Attachment B7(k)

Urban Design and Public Domain Study Appendices 8 to 10 – Waterloo Estate (South) – Land and Housing Corporation

7.8

7.8 INDICATIVE YIELD AND STAGING

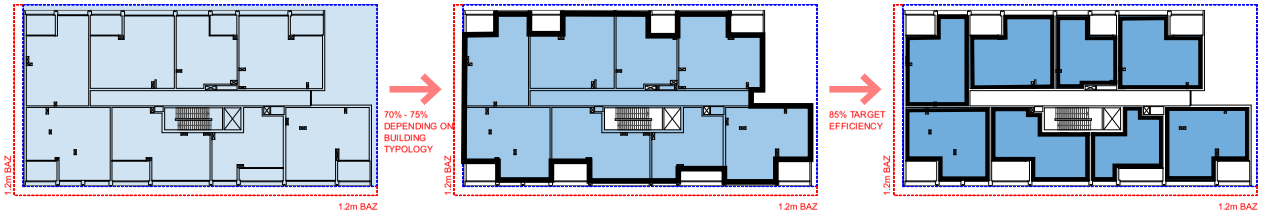
7.8.1 BUILDING AREA ASSUMPTIONS

The following diagrams illustrate the Primary Controls as described in “Part 2” of the Apartment Design Guide.

Envelope Efficiency
Where the building efficiency is 72.5% , the proposed BEA (Building Envelope Area) to GFA (Gross Floor Area) efficiency exceeds the ADG recommended metrics. Depending on the specific site, orientation and building typology, a building envelope BEA to GFA efficiency of 60%, 70%, 72.5% or 74% may be used.

The more regular the site, the higher the efficiency may be achieved.

Building Articulation Zone (BAZ)
The building articulation zone is used to assist in architectural expression and modulation and typically does not contribute additional BEA, GFA or NSA.



Building Envelope Area (BEA)
A building envelope should be 25-30% greater than the achievable gross floor area to allow for building components that do not count as floor space but contribute to building design and articulation such as balconies, lifts, stairs, external wall construction and open circulation space. (ADG, p29)

Gross Floor Area (GFA) & Floor Space Ratio (FSR)
GFA is not a measure of the maximum capacity of the building envelope. The envelope provides an overall parameter for the design of the development. The allowable gross floor area should only ‘fill’ approximately 70% to 75% of the building envelope area. Gross Floor Area divided by the site area is the Floor Space Ratio.

In new urban areas or where an existing neighbourhood is undergoing change, building envelopes should be tested prior to setting FSR controls (ADG, p32).

Nett Saleable Area (NSA)
Generally this is the internal area only of dwellings or tenancies and excludes unenclosed balconies or terraces unless noted.

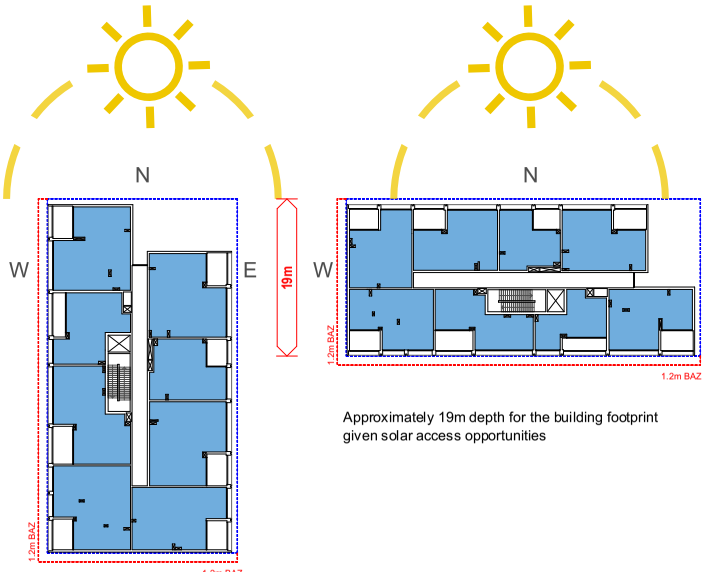


Fig. 7.8.1 Building Area Assumptions

The O'Dea Masterplan has been used as a benchmark as it contains a range of building typologies (form and sizes) that are consistent with the masterplan for Waterloo South. Final figures may vary between building typologies.

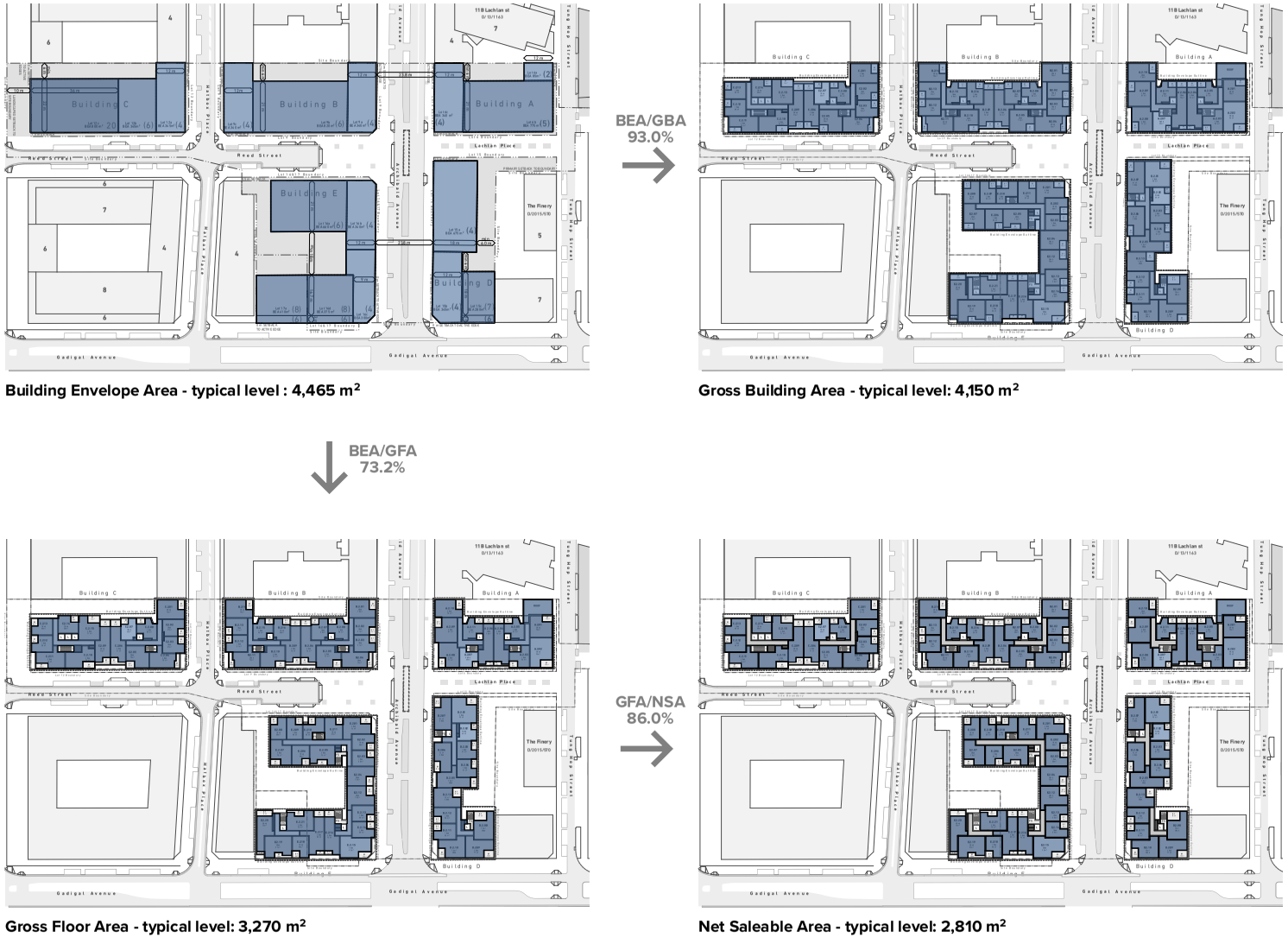


Fig. 7.8.2 O'Dea Masterplan Building Area Summary

7.8.2 DEVELOPMENT PARCELS

The layout of development parcels provides flexibility in the staging and delivery of Waterloo South

Waterloo South is subdivided into a network of 14 potential development lots that vary in size and shape to support a diversity of uses, scale and typologies to in proposals that reinforce the sub-precinct character.

- The Indicative Concept Proposal has considered the opportunity for staged delivery while maintaining full access and functionality to the Waterloo Metro Station, Metro Quarter, the Estate and surrounding context.
- Key public domain and community elements are intended to be delivered as part of the first stages to provide lively, integrated open space and community uses from the outset.
- Parcels have the potential to be delivered separately to allow flexibility to respond to market demands.

EXISTING LOTS + BUILDINGS

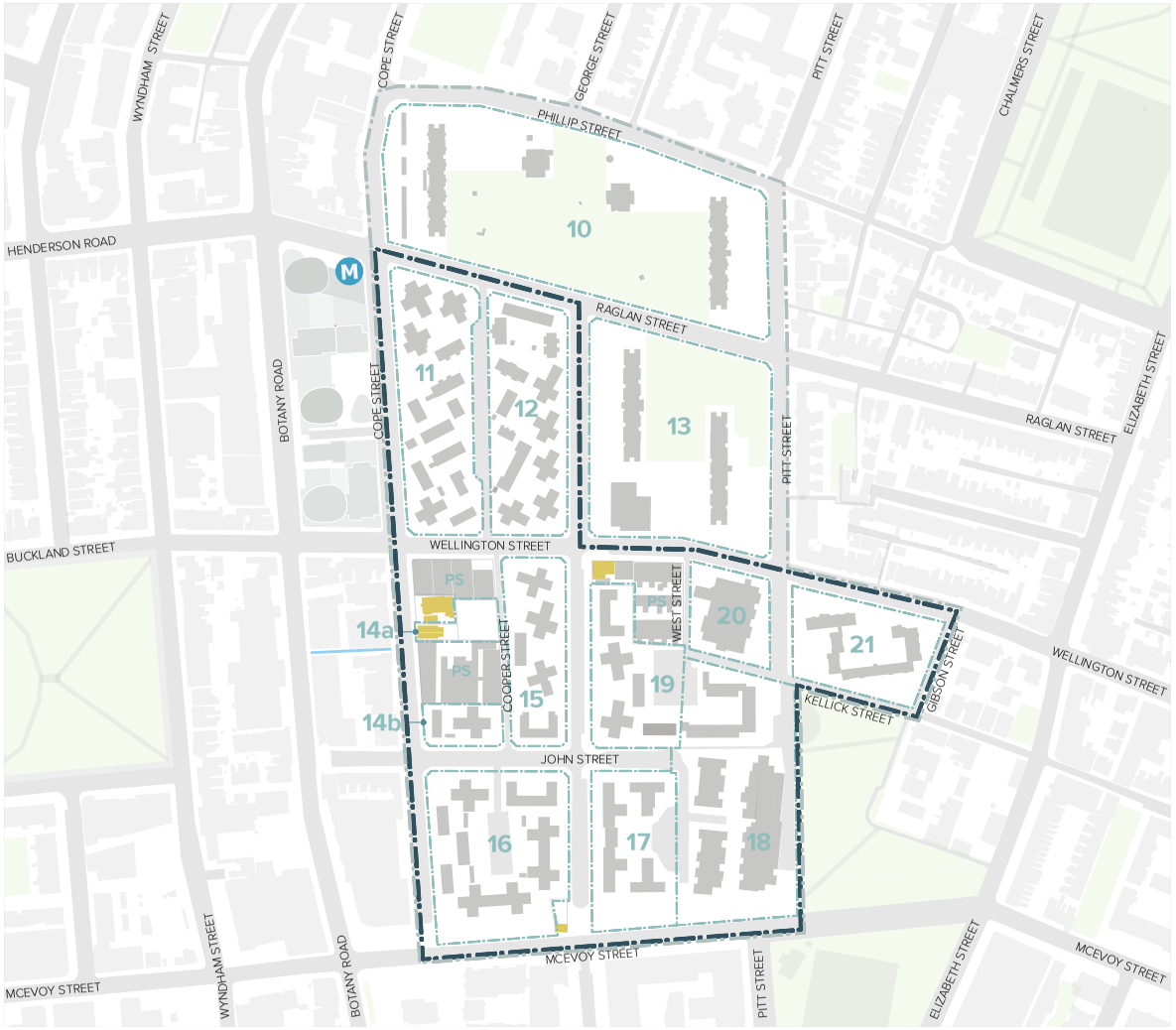


Fig. 7.8.3 Waterloo South within the existing Estate

0m 75

Legend

- Parcel Boundaries
- Private Site
- Existing Building
- Existing Heritage Item
- 10 Existing lot reference numbers

DEVELOPMENT PARCELS

Development Lot	Parcel	Parcel Area (m^2)	(Ha)	Use
-	**Parcel F / G**	22,530 m^2	2.25 Ha	Public Open Space - Park
1	**Parcel L**	1,295 m^2	0.13 Ha	Mixed Use
2	**Parcel M**	1,790 m^2	0.18 Ha	Mixed Use
3	**Parcel N**	1,350 m^2	0.13 Ha	Mixed Use
4	**Parcel O**	3,480 m^2	0.35 Ha	Mixed Use
5	**Parcel P**	6,690 m^2	0.67 Ha	Mixed Use
6	**Parcel Q**	1,885 m^2	0.19 Ha	Mixed Use
7	**Parcel R**	3,130 m^2	0.31 Ha	Mixed Use
8	**Parcel S**	3,985 m^2	0.40 Ha	Mixed Use
9	**Parcel T**	3,165 m^2	0.32 Ha	Mixed Use
10	**Parcel U**	5,285m^2	0.53 Ha	Mixed Use
-	**Parcel Va**	2,480 m^2	0.25 Ha	Public Open Space - Park
	Vb	710 m^2	0.07 Ha	Public Open Space
11	**Parcel W**	4,480 m^2	0.45 Ha	Mixed Use
12	**Parcel X**	3,105m^2	0.31 Ha	Mixed Use
13	**Parcel Y**	1,710 m^2	0.17 Ha	Mixed Use
14	**Parcel Z**	3,660 m^2	0.37 Ha	Mixed Use
Total		**70,720 m^2**	**7.07 Ha**	

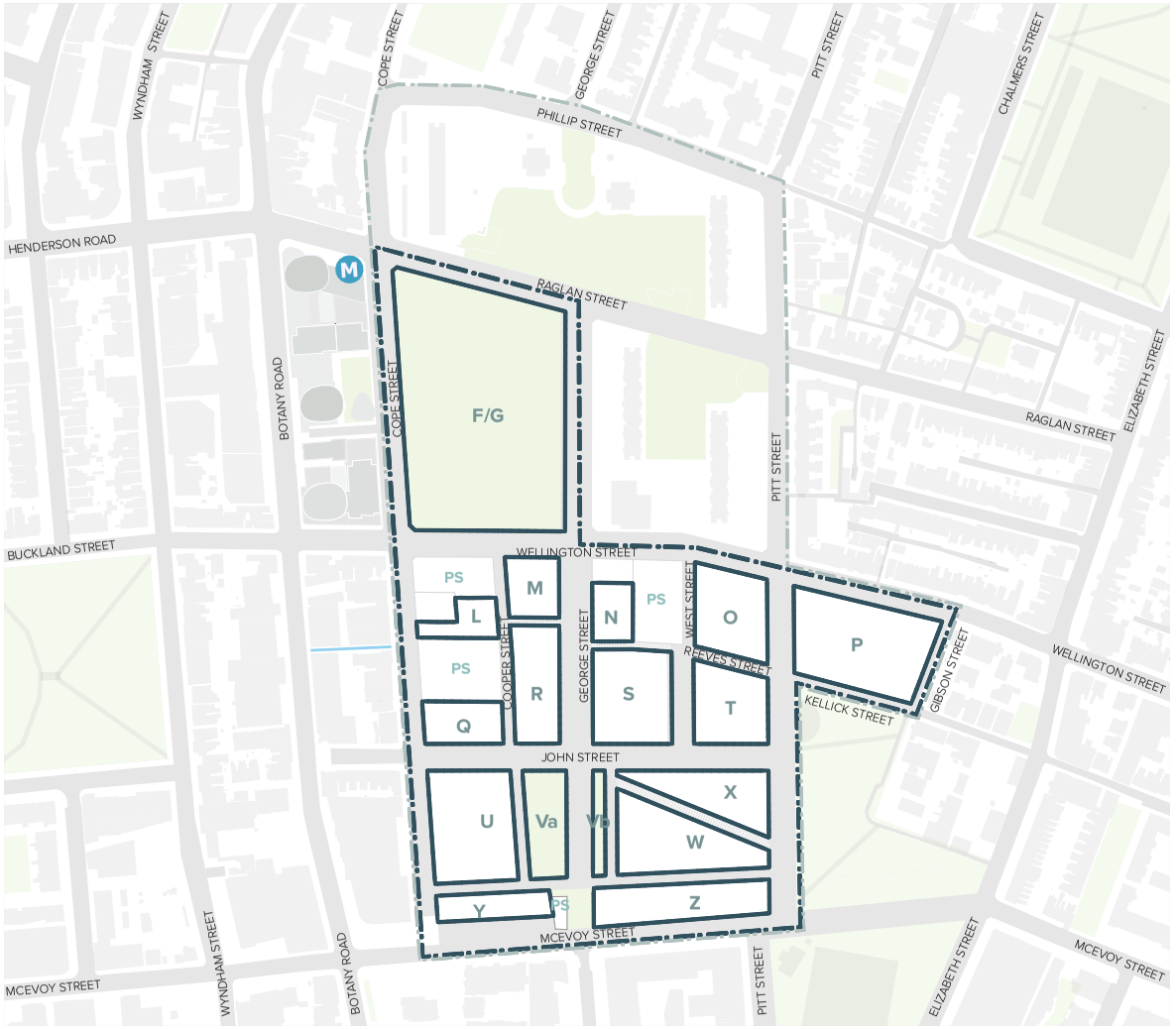


Fig. 7.8.4 Indicative development parcels

Parcel Boundaries
Private Site

DEVELOPABLE AREA

INDICATIVE YIELD

Parcel	Parcel Area (m^2)	(Ha)	Tree retention Zone (m^2)	Developable Area** (m^2)	Indicative Building Footprint (m^2)	Non-Residential GFA (m^2)	Retail & Services GFA (m^2)	Community & Cultural GFA (m^2)	Residential GFA (m^2)	Total GFA (m^2)	No. of Dwellings
Parcel F / G	22,530 m^2	2.25 Ha	-	-	-	**30 m^2**	-	30 m^2	**-**	**30 m^2**	-
Parcel L	1,295 m^2	0.13 Ha	-	1,295 m^2	670 m^2	**320 m^2**	-	320	**1280**	**1600**	15
Parcel M	1,790 m^2	0.18 Ha	-	1,790 m^2	1,790 m^2	**1,820 m^2**	740	1080	**18480**	**20300**	235
Parcel N	1,350 m^2	0.13 Ha	-	1,350 m^2	1,120 m^2	**140 m^2**	140	-	**7090**	**7230**	89
Parcel O	3,480 m^2	0.35 Ha	260 m^2	3,220 m^2	2,7630 m^2	**220 m^2**	160	60	**24160**	**24380**	309
Parcel P	6,690 m^2	0.67 Ha	400 m^2	6,290 m^2	4,870 m^2	**300 m^2**	240	60	**32370**	**32670**	415
Parcel Q	1,885 m^2	0.19 Ha	-	1,885 m^2	1,685 m^2	**230 m^2**	230	-	**20120**	**20350**	256
Parcel R	3,130 m^2	0.31 Ha	420 m^2	2,710 m^2	2,190 m^2	**2,840 m^2**	1000	1840	**3760**	**6600**	47
Parcel S	3,985 m^2	0.40 Ha	-	3,985 m^2	3,500 m^2	**3,640 m^2**	3560	80	**23980**	**27620**	307
Parcel T	3,165 m^2	0.32 Ha	-	3,165 m^2	2,280 m^2	**220 m^2**	180	40	**15570**	**15790**	198
Parcel U	5,285m^2	0.53 Ha	325 m^2	4,960 m^2	3,420 m^2	**400 m^2**	340	60	**29420**	**29820**	377
Parcel V	2,480 m^2	0.25 Ha	- 710 m^2	-	-				- -		
Parcel W	4,480 m^2	0.45 Ha	-	4,480 m^2	4,010 m^2	**2,560 m^2**	850	1710	**25060**	**27620**	321
Parcel X	3,105m^2	0.31 Ha	440 m^2	2,665 m^2	2,400 m^2	**2,020 m^2**	600	1420	**20430**	**22450**	260
Parcel Y	1,710 m^2	0.17 Ha	-	1,710 m^2	1,310 m^2	**1,350 m^2**	1350	-	**8790**	**10140**	111
Parcel Z	3,660 m^2	0.37 Ha	545 m^2	3,115 m^2	1,980 m^2	**1,810 m^2**	1810	-	**8590**	**10400**	108
Total			**3,100 m^2**	**42,620 m^2**	**33,855 m^2**	**17,900 m^2**	**11,200 m^2**	**6,700 m^2**	**239,100 m^2**	**257,000 m^2**	**3048**

* Tree retention zones areas are indicative based on the tree protection zones (TPZ) for the high or moderate tree proposed to be retained
** Developable area has been calculated based on parcel areas minus proposed tree retention zones

INDICATIVE BASEMENT AREA

Potential Basements No	Parcel	Indicative Footprint	Number of Levels	Basement Connection Required	On-site Detention/ Retention*
1	**Parcel L**	650	1	-	Required
2	**Parcel M**	1,550	3.5	Y	Required
3	**Parcel R**	2,150	1		Required
4	**Parcel N**	950	2	Y	Required
5	**Parcel S**	3,250	3		Required
6	**Parcel O**	2,750	3		Required
7	**Parcel T**	2,500	2	Y	Required
8	**Parcel P**	5,220	2	-	Required
9	**Parcel Q**	1,460	4		Required
10	**Parcel U**	4,050	2.5		Required
11	**Parcel Y**	1,360	2	Y	Required
12	**Parcel W**	3,790	3		Required
13	**Parcel X**	2,450	2	Y	Required
14	**Parcel Z**	2,150	1.5	Y	Required

* Refer to separate report by AECOM for on site detention / retention requirements for development parcels.

INDICATIVE BASEMENTS

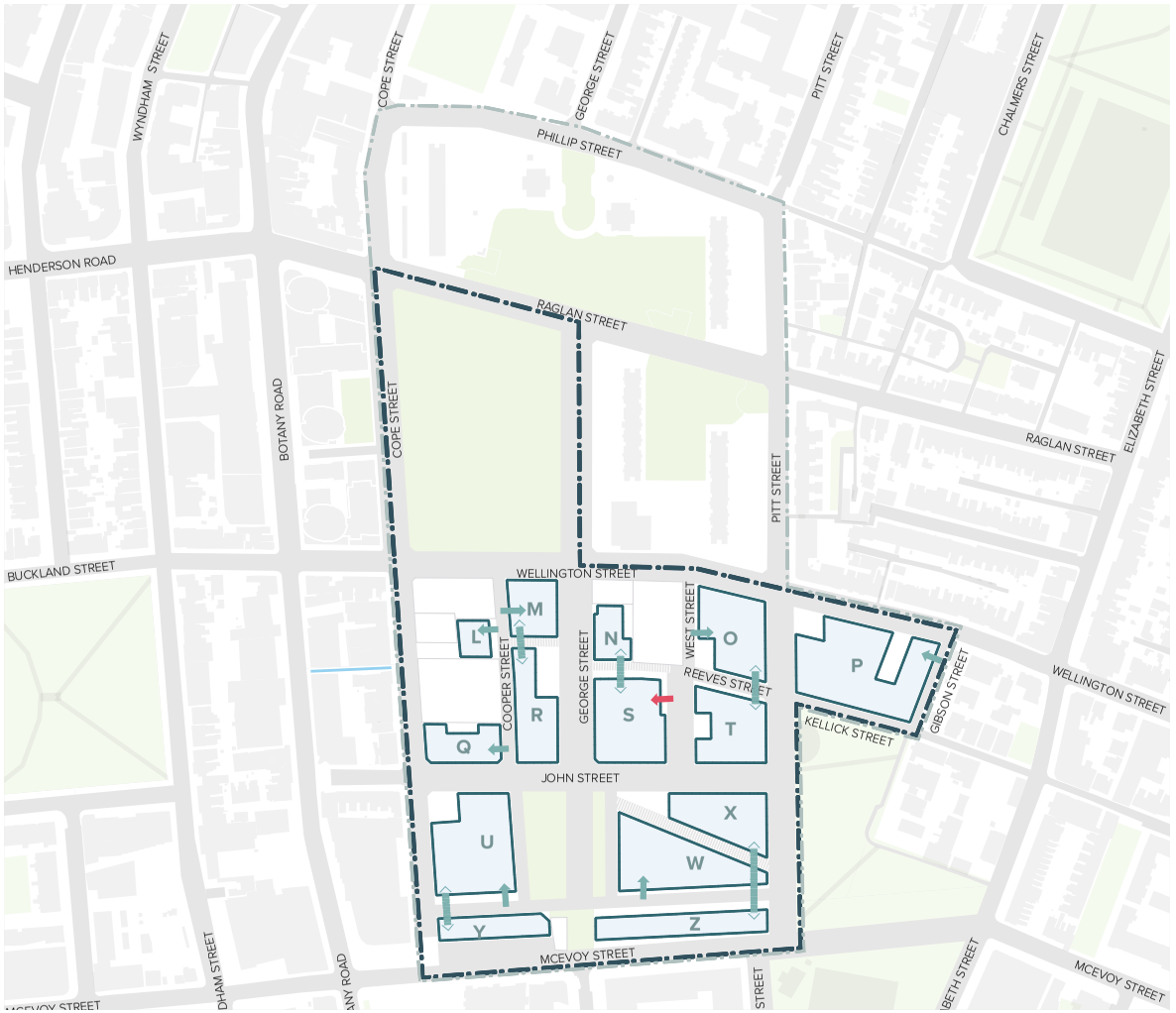


Fig. 7.8.5 Indicative basement extent

LANDSCAPE REPLACEMENT AREA

The landscape replacement area seeks to increase the future community's health and well-being through connection to nature by promoting a more diverse range of green strategies

LANDSCAPE REPLACEMENT AREA (LRA)

Developable site area is replaced by an area of equal value above the first floor as communal landscape zones and / or vertical plantings to encourage pervasive and accessible greenery in urban environments.

The LRA is provided as a percentage of site area (80%) contributing to communal landscape or vertical planting above the first level.

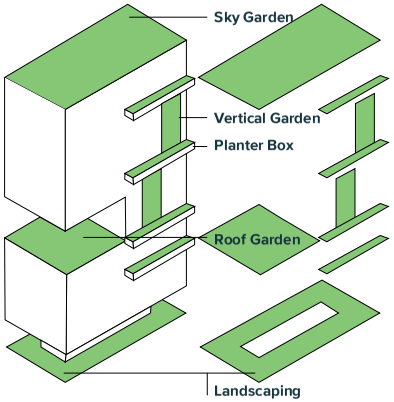


Fig. 7.8.6 Landscape replacement area control

INDICATIVE LANDSCAPE REPLACEMENT AREAS

The following areas are provided as an indicative approach to achieve the Place Performance Measures target LRA of 80% for Waterloo South:

Parcel	Developable Area (m^2)	Landscape Replacement Area (LRA - m^2)				Additional LRA**	Total LRA
		Tree Retention Zone	Deep Soil	Ground Level	Roof Level*	Required (m^2)	(m^2)
Parcel F / G	Public open space - Village Green						
Parcel L	1,295 m^2	-	130 m^2	310	330m^2	260 m^2	**1,030 m^2**
Parcel M	1,790 m^2	-	-	-	890 m^2	540 m^2	**1430 m^2**
Parcel N	1,350 m^2	-	160 m^2	-	560m^2	360 m^2	**1080 m^2**
Parcel O	3,220 m^2	260 m^2	80 m^2	350 m^2	1,310 m^2	570 m^2	**2570m^2**
Parcel P	6,290 m^2	400 m^2	450 m^2	960 m^2	2,430 m^2	790 m^2	**5030 m^2**
Parcel Q	1,885 m^2	-	200 m^2	-	840 m^2	460 m^2	**1500 m^2**
Parcel R	2,710 m^2	420 m^2	230 m^2	-	980 m^2	520 m^2	**2160 m^2**
Parcel S	3,985 m^2	-	290 m^2	550 m^2	1,470m^2	870 m^2	**3180 m^2**
Parcel T	3,165 m^2	-	210 m^2	540 m^2	1,140 m^2	640 m^2	**2530 m^2**
Parcel U	4,960 m^2	325 m^2	440 m^2	790 m^2	1,660 m^2	740 m^2	**3960 m^2**
Parcel V	Public open space - Waterloo Common						
Parcel W	4,480 m^2	-	830 m^2	540 m^2	1,690m^2	950 m^2	**3580 m^2**
Parcel X	2,665 m^2	440 m^2	-	-	1,200 m^2	490 m^2	**2130m^2**
Parcel Y	1,710 m^2	-	-	-	650 m^2	460 m^2	**1360 m^2**
Parcel Z	3,115 m^2	545 m^2	630 m^2	-	990 m^2	160 m^2	**2,490 m^2**
Total	**42,620 m^2**	**2,390 m^2**	**3,650 m^2**	**4,040 m^2**	**16,140 m^2**	**7,810 m^2**	**34,030 m^2**

* Landscaped areas for roof levels have been calculated up to 20 storeys and based on 50% of total roof area
** Additional Landscape Replacement Area to be provided through planter boxes, sky gardens or vertical gardens

CASE STUDY PRECEDENT - CENTRAL PARK

Fig. 7.8.7 Soft and hard landscaping on private terraces
Source: Turf, 2019

Fig. 7.8.8 Planter boxes on balconies
Source: Turf, 2019

Fig. 7.8.9 Planter boxes planted with ground covers and creepers
Source: Turf, 2019

Fig. 7.8.10 Vertical gardens on building facade
Source: Turf, 2019

7.8.3 POTENTIAL STAGING

Delivery of Waterloo South can be staged to maintain the use of the Metro Quarter, the Estate and surrounding context.

The staging strategy aims to:

- Provide flexibility to respond to changing market conditions and changing community needs over time.
- Deliver public open space in the first stages of renewal.
- Minimise disruption to existing residents with the first stages of development in areas with the lowest density.

14 Development Parcels
3 Potential Stages

STAGING SEQUENCE

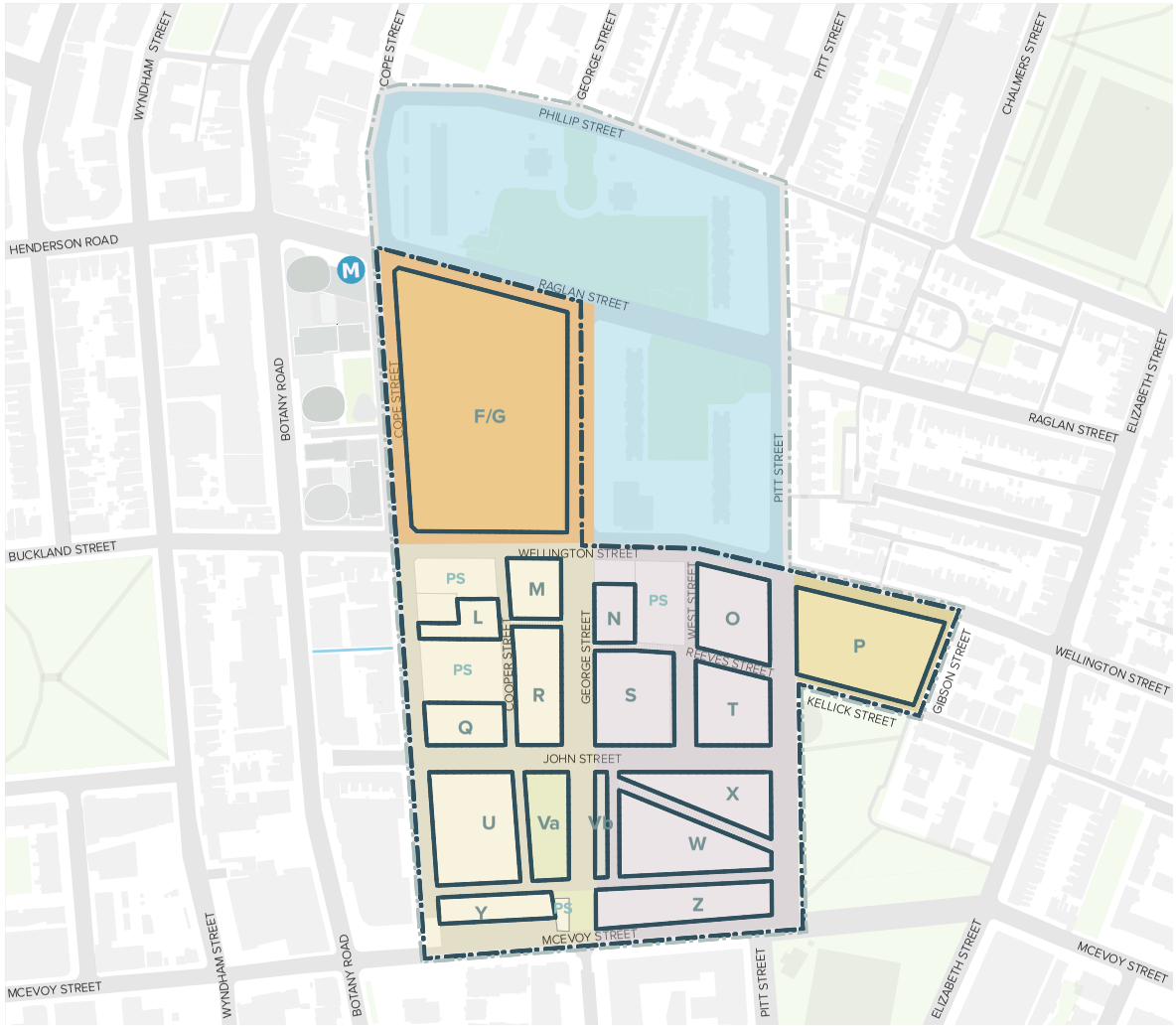


Fig. 7.8.11 Indicative staging sequence

7.9

7.9 SOLAR ANALYSIS

7.9.1 INTRODUCTION

POLICY CONTEXT

The desired built form outcome for Waterloo South has been tested with consideration to satisfying solar access provisions under relevant state and local policies

The desired built form outcome for Waterloo South has been tested with consideration to achieving solar access to apartments, surrounding context, public open space, communal open space and existing private open space consistent with the Apartment Design Guide (ADG) objectives and design criteria and City of Sydney DCP 2012 and draft Metro Quarter DCP 2018 provisions.

APARTMENT DESIGN GUIDE, Dept Planning & Environment

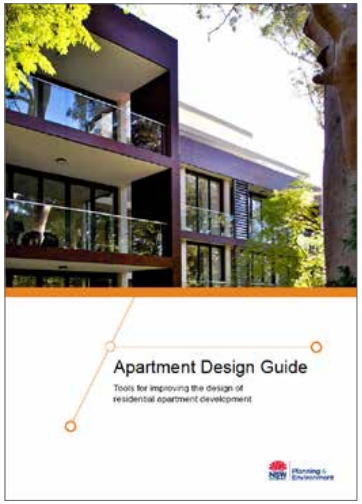


Fig. 7.9.1

ADG Objective 3B-2 Design guidance:
Where an adjoining property does not currently receive the required hours of solar access, the proposed building ensures **solar access to neighbouring properties is not reduced by more than 20%**

ADG Objective 3D-1 Design criteria:
Developments to **achieve a minimum of 50% direct sunlight to the principal usable part** of the communal open space for **a minimum of 2 hours between 9am and 3pm mid winter.**

ADG Objective 4A-1 Design criteria:
Living rooms and private open spaces of at least **70% of apartments** in a building **receive a minimum of 2 hours direct sunlight between 9 am and 3 pm at mid winter.**

A **maximum of 15% of apartments** in a building **receive no direct sunlight between 9 am and 3 pm at mid winter.**

CITY OF SYDNEY DCP 2012, City of Sydney

Fig. 7.9.2

Clause 3.1.4 (3a) Public Open Space provision states:
50% of the total area is to receive sunlight for 4 hours from 9am to 3pm on 21 June.

Clause 4.2.3.1 (2) provision states:
Development sites and neighbouring dwellings are to **achieve a minimum of 2 hours direct sunlight between 9am and 3pm on 21 June** onto at least 1 square metre of living room windows and **at least 50% of the minimum amount of private open space**.

Clause 4.2.3.1 (3) provision states:
New development must not create any additional overshadowing onto a neighbouring dwelling **where that dwelling currently receives less than 2 hours direct sunlight** to habitable rooms and 50% of the private open space between 9am and 3pm on 21 June.

WATERLOO METRO QUARTER DRAFT DCP 2018

Fig. 7.9.3

Clause 5.9.4.10.1 Solar Access provision states:
Development enables **sunlight to at least 50% of the total area of Cope Street Plaza or Raglan Street Plaza for a minimum of 3 hours between 9am and 3pm on 21 June.**

Clause 5.9.4.10.2 Solar Access provision states:
Development maintains sunlight to at least 50% of the total area of Alexandria Park for at least 4 hours between 9am to 3pm on 21 June.

Clause 5.9.4.10.3 Solar Access provision states:
Development does not result in any additional overshadowing of Alexandria Park Heritage Conservation Area after 11am on 21 June.

METHODOLOGY

Three dimensional building envelopes representing the desired built form outcome have been used to test solar access performance

METHODOLOGY AND ASSUMPTIONS

- The desired future built form is represented in **building envelopes** which **are greater in volume than the future proposed built form** consistent with the ADG approach to building envelopes (**ADG 2B Building Envelopes**).
- Waterloo South has been **tested concurrently with the existing context and where appropriate a future possible context**.
- Building envelopes have been tested to ensure that **70- 75% of the primary envelope facade area - North, East and West - receive a minimum of 2 hours direct sunlight between 9am and 3pm at mid winter**.
- The future detailed design **for street level and in some instances Level 1 built form includes and anticipates a variety of non-residential uses** that do not need to meet the ADG criteria for direct sunlight and therefore, **where relevant, the extent of the Primary Building Envelope Facade area calculated is varied accordingly.**
- A selection of **representative blocks or 'Lots'** within Waterloo South **have been designed in further detail** to test primary ADG controls **to ensure they can achieve desired outcomes including ADG objectives for solar and daylight access.**
- **As part of future detailed designs a comprehensive assessment will need to be undertaken** to ensure that ADG objectives and design criteria specific to the final built form outcome, specific layouts and context will be achieved.

CONSIDERATIONS

Waterloo South has a variety of interfaces that form the context. These interfaces require a different set of criteria for testing depending on their relationship to Waterloo South to understand and address the extent and influence of overshadowing. **The built form for Waterloo South responds to each of these interfaces with the intent that through future detailed design and assessment**:

- **Overshadowing** of neighbouring residential properties **is minimised**.
- Future development sites are considered.
- **Public Open Space** within and adjoining Waterloo South **achieves or exceeds the minimum required solar access in mid winter.**
- **'Loose fit' building envelopes have been used for proposed development to test solar access based on building forms being 70 - 75% smalle**r, consistent with ADG guidelines. This provides for the worst case scenario to be tested and allows for future flexibility in the built form design.
- For existing development, building envelopes have been tested to ensure that **70- 75% of the primary envelope facade area - North, East and West - receive a minimum of 2 hours direct sunlight between 9am and 3pm at mid winter**.

Fig. 7.9.4 Cope Street interface

Fig. 7.9.5 Raglan Street interface

Fig. 7.9.6 Pitt Street interface

Fig. 7.9.7 Kellick Street interface to Waterloo Park

7.9.2 SOLAR ENVELOPE

Determining a solar envelope through the understanding of existing contextual constraints was the starting point for the development of built form for Waterloo South

The solar envelope is a way to ensure solar access for amenity. It provides an understanding of possible massing within imaginary boundaries given by:

- The sun's relative path during a given time and day of the year.
- The period of the day and year when solar access is currently assessed, ie, equinox and solstices.

Massing within the solar envelope will not create unreasonable overshadowing to the adjacent context within these constraints.

The solar envelope provided a starting point to test the range of height and massing that could be supported within the Estate using the City of Sydney DCP and ADG objectives and design criteria and the surrounding context as constraints. The solar envelope was used as a tool for testing options at the Early Design Thinking and Concept Plan Options.

HEIGHT CONSTRAINTS

Two key aeronautical limits constrain the maximum possible heights across the Estate - the PANS OPS and the RTCC/ MVA providing a preliminary envelope.

To maximise building heights and stretch the height constraint posed by these limits, future detailed design will need to consider construction methodologies that will allow building within the 15m crane zone and utilise the 3 month temporary crane zone.

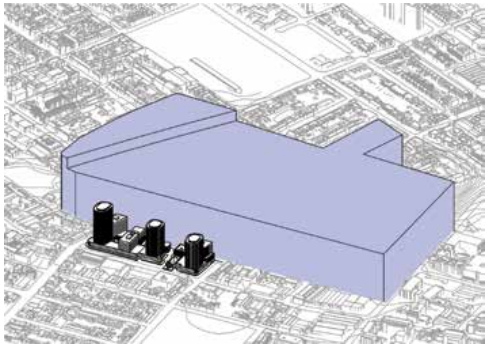


Fig. 7.9.8 Aeronautical limits extruded

SOLAR ACCESS PLANES

Solar access planes are the imaginary boundaries between the sun and the context requiring solar access to determine areas where future built form would not provide additional overshadowing. Solar access planes were cast based on the existing condition achieving the required solar access (based on the relevant DCP or ADG controls). For residential context, the solar access planes were based on providing 2 hours solar access between 9am - 3pm at mid-winter. For public open space, the solar access planes were based on providing 4 hours solar access between 9am - 3pm at mid-winter.

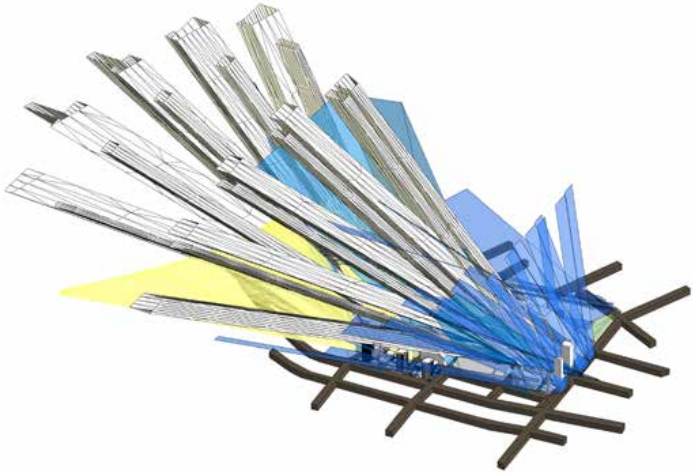


Fig. 7.9.9 Solar access planes for existing context

SOLAR ACCESS TO EXISTING CONTEXT

The existing surrounding context was analysed to gain an understanding for each site's potential re-development to residential uses. This determined the sites to be analysed based on the existing condition and the sites to be analysed based on the future potential for solar access.

Sites with high re-development potential were excluded from the calculation of the solar envelope and only sites with low re-development potential were used to further refine the solar envelope.

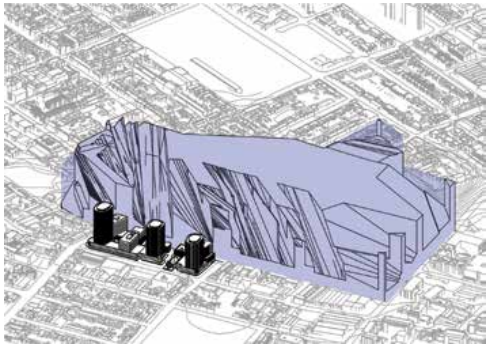


Fig. 7.9.10 Indicative envelope with solar planes to existing context subtracted

FUTURE OPEN SPACE

Further refinement was undertaken with the proposed open space distribution across the Estate subtracted from the solar envelope.

The solar access provisions for the proposed public open spaces within the masterplan further refined the solar envelope, based on a 50% stationary park area achieving 4 hours of sunlight between 9am to 3pm at mid-winter. Multiple locations and arrangements for the distribution of public open space were tested, with a range of options that explored the appropriate provision of open space, size and configurations to understand the resulting opportunities and challenges.

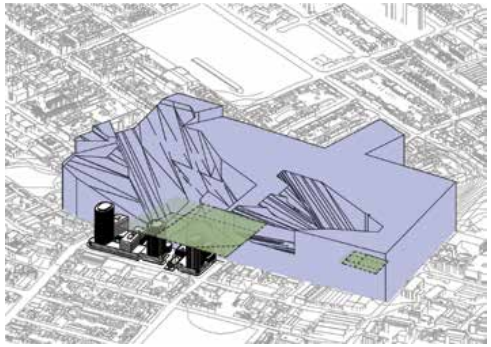


Fig. 7.9.11 Indicative envelope with proposed open spaces subtracted

FUTURE STREET NETWORK

The existing and proposed street and pedestrian network across the Estate was subtracted from the solar envelope.

Multiple arrangements for the street network were tested, with a range of options that explored the number of streets, widths and configurations to understand the resulting opportunities and challenges. As would be expected the north-south street alignments received more sunlight than east-west streets.

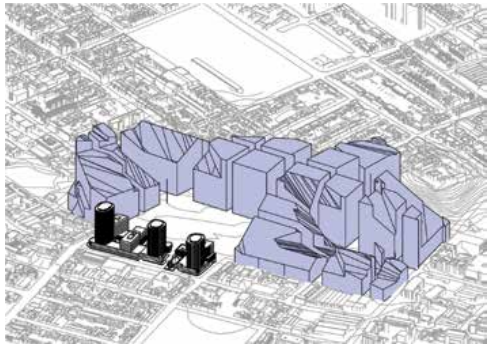


Fig. 7.9.12 Indicative envelope with existing and future street network subtracted

SOLAR ENVELOPE

The resulting solar envelope provided an understanding of where height and massing could be distributed to maintain the solar access provisions of the adjacent existing residential context and the public open space.

This process was the starting point for options testing and the development of the Preferred Masterplan. The placement of open space across the masterplan was a key priority that shaped the placement and arrangement of the resulting building massing. The masterplan approach sought to optimise the arrangement of the proposed open space across the site, then the arrangement of built form massing to respond to contextual as well as solar access provisions. The proposed built form massing provided further refinements to the solar envelope.

