	82
2	13651	16341	84
3	4866	5016	97
4	9059	11684	78

2pm Sun Study			
Area	Area in Sun (sqm)	Total Area (sqm)	Percentage in Sun (%)
1	13204	16031	82
2	11815	16341	72
3	2365	5016	47
4	6799	11684	58

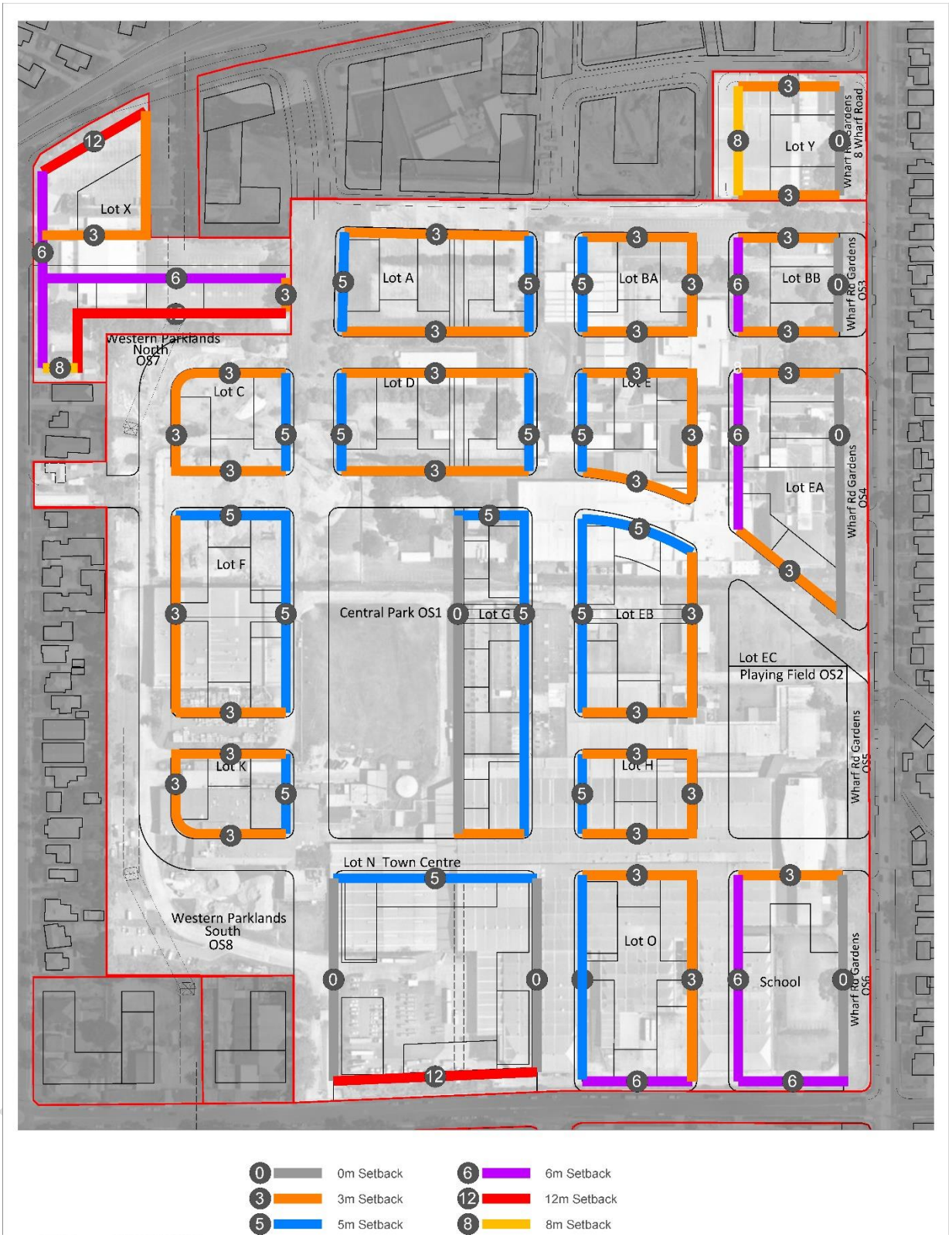
3pm Sun Study			
Area	Area in Sun (sqm)	Total Area (sqm)	Percentage in Sun (%)
1	10436	16013	65
2	9662	16341	59
3	551	5016	11
4	1818	11684	16

Cumulative Sun Access to Open Space

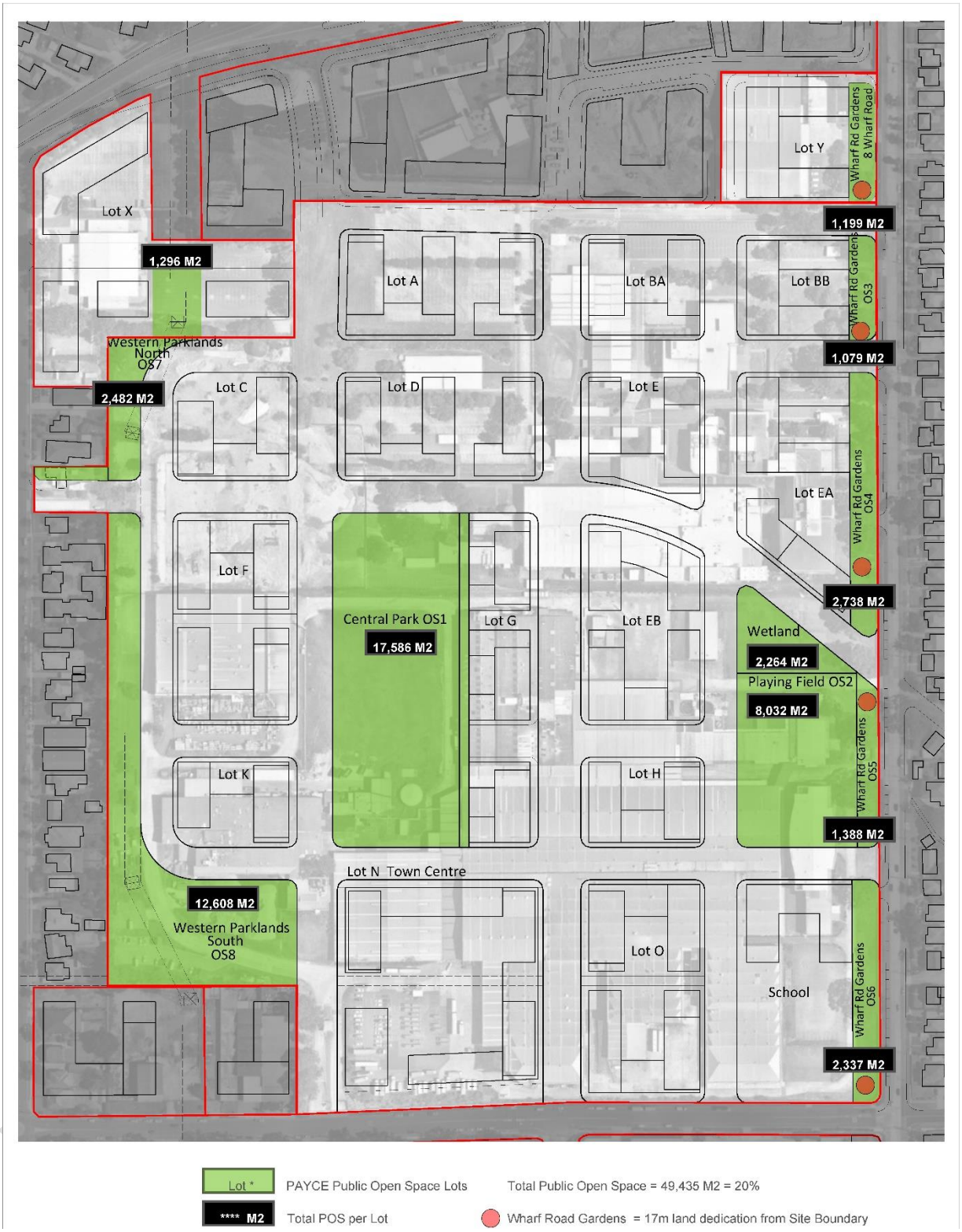
Cumulative Shadow Cast from Development to Open Space

Cumulative Sun Access to Public Open Spaces					
Area	Total Area	Max Sun Access Times	Total Area in Sun	Percentage in Sun	Total Area in Shadow
1	16013	12pm - 2pm	9921	62	6092
2	16341	11am - 1pm	10354	63	5987
3	5016	10am - 12pm	5016	100	0
4	11684	11am - 1pm	10266	88	1418