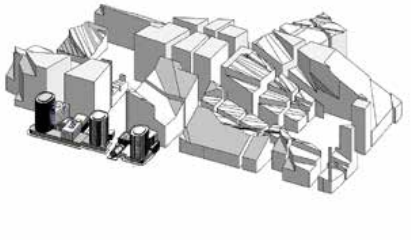


Fig. 7.9.13 Indicative solar envelope

7.9.3 SKY VIEW FACTOR

ASSUMPTIONS & CONSIDERATIONS

Waterloo South recognises the importance of providing appropriate levels of sky views within the public domain

Sky views enables the public to experience the benefits of natural daylighting and environmental views. The sky view factor is used as an indicator of the amount of sky that can be seen from the ground in an urban area.

The sky view factor (SVF) is the proportion of sky visible when viewed from the ground looking up. SVF ranges from SVF 0 (no sky visible) to SVF 1 (sky is completely visible to the horizon in all directions)

	λ_B	H	SVF
LCZ 1 Compact high-rise	40–60	>25	0.2–0.4
LCZ 2 Compact mid-rise	40–70	10–25	0.3–0.6
LCZ 3 Compact low-rise	40–70	3–10	0.2–0.6
LCZ 4 Open high-rise	20–40	>25	0.5–0.7
LCZ 5 Open mid-rise	20–40	10–25	0.5–0.8
LCZ 6 Open low-rise	20–40	3–10	0.6–0.9
LCZ 7 Lightweight low-rise	60–90	2–4	0.2–0.5
LCZ 8 Large low-rise	30–50	3–10	>0.7
LCZ 9 Sparsely built	10–20	3–10	>0.8
LCZ 10 Heavy industry	20–30	5–15	0.6–0.9
LCZ A Dense trees	<10	3–30	<0.4
LCZ B Scattered trees	<10	3–15	0.5–0.8
LCZ C Bush, scrub	<10	<2	0.7–0.9
LCZ D Low plants	<10	<1	>0.9
LCZ E Bare rock or paved	<10	<0.25	>0.9
LCZ F Bare soil or sand	<10	<0.25	>0.9
LCZ G Water	<10	-	>0.9

LCZ: The Local Climate Zone, categorised by a combination of surface structure, cover, and human activity
SVF: Sky View Factor(SVF):
H: Mean height of roughness element
λ_B: Ratio of building plan area to total plan area

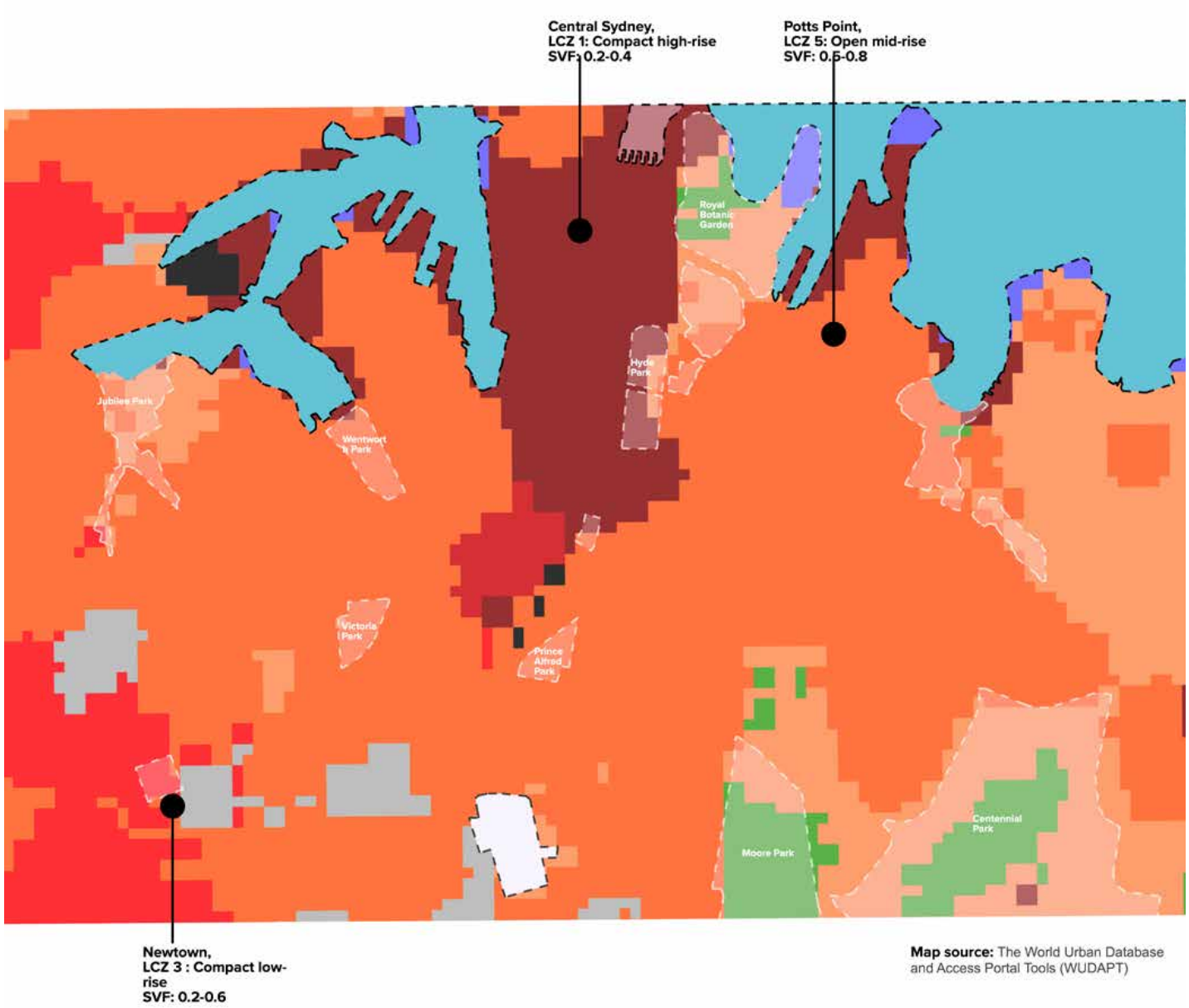


Fig. 7.9.14 City of Sydney SVF

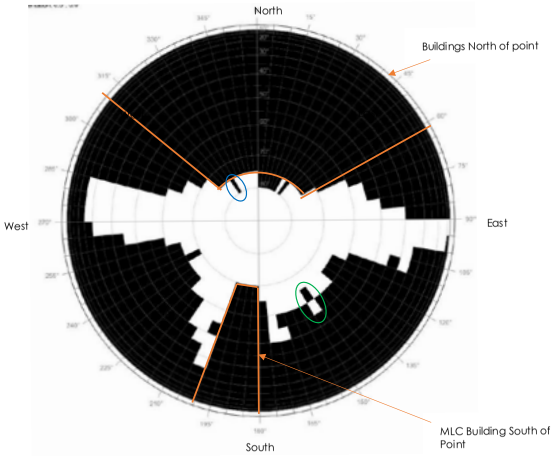
METHODOLOGY FOR ANALYSIS

Sky View Factor (SVF) is the extent of sky observed above a point as a proportion of the total possible sky hemisphere above the point.

SVF is the ratio of visible sky at a point and ranges from 0% for a fully obstructed sky to 100% for a fully open sky (eg., in a grass field)

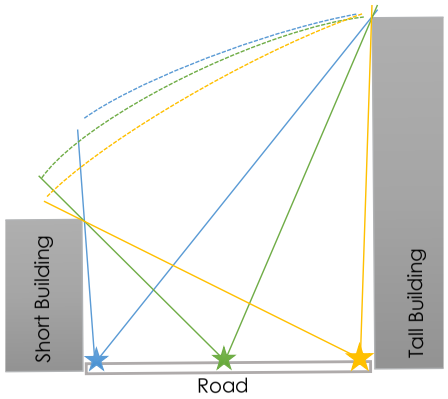
It is measured by a hemispherical sky (also known as fisheye camera, with surrounding obstacles (typically buildings, trees, etc.)

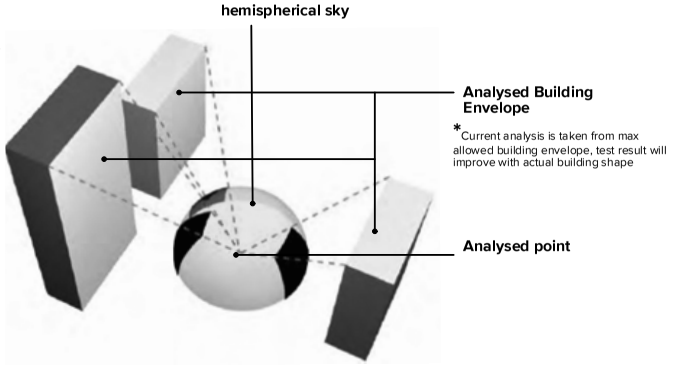
SVF is calculated as the proportion of the total possible sky hemisphere above a defned area. The test points are generated by a defined grid size.



REFERENCE METHODOLOGY

A 6 metre by 6 metre grid was adopted for the Sydney Metro Martin Place Integrated Station Development. This approach was adopted as a reference methodology for initial testing and further refined into the approach for Waterloo South.

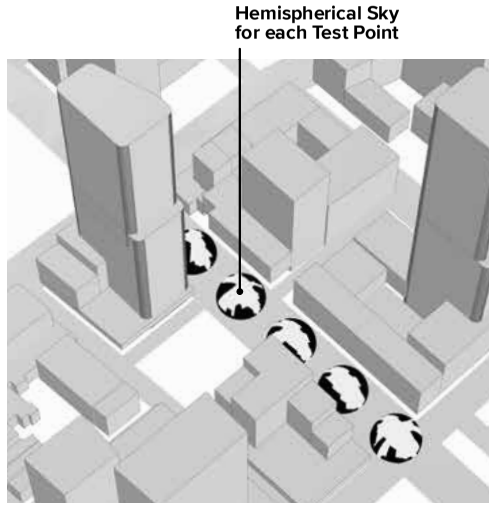




WATERLOO SOUTH METHODOLOGY

The Sky View Factor (SVF) methodology adopted for Waterloo South is based on:

- A 2 meter by 2 meter grid, that is more accurate than the reference methodology.
- Analysis included surrounding public domain 50 metres outside Waterloo South boundaries
- Using the building envelope areas (BEA) for the analysis as the 'worse case' scenario. Final building forms will be smaller than the building envelope areas and will provide improved results.
- A hemispherical sky was generated for each of the test points in the grid. In total, 27,794 hemispherical skies were generated across Waterloo South to calculate the SVF for the public domain.



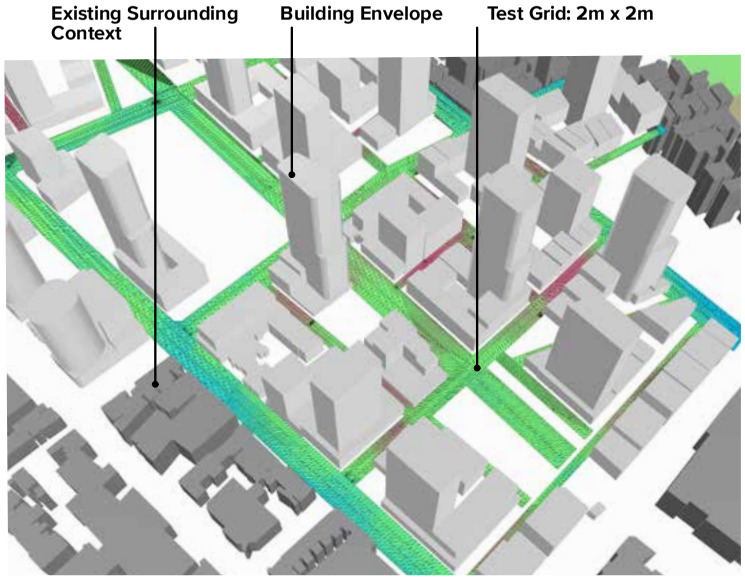


Fig. 7.9.15 SVF Methodology

The measured sky view factor (SVF) for Waterloo South is 0.6, making it similar to Potts Point at between 0.5 to 0.8 SVF

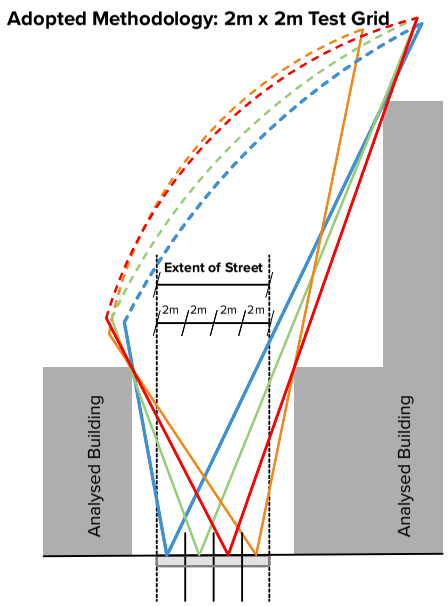
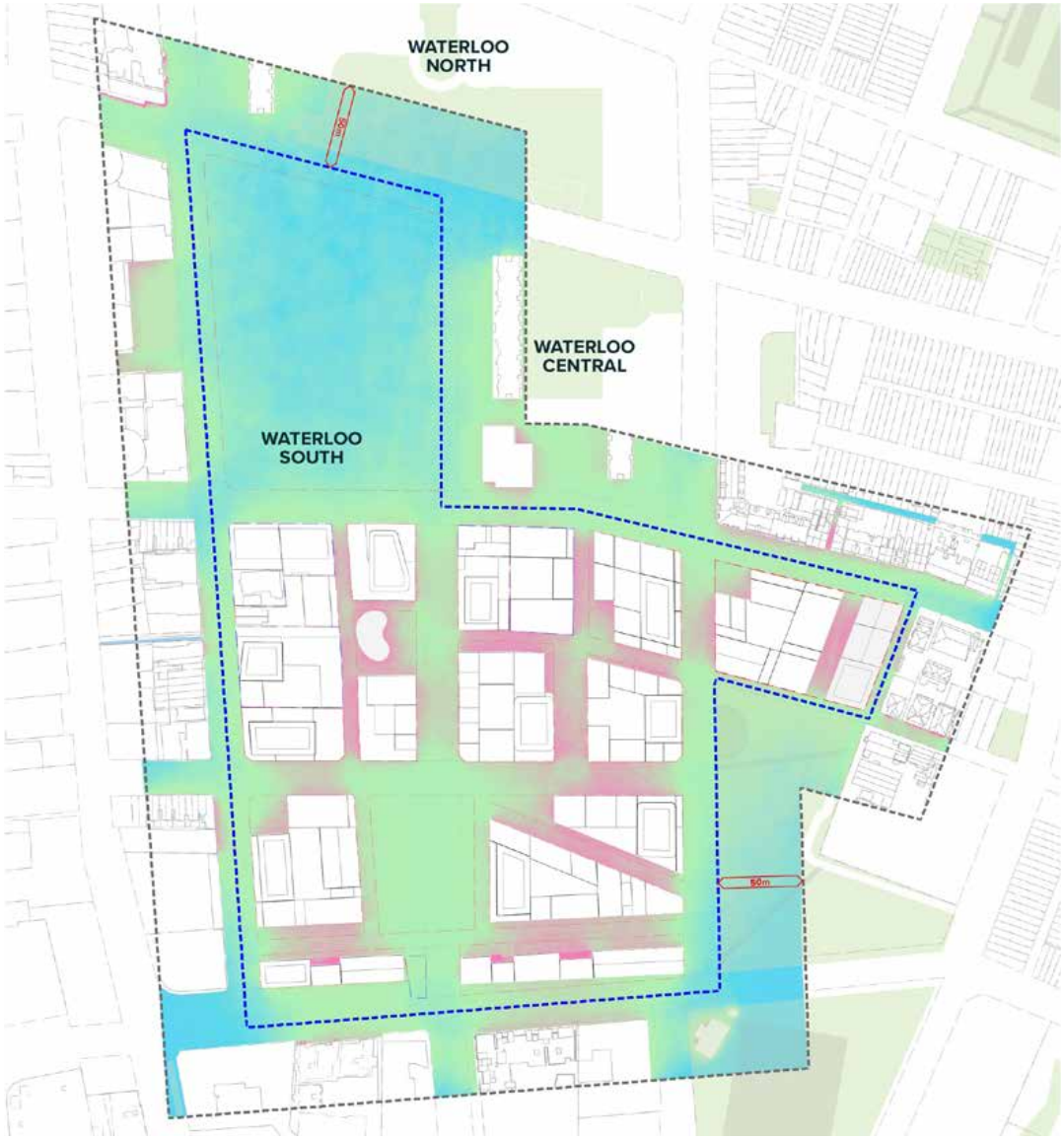


Fig. 7.9.16 Waterloo South SVF study

WATERLOO SOUTH SKY VIEW FACTOR



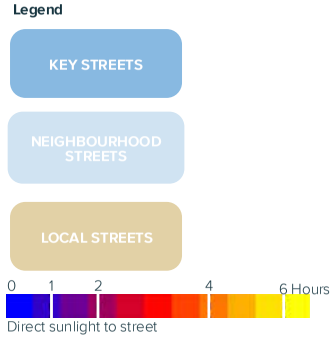
7.9.4 SUNLIGHT TO STREETS

SUNLIGHT TO STREETS - PERFORMANCE BY STREET TYPOLOGY

68% of the overall street area within Waterloo South receive a minimum of 2 hours sunlight between 9am to 3pm at mid-winter

68% of the overall street area within Waterloo South receives a minimum of 2 hours sunlight between 9am to 3pm at mid-winter

70% of the overall street area for Key Streets within Waterloo South receive a minimum of 2 hours sunlight between 9am to 3pm at mid-winter



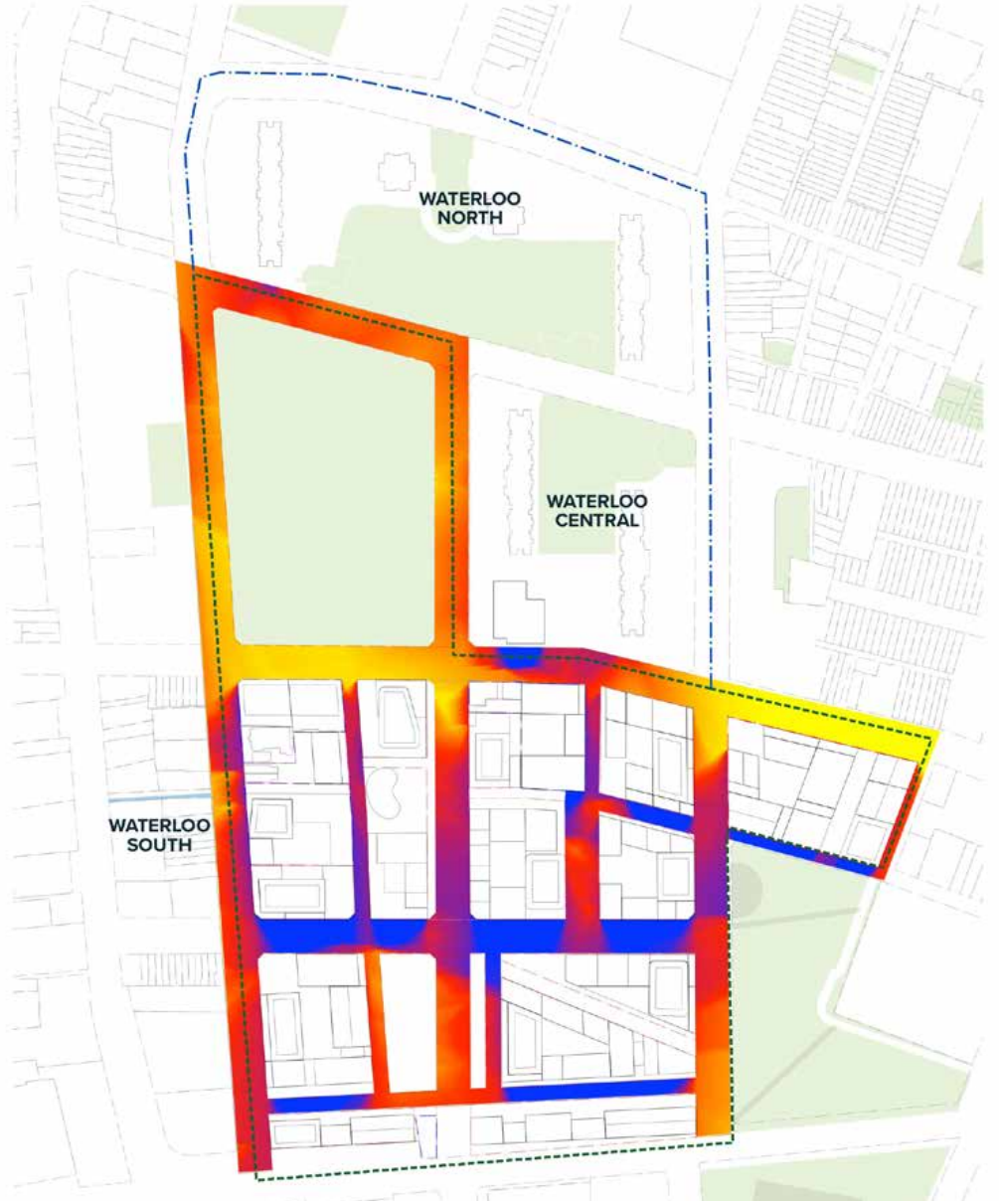


Fig. 7.9.17 Sunlight to streets

7.9.5 SOLAR ACCESS

ASSUMPTIONS & CONSIDERATIONS

Solar access is measured for the 'worst case' scenario at mid winter (June 21) when the sun is at its lowest in the sky

Public open space contributes to the liveability and attractiveness of urban places by providing green spaces that accommodate a wide range of active and passive uses. The CoS DCP 2012 provisions for 50% of the open space to receive a minimum 4 hours of sunlight between 9am to 3pm in mid-winter ensure healthy green parks that will require less on-going maintenance and disruption to residents and visitors. Access to sunlight for public open space has been measured as part of the solar testing.

In residential developments, solar and daylight access improves energy efficiency and amenity by creating pleasant conditions to live and work. Solar access is the ability of a building to receive direct sunlight without the obstruction from other buildings. Access to sunlight for habitable rooms and private open space for residential developments has been measured as part of the solar testing.

Fig. 7.9.18 Solar access to public open space

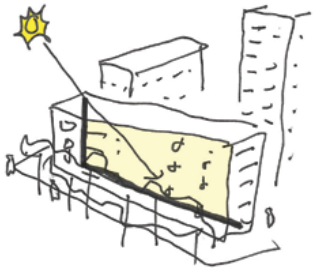


Fig. 7.9.19 Solar access to developments

Fig. 7.9.20 Solar access to communal open space

SUN PATH

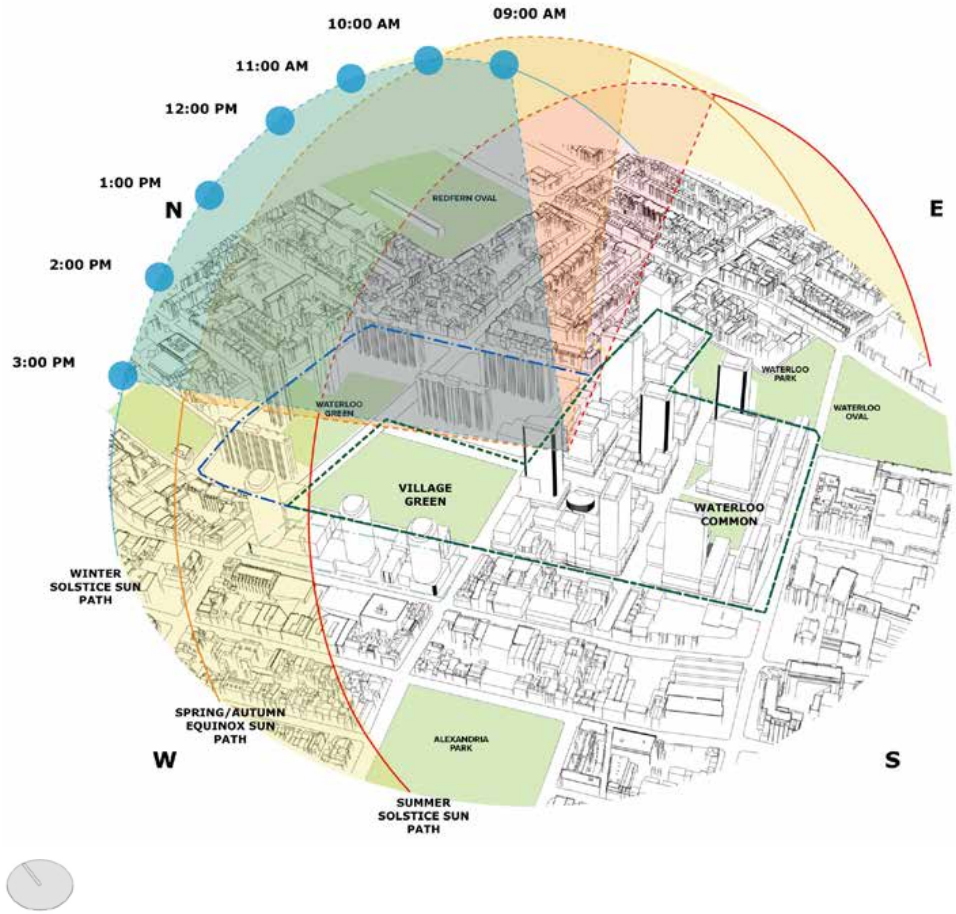


Fig. 7.9.21 Sun path for Waterloo at Winter Solstice, Spring and Autumn Equinox and Summer Solstice

TESTING METHODOLOGY

A parametric process was used to test the solar access performance of the preferred masterplan and adjacent existing and potential future context

PARAMETRIC PROCESS

The parametric process adopted allowed for rapid testing of numerous building configurations and provided highly accurate results that could be understood in a simple visual format. This process has been used to assess solar access to public open space, residential development and communal open spaces between 9am - 3pm at mid winter, in accordance with the ADG and the relevant DCP provisions for the overall masterplan.

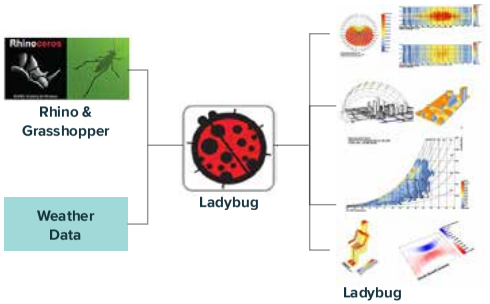


Fig. 7.9.22 The parametric process
Source: www.parametricmonkey.com, 2019

The process involved the use of Ladybug - an environmental plug-in for Grasshopper - that was used in conjunction with Rhino. Environmental data, including the sun path, was imported and a script was developed that could calculate the direct sunlight on any surface positioned at any orientation during a specified time window on a particular date and at a prescribed location. Both a numerical and graphical display of the results can then be created.

3D MODEL & CONTEXT

Fig. 7.9.23 The 3D model ready for analysis

A 3D model was obtained from the City of Sydney for the existing site and the adjacent context imported into the context model. 2D survey data was used to determine the orientation of True North.

The 3D model for the concept plan options and at a later stage, the Preferred Masterplan was imported into the context model for analysis.

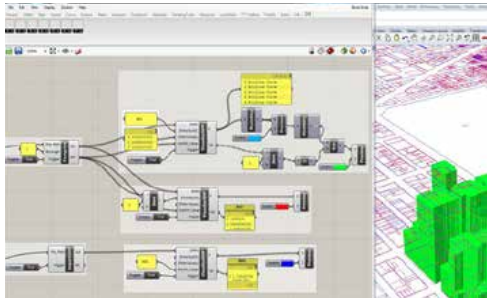


Fig. 7.9.24 Plugging in the surfaces to be analysed

Once the 3D model was inserted into Rhino, the surfaces to be analysed were connected to (or plugged in) that included:

- The primary façades (north, east and west) for the existing and future context and the masterplan envelopes.
- Existing and future open spaces.

Areas that were excluded from the analysis included:

- Existing and future non-residential areas
- South façades
- Ground level and level 1 areas included in the retail strategy's non-residential evolution over time.

SOLAR ANALYSIS

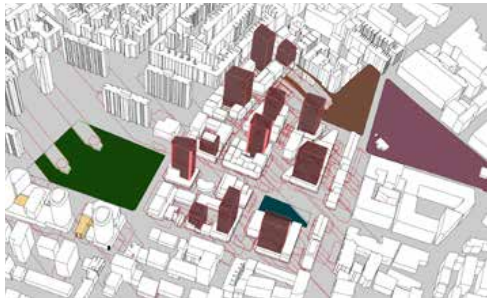


Fig. 7.9.25 Solar access analysis

The parametric tool was activated and solar access is simulated at 10 minute intervals between 9am to 3pm on June 21. Measurements were taken during the prescribed 6 hour window.

The parametric analysis allowed for rapid testing of block massing options and arrangements for the public open spaces across the masterplan.

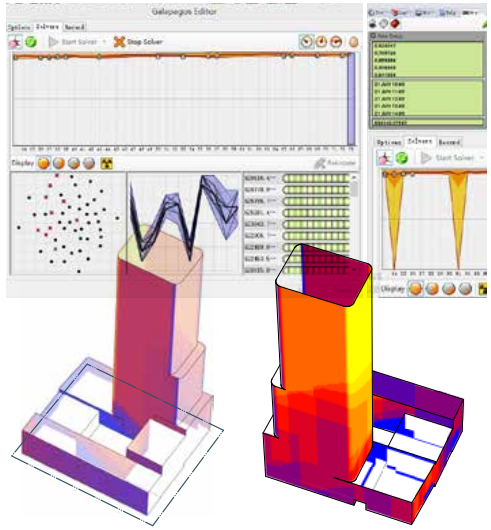


Fig. 7.9.26 Data can be displayed graphically or numerically

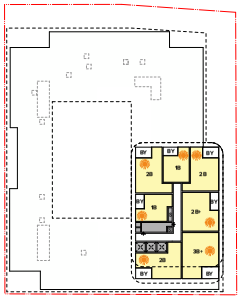


Fig. 7.9.27 Detailed solar analysis of selected lots

Further solar analysis for selected individual lots was undertaken, which were block planned in more detail. Shadows were cast at every hour between 9am-3pm and a manual count of apartments determined how many apartments per floor receive the minimum 2 hours of solar access (for all levels). The calculations confirm that buildings in the selected lot have the capacity to meet or exceed the ADG objectives and design criteria for solar access.

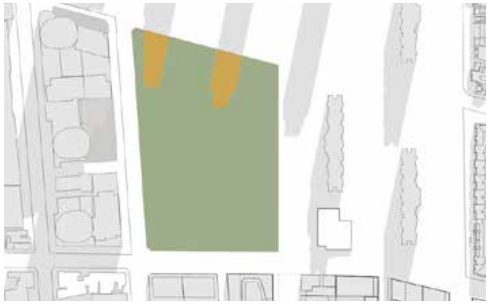


Fig. 7.9.28 Confirming solar access to open space

The same process has been adopted to determine the level of solar access received to public and communal open spaces. Surfaces were created to capture the extent of the open space to be measured but was analysed based on achieving solar access consistent with DCP provisions for parks and the ADG for communal open space. More detailed analysis was done with shadows cast at intervals of 15 minutes to confirm the time each space received sunlight within the prescribed 6 hour window between 9am to 3pm on June 21.

7.9.6 SOLAR ACCESS ANALYSIS

SOLAR ACCESS TO OPEN SPACE

A range of existing public open spaces are located adjacent to Waterloo South

There is an existing network of public open spaces surrounding Waterloo South that includes Redfern Park, Alexandria Park, Waterloo Park and Waterloo Oval.

Future open space will be provided to add to this existing network that includes the Raglan Street Plaza and Cope Street Plaza as part of the renewal of the adjacent Waterloo Metro Quarter. The Village Green and Waterloo Common will be provided as part of the renewal of Waterloo South.

Waterloo South's built form responds to each of these open spaces with the intent that through future detailed design and assessment the minimum required solar access is provided or exceeded. The following comments provide an overarching analysis of each interface:

CONTEXT ANALYSIS

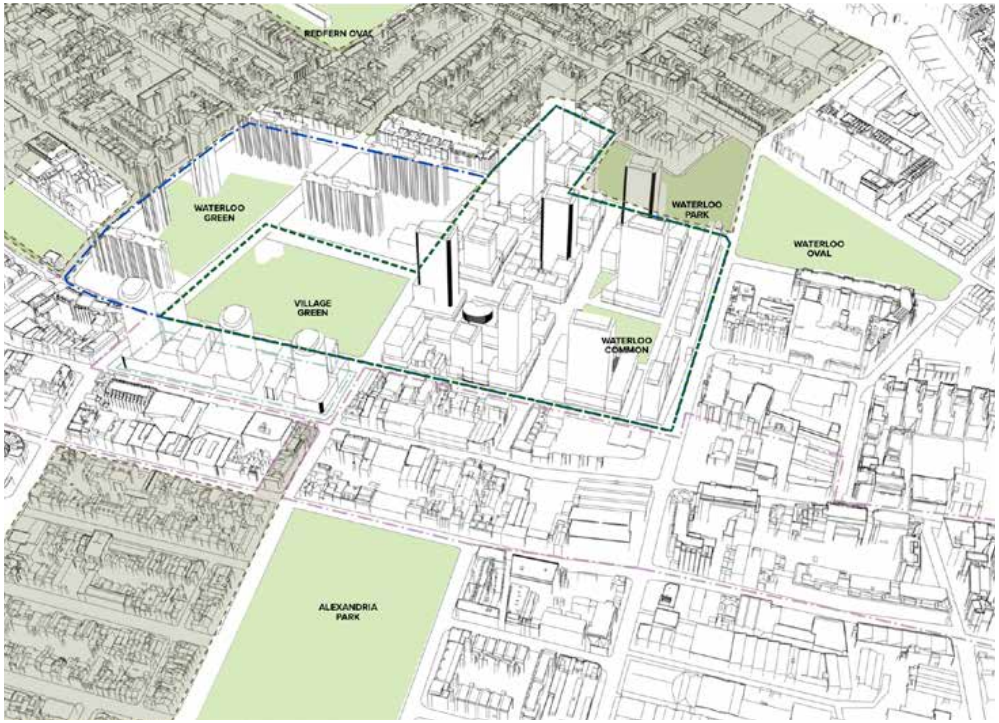


Fig. 7.9.29 Existing & future interfaces to Waterloo Estate

ADJACENT PUBLIC OPEN SPACE

Waterloo Park & Waterloo Oval

- Located to the East of Waterloo South.
- Waterloo South has been designed to maintain solar access to Waterloo Park and Waterloo Oval for a minimum of 4 hours between 9am and 3pm to a minimum 50% stationary open space area in mid winter, measured at hourly intervals to confirm the area receiving solar access at each time. Consideration has been given to overshadowing from the existing context as part of these calculations.

Alexandria Park Public Open Space

- Located to the West of Waterloo South.
- Waterloo South has no impact on Alexandria Park.

Fig. 7.9.31 Waterloo Park

WATERLOO METRO QUARTER

Open Space within the Metro Quarter

- The open space to Raglan Street Plaza and Cope Street Plaza as represented in the Waterloo Metro Quarter SSDA submission.
- Waterloo South has no impact on the future Raglan Street Plaza and Cope Street Plaza.

Fig. 7.9.32 Raglan Street Plaza
Source: Narratives, 2018

WATERLOO PRECINCT

Public Open Space within the Precinct

Two public open spaces - Village Green and Waterloo Common - are proposed as part of Waterloo South. Solar access has been tested as follows:

- The built form envelopes have been designed to provide solar access to the proposed public open spaces for a minimum of 4 hours between 9am and 3pm to a minimum 50% stationary open space area in mid winter, measured at hourly intervals to confirm the area receiving solar access at each time.
- The building envelopes represented in the Waterloo Metro SSDA submission have been included as part of the analysis for solar access to primary open spaces described above.

Fig. 7.9.33 Village Green
Source: Virtual Ideas, 2019

MID-WINTER WATERLOO SOUTH SHADOWS (9AM TO 3PM)

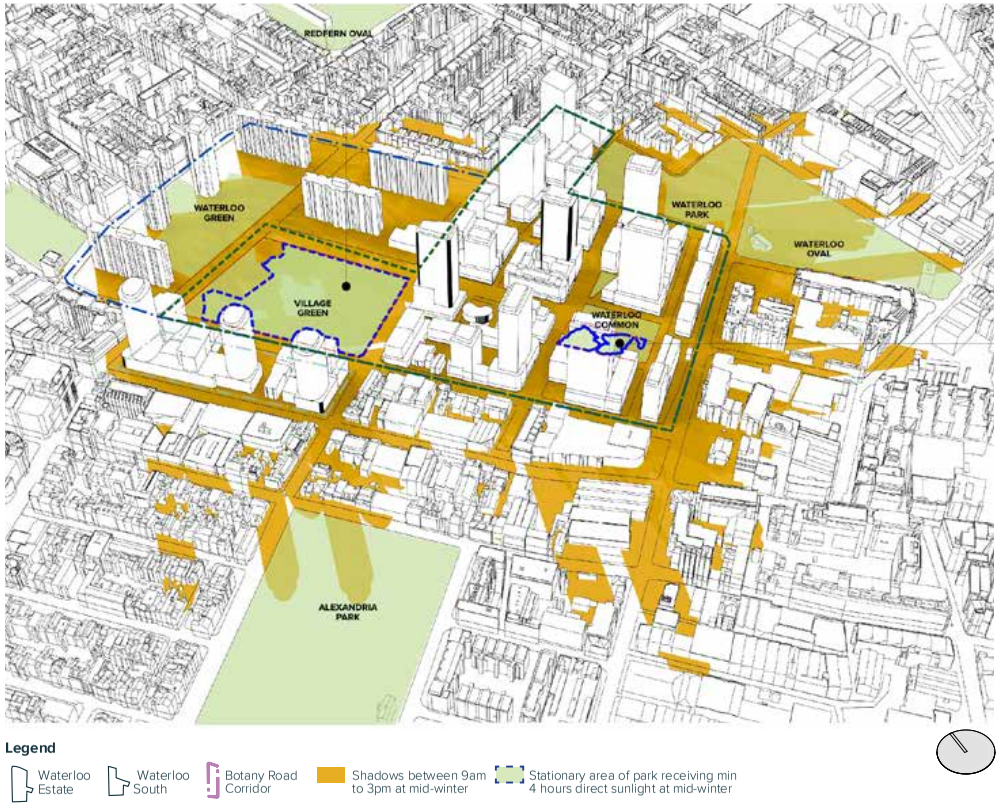


Fig. 7.9.30 Existing & future interfaces to Waterloo Estate

EXISTING OPEN SPACE

WATERLOO PARK

A minimum stationary 58 percent of the open space area receives sunlight for 4 hours between 9am to 3pm on June 21, exceeding the minimum DCP provisions for solar access

Waterloo Park (north of McEvoy Street) receives sunlight in excess of the minimum DCP provisions for solar access between 9am to 3pm on June 21.

Fig. 7.9.34 Waterloo Park Winter Solstice 9am

Fig. 7.9.35 Waterloo Park Winter Solstice 10am

Fig. 7.9.36 Waterloo Park Winter Solstice 11am

Fig. 7.9.37 Waterloo Park Winter Solstice 12pm

Fig. 7.9.38 Waterloo Park Winter Solstice 1pm

Fig. 7.9.39 Waterloo Park Winter Solstice 2pm

Fig. 7.9.40 Waterloo Park Winter Solstice 3pm

LEGEND

Waterloo South built form shadow to park

WATERLOO OVAL

A minimum stationary 97 percent of the open space area receives sunlight for 4 hours between 9am to 3pm on June 21, exceeding the minimum DCP provisions for solar access

Waterloo Oval (south of McEvoy Street) receives sunlight in excess of the minimum DCP provisions for solar access between 9am to 1pm on June 21.

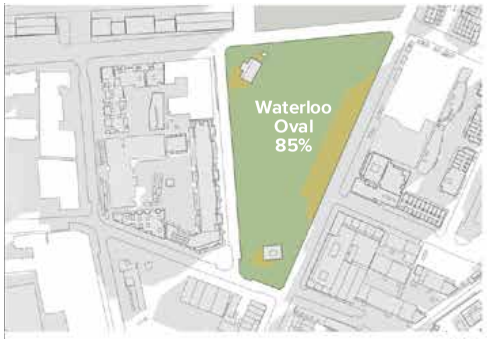


Fig. 7.9.41 Waterloo Oval Winter Solstice 9am

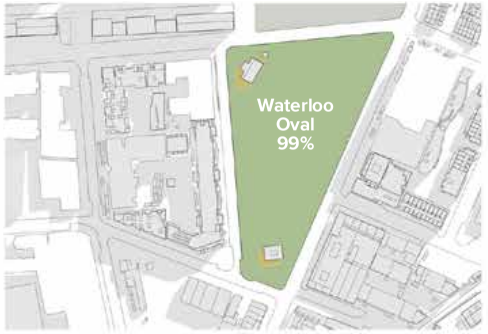


Fig. 7.9.42 Waterloo Oval Winter Solstice 10am

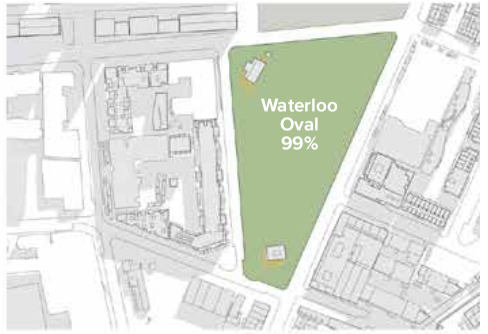


Fig. 7.9.43 Waterloo Oval Winter Solstice 11am

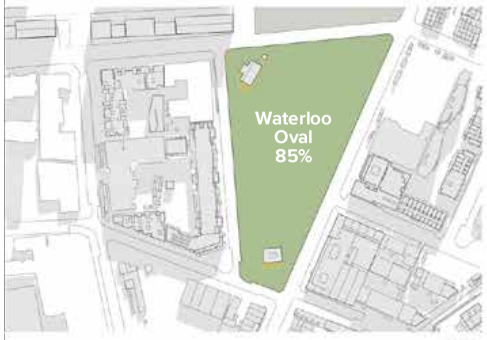


Fig. 7.9.44 Waterloo Oval Winter Solstice 12pm

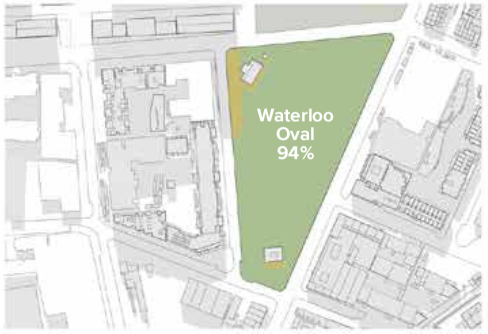


Fig. 7.9.45 Waterloo Oval Winter Solstice 1pm

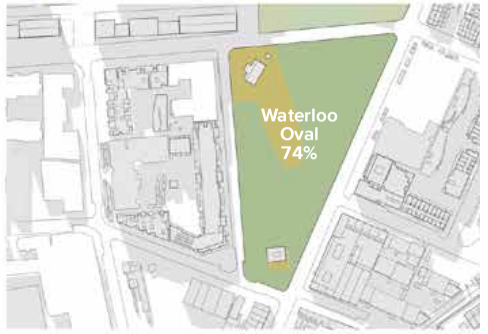


Fig. 7.9.46 Waterloo Oval Winter Solstice 2pm

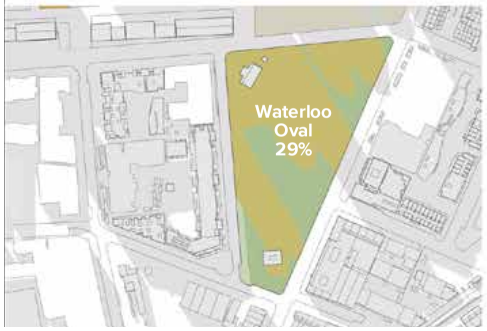


Fig. 7.9.47 Waterloo Oval Winter Solstice 3pm

LEGEND

Waterloo South built form shadow to park

FUTURE OPEN SPACE

VILLAGE GREEN

A minimum stationary 86 percent of the open space area receives sunlight for 4 hours between 9am to 3pm on June 21, exceeding the minimum DCP provisions for solar access

The proposed Village Green exceeds the minimum DCP provisions for solar access between 9am to 1pm on June 21.

Fig. 7.9.48 Waterloo Village Green Winter Solstice 9am

Fig. 7.9.49 Waterloo Village Green Winter Solstice 10am

Fig. 7.9.50 Waterloo Village Green Winter Solstice 11am

Fig. 7.9.51 Waterloo Village Green Winter Solstice 12pm

Fig. 7.9.52 Waterloo Village Green Winter Solstice 1pm

Fig. 7.9.53 Waterloo Village Green Winter Solstice 2pm

Fig. 7.9.54 Waterloo Village Green Winter Solstice 3pm

LEGEND

Waterloo South built form shadow to park

Metro Quarter built form shadow to park

WATERLOO COMMON

A minimum stationary 50 percent of the open space area receives sunlight for 4 hours between 9am to 3pm on June 21, in accordance with the minimum DCP provisions for solar access

The proposed Waterloo Common achieves the minimum DCP provisions for solar access between 9am to 1pm on June 21.

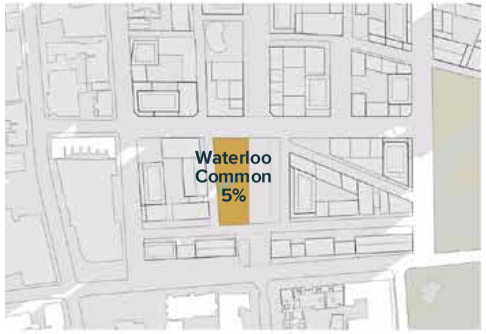


Fig. 7.9.55 Waterloo Common Winter Solstice 9am

Fig. 7.9.56 Waterloo CommonWinter Solstice 10am

Fig. 7.9.57 Waterloo Common Winter Solstice 11am

Fig. 7.9.58 Waterloo Common Winter Solstice 12pm

Fig. 7.9.59 Waterloo Common Winter Solstice 1pm

Fig. 7.9.60 Waterloo Common Winter Solstice 2pm

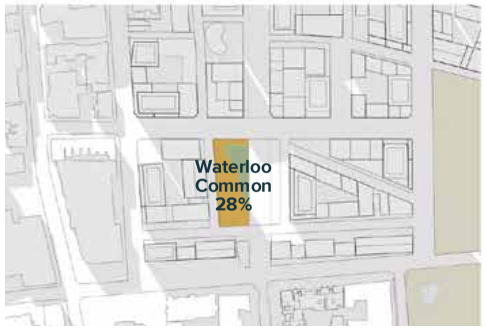


Fig. 7.9.61 Waterloo Common Winter Solstice 3pm

LEGEND

Waterloo South built form shadow to park

SUMMER SOLSTICE

Solar access to the surrounding existing public open space during the summer solstice is generally not affected by Waterloo South, with minor shadowing on Waterloo Park after 2pm.

During the summer solstice, the proposed parks for Waterloo South receive direct sunlight throughout the day. Shadows are fast moving and at any one hour between 9am and 3pm, more than 50 percent of the park receives direct sunlight.

Fig. 7.9.62 Summer Solstice 9am

Fig. 7.9.63 Summer Solstice 10am

Fig. 7.9.64 Summer Solstice 11am

SPRING & AUTUMN EQUINOX

Solar access to the surrounding existing public open space during the equinox is generally not affected by by Waterloo South, with shadowing on Waterloo Park starting at 12pm.

During the equinox, the proposed parks for Waterloo South receive direct sunlight throughout the day. Shadows are fast moving and at any one hour between 9am and 3pm, more than 50 percent of the park receives direct sunlight.

Fig. 7.9.69 Spring / Autumn Equinox 9am

Fig. 7.9.70 Spring / Autumn Equinox 10am

Fig. 7.9.71 Spring / Autumn Equinox 11am

WINTER SOLSTICE

Solar access to the surrounding existing public open space exceeds the minimum DCP provisions of 4 hours solar access to a stationary 50 percent park area between 9am and 3pm mid winter.

Solar access to the Raglan Street Plaza within the Metro Quarter exceeds the minimum DCP provisions of 2 hours solar access to 50 percent of the area between 9am and 3pm mid winter.

Solar access to the proposed parks for Waterloo South achieve the minimum DCP provisions of 4 hours solar access a stationary 50 percent park area between 9am and 3pm mid winter.

LEGEND

Waterloo South built form shadow to park

Metro Quarter built form shadow to park

Fig. 7.9.76 Winter Solstice 9am

Fig. 7.9.77 Winter Solstice 10am

Fig. 7.9.78 Winter Solstice 11am

Fig. 7.9.65 Summer Solstice 12pm

Fig. 7.9.66 Summer Solstice 1pm

Fig. 7.9.67 Summer Solstice 2pm

Fig. 7.9.68 Summer Solstice 3pm

Fig. 7.9.72 Spring / Autumn Equinox 12pm

Fig. 7.9.73 Spring / Autumn Equinox 1pm

Fig. 7.9.74 Spring / Autumn Equinox 2pm

Fig. 7.9.75 Spring / Autumn Equinox 3pm

Fig. 7.9.79 Winter Solstice 12pm

Fig. 7.9.80 Winter Solstice 1pm

Fig. 7.9.81 Winter Solstice 2pm

Fig. 7.9.82 Winter Solstice 3pm

SOLAR ACCESS TO EXISTING ADJACENT CONTEXT

A variety of interfaces form the context around Waterloo South; these require a different criteria for testing based on their location and relationship to the Waterloo South built form

An analysis of the existing surrounding context was undertaken to gain an understanding of each site's potential for future re-development to residential uses. This determined the sites to be analysed for solar access based on its existing condition and the sites to be analysed based on its future potential.

Sites identified with low re-development potential were assessed through the following criteria:
- Recently re-developed
- Currently under construction
- Sites with approved Development Approval
- Within a Heritage Conservation Area (HCA) or a heritage item
- Non-residential uses

Sites identified with future re-development potential were assessed through the following criteria:
- Zoning
- Current use
- Age of the buildings on the site
- Potential for amalgamation of smaller sites

Waterloo South's built form responds to each of these interfaces with the intent that through future detailed design and assessment the minimum required solar access is provided or exceeded. The following comments provide an overarching analysis of each interface:

EXISTING CONTEXT

McEvoy Street
- Located to the South of Waterloo South.
- Waterloo South maintains the capacity of neighbouring residential sites to achieve solar access for 2 hours to 70% of apartments by applying the methodology for measurement of solar access to primary building façades including Ground Level.

Alexandria Heritage Conservation Area
- Located to the West of Waterloo South.
- Waterloo South overshadows a limited number of dwellings between 9 and 10am mid winter which does not adversely compromise their ability to receive solar and daylight access.

Botany Road Corridor
- Located to the West of Waterloo South.
- The Botany Road Corridor area provides a mix of uses.
- Waterloo South has been designed to meet the intent of ADG Objective 3B-2 for minimising overshadowing to neighbouring residential properties, both existing and potential residential development in the future.


Fig. 7.9.83 Adjacent context


Fig. 7.9.84 Adjacent context,
Raglan Street facing west


Fig. 7.9.85 Adjacent context,
Botany Road facing north-east

East of the Masterplan - Pitt Street

- Located to the East of Waterloo South.
- Waterloo South does not result in any additional overshadowing before 1pm.
- Where the neighbouring sites - single dwelling or apartments - rely on solar access after 1pm, Waterloo South has been designed to meet the intent of ADG Objective 3B-2 for minimising overshadowing of neighbouring properties.

WATERLOO METRO QUARTER

- The building envelope methodology and assumptions used for Waterloo South have been applied to the Metro Quarter.
- Waterloo South has no impact on the proposed development as represented in the approved Waterloo Metro Quarter SSDA submission.
- The building envelopes represented in the Waterloo Metro Quarter SSDA submission have been included as part of the analysis for solar access testing for Waterloo South.

WATERLOO ESTATE

Private Sites within Waterloo South

- Private sites within Waterloo South have been tested with consideration to a possible future built form outcome utilising a maximum FSR consistent with Waterloo South.
- The building envelope methodology and assumptions used for Waterloo South have been applied to the private sites.

Fig. 7.9.86 Adjacent context,
Pitt Street

Fig. 7.9.87 Adjacent context,
Waterloo Metro Quarter

Fig. 7.9.88 Adjacent context,
Waterloo Estate

EXISTING CONTEXT

The existing interfaces that form the context around Waterloo South include the largely residential heritage conservation areas to the east and west and recent re-development south of McEvoy Street

Assessment of the surrounding context has identified the existing sites with low re-development potential. This includes:

Waterloo Heritage Conservation Area
Located to the east of Waterloo South, the area is significant as an early residential subdivision of the Mount Lachlan Estate and is largely comprised of low rise residential.

Alexandria Park Heritage Conservation Area
Located to the west of Waterloo South, the area is significant as a remnant of the growth of the Municipality of Alexandria in the second half of the nineteenth century.

Heritage Items
A number of heritage listed buildings are located largely to the west of Waterloo South, predominantly accommodating non-residential uses and mostly of low rise residential.

Recent Developments
Outside of the heritage conservation areas, surrounding sites have been progressively redeveloped to multi-residential uses.

Legend
- Waterloo South boundary
- Metro Quarter boundary
- Existing non-residential sites located within shadow impact range
- Existing heritage item located within shadow impact range
- Existing residential sites located within shadow impact range
- Waterloo South shadow impact range
- Metro Quarter shadow impact range

Refer to Appendix 7.5 for further detail.

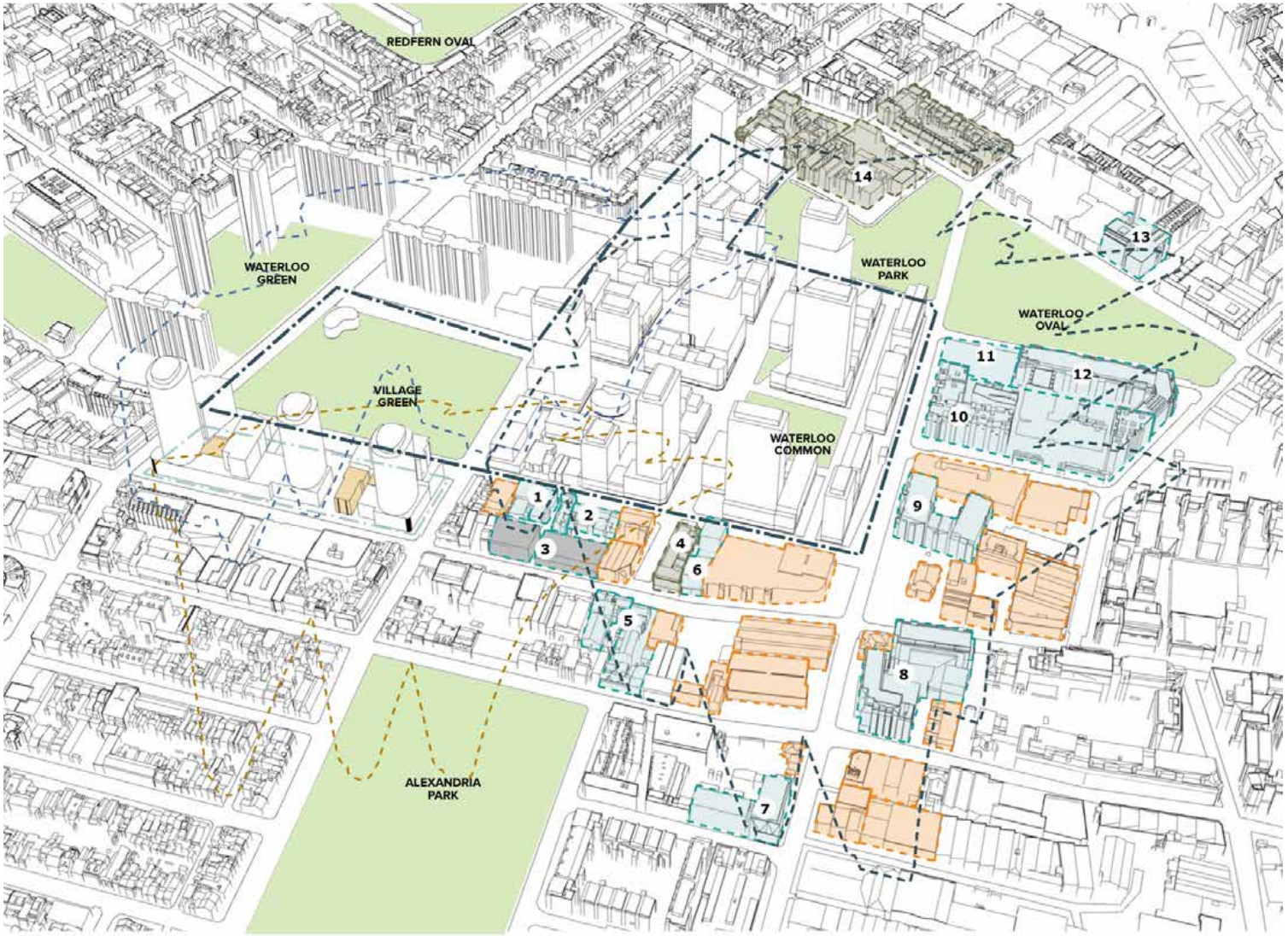


Fig. 7.9.89 Existing interfaces to Waterloo Estate

The existing interfaces with low re-development potential were evaluated with different criteria based on their location and relationship to Waterloo South's built form. As part of the testing of the building envelopes, the following assumptions have been made:

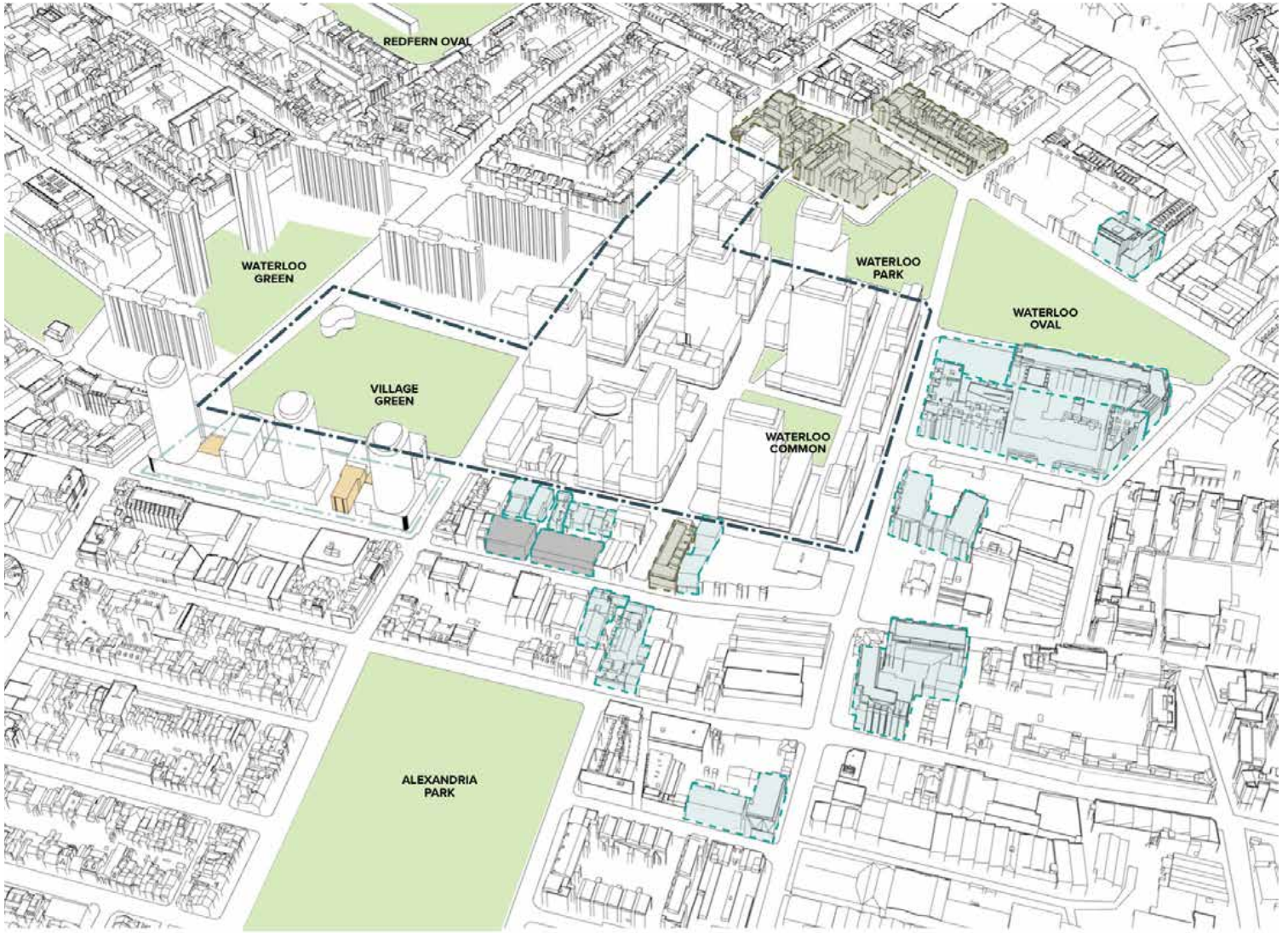
Sites with non-residential uses

- Existing non-residential sites have been excluded from solar analysis.

Sites with residential uses

- Existing sites that are currently not achieving the minimum ADG or DCP solar access provisions have been excluded from solar analysis

- Where detailed information was unavailable, sites have been tested to ensure that **70- 75% of the primary building facade area - North, East or West - receive a minimum of 2 hours direct sunlight between 9am and 3pm at mid winter**.



Legend

- Waterloo South boundary
- Metro Quarter boundary
- Existing heritage item located within shadow impact range
- Existing residential sites located within shadow impact range

Fig. 7.9.90 Solar access to existing context between 9am - 3pm mid winter

Neighbouring residential buildings receive minimum 2 hours of direct sunlight in mid-winter

The Waterloo South built form has been developed with consideration to the amenity of the surrounding context.

The solar access to surrounding residential dwellings has been studied at the Winter Solstice for their ability to satisfy the provisions of the Sydney Development Control Plan 2012 and the design criteria within the Apartment Design Guide.

1. 180-184 Cope Street,Waterloo
2. 186 - 204 Cope Street, Waterloo
3. 133 & 149 Botany Road,Waterloo
4. 9 - 21 John Street, Waterloo
5. 196 Botany Road, Waterloo
6. 168-170 Botany Road, Alexandria
7. 105-109 McEvoy Street Alexandria
8. 64-68 McEvoy Street, Alexandria
9. 52-54 McEvoy Street, Waterloo
10. 40-46 McEvoy Street, Waterloo
11. 34-38 McEvoy Street, Waterloo
12. 25-33 Allen Street, Waterloo
13. 826-828 Elizabeth Street Waterloo
14. Waterloo Conservation Area

Legend

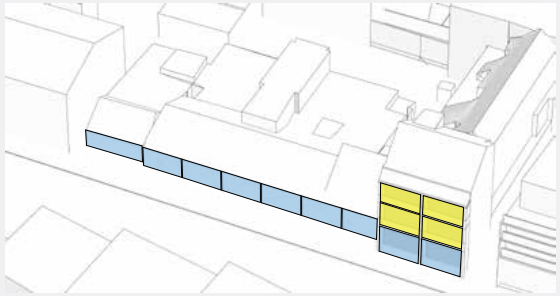
- Living room windows
- Windows to rooms other than living areas
- DCP compliance
- ADG compliance

Fig. 7.9.91 Neighbouring residential buildings solar access analysis

1. 180 - 184 COPE ST,WATERLOO ✓

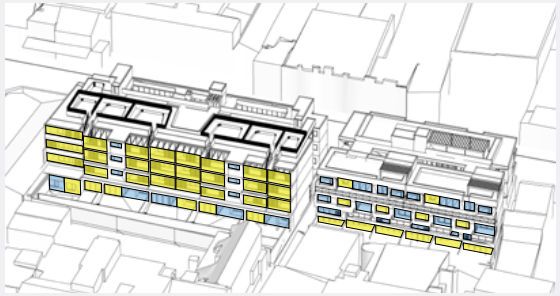
Proposed Waterloo South built f orm does not reduce the number of dwellings receiving minimum 2 hr of direct sun light to the living room windows or balconies.

2. 186 - 204 COPE ST,WATERLOO ✓ ✓



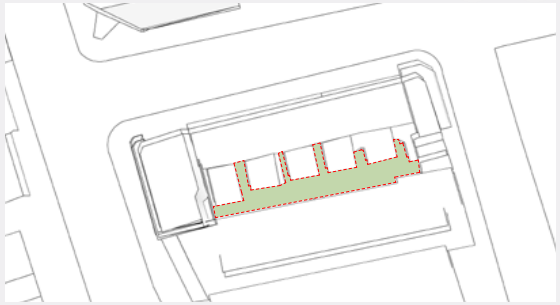
186 Cope street still retains its current solar access performance. 190 - 204 Cope Street has living room windows facing west which are not impacted by Waterloo South built form shadow.

3. 133 & 149 BOTANY ROAD,WATERLOO ✓



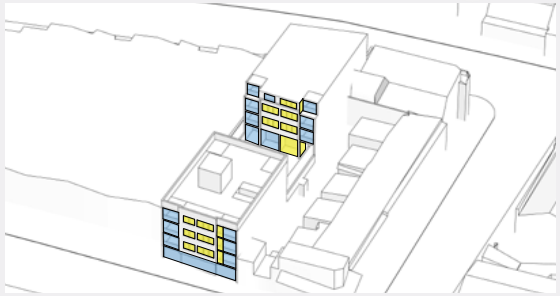
Proposed Waterloo South built form does not reduce the number of dwellings receiving minimum 2 hr of direct sun light to the living room windows or balconies.

4. 9 - 21 JOHN STREET ,WATERLOO ✓ ✓



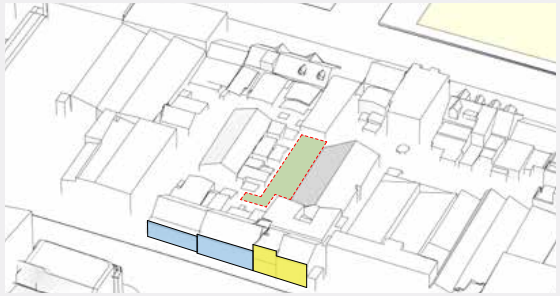
Private open spaces of the residential sites still achieving minimum of 2 hours direct sun light to 50% of its area.

5. 196 BOTANY ROAD, WATERLOO ✓



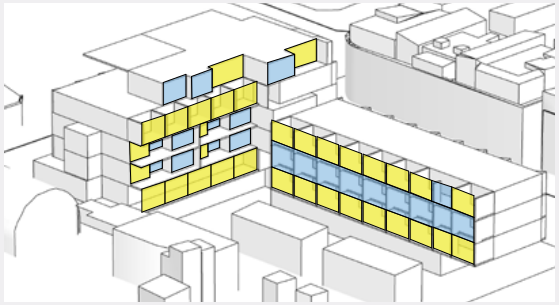
The subject site still retains over 70% of its dwellings receiving minimum 2 hr of direct sun light.

6. 168 - 170 BOTANY ROAD, WATERLOO ✓ ✓



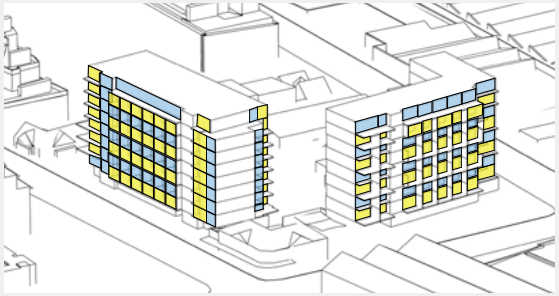
Private open spaces of the residential sites still achieved minimum of 2 hours direct sun light to 50% of its area. Proposed Waterloo South built form does not reduce the solar access to the living room windows or balconies.

7. 105-109 McEvoy Street Alexandria



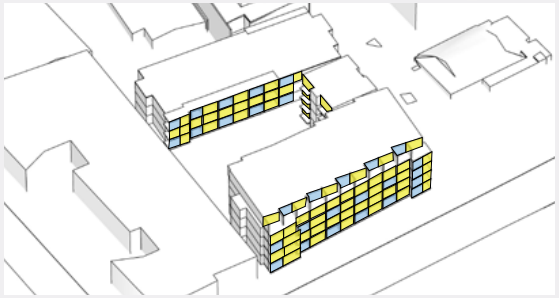
Proposed Waterloo South built form does not reduce the number of dwellings receiving minimum 2 hr of direct sun light to the living room windows or balconies.

8. 64-68 McEvoy Street, Alexandria



Proposed Waterloo South built form does not reduce the number of dwellings receiving minimum 2 hr of direct sun light to the living room windows or balconies.

9. 52-54 McEvoy Street, Alexandria

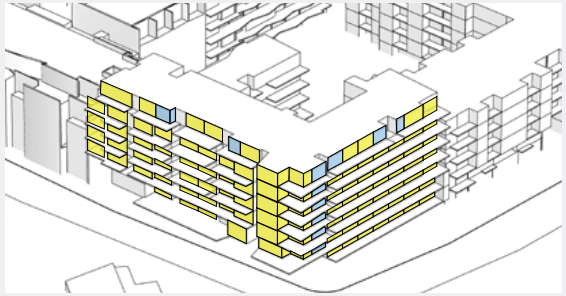


Proposed Waterloo South built form only impacting on 5 out of 73 units to subject development. Subject development still achieving 75% of the dwellings receiving minimum 2 hours of direct sun light to its living room and balcony.

10. 40-46 McEvoy Street, Waterloo

Solar access performance for subject development reduced from 65% to 60% of its dwellings receiving minimum 2 hr of direct sun light. The living room windows on western facade does not receive any direct sun light in the existing condition.

11. 34-38 McEvoy Street, Waterloo

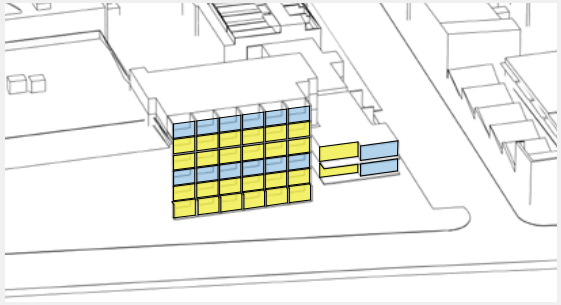


Subject development still achieves over 70% of its total dwellings receiving minimum 2 hours of direct sun light to living rooms and balconies.

12. 25-33 Allen Street, Waterloo

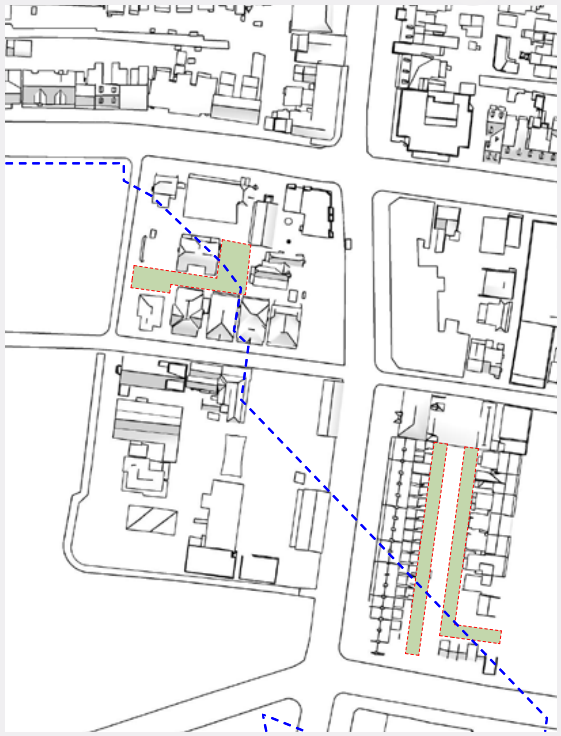
Proposed Waterloo South built form only impacting on 5 of the dwellings on the western facade of subject development. Impacted dwellings receives an increase of overshadowing for 15 - 30 minutes to its living room and balconies.

13. 826-828 Elizabeth Street WATERLOO



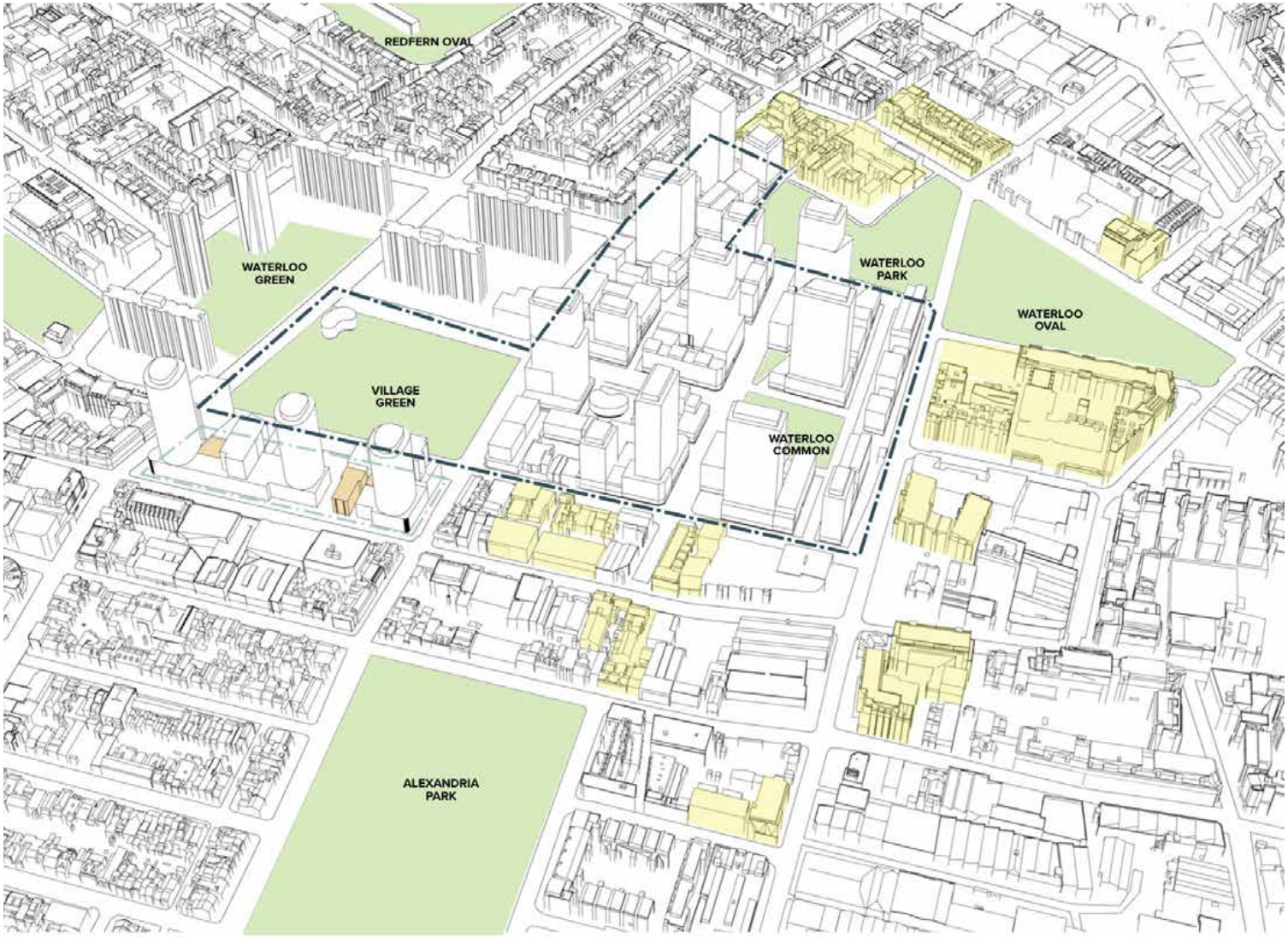
Proposed Waterloo South built form does not reduce the number of dwellings receiving minimum 2 hr of direct sun light to the living room windows or balconies.

14. WATERLOO CONSERVATION AREA



Private open spaces of the residential sites within shadow impacting range of proposed Waterloo South built form still achieved minimum of 2 hours direct sun light to 50% of its area.

Waterloo South does not change the capacity of existing interfaces that currently achieve the minimum ADG design criteria and DCP provisions of 2 hours direct sunlight between 9am and 3pm at mid winter



Legend

- Estate boundary
- Metro Quarter boundary
- Waterloo South des not change the capacity of the site to achieve recommended solar access

Fig. 7.9.92 Solar access to existing context between 9am - 3pm mid winter

SOLAR ACCESS TO FUTURE ADJACENT CONTEXT

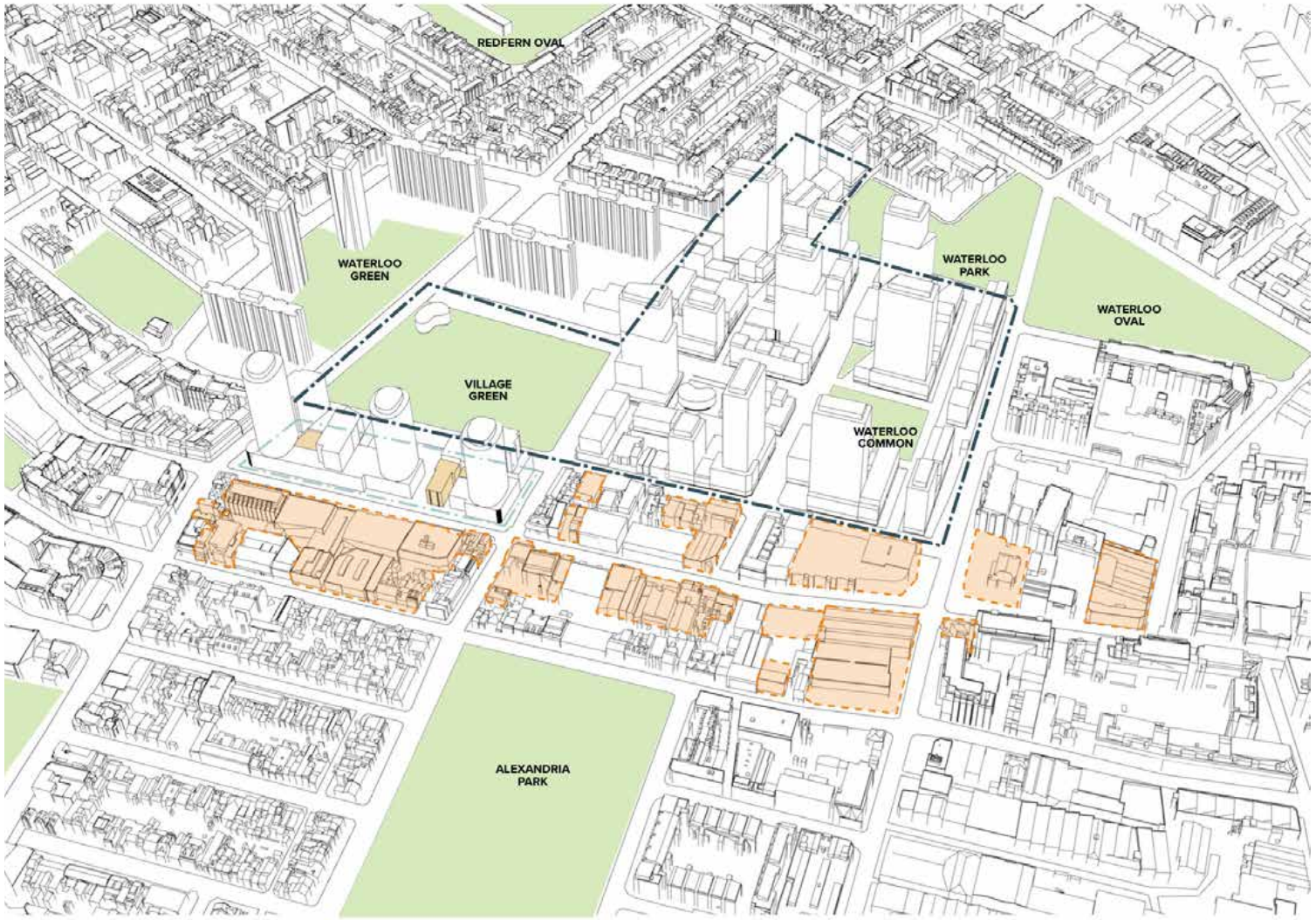
FUTURE CONTEXT

The existing sites adjacent to Waterloo South assessed with future re-development potential are limited to those along the Botany Road Corridor and currently undeveloped sites south of McEvoy Street

Assessment of the surrounding context has identified the existing sites with future re-development potential. This includes:

Botany Road Corridor

Undeveloped sites south of McEvoy Street



Legend

- Estate boundary
- Metro Quarter boundary
- Existing sites with future re-development potential

Refer to Appendix 7.5 for further detail.

Fig. 7.9.93 Future interfaces to Waterloo Estate

Building envelopes for likely future development surrounding Waterloo South have the capacity to achieve the design criteria objectives within the ADG of 2 hours direct sunlight between 9am and 3pm at mid winter

A scenario for likely future development along the Botany Road Corridor and currently undeveloped sites south of McEvoy Street has been used to test solar access with the understanding that the masterplan has the flexibility to respond when these sites are re-developed in the future. As part of the testing of the building envelopes, the following assumptions have been made:

- Likely future built form that is possible under current controls have been used for existing non-residential sites, which would typically be exclude from solar analysis to ensure that Waterloo South does not reduce the site's future development potential.
- For likely future development surrounding Waterloo South, building envelopes have been tested to ensure that **70- 75% of the primary envelope facade area - North, East and West - receive a minimum of 2 hours direct sunlight between 9am and 3pm at mid winter**.
- Communal open spaces are located on roof levels to ensure they **achieve a minimum of 50% direct sunlight to the principal usable part** for **a minimum of 2 hours between 9am and 3pm mid winter.**

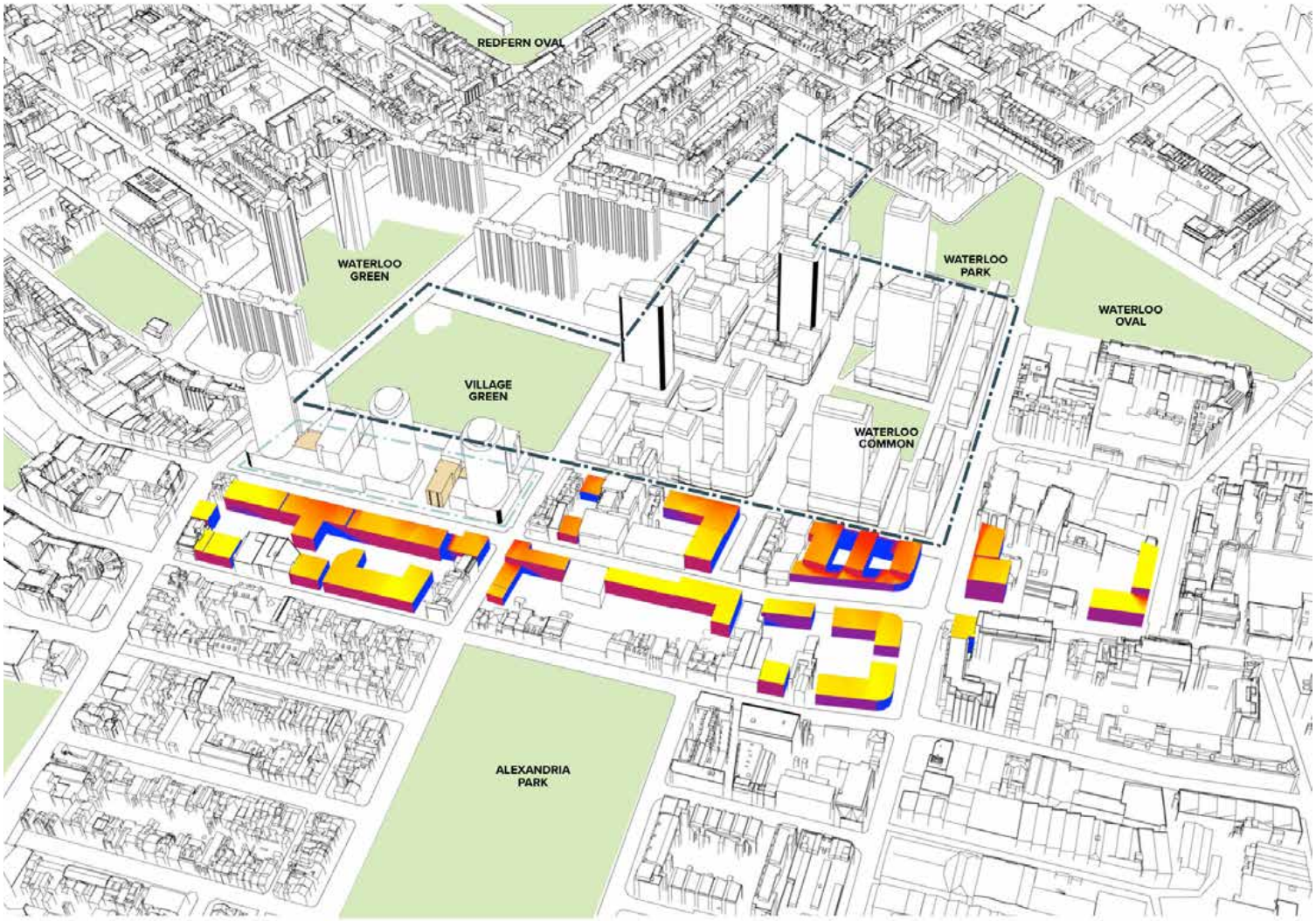


Fig. 7.9.94 Solar access to future potential context between 9am - 3pm mid winter, south west view

Legend

0 1 2 4 6 Hours

Direct sunlight to façades

Fig. 7.9.95 Solar access to future potential context between 9am - 3pm mid winter, north-east view

SOLAR ACCESS TO INDICATIVE CONCEPT PROPOSAL

The Indicative Concept Proposal comprises the existing Waterloo South social housing and a number of private sites

The Waterloo South Indicative Concept Proposal is comprised of:

Waterloo Estate Social Housing
Part of the Waterloo Social Housing Estate, currently owned by and managed by LAHC.

Private Sites
A number of sites are located within Waterloo South under private ownership. These are located at:

1. 221-223 Cope Street - with existing commercial uses
2. 116 Wellington Street - with existing commercial uses
3. 225-227 Cope Street - with existing residential uses
4. 233-239 Cope Street and 123-131 Cooper Street - with existing multi-residential uses
5. 111 Cooper Street - with existing residential uses
6. 291 George Street - with existing multi-residential uses
7. 110 Wellington Street - with existing multi-residential uses

Legend

- Estate boundary
- Metro Quarter boundary
- Private site with existing non-residential uses
- Private site with existing residential uses
- Private site with heritage item

Refer to Section 1.2 for further details.

WATERLOO SOUTH INDICATIVE CONCEPT PROPOSAL

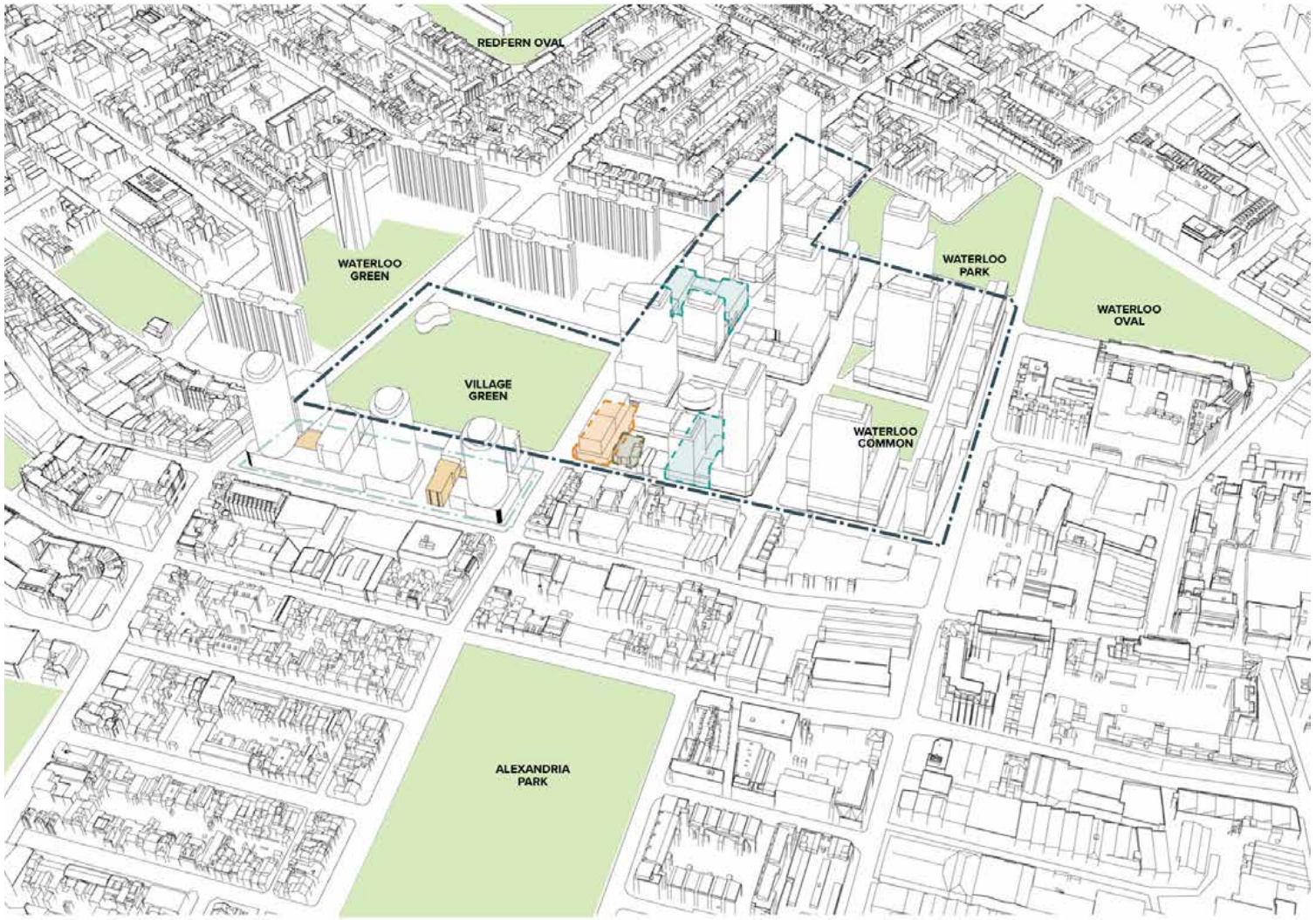


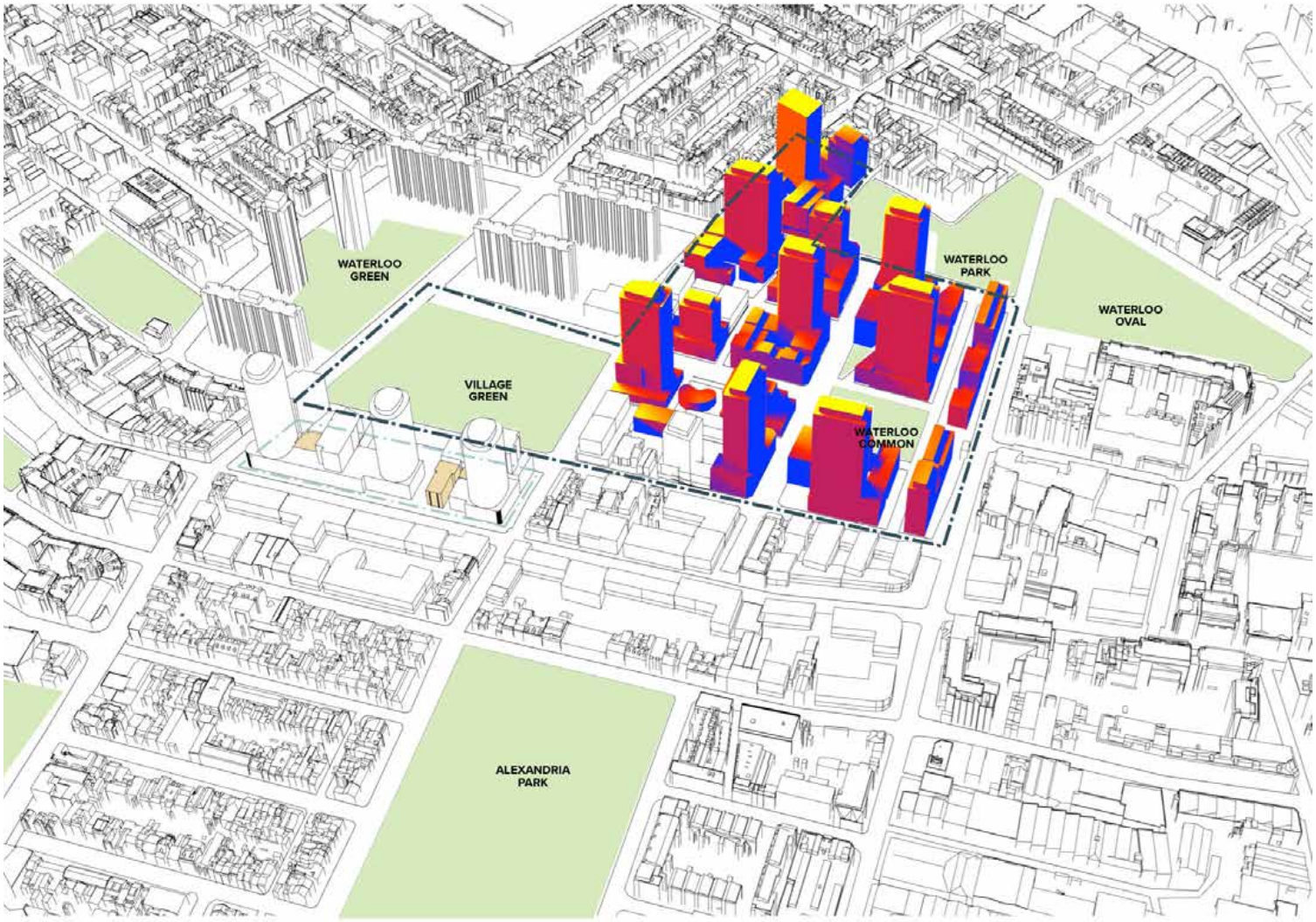
Fig. 7.9.96 Waterloo South Indicative Concept Proposal

Potential future building envelopes for the private sites within Waterloo South have the capacity to achieve the design criteria objectives within the ADG of 2 hours direct sunlight between 9am and 3pm at mid winter

As part of the testing of the building envelopes, the following assumptions have been made for Waterloo South:

Private Sites

- A scenario for likely future development within the private sites has been used to test solar access with the understanding that the masterplan has the flexibility to respond if these sites are re-developed in the future.
- Non-residential areas have been excluded from solar analysis.
- Building envelopes have been tested to ensure that **70- 75% of the primary envelope facade area - North, East and West - receive a minimum of 2 hours direct sunlight between 9am and 3pm at mid winter**.
- Communal open spaces are located on roof levels to ensure they **achieve a minimum of 50% direct sunlight to the principal usable part** for **a minimum of 2 hours between 9am and 3pm mid winter.**



Legend
0 1 2 4 6 Hours
Direct sunlight to façades

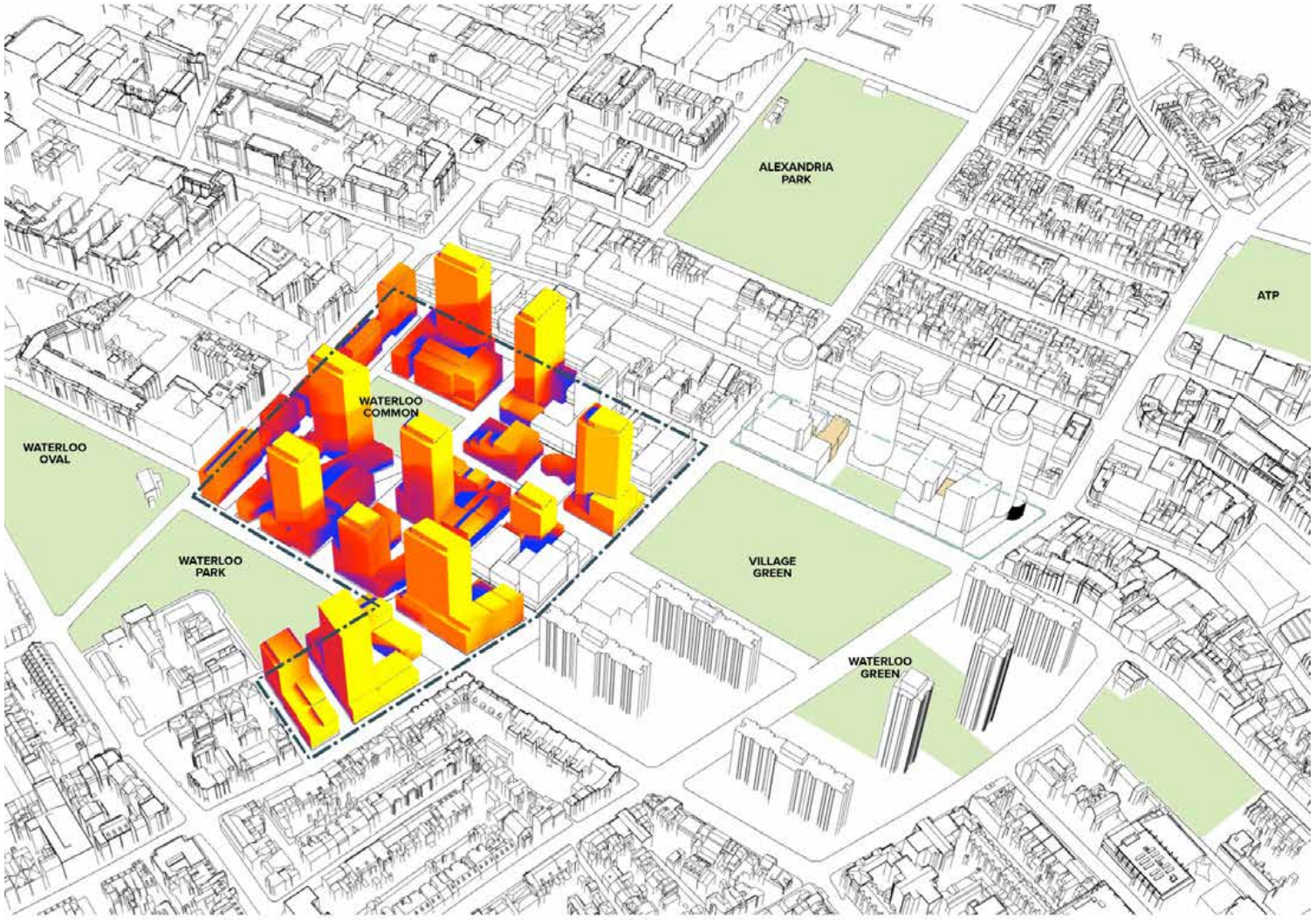
Refer to Appendix 7.5 for further detail.