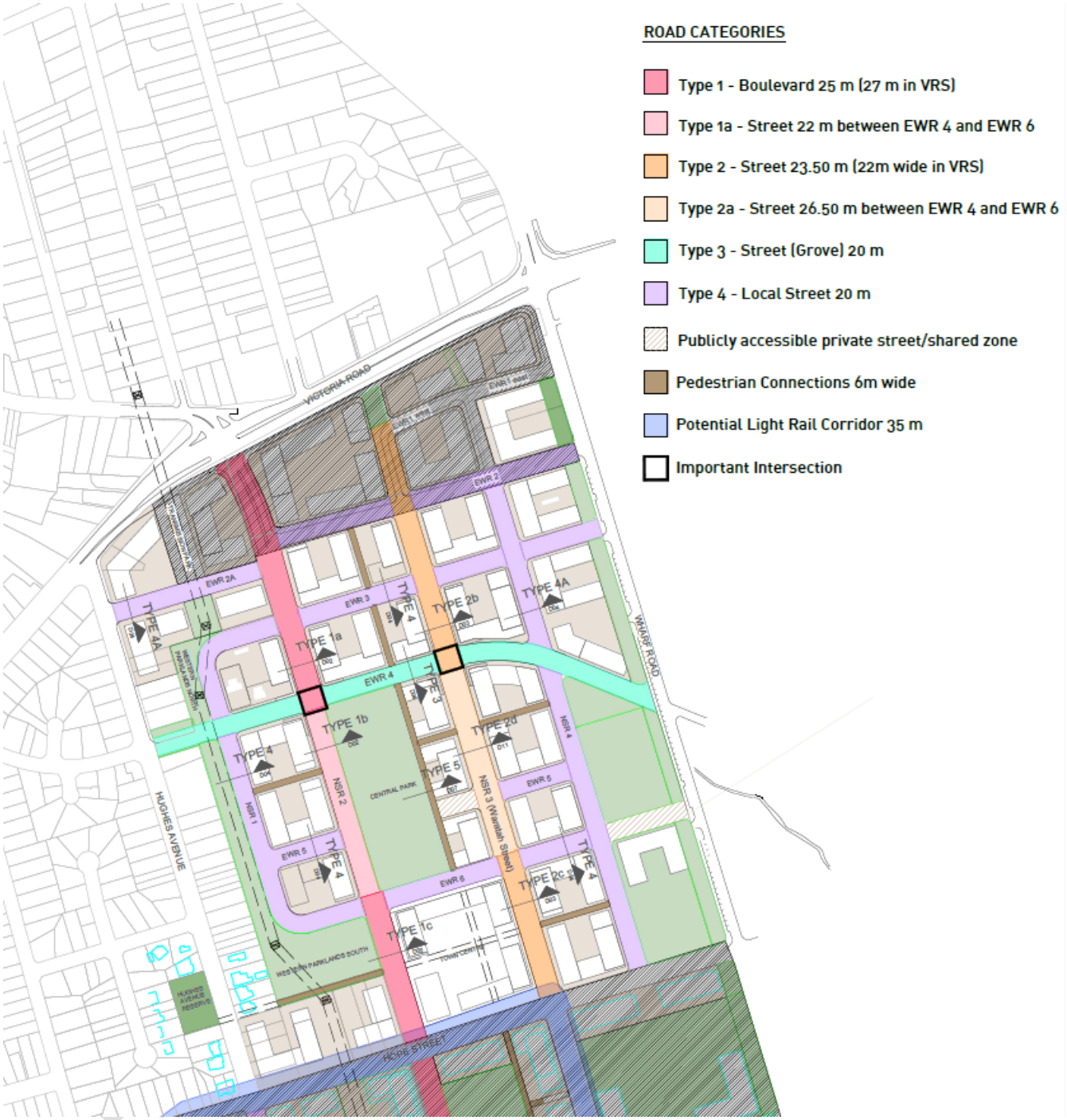
Appendix 4 – Building Setbacks



Appendix 5 – Public Open Space



Appendix 6 – Street Hierarchy



Appendix 7 – Street Schedule

City of Parramatta

Melrose Park North : Urban Design Public Domain Street Layouts

Author: VH **Rev: V5** **Date: 19.04.2021**

Melrose Park North RZ/1/2016 masterplan (Work in Progress)

S.No	Street / Pedestrian Connection name	Street / Pedestrian Connection Corridor Width	Direction	Proposed Street Nomenclature	Proposed Building Setback		Description of Elements in Road Reserve											
					W/N side of road corridor (whichever is applicable)	E/S side of road corridor (whichever is applicable)	Footway Width W/N (whichever is applicable)	Footway Width E/S (whichever is applicable)	Footpath W/N (whichever is applicable)	Footpath E/S (whichever is applicable)	Planting Beds W/N (whichever is applicable)	Planting Beds E/S (whichever is applicable)	Trees	Parking	Vehicular lanes	Bicycle Path/ Lane	WSUD Planter	Notes
Streets																		
1	NSR-1	20m	North South	XX Crescent	Western Parklands North and South	3m	4.2m	4.2m	2m	2m	Yes. 2.05m clear width	Yes. 2.05m clear width	Larger trees in Parking; smaller trees in planting beds	2.3m wide both sides	single lane 3.5 m wide, each way	No	Bio retention open tree pit for the smaller trees, WSUD treatment for tree in parking (planter or paving TBC)	
2	NSR-2 Typical (Type 1a)	25m	North South	XX Boulevard	5m typical along developments/ 0m at Western Parkland South opposite Town Centre	5m Typical	3.5m	3.5m	3.5m	3.5m	No	No	Larger trees in Parking; smaller trees in front setbacks, possible third row in footpath	2.6m wide both sides	Two 3.2 m wide lanes each way with buses plying on this street	No	For the tree in parking - either in planter or paving TBC Trees in verge to possibly have bio-retention tree pits	Bus Route on road. NSR 2 town centre has zero setback. Public domain on western side of street between EWR 4 and EWR 6, to possibly house a linear park with elements like seating spaces, exercise areas, games etc. in its footway width of 6.4 m.
	NSR-2 (Type 1b) between EWR 4 and EWR 6	22m				0m at Central Park	6.4m	3.4m		3.4m	Yes. Possible linear park		Larger trees in footpath on eastern side, and in verge on western side		Single 3.5 m wide lanes each way			
	NSR-2 (Type 1c) Town Centre Interface	25m				0m at Town Centre	3.5m	3.5m		3.5m	No		Larger trees in Parking; possible second row in western footpath		Two 3.2 m wide lanes each way OR single 3.5 m wide lanes each way with line marked median, depending on the connection to Hope Street. Buses ply on this street			
3	NSR-3	23.5m	North South	Waratah Street	5m overall / 0m at Town Centre	5m	6.25 includes cycleway	6.25 includes cycleway	1.8m	1.8m	Yes. 1.95m clear width	Yes. 1.95m clear width	Larger trees in Parking; smaller trees in between the footpath and the cycle track	2.3m wide both sides	single lane 3.2 m wide, each way	Yes - one way paired, separated bicycle paths - both sides having an assumed 2.5m wide bicycle corridor, 1.5m wide on both sides asphalted with a 1m concreted portion alongside to allow for people coming out of parked cars from the on-street parking lane	For the tree in parking - either in planter or paving TBC	NSR 3 Town Centre condition, town centre setback is 0m and development side is a 5m setback. 3m wider public domain on western side of street between EWR 4 and EWR 6. Total public area available (excluding the cycleway) is 6.75 and this can house a linear park with elements like seating spaces, exercise areas, games etc.
	NSR-3 (Type 2d) between EWR 4 and EWR 6	26.5m			5m		9.25 includes cycleway	6.25 includes cycleway	2m		Possible Linear Park							
4	NSR-4	20m	North South	XX Street	3m	6m for developments / Lot EC (Wetland) and playing field / 6m for school	4.2m	4.2m	2m	2m	Yes. 2.05m clear width	Yes. 2.05m clear width	Larger trees in Parking; smaller trees in planting beds. 3rd row of trees in 6m setback	2.3m wide both sides	single lane 3.5 m wide, each way	No	Bio retention open tree pit for the smaller trees, WSUD treatment for tree in parking (planter or paving TBC)	
5	Wharf road	existing road	North South	Wharf Road					3m shared path							Yes - shared		The shared path is desired to be 3m but is to be adjusted in width depending on future additional traffic lanes. Where possible, a 3m path should be put in and reduced where constrainsts exist. Bus route on road
6	EWR-2A	20m	East West	XX Street	3m	6m	4.2m	4.2m	2m	2m	Yes. 2.05m clear width	Yes. 2.05m clear width	Larger trees in Parking; smaller trees in planting beds	2.3m wide both sides	single lane 3.5 m wide, each way	No	Bio retention open tree pit for the smaller trees, WSUD treatment for tree in parking (planter or paving TBC)	The possibility of connecting the EWR-2A to NSR 2 needs to be explored. Levels could be an issue in trying to achieve this outcome. Layout and connection subject to final advice from Traffic.
7	EWR-3	20m	East West	XX Street	3m	3m	4.2m	4.2m	2m	2m	Yes. 2.05m clear width	Yes. 2.05m clear width	Larger trees in Parking; smaller trees in planting beds	2.3m wide both sides	single lane 3.5 m wide, each way	No	Bio retention open tree pit for the smaller trees, WSUD treatment for tree in parking (planter or paving TBC)	
8	EWR-4	20m	East West	XX Grove	3m	5m / lot EC (Wetland)	3m	6m	3m wide shared path	2m wide	no	in swale	Larger trees in Parking	2.3m wide both sides	single lane 3.2 m wide, each way	Yes - shared, on northern side of the street	Open Continuous Swale / Raingarden	
9	EWR-5	20m	East West	XX Street	3m	3m	4.2m	4.2m	2m	2m	Yes. 2.05m clear width	Yes. 2.05m clear width	Larger trees in Parking; smaller trees in planting beds	2.3m wide both sides	single lane 3.5 m wide, each way	No	Bio retention open tree pit for the smaller trees, WSUD treatment for tree in parking (planter or paving TBC)	
10	EWR-6	20m	East West	XX Street	3m Typical / Central Park / Playing Field	3m Typical / 5m at Town Centre	4.2m	4.2m	2m	2m	Yes. 2.05m clear width	Yes. 2.05m clear width	Larger trees in Parking; smaller trees in planting beds	2.3m wide both sides	single lane 3.5 m wide, each way	No	Bio retention open tree pit for the smaller trees, WSUD treatment for tree in parking (planter or paving TBC)	

Publicly accessible private street/ shared space -																	
11	Connection between G6/G4 and G8, links to EWR 3	20m	East West	xx Lane	3m	3m	possibly 4.2m	possibly 4.2m	possibly 2m	possibly 2m	yes	yes	Large trees along the sides	possibly yes	Shared lanes possibly 3.2 to 3.5m wide each way	No	Possibly Bio retention open tree pits for the trees	
12	Connection between Playing Field and School, links to NSR 4 and possibly Wharf Road	20m	East West	xx Lane	3m	3m	possibly 4.2m	possibly 4.2m	possibly 2m	possibly 2m	yes	yes	Large trees along the sides	possibly yes in a width of 2.3 m both sides	Shared lanes possibly 3.5m wide each way	No	Possibly Bio retention open tree pits for the trees	
Pedestrian Connections -																		
13	Pedestrian connection between A2-A4/A5 and links EWR2 and EWR 3	6m wide (12m building to building), extending street to street	North South	xx Lane		**Refer Masterplan Drawing A01 dated 19.04.2021 Rev M and Street Hierarchy Plan drawing L01 Rev K dated 16.04.2021** **Controls –** **The Pedestrian Connections are to be:** - Located as per the Masterplan - 24/7 publicly accessible - Extend from street to street or street to park - Open to sky (except at the mall) - Located within property boundaries on deep soil (preferably) and or on basement slab except one along central park which is located within the park boundaries. - Available for controlled access for light weight maintenance/service vehicles - Fully accessible using, in order of preference – - graded walkways (no steeper than 1:20) where possible; limited use of ramp system as per DDA; - 24/7 clearly visible publicly accessible lift service within the building structure, or - alternative options for approval; **The Pedestrian Connections are to have:** - View lines along lane easement to align across all blocks - Building to building separation as shown on the masterplan - A public path 3-6m wide (based on site situation and constraints) and the balance of the 12m, where applicable, with landscape and canopy trees - Trees in deep soil (preferably) or in set down slabs and planters to encourage and sustain large canopy trees as per ADG requirements including soil volumes, soil depth, irrigation and sub-soil drainage - Pedestrian lighting to provide safe 24/7 access using Council approved lane lighting types as per the PDG - Materials as per the PDG (TBC) - The Pedestrian Connections should provide secondary entry to the buildings and courtyards - Park edge north/south connection is to have: - A low wall located along the park edge within the 6m lane boundary assumption. This wall could occur on both sides of the path depending on levels difference between the park and private boundary. The wall is to be masonry, a minimum of 450mm wide and a suitable option for sitting. - Canopy trees within the pathway in a set down slab (if required) to define park edge - The North South connection is to align with shopping mall entrance and provide direct access to Hope Street through the mall as per the master plan. This connection should be fully accessible (based on principles described above) and should be accessible 24/7. - Where retaining walls are required they are to be located within property boundary (except along Central Park). - Landscaping, lighting and street furniture elements such as seating (formal and incidental) is to be developed as an overall design, and be strategically located, with particular recognition of the grades and sight lines across the site. - Fences, to courtyards adjoining the laneways, are to have a masonry base and be designed to provide views into the courtyards.	
14	Pedestrian connection between D3-D4/D5 and links EWR 3 and EWR 4	6m wide (12m building to building), extending street to street	North South	xx Lane														
15	Pedestrian connection between Central park and blocks G2, G3, G5, G6, G8 & G9; and links EWR 4 and EWR 6	6m wide, extending street to street	North South	xx Lane														
16	Pedestrian connection between F3 & F6 and F1 & F4, and links NSR 1 & NSR 2	6m wide (12m building to building), extending street to street	East West	xx Lane														
17	Pedestrian connection betweenG1/G3 and G5 and links NSR 3 and Central Park	6m wide (12m building to building), extending street to street	East West	xx Lane														
18	Pedestrian connection between EB1 & EB4 and EB3 & EB6, links NSR 3 & NSR 4	6m wide (12m building to building), extending street to street	East West	xx Lane														
19	Pedestrian connection between O1 & O4 and O3 & O6, links NSR 3 & NSR 4	6m wide (12m building to building), extending street to street	East West	xx Lane														
20	24/7 Pedestrian access connections through town centre as shown on the drawing	6m	North South	xx Place														
21	24/7 Pedestrian access connections through town centre as shown on the drawing	6m	East West	xx Place														
22	Pedestrian connection between Western Parklands south and lots P & Q; and links Hughes Avenue reserve (across Hughes avenue) and NSR 2	6m wide, extending street to street through lot along Hughes Avenue	East West	xx Lane														

ELEMENTS & MATERIALS :
All Footpaths - Concrete, as per Council's details (unless otherwise specified), widths as specified above.
Town Centre, Shops & Cafe Areas, and important intersections' Paving & Footpaths - Provision of Stone Paving to be investigated
Bicycle paths - Asphalt finish on concrete. Pavement markings and cross section as specified in CoP Bicycle facilities Design Guide (Draft) - To be forwarded to the applicants.
Shared Paths - Concrete. Pavement marking (TBC) to be as specified in CoP Bicycle facilities Design Guide.
Kerb and gutter - Concrete. Dimensions and arrangement as per Council's details.
Roads - Asphalt to Council's standard details; however, other materials to help reduce heat to be explored.
Water Sensitive Urban Design (WSUD) Details - To be worked out based on requirements noted above. **WSUD techniques** to follow best practice and be appropriate for site specific applications, in particular street grades, and approved by Manager DTSU.
Street Furniture - Placement of elements as per the Parramatta Public Domain Guidelines (PPDG)
Lighting Design & Light Pole types - To be confirmed based on detailed lighting plan of the Melrose Park North Precinct. Light pole locations in plan and spacing to be confirmed based on required lighting levels and luminaire type.
Tree Species - Selection to be informed by DCP building height, setback controls and subsequent solar access.
Tree Pits - All tree pits to be designed to include structural soil support systems e.g. 'Strata Vaults' and WSUD guided soil profiles, as specified.
All Fill in the public domain and on private lot deep soil to use constructed soil profile as approved by Manager DTSU.
Road Intersections - To be designed to suit usage and surrouding elements. These must have blisters at all intersections but these may be more extensive at important intersections. Designs may vary depending on pedestrian and bicycle requirements.
Pedestrian Laneways - To be fully accessible. Arrangement, materials and cross sections to be confirmed.
Retaining walls and Fences - To be designed to Council's satisfaction, and to be located in the private domain in their entirety.

ASSUMPTION:
Access to building car parking is always from the southern side of the building unless otherwise noted.

Appendix 8 – Stormwater Management Strategy

Melrose Park North Precinct – DCP & Masterplan – Design for Water Management–

Contents

Water Management Design - Overview

Urbanisation brings impermeable paving and roofing, replacing 'natural' landscapes. More rainwater runs off, and it runs faster. This substantially changes the catchment: flooding is increased, water and waterways become polluted, bushland degrades and there are numerous other impacts. Sustainable water management is required to counteract this.

Overland flow will traverse the VRS and Melrose Park precinct during severe storms. There is a catchment above Victoria Road that contributes to this overland flow.

At present overland flow and drainage across Melrose Park is informal but allows overland stormwater to be delayed on its passage through the site into the two key discharge points – Wharf Road, near Jennifer Park, and Hope Street.

Once the development is completed this overland flow will be unrestricted unless management measures are implemented to compensate for accelerated runoff, lower permeability and other factors that would otherwise increase flooding below the site.

In some cases, flooding can be alleviated by increased capacity of the downstream conveyance systems. However these options have proved impractical here.

The alternative to be used in Melrose Park is to implement stormwater/floodwater detention within the Melrose Park precinct so that peak discharges are reduced below predevelopment peak levels and at the same time Council's obligations regarding on site detention in the Parramatta River Catchment are met.

A system of private on site and public stormwater detention is required to ensure flooding downstream in the two catchments is not made worse by the Melrose Park precinct development.

This detention and flood peak management must occur for the range of storm/rainfall events up to the 1% AEP, and not just for the 1% AEP event alone.

Flood detention will not reduce the total volume of water flowing across the site but will delay and reduce its peak so that flood levels are kept below predevelopment levels at least up to the 1% AEP events.

There will be both private and public detention and water management systems operating side by side throughout the precinct.

Private On-Site-Detention (OSD) and Water Sensitive Urban Design (WSUD) will be provided within the privately owned sites for each development in accordance with the Upper Parramatta River Catchment Trust Handbook Edition 4. WSUD within the private sites will manage water quality as well as rainwater capture and use.

As a second system, Public OSD and WSUD will be provided within the road reserves where practicable, as well as playing fields, parks and other public lands. The primary purpose of the Public OSD systems is to ensure that flooding conditions are not exacerbated in existing development that lies downstream of the Melrose Park North Precinct for all storms up to 1% AEP in intensity. As a minimum, both overland and piped flows are to be detained in two surface detention systems which

are to be located in the open space areas which are to be provided adjacent to Wharf Road and Hope Street.

The roads will theoretically convey up to the 5% AEP flows in the pipes and between opposite kerbs. The 'public' 1% AEP flows above the 5% AEP flows will be conveyed across the whole road reserve width between property boundaries and in designed floodways if the road width is not sufficient.

Flood planning levels for buildings adjacent to the overland flow paths will be derived from the condition in a 1% AEP event where drainage pits and pipes are assumed to be not functioning and all flow is overland (100% blockage). Flood Planning Levels will include 0.5m freeboard.

Both the private and public WSUD systems must achieve the water quality targets set out in this Development Control Plan.

The development of the Parramatta LGA and Melrose Park itself requires integrating water management within the landscape and urban design using appropriate, sustainable technology.

This annexure provides technical guideline for water management for the whole Melrose Park North Planning Precinct. It applies to water management as follows.

Water Management Design Overall Principles

Flooding and Overland Flow Design Principles

DP 01. Assess and design for the safe conveyance (and detention) of overland flow through the site with protection of people, buildings and property during rainfall events of 1% AEP (100 year) plus 0.5m freeboard and up to Probable Maximum Precipitation Floods (PMP, PMF).[1]

DP 02. Design conveyance and detention of overland flow to ensure there is no worsening of flooding in a 1% AEP event anywhere as a result of the development of the precinct and there is no significant worsening of flooding in higher events up to the PMP/PMF anywhere as a result of the development

Stormwater conveyance and detention Design Principles

DP 03. Assess and design for the safe conveyance and detention of piped stormwater through the site with protection of people, buildings and property during rainfall events of 5% AEP – 1% AEP (20 – 100 year).[2]

DP 04. Attenuate stormwater discharges between 50% AEP events and 1% AEP events using OSD on private lots in order to reduce downstream environmental impacts.

Water Sensitive Urban Design Principles

DP 05. Maximise rainfall capture and use as an alternative water supply.

DP 06. Ensure runoff water quality is within acceptable limits using landscape integration and if necessary treatment technology

DP 07. Use water sensitive design to enhance the landscape

[1] Note riverine flooding does not directly affect the MP North precinct site but does affect the southern MP precinct, including the riverbank flow and stormwater discharge patterns in that area.