Fig. 7.9.97 Solar access to Waterloo South between 9am - 3pm mid winter, south west view

Building envelopes for Waterloo South have the capacity to achieve the design criteria objectives within the ADG of 2 hours direct sunlight between 9am and 3pm at mid winter

Waterloo South

- Non-residential areas have been excluded from solar analysis.
- With consideration for the retail strategy's evolution over time, the ground level and first floor level residential in key areas has been excluded from solar analysis for the masterplan building envelopes with the understanding that in detailed lot studies, all residential units (including ground and first floor areas excluded in the earlier analysis) are included as part of the overall calculation for solar access.
- Building envelopes have been tested to ensure that **70- 75% of the primary envelope facade area - North, East and West - receive a minimum of 2 hours direct sunlight between 9am and 3pm at mid winter**.
- Communal open spaces are located on roof levels to ensure they **achieve a minimum of 50% direct sunlight to the principal usable part** for **a minimum of 2 hours between 9am and 3pm mid winter.**



Refer to Appendix 7.4 and 7.5 for further detail.

Fig. 7.9.98 Solar access to Waterloo South between 9am - 3pm mid winter, north east view

SOLAR ACCESS TO LOT S

Detailed testing for the individual lots confirm that in detailed design Waterloo South has the capacity to meet the ADG objectives and design criteria for solar access

LOT STUDY ANALYSIS

Detailed Lot study analysis of the proposed built form for Waterloo South was undertaken to test the methodology and assumptions:

- **The assumptions have been tested against a representative block or 'Lot S' as part of the masterplan process**.

- The preferred residential to non-residential mix (approximately 95% : 5%) and distribution based on the retail strategy was used to test the representative lots.

- The average apartment mix for the overall masterplan was used to test the representative lots. This has been proportioned as a range of 25% -30% social (affordable rental) : 70%-75% market.

- The dwelling mix includes a range that includes:
  - Studios ranging from 35 - 40 sqm
  - 1 Beds ranging from 50 - 55 sqm
  - 2 Beds ranging from 70 - 75 sqm
  - 2 Beds ranging from 80 - 85 sqm
  - 3 Beds ranging from 90 - 95 sqm

- The dwelling mix to be consistent with City of Sydney DCP 2012 guidelines

- The individual Lot Study indicates that the **masterplan building envelopes and resultant built form outcome(s) are capable of meeting the ADG design criteria for solar and daylight access**.

Refer to Appendix 7.5 for the Lot S individual lot study

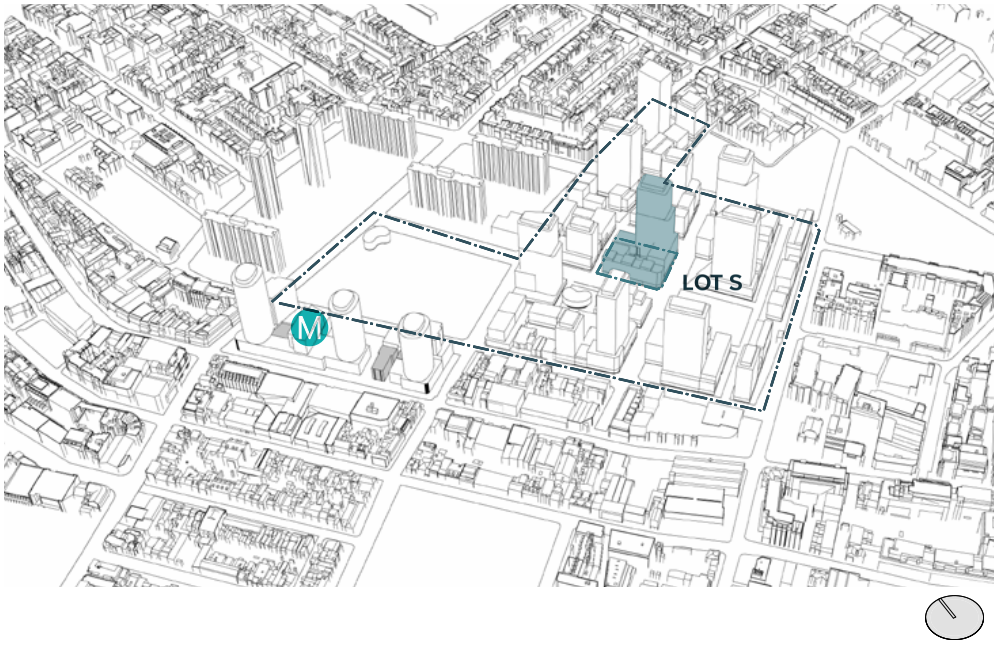


Fig. 7.9.99 Selected lots for detailed analysis

Detailed testing for Lot S confirms the proposed building envelopes have the capacity to meet the ADG objectives and design criteria for solar access

METHODOLOGY

The individual lot was block planned in detail to determine if the yield and amenity standards of the Apartment Design Guide were achievable within the proposed building envelopes.

This was based on ensuring that **70 - 75% of the primary envelope facade area - North, East and West - receive a minimum of 2 hours direct sunlight between 9am and 3pm at mid winter** for the Preferred Masterplan building envelopes.

This was then tested in further detail, to ensure that in future detailed design, the building envelopes had the capacity and flexibility for future apartment planning to achieve the minimum solar access provisions. This was done through manual counts of the apartments that received the required solar access across each lot.

The individual lot analysis validated the assumptions for the building envelopes, with all buildings within the three selected lots meeting or exceeding the **ADG Objective 4A-1** Design Criteria for a **minimum 70% of apartments to receive 2 hours direct sunlight between 9am and 3pm mid winter**.

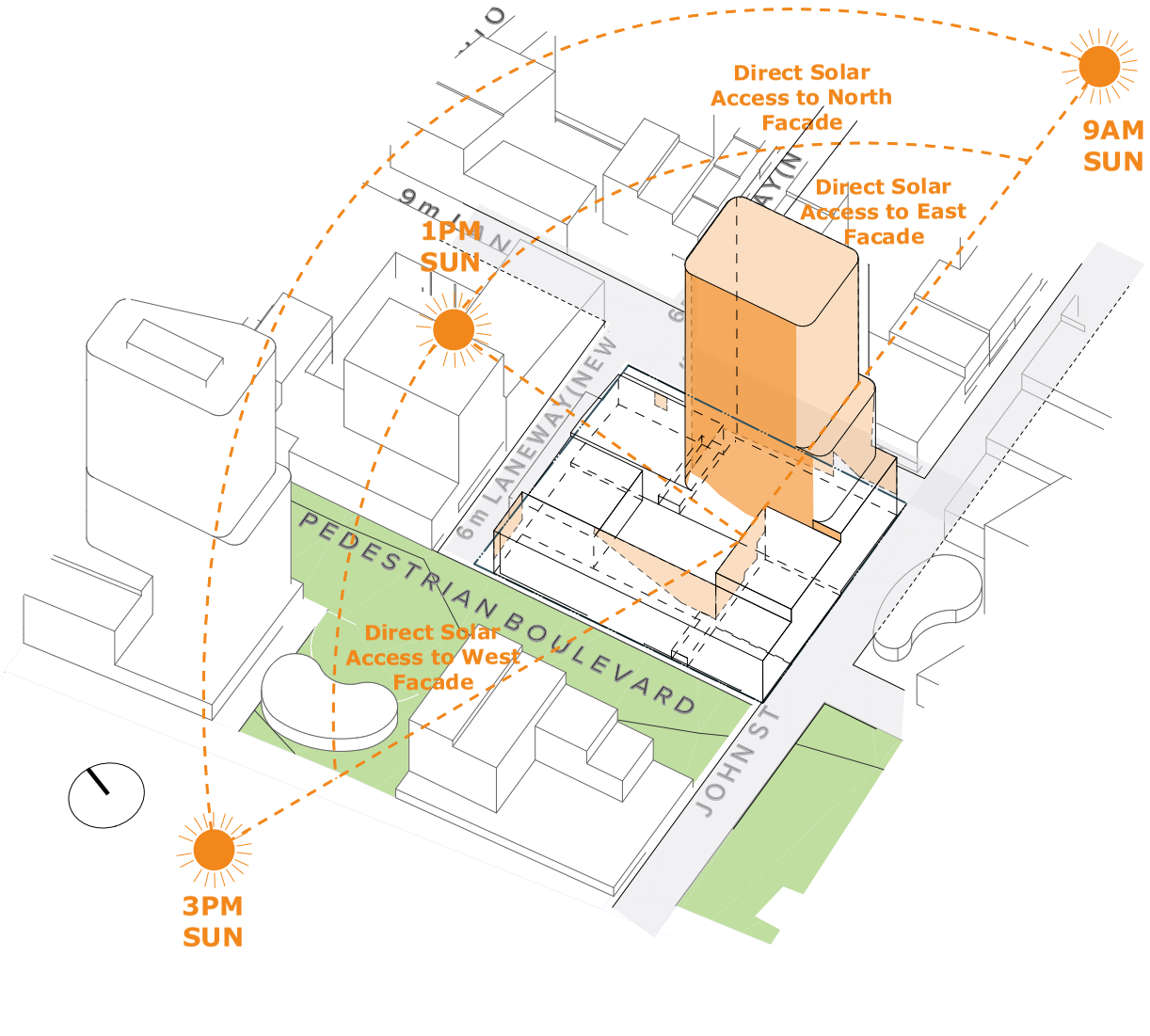


Fig. 7.9.100 Lot S direct sunlight to façades mid winter

LOT S

A manual count of the apartments receiving the minimum required solar access confirms that in detailed design, proposed development in Lot S has the capacity to meet or exceed the ADG objectives and design criteria for solar access

COMMUNAL OPEN SPACE

Communal open spaces located on roof levels **achieve a minimum of 50% direct sunlight to the principal usable part** for **a minimum of 2 hours between 9am and 3pm mid winter.**

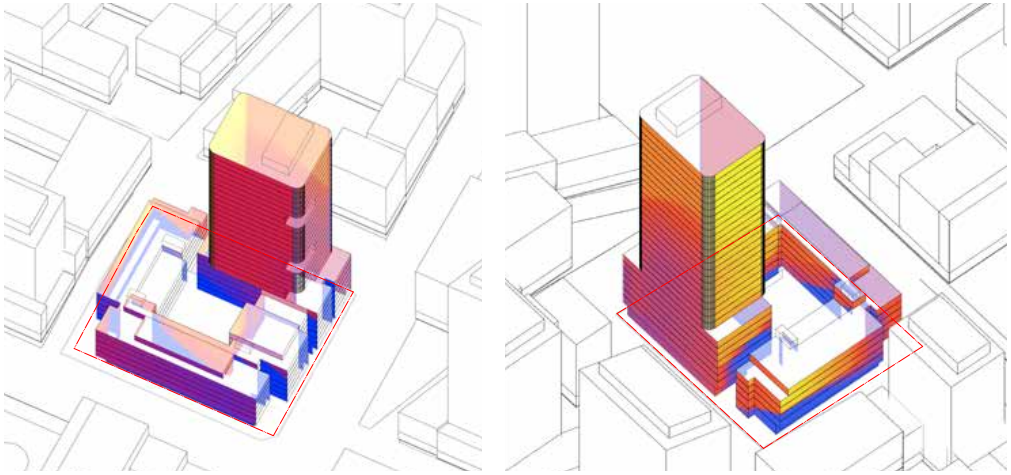


Fig. 7.9.101 Percentage of primary façades (east, north & west) that receives min. 2 hours of direct sunlight from 9am - 3pm mid winter

LIVING ROOMS & PRIVATE OPEN SPACE

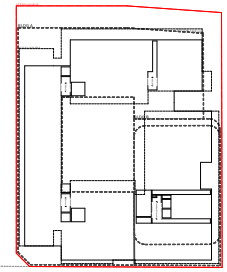
The block planning for Lot S provided a more detailed solar analysis to determine the solar access performance of living room areas and private open space.

Using the more detailed block planning, shadows were cast at every hour between the prescribed 6 hour window between 9am to 3pm on June 21 onto the detailed block massing to determine the solar access to living room areas and private open space.

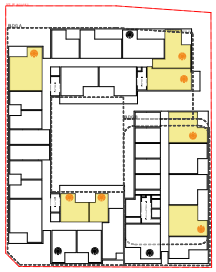
A manual count of apartments was done to determine how many apartments per floor receive the minimum 2 hours of solar access that included all levels. The calculations confirms that each building has the capacity to exceed the ADG objectives and design criteria for solar access.

SUMMARY:

- Building A - 71% of dwellings achieve solar access at mid-winter
- Building B - 75% of dwellings achieve solar access at mid-winter



Ground Level



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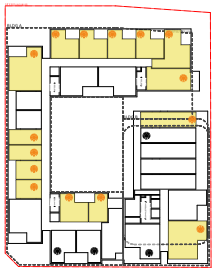

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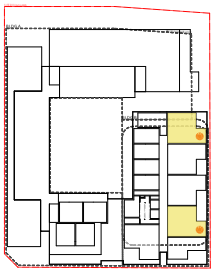
Level 6



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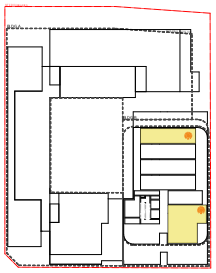

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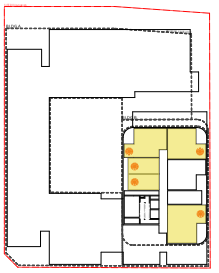

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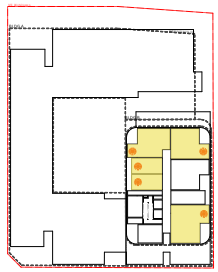

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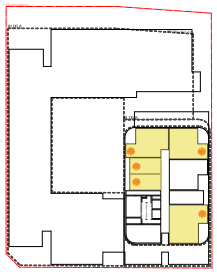

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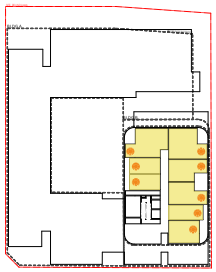

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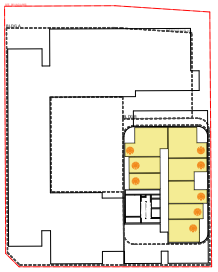

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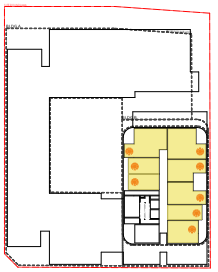

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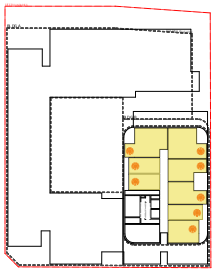

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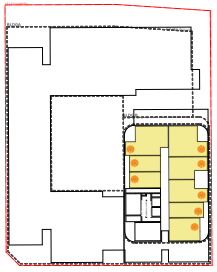

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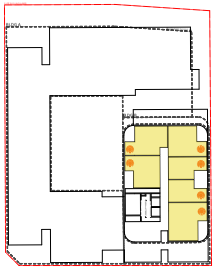

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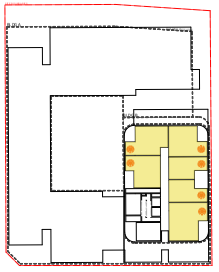


Level 25, 27 & 29

Legend

Receives min. 2 hours solar access between 9am to 3pm at mid-winter

Fig. 7.9.102 Lot S solar analysis diagrams based on indicative block planning

7.9.7 SHADOW DIAGRAM ANALYSIS

Waterloo South has the capacity in detailed design to achieve solar access consistent with ADG objectives and design criteria as well as the provisions under the City of Sydney DCP 2012 and the draft DCP for the Metro Quarter

Shadow diagram analysis has been provided for the key periods in the year - the winter solstice, the spring and autumn equinox and the summer solstice - to provide a full understanding of the solar access to Waterloo South across the year.

Detailed testing confirms:

- Existing and future open spaces achieve or exceed the minimum solar access provisions of the relevant DCP between 9am and 3pm mid winter.
- The adjacent existing and potential future residential context has the capacity to achieve the minimum solar access design criteria objectives of the ADG and DCP provisions between 9am and 3pm at mid winter.
- The potential future building envelopes for the private sites within Waterloo South have the capacity to achieve the minimum solar access design criteria objectives within the ADG between 9am and 3pm at mid winter.
- The potential future building envelopes for Waterloo South have the capacity to achieve the minimum solar access design criteria objectives within the ADG between 9am and 3pm at mid winter.

Existing Public Open Space

- Solar access to the surrounding existing public open space exceeds the minimum DCP provisions of 4 hours solar access to 50 percent of the stationary park area between 9am and 3pm mid winter.

Future Open Space

- Solar access to the Raglan Street Plaza and Cope Street Plaza within the Metro Quarter is not impacted by Waterloo South.
- Solar access to the proposed public open spaces for Waterloo South achieve the minimum DCP provisions of 4 hours solar access to 50 percent of the stationary park area between 9am and 3pm mid winter.

Existing Residential Context

- Waterloo South does not change the capacity of existing interfaces that currently achieve the minimum ADG and DCP provisions of 2 hours direct sunlight between 9am and 3pm at mid winter.

Future Residential Context

- Building envelopes for likely future development surrounding Waterloo South have the capacity to achieve the minimum design criteria objectives within the ADG of 2 hours direct sunlight between 9am and 3pm at mid winter, with the understanding that the masterplan has the flexibility to respond to future built form if these sites are re-developed in the future.
- Building envelopes for Waterloo South have the capacity to achieve the minimum design criteria objectives of the ADG of 2 hours direct sunlight between 9am and 3pm at mid winter.

Existing Private Open Space

- Waterloo South does not change the capacity of existing interfaces that currently achieve the minimum ADG and DCP provisions of 2 hours direct sunlight between 9am and 3pm at mid winter.

Future Private Open Space

- Communal open spaces are located on roof levels to ensure they achieve a minimum of 50% direct sunlight to the principal usable part for a minimum of 2 hours between 9am and 3pm mid winter.

WINTER SOLSTICE _ JUNE 21

WINTER SOLSTICE (JUNE 21) 9AM

RAGLAN STREET PLAZA (METRO QUARTER)
(Refer to 7.9.6 Solar access analysis for further detail)

COPE STREET PLAZA (METRO QUARTER)
(Refer to 7.9.6 Solar access analysis for further detail)

VILLAGE GREEN
(Refer to 7.9.6 Solar access analysis for further detail)

WATERLOO COMMON
(Refer to 7.9.6 Solar access analysis for further detail)

LEGEND

- Estate boundary
- Waterloo South boundary
- Proposed lot boundary
- Heritage Conservation Area (HCA)
- Existing shadows
- Waterloo Metro Quarter shadows
- Waterloo South shadows

0m 75 N

Fig. 7.9.103 Winter solstics 9am

WINTER SOLSTICE (JUNE 21) 10AM

Fig. 7.9.104 Winter solstice 10am

WINTER SOLSTICE (JUNE 21) 11AM

Fig. 7.9.105 Winter solstice 11am

WINTER SOLSTICE (JUNE 21) 12PM

Fig. 7.9.106 Winter solstice 12pm

WINTER SOLSTICE (JUNE 21) 1PM

RAGLAN STREET PLAZA (METRO QUARTER)
(Refer to 7.9.6 Solar access analysis for further detail)

COPE STREET PLAZA (METRO QUARTER)
(Refer to 7.9.6 Solar access analysis for further detail)

VILLAGE GREEN
(Refer to 7.9.6 Solar access analysis for further detail)

WATERLOO COMMON
(Refer to 7.9.6 Solar access analysis for further detail)

LEGEND

- Estate boundary
- Waterloo South boundary
- Proposed lot boundary
- Heritage Conservation Area (HCA)
- Existing shadows
- Waterloo Metro Quarter shadows
- Waterloo South shadows

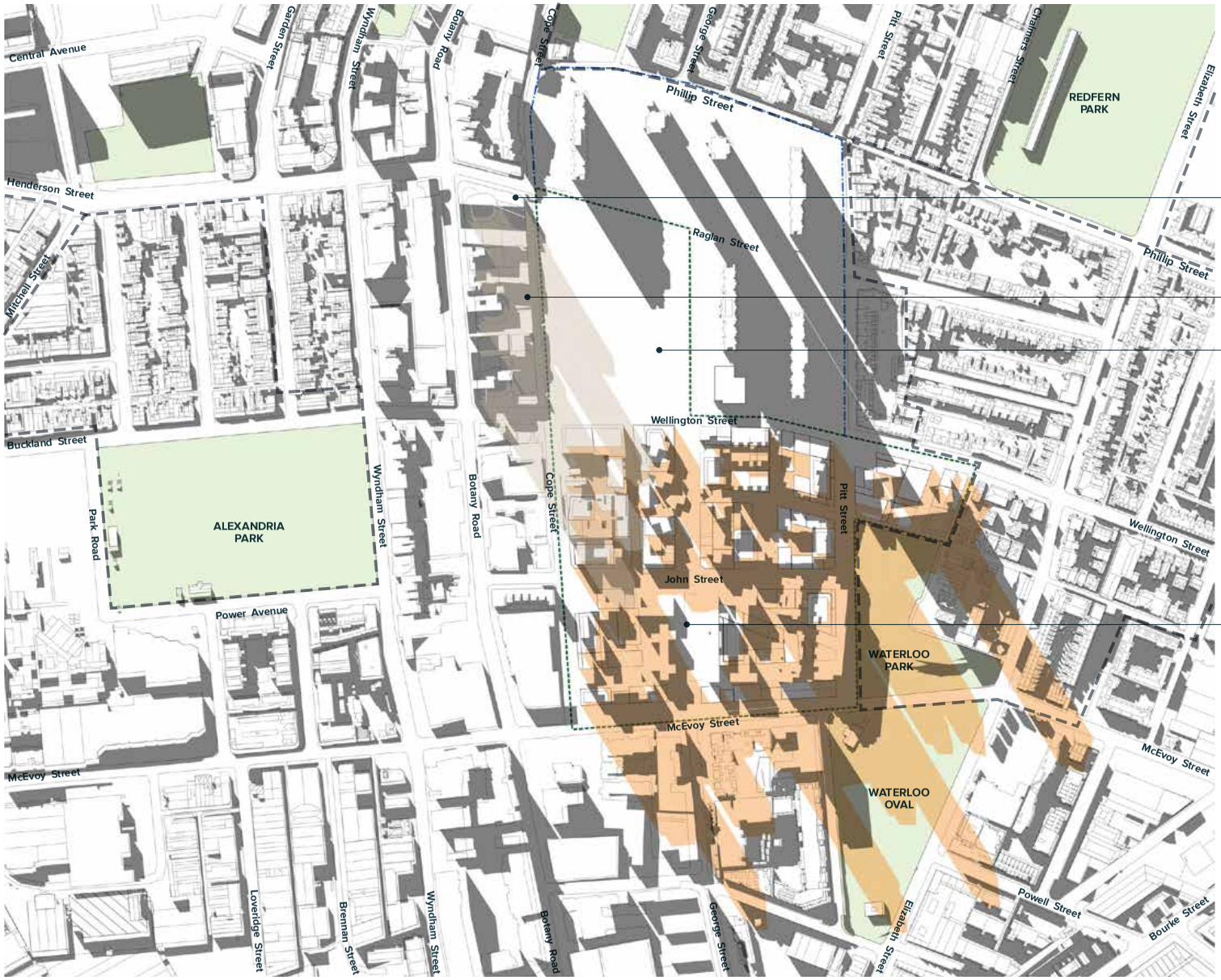
0m 75 N

Fig. 7.9.107 Winter solstice 1pm

WINTER SOLSTICE (JUNE 21) 2PM

Fig. 7.9.108 Winter solstice 2pm

WINTER SOLSTICE (JUNE 21) 3PM



RAGLAN STREET PLAZA (METRO QUARTER)
(Refer to 7.9.6 Solar access analysis for further detail)

COPE STREET PLAZA (METRO QUARTER)
(Refer to 7.9.6 Solar access analysis for further detail)

VILLAGE GREEN
(Refer to 7.9.6 Solar access analysis for further detail)

WATERLOO COMMON
(Refer to 7.9.6 Solar access analysis for further detail)

LEGEND

- Estate boundary
- Waterloo South boundary
- Proposed lot boundary
- Heritage Conservation Area (HCA)
- Existing shadows
- Waterloo Metro Quarter shadows
- Waterloo South shadows

0m 75 N

Fig. 7.9.109 Winter solstice 3pm

At the spring and autumn equinox (March and September 21), day and night are equal as the seasons change

Existing Public Open Space

- Solar access to the surrounding existing public open space during the equinox is generally not affected by Waterloo South with shadowing on Waterloo Park starting at 12pm.

Future Open Space

- Solar access to the Raglan Street Plaza and Cope Street Plaza within the Metro Quarter is not impacted by Waterloo South.

- During the equinox, the proposed public open spaces for the Waterloo South receives direct sunlight throughout the day. Shadows are fast moving and at any one hour between 9am and 3pm, more than 50 percent of the park receives direct sunlight.

SPRING & AUTUMN EQUINOX _ MARCH / SEPTEMBER 21

SPRING & AUTUMN EQUINOX (MARCH & SEPT 21) 9AM

RAGLAN STREET PLAZA (METRO QUARTER)
(Refer to 7.9.6 Solar access analysis for further detail)

COPE STREET PLAZA (METRO QUARTER)
(Refer to 7.9.6 Solar access analysis for further detail)

VILLAGE GREEN
(Refer to 7.9.6 Solar access analysis for further detail)

WATERLOO COMMON
(Refer to 7.9.6 Solar access analysis for further detail)

LEGEND

- Estate boundary
- Waterloo South boundary
- Proposed lot boundary
- Heritage Conservation Area (HCA)
- Existing shadows
- Waterloo Metro Quarter shadows
- Waterloo South shadows

0m 75 N

Fig. 7.9.110 Spring and Autumn equinox 9am

SPRING & AUTUMN EQUINOX (MARCH & SEPT 21) 10AM

RAGLAN STREET PLAZA (METRO QUARTER)
(Refer to 7.9.6 Solar access analysis for further detail)

COPE STREET PLAZA (METRO QUARTER)
(Refer to 7.9.6 Solar access analysis for further detail)

VILLAGE GREEN
(Refer to 7.9.6 Solar access analysis for further detail)

WATERLOO COMMON
(Refer to 7.9.6 Solar access analysis for further detail)

LEGEND

- Estate boundary
- Waterloo South boundary
- Proposed lot boundary
- Heritage Conservation Area (HCA)
- Existing shadows
- Waterloo Metro Quarter shadows
- Waterloo South shadows

0m 75 N

Fig. 7.9.111 Spring and Autumn equinox 10am

SPRING & AUTUMN EQUINOX (MARCH & SEPT 21) 11AM

Fig. 7.9.112 Spring and Autumn equinox 11am

SPRING & AUTUMN EQUINOX (MARCH & SEPT 21) 12PM

Fig. 7.9.113 Spring and Autumn equinox 12pm

SPRING & AUTUMN EQUINOX (MARCH & SEPT 21) 1PM

Fig. 7.9.114 Spring and Autumn equinox 1pm

SPRING & AUTUMN EQUINOX (MARCH & SEPT 21) 2PM

RAGLAN STREET PLAZA (METRO QUARTER)
(Refer to 7.9.6 Solar access analysis for further detail)

COPE STREET PLAZA (METRO QUARTER)
(Refer to 7.9.6 Solar access analysis for further detail)

VILLAGE GREEN
(Refer to 7.9.6 Solar access analysis for further detail)

WATERLOO COMMON
(Refer to 7.9.6 Solar access analysis for further detail)

LEGEND

- Estate boundary
- Waterloo South boundary
- Proposed lot boundary
- Heritage Conservation Area (HCA)
- Existing shadows
- Waterloo Metro Quarter shadows
- Waterloo South shadows

0m 75

Fig. 7.9.115 Spring and Autumn equinox 2pm

SPRING & AUTUMN EQUINOX (MARCH & SEPT 21) 3PM

RAGLAN STREET PLAZA (METRO QUARTER)
(Refer to 7.9.6 Solar access analysis for further detail)

COPE STREET PLAZA (METRO QUARTER)
(Refer to 7.9.6 Solar access analysis for further detail)

VILLAGE GREEN
(Refer to 7.9.6 Solar access analysis for further detail)

WATERLOO COMMON
(Refer to 7.9.6 Solar access analysis for further detail)

LEGEND

- Estate boundary
- Waterloo South boundary
- Proposed lot boundary
- Heritage Conservation Area (HCA)
- Existing shadows
- Waterloo Metro Quarter shadows
- Waterloo South shadows

0m 75 N

Fig. 7.9.116 Spring and Autumn equinox 3pm

At the summer solstice (December 21), the sun is at its highest in the sky and receives the most direct sunlight over the course of the day

Existing Public Open Space

- Solar access to the surrounding existing public open space during the summer solstice is generally not affected by the Preferred Masterplan, with minor shadowing on Waterloo Park after 2pm.

Future Open Space

- Solar access to the Raglan Street Plaza and Cope Street Plaza within the Metro Quarter is not impacted by Waterloo South.

- During the summer solstice, the proposed public open spaces for Waterloo South receives direct sunlight throughout the day. Shadows are fast moving and at any one hour between 9am and 3pm, more than 50 percent of the park receives direct sunlight.

SUMMER SOLSTICE _ DECEMBER 21

SUMMER SOLSTICE (DEC 21) 9AM

Fig. 7.9.117 Summer solstice 9am

SUMMER SOLSTICE (DEC 21) 10AM

Fig. 7.9.118 Summer solstice 10am

SUMMER SOLSTICE (DEC 21) 11AM

Fig. 7.9.119 Summer solstice 11am

SUMMER SOLSTICE (DEC 21) 12PM

Fig. 7.9.120 Summer solstice 12pm

SUMMER SOLSTICE (DEC 21) 1PM

RAGLAN STREET PLAZA (METRO QUARTER)
(Refer to 7.9.6 Solar access analysis for further detail)

COPE STREET PLAZA (METRO QUARTER)
(Refer to 7.9.6 Solar access analysis for further detail)

VILLAGE GREEN
(Refer to 7.9.6 Solar access analysis for further detail)

WATERLOO COMMON
(Refer to 7.9.6 Solar access analysis for further detail)

LEGEND

- Estate boundary
- Waterloo South boundary
- Proposed lot boundary
- Heritage Conservation Area (HCA)
- Existing shadows
- Waterloo Metro Quarter shadows
- Waterloo South shadows

0m 75 N

Fig. 7.9.121 Summer solstice 1pm

SUMMER SOLSTICE (DEC 21) 2PM

Fig. 7.9.122 Summer solstice 2pm

SUMMER SOLSTICE (DEC 21) 3PM

Fig. 7.9.123 Summer solstice 3pm

7.10

7.10 ASSESSMENTS

Fig. 7.10.1 Big Roof gathering space within the Village Green
Source: Virtual Ideas, 2020

7.10.1 SEPP 65 AND ADG

SEPP 65 DESIGN QUALITY PRINCIPLES

DESIGN QUALITY PRINCIPLE 1

CONTEXT & NEIGHBOURHOOD CHARACTER

Good design responds and contributes to its context. Context is the key natural and built features of an area, their relationship and the character they create when combined. It also includes social, economic, health and environmental conditions.

Responding to context involves identifying the desirable elements of an area's existing or future character. Well-designed buildings respond to and enhance the qualities and identity of the area including the adjacent sites, street scape and neighbourhood. Consideration of local context is important for all sites, including sites in established areas, those undergoing change or identified for change.

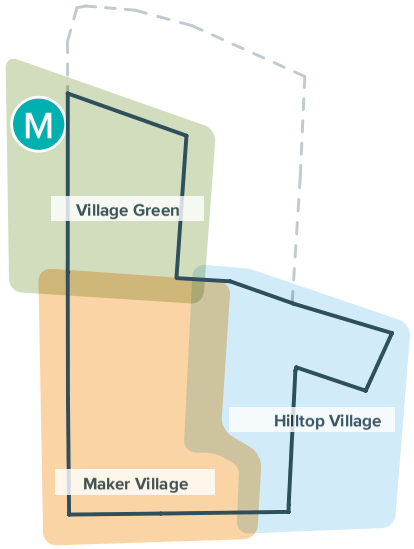


Fig. 7.10.2 Waterloo South's 3 character sub-precinct areas

PROPOSAL

The future vision for Waterloo South anticipates an intensification of residential development around the future metro station at Waterloo for a new urban village and local centre, that will make a positive contribution to the City of Sydney's network of villages and multi-centre city strategy.

Waterloo is layered, proud, distinct and resilient. This place character - drawn from social, environmental, economic and cultural aspects - encapsulates the fundamental qualities that define Waterloo and make it special today, to inform the character and future vision for Waterloo South and the Estate. Waterloo is made special by its rich tapestry of stories and layered history. The convergence of social, economic, environmental and cultural qualities inform this local character and understanding how the place character defines the past and present will help to inform the future Waterloo.

Fig. 7.10.3 Waterloo's place character

The Waterloo South Indicative Concept Proposal responds to the place character and seeks to connect the Estate to surrounding communities. Waterloo South Urban Village is structured around diverse new open spaces, streets and lanes, to make a more connected place in all senses; connected to the traditional landscape, connected to its history, connected to its industrial heritage, connecting people to community, places and transport, and connecting Waterloo to greater Sydney. New laneways and setbacks along streets facilitate the retention of existing trees and create landscaped pocket parks and social corners.

Placemaking activities defined a network of 3 sub-precincts in the masterplan for Waterloo South Urban Village based on their place characteristics; Village Green, Maker Village and Hilltop Village. Within these sub-precincts reside the key places of Waterloo South; the Village Green and Waterloo Common. George Street is renewed into an activity street that connects the key places to the future Waterloo Metro Station and surrounding neighbourhoods. The key places are hubs for activation, engagement, and social connectedness, and are anchored by mixed-use community hubs that will provide activation and programming of those spaces.

The Village Green is a place for the community to come together and serves as a transition from the Metro Quarter active transport hub, Waterloo South and the rest of the Estate. Located next to the future Waterloo Metro Station to provide a green arrival, it is the largest open space area for large community events, community gardens, recreation and rest. Directly opposite the main entry to the metro station at Cope Street, the 'Big Roof' celebrates the area's Aboriginal heritage and provides a sheltered space for community meetings and events. The surrounding 'Gadigal Garden', planted with endemic species, provides a transition to the open grassed area, more active areas of the park and community garden. An urban filter zone between the Metro Quarter's Cope Street Plaza and Village Green supports a range of more active uses that include markets for day / night activation.

Maker Village, southwest of the Village Green, still retains evidence of its industrial past around Cope and McEvoy streets. Waterloo Common is located at its centre, and is connected to the Village Green by the George Street Activity Street. Waterloo Common addresses the need for public open space for residents living in the southern part of the Estate. Compared to the Village Green it is more intimate and resident focused for the local community, with community gardens and retention of stands of trees. Active uses along the George Street Activity Street and Cooper Street, and a smaller plaza and mixed-use community hub adjacent to Waterloo Common, provide activation in the southern half of the Estate. Landscaped setbacks, including at the corner of Cope and John streets, provides for retention of existing mature trees as does the generous setbacks along McEvoy Street which also provides a buffer to traffic.

Hilltop Village, in the southeast of Waterloo South, is characterised by its steep topography and its interface with Our Lady of Mt Carmel Church and School, Waterloo Park and Waterloo Oval. Pitt Street is proposed to reconnect with McEvoy Street, but is intended for local traffic only, and will be designed as a slow street. A diagonal pedestrian lane, incorporating landscape and water elements, links Waterloo Common to Waterloo Park and Oval and draws people across to George Street and up to the Village Green and Metro Quarter.

The George Street Activity Street is the primary north – south movement corridor in Waterloo South, an activated 'green spine' connecting the Village Green and Waterloo Common to surrounding communities. It also connects to a range of pocket parks, social corners, retail, services and community facilities along its route and is envisaged to become a future Pedestrian Boulevard that provides a series of open spaces and parks that can be programmed with a variety of activities.

DESIGN QUALITY PRINCIPLE 2

BUILT FORM & SCALE

Good design also achieves an appropriate built form for a site and the building's purpose in terms of building alignments, proportions, building type, articulation and the manipulation of building elements.

Appropriate built form defines the public domain, contributes to the character of streetscapes and parks, including their views and vistas, and provides internal amenity and outlook.

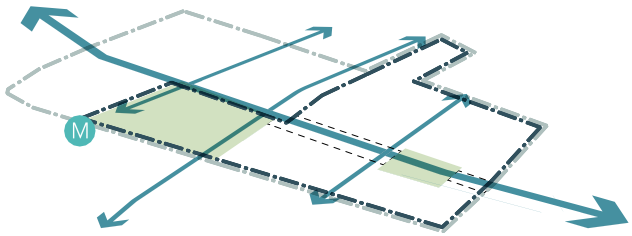


Fig. 7.10.4 The public domain defines the street level experience

PROPOSAL

The public domain-led approach for Waterloo South provides a localised environmental response that connects Waterloo South to its context and provides for a uniquely Waterloo public domain, to support the needs of the existing diverse and unique community. Urban and built form elements, shaped by the open space and public domain configuration, promote a diversity of built form, clear definition of the public domain, and street-walls that frame the experience at eye level, whilst taller buildings provide markers, landmarks and height diversity. Built form diversity operates at Street Level (with low-rise buildings ranging from 1 to 6 storeys + attic), Local Level (with mid-rise buildings ranging from 7 to 8 storeys + attic and 15 to 20 storeys), and Neighbourhood Level (with tall buildings ranging from 29 to 32 storeys), as buildings heights are experienced at various scales.

Building heights across Waterloo South are structured to define the street edge at the pedestrian scale, whilst providing legibility and orientation at the local and neighbourhood level. Their position and orientation respond to many considerations including separation to other buildings, street setbacks, maximum heights, floorplate sizes and block lengths, articulation requirements, through site link requirements, location adjacent to open space or along major movement corridors, solar access to adjacent areas, mitigation of wind effects, key views and vistas, relationship to topography, and transition to existing context both within Waterloo South and adjacent areas.

A number of approaches are employed to respond to the interfaces with heritage items and the adjacent Heritage Conservation Areas. These include physical separation such as the Botany Road Corridor, setback of taller buildings above street-wall heights relating to adjacent buildings to be retained, transition in scale through a series of stepped forms, retention of existing fabric where it contributes to the streetscape character, and the adaptive re-use and addition to character buildings.

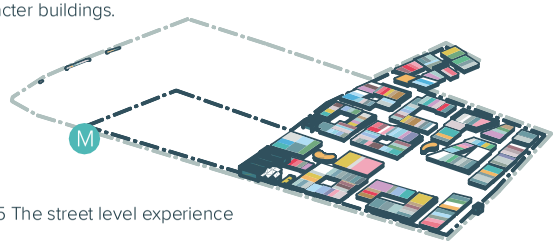


Fig.7.10.5 The street level experience

Low-rise buildings ranging from 1 to 3 storeys includes retention of existing terrace houses, heritage buildings and items that contribute to the streetscape. These buildings define the street edge and the experience at eye level., provide a transition to lower scale buildings and provide the immediate eye level experience. Low-rise buildings of 1 to 6 + attic storeys define the street edge, frame the fine grain network of streets, laneways, links and public domain spaces, and are the predominant pedestrian experience when combined with awnings, active frontages, and landscaping within the public domain or landscape setbacks.

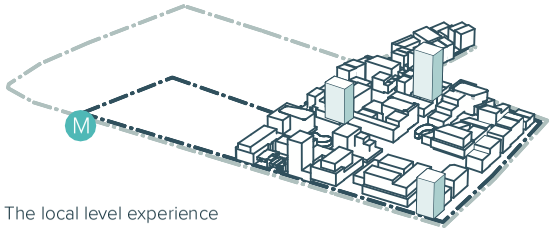


Fig.7.10.6 The local level experience

Mid-rise buildings ranging from 6 to 8 + attic storeys complete the street-wall and define the public domain, being the longest distance that the street can be seen at eye level. The majority of buildings are 4 to 8 storeys, with four neighbourhood tall buildings between 15 to 20 storeys providing fine grain infill forms, height diversity, and opportunities for dwellings at higher levels that benefit from local district views.

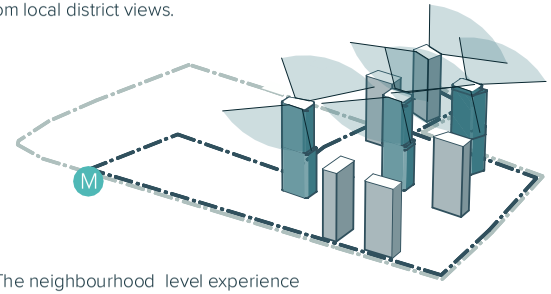


Fig.7.10.7 The neighbourhood level experience

Tall buildings, at a neighbourhood and district level, act as geographic markers and landmarks to Waterloo South. Five buildings between 30 to 32 storeys relate to the existing heights already within the area, and are located at gateways to Waterloo South, whilst three Landmark buildings, between 29 to 31 storeys, define key places and correspond to the pedestrian lanes that connect surrounding areas to George Street, the Village Green and Metro Quarter.

DESIGN QUALITY PRINCIPLE 3

DENSITY

Good design achieves a high level of amenity for residents and each apartment, resulting in a density appropriate to the site and its context.

Appropriate densities are consistent with the area's existing or projected population. Appropriate densities can be sustained by existing or proposed infrastructure, public transport, access to jobs, community facilities and the environment.

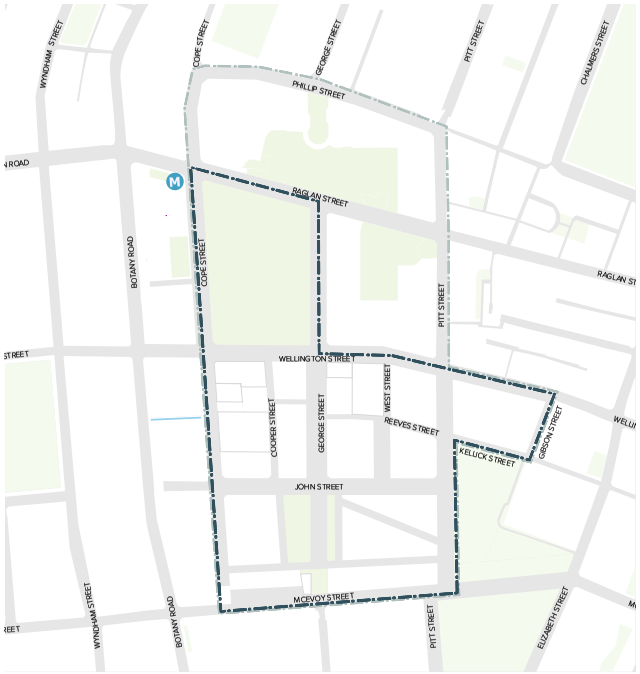


Fig. 7.10.8 Waterloo South will deliver key public domain elements

PROPOSAL

As Sydney's population grows, available land in suitable locations, especially around new transport infrastructure, is being renewed to accommodate more homes and jobs in a more dense urban form. Waterloo South is well positioned to provide new homes, jobs, services and amenities, close to transport, being strategically located in NSW's greatest economic corridor that connects Macquarie Park through Central Sydney to the airport.

Waterloo South is of state importance in achieving the government's objectives to deliver more housing and better outcomes for social housing tenants, including transitioning out of social housing, by looking at delivery of the whole continuum of housing, in new mixed communities where they are tenure blind and indistinguishable from each other. It is a key growth site for future housing close to Central Sydney, especially when compared to the low-growth potential of the surrounding heritage conservation areas, or nearby areas that are already substantially developed.

The Estate will be delivered through the 'Communities Plus' program to deliver on 'Future Directions' to transform social housing in NSW. The catalyst for renewal is the future Waterloo Metro Station, a key part of delivering the increased connectivity that will make Waterloo part of the 30-minute city, connecting to opportunities for jobs, services, education and recreation. With the new metro station, and increased services and amenities provided by the Metro Quarter over station development, Waterloo will become a new urban village and local centre, contributing to the City of Sydney's network of villages and multi-centre city strategy. As part of the Redfern Waterloo Growth Area, and adjacent to the City of Sydney Innovation Corridor, the Estate is set within a context that will also fundamentally change over the next 40 years.

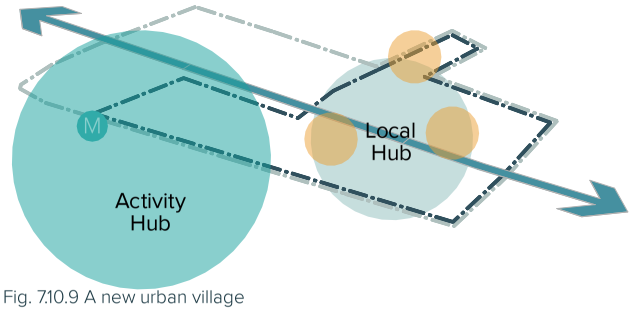


Fig. 7.10.9 A new urban village

Waterloo has a complex cultural identity, being an important place for Aboriginal people, as the traditional homeland of the Gadigal people. It is highly multicultural, with 58% of residents born overseas compared to 47.7% in the City of Sydney and 36.7% in Greater Sydney. Currently there is also a high proportion of residents over 65 compared to the City of Sydney and Greater Sydney, which impacts the needs in the area. Therefore the quantum and types of housing, services and amenities provided will need to grow, and evolve over time, to meet the needs of changing demographics.

These changes are all part of Waterloo's ongoing cycle of growth and renewal which has seen it change from a thriving wetland pre-colonial community, to a refuge for displaced Gadigal people, through the establishment of early industry and workers housing, and a place that accommodated many new immigrants, to the emergence of social housing in larger developments that gradually replaced the original buildings and block pattern. Each cycle has brought with it changes to the building stock to suit the particular needs of the time, resulting in a lot pattern and built form that is layered and diverse. A layered response, with a diversity of uses, height and built form, is considered to be both appropriate and contextual in the ongoing cycle of renewal.

Waterloo South, as the first stage of the renewal of the Estate (ahead of Waterloo North and Waterloo Central), will support early delivery of key public domain elements. With the lowest density spread over a relatively large area, Waterloo South will allow new housing to be provided with the least disruption for existing tenants. It will also provide increased services, employment and recreational opportunities to support the diverse needs of the growing community.

Fig. 7.10.10 Retail, services, community and cultural uses

DESIGN QUALITY PRINCIPLE 4

SUSTAINABILITY

Good design combines positive environmental, social and economic outcomes. Good sustainable design includes use of natural cross ventilation and sunlight for the amenity and liveability of residents and passive thermal design for ventilation, heating and cooling reducing reliance on technology and lowering operation costs. Other elements include recycling and reuse of materials and waste, use of sustainable materials, and deep soil zones for groundwater recharge and vegetation.

Fig. 7.10.11 Retention of existing trees
Source: Virtual Ideas, 2020

PROPOSAL

Ecologically Sustainable Design (ESD) principles have been considered thoroughly throughout the planning process. The Waterloo South Indicatice Concept Proposal is designed to be sustainable and to contribute positively to the environmental, social and economic aspects of the area. Relevant regulatory and compliance requirements at the international, national, state, regional and local levels have been integrated into a sustainability framework developed to guide the renewal of Waterloo South.

Fig. 7.10.12 Green Star Rating tools proposed for Waterloo South

The design response for Waterloo South will align to the Green Star Communities National Framework and deliver a **6 Star Green Star Communities** and **5 Star Green Star Design and As Built (v1.2) (Design Review certified)** ratings for relevant buildings within Waterloo South. A 6 star rating is indicative of 'World Leadership' and is above and beyond current typical industry practice The commitment to the Green Star Communities rating tool is based on its alignment with relevant planning policies, regulation, guidelines and LAHC's redevelopment vision for the entire Waterloo Estate.

Specific initiatives have been identified and embedded within the Waterloo South master plan with the aim of aligning to a 6 Star Green Star Communities rating. These include:

Sustainable Transport and Movement
The proposed movement network that adds new streets, laneways and links to the existing network, reconnects Waterloo South to the surrounding context, with the prioritisation of pedestrians and cyclists and re-establishment of a finer grain network of links and lanes, drawing people to the main open spaces, the Metro Quarter and active transport connections. Streets are designed as slow streets, with new and upgraded pedestrian crossings, to encourage walking and cycling. Widened footpaths, cycling infrastructure and pedestrian friendly urban design encourage active transport modes for healthy and active living.

Ecological Value
A range of strategies includes retention of high and moderate value trees, and tree replacement ratios, as well as avoiding damage to existing sites of ecological value and provision of natural habitats.

Heat Island Effect
The provision of public infrastructure that increases the public domain through new open space, streets, pocket parks, social corners and setbacks provides for green photosynthetic infrastructure such as street trees and parks. The canopy cover will provide respite from the heat of the summer sun and will shade the streets across Waterloo South to reduce the effects of the urban heat island effect. A target 3 : 1 replacement ratio for every high and moderate value tree removwd aims to achieve 30 percent canopy cover, with 50 percent trees within the public domain. The types and diversity of species provided support flora and fauna and productivity through edible species. Bush tucker species will connect back to Indigenous culture. The masterplan achieves the deep soil and open space recommendations of the ADG and in doing so will provide a variety of open space and landscaped areas to enhance the overall amenity for the residents and assist in mitigating the heat island effect.

Stormwater
Incorporation of water sensitive urban design (WSUD) features within Waterloo South will contribute to a green and resilient urban environment. Bio-retention tree pits have been incorporated to assist with treating runoff through filtration and reduce stormwater runoff volumes along pedestrian pathways in rainfall events. Widened footpaths provide the opportunity to utilise the former kerb alignment as the new invert level therefore directing runoff into the tree pits through kerb inlets along adjacent pathways and roadsides. Development lots will provide on-site retention and detention of stormwater as part of the detailed building design and procurement stages to mitigate stormwater peak discharge. The cultural significance of water is celebrated through integrated water management that is embedded as part of the public domain through WSUD, water play and detention under the two local parks

Resources
The building forms, massing and orientation have been organised to optimise natural daylighting and solar access to potential primary internal and external areas, while minimising wind and noise impacts. Energy efficient appliances and water efficient devices will be specified to exceed BASIX requirements to minimise water consumption and resources.

Refer to the separate report prepared by Aecom for further details.

DESIGN QUALITY PRINCIPLE 5

LANDSCAPE

Good design recognises that together landscape and buildings operate as an integrated and sustainable system, resulting in attractive developments with good amenity. A positive image and contextual fit of well-designed developments is achieved by contributing to the landscape character of the streetscape and neighbourhood.

Good landscape design enhances the development's environmental performance by retaining positive natural features which contribute to the local context, co-ordinating water and soil management, solar access, micro-climate, tree canopy, habitat values, and preserving green networks. Good landscape design optimises usability, privacy and opportunities for social interaction, equitable access, respect for neighbours amenity, provides for practical establishment and long term management.

Fig. 7.10.13 A green arrival from the metro station Village Green
Source: Virtual Ideas, 2020

PROPOSAL

Waterloo South Urban Village is structured around diverse new open spaces, streets and lanes, to make a more connected place in all senses; connected to the traditional landscape, connected to its history, connected to its industrial heritage, connecting people to community, places and transport, and connecting Waterloo to greater Sydney. The primary public open spaces, the Village Green and Waterloo Common, reflect the community desire for multiple spaces and equitable access to open space. The Village Green is the community focused larger open space, located next to Waterloo Metro Station, to host community events. The Village Green is supported by the smaller, more intimate, local scale open space provided by Waterloo Common located to serve the southern part of the Estate.

The Village Green and Waterloo Common are supplemented by a variety of urban plazas, pocket parks and social corners, distributed throughout Waterloo South, that satisfy a range of community desires, including being locations for dispersed community hubs and facilities, as well as landscape spaces that promote the retention of significant trees. The public open spaces and variety of other open spaces facilitate a range of activities, host productive landscapes, integrate water management, and provide landscaped setbacks, tree retention zones and an urban forest strategy. The range of gathering areas and communal spaces support social connectedness and community interaction.

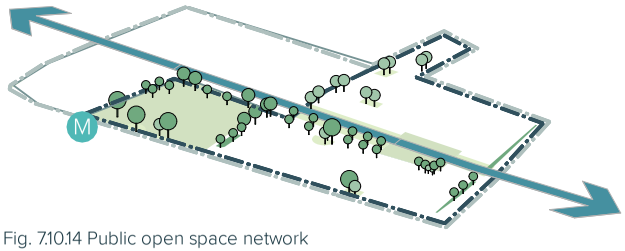


Fig. 7.10.14 Public open space network

Both key places are supported by streets that are designed as active places and which improve the pedestrian and cycling experience. Their diversity of width and design reflect their range of different purposes and activities, from 6-9m wide landscaped pedestrian laneways and 13m shared streets, to 20.2m local streets and the 20-25m wide George Street Activity Street.

The future vision for the Estate sees George Street reinvented as a pedestrianised, and landscaped 'green spine' that connects the diversity of open spaces together as well as being a series of spaces in itself. Recognising that the evolution of George Street into a Pedestrian Boulevard will take time, an interim approach is proposed as part of Waterloo South, to renew George Street into a pedestrian friendly activity street that is activated by a range of retail, services, community and cultural uses.

From George Street, a number of pedestrian laneways diverge to connect to significant open spaces adjacent to Waterloo South. These links have the potential to integrate water as a landscape element that references the traditional landscape. The links serve as more direct connections from parts of Waterloo South to George Street, the Village Green and the Metro Quarter. Increasing the number of streets, lanes and links leads to a more permeable pedestrian and cycle friendly environment that encourages active transport options.

An Accessible Local Movement Route promotes community interaction and connects the primary public open spaces, and a range of urban plazas, pocket parks and social corners, with community facilities, retail and services, and active transport options. Tree retention zones are provided for the retention of significant individual trees as well as clusters of trees located at the interface of the public and private domain.

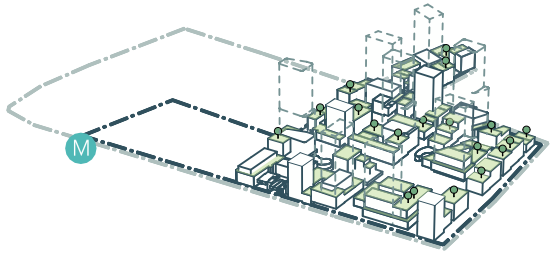


Fig. 7.10.15 Private open space network

Private open space typologies that include communal open space, landscaped roof gardens and building façades provide increased greenery to Waterloo South and connects people to nature. Rooftop gardens on buildings increase community access to open space and provides additional typologies to the open space network. Enhanced amenity is provided due to their location, including improved solar access and views.

DESIGN QUALITY PRINCIPLE 6

AMENITY

Good design positively influences internal and external amenity for residents and neighbours. Achieving good amenity contributes to positive living environments and resident well-being.

Good amenity combines appropriate room dimensions and shapes, access to sunlight, natural ventilation, outlook, visual and acoustic privacy, storage, indoor and outdoor space, and ease of access for all age groups and degree of mobility.

PROPOSAL

The Waterloo South Indicative Concept Proposal is the result of an extensive, evidence based, investigative and iterative process that has looked at best practice and case studies in Australia and globally to benchmark and measure its performance. Waterloo South has been assessed on its own amenity performance and its impact on the adjacent areas through analysis of solar access, overshadowing, wind impacts, flooding, air quality and acoustic amenity.

The Apartment Design Guide, National Construction Code, and City of Sydney DCP 2012 were used as appropriate guidelines. The NSW Government Architect's 'Better Placed' has informed the development of a number of strategies to ensure that the future natural and built environment of Waterloo South will be healthy, responsive, integrated, equitable and resilient.

Health and well-being are prioritised by providing open space access to the community within 200m of building entries. The urban forest strategy creates a highly landscaped environment that connects people to nature and at a broader scale connects to the regional Green Grid. Productive landscapes that includes bush tucker species and community gardens within the public open space provide places for community interaction and connect back to traditional Aboriginal practices.

The key spaces within Waterloo South are two majors parks - the Village Green and Waterloo Common together with the adjacent landscape reserve - providing 2.57 hectares of public open space. Both parks offer active and passive spaces for the community. The tree-lined spaces are connected to one another via the George Street Activity Street. The hierarchy of productive landscape includes community gardens provided in the Village Green and Waterloo Commons for the wider community and communal gardens, private food gardens and rooftop gardens within development lots for residents within those developments. Landscape setbacks are provided for the retention of significant trees and provide mature landscape, canopy and amenity.

The high performing and activation ready public domain and non-residential uses supports the everyday experience through active frontages, a pedestrian scale, lot diversity and finer grain of the urban and built form. An accessible local movement route promotes an all-ages inclusive and accessible route, enables community interaction, and connects the primary public open spaces, a range of urban plazas, pocket parks and social corners, with community facilities, retail and services, and active transport options.

A mix of housing and neighbourhood character areas reflects the diverse community, provides housing choice and equitable access to services and amenities. The urban and built form enables this through building types and heights that support different types and scales of use. Adaptable basement, ground and first floor levels will enable the sustainable evolution over time of the ground plane to non-residential uses to meet the needs of the growing community.

The distribution of built form, and the proposed building envelopes, have been tested for their potential to satisfy the controls contained in the proposed planning framework as well applicable state and local government policies. This has confirmed the ability of the master plan, and building envelopes, to satisfy SEPP65 and the Apartment Design Guide's objectives for building separation, apartment sizes, floor to ceiling heights, circulation from a core, solar access, natural ventilation, the quantum of communal open space and its solar access, and any amenity impacts onto adjacent sites.

Detailed lot studies have been conducted on a selection of different lots through each stage of development of the masterplan (from Concept Plan Options, Preferred Masterplan to the Waterloo South Indicative Concept Proposal), chosen to represent a broad range of different lots and building types.

Solar Access to Public Open Space
A **fixed 50%** of the total public open space **area is to receive sunlight for 4 hours from 9am to 3pm on 21 June.**

Fig. 7.10.16 Solar access to public open space

Solar Access to Residential Development
Developments to **achieve a minimum of 50% direct sunlight to the principal usable part** of the communal open space for **a minimum of 2 hours between 9am and 3pm mid winter.**

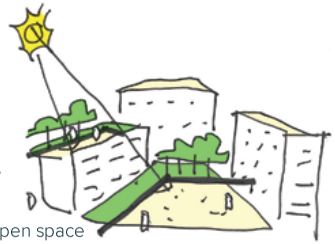


Fig. 7.10.17 Solar access to communal open space

Solar Access to Communal Open Space
Living rooms and private open spaces of at least **70% of apartments** in a building **receive a minimum of 2 hours direct sunlight between 9 am and 3 pm at mid winter.**

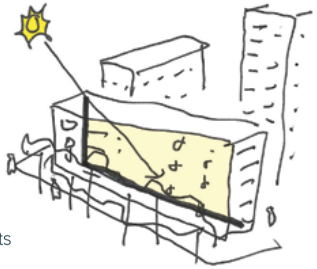


Fig. 7.10.18 Solar access to developments

DESIGN QUALITY PRINCIPLE 7

SAFETY

Good design optimises safety and security, within the development and the public domain. It provides for quality public and private spaces that are clearly defined and fit for the intended purpose. Opportunities to maximise passive surveillance of public and communal areas promote safety.

A positive relationship between public and private spaces is achieved through clearly defined secure access points and well-lit and visible areas that are easily maintained and appropriate to the location and purpose.

Fig. 7.10.19 Passive Surveillance
Source: Virtual Ideas, 2019

PROPOSAL

Well designed and maintained urban environments are essential for improved safety in the community. Public safety for pedestrians, cyclists and motorists is important for Waterloo South to be a welcoming and safe place for people to live and visit. Waterloo South will increase safety in the Estate by improving the quality of the environment, minimising the opportunity for crime and promoting an accessible and liveable place that encourages a feeling of safety and community participation. This is achieved through:

A physically well-connected neighbourhood
In line with the guidelines of the Sydney Streets Code, Waterloo South, as a pedestrian priority environment, will reduce and slow vehicle movements with a network of shared slow streets, laneways and pedestrian links, increasing the ground level permeability of Waterloo South. Safe movement, good connections and access are provided through public places that provide well defined routes and clear sightlines (day and night) so residents and visitors can see and be seen.

Well defined public and private spaces
Urban and built form elements, shaped by the open space and public domain configuration, promote a diversity of built form responses, clear definition of the public domain and street-walls that frame the experience at eye level, whilst taller slender buildings provide markers, landmarks and height diversity. Throughout Waterloo South buildings define the public domain reinforcing sightlines and strengthening views to and from key spaces, streets and laneways, for good passive surveillance.

Improved surveillance of public spaces.
Increased visibility and active edges at ground level, through a mix of uses, with residential uses at both ground and upper levels addressing the streets and laneways, will maximise passive surveillance, creating a safe environment to live, work and visit. Visibility and surveillance of the public environment is maximised by providing public places that are overlooked from adjoining buildings, for 'eyes on the street' or 'natural surveillance' from passers-by to make people feel safer and potential offenders feel exposed.

Activity
Through a combination of co-locating community buildings with key public domain spaces, and a fine grain street network, activity is enhanced at these key places. This is strengthened by well programmed public domain spaces and the creation of parks as places for people to meet and spend time throughout the day. The association of community facilities with public open space responds to the community desire to facilitate activation of those spaces and their potential for programming as places for public art and community involvement. Retail and services along George Street provides for equitable access. Smaller retail and services provision distributed throughout Waterloo South has the flexibility to increase in size over time.

By limiting blank façades, providing active retail and community edges, landscaped building setbacks, and active social corners, a safe and vibrant day to night economy will be encouraged, promoting pedestrian activity and active use of the public domain.

The permeable ground plane and pedestrian focused streets encourages active modes of tranport such as walking and cycling, maximises activity, social interaction and surveillance in public places and reduces the risk of crime.

Creating a sense of ownership
Clearly defined private and public space for improved public safety and to encourage residents to take responsibility and pride in places they use and inhabit.

Management and maintenance
Attractive public places will encourage use of the spaces, a sense of ownership and improve people's perception of how safe a place is and supports their desire to occupy and use those places for community well-being in safety.

DESIGN QUALITY PRINCIPLE 8

HOUSING DIVERSITY & SOCIAL INTERACTION

Good design achieves a mix of apartment sizes, providing housing choice for different demographics, living needs and household budgets.

Well-designed apartment developments respond to social context by providing housing and facilities to suit the existing and future social mix. Good design involves practical and flexible features, including different types of communal spaces for a broad range of people, providing opportunities for social interaction amongst residents.

Fig. 7.10.20 Providing opportunities for social interaction
Source: Virtual Ideas, 2020

PROPOSAL

The Waterloo South Indicative Concept Proposal supports 3,048 dwellings and approximately 17,900 sqm Gross Floor Area of non-residential uses including 11,200 sqm retail and services uses and 9,700 sqm of community and cultural facilities.

Urban and built form elements, shaped by the open space and public domain configuration, promote a diversity of built form responses and have the flexibility to accommodate a range of housing tenures. A mix and choice of tenure blind social (affordable rental) and market dwellings is provided. Flexible dwelling typologies respond to the existing and future community's needs.

All blocks contain a variety of built forms and heights that allow for different options to accommodate the mix of social (affordable rental) and market housing, as well as satisfy considerations for ground level activation, relationship to context, and solar access provisions to public, communal, and private open space. The building envelopes have been designed to be flexible and to accommodate a range of housing mixes (studio, 1 bed, 2 bed, 3 bed and 4 bed apartments) and multiple apartment types and sizes allowing a variety of options for different demographics and price points to support housing diversity and affordabilility.

Community facilities, services and shops are provided along George Street Activity Street, with smaller retail and community facilities dispersed and located around primary public open spaces, plazas and social corners and connected by an accessible local movement route (ALMR). The intensification of retail and service hubs along the key north-south George Street connection, provides equitable access across the Estate. The smaller retail and services distributed throughout Waterloo South, have the flexibility to increase in size over time through an adaptable ground plane strategy. The association of community facilities with public open space responds to the community desire to facilitate activation of those spaces and their potential for programming as places for public art and community involvement.

Within the external communal spaces will be designed to engender community spirit for residents by offering a variety of open spaces including areas for groups to meet and socialise and also for more quiet individual activities. All common areas are designed for equitable access. Vertical neighbourhoods provide additional communal open spaces for residents to meet and interact. within the buildings.

Fig. 7.10.21 Community and cultural facilities located along accessible route

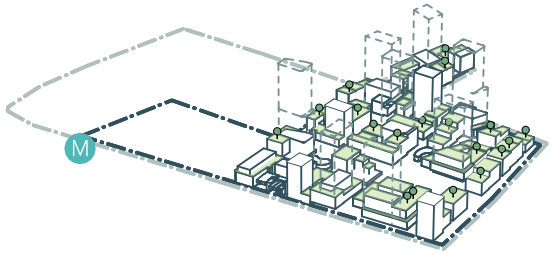


Fig. 7.10.22 Communal open spaces supports public open space network

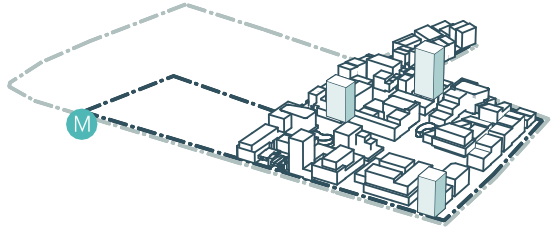


Fig. 7.10.23 Diversity of built form - low to midrise buildings

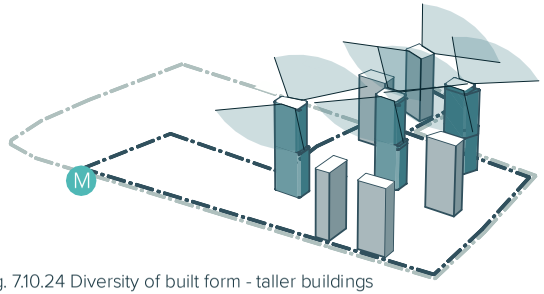


Fig. 7.10.24 Diversity of built form - taller buildings

DESIGN QUALITY PRINCIPLE 9

AESTHETICS

Good design achieves a built form that has good proportions and a balanced composition of elements, reflecting the internal layout and structure. Good design uses a variety of materials, colours and textures.

The visual appearance of well-designed apartment development responds to the existing or future local context, particularly desirable elements and repetitions of the streetscape.

Fig. 7.10.25 Built form responds to future local context
Source: Virtual Ideas, 2020

PROPOSAL

Understanding how Waterloo's place character defines the past and present helped to inform the character and future vision for Waterloo South as the first stage of renewal of the Estate. Waterloo is layered, proud, distinct and resilient; made special by its rich tapestry of stories and layered history.

Placemaking activities defined three sub-precinct character areas for Waterloo South, based on their existing and future place characteristics; Village Green, Maker Village and Hilltop Village. Within these sub-precincts reside key places of Waterloo South; the Village Green and Waterloo Common while George Street connects them all together. The key places are hubs for activation, engagement, and social connectedness, and are anchored by mixed-use community hubs that will provide activation and programming of those spaces.

Urban and built form elements, shaped by the open space and public domain configuration, promote a diversity of built form responses, clear definition of the public domain, and street-walls that frame the experience at eye level, whilst taller slender buildings provide markers, landmarks and height diversity. The proposed building envelopes have been developed to accommodate design opportunities for different architectural responses for each stage to achieve a high level of visual interest and aesthetics in response to the existing and future local context.

Within Waterloo South, streetwalls define the public domain and create the street level experience. Visual interest is achieved through scale, built form variation and character. Modulated streetwalls support a human scale environment. Key strategies include:

- Setting taller buildings back from the street edge to create a pedestrian scaled public domain at key street frontages,
- Limiting maximum streetwall lengths,
- Providing consistent street wall definition and;
- Supporting the street level experience through scale, variation and a mix of architectural responses.

Non-residential setbacks have been provided along key streets to:

- Provide active uses at the interface between public and private domain, adjacent to community spaces, to extend and activate the public domain.
- Respond to flooding and freeboard requirements.

Residential setbacks have been provided along key streets to:

- Provide space for landscape buffers that increase privacy for ground level residential dwellings as a transition between public and private domain.
- Provide semi-private space that fosters social interaction among neighbours.
- Respond to flooding and freeboard requirements.

Upper level setbacks, attics and changes in facade plane have been provided along key streets to:

- Provide human scale to the street through reduced building heights at the interface between the public and private domain.
- Respond to existing context by providing an appropriate transition in height.
- Improve the pedestrian experience through increased daylight access to the public domain.

Neighbourhood scale buildings (15 to 20 storeys) provide small 'infill' forms that meet the ground and extrude the fine grained urban character vertically. Tall buildings provide a transition in scale that contributes to an attractive skyline and relates to existing heights within the locality. Landmark buildings (29 to 32 storeys) are located to mark key alignments connecting to the surrounding existing and future context.

The aesthetics of the proposal do not form part of a planning proposal submission. These will be addressed as part of the future design excellence process and subsequent detailed Development Application submissions. This submission, however, includes illustrative plans for a selected lot (Lot S) and photomontages to give an indication of the overall scale of the buildings relative to their context. The design, materials and colours shown are purely indicative at this stage.

Refer to:

- Urban Design Report for photomontages and interface sections illustrating the relationship to the existing and future context
- Appendix 7.5 for the illustrative indicative plans for Lot S
- Appendix 7.7 for the photomontages
- Animation provided separately as part of this submission

Fig. 7.10.26 Waterloo Common Activity Zone
Source: Virtual Ideas, 2020

7.10.2 ADG COMPLIANCE TABLE

PART 2: DEVELOPING THE CONTROLS

RESPONSE TO APARTMENT DESIGN GUIDE OBJECTIVES

The following provides a design response to the relevant objectives of the Apartment Design Guide (ADG) and describes the measures by which the proposed development meets these objects.

OBJECTIVE	RESPONSE (based on achieving design criteria and the relevant design guidance)
2A Primary Controls **Objective 2A** Planning controls should be developed taking into account: • Sunlight and daylight access • Orientation and overshadowing • Natural ventilation • Visual and acoustic privacy • Ceiling heights • Communal open space • Deep soil zones • Public domain interface • Noise and pollution Controls need to be tested to ensure the desired density and massing can be accommodated within the building height and setback controls.	**SATISFIES OBJECTIVE** The desired built form outcome for Waterloo South has been tested to confirm that the desired density and massing can be accommodated within the building height and setback controls and satisfy the objectives, design criteria and gudiance within the ADG. Waterloo South has been tested concurrently with the existing context and where appropriate a future possible context. The desired future built form is represented in building envelopes which are greater in volume than the future proposed built form consistent with the ADG approach to building envelopes (ADG 2B Building Envelopes). Building envelopes have been tested to ensure that the planning controls consider the amenity criteria within the ADG. Throughout the masterplan process, starting from the Concept Plan Options stage, a selection of representative blocks or 'Lots' have been designed in further detail to test the primary ADG criteriato ensure they can achieve desired outcomes including solar and daylight access. The desired built form outcome has also been informed by technical input on: • Acoustic privacy • Noise and pollution For the Waterloo South Indicative Concept Proposal, Lot S has been used to test that the proposed controls respond to: • Sunlight and daylight access • Orientation and overshadowing • Natural ventilation • Visual privacy • Ceiling heights • Communal open space • Deep soil zones • Public domain interface As part of future detailed designs a comprehensive assessment will need to be undertaken to ensure that ADG objectives and design criteria specific to the final built form outcome and context will be achieved.
2B Building Envelopes **Objective 2B** Building envelopes should be 25-30% greater than the achievable floor space in order to facilitate adequate building articulation and achieve amenity goals.	**SATISFIES OBJECTIVE** 'Loose fit' building envelopes have been used for proposed development based on building forms being 70 - 75% smaller, consistent with ADG guidelines. This provides for the broadest scenario to be tested and allows for future flexibility in the built form design. (ADG 2B Building Envelopes).

PART 2: DEVELOPING THE CONTROLS

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The following provides a design response to the relevant objectives of the Apartment Design Guide (ADG) and describes the measures by which the proposed development meets these objects.

OBJECTIVE	RESPONSE (based on achieving design criteria and the relevant design guidance)
2C Building Height **Objective 2C** Ensure that building height controls respond to: • The desired number of storeys • The minimum floor to floor heights required for future building uses • The desired future scale and character of the local area • Landform and heritage • Amenity	**SATISFIES OBJECTIVE** The public domain has been arranged with a focus on the public realm experience through varied open space, street and movement networks. The private domain is arranged with a focus on providing diverse and flexible urban and built forms that allow for a range of architectural responses. Building heights across Waterloo South are distributed to define the street edge at the pedestrian scale and provide legibility and orientation at the local and neighbourhood level. The mix and range of tall buildings will create a visually interesting skyline, with slender forms, achieved through small floor plates that respond to solar access and wind itigation. Low rise typologies frame the public space and create the street level pedestrian experience. Mid rise typologies define the public domain and create the local level experience. Tall buildings define Waterloo South at the neighbourhood level. Built form diversity operates at Street (low-rise; 1 to 6 storeys + attic), Local (mid-rise; 8 storeys to 15 storeys), Neighbourhood (tall; 20 storeys) and District (landmark; 29 to 32 storeys) levels, as buildings heights are experienced differently at the street or eye level. Built form and building heights have been distributed across Waterloo South in response to the street, local and neighbourhood level experience. Key influences to their location, configuration and placement are: Street Level: • To provide a comfortable and engaging pedestrian environment • To respond to solar access requirements to existing public open space that includes Alexandria Park and Waterloo Park North to meet the City of Sydney Development Control Plan 2012 provisions • To respond to solar access provisions to the proposed Raglan Street Plaza at the Metro Quarter • To respond to solar access provisions to proposed public open space • To respond to solar access provisions to existing and future surrounding context Local Level: • To respond to existing and future context • To respond to key views and vistas • To align to key view corridors • To define the public domain experience Neighbourhood Level: • To locate district maximum heights next to new open space, and along George Street and the Blue Line connecting to the future metro station • To respond to solar access requirements District Level: • To provide landmarks that assist in way-finding and orientation through the Estate and in the skyline. • To locate people closer to infrastructure that includes transport, open space, retail, services and facilities. • To respond to solar access requirements.

PART 2: DEVELOPING THE CONTROLS

RESPONSE TO APARTMENT DESIGN GUIDE OBJECTIVES

The following provides a design response to the relevant objectives of the Apartment Design Guide (ADG) and describes the measures by which the proposed development meets these objects.

OBJECTIVE	RESPONSE (based on achieving design criteria and the relevant design guidance)
2D Floor Space Ratio **Objective 2D** Floor Space Ratios should be set which are consistent with achieving other parameters such as building height, building envelope and setbacks to: • Align with the optimum capacity of the site • Work with the desired density of the local area • Provide opportunities for building articulation Where both residential and non-residential uses such as retail or commercial offices are permitted, develop FSR controls for each use. • The allowable gross floor area for residential should only 'fill' approximately 70% of the building envelope. • Commercial and retail generally fill 80-85% of their envelope. Note that residential FSR tends to be lower compared with commercial or retail ratios. This is because residential buildings are typically less deep than commercial buildings to provide higher levels of internal amenity and to incorporate more non-GFA elements such as balconies	**SATISFIES OBJECTIVE** The future vision for Waterloo South anticipates an intensification of residential development around the future metro station at Waterloo for a new urban village and local centre, that will make a positive contribution to the City of Sydney's network of villages and multi-centre city strategy. Depending on the specific site, orientation and building typology, a building envelope BEA to GFA efficiency of 60%, 70%, 72.5% or 74% may be achieved. The more regular the site, the higher the efficiency may be achieved. Building efficiency for non-residential uses and residential uses is also differentiated. with lower efficiency for residential buildings to provide for shallower floorplates that accommodate higher levels of internal amenity and to incorporate additional non-GFA elements such as balconies
2E Building Depth **Objective 2E** Use a range of appropriate maximum apartment depths • 12 - 18 metres from glass line to glass line At a detailed level this dimension is held to refer most directly to 'street-wall' buildings with small or no building separation to their ends. Freestanding towers may be deeper but must demonstrate how satisfactory levels of daylight and natural ventilation are to be achieved (for example by the use of larger windows).	**SATISFIES OBJECTIVE** 'Loose fit' building envelopes have been used for proposed development based on building forms being 70 - 75% smaller, consistent with ADG guidelines. This supports apartment depths that range from 12 to 18 metres from glass line to glass line.

PART 2: DEVELOPING THE CONTROLS

RESPONSE TO APARTMENT DESIGN GUIDE OBJECTIVES

The following provides a design response to the relevant objectives of the Apartment Design Guide (ADG) and describes the measures by which the proposed development meets these objects.

OBJECTIVE	RESPONSE (based on achieving design criteria and the relevant design guidance)
2F Building Separation **Objective 2F** To ensure adequate amenity, especially daylight and privacy levels, minimum building separations are offered but may be varied to zero. For buildings 9 storeys and over (>25 metres): • 24 metres between habitable rooms/balconies. • 18 metres between habitable rooms/balconies and non-habitable rooms. • 12 metres between non-habitable rooms. For buildings 5-8 storeys (13-25 metres): • 18 metres between habitable rooms/balconies. • 13 metres between habitable rooms/balconies and non-habitable rooms. • 9 metres between non-habitable rooms. For buildings 3-4 storeys (12 metres or less): • 12 metres between habitable rooms/balconies. • 9 metres between habitable rooms/balconies and non-habitable rooms. • 6 metres between non-habitable rooms.	**SATISFIES OBJECTIVE** Building separation achieves the aims and is generally consistent with ADG guidelines based on the height of buildings ensure adequate amenity, especially daylight and privacy levels. Building separation varies for streetwalls to define the public domain and create the street level experience. The width between, and height of, streetwall buildings defines the scale and experience of the public domain.
2G Street Setbacks **Objective 2G** • Generally street setbacks should be between 1 and 10 metres although they may be reduced to zero where deemed appropriate.	**SATISFIES OBJECTIVE** Landscape setbacks and tree retention zones have been provided to retain high and moderate trees to provide a mature landscape from the outset Non-residential setbacks have been provided along key streets to: • Provide active uses at the interface between public and private domain, adjacent to community spaces, to extend and activate the public domain. • Respond to flooding and freeboard requirements. Residential setbacks have been provided along key streets to: • Provide space for landscape buffers that increase privacy for ground level residential dwellings as a transition between public and private domain. • Provide semi-private space that fosters social interaction among neighbours. • Respond to flooding and freeboard requirements.
2H Side and Rear Setbacks • Side and rear setbacks are to be appropriate to the context and should assist in achieving amenity, especially adequate daylight.	**N/A**

PART 3: SITING THE DEVELOPMENT

RESPONSE TO APARTMENT DESIGN GUIDE OBJECTIVES

The following provides a design response to the relevant objectives of the Apartment Design Guide (ADG) and describes the measures by which the proposed development meets these objects.

OBJECTIVE	RESPONSE (based on achieving design criteria and the relevant design guidance)	
3A Site Analysis **Objective 3A-1** • Site analysis illustrates that design decisions have been based on opportunities and constraints of the site conditions and their relationship to the surrounding context	**SATISFIES OBJECTIVE** • Detailed site analysis has been undertaken and a site analysis plan is included in the masterplan drawings demonstrating how the design has considered site amenity	Refer to the following for further information • Urban Design & Public Domain Study
3B Orientation **Objective 3B -1** • Building types and layouts respond to the streetscape and site while optimising solar access within the development	**SATISFIES OBJECTIVE** • The proposal provides building forms with a defined street edge and the opportunity for direct access from the street for both residential and non-residential uses	• The masterplan has been designed to maximise views and access to daylight whilst minimising wind and noise impacts
Objective 3B-2 Overshadowing of neighbouring properties is minimised during mid-winter: • Living areas, private open space and communal open space should receive solar access in accordance with sections 3D and 4A • Where an adjoining property does not currently receive the required hours of solar access, the proposed building ensures solar access to neighbouring properties is not reduced by more than 20% • If the proposal will significantly reduce the solar access of neighbours, building separation should be increased beyond minimums contained in section 3F Visual privacy • Overshadowing should be minimised to the south or down hill by increased upper level setbacks • It is optimal to orientate buildings at 90 degrees to the boundary with neighbouring properties to minimise overshadowing and privacy impacts, particularly where minimum setbacks are used and where buildings are higher than the adjoining development • A minimum of 4 hours of solar access should be retained to solar collectors on neighbouring buildings	**SATISFIES OBJECTIVE** • The concept proposal has been developed with consideration to the amenity of the surrounding context. • The solar access of surrounding apartment buildings and dwellings has been studied at the Winter Solstice to satisfy the objectives of the Sydney Development Control Plan 2012 and the ADG. • The surrounding context has been analysed based on existing conditions for sites with low re-development potential and for potential future conditions for sites with medium to high re-development potential. • In line with the proposed retail strategy, All non-residential and some adaptable floorspace has been excluded from the direct sunlight calculations. Refer to the following for further information: • Appendix 7.4 Land Uses, Sustainability and Resilience • Appendix 7.9 Solar Analysis • Urban Design & Public Domain Study	
3C Public Domain Interface **Objective 3C-1** Transition between private and public domain is achieved without compromising safety and security • Maximum 1m level change between private terraces, front gardens and dwelling entries above the street level • The height of solid fences or walls should be limited to 1m	**SATISFIES OBJECTIVE** • Active retail edges promote a vibrant day to night economy aligning with the Sydney Metro operating hours and encourage pedestrian movement and use of the public domain. • Residential access points will be carefully and appropriately located for legibility for residents and visitors;	• Residential lobbies will be designed to be secure to control access and to appropriately separate circulation routes; • Apartment windows and balconies will be located to provide for passive surveillance over the public domain; • The proposed design has minimised any opportunities for people to be concealed.

PART 3: SITING THE DEVELOPMENT

RESPONSE TO APARTMENT DESIGN GUIDE OBJECTIVES

The following provides a design response to the relevant objectives of the Apartment Design Guide (ADG) and describes the measures by which the proposed development meets these objects.

OBJECTIVE	RESPONSE (based on achieving design criteria and the relevant design guidance)	
Objective 3C-2 • Amenity of the public domain is retained and enhanced	**SATISFIES OBJECTIVE** • The public domain will provide new community hubs, creating a place that is activated, vibrant and pedestrian and cycle focused. • Street pavements and material palettes will be consistent with the design objectives and key principles of the City of Sydney Streets Design Code and Australian Standards. • Public domain furniture will be in accordance with the City of Sydney palette as well as purpose-built elements that help identify the site's characteristics and culture. Street furniture is co-located with trees to avoid clutter and to create focus points for community activity.	• A building massing wind tunnel analysis including awnings has been prepared. Waterloo South meets the comfortable walking criteria and the short term and long term exposure criteria. Windtech confirms the outcomes from the modelling done to date support the rezoning. • The design will minimise the prominence of building service facades and blank walls facing the public domain. Refer to the following for further information • Separate report by Windtech
3D Communal and Public Open Space **Objective 3D-1** • An adequate area of communal open space is provided to enhance residential amenity and to provide opportunities for landscaping	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying** • A minimum target of 25% of site area is classified as communal open space • The proposal is capable of achieving a minimum of 50% direct sunlight to the principal usable part of the communal open space for a minimum of 2 hours between 9 am and 3 pm on 21 June (mid-winter)	• The masterplan seeks to exceed the minimum requirement for communal open space by providing areas in excess of the minimum target and through a mix of open space typologies that include communal open space, rooftop open space and vertical villages to provide open space with increased amenity.
Objective 3D-2 Communal open space is designed to allow for a range of activities, respond to site conditions and be attractive and inviting **Design Criteria** 1. Communal open space has a minimum area equal to 25% of the site (see figure 3D.3) 2. Developments achieve a minimum of 50% direct sunlight to the principal usable part of the communal open space for a minimum of 2 hours between 9 am and 3 pm on 21 June (mid-winter)	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying** • The communal spaces will have have sufficient space to allow for a wide range of activities and include seating for individuals or groups, barbecue areas, play equipment or play areas, swimming pools, gyms, tennis courts or common rooms • responds to microclimate and site conditions with access to sun in winter, shade in summer and shelter from strong winds and down drafts • Visual impacts of services should be minimised, e.g. for ventilation duct outlets from basement car parks, electrical substations and detention tanks	
Objective 3D-3 Communal open space is designed to maximise safety	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying** • The communal spaces will be readily visible from habitable rooms and private open space areas while maintaining visual privacy. • The communal spaces willl be well lit • Communal open space/facilities will be provided for children and young people that are safe and contained	

PART 3: SITING THE DEVELOPMENT

RESPONSE TO APARTMENT DESIGN GUIDE OBJECTIVES

The following provides a design response to the relevant objectives of the Apartment Design Guide (ADG) and describes the measures by which the proposed development meets these objects.

OBJECTIVE	RESPONSE (based on achieving design criteria and the relevant design guidance)
Objective 3D-4 • Public open space, where provided, is responsive to the existing pattern and uses of the neighbourhood	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying** • Two new parks will be provided, the Village Green will serve as the community heart and provide a 'green arrival' to Waterloo from Waterloo Metro Station. As a neighbourhood scale park, it will support a range of open, flexible, landscaped, community spaces that reflect both the existing and future character of the locality. • An active frontage will be providedalong George Street and the parksto engage and activate the public domain. • The masterplan responds to the flooding through a range of strategies that include the location of parks. Indicative freeboard freeboard planning levels have informed the mastreplan. Refer to the following for further information • Appendix 7.7 • Separate report prepared by AECOM
3E Deep Soil Zones **Objective 3E-1** • Deep soil zones provide areas on the site that allow for and support healthy plant and tree growth. They improve residential amenity and promote management of water and air quality **Design Criteria** Deep soil zones are to meet the following minimum requirements: Site Area / Min. Dimension / Deep Soil Zone (% Site Area) < 650m2 / - / 7% 650-1,500 m2 / 3m > 1,500m2 / 6m > 1,500m2 with significant existing tree cover / 6m **Design Guidance** On some sites it may be possible to provide larger deep soil zones, depending on the site area and context: • 10% of the site as deep soil on sites with an area of 650 - 1,500m^2 • 15% of the site as deep soil on sites greater than 1,500m^2	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying** • Deep soil zones will be provided throughout the development. • Although deep soil requirements vary between development lots, Waterloo South targets a minimum overall deep soil area of 15% of the developable area. Refer to the following for further information • Appendix 7.8 for an indicativie approach to achieving the target 15% deep soil area

PART 3: SITING THE DEVELOPMENT

RESPONSE TO APARTMENT DESIGN GUIDE OBJECTIVES

The following provides a design response to the relevant objectives of the Apartment Design Guide (ADG) and describes the measures by which the proposed development meets these objects.

OBJECTIVE	RESPONSE (based on achieving design criteria and the relevant design guidance)
3F Visual Privacy Adequate building separation distances are shared equitably between neighbouring sites, to achieve reasonable levels of external and internal visual privacy • Apartment buildings should have an increased separation distance of 3m (in addition to the requirements set out in design criteria 1) when adjacent to a different zone that permits lower density residential development to provide for a transition in scale and increased landscaping • Direct lines of sight should be avoided for windows and balconies across corners • No separation is required between blank walls	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying** • The flexible 'loose fit' building forms provided allows for a range of architectural responses. Refer to the following for further information • Appendix 7.7 for separation between buildings within the site.