[2] As above

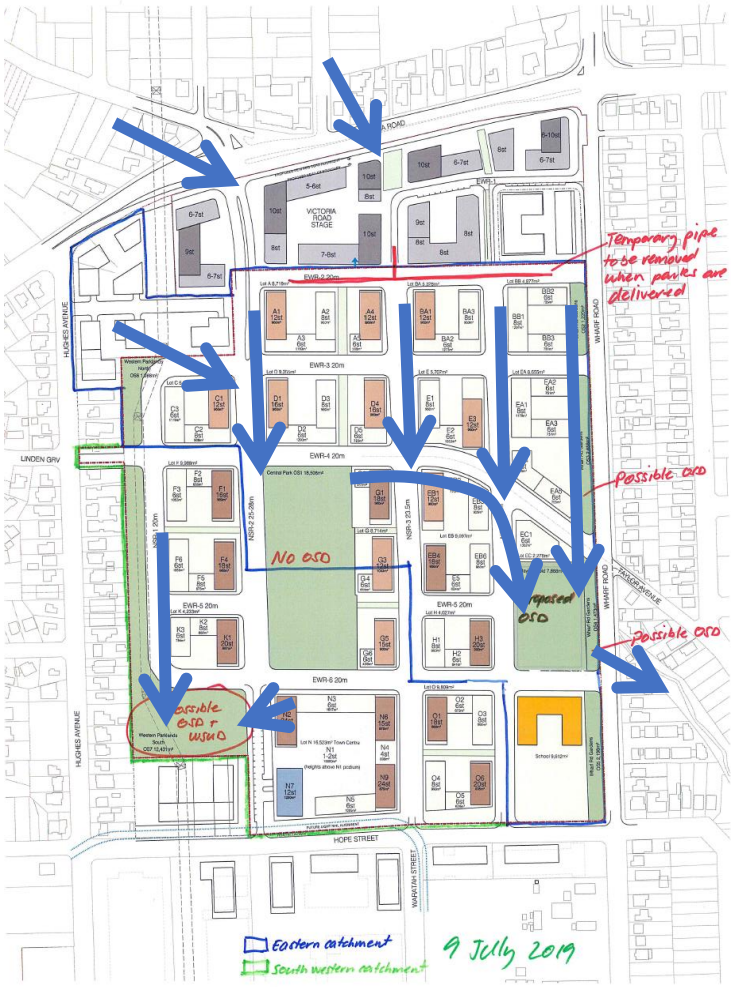
DP 08. Support tree canopies with rainwater and deep soil to increase evapotranspiration, urban heat reduction and to reduce uncontrolled runoff.
DP 09. Design, conserve and manage the environment to secure healthy waterways

These three aspects of the Water Management System work together as follows.

1. Flooding and Overland Flow

Design Principles

DP 01. Protect the community and developments from river flooding rising from Parramatta River and its tributaries /creeks.
DP 02. Protect the community and developments from overland flow flooding from rainfall up-slope of the site.
DP 03. Manage the risks for all floods up to the Probable Maximum Flood.
DP 04. Identify and manage overland flow paths and buildings and land affected by them.



Sketch of approximate overland flow paths and public detention basins.
For details refer Lyall and Associates drawings dated 5 November 2020 - Figure 6: *Indicative Extent and Depth of Inundation - Post-VRS and PP Development and Complete Blockage Conditions – 1% AEP* (9 sheets) (Included as attachment)

Design Controls – Overland flow flooding - assessment of flood behaviour

The following design controls are to be adopted for defining the nature of flooding under pre- and post-development conditions:

DC 01. A set of hydrologic and hydraulic models are to be developed of the catchments within which the Melrose Park North Precinct is located.

DC 02. The 'ensemble approach' prescribed in *Australian Rainfall and Runoff* (ARR) *2019* is to be adopted for deriving design discharge hydrographs for storms up to 0.2% AEP in intensity, while the 2003 update of the Bureau of Meteorology's *"The Estimation of Probable Maximum Precipitation in Australia: Generalised Short-Duration Method"* is to be used to derive estimates of Probable Maximum Precipitation.

DC 03. The hydraulic model is to incorporate all of the features which influence flood behaviour in the study catchments, including details of the existing stormwater drainage system.

DC 04. Blockage factors of 20% and 50% are to be applied to on-grade and sag type inlet pits, respectively when designing major/minor drainage systems.

DC 05. Flood and stormwater behaviour is to be defined for design storms with AEPs of 5% and 1%, as well as the Probable Maximum Flood (PMF).

DC 06. Steady-state design discharge hydrographs are to be adopted for defining the maximum rate at which flow will discharge from each individual super lot within the Melrose Park North Precinct under post-development conditions. This flow rate is to be based on the OSD calculations which are referred to in this document and is to be adopted when defining flood behaviour under post-development conditions for storms up to 0.2% AEP in intensity. Uncontrolled flow from each super lot is to be adopted when defining flood behaviour for more intense storm events (for example, the PMF event).

DC 07. The impact that a potential increase in design 1% AEP rainfall intensities associated with future climate change is to be assessed. The assessment is to be in accordance with the NSW Department of Planning, Infrastructure and Environment's floodplain risk management guideline entitled "Practical Considerations of Climate Change". Design storms of 0.5% and 0.2% AEP may respectively be adopted as being analogous to Representative Pathway Concentration 4.5 and 8.5 increases in 1% AEP design rainfall intensities under year 2090 conditions for the purpose of the assessment, noting that the assessment need only be undertaken for post-development conditions.

DC 08. An assessment is to be undertaken into the impact a complete blockage of the existing and proposed piped drainage system in the vicinity of the Melrose Park North Precinct would have on flood behaviour for a 1% AEP storm event, as well as its implications on the proposed developments.

DC 09. When modelling to determine flood levels and flood planning levels with respect to overland flow, the analysis and modelling of the overland flow paths must be with 2D modelling such as Tuflow, and must assume all flow is overland, while piped reticulation is fully blocked and not contributing to conveyance.

DC 010. This modelling must also assume on site detention is fully functional within the private lots and that such flows are discharging on to the surfaces of roads etc.

DC 011. For this purpose overland flow flood levels, flow rates, patterns and extents may be assumed to be those shown in the Lyall and Associates drawings dated 5 November 2020 - Figure 6: *Indicative Extent and Depth of Inundation - Post-VRS and PP Development and Complete Blockage Conditions – 1% AEP* (9 sheets) (Included as attachment)

DC 012. The Flood Planning Levels shall be the adjacent interpolated 1% AEP flood levels (100% blocked) plus 0.5m freeboard.

DC 013. Minimum finished floor levels must be the respective Flood Planning Levels as defined above. There must be no habitable rooms / floors below the applicable flood planning level, including residential, retail, community use and offices.

DC 014. Non-habitable rooms/floors as may be determined by Council, such as car parks, waste and loading docks, plant rooms and the like, may be constructed below the applicable Flood Planning levels, provided such floors are protected by the building design from inundation by overland flow up to the applicable Flood Planning Level(s).

DC 015. Council may require a sensitivity analysis for the effects of climate change.

2. Stormwater conveyance and detention

Design Principles – stormwater conveyance and detention - overall

DP 01. Manage and moderate stormwater flow across the catchment to minimise the effects of urbanisation, which include: increased amount of runoff, shorter times of concentration, faster and deeper overland flows, erosion and flooding.

DP 02. Manage and moderate stormwater flow from individual sites to compensate for increased impervious areas and faster conveyance systems, using on site detention, WSUD, deep soil, permeability and other measures.

DP 03. Provide effective, safe conveyance of stormwater across the catchment using planned and managed overland flow paths, trunk and local drainage.

DP 04. Provide sustainable management, conveyance and detention of stormwater within the Public Domain

DP 05. Mitigate floods.

DP 06. Melrose Park North requires a combination of on-site detention within the private lots and stormwater detention basins in the public domain to sufficiently attenuate flows prior to discharge from the precinct. These two systems must be designed to work together hydraulically in a full range of design storms.

DP 07. Stormwater from the private lots must be attenuated using OSD in accordance with this DCP and generally in accordance with catchment management criteria advised by the Upper Parramatta River Catchment Trust in their Edition 4 OSD Design Handbook.

DP 08. The two planned public stormwater detention basins (and any others) receive this attenuated stormwater from the private lots, plus stormwater runoff from roads and public lands, and must moderate these inflows to ensure discharges from the Melrose Park North precinct do not worsen flooding in a 1% AEP event (cluster) and do not *significantly* worsen flooding for *any* rainfall events up to the Probable Maximum Precipitation.

Design Principles – Stormwater conveyance and detention - private land

Council has identified the following design criteria which is to be adopted in the design of the Private OSD systems, noting for OSD on private land that it is generally in accordance with the Fourth Edition Upper Parramatta River Trust's (**UPRCT's**) On-site Stormwater Detention Handbook (**UPRCT Edition 4**).

The design principles for stormwater conveyance and detention within private land are:

DP 01. To ensure that new developments and redevelopments do not increase peak stormwater flows in any downstream area during major storms up to 1% AEP in intensity.

DP 02. To reduce post-development peaks throughout the catchment in a 50% AEP storm event to be as close to natural levels as practical and

DP 03. To encourage the integration of OSD with other water quality WSUD measures.

DP 04. To prevent any increase in the site discharge to the downstream drainage system nor reduction in the volume of storage provided unless specifically allowed in the following sections or for rainwater storage.

Design Objectives - Stormwater detention and conveyance - private land

The objectives of Stormwater detention and conveyance - private land shall be to:

DO 01. To limit flow peaks throughout the catchment in a 1% AEP storm event, to estimated peak flows under 1999 conditions, even if the further development of the catchment is equivalent to full medium/high density redevelopment throughout the catchment thereby preventing any increase in downstream peak flows resulting from new developments or redevelopments by temporarily storing on-site the additional and quicker runoff generated;

DO 02. Prevent increases in downstream flooding and drainage problems that could:

a) increase flood losses;
b) damage public assets;
c) reduce property values;
d) require additional expenditure on flood mitigation or drainage works.

DO 03. Reduce post-development peaks, throughout the catchment, in the 50% AEP storm event to as close to natural levels as practical;

DO 04. Encourage integration of OSD systems into the architectural design and layout of the development so that adequate storage areas are included in the initial stages of the site design;

DO 05. Encourage integration of the OSD facilities into a sustainable overall water management plan for the site;

DO 06. Require construction supervision of OSD systems by the OSD designer to improve construction standards.

Design Controls Stormwater conveyance and detention - private land

DC 01. The private lot stormwater drainage system (including surface gradings, gutters, pipes, surface drains and overland flow paths) for the property must:

a) be able to collectively convey all runoff to the OSD system in a 1% AEP storm event with a duration equal to the time of concentration of the site; and
b) ensure that the OSD storage is by-passed by all runoff from neighbouring properties and any part of the site not being directed to the OSD storage, for storms up to and including the 1% AEP storm event.
c) direct all site runoff to the Private OSD. That is the storage is 'on-line'.

DC 02. The Private OSD is to have two orifices (or other) outlets and a non-piped overflow spillway;

DC 03. The primary or lower orifice or controlled discharge must have a SRD_L of 40 L/s/ha. This must be located as close as possible to the storage invert;

DC 04. A secondary orifice must be provided located at the base of a discharge control pit (DCP) providing HED with a SRD_U of 150 L/s/ha;

DC 05. SRD_L (40 L/s/ha) and SRD_U (150 L/s/ha) may need to be adjusted in accordance with the procedures set out in UPRCT ED 4 Section 5.1 when the entire site cannot be drained to the storage.

DC 06. The crest of the DCP must be designed to be at the water level of the 50% AEP storm event when the volume in the lower storage (SSR_L) reaches 245 m^3/ha;

DC 07. The secondary orifice must operate from when the water level in the storage exceeds the crest level and water starts to overflow into the DCP;

DC 08. A non-piped spillway, of suitable length must be provided to prevent flooding of neighbouring lands if the OSD outlets become blocked. This overflow must be located at the top of the storage (i.e. at 396 m^3 /ha).

DC 09. The SSR_T and SSR_L are only adjusted if a rainwater tank is included in the development / redevelopment and an airspace "credit" is claimed to partially offset the SSR.

DC 010. The site area to be adopted for sizing the Private OSD systems in the individual super lots is to include half of the adjacent road reserve, appreciating that the portion of the site area which is not controlled by each individual Private OSD system may exceed the permissible 30% rule.

DC 011. Unless otherwise advised by Council, Version 9 of the UPRCT Edition 4 OSD calculation sheet shall be used for sizing the various components of the Private OSD systems.

DC 012. Guidelines to assist in determining depths and frequencies of ponding for different classes of storages are given in Table 6.1 of UPRCT Edition 4. It is emphasised that these are general guidelines that will be varied according to the nature of the development and the location of the storage.

DC 013. In general, the maximum depth of ponding in above ground storages is 600 mm.

DC 014. Council may approve deeper ponding in individual cases where the applicant demonstrates that safety issues have been adequately addressed. For example, warning signs and fencing must be installed where the depth exceeds 600 mm or the ponding is adjacent to pedestrian traffic areas.

DC 015. Surface storages should be constructed so as to be easily accessible, with gentle side slopes permitting walking in or out. A maximum gradient of 1(V):4(H) (i.e. 1 vertical to 4 horizontal) will be required on at least one side to permit safe egress in an emergency. Where steep or vertical sides are unavoidable, due consideration should be given to safety aspects, such as the need for fencing or steps or a ladder, both when the storage is full and empty.

DC 016. Balustrades (fences) must comply with the Building Code of Australia (See Section D2.16 of the Code), while safety fences should comply with the Swimming Pool Act 1992. Fencing must not obstruct overland flow and floodwaters.

Private OSD System Glossary[3]

Detention storage	Detention devices capture and temporarily store stormwater runoff during major (infrequent) storm events. Stormwater is then discharged to the drainage system at a controlled rate. Detention devices act to mitigate potential downstream flooding impacts.
Extended Detention storage	The lower portion of the OSD storage, which detains stormwater in smaller, frequent storms up to the 50% AEP event in order to reduce stormwater runoff closer to the rates under natural, pre-development conditions. This helps

[3] From UPRCT OSD Handbook Edition 4.

	minimise damage and disturbance to downstream watercourses and aquatic ecosystems.
Flood Detention storage	The upper portion of the OSD storage that detains stormwater to prevent any increase in downstream flooding in moderate to major storms. Water held in the Flood Detention storage drains away through both the primary and secondary orifice outlets.
PSD	Permissible Site Discharge - the maximum allowable discharge leaving the site in litres/sec/hectare (L/s/ha)
SRD_L	the Site Reference Discharge from the extended detention storage in litres/sec/hectare (L/s/ha), or in litres/sec (L/s) when applied to a specific site, when the volume of runoff stored in the extended detention storage equals the SRD_L. In the case of the Melrose Park North Precinct, the SRD_L has been set at 40 L/s/ha.
SRD_U	the Site Reference Discharge from the DCP that receives stormwater when the volume of runoff exceeds the volume of the extended detention storage in litres/sec/hectare (L/s/ha), or in litres/sec (L/s) when applied to a specific site. The site reference discharge occurs when the DCP is completely filled and HED conditions are established at the commencement of flood detention. In the case of the Melrose Park North Precinct, the SRD_U has been set at 150 L/s/ha.
SSR_L	the minimum volume (in m^3/hectare or in m^3 when applied to a specific site) required for the lower Extended Detention storage when the outflow is restricted to the SRD_L. In the case of the Melrose Park North Precinct, the SSR_L has been set at 245 L/s/ha.
SSR_T	the total volume (in m^3/hectare or in m^3 when applied to a specific site) required for overall storage (combined Extended Detention storage and Flood Detention storage) when outflows occur through the primary and secondary orifice outlets. In the case of the Melrose Park North Precinct, the SSR_T has been set at 396 L/s/ha.

Public stormwater detention systems

Council has identified the following design criteria which are to be adopted in the design of the Public stormwater conveyance and detention systems, noting that it is generally in accordance with the latest addition of Australian Rainfall and Runoff (**ARR 2019**).

Design Principles - Stormwater Conveyance and Detention - Public Domain

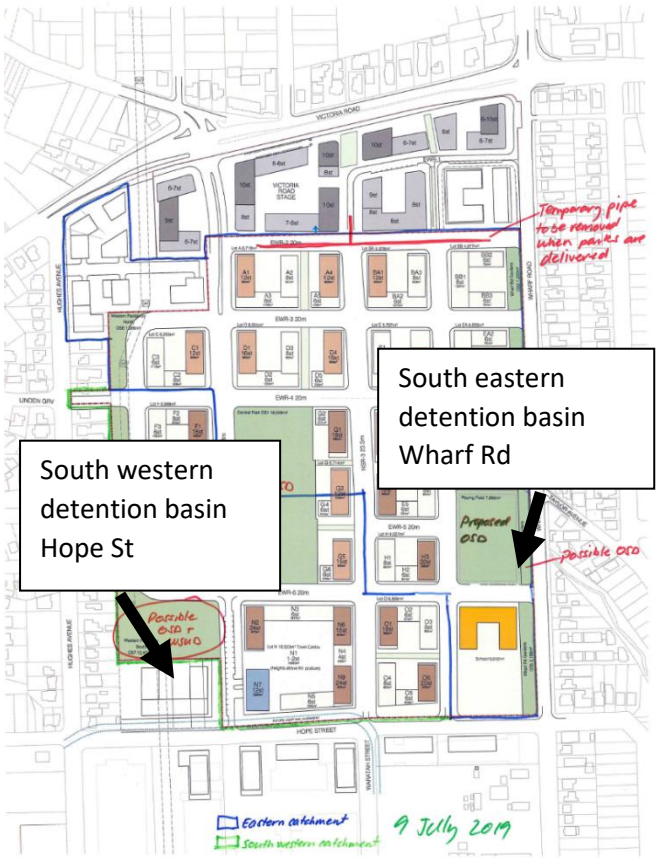
The objectives of the Public OSD systems which are to be incorporated in the Melrose Park North Precinct are to ensure that:

DP 01. Flooding conditions and risks must not be worsened anywhere for all storms up to 1% AEP in intensity.

DP 02. Flooding conditions and risks must not be *significantly* worsened anywhere for storms that are more intense than 1% AEP up to the Probable Maximum Precipitation.

DP 03. Safety, amenity, aesthetic and ecological values affected by the detention systems are satisfactory.

DP 04. Detention infrastructure can readily be maintained in perpetuity



Design Controls - Stormwater Conveyance and Detention - Public Domain

DC 01. Two locations are identified for public domain, above ground detention: South East (Wharf Rd) and South West (Hope St) (see map).

DC 02. Central Park is not to be used for any detention purposes.

DC 03. Sufficient area[4] must be provided for above ground detention purposes within the public domain of the northern precinct of Melrose Park assuming max depths of 300mm – 600mm.

DC 04. south eastern catchment 8200 m^2 [5]

DC 05. south western catchment 2200 m^2 [6]

DC 06. To this is to be added sloping sides, inflow and outflow swales etc.

DC 07. Both, proposed playing fields/open space are in suitable locations and of appropriate size to be used for stormwater detention purposes.[7]

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[4] Estimated at approximately 10,400m^2 but this is to be verified.

[5] To be verified

[6] To be verified

[7] Area estimated at approx. 7,800m^2 – to be verified

DC 08. Unless otherwise approved by Council, both basins shall be designed as a dry basins, with low level inundation potentially occurring statistically every 18 months (approx.) and will remain temporarily wet (for a few hours) after a triggering rain event.