Design Criteria
Deep soil zones are to meet the following minimum requirements:

Building Height	Habitable Rooms + Balconies	Non-Habitable Rooms
Up to 12m (4 Storeys)	6m	3m
Up to 25m (5-8 Storeys)	9m	4.5m
Over 25m (9+ Storeys)	12m	6m

Note:
- Separation distances between buildings on the same site should combine required building separations depending on the type of room (see figure 3F.2)
- Gallery access circulation should be treated as habitable space when measuring privacy separation distances between neighbouring properties

Objective 3F-2 • Site and building design elements increase privacy without compromising access to light and air and balance outlook and views from habitable rooms and private open space	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying** • Outlook and privacy will be managed by the overall urban framework including building separation, articulation, dividing walls and privacy screens. • In selected locations, screening can be utilised to enhance privacy between apartments.

PART 3: SITING THE DEVELOPMENT

RESPONSE TO APARTMENT DESIGN GUIDE OBJECTIVES

The following provides a design response to the relevant objectives of the Apartment Design Guide (ADG) and describes the measures by which the proposed development meets these objects.

OBJECTIVE	RESPONSE (based on achieving design criteria and the relevant design guidance)
3G Pedestrian Access and Entries **Objective 3G-1** • Building entries and pedestrian access connects to and addresses the public domain	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying** • Separate residential lobbies for each core can be provided at ground level and in the basement. • Residential lobbies will be signposted and have a distinct architectural typology for legibility and amenity across the whole development. • Outlook from open space is improved significantly by relocating primary areas to rooftops for improved solar access.
Objective 3G-2 • Access, entries and pathways are accessible and easy to identify	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying** • Where required, ramps and stairs will be integrated with the overall landscape and building design concept for accessible and legible entries. • Residential lobbies and amenity building entries will be provided with a distinct architectural character and articulated awning structure over for increased legibility.
Objective 3G-3 • Large sites provide pedestrian links for access to streets and connection to destinations	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying** • A network of streets and through site link connections provide a highly permeable ground plane that facilitates pedestrian and cycle movement.
3H Vehicle Access **Objective 3H-1** • Vehicle access points are designed and located to achieve safety, minimise conflicts between pedestrians and vehicles and create high quality streetscapes	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying** • Servicing and loading are combined and shared between blocks to reduce the amount of blank and service walls to the street frontages • Clear sight lines will be provided at the carpark entry/exit point and vehicle crossings.

PART 3: SITING THE DEVELOPMENT

RESPONSE TO APARTMENT DESIGN GUIDE OBJECTIVES

The following provides a design response to the relevant objectives of the Apartment Design Guide (ADG) and describes the measures by which the proposed development meets these objects.

OBJECTIVE	RESPONSE (based on achieving design criteria and the relevant design guidance)
3J Bicycle and Car Parking **Objective 3J-1** • Car parking is provided based on proximity to public transport in metropolitan Sydney and centres in regional areas • Where a car share scheme operates locally, provide car share parking spaces within the development. Car share spaces, when provided, should be on site **Design Criteria** For development in the following locations: • On sites that are within 800 metres of a railway station or light rail stop in the Sydney Metropolitan Area; or • On land zoned, and sites within 400 metres of land zoned, B3 Commercial Core, B4 Mixed Use or equivalent in a nominated regional centre The minimum car parking requirement for residents and visitors is set out in the Guide to Traffic Generating Developments, or the car parking requirement prescribed by the relevant council, whichever is less The car parking needs for a development must be provided off street	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying** • Consistent with the City of Sydney's most restrictive parking rates, the proposedparking rates for Waterloo South are: • Category A for residential parking • Category D for non-esidential parking In line with state and local policies to reduce parking, the Indicative Concept Proposal demonstrates an indicative approach to further reduce parking through the provision of a capped maximum of 1,815 spaces for Waterloo South, distributed betwen development lots. This consists of: • 190 retail and community spaces • 1,463 residential spaces • 90 visitor spaces • 72 car share spaces Vehicular access to and circulation through the site has been minimised to reduce any potential conflict with the highly pedestrian public domain.
Objective 3J-2 • Parking and facilities are provided for other modes of transport	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying** • The public domain design encourages bicycle movement throughout the site, with minimal level changes, generous circulation widths and significant parking provision.
Objective 3J-3 • Car park design and access is safe and secure	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying** • Car park access will be secured at appropriate locations for safety of non-residential and residential uses.
Objective 3J-4 • Visual and environmental impacts of underground car parking are minimized • Protrusion of car parks should not exceed 1m above ground level.	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying** • Entries to basements are minimised in width and appearance where possible while complying with the development standards. • Basement services have been consolidated to reduce inactive facades • Links between basements are provided at Basement 2 to provide adequate depth for landscape, public domain and services zones above.

PART 3: SITING THE DEVELOPMENT

RESPONSE TO APARTMENT DESIGN GUIDE OBJECTIVES

The following provides a design response to the relevant objectives of the Apartment Design Guide (ADG) and describes the measures by which the proposed development meets these objects.

OBJECTIVE	RESPONSE (based on achieving design criteria and the relevant design guidance)
Objective 3J-5 • Visual and environmental impacts of on-grade car parking are minimised	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying** • Car parking areas are not visible from the public domain; • The car parking is located below ground in basement carparks • Where basement carparks are above ground due to a change in level, parking will be sleeved with active uses
Objective 3J-6 Visual and environmental impacts of above ground enclosed car parking are minimised Screening, landscaping and other design elements including public art should be used to integrate the above ground car parking with the facade. Design solutions may include: • Car parking that is concealed behind the facade, with windows integrated into the overall facade design (approach should be limited to developments where a larger floor plate podium is suitable at lower levels) • Car parking that is 'wrapped' with other uses, such as retail, commercial or two storey Small Office/Home Office (SOHO) units along the street frontage	**N/A**

PART 3: SITING THE DEVELOPMENT

RESPONSE TO APARTMENT DESIGN GUIDE OBJECTIVES

The following provides a design response to the relevant objectives of the Apartment Design Guide (ADG) and describes the measures by which the proposed development meets these objects.

OBJECTIVE	RESPONSE (based on achieving design criteria and the relevant design guidance)
4A Solar and Daylight Access **Objective 4A-1** To optimise the number of apartments receiving sunlight to habitable rooms, primary windows and private open space **Design Criteria** For development in the following locations: 1. Living rooms and private open spaces of at least 70% of apartments in a building receive a minimum of 2 hours direct sunlight between 9 am and 3 pm at mid winter in the Sydney Metropolitan Area and in the Newcastle and Wollongong local government areas 2. In all other areas, living rooms and private open spaces of at least 70% of apartments in a building receive a minimum of 3 hours direct sunlight between 9 am and 3 pm at mid winter 3. A maximum of 15% of apartments in a building receive no direct sunlight between 9 am and 3 pm at mid winter	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying** • The envelopes have been designed to maximise views and access to daylight while minimising wind and noise impacts. Apartment amenity is consistent with the objectives of the ADG. • McEvoy Street presents a noise source to the development. The building envelope proposed for buildings along McEvoy supports single loaded floorplates for north facing dwellings. • Waterloo South has been tested concurrently with the existing context and where appropriate a future possible context. • Building envelopes have been tested to ensure that 70- 75% of the primary envelope facade area - North, East and West - receive a minimum of 2 hours direct sunlight between 9am and 3pm at mid winter. • A representative Lot (S) has been designed in further detail to test primary ADG design criteria to ensure it can satisfy desired outcomes including ADG objectives for solar and daylight access. Although the design is indicative only at this stage, the illustrative plans achieve or exceed the minimum of 70% solar access requirement. • As part of future detailed designs a comprehensive assessment will need to be undertaken to ensure that ADG objectives and design criteria specific to the final built form outcome and context will be achieved.
Objective 4A-2 Daylight access is maximised where sunlight is limited • Courtyards, skylights and high level windows (with sills of 1,500mm or greater) are used only as a secondary light source in habitable rooms	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying** • The residential towers have been designed to maximise views and access to daylight while minimising wind and noise impacts. Apartment amenity is consistent with the objectives of the Apartment Design Guide (ADG). • Skylights can be utilised to maximise daylight.
Objective 4A-3 Design incorporates shading and glare control, particularly for warmer months	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying**
4B Natural Ventilation **Objective 4B-1** All habitable rooms are naturally ventilated • The area of unobstructed window openings should be equal to at least 5% of the floor area served • Light wells are not the primary air source for habitable rooms	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying** • Windows and doors will be sized to satisfy the ADG objective for natural ventilation. • Proposed overall building depths facilitates natural ventilation to habitable rooms.

PART 3: SITING THE DEVELOPMENT

RESPONSE TO APARTMENT DESIGN GUIDE OBJECTIVES

The following provides a design response to the relevant objectives of the Apartment Design Guide (ADG) and describes the measures by which the proposed development meets these objects.

OBJECTIVE	RESPONSE (based on achieving design criteria and the relevant design guidance)
Objective 4B-2 The layout and design of single aspect apartments maximises natural ventilation Apartment depths are limited to maximise ventilation and airflow Natural ventilation to single aspect apartments is achieved with the following design solutions: • Primary windows are augmented with plenums and light wells (generally not suitable for cross ventilation) • Stack effect ventilation / solar chimneys or similar to naturally ventilate internal building areas or rooms such as bathrooms and laundries • Courtyards or building indentations have a width to depth ratio of 2:1 or 3:1 to ensure effective air circulation and avoid trapped smells	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying** • Apartment depths will be consistent with the ADG design guidance to maximise ventilation and airflow.
Objective 4B-3 The number of apartments with natural cross ventilation is maximised to create a comfortable indoor environment for residents • The building should include dual aspect apartments, cross through apartments and corner apartments and limit apartment depths • In cross-through apartments external window and door opening sizes/ areas on one side of an apartment (inlet side) are approximately equal to the external window and door opening sizes/areas on the other side of the apartment (outlet side) (see figure 4B.4) **Design Criteria** 1. At least 60% of apartments are naturally cross ventilated in the first nine storeys of the building. Apartments at ten storeys or greater are deemed to be cross ventilated only if any enclosure of the balconies at these levels allows adequate natural ventilation and cannot be fully enclosed 2. Overall depth of a cross-over or cross-through apartment does not exceed 18m, measured glass line to glass line	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying** • The envelopes have been designed to optimise natural cross ventilation while minimising wind and noise impacts. Apartment amenity is consistent with the objectives of the ADG A representative Lot (S) has been designed in further detail to test primary ADG design criteria to ensure it can achieve the desired outcomes including: • ADG objectives for solar and daylight access. Although the design is indicative only at this stage, the illustrative plans achieve or exceed the minimum design criteria of 60% cross-ventilation. • Cross-through apartments do not exceed 18m glass line to glass line. • Natural cross-ventilation is proposed by corner or cross-through strategy to the living area and n-1 bedrooms.

PART 3: SITING THE DEVELOPMENT

RESPONSE TO APARTMENT DESIGN GUIDE OBJECTIVES

The following provides a design response to the relevant objectives of the Apartment Design Guide (ADG) and describes the measures by which the proposed development meets these objects.

OBJECTIVE	RESPONSE (based on achieving design criteria and the relevant design guidance)
4C Ceiling Heights **Objective 4C-1** • Ceiling height achieves sufficient natural ventilation and daylight access	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying** • For typical residential levels, a minimum floor-to-floor height of 3.1m is used so that the ADG design criteria of 2.7m ceiling height may be achieved in habitable rooms. • At Ground level, a minimum floor-to-floor height of 4.5m is used so that the ADG design criteria of 3.6m ceiling height may be achieved in habitable rooms. • At level 1, a minimum floor-to-floor height of 3.7m is used so that the ADG design criteria of 3.3m ceiling height may be achieved in habitable rooms.
Objective 4C-2 • Ceiling height increases the sense of space in apartments and provides for well-proportioned rooms	**NOTED**
Objective 4C-3 • Ceiling heights contribute to the flexibility of building use over the life of the building	**NOTED**

Design Criteria

1. Measured from finished floor level to finished ceiling level, minimum ceiling heights are:

Habitable rooms	2.7m
Non-habitable	2.4m
For 2 storey apartments	2.7m for main living area 2.4m for second floor, where area does not exceed 50% of the apartment area
Attic spaces	1.8m at edge of room with a 30° minimum ceiling slope
If located in mixed use areas	3.3m for ground floor and first floor to promote future flexibility of use

2. These minimums do not preclude higher ceilings if desired

PART 3: SITING THE DEVELOPMENT

RESPONSE TO APARTMENT DESIGN GUIDE OBJECTIVES

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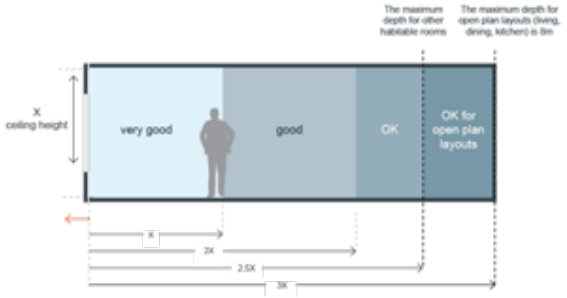
OBJECTIVE	RESPONSE (based on achieving design criteria and the relevant design guidance)
4D Apartment Size and Layout **Objective 4D-1** • The layout of rooms within an apartment is functional, well organised and provides a high standard of amenity	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying** • The proposal allows for all apartments to satisfy the design criteria for internal areas within the ADG • All habitable rooms will include windows to satisfy the design criteria within the ADG • Window and door openings will be sized to allow the ADG and NCC minimum recommendations for daylight and natural ventilation to be achieved.



Design Criteria 1. Apartments are required to have the following minimum internal areas:	
Apartment Type	Minimum Internal Area
Studio	35m^2
1 Bedroom	50m^2
2 Bedroom	70m^2
3 Bedroom	90m^2
The minimum internal areas include only one bathroom. Additional bathrooms increase the minimum internal area by 5m^2 each A fourth bedroom and further additional bedrooms increase the minimum internal area by 12m^2 each 2. Every habitable room must have a window in an external wall with a total minimum glass area of not less than 10% of the floor area of the room. Daylight and air may not be borrowed from other rooms	

The depth of a single aspect apartment relative to the ceiling height directly influences the quality of natural ventilation and daylight access. The maximum depth of open plan layouts that combine living, dining and kitchen spaces is 8 metres

PART 3: SITING THE DEVELOPMENT

RESPONSE TO APARTMENT DESIGN GUIDE OBJECTIVES

The following provides a design response to the relevant objectives of the Apartment Design Guide (ADG) and describes the measures by which the proposed development meets these objects.

OBJECTIVE	RESPONSE (based on achieving design criteria and the relevant design guidance)
Objective 4D-2 • Environmental performance of the apartment is maximised **Design Criteria** 1. Master bedrooms have a minimum area of 10m^2 and other bedrooms 9m2 (excluding wardrobe space) 2. Bedrooms have a minimum dimension of 3m (excluding wardrobe space) 3. Living rooms or combined living/dining rooms have a minimum width of: - 3.6m for studio and 1 bedroom apartments - 4m for 2 and 3 bedroom apartments 4. The width of cross-over or cross-through apartments are at least 4m internally to avoid deep narrow apartment layouts	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying**
Objective 4D-3 Apartment layouts are designed to accommodate a variety of household activities and needs **Design Criteria** 1. Habitable room depths are limited to a maximum of 2.5 x the ceiling height 2. In open plan layouts (where the living, dining and kitchen are combined) the maximum habitable room depth is 8m from a window Apartment layouts allow flexibility over time, design solutions may include: • All bedrooms allow a minimum length of 1.5m for robes • The main bedroom of an apartment or a studio apartment should be provided with a wardrobe of a minimum 1.8m long, 0.6m deep and 2.1m high • Dimensions that facilitate a range of activities and privacy levels • Room sizes and proportions or open plans (rectangular spaces (2:3) are more easily furnished than square spaces (1:1)) • Efficient planning of circulation to maximise the amount of usable floor space in rooms • Dual master apartments • Dual key apartments	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying**

PART 3: SITING THE DEVELOPMENT

RESPONSE TO APARTMENT DESIGN GUIDE OBJECTIVES

The following provides a design response to the relevant objectives of the Apartment Design Guide (ADG) and describes the measures by which the proposed development meets these objects.

OBJECTIVE	RESPONSE (based on achieving design criteria and the relevant design guidance)
4E Private Open Spaces and Balconies **Objective 4E-1** Apartments provide appropriately sized private open space and balconies to enhance residential amenity Note: Dual key apartments which are separate but on the same title are regarded as two sole occupancy units for the purposes of the BCA and for calculating the mix of apartments	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying**
Objective 4E-2 • Primary private open space and balconies are appropriately located to enhance liveability for residents	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying**
Objective 4E-3 • Private open space and balcony design is integrated into and contributes to the overall architectural form and detail of the building	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying** The proposed building envelopes have been developed to accommodate integration of the balconies into the overall building design.
Objective 4E-4 • Private open space and balcony design maximises safety	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying**

Design Criteria

1. All apartments are required to have primary balconies as follows

Dwelling Type	Minimum Area	Minimum Depth
Studio	4m2	-
1 Bedroom	8m2	2m
2 Bedroom	10m2	2m
3+ Bedroom	12m2	4m

The minimum balcony depth to be counted as contributing to the balcony area is 1m

2. For apartments at ground level or on a podium or similar structure, a private open space is provided instead of a balcony. It must have a minimum area of 15m2 and a minimum depth of 3m

PART 3: SITING THE DEVELOPMENT

RESPONSE TO APARTMENT DESIGN GUIDE OBJECTIVES

The following provides a design response to the relevant objectives of the Apartment Design Guide (ADG) and describes the measures by which the proposed development meets these objects.

OBJECTIVE	RESPONSE (based on achieving design criteria and the relevant design guidance)
4F Common Circulation and Spaces **Objective 4F-1** Common circulation spaces achieve good amenity and properly service the number of apartments **Design Criteria** 1. The maximum number of apartments off a circulation core on a single level is eight 2. For buildings of 10 storeys and over, the maximum number of apartments sharing a single lift is 40 Longer corridors greater than 12m in length from the lift core should be articulated. Design solutions may include: • A series of foyer areas with windows and spaces for seating • Wider areas at apartment entry doors and varied ceiling heights Where design criteria 1 is not achieved, no more than 12 apartments should be provided off a circulation core on a single level	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying**
Objective 4F-2 • Common circulation spaces promote safety and provide for social interaction between residents	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying**

PART 3: SITING THE DEVELOPMENT

RESPONSE TO APARTMENT DESIGN GUIDE OBJECTIVES

The following provides a design response to the relevant objectives of the Apartment Design Guide (ADG) and describes the measures by which the proposed development meets these objects.

OBJECTIVE	RESPONSE (based on achieving design criteria and the relevant design guidance)
4G Storage **Objective 4G-1** Adequate, well designed storage is provided in each apartment • Storage is accessible from either circulation or living areas • Storage provided on balconies (in addition to the minimum balcony size) is integrated into the balcony design, weather proof and screened from view from the street • Left over space such as under stairs is used for storage **Design Criteria** 1. In addition to storage in kitchens, bathrooms and bedrooms, the following storage is provided:	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying**

Dwelling Type	Storage Size (Volume)
Studio	4m^3
1 Bedroom	6m^3
2 Bedroom	8m^3
3+ Bedroom	10m^3
At least 50% of the required storage is to be located within the apartment.	

Objective 4G-2 Additional storage is conveniently located, accessible and nominated for individual apartments	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying**
4H Acoustic Privacy **Objective 4H-1** Noise transfer is minimised through the siting of buildings and building layout	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying**
Objective 4H-2 Noise impacts are mitigated within apartments through layout and acoustic treatments	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying**

PART 3: SITING THE DEVELOPMENT

RESPONSE TO APARTMENT DESIGN GUIDE OBJECTIVES

The following provides a design response to the relevant objectives of the Apartment Design Guide (ADG) and describes the measures by which the proposed development meets these objects.

OBJECTIVE	RESPONSE (based on achieving design criteria and the relevant design guidance)
4J Noise and Pollution **Objective 4J-1** In noisy or hostile environments the impacts of external noise and pollution are minimised through the careful siting and layout of buildings Achieving the design criteria in this Apartment Design Guide may not be possible in some situations due to noise and pollution. Where developments are unable to achieve the design criteria, alternatives may be considered in the following areas: • Solar and daylight access • Private open space and balconies • Natural cross ventilation	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying** • McEvoy Street presents a noise source to the development. The building envelope proposed for buildings along McEvoy Street support single loaded floorplates for north facing dwellings. Refer to the Acoustic Report for further information.
Objective 4J-2 Appropriate noise shielding or attenuation techniques for the building design, construction and choice of materials are used to mitigate noise transmission	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying**
4K Apartment Mix **Objective 4K-1** A range of apartment types and sizes is provided to cater for different household types now and into the future Flexible apartment configurations are provided to support diverse household types and stages of life including single person households, families, multi-generational families and group households	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying** • Approximately 3,048 apartments will be provided, 30 percent social (affordable rental) housing and the remainder to be private market housing. • A variety of apartment types will be provided, including 15% adaptable dwellings to meet the objectives of the Sydney DCP 2012 and 20% Livable dwellings to meet the objectives within the ADG. • The future apartment mix will be taking into consideration the distance to public transport, employment and education centres, as well as the current market demands and projected future demographic trends within the area.
Objective 4K-2 The apartment mix is distributed to suitable locations within the building	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying**

PART 3: SITING THE DEVELOPMENT

RESPONSE TO APARTMENT DESIGN GUIDE OBJECTIVES

The following provides a design response to the relevant objectives of the Apartment Design Guide (ADG) and describes the measures by which the proposed development meets these objects.

OBJECTIVE	RESPONSE (based on achieving design criteria and the relevant design guidance)
4L Ground Floor Apartments **Objective 4L-1** Street frontage activity is maximised where ground floor apartments are located Direct street access should be provided to ground floor apartments Activity is achieved through front gardens, terraces and the facade of the building. Design solutions may include: • Both street, foyer and other common internal circulation • Entrances to ground floor apartments • Private open space is next to the street • Doors and windows face the street Retail or home office spaces should be located along street frontages Ground floor apartment layouts support small office home office (SOHO) use to provide future opportunities for conversion into commercial or retail areas. In these cases provide higher floor to ceiling heights and ground floor amenities for easy conversion	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying**
Objective 4L-2 Design of ground floor apartments delivers amenity and safety for residents Privacy and safety should be provided without obstructing casual surveillance. Design solutions may include: • Elevation of private gardens and terraces above the street level by 1-1.5m • Landscaping and private courtyards • Window sill heights that minimise sight lines into apartments • Integrating balustrades, safety bars or screens with the exterior design	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying**
4M Facades **Objective 4M-1** Building facades provide visual interest along the street while respecting the character of the local area Building facades relate to key datum lines of adjacent buildings through upper level setbacks, parapets, cornices, awnings or colonnade heights	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying** • The proposed building envelopes have been developed to accommodate design opportunities for different architectural responses to achieve a high level of visual interest and aesthetics, in response to the existing and local context. • The aesthetics of the proposal do not form part of this application • The design, materials and colours are purely indicative and illustrative at this stage.
Objective 4M-2 Building functions are expressed by the facade	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying**

PART 3: SITING THE DEVELOPMENT

RESPONSE TO APARTMENT DESIGN GUIDE OBJECTIVES

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OBJECTIVE	RESPONSE (based on achieving design criteria and the relevant design guidance)
4N Roof Design **Objective 4N-1** Roof treatments are integrated into the building design and positively respond to the street	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying**
Objective 4N—2 Opportunities to use roof space for residential accommodation and open space are maximised	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying** Habitable roof space is provided with good levels of amenity and include: • Penthouse apartments • Dormer or clerestory windows • Operable skylights Open space is provided on roof tops with visual and acoustic privacy, comfort levels, safety and security considerations
Objective 4N—3 Roof design incorporates sustainability features	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying**
4O Landscape Design **Objective 4O—1** Landscape design is viable and sustainable	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying** • The tree palette for Waterloo South aims to augment local character and species diversity (both native and exotic), maintaining biodiversity and support local wildlife. • Species will support local native bee species and foraging wildlife whilst providing canopies that will create shade minimising urban heat island effect and cooling the public domain during summer months. • Low growing, flood tolerant understorey species have been selected to further define the public domain, provide habitat and assist with WSUD, avoiding obstruction of sight lines across the site and streets creating a safe and healthy environment. • Tree and understorey species are of indigenous significance and provide edible elements for cooking with flowers, fruits, roots and seeds all providing a source of food with the public domain. • A target 30% of planting will be provided as edible species Refer Appendic 7.3 for further details
Objective 4O—2 Landscape design contributes to the streetscape and amenity	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying** Refer Appendic 7.3 for further details

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RESPONSE TO APARTMENT DESIGN GUIDE OBJECTIVES

The following provides a design response to the relevant objectives of the Apartment Design Guide (ADG) and describes the measures by which the proposed development meets these objects.

OBJECTIVE	RESPONSE (based on achieving design criteria and the relevant design guidance)
4P Planting on Structures **Objective 4P—1** Appropriate soil profiles are provided Plant type / Soil Depth / Soil Area Large Trees / 1,200 mm / 10 x 10m or equivalent Medium Trees / 1,000 mm / 6 x 6m or equivalent Small Trees / 800 mm / 3.5 x 3.5m or equivalent Shrubs / 500 - 600 mm / - Ground Cover / 300 - 450 mm / - Turf / 200 mm / -	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying**
Objective 4P—2 Plant growth is optimised with appropriate selection and maintenance	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying** • Diverse planting that are low in maintenance and suited to the site will be incorporated to enhance the performance of the landscaped areas Refer Appendic 7.3 for further details
Objective 4P—3 Planting on structures contributes to the quality and amenity of communal and public open spaces	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying** Building design will incorporate opportunities for planting on structures including: • Wall design that incorporates planting • Green roofs, particularly where roofs are visible from the public domain • Planter boxes Refer Appendic 7.5 and 7.8 for further details
4Q Universal Design **Objective 4Q—1** Universal design features are included in apartment design to promote flexible housing for all community members Developments achieve a benchmark of 20% of the total apartments incorporating the Livable Housing Guideline's silver level universal design features	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying**

PART 3: SITING THE DEVELOPMENT

RESPONSE TO APARTMENT DESIGN GUIDE OBJECTIVES

The following provides a design response to the relevant objectives of the Apartment Design Guide (ADG) and describes the measures by which the proposed development meets these objects.

OBJECTIVE	RESPONSE (based on achieving design criteria and the relevant design guidance)
Objective 4Q—2 A variety of apartments with adaptable designs are provided Adaptable housing should be provided in accordance with the relevant council policy	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying** • Adaptable apartments will be provided at a rate of 15% in accordance with the City of Sydney 2004 Access DCP
Objective 4Q—3 Apartment layouts are flexible and accommodate a range of lifestyle needs Apartment design incorporates flexible design solutions which may include: • Rooms with multiple functions • Dual master bedroom apartments with separate bathrooms • Larger apartments with various living space options • Open plan 'loft' style apartments with only a fixed kitchen, laundry and bathroom	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying**
4R Adaptive Re-Use **Objective 4R—1** New additions to existing buildings are contemporary and complementary and enhance an area's identity and sense of place	**N/A**
Objective 4R—2 Adapted buildings provide residential amenity while not precluding future adaptive reuse	**NOTED**
4S Mixed Use **Objective 4S-1** Mixed use developments are provided in appropriate locations and provide active street frontages that encourage pedestrian movement	**SATISFIES** • Waterloo South delivers a highly active streetscape • The size and type of tenancy located along the primary pedestrian paths has been designed to respond to the nature of movement and street interfaces.
Objective 4S-2 Residential levels of the building are integrated within the development, and safety and amenity is maximised for residents	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying**
4T Awnings and Signage **Objective 4T-1** Awnings are well located and complement and integrate with the building design	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying** • Awnings and covered areas will be provided over building entries for building address and public domain amenity.

PART 3: SITING THE DEVELOPMENT

RESPONSE TO APARTMENT DESIGN GUIDE OBJECTIVES

The following provides a design response to the relevant objectives of the Apartment Design Guide (ADG) and describes the measures by which the proposed development meets these objects.

OBJECTIVE	RESPONSE (based on achieving design criteria and the relevant design guidance)
Objective 4T—2 Signage responds to the context and desired streetscape character	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying**
4U Energy Efficiency **Objective 4U—1** Development incorporates passive environmental design	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying**
Objective 4U—2 Development incorporates passive solar design to optimise heat storage in winter and reduce heat transfer in summer	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying**
Objective 4U—3 Adequate natural ventilation minimises the need for mechanical ventilation	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying**
4V Water Management **Objective 4V—1** Potable water use is minimised	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying**
Objective 4V—2 Urban stormwater is treated on site before being discharged to receiving waters	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying**
Objective 4V—3 Flood management systems are integrated into site design	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying**
Objective 4W-1 Waste storage facilities are designed to minimise impacts on the streetscape, building entry and amenity of residents	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying**
Objective 4W-2 Domestic waste is minimised by providing safe and convenient source separation and recycling	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying**
4X Building Maintenance **Objective 4X-1** Building design detail provides protection from weathering	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying**
Objective 4X-2 Systems and access enable ease of maintenance	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying**
Objective 4X-3 Material selection reduces ongoing maintenance costs	**FUTURE ASSESSMENT AT DA STAGE** **Capable of Satisfying**

Fig. 7.10.27 Waterloo Common community hub
Source: Virtual Ideas, 2020

7.10.3 BETTER PLACED

Waterloo South is a catalyst for the positive evolution of the Estate and surrounding areas. A number of strategies have been developed, based on the seven Better Placed objectives, that will ensure the new urban village for Waterloo will be healthy, responsive, integrated, equitable and resilient

Better Placed is a guideline by the Government Architect of NSW for a design-led planning strategy to create liveable, productive, sustainable and resilient communities.

BETTER FIT

Contextual, Local and of its place

Good design in the built environment is informed by and derived from its location, context and social setting. It is place-based and relevant to and resonant with local character, and communal aspiration. It also contributes to evolving character and setting.

Contextual

A building, place or space that responds to the context in which it is designed

Local

A building, place or space that relates to an area, or neighbourhood

Of its place

A building, place or space that relates to its surrounds

Integrated design, spanning precincts, public realm and buildings, should encompass an appropriate contextual fit, through:

Objective	Evaluation Requirements	Design Response
1.1	Considering the design in its immediate environs, and the wider context	As Sydney's population grows, available land in suitable locations, especially around new transport infrastructure, is being renewed to accommodate more homes and jobs in a more dense urban form. Waterloo South is well positioned to provide new homes, jobs, services and amenities, close to transport, being strategically located in NSW's greatest economic corridor that connects Macquarie Park through Central Sydney to the airport. It is a key growth site for future housing close to Central Sydney, especially when compared to the low-growth potential of the surrounding heritage conservation areas, or nearby areas that are already substantially developed.
1.2	Responding to the local landscape setting and its natural features, including topography, waterways and vegetation	Waterloo South's public domain framework and strategy draws upon its existing significant and unique features to create an active, safe, adaptive and resilient public domain.
1.3	Responding to the broader urban context in terms of existing street patterns, development and built form	With the metro station on Waterloo's doorstep, the Metro Quarter active transport hub will facilitate the regional gateway and provide a central location for retail, community services and community spaces. The Village Green will provide a green arrival and gateway into Waterloo South
1.4	Effectively addressing the immediate site conditions, surrounding public realm, neighbouring buildings or sites, and interfaces	A number of approaches are employed to respond to the interfaces with surrounding context, heritage items and the adjacent Heritage Conservation Areas. The pedestrian priority movement network, involving new streets, laneways and links to the existing network, reconnects Waterloo South to the surrounding context with the re-establishment of a finer grain network of links and lanes, drawing people to the main open spaces, the Metro Quarter and transport connections.
1.5	Building on and reinforcing distinct and authentic local characteristics, qualities and attributes, referencing local heritage and local materials where applicable to support local identity	Placemaking activities defined three sub-precinct character areas for Waterloo South, based on their existing and future place characteristics; Village Green, Maker Village and Hilltop Village. The green public domain will celebrate the layered natural and cultural history of Waterloo and its proud community. From the Waterloo wetlands, to the history of industry and innovation, to the lofty trees, the diversity of cultural backgrounds and the network between neighbours, the stories and community voice will be shared and act as a link through the community.
1.6	Retaining and enhancing existing buildings and vegetation of public value	Waterloo South has the opportunity to create a series of integrated green systems by retaining key existing trees and canopy, maximising access to open space, reinforcing and strengthening district green grid connections. The range of strategies include retention of high and moderate value trees and tree replacement ratios as well as avoid damage to existing sites of ecological value, and provision of natural habitats.
1.7	Contributing to change in the urban context, where appropriate or desirable, in a managed, careful and responsive manner, establishing a reference for future built form and urban design	The public domain-led approach for Waterloo South provides a localised environmental response that connects Waterloo South to its context and provides for a uniquely Waterloo public domain, to support the needs of the existing diverse and unique community. Urban and built form elements, shaped by the open space and public domain configuration, promote a diversity of built form, clear definition of the public domain, and street-walls that frame the experience at eye level, whilst taller buildings provide markers, landmarks and height diversity.
1.8	Contributing to the immediate public realm, through activation, passive surveillance, visual interest and improved amenity; supporting community interaction and addressing local needs and opportunities	Within the pedestrian priority precinct, public open space will be accessible to the community and support community belonging through spaces for gathering and a range of active and passive uses. A liveable and mixed community will be supported by local retail and community services & facilities and will include a variety of housing choices and building typologies. Active streets and small neighbourhood areas will reflect community character and respond to place, supporting the daily life of the community.
1.9	Creating or contributing to a distinctive, defined urban character in the local area.	Waterloo South will become a distinct urban village experience which connects people to each other, to nature and the greater city of Sydney. A distinct public domain will have a strong local character, with a large Village Green and Waterloo Common positioned along George Street active spine.

BETTER PERFORMANCE

Sustainable, adaptable and durable

Environmental sustainability and responsiveness is essential to meet the highest performance standards for living and working.

Sustainability is no longer an optional extra but a fundamental aspect of functional, whole-of-life design.

Good built environment design achieves high performance standards, through:

Objective	Evaluation Requirements	Design Response
2.1	Facilitating and encouraging sustainable transport modes including walking, cycling and public transport and minimising the space dedicated to vehicle movement and parking	Waterloo South will be a highly walkable place, by creating a pedestrian priority precinct that prioritises active transport modes. The public domain will harness opportunities to create a linked and diverse network of spaces, and deliver a fine grained urban grid, to support and promote a highly walkable place. Opportunities for highly activated and diverse streets, laneways and pedestrian links will create an urban neighbourhood for people that is safe, walkable and connected.
2.2	Accommodating an appropriate range of well-distributed, public or private activities	The Village Green and Waterloo Common are supplemented with a variety of other open spaces distributed throughout Waterloo South including urban plazas, pocket parks and social corners that satisfy a range of community desires. These spaces are enhanced by dispersed community hubs and facilities, as well as landscaped spaces that promote the retention of significant trees.
2.3	Accommodating future change in use or activities	A mixed use zoning across Waterloo South allows for flexibility of uses over time to support a high performing and activation ready public domain. Flexible dwelling typologies respond to the existing and future community's needs.
2.4	Integrating green infrastructure, including tree canopy, open space, bushland and waterways with urban development and grey infrastructure, such as streets, roads and public transport	With an increased global and community focus on environment and sustainability, ensuring Waterloo South adopts similar attitudes is primary. Blue-Green infrastructure includes an extensive approach to street tree planting, understory planting,bio-retention and tree pits. This network of infrastructure works to support and improve existing habitat arrangements and biodiversity. Integrating elements of play and exploration within the network promotes an awareness and presence of the network and infrastructure throughout the community.
2.5	Contributing to resource efficiency (energy, water, materials), including minimising consumption, and accommodating localised energy generation, water recycling and food production	The design response for Waterloo South will align to the Green Star Communities National Framework and deliver a 6 Star Green Star Communities and 5 Star Green Star Design and As Built (v1.2) (Design Review certified) ratings for selected buildings within Waterloo South. A 6 star rating is indicative of 'World Leadership' and is above and beyond current typical industry practice
2.6	Prioritising the use of robust, locally sourced materials and resilient, climate-responsive plant species	Specific initiatives have been identified and embedded within the Waterloo South master plan with the aim of aligning to a 6 Star Green Star Communities rating.
2.7	Responding to local climate conditions, and using efficient, passive approaches and systems to provide shade, shelter, heating and cooling to reduce the burden on, or need for, mechanical systems	The provision of public infrastructure that increases the public domain through new open spaces, streets, pocket parks, social corners and setbacks provides for green photosynthetic infrastructure such as street trees and parks. The canopy cover will provide respite from the heat of the summer sun and will shade the streets across Waterloo South to reduce the effects of the urban heat island effect. The building forms, massing and orientation have been organised to maximise natural daylighting and solar access to the primary living spaces and external areas, while minimising wind and noise impacts.
2.8	Arranging layouts, facades, materials and fixtures to optimise environmental performance, through access to fresh air, natural light, greenery and vegetation.	Waterloo South's public domain will create an active, safe, adaptive and resilient Estate. Promoting community interaction, the public domain will enable flexibility of use for the community, both residents and visitors.

Sustainable

Relates to the endurance of systems, buildings, spaces and processes – their ability to be maintained at a certain rate or level, which contributes positively to environmental, economic and social outcomes

Adaptable

A building, place or space that can adjust to new conditions, or to be modified for a new purpose

Durable

A building, place or space that is built to be able to withstand wear and pressure

BETTER FOR COMMUNITY

Inclusive, connected and diverse

The design of the built environment must seek to address growing economic and social disparity and inequality, by creating inclusive, welcoming and equitable environments.
Incorporating diverse uses, housing types and economic frameworks will support engaging places and resilient communities.

Inclusive
A building, place or space that embraces the community and individuals who use it

Connected
A building place or space that establishes links with its surrounds, allowing visitors and residents to move freely and sustainably

Diverse
A building, place or space that embraces a richness in use, character and qualities

Good design creates better communities, through:

Objective	Evaluation Requirements	Design Response
3.1	Supporting appropriate layout, density and way-finding for walking, cycling and access to services, facilities and public transport	Waterloo South, as a pedestrian priority environment, will reduce and slow vehicle movements with a network of shared slow streets, laneways and pedestrian links, increasing the ground level permeability of Waterloo South. Safe movement, good connections and access are provided through public places that provide well defined routes and clear sightlines (day and night) so residents and visitors can see and be seen.
3.2	Developing layouts in precincts, buildings and spaces that encourage exploration, movement, and equitable public access in public and community buildings as well as privately owned public spaces	Urban and built form elements, shaped by the open space and public domain configuration, promote a diversity of built form responses, clear definition of the public domain, and street-walls that frame the experience at eye level, whilst taller slender buildings provide markers, landmarks and height diversity.
3.3	Accommodating or contributing to a diverse and integrated mix of spaces and uses including diverse housing types, community spaces and commercial premises	Developing unique place characteristics, through built form and public domain strategies, the public domain plan creates a hierarchy of movement systems and spaces catering to the diverse needs and lifestyles of the community. A mix and choice of tenure blind social (affordable rental) and market dwellings is provided.
3.4	Supporting equitable access to a diverse range of local economic or employment opportunities	Waterloo South, will provide increased services, employment and recreational opportunities to support the diverse needs of the growing community. Community facilities, services and shops provide accessible jobs, retail, amenities and education opportunities. The new metro station, and increased services and amenities provided by the Metro Quarter over station development will provide additional opportunities for jobs, services, education and recreation as well as increased connectivity.
3.5	Providing or contributing to a range of types of open space in the public realm, varying in sizes and configuration and connecting to wider networks, particularly in higher density urban locations	Waterloo South has the opportunity to create a series of integrated green systems by retaining key existing trees and canopy, maximising access to open space, reinforcing and strengthening district green grid connections, and incorporating biophilic design principles (by designing with an understanding of the need to connect with nature), to contribute to climate mitigation and create a healthy, liveable urban environment.
3.6	Creating internal and external layouts which can accommodate a wide range of events, activities and informal social interactions	The public open spaces and variety of other open spaces facilitate a range of activities, host productive landscapes, integrate water management, and provide landscaped setbacks, tree retention zones and an urban forest strategy. The range of gathering areas and communal spaces support social connectedness and community interaction. Cultural interpretation and integration will be present in numerous forms and styles including street art, temporary events, Indigenous programmes and street performance. A range of social interactions will be supported.
3.7	Ensuring permeable edges to buildings and spaces by creating frontages, connections and entrances that are legible, engaging and welcoming especially in town centres, main streets and higher-density areas	The public domain will provide an active, safe and adaptive environment that promotes community interaction through flexibility of uses, and a diverse hierarchy of spaces where people can gather, meet and relax. Streets will be places of social connectedness through the inclusion of activated street interfaces, and an energised ground plane where buildings contribute positively to the public domain.
3.8	Contributing to an interconnected network of green infrastructure, linking tree canopy, open space, bushland and waterways.	The public domain and open space network needs to support the diverse community by providing an adaptable and flexible public domain network. Waterloo South presents opportunities to create safe and pleasant connections between key destinations for people of all ages with a high level of amenity, activity and inclusiveness.

BETTER FOR PEOPLE

Safe, comfortable and liveable

The built environment must be designed for people with a focus on safety, comfort and the basic requirement of using public space. The many aspects of human comfort which affect the usability of a place must be addressed to support good places for people.

Safe

A building, place or space that protects its people from harm or risk of harm

Comfortable

A building, place or space that provides physical and emotional ease and well-being for its people

Liveable

A built environment which supports and responds to people's patterns of living, and is suitable and appropriate for habitation, promoting enjoyment, safety and prosperity

Good design contributes to places that are better for people, through:

Objective	Evaluation Requirements	Design Response
4.1	Prioritising people as the most important design consideration and the foundation for design decisions	The opportunity at Waterloo South is the bringing together of people of different ages, means and cultures in a tolerant and universally enriching community. At its core it will be a place for people to connect where people truly want to spend time. The non-retail uses balance Waterloo's local neighbourhood qualities and character through a distinctive retail high street that supports the Metro Quarter's activity centre that prioritises convenience. The public domain aims to put the community first. Health and well-being are prioritised by providing open space access to the community within 200m of building entries. The urban forest strategy creates a highly landscaped environment that connects people to nature and at a broader scale connects to the regional Green Grid. Productive landscapes that includes bush tucker species and community gardens within the public open space provide places for community interaction and connect back to traditional Aboriginal practices.
4.2	Providing an appropriate range of climatic experiences – shelter, enclosure, openness, solar access and shade	Ecologically Sustainable Design (ESD) principles have been considered thoroughly throughout the planning process.
4.3	Supporting a spectrum of public realm uses – including individual (walking, waiting, sitting), social (meeting, interacting) and active recreational activities (playing) – through the design of spatial layouts, furniture, materials, planting and other details	Furniture and urban elements within Waterloo South aim to be aesthetically pleasing, functional and robust for residents and the wider community. The amount and type of furniture in different areas will be determined by the expected rate of use and program identified for that specific area
4.4	Accommodating an appropriate range of social and community activities by providing flexible spaces that are adaptable as future circumstances change	The association of community facilities with public open space responds to the community desire to facilitate activation of those spaces and their potential for programming as places for public art and community involvement. Retail and services along George Street provide for equitable access. Smaller retail and services provision distributed throughout Waterloo South has the flexibility to increase in size over time.
4.5	Optimising comfort and enjoyment within buildings and spaces, through acoustic and thermal comfort, appropriate lighting, appropriately proportioned spaces and connection to surroundings	Health and well-being are prioritised by incorporating biophilic design principles (by designing with an understanding of the need to connect with nature), to contribute to climate mitigation and create a healthy, liveable urban environment. The high performing and activation ready public domain and non-residential uses supports the everyday experience through active frontages, a pedestrian scale, lot diversity and finer grain of the urban and built form.
4.6	Ensuring that layout arrangements and the relationships between spaces and perimeters maximise activation, visibility, clarity, activity and opportunities for passive surveillance	Increased visibility and active edges at ground level, through a mix of uses, with residential uses at both ground and upper levels addressing the streets and laneways, will maximise passive surveillance, creating a safe environment to live, work and visit. Visibility and surveillance of the public environment is maximised by providing public places that are overlooked from adjoining buildings, for 'eyes on the street' or 'natural surveillance' from passers-by to make people feel safer and potential offenders feel exposed. Throughout Waterloo South, buildings define the public domain, reinforcing sightlines and strengthening views to and from key spaces, streets and laneways, for good passive surveillance.
4.7	Contributing positively to the physical and mental health and wellbeing of local users and visitors; enhancing opportunities for physical activity, social interaction and access to healthy food.	Waterloo South will increase safety in the Estate by improving the quality of the environment, minimising the opportunity for crime and promoting an accessible and liveable place that encourages a feeling of safety and community participation Attractive public places will encourage use of the spaces, a sense of ownership and improve people's perception of how safe a place is and supports their desire to occupy and use those places for community safety and well-being.

BETTER WORKING

Functional, efficient and fit for purpose

Having a considered, tailored response to the program or requirements of a building or place, allows for efficiency and usability with the potential to adapt to change. Buildings and spaces which work well for their proposed use will remain valuable and well-utilised.

Functional
A building, place or space that is designed to be practical and purposeful

Efficient
A building, place or space that is constructed and functions with minimal wasted effort

Fit for purpose
A building, place or space that works according to its intended use

Well-designed environments work better for all, through:

Objective	Evaluation Requirements	Design Response
5.1	Accommodating and responding to people's daily needs and amenity, including activities, use requirements and movement patterns in the urban environment	Health and well-being are prioritised by providing open space access to the community within 200m of building entries. Community facilities, services and shops are provided along George Street Activity Street, with smaller retail and community facilities dispersed and located around primary public open spaces, plazas and social corners and connected by an accessible local movement route (ALMR).
5.2	Supporting a range of diverse uses which activate places day and night, inside and outside, by overlapping or extending the times of use by different groups	The high performing and activation ready public domain and non-residential uses supports the everyday experience through active frontages, a pedestrian scale, lot diversity and finer grain of the urban and built form. Numerous activation opportunities are provided as part of the renewal of Waterloo South, to build upon existing opportunities. These include leveraging the existing maker and creative industries, the strong local character, the community's strong sense of belonging and the integral Aboriginal culture.
5.3	Supporting housing and commercial activity at higher densities close to local shops, services and public transport; minimising travel distances and providing easy access to services	The Waterloo South Indicative Concept Proposal supports 3,048 dwellings and approximately 17,900 sqm Gross Floor Area of non-residential uses including 11,200 sqm retail and services uses and 9,700 sqm of community and cultural facilities. A mix of housing and neighbourhood character areas reflects the diverse community and provides housing choice. The urban and built form enables these uses through building types and heights that support different types and scales of use Adaptable basement, ground and first floor levels will enable the sustainable evolution over time of the ground plane to non-residential uses to meet the needs of the growing community.
5.4	Creating indoor and outdoor spaces which accommodate and prioritise shared use, to optimise value for building occupants and the public	The key places will be hubs for activation within Waterloo South , providing equitable access to a mix of spaces for people of all ages. Community buildings are co-located next to public spaces including parks, plazas and social corners to facilitate community activities and interaction and create community anchors within each sub-precinct character area. The community buildings will provide spaces for local residents to access key services, promote artistic responses and maintain connections to surrounding residents and communities. Vertical neighbourhoods provide additional communal open spaces for residents to meet and interact.
5.5	Ensuring spatial layouts are accessible, legible and easily navigable	The proposed movement network, that adds new streets, laneways and links to the existing network, reconnects Waterloo South to the surrounding context, with the prioritisation of pedestrians and cyclists and re-establishment of a finer grain network of links and lanes, drawing people to the main open spaces, the Metro Quarter and active transport connections. Streets are designed as slow streets, with new and upgraded pedestrian crossings, to encourage walking and cycling. Widened footpaths, cycling infrastructure and pedestrian friendly urban design encourage active transport modes for healthy and active living.
5.6	Ensuring spatial layouts are flexible to accommodate potential future changes in use, responding to future requirements and movement patterns	The smaller retail and services distributed throughout Waterloo South, have the flexibility to increase in size over time through an adaptable ground plane strategy. The association of community facilities with public open space responds to the community desire to facilitate activation of those spaces and their potential for programming as places for public art and community involvement.
5.7	Ensuring spaces are appropriately sized to accommodate activity while maintaining movement paths.	The public domain and open space network needs to support the diverse community by providing an adaptable and flexible public domain network, a linked and diverse network of open spaces, and a fine grained urban grid, to support and promote a highly walkable place. The public open space is defined by two public open spaces - the Village Green and Waterloo Common. Urban plazas provide activated public space that connects Waterloo South to the major transport hub. Social corners and pocket parks provide more intimate community places for residents within the immediate vicinity. The pocket parks located across Waterloo South increase the overall open space and diversity available and act as local places for leisure and social connection throughout the public domain.

BETTER VALUE

Creating and adding value

Good design generates on-going value for people and communities and minimises costs over time. Creating shared value of place in the built environment raises standards and quality of life for users, as well as adding return on investment for industry.

Creating Value

Conceiving and providing new opportunities for a building, place or space that increase social, economic or environmental benefits to the community

Adding Value

Leveraging and building on the existing characteristics and qualities of a building, place or space to increase social, economic or environmental benefits to the community

Well-designed built environments create current and future value for those who create them, and for their end users, by:

Objective	Evaluation Requirements	Design Response
6.1	Accommodating a range of economic, small business and entrepreneurial opportunities in local areas and ensuring they are well connected and accessible	The distribution of local retail and services throughout Waterloo South provides equitable access to, and responds to the needs of, the community. A broad mix of frontage widths support diversity of scale and affordability.
6.2	Facilitating the enjoyment of public space by all people, including active and passive occupants (pedestrians, consumers, onlookers and visitors)	The new and diverse range of streets will support new shops, services and other businesses, contributing to an activated and more highly connected and integrated movement network.
6.3	Providing or supporting a range of housing, uses and urban density to encourage accessibility, diversity, affordability and leverage efficiencies of access to services and public transport	All blocks contain a variety of built forms and heights that allow for different options to accommodate the mix of social (affordable rental) and market dwellings, as well as satisfy considerations for ground level activation, relationship to context, and solar access provisions to public, communal, and private open space. The building envelopes have been designed to be flexible and to accommodate a range of housing mixes (studio, 1 bed, 2 bed, 3 bed and 4 bed apartments) and multiple apartment types and sizes allowing a variety of options for different demographics and price point, to support housing diversity and affordabilility.
6.4	Developing built elements and surfaces that are resilient and durable while reflecting quality and permanence, ensuring visual and functional quality over time	Waterloo South will have a consistent palette or suite of furniture and urban elements, complimentary to the built and natural surrounds whilst also being sympathetic to the sites rich heritage. Public Domain furniture is to be in accordance with City of Sydney palette (Sydney Street Codes 2013) as well as purpose built elements in special / key areas that help identify the sites characteristics and culture. The palette will improve the local aesthetic of the Estate and set a precedent for future development in the LGA.
6.5	Taking a whole-of-life approach when considering cost, and considering wider public benefits over time	The Waterloo South Indicatice Concept Proposal is designed to be sustainable and to contribute positively to the environmental, social and economic aspects of the area. Relevant regulatory and compliance requirements at the international, national, state, regional and local levels have been integrated into a sustainability framework developed to guide the renewal of Waterloo South.
6.6	Considering ongoing maintenance costs such as cleaning, vegetation, water and energy use	Furniture and urban elements within Waterloo South aim to be aesthetically pleasing, functional and robust for residents and the wider community.
6.7	Facilitating and encouraging social interaction in buildings and spaces, while also making appropriate provision for privacy and seclusion	The external communal spaces will be designed to engender community spirit for residents within the development by offering open spaces including areas for groups to congregate and also for more private activities. All common areas are designed for equitable access. Vertical neighbourhoods provide additional communal open spaces for residents to meet and interact.
6.8	Delivering ongoing public value through new or enhanced public spaces and interfaces with the public realm, with the flexibility to respond to changing usage patterns and functional needs over time	The approach to Waterloo South adopts a 'Complete Streets' approach whereby streets are considered as social places beyond just their functional purposes. These places are developed holistically, integrating all aspects of public domain design, to create environments that are unique, engaging, hard working and high performing.
6.9	Allowing for future adaptation to accommodate demographic changes, new patterns of use and the integration of new technologies	Adaptable basement, ground and first floors allow for the sustainable growth and evolution of Waterloo South's ground plane to non-residential uses to respond to the increasing amenity needs of the growing community. This will support connection over time to neighbouring activity centres and future development along Botany Road, in Green Square and Redfern.
6.10	Demonstrating inventiveness and innovation in design.	Waterloo South represents a public domain led, evidence based approach to planning that has been shaped by the outcomes of extensive community consultation. A continuous process of assessment, review and reiteration that included its own set of Place Performance Measures provides a response that is uniquely Waterloo.

BETTER LOOK & FEEL

Engaging, inviting and attractive

Our built environment should be welcoming and aesthetically pleasing, encouraging communities to use and enjoy local places. The feel of a place, and how we use and relate to our environments, depends upon the aesthetic quality of our places, spaces and buildings. The visual environment should contribute to its surroundings and promote positive engagement.

Engaging
A building, place or space that draws people in with features that generate interest

Inviting
A building, place or space that is welcoming to visitors, community and individuals

Attractive
A building, place or space that is aesthetically pleasing, or appealing

Well-designed built environments look and feel better, through:

Objective	Evaluation Requirements	Design Response
7.1	Demonstrating a clear aesthetic intent	Understanding how Waterloo's place character defines the past and present helped to inform the character and future vision for Waterloo South as the first stage of renewal of the Estate.
7.2	Creating engaging and attractive environments	The association of community facilities with public open space responds to the community desire to facilitate activation of those spaces and their potential for programming as places for public art and community involvement.
7.3	Creating a series of connected and distinct places that contribute to the interest and legibility of the built environment	Urban and built form elements, shaped by the open space and public domain configuration, promote a diversity of built form responses and have the flexibility to accommodate a range of housing mix. A mix and choice of tenure blind social (affordable rental) and market dwellings is provided. Flexible dwelling typologies respond to the existing and future community's needs.
7.4	Establishing appropriate, visually appealing built form in terms of scale, proportions, location and the configuration of buildings and spaces	Building heights across Waterloo South are structured to define the street edge at the pedestrian scale, whilst providing legibility and orientation at the local and neighbourhood level. Their position and orientation respond to many considerations including separation to other buildings, street setbacks, maximum heights, floorplate sizes and block lengths, articulation requirements, through site link requirements, location adjacent to open space or along major movement corridors, solar access to adjacent areas, mitigation of wind effects, key views and vistas, relationship to topography, and transition to existing context both within Waterloo South and adjacent areas.
7.5	Integrating landscape design and service elements with the building design to create welcoming and interesting places	Waterloo South's public domain framework and strategy draws upon its existing significant and unique features to create an active, safe, adaptive and resilient public domain. This will promote community interaction and enable flexibility of use, catering to the diverse needs and lifestyles of Waterloo South's existing and future community.
7.6	Achieving a purposeful composition of materials and elements including colours, textures, finishes, light and detailing	The proposed building envelopes have been developed to accommodate future design opportunities for differing facade expression for each stage to achieve a high level of visual interest and aesthetics, in response to the existing and future local context
7.7	Thoughtfully integrating public art	There are many opportunities for public art to be integrated as an important element of the public domain. Opportunities for public art are maximised through the range of public art typologies. As a significant aspect and voice for Waterloo South, the public art strategy will explore the contribution of these art forms to the identity of Waterloo South.
7.8	Developing active street frontages and an engaging environment for pedestrians, visually and materially, by minimising blank facades at street level to positively contribute to the public realm	Through a combination of co-locating community buildings with key public domain spaces, and a fine grain street network, activity is enhanced at these key places. This is strengthened by well programmed public domain spaces and the creation of parks as places for people to meet and spend time throughout the day. By limiting blank façades, providing active retail and community edges, landscaped building setbacks, and active social corners, a safe and vibrant day to night economy will be encouraged along the George Street 'Active Spine', promoting pedestrian activity and active use of the public domain.
7.9	Reflecting a commitment to and investment in design excellence.	The Indicative Concept Proposal for Waterloo South is the result of an extensive, evidence based, investigative and iterative process that has looked at best practice and case studies in Australia and globally to benchmark and measure its performance, and has been shaped by the outcomes of significant community engagement. The process commenced with analysis of the existing social, environmental and physical context of Waterloo which established ten key design insights, and the creation of a project vision, objectives and principles to guide the masterplan process. The NSW Government Architect's Better Placed guidelines informed the development of a number of strategies to ensure that the future natural and built environment of Waterloo South will be healthy, responsive, integrated, equitable and resilient.

7.10.4 PLACE PERFORMANCE MEASURES

HOUSING

A fully, integrated urban village of social (affordable rental) and market housing.

MEASURE:	OBJECTIVE:	METRIC:
SUB-PRECINCT COMPLETENESS **Role + Function** A sub-precinct is a distinct geographical character area located off the primary public open space network that has clearly defined edges (streets and/or open spaces) and place-based architectural styling and materiality.	Development sub-precincts each provide a high degree of self-sufficiency for daily needs, including groceries, civic uses and public gathering spaces.	A target 80% of resident daily amenity needs are met within a 5 minute walk of a residential building entry point including community orientated uses and identifiable open space.
VERTICAL VILLAGE **Role + Function** An apartment block that includes building design and composition with shared amenities and communal spaces for resident social connection.	Buildings contribute to the social and environmental performance and green character of the estate through design for optimum scales of social groupings to ensure social connectedness amongst residents.	The provisions of the Apartment Design Guide continue to apply to private communal open space A target 1 communal private open space per 50 dwellings. .
OPEN SPACE ACCESSIBILITY Public open space within immediate proximity to residential tenants measured as distance of open space to residential building entry points.	The open space network: • Is of a cumulative size that caters for forecast local need • Is distributed to be easily accessible for all residents by walking • Comprises of a number of distinct spaces • Contributes to broader urban design outcomes • Has a high level of amenity, including solar access • Contributes to connection to nature • Caters for a diverse range of active and passive recreational and social activities	A target of 80% of all residential building entry points are within 100m of identifiable public and private communal open space. **Note:** Acceptable open space typologies include parklets, pocket parks, playgrounds, roof gardens / sky terraces, linear greens and neighbourhood parks but excludes streets, lanes and pedestrian passages.

CULTURE & DESIGN

A safe and welcoming place to live and visit.

MEASURE:	OBJECTIVE:	METRIC:
COMMUNITY RESILIENCE The sustained ability of a community to utilize available resources (energy, communication, transportation, food, etc.) to respond to, withstand, and recover from adverse situations such as economic collapse and climate-related disasters.	Development establishes community resilience through design features, strategies and community-based programs to ensure resilience through infrastructure, community resources and social interactions in order to weather disruptions or disasters of any type.	Development provides for at least one dry, covered and secure refuge location in each sub-precinct
ADAPTABLE GROUND FLOORS Street-level building and public domain structure designed to accommodate a diverse range of uses over time and include generous floor-to-ceiling height, active frontages and awnings to create shelter for pedestrians.	Development provides adequate floor space for non-residential uses at the ground floor for street activation. Buildings are designed to enable future conversion to a variety of uses.	A target of 3,250 linear metres of active ground floor space is provided within the Precinct. Minimum to floor-to-floor heights are: • 4.5m for ground floor and first basement level • 3.7m for the first floor
	PEDESTRIAN SHELTER Pedestrian shelter is provided to protect users of the public domain from direct sunlight and rainfall.	Pedestrian shelter is provided above active frontages with: • Depth 3.0 - 3.5m • Maximum height above the adjoining public domain finished ground level of 4.0m
BUILDING ENTRIES	Development at the ground plane has a layout and design that activates the adjoining public domain.	Development incorporates minimum 10 building entry points for every 100m of façade with no greater than 7m of inactive or blank wall spaces. **Note:** In circumstances where more than 7m of inactive or blank wall space is unavoidable, public art, street murals or affordances should be utilised to activate the area.
BUILDING FRONTAGE	Subdivision facilitates innovative and high-quality public domain, private domain and interface outcomes.	To achieve diversity, a target mix of lot frontage sizes is provided within each development lot that range from: • Extra Small: 4.5 – 6m • Small: 7 – 12m • Medium: 13 – 25m • Large:26 – 45m • Extra Large: 46 – 90m

OPEN SPACE & ENVIRONMENT

High quality public spaces and a sustainable urban environment.

MEASURE:	OBJECTIVE:	METRIC:
LANDSCAPE REPLACEMENT AREA A planning control that establishes a minimum percentage of developable site area contributing to communal landscape or vertical planting above the first level (e.g. green roofs and walls, sky gardens, planter boxes etc.).	Buildings contribute to the social and environmental performance and green character of the estate through the Landscape Replacement Area Control (LRAC): Developable site area contributes to communal landscape or vertical planting above the first level to improve resident wellbeing (e.g. green roofs and walls, sky gardens, planter boxes etc.).	A target 80% of the site area is allocated to communal landscape or vertical planting above ground level. **Note:** Vertical space contributes to this amount to the same extent as horizontal space.
URBAN FOREST The arrangement, density and management of trees, shrubs and other vegetation in urban areas.	Development optimises the amount and quality of canopy tree coverage throughout the precinct and retains the majority of existing high and moderate value mature trees where they do not impede overall good urban design outcomes.	**TREE RETENTION RATIO** • A target 50% existing high and moderate value trees are maintained. **TREE CANOPY** A target of 30% of the land surface area of WAterloo South is able to be shaded by tree canopy at maturity. **Note:** This is measured by using assumptions for species canopy coverage adjusted for any local factors such a microclimate.
SKYVIEW FACTOR The sky view factor is used as an indicator of the amount of sky that can be seen from the ground in an urban area.	Sky views enables the public to experience the benefits of natural daylighting and environmental views.	A target minimum 50% or SVF 0.5
SUNLIGHT TO PARKS Provision for a percentage of open space area to receive a sunlight between in mid-winter	Public open space contributes to the liveability and attractiveness of urban places by providing green spaces that accommodate a wide range of active and passive uses. Providing appropriate levels of sunlight ensure healthy green parks that will require less on-going maintenance and disruption to residents and visitors.	A target minimum fixed 50% of the total public open space area is to receive sunlight for 4 hours from 9am to 3pm on 21 June.
SUNLIGHT TO STREETS Provision for a percentage of public streets area to receive a sunlight between in mid-winter	Attractive streets contributes to the liveability and attractiveness of urban places by encouraging active transport modes. Providing appropriate levels of sunlight ensure healthy street trees that will require less on-going maintenance and disruption to residents and visitors.	A target minimum 50% of the total public street area to receive a minimum of 2 hours sunlight between 9am to 3pm at mid-winter

TRANSPORT & CONNECTIVITY

A well connected inner city location.

MEASURE:	OBJECTIVE:	METRIC:
INTERSECTION DENSITY + SMALL BLOCK The number of pedestrian-oriented street intersections per square km.	Development to incorporate block dimensions and intersection densities that support high levels of walkability.	Blocks shall have a maximum dimension of 65m x 65m before a building break is provid through: • Through site link • Change in plane
PARKING Parking structures designed and governed in a manner which allows for adaptable alternative uses over time.	Carparking and site access: • Maximises walking and cycling for local and district trips. • Maximises public transport for longer trips. • Minimises private car use where alternative travel choices exist while enabling convenient travel for movement impaired persons. • Provides for functional and safe vehicle access to the Precinct, blocks and sites in a way that does not detract from a high-quality pedestrian experience.	**PARKING RATE** City of Sydney Parking Rates: • Residential Parking - Category A • Non-Residential Parking - Category D Target reduced parking rates at the detailed design and procurement phases
		A target 30% of on-site resident carparking spaces are decoupled from dwellings. **Note:** Decoupling of carparking spaces can enable a greater balance between reducing dwelling sale or rental costs and catering for people for who would prefer to have a vehicle for mobility purposes.
MOBILITY ON DEMAND NETWORK An innovative transportation concept where all consumers can access mobility, goods, and services on demand by dispatching or using shared mobility, delivery services, and public transportation solutions through an integrated and connected multi-modal network.		**MOBILITY ON DEMAND NETWORK** Development provides dedicated car share parking spaces **Note:** These spaces may be on or off street.

SERVICES & AMENITIES

New improved services, facilities and amenities to support a diverse community.

MEASURE:	OBJECTIVE:	METRIC:
PRODUCTIVE LANDSCAPES The total net area set aside for horticultural uses including: community and allotment gardens; edible landscapes; vertical gardens; roof gardens; market gardens; industrial gardens (incl. hydroponic); bee hives and balcony containers.	Development includes productive landscape areas and spaces that build community cohesion through supporting involvement and integration of residents within the community.	A target minimum of 1m^2 of productive garden space per dwelling is allocated across a variety of types of productive gardens: • 30% public domain. • 40% private communal courtyards. • 30% private balconies, podiums and rooftops.
PARKS AS PLACES Parks designed with a minimum number of activities and affordances that are identifiable by residents as distinctive places within the Precinct.	Development includes parks designed as distinctive places that accommodate a range of recreation and social interaction activities.	Each park is able to accommodate a target of up to 10 different activities, including 5 activities that are capable of being undertaken during the evening. **Note:** This may occur in a number of ways, including through flexible, multi-use passive spaces or specific programming including built infrastructure such as playgrounds and sports courts. Where activity is enabled after dark, adequate consideration is given to noise, lighting and other amenity impacts on nearby dwellings.
EDIBLE LANDSCAPES Urban landscape which combined fruit and nut trees, berry bushes, vegetables, herbs, edible flowers, etc. in conjunction with ornamental plants into well designed landscape treatments.	Development reduces ecological footprint by providing access to affordable, fresh, and unprocessed produce to improve health and strengthen social bonds between residents.	A target of 30% of all vegetation in the public domain is edible to humans. **Note:** Public domain areas include ground plane and publicly accessible space including private communal courtyards.

MEASURE:	OBJECTIVE:	METRIC:
GROUND PLANE SPACE DIVERSITY Spatial hierarchy, size and mix of commercial spaces located at street-level.	Development includes a ground plane with a diversity of tenancy sizes to enhance activation of the public domain.	Target the following gross floor area mix for non-residential tenancies at the ground level to include: • Tenancies less than 25m^2. • Tenancies between 26 – 50m^2. • Tenancies between 51 – 100m^2.
GROUND PLANE TRANSPARENCY The ability of pedestrians to have visibility into interior commercial spaces at street-level.	Development at the ground plane has a layout and design that activates the adjoining public domain.	Target 75% of the façade of the ground floor non-residential use facing the public domain to be transparent glass windows. **Note:** Measurement is made at pedestrian eye level from a perpendicular view line. The interior front 3.5m of a non-residential premise has a layout, design and fit-out that enables unbroken views into the premises at pedestrian eye level (1.7m above finished ground) from a perpendicular view line. **Note:** The placement of storage or display shelves above this height is not permitted.

PLACE PERFORMANCE MEASURES SUMMARY TABLE

OBJECTIVE	MEASURE	METRIC	TARGET
Transport & Connectivity A well connected inner city location.	Shared Streets	Maximum speed of vehicles on shared streets (km/hr)	40 km/hr
	Block Size	Maximum dimension of block sizes	65 x 65
	Streets as Places	Number of potential activities per street	3
	Adaptable Parking	Percentage of decoupled car parking spaces from dwellings	30%
	Mobility on Demand	Provision of dedicated car share parking spaces (on and off street)	72
Open Space & Environment High quality public spaces and a sustainable urban environment.	Tree Retention Ratio	Percentage of existing high and moderate value trees retained	50%
	Tree Replacement Ratio	Replacement ratio for every high and moderate value tree removed	3 : 1
	Landscape Replacement	Percentage of site area allocated to landscaping	80%
	Sky view Index	Percentage of sky that can be seen from the public domain	50% (0.5)
	Sunlight to Parks	Percentage of fixed Park area with 2 hours of sunlight between 9am to 3pm at mid-winter	50%
	Sunlight to streets	Percentage of public street area with 2 hours of sunlight between 9am to 3pm at mid-winter	50%
Culture & Design A safe and welcoming place to live and visit.	Building Entries	Number of building entries per 100 metres of building facade	10
	Adaptable Ground Floor	Linear metre of active ground floor space	3,250 m
		Floor to floor heights that allow for future adaptation	B1 / GL - 4.5 m L1 - 3.7 m Typ - 3.1m
		Depth and height of pedestrian shelter at street level	D3.0 - 3.5 m H max
	Lot Frontage Widths	Mix of lot frontage widths for diversity	XS, S, M, L & XL
	Sub-PrecinctCompleteness	Percentage of daily needs met within a 5 minute walk from residential entries	80%
Housing A fully, integrated urban village of social (affordable rental) and market housing.	Vertical Village	Ratio of private communal space per dwelling	1 / 50
	Open Space Accessibility	Percentage of building entries to be within 100m of open space	80%
	Equitable Amenity	Equitable amenity for social (affordable rental) and market dwellings	ADG
Services & Amenities New improved services, facilities and amenities to support a diverse community.	Productive Landscapes	Area of productive garden provided per dwelling	0.5 m²/dw
	Parks as Places	Number of potential activities per public open space	5 - 10
	Edible Landscapes	Percentage of edible species in the public domain	30%
	Ground Plane Diversity	Provide a mix that includes smaller tenancy sizes within each lot	25 - 100 m²
	Ground Plane Transparency	Percentage of non-residential frontage that is transparent	75%

PLACE PERFORMANCE MEASURES EVALUATION

OBJECTIVE	MEASURE	TARGET	WATERLOO SOUTH
Transport & Connectivity A well connected inner city location.	Shared Streets	40 km/hr	✓
	Block Size	65 x 65	✓
	Streets as Places	3	✓
	Adaptable Parking	30%	✓
	Mobility on Demand	72	✓
Open Space & Environment High quality public spaces and a sustainable urban environment.	Tree Retention Ratio	50%	✓
	Tree Replacement Ratio	3 : 1	✓
	Landscape Replacement	80%	✓
	Sky view Index	50% (0.5)	✓
	Sunlight to Parks	50%	✓
	Sunlight to streets	50%	✓
Culture & Design A safe and welcoming place to live and visit.	Building Entries	10	✓
	Adaptable Ground Floor	3,250 m	✓
		B1 / GL - 4.5 m L1 - 3.7 m Typ - 3.1m	✓
		D3.0 - 3.5 m H max	✓
	Lot Frontage Widths	XS, S, M, L & XL	✓
	Sub-PrecinctCompleteness	80%	✓
Housing A fully, integrated urban village of social (affordable rental) and market housing.	Vertical Village	1 / 50	✓
	Open Space Accessibility	80%	✓
	Equitable Amenity	ADG	✓
Services & Amenities New improved services, facilities and amenities to support a diverse community.	Productive Landscapes	0.5 m^2/dw	✓
	Parks as Places	5 - 10	✓
	Edible Landscapes	30%	✓
	Ground Plane Diversity	25 - 100 m^2	✓
	Ground Plane Transparency	75%	✓

7.10.5 COMMONLY USED TERMS

Aboriginal peoples / indigenous people/aboriginal community/ indigenous community

Aboriginal peoples are from mainland Australia. Torres Strait Islanders are from the Torres Strait. Indigenous is a term that encompasses both Aboriginal and Torres Strait Islander people.

Redfern and Waterloo are significant sites for the Aboriginal peoples, and many Aboriginal residents and visitors to the area have connections to language and cultural groups around NSW and Australia.

The traditional owners of the land at Waterloo are the Gadigal People of the Eora Nation.

Accessible Local Movement Route (ALMR)

A pedestrian pathway designed for recreation, slow cycling or walking with limited vehicular crossings that is safe and accessible to all ages and abilities.

Activities

A physical or passive pursuit undertaken by a person in a public space. This includes temporary activities, social corners and recreational affordances.

Activity Centre

A mixed-use urban area where there is a concentration of commercial activities such as offices, retail, higher-density housing, entertainment, civic/community, education and medical services.

Adaptable Ground Floor

Street-level building and public domain structure designed to accommodate a diverse range of uses over time and include generous floor-to-ceiling height and active frontages.

Adaptable Parking

Parking structures designed and governed in a manner which allows for adaptation to alternative uses over time.

Affordable housing

Housing that is appropriate for the needs of a range of very low to moderate income households and priced so that these households are also able to meet other basic living costs such as food, clothing, transport, medical care and education.

Affordance

A grouping of public and/or private environmental elements to make a street more appealing to users. For example, public seating and art co-located with retained trees

Arterial Road

A high-capacity urban road with a primary function to deliver traffic from collector roads to freeways or expressways, and between urban centres at the highest level of service possible.

Blue Line

A continuous landscaping feature incorporating bio-retention, bio-swales and water-play areas providing a physical references to the historic natural water systems of Waterloo.

City of Sydney Regional Cycle Route

A metropolitan-wide cycle network that features 11 regional routes and local connections made up of separated cycleways, shared paths, bike lanes and light and slow traffic streets.

Central to Eveleigh urban transformation strategy

Central to Eveleigh Urban Transformation Program: renewal of the inner city rail corridor from Central to Eveleigh (extending to Macdonaldtown and Erskineville train stations), a 50-hectare site.

Central Sydney

An area of the City of Sydney from Central Station, through the CBD to Circular Quay, encompassing the Royal Botanical Gardens and Potts Point.

City of Sydney

The City of Sydney is the Local Government Authority for the suburb of Waterloo. Working closely with DP&E, the City of Sydney will be responsible for input into the study requirements and will take the lead in planning and urban design parameters and the ongoing review and assessment of report and tasks required to achieve rezoning.

Commercial Premises

Buildings, tenancies or land intended to generate a profit, from capital gain and/or rental income, including office, medical centres, hotels, retail stores and malls, warehouses, and commercially operated parking garages.

Communal Open Space

An environmental resource such as a garden, accessible rooftop, or green space that provides outdoor recreation opportunities for residents and visitors. Some communal open space may be accessible and usable by the general public.

Community

Includes all the people who live, work, study, own property, conduct private or government business, visit or use the services, facilities and public spaces of the Waterloo SSP study area.

Community Facilities

Premises used by members of a community for artistic, social or cultural uses or community support services that may include the preparation and service of food and beverages.

Community Hub

A central facility within a community such as a school, a neighbourhood centre or other public space that offers co-located or integrated services such as education, health care and social services.

Community Resilience

The sustained ability of a community to utilise available resources (energy, communication, transportation, food, etc.) to respond to, withstand, and recover from adverse situations such as climate change

Community and stakeholder engagement

FACS is applying the IAP2 Public Participation Spectrum consisting of 5 levels of engagement: Inform, Consult, Involve, Collaborate and Empower.

Communities Plus

The Communities Plus program is a key priority under Future Directions. It will deliver up to 23,000 new and replacement social housing dwellings and approximately 500 affordable dwellings integrated with private housing. It will be delivered in partnership with the private and community housing sector. The Waterloo redevelopment is a major project under this program.

Culturally and linguistically diverse

The term "culturally and linguistically diverse" (CALD) is commonly used to describe people who have a cultural heritage different from that of people from the dominant Anglo-Australian culture. It replaces the previously used term of people from a "non-English speaking background" (NESB).

Department of Planning, Industry and Environment

The Department of Planning, Industry and Environment are responsible for determining the planning pathways, developer contributions framework and preparing a recommendation to the Minister for the rezoning of the Waterloo Precinct within the State Significant process, as well as within the broader District Planning being undertaken as part of implementing A Plan for Growing Sydney by the Greater Sydney Commission.

Development Control Plan

A Development Control Plan (DCP) provides detailed planning and design guidelines to support the planning controls in the Local Environmental Plan (LEP) and is prepared and adopted by councils. It identifies additional development controls and standards for addressing development issues at a local level and can be applied more flexibly than a LEP.

Edible Landscapes

The use of food-producing plants in a urban landscape. It combines fruit and nut trees, berry bushes, vegetables, herbs, edible flowers, etc., along with ornamental plants into well designed landscape treatments. Where possible, edible landscapes in Waterloo should include native foods traditionally consumed by Indigenous peoples.

Family and Community Services

The Family and Community Services (FACS) cluster works with children, adults, families and communities to improve lives and help people realise their potential.

Family and Community Services supports vulnerable people and families to participate in social and economic life and build stronger communities.

Food Cooperative

A community-managed food distribution outlet organised as a cooperative, rather than a private or public company.

Future Directions

Future Directions for Social Housing in NSW sets out the NSW Government's vision for social housing for the next ten years. It includes a commitment to invest over $1bn in new social and affordable housing. This investment is combined with transferring management of up to 35% of all government owned social housing dwellings to community housing providers.

Ground plane transparency

The ability of pedestrians to have visibility into interior commercial spaces at street-level.

Hierarchy of Streets

An urban planning technique for laying out road networks to create a diverse range of streets that prioritise different functions, from major traffic routes to pedestrian only laneways.

Identifiable Open Space

A useable public open space that has been designed and delivered to serve a function, e.g. park, plaza, playing field, community garden, etc.

Landscaped Setback

Green space provided within private lots, setting the built form line back from the lot boundary.

Landscape Replacement Area Control (LRAC)

A planning control which requires landscape area provisions on ground and upper levels of a development equivalent in size to 80% of the Lot site area.

Laneway

Narrow road or path for pedestrian and/or vehicular use.

Local Environmental Plans

Local Environmental Plans (LEPs) are an integral part of the NSW planning system. They are created by councils in consultation with their community to control the form and location of new development, along with protecting open space and environmentally sensitive areas.

LEPs guide planning decisions for local government areas. Through zoning and development controls, they allow councils and other consent authorities to manage the ways in which land is used. LEPs are the primary planning tool to shape the future of communities and also govern and direct the estimated $29 billion worth of local development that is determined each year.

Low Rise Buildings

An enclosed structure of 1-6 stories in height.

Land and housing Corporation

The NSW Land and Housing Corporation (LAHC) is responsible for the management of the NSW Government's social housing portfolio. LAHC operates under the portfolio and direction of the Minister for Family and Community Services and Minister for Social Housing. LAHC and FACS work together to achieve a unified administration of the Act.

Mid Rise Buildings

An enclosed structure of 7-15 stories in height.

Mobility on Demand

An innovative transportation concept where all consumers can access mobility, goods, and services on demand by dispatching or using shared mobility, delivery services, and public transportation solutions through an integrated and connected multi-modal network.

Non-Government Organisations (NGO) and community groups

FACS has strong relationships with local non-government organisations in Waterloo that deliver community development programs. They are referred to as NGOs. The main NGOs and community organisations FACS works with are Inner Sydney Voice, Counterpoint, South Sydney Community Aid, the Neighbourhood Advisory Board (NAB) and the Waterloo Redevelopment Group (WRG)

Market Housing

Unsubsidised, privately owned housing available to the open market.

Masterplan / Precinct Plan / Indicative Concept Plan
A plan that shows an overall development concept that includes urban design, landscape, infrastructure, service provision, circulation, present and future land use and built form. It consists of three-dimensional images, texts, diagrams, statistics, reports, maps and aerial photos that describe how a specific location will be developed. It provides a structured approach and creates a clear framework for developing an area.

Open Space Accessibility
Public open space within immediate proximity to residential tenants measured as distance of open space to residential building entry points.

Pedestrian Boulevard
A wide street within a city or town reserved for pedestrian-only and slow cycling use and in which most or all automobile traffic may be prohibited except for emergency or essential services.

Pedestrian Laneway
A small-scale public street that adjoins directly to buildings for pedestrian-only use and in which most or all automobile traffic may be prohibited except for emergency or essential services.

Pedestrian Link
A mid-block or through-block street or pathway that adjoins directly to buildings for pedestrian-only use.

Plaza
Hard landscapd open space in the public realm.

Productive Gardens
Space dedicated to horticultural uses to produce fresh food.

Productive Landscape
The total net area set aside for horticultural uses including: community and allotment gardens; edible landscapes; vertical gardens; roof gardens; market gardens; industrial gardens (incl. hydroponic); bee hives and balcony planters.

Relocation of social housing residents
The NSW Government has stated that every current social housing resident in Waterloo will have the right of return to the redeveloped Waterloo estate. Because the project will occur in stages over 15-20 years, residents will be relocated gradually, and many will be able to move directly into their new homes as stages are completed.

Each resident will be allocated a FACS relocation officer who will work closely with them to ensure their specific needs and entitlements are met

Residential Buildings
Enclosed structures designed for people to live in.

Shared Slow Streets
Streets designed to minimise traffic speed and segregation between modes of road user, typically done by removing features such as kerbs, road surface markings, traffic signs, and traffic lights.

Sky View Factor (SVF)
The propostion of sky visible when viewed from the group up. SVF ranges from 0 (no sky visible) to 1 (the sky is visible from the horizon in all directions).

Social Corners
Activated sidewalk intersections with public affordances for pedestrians to rest and socialise.

Social Housing
Rented housing provided at a subsidised rate through a government agency of NGO.

Social streets
Streets designed to promote socialisation between neighbouring residents in the same street and within a community.

Solar Access
The ability of a given space to receive solar insolation within policy requirements

Solar Access to Parks
The ability of a fixed point to receive solar insolation within policy requirements of 50% of park area to receive 4hours of solar insolation between 9am - 3pm.

Solar Insolation
The amount of sunlight reaching a surface.

State Environmental Planning Policies
State Environmental Planning Policies (SEPPs) deal with matters of State or regional environmental planning significance. They are made by the Governor on the recommendation of the Minister for Planning and may be exhibited in draft form for public comment before being published as a legal document.

State Significant Precinct (SSP)
State Significant Precincts (SSPs) are areas that the Minister for Planning considers to be matters of state or regional planning significance, because of their social, economic or environmental characteristics.

These areas can play a particularly important role in achieving government policy objectives, including those relating to increasing the supply of housing and employment in key locations, and improving housing choice and affordability.

Sub-Precinct
An area with a distinct character including topography, streets, open spaces, landscape, built form and activities that future developments should respond to and enhance.

Sydney Metro
Sydney Metro is Australia's biggest public transport project.
This new standalone railway will deliver 31 metro stations and more than 65 kilometres of new metro rail, revolutionising public transport in Sydney.

Waterloo station will be delivered as part of the Chatswood to Sydenham component of Sydney Metro City and Southwest involves the construction and operation of a 15.5 kilometre metro line from Chatswood, under Sydney Harbour and through Sydney's CBD out to Sydenham.

Tall Buildings
An enclosed structure of 16 or more stories in height.

Tree Replacement Ratio
The minimum number of new trees planted within a development area divided by the number of existing trees removed from the development area.

Tree Retention Ratio	The minimum number of existing trees to remain within a development area divided by the total number of existing trees within the development area.
Urban Forest	A collection of trees that grow within a city, town or a suburb at sufficient enough density to be considered a forest.
UrbanGrowth NSW Development Corporation	UrbanGrowth NSW Development Corporation was the NSW Government's urban transformation agency. It was a State Owned Corporation (SOC), reporting to the Minister for Planning, set up in 2013. In July 2019, UrbanGrowth NSW Development Corporation was abolished and its functions transferred to Infrastructure NSW.
Vertical Village	Apartment buildings that include a building design and composition with shared amenities and communal spaces distributed throughout the building for resident social connection in smaller groups of dwellings.
Waterloo Central	Part of the renewal of Waterloo Estate, the area bounded by RagIn Street to the north, Pitt Street to the east, WelIngton Street to the south and George Street to the west.
Waterloo Common	Public Park located to the south of John Street within Waterloo South.
Waterloo Estate	Waterloo Estate is the 18.12 ha social housing estate, owned by the Land and Housing Corporation. Waterloo estate consists of 2,012 dwellings within a mix of low to medium rise walk-ups, three medium rise apartment buildings (4-7 storeys) and six high rise blocks (two 30 storey and four 16 storey). Waterloo Estate is primarily bound by Phillip Street to the North, Pitt Street to the East, McEvoy Street to the South and Cope Street to the East. The Waterloo estate also includes the parcel of land bound by Pitt Street, Wellington Street, Gibson Street and Kellick Street.
Waterloo Estate residents	There are around 2,650 social housing residents living in the Waterloo redevelopment area and they are LAHC's key stakeholders: 8% of these are from Aboriginal/Torres Straight Islander backgrounds; there are around 6% Russians and 6% Chinese; nearly 12% are 80 years and over; around 5% of households report wages as the main source of income. The NSW Government has stated that all current social housing residents have the right of return to the redeveloped Waterloo estate.
Waterloo Metro Quarter	The Waterloo Metro Quarter is the land adjoining the Waterloo Estate bound by Botany Road, Raglan Street, Cope Street and Wellington Streets within which the Waterloo metro station and the development above and around the station. The heritage-listed Waterloo Congregational Church at 103 Botany Road is excluded.
Waterloo North	Part of the renewal of Waterloo Estate. The area bounded by Philip Street to the north, Pitt Street to the east, Raglan Street to the south and Cope Street to the west.
Waterloo South	Part of the renewal of Waterloo Estate. The area bounded by Raglan Street to the north, George Street south to Wellington Street, eastwards to Kellick Street on to Gibson Street, Pitt Street to the south east, McEvoy Street to the south and Cope Street to the west.
Waterloo Village Green	Public Park bounded by Raglan Street to north, George Street to east, Wellington Street to south and Cope Street to west.
Waterloo State Significant Precinct	The Waterloo State Significant Precinct study area is the area for which the Waterloo SSP Study is being rezoned for future re-developed, and comprises the Waterloo Estateand the Waterloo Metro Quarter.

7.10.6 ABBREVIATIONS

ABS	Australian Bureau of Statistics
ADG	Apartment Design Guide
ALMR	Accessible Local Movement Route
BASIX	Building Sustainability Index
CALD	Culturally and Linguistically Diverse
CCD	Census Collection District
CoS	City of Sydney
CPTED	Crime Prevention Through Environmental Design
DA	Development Application
DCP	Development Control Plan
DPI&E	NSW Department of Planning, Industry and Environment
ESD	Ecologically Sustainable Development
FACS	Family and Community Services
FSR	Floor Space Ratio
GFA	Gross Floor Area
Ha	Hectare
HCA	Heritage Conservation Area
LAHC	NSW Land and Housing Corporation
LEP	Local Environmental Plan
LGA	Local Government Area
NGOs	Non-government organisations
OEH	NSW Office of Environment and Heritage
PMF	Probable Maximum Flood
PP	Planning Proposal
RMS	NSW Roads and Maritime Services
SDCP	Sydney Development Control Plan
SEPP	State Environmental Planning Policy
SLEP	Sydney Local Environmental Plan
SOC	State Owned Organisation
SSDA	State Significant Development Application
SSP	State Significant Precinct
sq.m	Square metre
TfNSW	Transport for NSW
TWIGS	Technical Working
UGNSW	UrbanGrowth NSW Development Corporation i
WSUD	Water Sensitive Urban Design
1% AEP	Statistical flood event occurring once every 100 years

7.10.7 TECHNICAL REPORTS

Windtech	Waterloo South Masterplan - Pedestrian Wind Environment Study	2020
Strategic Airspace	Waterloo South Planning Proposal - Aeronautical Impact Assessment	2020
AECOM	Waterloo South Ecological Sustainable Develoment Study	2020
AECOM	Waterloo - Geotech and Contamination Study	2020
AECOM	Waterloo South - Flooding and Stormwater Study	2020
AECOM	Waterloo Climate Change Adaptation Report	2020
AECOM	Waterloo - Utilities and Servicing Study	2020
Urbis	Waterloo South Planning Proposal - Heritage Impact Statement	2020
Urbis	Waterloo South Planning Proposal - Aboriginal Cultural Heritage Study	2020
SLR	Waterloo South Noise and Vibration Assessment	2020
SLR	Waterloo South - Air Quality Assessment	2020
SLR	Waterloo South - Renewal Light Spill Assessment	2020
Eco-Logical Australia	Waterloo South Renewal Planning Proposal - Flora and Fauna Study	2020
Jacobs	Waterloo South Planning Proposal - Transport Study	2020
Arterra Consulting Arboriculture	Waterloo Estate South - Urban Forest Study	2020
Macroplan Dimasi	Waterloo South Economic development, local retail and services study	2020
Milne Stonehouse & Sue Boaden	Waterloo South Public Art Plan	2020
Hill PDA	Waterloo South Housing Diversity and Affordability Study	2020
Elton	Waterloo South Social Sustainability Report	2020
GHD	Social Baseline Report - Waterloo	2020
.id	Waterloo South - Population and Demographic Study, .id	2020
Ethos Urban	Explanation of Intended Effect.	2020
Ethos Urban	Development Control Plan	2020
Turner Studio and Turf	Urban Design and Public Domain Study	2020
Roberts Day	Place Strategy	2020
Elton and KJA	Consultation and Visioning Report	2020
Colliers	Market Study	2019
NSW Land and Housing Corporation	Design Excellence Strategy	2019

7.10.8 LIST OF FIGURES

2.3.2	Existing and future resident and worker population fro the Waterloo Station catchment areas	Population figures are sourced from Census 2016 data (Australian Bureau of Statistics)
2.3.3	Waterloo's Cultural Diversity	Waterloo South - Population and Demographic Study, .id
2.3.4	Local Aboriginal and Torres Strait population	Waterloo South - Population and Demographic Study, .id
2.3.5	Local population age diversity	Waterloo South - Population and Demographic Study, .id
2.3.6	Tenure mix	Waterloo South - Population and Demographic Study, .id
2.3.7	Dwelling occupant mix	Waterloo South - Population and Demographic Study, .id
2.3.8	Educational attainment rate	Waterloo South - Population and Demographic Study, .id
2.3.9	Average income levels	Waterloo South - Population and Demographic Study, .id
2.3.10	Employment rate	Waterloo South - Population and Demographic Study, .id
2.3.11	Waterloo Green	Turner, 2018
2.3.12	March For Justice For TJ Hickey, Feb 2015	https://warriorpublications.wordpress.com, 2018
2.3.13	A layered landscape	Victoria Machado, Pinterest, 2010
2.3.14	Bush tucker	Aboriginal Heritage Tour, City of Sydney, 2019
2.3.15	Totems	Bede Tungutalum Pukumani poles, ABC NEWS, 2018
2.3.16	Mural, Redfern	Torsten Blackwood/AFP/Getty Images, 2018
2.3.17	Aboriginal Housing	Ezra Shaw/Getty Images, 2016
2.3.18	A plentiful land	John W. LEWIN, Art Gallery of South Australia, 1813
2.3.19	The first mills	Australian Town and Country Journal, 16 June 1877
2.3.20	The Bedford Hotel, Redfern, 1893	The Australian Town and Country Journal
2.3.21	People of Alexandria, 1934	Hood Collection, Mitchell Library, State Library of NSW
2.3.22	BMC Leyland Factory	sites.google.com/site/wolseleycarclubofNSW/
2.3.23	The first blocks	City of Sydney Archives; 19 July 1961; File 032/032693
2.3.24	Community Day at Waterloo Green	The South Sydney Herald, March 2015
2.3.25	1840: Pre-Settlement Expansion	Plan of the Waterloo Estate, c.1840 © State Library of NSW
2.3.26	1887: Early settlement Expansion	Sand's Directory Map of the City of Sydney & Suburbs, City of Sydney, 1887
2.3.27	1900's: Post expansion	Waterloo South - Flooding and Stormwater Study, AECOM
2.3.28	Shea's Creek Canal geological map , 1896	Adapted from Geological sketch map, https://dictionaryofsydney.org, 2019
2.3.29	Pre-settlement mural, Redfern	Turner, 2020
2.3.30	Manufacturing Spaces	City of Sydney Survey, 1938 - 50
2.3.31	1825	Land and Property Information 1825
2.3.32	1840	Plan of the Waterloo Estate, c.1840 © State Library of NSW
2.3.33	1887	Sands' Directory Map of Sydney and Suburbs, Historical Atlas of Sydney, 1887
2.3.34	1890	Waterloo Parish of Alexandria, Higinbotham & Robinson, Sydney State Library of NSW, 1890
2.3.35	1941	Building Surveyor's Detail Sheets, City of Sydney, 1941
2.3.36	1950	Civic Survey, City of Sydney, 1950
2.3.37	1982	NSW Land Registry Services, LTO Charting Maps, South Sydney, Sheet 11, 1982.
2.3.38	Waterloo Estate Markets	Bryony Simcox and Stefanie Matosevic, Roberts Day, 2018

2.4 SITE

2.4.1	Existing building facade in Waterloo Estate	Turner, 2018
2.4.2	Traditional Landscape - Past And Present	Turner, 2020
2.4.3	Open Space Network	Turner, 2020
2.4.4	Significant Trees	Turner, 2020
2.4.5	Critical Interfaces	Turner, 2020
2.4.6	Views And Vistas	Turner, 2020
2.4.7	Density And Scale	Turner, 2020
2.4.8	Existing Trees in Waterloo Park	Turner, 2018
2.4.9	Street connectivity	Turner, 2020
2.4.10	Permeability	Turner, 2020