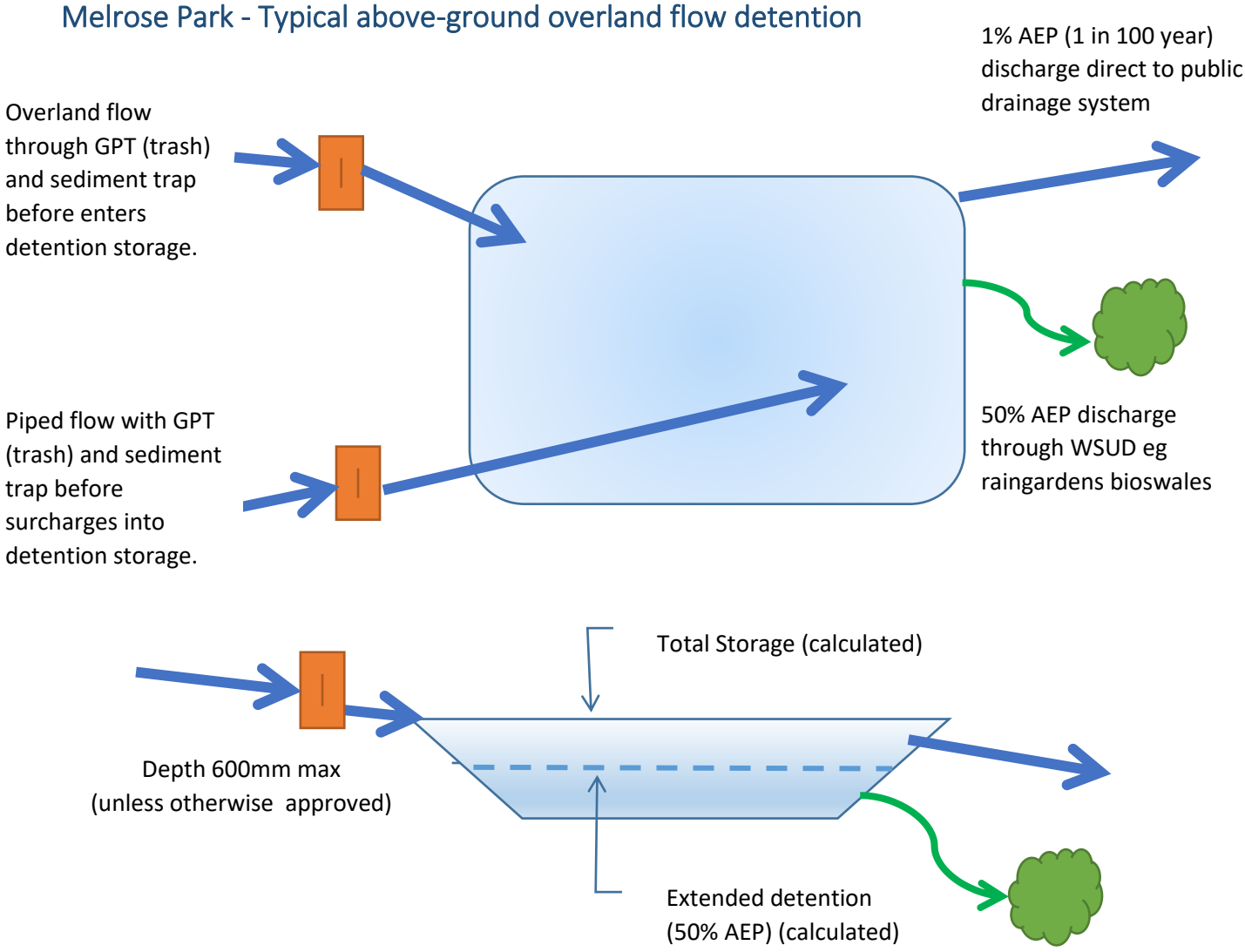
DC 09. The depth of the basins will be 300mm up to 600mm before they overflow and they must not pose a safety hazard or affect overall usability of the playing field.

DC 010. To achieve the required detention volume it is possible that a portion of the Western Parklands South (high voltage power lines corridor) could be utilised for both detention and WSUD purposes in addition to the playing fields.

DC 011. It may also be possible to utilise some of the Wharf Road Gardens for detention if required.

DC 012. Large diameter (approx. 3m) temporary pipes will be laid under EWR-2 to manage and detain stormwater flowing from the catchment north of the VRS and from the VRS itself until the new open space areas' detention basins are delivered, at which time it will be decommissioned.

Melrose Park - Typical above-ground overland flow detention



3. Water Sensitive Urban Design - Rainfall use and water quality, enhancing the landscape and healthy waterways

Design Principles - WSUD

DP 01. In the Melrose Park North developments must implement Water Sensitive Urban Design (WSUD).

DP 02. WSUD is planning that improves the liveability, resilience, sustainability and productivity of a development.

DP 03. A water sensitive stormwater system must be designed to minimise the impact of urban development on the catchment, by improving the quality and quantity of stormwater runoff as well as providing ancillary benefits.

DP 04. Such a WSUD system may contribute to aspects such as biodiversity, reduction of potable water use, carbon sequestration, habitat provision, amenity, community engagement in water resource management and reduction of urban heat island effect.

DP 05. To protect and enhance natural water systems (creeks, rivers, wetlands, estuaries, lagoons, groundwater systems etc.).

DP 06. To improve water quality of stormwater runoff from urban catchments.

DP 07. To minimise harmful impacts of urban development upon water balance and surface and groundwater flow regimes.

DP 08. To integrate stormwater management systems into the landscape in a manner that provides multiple benefits, including water quality protection, enhancement of natural ecosystems, stormwater retention/detention, water recycling and recreational and visual amenity.

DP 09. To improve water security by using stormwater as a resource to substitute potable water demand.

Design Objectives – WSUD

DO 01. Capture and use rainwater in place of mains water

DO 02. Use Water Sensitive Urban Design principles to manage water, particularly for rainfall events less than 1 in 6 months probability.

DO 03. Implement successful Water Sensitive Urban Design and Stormwater Quality improvements for the public domain.

DO 04. Implement successful Water Sensitive Urban Design and Stormwater Quality improvements for private developments.

Design Controls - WSUD:

DC 01. WSUD principles are to be integrated into the development through the design of the stormwater systems and landscaping scheme and in the orientation of the development rather than relying on 'end of pipe' treatment devices prior to discharge.

DC 02. Some options for WSUD measures at Melrose Park include:

a) Vegetated and grassy swales
b) Vegetated filter and buffer strips,

c) Wetlands,
d) Sand and gravel filters (depending on indigenous soil suitability),
e) Bio-retention systems,
f) Permeable/Porous Pavements,
g) Infiltration Basins,
h) Rainwater Tanks,
i) Gross Pollutant Traps and Filters,
j) Passive watering systems for landscaped areas,
k) Additional deep soil areas,
l) Naturalised watercourses,
m) Rain gardens,
n) 'End of pipe' proprietary treatment devices (these must be used in conjunction with other landscape integrated measures to provide ancillary social, environmental and economic benefits).

This is not an exclusive list and Council does not specify particular measures for particular types of development. These measures are typically employed in a 'treatment train' to maximise the range of pollutants removed.

DC 03. Development is to be sited and designed to minimise disturbance of natural watercourses and overland flow paths.

DC 04. Impervious surfaces are to be minimised and soft landscaping with deep soil and tree planting extensively used to promote infiltration, evapotranspiration and reduced stormwater run-off.

DC 05. WSUD elements should be located and configured to maximise the impervious area that is treated.

a. WSUD must be adopted for the following development types:
b. Residential on lots greater than 1500m^2 or with 5 or more dwellings.
c. Commercial and Industrial – development, redevelopment and alterations/additions which increase gross floor area by more than 150m2 or alter and/or add more than 150m2 of impervious area. (Approach to WSUD will vary depending on lot size.)
d. Subdivisions of Industrial/commercial properties.
e. Subdivision of residential properties where the existing lot is greater than 1500m^2 or 5 or more lots are being created.
f. Other development >$50k in value which exceeds <u>either</u> of the following criteria:

DC 06. Development which alters and/or adds more than 150 m^2 of impervious area

DC 07. Development which results in an increase in gross floor area of more than 150 m^2

DC 08. WSUD systems shall generally be designed to treat storm events up to the 1 in 6 month Average recurrence interval. Low flows of this frequency must be separated from higher flows that will be diverted into OSD and other stormwater quantitative management systems.

DC 09. The WSUD strategy must achieve the following pollution reduction targets:

DC 010. Pollutant	**DC 011. Performance Target**
	DC 012. % reduction in the post development mean annual load of pollutant

Gross Pollutants (greater than 5mm)	90%
Total Suspended Solids (TSS)	85%
Total Phosphorus (TP)	60%
Total Nitrogen (TN)	45%
Hydrocarbons, motor oils, oil and grease	90%

NOTE: Reductions in loads are relative to the pollution generation from the same development without treatment.

DC 013. The post development mean annual runoff volume from the entire site must be reduced by at least 10% from that pre-development. This may be achieved with rainwater tanks, infiltration into deep soil, minimising impervious areas, using permeable paving and other methods.

DC 014. Rainwater is a valuable water resource to be harvested and used if possible.

DC 015. The receiving waterway must be protected and enhanced.

DC 016. Where water sensitive urban design measures are required**,** DA lodgement must be supported by the following documentation:

a) A WSUD strategy report, describing the treatment train including all measures used, justification for this selection and a summary of design ancillary benefits.

b) MUSIC software modelling (or equivalent) to demonstrate that the proposed WSUD strategy achieves the required pollution reduction targets. Both a written summary of the assumptions, configuration and results of the model, and a digital copy of the model file must be submitted.

c) The above documentation must be prepared by a qualified hydraulic/environmental engineer in consultation with the project landscape and architectural professionals.

DC 017. Council requires simple WSUD landscape designs that achieve water management objectives without unusual or complicated maintenance demands.

DC 018. The DA must be accompanied with a management and maintenance Plan for the WSUD biological and landscape facilities for both establishment phase (3-5 years) and the long term phase.

DC 019. The DA must be accompanied with a Management and Maintenance Plan for the WSUD proprietary treatment devices (such as GPT's, filters etc).

DC 020. The Applicant must also provide evidence to Council that they have signed a minimum 3 year contract with a suitable maintenance contractor to carry out ongoing maintenance of the water treatment facilities and technology installed on site.

4. Resources and Further Information

Australian Disaster Resilience Handbook 7, Managing the Floodplain: A Guide to Best Practice in Flood Risk Management in Australia (AIDR 2017), Australian Government

Australian Runoff Quality, Engineers Australia 2005

Melbourne Water, https://www.melbournewater.com.au/planning-and-building/stormwater-management

Ball J, Babister M, Nathan R, Weeks W, Weinmann E, Retallick M, Testoni I, (Editors) Australian Rainfall and Runoff: A Guide to Flood Estimation, © Commonwealth of Australia (Geoscience Australia), 2019.

Book 9: Runoff in Urban Areas: Coombes, P., and Roso, S. (Editors), 2019 Runoff in Urban Areas, Book 9 in Australian Rainfall and Runoff - A Guide to Flood Estimation, Commonwealth of Australia, © Commonwealth of Australia (Geoscience Australia), 2019.

CRC for Water Sensitive Cities, https://watersensitivecities.org.au/

Facility for Advancing Water Biofiltration 2008, Guideline Specifications for Soil Media in Bioretention Systems

Floodplain Development Manual NSW

Flood Emergency Planning for Disaster Resilience, Australian Institute for Disaster Resilience, First Edition 2020

Melrose Park Flooding and Drainage Investigation – VRS and PP Development Sites – Lyall and Associates, 5 November 2020 - Figure 6: *Indicative Extent and Depth of Inundation - Post-VRS and PP Development and Complete Blockage Conditions – 1% AEP* (9 sheets) (Included as attachment)

MUSIC Modelling Guidelines for New South Wales - eWater Cooperative Research Centre 2009

South East Queensland Healthy Waterways Partnership 2010, Water by Design Guidelines and Resources - http://waterbydesign.com.au/guidelines/

Water Sensitive Planning Guide - www.wsud.org

Water Sensitive Urban Design Engineering Procedure: Stormwater, Melbourne Water.

Water Sensitive Urban Design Technical Guidelines for Western Sydney (UPRCT, 2004) - www.wsud.org/tech

Council Resources:

Parramatta DCP 2011

City of Parramatta Council, Stormwater Disposal Policy

City of Parramatta Council, Development Engineering guidelines June 2018

Upper Parramatta River Catchment Trust Handbook, Edition 4.

Attachment

Melrose Park Flooding and Drainage Investigation – VRS and PP Development Sites – Lyall and Associates, 5 November 2020 - Figure 6: *Indicative Extent and Depth of Inundation - Post-VRS and PP Development and Complete Blockage Conditions – 1% AEP* (9 sheets)

Indicative Depth of Inundation (m)

- < 0.05
- 0.05 to 0.10
- 0.10 to 0.20
- 0.20 to 0.30
- 0.30 to 0.40
- 0.40 to 0.50
- 0.50 to 0.60
- 0.60 to 0.70
- 0.70 to 0.80
- 0.80 to 0.90
- 0.90 to 1.00
- > 1.00

REFER SHEET 2
REFER SHEET 3
REFER SHEET 4
REFER SHEET 5
REFER SHEET 6
REFER SHEET 7

COWELL'S LANE RESERVE
BARTLETT STREET
DELAWARE ROAD
MARSDEN ROAD
WINBOURNE STREET
BRUSH ROAD
DARVALL ROAD
WEST RYDE
VICTORIA ROAD
CITY OF RYDE COUNCIL
HAY STREET
BENNETT STREET
MOSS STREET
DARWIN STREET
HUXLEY STREET
DEAKIN STREET
HIBBLE STREET
CONSTITUTION ROAD
REX STREET
FEDERAL ROAD
ADELAIDE STREET
MEADOWBANK LANE
ANDREW STREET
MEADOWBANK
CROWLEY CRESCENT
RYDE PARRAMATTA GOLF CLUB
ARCHER CREEK
COBHAM AVENUE
LANCASTER AVENUE
WHARF ROAD
WARATAH STREET
PARRAMATTA RIVER
COWELLS LANE
WILLIAM STREET
FITZGERALD ROAD
KISSING POINT ROAD
ERMINGTON
SILVERWATER ROAD
STEVENS STREET
PARKES STREET
MACARTHUR STREET
CITY OF PARRAMATTA COUNCIL
VICTORIA ROAD
TURNER STREET
TRUMPER STREET
ATKINS ROAD
HUGHES AVENUE
HOPE STREET
MELROSE PARK
SPURWAY STREET
MARGUERETTE STREET
SPOFFORTH STREET
BORONIA STREET

N

80 0 80 160 240

Scale: 1:8,000

LEGEND

- LGA Boundary
- Modelled Stormwater Drainage Network
- Two-Dimensional Model Extent
- Proposed VRS Development Site
- Proposed PP Development Site
- Proposed VRS and PP Road Design

Lyall & Associates

MELROSE PARK STORMWATER DRAINAGE STRATEGY

Figure 6
(Sheet 1 of 7)

INDICATIVE EXTENT AND DEPTH OF INUNDATION
POST-VRS AND PP DEVELOPMENT AND COMPLETE BLOCKAGE CONDITIONS - 1% AEP

Indicative Depth of Inundation (m)

- < 0.05
- 0.05 to 0.10
- 0.10 to 0.20
- 0.20 to 0.30
- 0.30 to 0.40
- 0.40 to 0.50
- 0.50 to 0.60
- 0.60 to 0.70
- 0.70 to 0.80
- 0.80 to 0.90
- 0.90 to 1.00
- > 1.00
- Flow Direction Arrow

WILLIAM STREET
FITZGERALD ROAD
KISSING POINT ROAD
VICTORIA ROAD
ERMINGTON
LOT AC
LOT AD
LOT AB
LOT AA
LOT BA
LOT A
MELROSE PARK
CITY OF PARRAMATTA COUNCIL
HUGHES AVENUE
JOINS SHEET 3
JOINS SHEET 4
JOINS SHEET 5
0.50
0.01
0.02
0.25
1.07
0.09
1.28
0.34
0.21
1.16
0.12

N
10 0 10 20 30 m
Scale: 1:1,000

Lyall & Associates

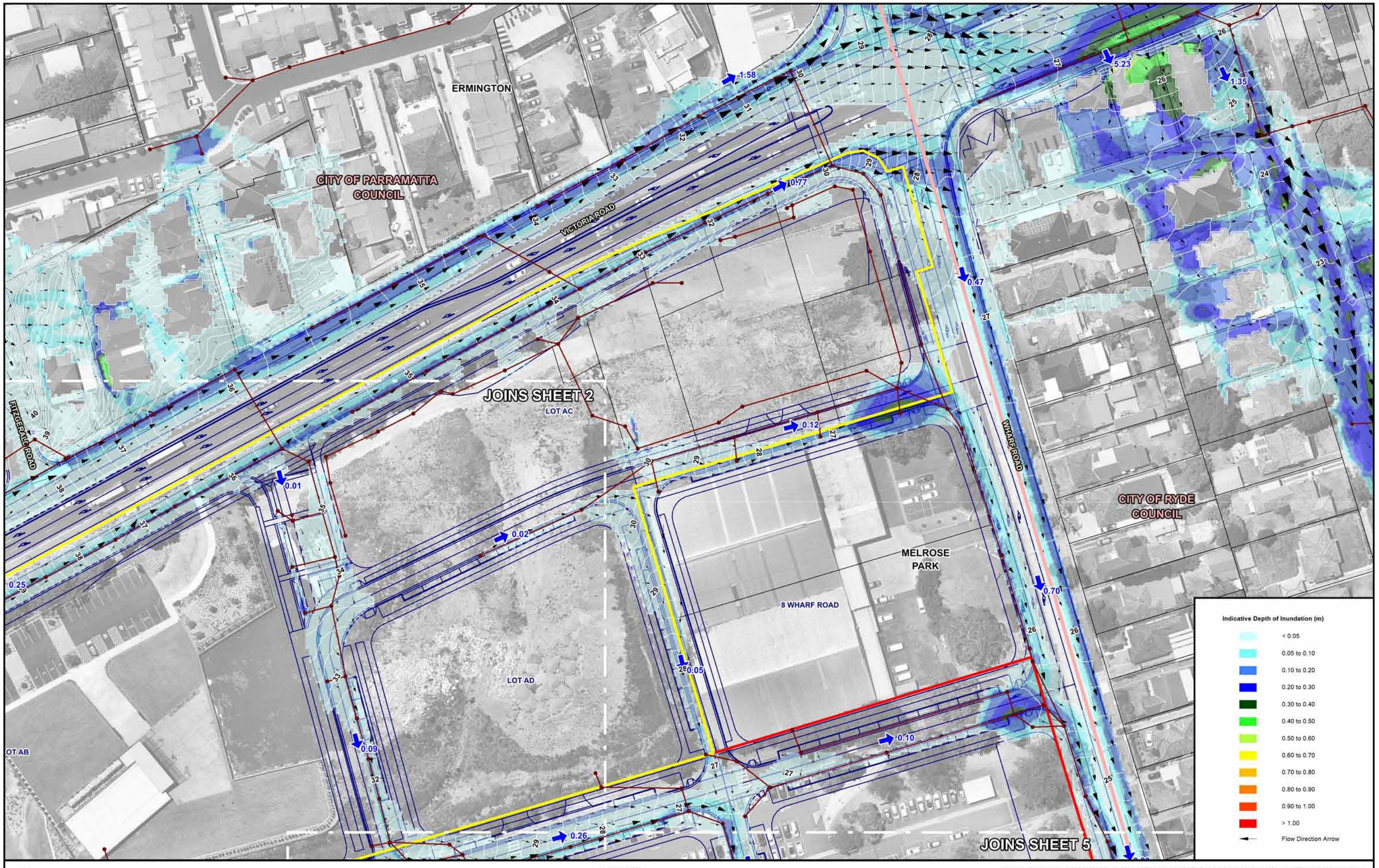
LEGEND

- LGA Boundary
- Modelled Stormwater Drainage Network
- Two-Dimensional Model Extent
- Water Surface Elevation Contours (0.2m Interval)
- Proposed VRS Development Site
- Proposed PP Development Site
- Proposed VRS and PP Road Design
- 1.58 Peak Overland Flow (m³/s)

MELROSE PARK STORMWATER DRAINAGE STRATEGY

Figure 6
(Sheet 2 of 7)

INDICATIVE EXTENT AND DEPTH OF INUNDATION
POST-VRS AND PP DEVELOPMENT AND COMPLETE BLOCKAGE CONDITIONS - 1% AEP



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Scale: 1:1,000

Lyall & Associates

LEGEND

- LGA Boundary
- Modelled Stormwater Drainage Network
- Two-Dimensional Model Extent
- Water Surface Elevation Contours (0.2m Interval)
- Proposed VRS Development Site
- Proposed PP Development Site
- Proposed VRS and PP Road Design
- 1.58 ← Peak Overland Flow (m³/s)

MELROSE PARK STORMWATER DRAINAGE STRATEGY

Figure 6
(Sheet 3 of 7)

INDICATIVE EXTENT AND DEPTH OF INUNDATION
POST-VRS AND PP DEVELOPMENT AND COMPLETE BLOCKAGE CONDITIONS - 1% AEP

Indicative Depth of Inundation (m)

- < 0.05
- 0.05 to 0.10
- 0.10 to 0.20
- 0.20 to 0.30
- 0.30 to 0.40
- 0.40 to 0.50
- 0.50 to 0.60
- 0.60 to 0.70
- 0.70 to 0.80
- 0.80 to 0.90
- 0.90 to 1.00
- > 1.00
- Flow Direction Arrow

JOINS SHEET 2

JOINS SHEET 5

JOINS SHEET 6

JOINS SHEET 7

LOT C

LOT D

LOT F

LOT G

HUGHES AVE

0.34

0.12

0.44

0.78

0.07

0.26

0.42

1.10

N

10 0 10 20 30 m

Scale: 1:1,000

Lyall & Associates

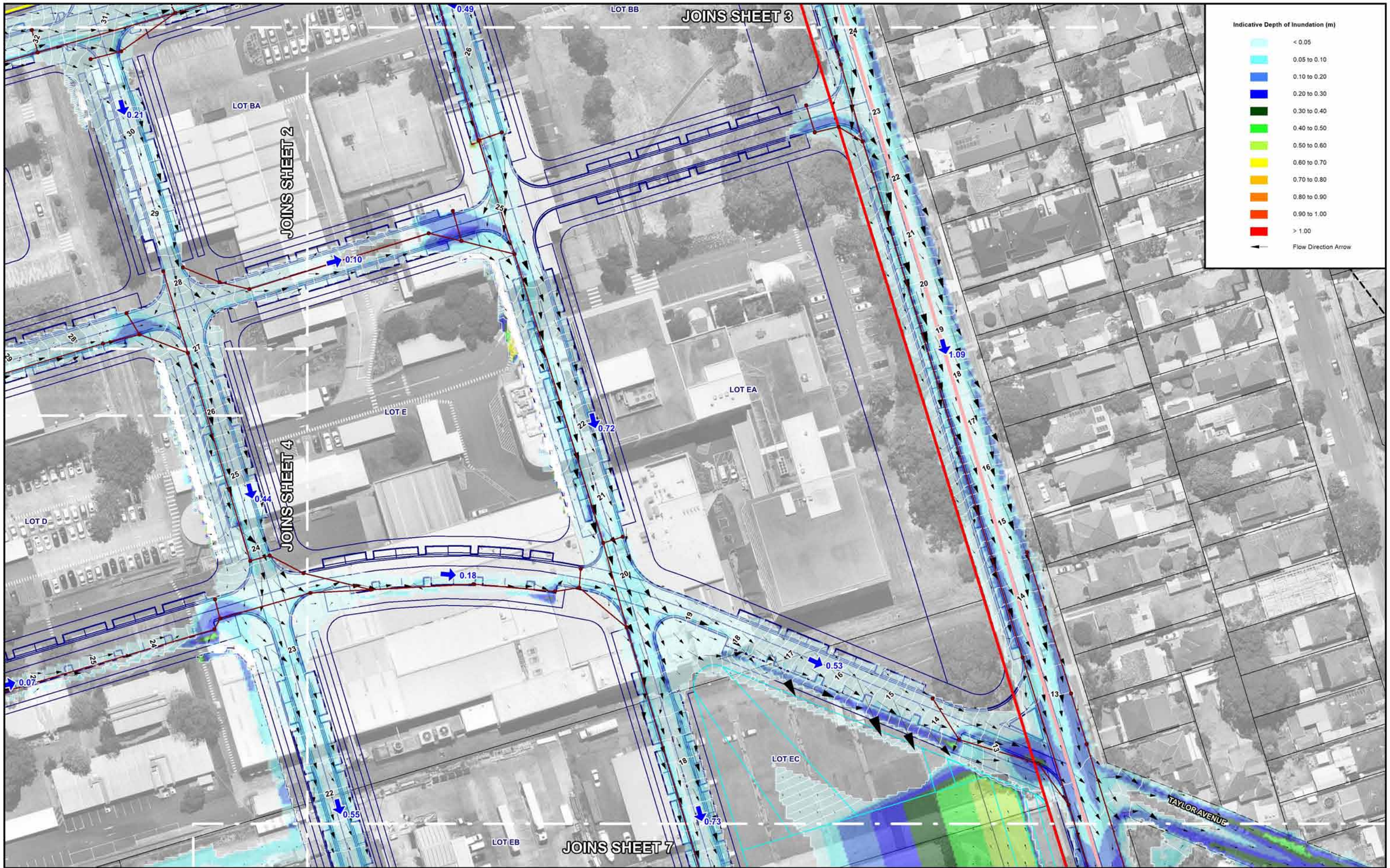
LEGEND

- LGA Boundary
- Modelled Stormwater Drainage Network
- Two-Dimensional Model Extent
- Water Surface Elevation Contours (0.2m Interval)
- Proposed VRS Development Site
- Proposed PP Development Site
- Proposed VRS and PP Road Design
- 1.58 Peak Overland Flow (m³/s)

MELROSE PARK STORMWATER DRAINAGE STRATEGY

Figure 6
(Sheet 4 of 7)

INDICATIVE EXTENT AND DEPTH OF INUNDATION
POST-VRS AND PP DEVELOPMENT AND COMPLETE BLOCKAGE CONDITIONS - 1% AEP



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Scale: 1:1,000

Lyall & Associates

LEGEND

- LGA Boundary
- Modelled Stormwater Drainage Network
- Two-Dimensional Model Extent
- Water Surface Elevation Contours (0.2m Interval)
- Proposed VRS Development Site
- Proposed PP Development Site
- Proposed VRS and PP Road Design
- Proposed Detention Basin
- 1.58 ← Peak Overland Flow (m³/s)

MELROSE PARK STORMWATER DRAINAGE STRATEGY

Figure 6
(Sheet 5 of 7)

INDICATIVE EXTENT AND DEPTH OF INUNDATION
POST-VRS AND PP DEVELOPMENT AND COMPLETE BLOCKAGE CONDITIONS - 1% AEP

JOINS SHEET 4

JOINS SHEET 7

CITY OF PARRAMATTA COUNCIL

LOT G

LOT H

LOT K

LOT N

LOT O

MELROSE PARK

1.33

0.53

0.39

0.15

0.49

0.01

2.48

Indicative Depth of Inundation (m)

- < 0.05
- 0.05 to 0.10
- 0.10 to 0.20
- 0.20 to 0.30
- 0.30 to 0.40
- 0.40 to 0.50
- 0.50 to 0.60
- 0.60 to 0.70
- 0.70 to 0.80
- 0.80 to 0.90
- 0.90 to 1.00
- > 1.00
- Flow Direction Arrow

N

10 0 10 20 30 m

Scale: 1:1,000

Lyall & Associates

LEGEND

- LGA Boundary
- Modelled Stormwater Drainage Network
- Two-Dimensional Model Extent
- Water Surface Elevation Contours (0.2m Interval)
- Proposed VRS Development Site
- Proposed PP Development Site
- Proposed VRS and PP Road Design
- Proposed Detention Basin
- 1.58 Peak Overland Flow (m^3/s)

MELROSE PARK STORMWATER DRAINAGE STRATEGY

Figure 6
(Sheet 6 of 7)

INDICATIVE EXTENT AND DEPTH OF INUNDATION
POST-VRS AND PP DEVELOPMENT AND COMPLETE BLOCKAGE CONDITIONS - 1% AEP

JOINS SHEET 5

JOINS SHEET 4

JOINS SHEET 6

LOT G

LOT H

LOT G

LOT O

LOT N

CITY OF PARRAMATTA COUNCIL

CITY OF RYDE COUNCIL

MELROSE PARK

SCHOOL

WHARF ROAD

0.21

1.11

1.50

0.99

2.28

0.39

0.15

0.49

21

20

19

18

17

16

15

12

11

Indicative Depth of Inundation (m)

- < 0.05
- 0.05 to 0.10
- 0.10 to 0.20
- 0.20 to 0.30
- 0.30 to 0.40
- 0.40 to 0.50
- 0.50 to 0.60
- 0.60 to 0.70
- 0.70 to 0.80
- 0.80 to 0.90
- 0.90 to 1.00
- > 1.00
- Flow Direction Arrow

N

10 0 10 20 30 m

Scale: 1:1,000

LEGEND

- LGA Boundary
- Modelled Stormwater Drainage Network
- Two-Dimensional Model Extent
- Water Surface Elevation Contours (0.2m Interval)
- Proposed VRS Development Site
- Proposed PP Development Site
- Proposed VRS and PP Road Design
- Proposed Detention Basin
- 1.58 Peak Overland Flow (m³/s)

Lyall & Associates

MELROSE PARK STORMWATER DRAINAGE STRATEGY

Figure 6
(Sheet 7 of 7)

INDICATIVE EXTENT AND DEPTH OF INUNDATION
POST-VRS AND PP DEVELOPMENT AND COMPLETE BLOCKAGE CONDITIONS - 1% AEP