2.4.11	Active transport network	Turner, 2020
2.4.12	Movement network	Turner, 2020
2.4.13	Active transport hub	Turner, 2020
2.4.14	Parking and servicing	Turner, 2020
2.4.15	Existing cycle path on George Street	Turner, 2020
2.4.16	Housing stock	Turner, 2020
2.4.17	Housing age	Turner, 2020
2.4.18	Housing Density	Turner, 2020
2.4.19	Population density	Turner, 2020
2.4.20	Connection to public transport (200-400m)	Turner, 2020
2.4.21	Community	Turner, 2020
2.4.22	Waterloo Estate	Turner, 2018
2.4.23	Retail	Turner, 2020
2.4.24	Family	Turner, 2020
2.4.25	Youth	Turner, 2020
2.4.26	Elderly	Turner, 2020
2.4.27	Aboriginal	Turner, 2020
2.4.28	Arts and Culture	Turner, 2020
2.4.29	Waterloo Estate Community garden mural	Turner, 2018
2.4.30	Height constraints	Turner, 2020
2.4.31	Solar access	Turner, 2020
2.4.32	Microclimate	Turner, 2020
2.4.33	Flooding	Turner, 2020
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2.4.35	Infrastructure constraints	Turner, 2020
2.4.36	Shared bicycles in Redfern	Turner, 2018

3.0 APPROACH

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3.1.1	Integrated working model	Turner, 2020
3.1.2	The masterplan design process	Turner, 2020
3.1.3	Methodology Map	Turner, 2020

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3.2.2	Options testing models	Turner, 2020
3.2.3	Key design insight 1	Eveleigh Railway Workshops 1926, Alchemy, EveleighStories
3.2.4	Key design insight 2	City of Sydney, 2012
3.2.5	Key design insight 3	Eats Beats Street, Kensington Street, 2018
3.2.6	Key design insight 4	Want Community? Build Walkability. Sara h Kobos, 2016
3.2.7	Key design insight 5	Preview: Sydney Contemporary 2018, Andrew McIlroy, 2018
3.2.8	Key design insight 6	Turner, 2018
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3.2.10	Key design insight 8	TonkinZulaikhaGreer Architect, 2005
3.2.11	Key design insight 9	This Moth in Atlanta: July 2018, Emory University, 2018
3.2.12	Key design insight 10	Thesoulcialista, Home Interior Design & Decoration Ideas
3.2.13	Bakery Lane, Brisbane.	Turf, 2020
3.2.14	Visioning engagement snapshot	‘Let’s Talk Waterloo’, KJA, 2018
3.2.15	Residents at the Community Day	‘Let’s Talk Waterloo’, KJA, 2018
3.2.16	Joynton Avenue Tree Retention, Zetland	City of Sydney
3.2.17	Passeig de St Joan, Barcelona	Metalocus Magazine
3.2.18	Square Roots, Brooklyn	6Sqft.com
3.2.19	Green Laneways, Melbourne	https://cbdnews.com.au/laneway-project-progressing/
3.2.20	Park Royal Hotel Singapore	WOHA Architects
3.2.21	Passeig de St Joan, Barcelona	Metalocus Magazine

3.2.22	Hammarby Sjöstad, Stockholm	https://www.itdp.org/wp-content/uploads/2014/07/20.-092211_ITDP_NED_Hammarby.pdf
3.2.23	Southeast False Creek, Vancouver	
3.2.24	City Of Vinge, Fredrikssund	https://www.effekt.dk/vin
3.2.25	Copenhagen Cycle Strategy	Dissing And Weitling Architecture
3.2.26	Central Park, Sydney	
3.2.27	Herzberg Public Housing, Vienna	http://www.awg.at/de/startseite/
3.2.28	L101 Baugruppe, Berlin	https://architizer.com/projects/li01-new-development-of-six-residential-buildings-liebigstrasse-1-berlin-friedrichshain/
3.2.29	Safe Streets, Safe City, Calgary	https://www.calgarysafetycouncil.com/programs/pedestrian-programs.html
3.2.30	Tanner Springs, Portland, Oregon	https://ramboll.com/projects/germany/tanner-springs-park
3.2.31	Bryant Park, New York	https://uvanyc.org/event/the-princess-bride-in-bryant-park/
3.2.32	Kings Cross Masterplan, London	http://www.londontown.com/LondonInformation/Attractions/Granary-Square/82542/imagesPage/107801
3.2.33	Indigenous Portraits by Matt Adnate	https://www.welcometocountry.org/adnates-aboriginal-mural-journey/
3.2.34	Public Space Booking, Helsinki	https://www.archdaily.com/907675/oodi-helsinki-central-library-ala-architects
3.2.35	Elephant Park, London	https://www.elephantpark.co.uK/about-elephant-park/
3.2.36	Chophouse Row, Seattle	sklarchitects.com
3.2.37	Enghaveparken, Copenhagen	https://inhabitat.com/copenhagens-enghaveparken-public-park-is-designed-to-be-flooded/
3.2.38	Low2no, Helsinki Finland	https://www.arup.com/projects/low2no
3.2.39	Rad Lab Pocket Park, San Diego	https://www.radlabsd.com/pocket-park
3.2.40	Cheonggyecheon River Transformation Incheon, South Korea	https://www.flickr.com/photos/25869929@N03/2468502996
3.2.41	Hindley West Placemaking Pilot, Adelaide	https://citimag.indaily.com.au, 2019
3.2.42	Jewel Station precinct, Melbourne	https://www.pps.org, 2019
3.2.43	Muru Mittigar, Penrith	https://murumittigar,.com.au, 2019
3.2.44	Wynyard Quarter Placemaking, Auckland	https://www.wynyard-quarter.co.nz, 2019
3.2.45	Arcola Theatre, London	https://www.arcolatheatre.com, 2019
3.2.46	One Love City, Copenhagen	https://detours.biz/projects/one-love-city, 2019
3.2.47	Eco Carlton Project, Melbourne	https://www.bioregional.com, 2019
3.2.48	Incredible Edible Todmorden, Todmorden	http://calmfulliving.com, 2019
3.2.49	Nine Elms, London	www.onenineelms.com, 2019
3.2.50	Elephant & Castle, London	https://www.elephantandcastle.org.uK, 2019
3.2.51	Woodwards, Vancouver	http://vancouverneon.com, 2019
3.2.52	Joyce Collingwood, Vancouver	http://vancouver.ca, 2019
3.2.53	Tanjong Pagar, Singapore	https://thehoneycombers.com, 2019
3.2.54	Regent Park, Toronto	http://urbantoronto.ca, 2019
3.2.55	Hudson Yards, New York	hudsonyardsnewyork.com, 2019
3.2.56	Central Park, Sydney	Turf Design, 2019
3.2.57	Bercy, Paris	https://en.convention.parisinfo.com, 2019
3.2.58	Woodberry Down	https://propertyhouse.co.uk/tag/woodberry-down/#lightbox[group-22181]/2/, 2019
3.2.59	The relationship of Placemaking to other performance measures	Roberts Day, 2019
3.2.60	Edible Garden City	Edible Garden City, Singapore, 2017.
3.2.61	Family Day on Waterloo Green	Counterpoint Community Services Facebook Page, 2018
3.2.62	Bushfood	Tourism Australia / Oliver Strewe, 2017
3.2.63	Community Garden	Johnny Weeks for The Guardian, 2018
3.2.64	Corner of Cope and John streets	Bryony Simcox and Stefanie Matosevic, Roberts Day, 2018
3.2.65	Jewell Station pop-up event, Melbourne	https://www.betterblock.org, 2018
3.2.66	How Green?	Turner, 2020
3.2.67	How Low?	Turner, 2020
3.2.68	Park Royal Hotel Singapore	WOHA Architects
3.2.69	Passeig De St Joan Boulevard	Metalocus Magazine

3.2.70	Hammarby Sjöstad Stockholm, Sweden	https://www.itdp.org/wp-content/uploads/2014/07/20.-092211_ITDP_NED_Hammarby.pdf
3.2.71	City Of Vinge Fredrikssund	https://www.effekt.dk/vin
3.2.72	How Connected?	Turner, 2020
3.2.73	How Centred?	Turner, 2020
3.2.74	How Diverse?	Turner, 2020
3.2.75	How Blue?	Turner, 2020
3.2.76	Central Park	
3.2.77	Gillet Square	https://www.hawkinsbrown.com/projects/gillett-square
3.2.78	Lower Yonge Precinct Toronto, Canada	https://waterfrontoronto.ca/nbe/portal/waterfront/Home/waterfronthome/projects/lower+yonge+precinct+planning
3.2.79	Elephant Park London, UK	https://www.elephantpark.co.uK/about-elephant-park/
3.2.80	Chophouse Row Seattle, Washington	sklarchitects.com
3.2.81	Bankside Urban Forest London, UK	https://worldlandscapearchitect.com/neo-bankside-london-uk-gillespies/
3.2.82	Cheonggyecheon River Transformation Incheon, South Korea	https://www.flickr.com/photos/25869929@N03/2468502996
3.2.83	Tanner Springs Portland, Oregon	https://ramboll.com/projects/germany/tanner-springs-park
3.2.84	Pedestrian Boulevard	Turner, 2018
3.2.85	Consistent street edge	Turner, 2018
3.2.86	Green arrival	Turner, 2018
3.2.87	Shared courtyard	Turner, 2018
3.2.88	Built form with park address	Turner, 2018
3.2.89	Hierarchy of streets and social spaces	Turner, 2018
3.2.90	Central park connected to central spine	Turner, 2018
3.2.91	Adaptive re-use of existing buildings	Turner, 2018
3.2.92	Integrated water management	Turner, 2018
3.2.93	Variety of street level interfaces	Turner, 2018
3.2.94	Central activity hub	Turner, 2018
3.2.95	Diversity of open spaces	Turner, 2018
3.2.96	Frontage to landscape	Turner, 2018
3.2.97	Fine grain uses	Turner, 2018
3.2.98	Diversity of neighbourhoods	Turner, 2018
3.2.99	Strategic Direction 1 Open Space and Public Domain	Turner, 2020
3.2.100	Strategic Direction 1 Open Space and Public Domain	Turner, 2020
3.2.101	Strategic Direction 1 Open Space and Public Domain	Turner, 2020
3.2.102	Waterloo Estate Concept Plan Option	Turner, 2020
3.2.103	View from Cope Street to Waterloo Station	Tim Throsby, 2018
3.2.104	View from George Street to Waterloo Green	Tim Throsby, 2018
3.2.105	Waterloo Village Green Concept Plan Option	Turner, 2020
3.2.106	View from Cope Street to Waterloo Station	Tim Throsby, 2018
3.2.107	View from the Metro Quarter to the Estate	Tim Throsby, 2018
3.2.108	Waterloo Park Concept Plan Option	Turner, 2020
3.2.109	View from Cope Street to Waterloo Station	Tim Throsby, 2018
3.2.110	View along George Street Pedestrian Boulevard	Tim Throsby, 2018
3.2.111	Options Testing	‘Let’s Talk Waterloo”, Elton, 2018
3.2.112	Options Testing	‘Let’s Talk Waterloo”, Elton, 2018
3.2.113	Options Testing	‘Let’s Talk Waterloo”, Elton, 2018
3.2.114	Options Testing	‘Let’s Talk Waterloo”, Elton, 2018
3.2.115	Options Testing	‘Let’s Talk Waterloo”, Elton, 2018
3.2.116	The Preferred Masterplan 2019	Turner, 2020
3.2.117	City of Sydney Alternate Plan - March 2019	City of Sydney, 2019
3.2.118	Summary of Considerations	Turner, 2020
3.2.119	Supermarkets	https://esperancetide.com, 2019
3.2.120	Mini Majors	ttps://www.firstchoicebb.com.au, 2019
3.2.121	Other Retail	http://www.thecommune.co, 2019

3.2.122	Banks / Insurance / Travel	https://www.marketingmag.com.au
3.2.123	Allied / Community Healthy	LAHC, 2018
3.2.124	Childcare	https://www.probuild.com.au, 2019
3.2.125	Library	https://dynamic.architecture.com.au
3.2.126	Community Centre	LAHC, 2018
3.2.127	Activity Rooms	LAHC, 2018
3.2.128	Creative Arts Centre	https://injalak.com, 2019
3.2.129	Creative Spaces	Turner, 2020
3.2.130	Satellite Health	https://www.rmycph.com.au, 2019
3.2.131	Multi-Purpose Recreation (Youth)	LAHC, 2018
3.2.132	Learning / Cultural / Well-being	https://cityofsydney.NSW.gov.au, 2019
3.2.133	A distinctly Waterloo public domain with a strong local character and community belonging	Turf, 2020
3.2.134	Integral Aboriginal culture and placemaking	Turf, 2020
3.2.135	A highly connected active transport hub	Turf, 2020
3.2.136	A pedestrian priority walkable precinct	Turf, 2020
3.2.137	Accessible and inclusive green environment and hierarchy of open spaces	Turf, 2020
3.2.138	Gathering areas and communal spaces supporting social connectedness	Turf, 2020
3.2.139	A high performing and activation ready public domain and non-residential uses	Turf, 2020
3.2.140	An accessible range of local community facilities, services and retail to meet everyday needs	Turf, 2020
3.2.141	Accessible jobs and educational opportunities	Turf, 2020
3.2.142	A mix and choice of tenure blind social (affordable rental) and market dwellings	Turf, 2020
3.2.143	User and contextual responses to built form	Turf, 2020
3.2.144	Blue Line	Turf, 2020

4.0 FRAMEWORK

4.0.1	Indicative CGI: Cope Street facing north, Waterloo Village Green pavilion	Virtual Ideas, 2020

4.1 INDICATIVE CONCEPT PROPOSAL

4.1.1	Waterloo South indicative concept proposal	Turner, 2020
4.1.2	Waterloo Common water play and plaza	Virtual Ideas, 2020
4.1.3	'Big Roof' within Village Green	Virtual Ideas, 2020
4.1.4	WSUD	Virtual Ideas, 2020
4.1.5	Waterloo Common community garden	Virtual Ideas, 2020
4.1.6	Local shops at Waterloo South	Virtual Ideas, 2020

4.2 STRUCTURE

4.2.1	Indicative CGI: George Street pocket park	Virtual Ideas, 2020
4.2.2	Environment and Open Space	Turner, 2020
4.2.3	Primary parks	Turner, 2020
4.2.4	Productive landscapes	Turner, 2020
4.2.5	Water-sensitve urban design within public domain	Turner, 2020
4.2.6	Urban forest strategy	Turner, 2020
4.2.7	Key tree-lined view corridors	Turner, 2020
4.2.8	Tree retention zones	Turner, 2020
4.2.9	Transport, street and connections	Turner, 2020
4.2.10	Pedestrian priority precinct	Turner, 2020
4.2.11	Accessible local movement route	Turner, 2020
4.2.12	Cycle network	Turner, 2020
4.2.13	Public transport network	Turner, 2020
4.2.14	Community facilities, services and shops	Turner, 2020
4.2.15	Neighbourhood and local hubs of activities	Turner, 2020
4.2.16	Retail and services	Turner, 2020
4.2.17	Social corners and community hubs	Turner, 2020

6.2.5	A multi-centre city	Adapted from Central Sydney Strategy 2016 - 2036, City of Sydney, 2016
6.2.6	Landmark, local and tall buildings around Waterloo	Relevant DAs and Planning Proposals, City of Sydney and Department of Planning & Environment, 2019.
6.2.7	Proposed tall buildings with and without solar constraints	Turner, 2020
6.2.8	Proposed neighbourhood buildings in close proximity to open spaces	Turner, 2020
6.2.9	Proposed district tall buildings along key streets	Turner, 2020
6.2.10	Proposed landmark buildings along blue line	Turner, 2020
6.2.11	Proposed location of local buildings	Turner, 2020
6.2.12	Proposed location of free standing buildings	Turner, 2020
6.2.13	Proposed location of landmark buildings	Turner, 2020
6.2.14	Proposed building heights (in storeys)	Turner, 2020
6.2.15	Kensington Street, Chippendale	Turf, 2020
6.2.16	Buildings of 1 to 3 storeys	Turner, 2020
6.2.17	Waterloo Street, Carlton	Milieu Property, 2016
6.2.18	Palencia Cultural Civic Center	Exit Architects, 2018
6.2.19	Buildings of 4 storeys	Turner, 2020
6.2.20	Tjornely, Greve, Denmark by Studio Local	World Architecture News, 2018
6.2.21	Buildings of 6 to 6+attic storeys	Turner, 2020
6.2.22	South Kilburn Estate by Alison Brooks	Paul Riddle, 2017
6.2.23	Buildings of 8 to 8+attic storeys	Turner, 2020
6.2.24	Camden Courtyards, UK	Sheppard Robson, 2017
6.2.25	Mid-rise buildings of 15 to 20 storeys	Turner, 2020
6.2.26	Building Pueyrredón 1101	Estudio Pablo Gagliardo, 2017
6.2.27	The Book Company Headquarters	N.E.E.D Architecture, 2017
6.2.28	Tall buildings of 28 to 32 storeys	Turner, 2020
6.2.29	Geysir, Stockholm	C.F. Møller, 2017
6.2.30	Geysir, Stockholm	C.F. Møller, 2017
6.2.31	Landmark buildings of 38 to 40 storeys	Turner, 2020
6.2.32	Santa Fe Tower, Mexico City	Sordo Madaleno Architects, 2018
6.2.33	Bosco Verticale	Stefano Boeri Architetti, 2014
6.2.34	Community buildings	Turner, 2020
6.2.35	The Word, UK	Faulkner Brown, 2016
6.2.36	Royal Arena, Denmark	3XN & HKS, 2017
6.2.37	Row apartment buildings	Turner, 2020
6.2.38	North Melbourne Townhouses	Freadman White, 2014
6.2.39	Union Balmain	Turner, 2020
6.2.40	Linear buildings	Turner, 2020
6.2.41	Camden Courtyards	Sheppard Robson, 2017
6.2.42	Residence Ham	CAAN Architects, 2012
6.2.43	Courtyard buildings	Turner, 2020
6.2.44	Massy - Co	MFR Architects, 2012
6.2.45	Divercity. Source: Turner, 2020	Turner, 2020
6.2.46	Mixed-use courtyard buildings	Turner, 2020
6.2.47	Casba Danks Street by SJB Architects	Turner, 2020
6.2.48	Casba by SJB	Turner, 2020
6.2.49	Neighbourhood tall buildings	Turner, 2020
6.2.50	The Address-Taiga	Turner, 2020
6.2.51	Unitt Urban Living	Basiches Arquitetos Associados, 2014
6.2.52	Hanover Street	Squire & Partners, 2013
6.2.53	Landmark buildings with podium	Turner, 2020
6.2.54	Paragon, Zetland	Turner, 2018
6.2.55	East Village, Zetland	Turner, 2018
6.2.56	Hybrid buildings	Turner, 2020
6.2.57	One Central Park Sydney by Fosters & Partners, Ateliers Jean Nouvel and PTW	Nikkei Asian Review, 2018

6.2.58	Lombard Wharf, London by Patel Taylor	Designboom, Peter Cook, 2017
6.2.59	Affordable family Housing in Railway Lands West Precinct, Toronto	Architizer, KPMB Architects, 2012
6.2.60	Selected lot analysis	Turner, 2020
6.2.61	Lot s individual lot analysis	Turner, 2020

6.3 INTERFACES

6.3.1	Indicative CGI: Cope Street facing north, Waterloo Village Green pavilion	Virtual Ideas, 2020
6.3.2	1943 Lot Structure	Waterloo Estate South - Urban Forest Study
6.3.3	1975 Lot Structure	Waterloo Estate South - Urban Forest Study
6.3.4	2017 Lot Structure	Waterloo Estate South - Urban Forest Study
6.3.5	Urban Fabric Elements	Turner, 2020
6.3.6	Redfern Street Village low density retail strip with towers at Redfern Station	Turner, 2020
6.3.7	Low rise character strip next to Redfern Waterloo Commercial one tower,s view from Raglan Street	Turner, 2020
6.3.8	The Alexandria Park HCA from Henderson Road, with Water Estate beyond	Turner, 2020
6.3.9	Medium density residential development on Botany Road, with low scale building between	Turner, 2020
6.3.10	Green Square HCA, directly adjacent to new high density residential development	Turner, 2020
6.3.11	Low density dwellings in Elizabeth Street adjacent to urban renewal residential development	Turner, 2020
6.3.12	Terrace huses adjacent to urban renewal Estate at the corner of McEvoy and Elizabeth Street	Turner, 2020
6.3.13	Redfern Estate HCA near Redfern Oval with Waterloo Estate beyond; view from Philip Street	Turnrer, 2020
6.3.14	Waterloo SSP within the existing and future context	Turner, 2020
6.3.15	Evolution of Waterloo SSP	Turner, 2020
6.3.16	Pitt Street looking towards Welling Street	Google Maps, 2018
6.3.17	Key plan	Turner, 2020
6.3.18	Wellington Street (East) interface	Turner, 2020
6.3.19	Pitt Street looking towards McEvoy Street	Google Maps, 2018
6.3.20	Key plan	Turner, 2020
6.3.21	Pitt Street (South) interface	Turner, 2020
6.3.22	Key plan	Turner, 2020
6.3.23	Cope Street (South) interface	Turner, 2020
6.3.24	Cope Street looking north	Google Maps, 2018
6.3.25	Key plan	Google Maps, 2018
6.3.26	Cope Street (South) interface	Turner, 2020
6.3.27	Cooper Street looking towards Wellington Street	Turner, 2020
6.3.28	Key plan	Turner, 2020
6.3.29	Cooper Street heritage interface	Turner, 2020
6.3.30	Kellick Street looking towards Pitt Street	Google Maps, 2018
6.3.31	Key Plan	Turner, 2020
6.3.32	Kellick Street interface	Turner, 2020
6.3.33	Gibson Street looking towards Kellick Street	Google Maps, 2018
6.3.34	Key plan	Turner, 2020
6.3.35	Gibson Street interface	Turner, 2020
6.3.36	McEvoy Street looking towards Cope Street	Google Maps, 2018
6.3.37	Key plan	Turner, 2020
6.3.38	McEvoy Street (East) interface	Turner, 2020
6.3.39	Indicative CGI: Waterloo Village Green active play area	Virtual Idea, 2020
6.3.40	Pedestrian Boulevard to Village Green interface, section 2	Turner, 2020
6.3.41	Indicative CGI: George Street community hub plaza	Virtual Ideas, 2020
6.3.42	Pedestrian Boulevard	Turner, 2020
6.3.43	Indicative CGI: Waterloo Common activity area	Viertual Ideas, 2020
6.3.42	Key plan	Turner, 2020
6.3.43	Social corner interface	Turner, 2020
6.3.44	Key plan	Turner, 2020
6.3.45	Waterloo Common interface	Turner, 2020
6.3.46	Indicative CGI: Social corner	Viertual Ides, 2020
6.3.47	Key plan	Turner, 2020

6.3.48	Social corner interface	Turner, 2020

APPENDIX 7.1 BASELINE ANALYSIS

7.1.1	SEPP: State Significant Precincts	Dept. Planning & Environment, 2005
7.1.2	SEPP: Urban Renewal	Dept. Planning & Environment, 2010
7.1.3	A Metropolis Of Three Cities	Greater Sydney Commission, 2018
7.1.4	Eastern District Plan	Greater Sydney Commission, 2018
7.1.5	Future Transport Strategy 2056	Transport For NSW
7.1.6	Future Directions For Social Housing In NSW	NSW Family And Community Services, 2014
7.1.7	Central To Eveleigh Urban Transformation Strategy	Urban Growth NSW, 2016
7.1.8	Better Placed	Government Architect NSW, 2017
7.1.9	Sustainable Green Grid	Government Architect NSW, 2016
7.1.10	Greener Places	Government Architect NSW, 2017
7.1.11	Apartment Design Guide	NSW Department Of Planning & Environment
7.1.12	A Liveability Framework For Sydney	NSW Department Of Planning & Environment And Greater Sydney Commission, 2016
7.1.13	Create NSW: Arts And Cultural Policy Framework	Arts NSW, 2013
7.1.14	City Plan 2036	City of Sydney, 2019
7.1.15	Housing for All	City of Sydney, 2019
7.1.16	Sydney LEP	NSW Department Of Planning & Environment, 2012
7.1.17	Sydney DCP	City Of Sydney, 2012
7.1.18	Draft Central Sydney Planning Strategy 2016 -2036	City Of Sydney
7.1.19	Sustainable Sydney 2030 Community Strategic Plan 2017-2021	City Of Sydney, 2017
7.1.20	Development Capacity Study, 2019	City of Sydney, 2019
7.1.21	Digital Strategy	City of Sydney, 2017
7.1.22	Creative City	City of Sydney, 2014
7.1.23	Liveable Green Network	City of Sydney, 2011
7.1.24	Environmental Action 2016-2021	City Of Sydney, 2017
7.1.25	Open Space, Sports And Recreation Needs Study, Volume 1: The Strategy	City of Sydney, 2016
7.1.26	Open Space, Sports And Recreation Needs Study, Volume 2: Open Space Delivery Plan	City of Sydney, 2016
7.1.27	Public Domain Manual	City of Sydney, 2017
7.1.28	Sydney Street Code	City of Sydney, 2013
7.1.29	Street Tree Masterplan	City of Sydney, 2011
7.1.30	Urban Forest Strategy	City of Sydney, 2013
7.1.31	Sydney Landscape Code	City of Sydney, 2016
7.1.32	Sydney Streets Technical Specification	City of Sydney, 2016
7.1.33	Sydney Lights Design Code	City Of Sydney, 2015
7.1.34	Cycle Strategy And Action Plan (2007-2017)	City Of Sydney, 2007
7.1.35	Draft Cycle Strategy And Action Plan	City Of Sydney. 2018
7.1.36	Urban Ecology Strategic Action Plan	City Of Sydney, 2014
7.1.37	Legible Sydney, Way Finding Strategy	City Of Sydney, 2016
7.1.38	Walking Strategy And Action Plan	City Of Sydney, 2017
7.1.39	Community Garden Guidelines	City Of Sydney, 2016
7.1.40	Waterloo Park Playground Provides A Key Open Space With Dense Tree Cover	Bryony Simcox And Stefanie Matosevic, Roberts Day, 2018
7.1.41	Existing Open Space Network	Sydney Green Grid, The NSW Government Architects Office & Tyrell Studio, March 2017 & Waterloo - Open Space Study, Clouston Associates
7.1.42	Green Grid	Sydney Green Grid, The NSW Government Architects Office & Tyrell Studio, March 2017
7.1.43	Blue Grid	Sydney Green Grid, The NSW Government Architects Office & Tyrell Studio, March 2017
7.1.44	Ecological Grid	Sydney Green Grid, The NSW Government Architects Office & Tyrell Studio, March 2017
7.1.45	Ochre Grid	Sydney Green Grid, The NSW Government Architects Office & Tyrell Studio, March 2017

7.1.46	Urban Forest	Adapted From City Of Sydney Urban Forest Strategy 2013, City Of Sydney, Feb 2013
7.1.47	Liveable Green Network	Adapted From City Of Sydney Livable Green Network Strategy And Masterplan Report, City Of Sydney, May 2011
7.1.48	Character	Adapted From Sydney Streets Design Code, City Of Sydney, 2013
7.1.49	Waterloo Open Space Study Report	Waterloo - Open Space Study, Clouston Associates
7.1.50	Existing Canopy Cover	Waterloo Estate South - Urban Forest Study
7.1.51	High Value Trees	Waterloo Estate South - Urban Forest Study
7.1.52	Moderate Value Trees	Waterloo Estate South - Urban Forest Study
7.1.53	Figs	Waterloo Estate South - Urban Forest Study
7.1.54	Tree Families	Waterloo Estate South - Urban Forest Study
7.1.55	Biodiversity Constraints	Waterloo Estate South - Urban Forest Study
7.1.56	Building Heights At District Level	Sydney LEP 2012 Height of Buildings Map, City of Sydney 2012
7.1.57	Land Use	Sydney LEP 2012 Land Use Map, City of Sydney 2012
7.1.58	Character	Turner, 2020
7.1.59	Housing Typologies	Sydney Lep 2012 Land Use Map, City Of Sydney 2012
7.1.60	Turganga Tower	Arup, 2018
7.1.61	Walk-up Housing	Arup, 2018
7.1.62	Captain Cook Building	Arup, 2018
7.1.63	228-231 Cope Street.	Arup, 2018
7.1.64	7.1.62 Drysdale	Arup, 2018
7.1.65	Waterloo Congregational Church	Arup, 2018
7.1.66	Building Heights	Arup, 2018
7.1.67	Existing Block Structure	Arup, 2018
7.1.68	Heritage Conservation Areas	Arup, 2018
7.1.69	Redfern Street	Arup, 2018
7.1.70	Pitt Street	Waterloo South Planning Proposal - Heritage Impact Statement, Urbis
7.1.71	George Street	Waterloo South Planning Proposal - Heritage Impact Statement, Urbis
7.1.72	John Street	Turner, 2020
7.1.73	Heritage Items	Waterloo South Planning Proposal - Heritage Impact Statement, Urbis
7.1.74	Gadigal House	Waterloo South Planning Proposal - Heritage Impact Statement, Urbis
7.1.75	The Cricketers Arms	Waterloo South Planning Proposal - Heritage Impact Statement, Urbis
7.1.76	Former CBC Bank	Turner, 2020
7.1.77	221 Pitt Street	Turner, 2020
7.1.78	The Cauliflower Hotel	Waterloo South Planning Proposal - Heritage Impact Statement, Urbis
7.1.79	Mount Carmel Catholic Primary School	Turner, 2019
7.1.80	Heritage Items within the Estate	Waterloo South Planning Proposal - Heritage Impact Statement, Urbis
7.1.81	The Duke Of Wellington Hotel,	Waterloo South Planning Proposal - Heritage Impact Statement, Urbis
7.1.82	The Former Waterloo Pre-School,	Turner, 2020
7.1.83	Waterloo Congregational Church	Waterloo South Planning Proposal - Heritage Impact Statement, Urbis
7.1.84	Terrace Houses	Turner, 2020
7.1.85	Electricity Substation	Turner, 2020
7.1.86	Critical Interfaces	Turner, 2020
7.1.87	Existing Publicly Accessible Open Space	Turner, 2020
7.1.88	The existing Waterloo Green	Turner, 2020
7.1.89	External Views	Turner, 2020
7.1.90	Sydney Park, hill-top facing north-east	Haycraft Duloy Pty Ltd. 2019.
7.1.91	Moore Park, facing west	Haycraft Duloy Pty Ltd. 2019.
7.1.92	Lachlan Street and Gadigal Avenue, facing west	Haycraft Duloy Pty Ltd. 2019.
7.1.93	Green Square Plaza, facing north	Haycraft Duloy Pty Ltd. 2019.

7.1.94	Alexandria Park, south-west corner facing north-east	Haycraft Duloy Pty Ltd. 2019.
7.1.95	Redfern Park, north-east corner, facing south-west	Haycraft Duloy Pty Ltd. 2019.
7.1.96	Redfern Park, north-east corner, facing south-west	Haycraft Duloy Pty Ltd. 2019.
7.1.97	George Street between Albert Street and Philip Street, facing south	Haycraft Duloy Pty Ltd. 2019.
7.1.98	External Views	Haycraft Duloy Pty Ltd. 2019.
7.1.99	Redfern Oval, south-east corner facing south-west	Haycraft Duloy Pty Ltd. 2019.
7.1.100	Wellington Street and Gibson Street facing west	Haycraft Duloy Pty Ltd. 2019.
7.1.101	Wellington Street and Beaumont Street facing west	Haycraft Duloy Pty Ltd. 2019.
7.1.102	Kellick Street and Gibson Street facing west	Haycraft Duloy Pty Ltd. 2019.
7.1.103	Waterloo Oval, south-east corner facing north-east	Haycraft Duloy Pty Ltd. 2019.
7.1.104	George Street between Allen Street and Bourke Street	Haycraft Duloy Pty Ltd. 2019.
7.1.105	Botany Road and McEvoy Street facing north-east	Haycraft Duloy Pty Ltd. 2019.
7.1.106	John Street between Botany Road and Cope Street facing east	Haycraft Duloy Pty Ltd. 2019.
7.1.107	Local Views	Haycraft Duloy Pty Ltd. 2019.
7.1.108	Wellington Street between Botany Road and Cope Street facing east	Haycraft Duloy Pty Ltd. 2019.
7.1.109	Botany Road betwen Raglan Street and Wellington Street facing east	Haycraft Duloy Pty Ltd. 2019.
7.1.110	Botany Road and McEvoy Street facing south-east	Haycraft Duloy Pty Ltd. 2019.
7.1.111	NCIE Oval, north-west corner facing south	Haycraft Duloy Pty Ltd. 2019.
7.1.112	Garen Street and Buckland Street facing east	Waterloo South Planning Proposal - Visual Impact Study
7.1.113	Alexandria Park, north-east corner facing east	Haycraft Duloy Pty Ltd. 2019.
7.1.114	Alexandria Park, south-east corner facing north-east	Haycraft Duloy Pty Ltd. 2019.
7.1.115	Off Philip Street, west of Turanga Tower facing south	Haycraft Duloy Pty Ltd. 2019.
7.1.116	George Street and Wellington Street facing south	Haycraft Duloy Pty Ltd. 2019.
7.1.117	Cooper Street, near Raglan Street, facing south	Haycraft Duloy Pty Ltd. 2019.
7.1.118	Areas accessible within 30minutes from Waterloo through walking , cycling and public transport	Adapted from Easter City distriact Plan, Greater Sydney Comission, March 2018
7.1.119	Pedestrian Network	Adapted From City Of Sydney Livable Green Network Strategy And Masterplan Report, City Of Sydney, May 2011
7.1.120	Cycle Network	Adapted From Draft Cycling Strategy And Action Plan, City Of Sydney, 2018
7.1.121	Bus Network	State Transit Eastern Suburbs Network Map, Transport NSW, 2018
7.1.122	Train And Metro Network	Turner, 2020
7.1.123	North-South Connectivity	Turner, 2020
7.1.124	East-West Connectivity	Turner, 2020
7.1.125	Mcevoy Street Widening	Alexandria To Moore Park Connectivity Upgrade - Community Update, RMS, June 2017.
7.1.126	Street Network	Turner, 2020
7.1.27	Social gathering	LAHC, 2019
7.1.28	Housing typologies	Turner, 2020
7.1.29	Existing housing age	Turner, 2020
7.1.130	Active Frontages	Adapted From Sydney Dcp 2012 Active Frontages Map, City Of Sydney, 2012.
7.1.131	Neighbourhood Retail	Waterloo SSP Economic, Retail And Waterloo South Economic development, local retail and services study, Macroplan Dimensi
7.1.132	Local Retail	Waterloo SSP Economic, Retail And Waterloo South Economic development, local retail and services study, Macroplan Dimensi
7.1.13	Community Services	Waterloo SSP Economic, Retail And Waterloo South Economic development, local retail and services study, Macroplan Dimensi
7.1.134	Aboriginal Community Services	Waterloo SSP Economic, Retail And Waterloo South Economic development, local retail and services study, Macroplan Dimensi
7.1.135	Family Services	Waterloo SSP Economic, Retail And Waterloo South Economic development, local retail and services study, Macroplan Dimensi

7.1.136	Education	Waterloo SSP Economic, Retail And Waterloo South Economic development, local retail and services study, Macroplan Dimensi
7.1.137	Health	Waterloo SSP Economic, Retail And Waterloo South Economic development, local retail and services study, Macroplan Dimensi
7.1.138	Open Space	Waterloo SSP Economic, Retail And Waterloo South Economic development, local retail and services study, Macroplan Dimensi
7.1.139	Community Gardens	Waterloo SSP Economic, Retail And Waterloo South Economic development, local retail and services study, Macroplan Dimensi
7.1.140	Arts And Culture	Waterloo South Public Art Plan, Mine Stonehouse
7.1.141	Aboriginal Arts And Culture	Waterloo South Public Art Plan, Mine Stonehouse
7.1.142	Public Art	Waterloo South Public Art Plan, Mine Stonehouse
7.1.143	Creative Industries	Waterloo South Public Art Plan, Mine Stonehouse
7.1.144	Places Of Worship	Waterloo South Public Art Plan, Mine Stonehouse
7.1.145	Key Festivals And Events	Waterloo South Public Art Plan, Mine Stonehouse
7.1.146	Day / Night Activities	Waterloo SSP Economic, Retail And Waterloo South Economic development, local retail and services study, Macroplan Dimensi
7.1.147	Regional Chamber Of Commerce And Industry, Picardie	Designboom, Danny Hudson, 2012
7.1.148	Solar Roof Panels	Green Roofs Australasia, 2019
7.1.149	Bio-swale	Carvalho & Good, PLCC, 2019
7.1.150	Vertical Garden By Patrick Blanc	Inhabitat, 2019
7.1.151	Prescribed Airspace Limits	Waterloo South Planning Proposal - Aeronautical Impact Assessment, Strategic Airspace
7.1.152	Topography	Waterloo - Geotech and Contamination Study, AECOM
7.1.153	Contamination	Waterloo - Geotech and Contamination Study, AECOM
7.1.154	Alexandria Canal Catchment	Waterloo South - Flooding and Stormwater Study, AECOM
7.1.155	Existing Open Channel	Waterloo South - Flooding and Stormwater Study, AECOM
7.1.156	100Yr Flood Levels	Waterloo South - Flooding and Stormwater Study, AECOM
7.1.157	Water Sensitive Urban Design	Clouston Associates, Aug 2018
7.1.158	Existing open channel at Cope Street	Turner, 2020
7.1.159	Shadow Composite June 21	Turner, 2020
7.1.160	Shadow Composite September / March 21 From 9am-3pm.	Turner, 2020
7.1.161	Shadow Composite December 21	Turner, 2020
7.1.162	Air Quality	Http://www.metropia.com/Blog/Clean-Air-Nyc-Going-Beyond-Mass-Transit
7.1.163	Day Time Noise Sources	Waterloo - Geotech and Contamination Study, AECOM
7.1.164	Night Time Noise Sources	Waterloo - Geotech and Contamination Study, AECOM
7.1.165	Prevailing winds	Waterloo South Masterplan - Pedestrian Wind Environment Study
7.1.166	Existing utility routes	Waterloo - Utilities and Servicing Study, AECOM
7.1.167	Existing potable water network	Waterloo - Utilities and Servicing Study, AECOM
7.1.168	Existing sewer network	Waterloo - Utilities and Servicing Study, AECOM
7.1.169	Existing energy network	Waterloo - Utilities and Servicing Study, AECOM
7.1.170	Existing gas network	Waterloo - Utilities and Servicing Study, AECOM

APPENDIX 7.2 OPTIONS

7.2.1	Primary Parks	Turf, 2020
7.2.2	Pedestrian Boulevard	Turf, 2020
7.2.3	Water Storey	Turf, 2020
7.2.4	Green Links	Turf, 2020
7.2.5	Productive Landscapes	Turf, 2020
7.2.6	Urban Plazas	Turf, 2020
7.2.7	Pocket Parks and Social Corners	Turf, 2020
7.2.8	George Street Mid 25m	Turf, 2020
7.2.9	George Street North 20m	Turf, 2020
7.2.10	George Street South 20m	Turf, 2020
7.2.11	George Street Mid 25m	Turf, 2020
7.2.12	George Street North 20m	Turf, 2020
7.2.13	George Street South 20m	Turf, 2020
7.2.14	George Street North 20m	Turf, 2020
7.2.15	George Street North 20m	Turf, 2020
7.2.16	George Street South 20m	Turf, 2020
7.2.17	George Street Mid 25m	Turf, 2020
7.2.18	George Street North 20m	Turf, 2020
7.2.19	City of Sydney Tree replacement ratio	Turner, 2020
7.2.20	Alternative tree replacement ratio	Turner, 2020
7.2.21	Multi-layered integration of vegetration	Turner, 2020
7.2.22	Utilising height to benefit urban and open space relationship	Turner, 2020
7.2.23	Creating hierarchy of movement and open space	Turner, 2020
7.2.24	Facilitating activity and community	Turner, 2020
7.2.25	Inter-mixing uses to encourage activity	Turner, 2020
7.2.26	Use of blue and green elements from identity and improve open space enjoyment	Turner, 2020
7.2.27	A diverse use of built and open forms	Turner, 2020
7.2.28	Utilising green and blue elements as primary urban elements	Turner, 2020
7.2.29	Connecting local services and facilities through green spaces and routes	Turner, 2020
7.2.30	Multiple built and open spaces provide a diverse identity	Turner, 2020
7.2.31	View of Waterloo Green	Tim Throsby (illustrator) 2020
7.2.32	A central open space facilitates the community	Turner, 2020
7.2.33	View of Village Green	Tim Throsby (illustrator) 2020
7.2.34	Connecting the surroundings to a new hub	Turner, 2020
7.2.35	View of Waterloo Park	Tim Throsby (illustrator) 2020
7.2.36	Waterloo Estate	Turner, 2020
7.2.37	Diversity in built form	Turner, 2020
7.2.38	Waterloo Village Green	Turner, 2020
7.2.39	Lot Structure	Turner, 2020
7.2.40	5 Year Comparison	Turner, 2020
7.2.41	10 Year Comparison	Turner, 2020
7.2.42	15 Year Comparison	Turner, 2020
7.2.43	20 Year Comparison	Turner, 2020
7.2.44	Place Performance Measures	Turner, 2020

7.3 APPENDIX PUBLIC DOMAIN

7.3.1	Baffi & Mo 2017, Redfern Street	https://www.broadsheet.com.au/sydney/redfern/cafes/baffi-mo
7.3.2	Top Left Bryant Park, NYC	Source Dan DeLuca, Flickr, https://www.flickr.com/photos/dandeluca/2885172825/in/photolist-5oXgn4-pNjp6N-iF1aZK-7BqtEg-dBedyQ-dB8KXg-DDMzw-dBed73-dB8L92-4N95e9-2WX5B-dB8L3R-dB8KMk-dB8Lq6-dBedtq-dBedSf-iF54DG-iF2AVy-pkdXDd-7sd6oP-wJjsNo-c5UiNj-pkd7kT-H6tZEU-bPsjo4-qtRkvq-6gqs8P-dzMd4y-4dE995-dBecC9-bVSFbX-dggAoZ-dzFKqa-87QZ2b-7k6u9T-dzFGQZ-X8MKX9-qseGFK-6kLkfZ-aTmWq6-AR5w6p-65n5LK-eiCBag-dzMeyd-87At4V-ff2YpK-6ayMCy-dzMcgh-ffhhpy-dzMdyQ
7.3.2	Top Right: South Boulevard, Copenhagen, 2016	SLA & Magnus Klitten https://www.visitcopenhagen.com/copenhagen/sonder-boulevard-gdk705372
7.3.2	Bottom Left: Printing Press Communal Roof NYC	Terrain http://www.terrain-nyc.net/printing-press-roof BR: Central Park, Sydney Source Jason A Dibbs https://arcspace.com/feature/one-central-park/
7.3.2	Bottom Right: Central Park, Sydney	Jason A Dibbs https://arcspace.com/feature/one-central-park/
7.3.3	Top Left: Cafe Breakout, Redfern	https://www.broadsheet.com.au/sydney/redfern/cafes/baffi-mo
7.3.3	Top Right: AECCAFE Kensington Street, Sydney	https://i2.wp.com/www10.aeccafe.com/blogs/arch-showcase/files/2016/10/Kensington-Street_-Photography-by-Kensington-Street.jpg
7.3.3	Bottom Left: New Road, Brighton 2007	Gehl Architects http://www.landezine.com/index.php/2011/04/new-road-by-landscape-projects-and-gehl-architects/
7.3.3	Bottom Right: NAIDOC Week, Redfern	SBS https://www.sbs.com.au/yourlanguage/aboriginal/en/audiotrack/ncie-celebrates-their-naidoc-family-day
7.3.4	Top Left: Victoria Park, Sydney	Brigitta Schyns, 2019, 2019
7.3.4	Top Right: Edinburgh Rain-garden, Melbourne	GHD http://www.landezine.com/index.php/2012/10/edinburgh-gardens-raingarden-by-ghd-pty-ltd/
7.3.4	Bottom Left: Waterloo	Mike Home
7.3.4	Bottom Right: Sydney Park, Sydney	Sara Reilly, 2019 https://architizer.com/projects/sydney-park-water-re-use-project/
7.3.5	Top Left: Bryant Park, NYC.	Angelito JUSAy https://demo.the-hive.com.au/gallery
7.3.5	Top Right: Brooklyn Grange, NYC	Brooklyn Grange https://www.facebook.com/BrooklynGrange/photos/pb.261465154502.-t2207520000.1437500809./10153060091629503/?2207520000.1437500809./10153060091629503/?type=1&theater2207520000.1437500809./10153060091629503/?type=1&theater.-000.1437500809./10153060091629503/?type=1&theater
7.3.5	Bottom Left: Laneways, Melbourne	Craig Sillitoe http://www.traveller.com.au/six-of-the-best-melbourne-laneways-12wkbf
7.3.5	Bottom Right: Sydney University Library Lawn, Sydney	Turf, 2020
7.3.6	TL: Bush Traders, Darwin	https://www.facebook.com/aboriginalbushtraders/photos/a.1834267723566028/2149816545344476/?type=3&theater
7.3.6	TR: Street Art Melbourne, Matt Adante	https://www.adnate.com.au/new-page-1-1
7.3.6	BL: Pitt Street Mall, Sydney	Soon, Flickr https://www.flickr.com/photos/randomecho/261471265/in/photolist-dYw8bh-butmy9-64wisV-6ikSXC-5SBVE7-dHQLXo-gkKxAP-phHWcd-pDJZKa-5njQHE-qvkJD2-p77ig-Vf7PeH-4m2Gu-5njQHm-5njQHy-e2RKQz-5njQHu-pizDQN-5njQHw-phKAec-dbWtpF-5njQHh-6pzZsQ-9c8txK-cF4pVQ-aP1hCg-eLXy5S-6LNBKY-zojFrP-9vcC2e-8ZjYDp-J9pVq9-8ZjYv8-dVJXjF-wifN27-oHuxbn-6GpVnw-9vfCPh-8ZjYPn-65VRbw-dcb7Yo-5s4KcS-8AVgTG-dgHhc1-cFqYSQ-8saPDs-JbJxaX-aiLANg-8saQr5
7.3.6	BR: Chippendale Green, Sydney	Turf, 2020
7.3.7	Public Domain Strategy	Turf, 2020
7.3.8	Waterloo South indicative concept proposal	Turner, 2020
7.3.9	Waterloo South key places	Turner, 2020
7.3.10	Bryant Park, NYC	Angelito JUSAy https://bryantpark.org/the-park
7.3.11	Ian Potter Wild Play, Centennial Park	https://christineknight.me/2017/10/ian-potter-childrens-wild-play-garden-centennial-park-sydney-australia/
7.3.12	Campus Maritus, Detriot	Samuel Trotter https://www.freep.com/story/news/local/2015/07/17/detroit-dowtown-basketball-hoops-tournaments/30326711/

7.3.13	Beacon Food Forest, Seattle	Sandy Pemitz https://www.planning.org/blog/blogpost/9107338/
7.3.14	Edible Park, Medini, Malaysia	Little Miss Granola https://www.malaymail.com/news/eat-drink/2018/03/31/lush-garden-that-keeps-on-giving/1611427
7.3.15	Goyder Square, Palmerston	Turf, 2020
7.3.16	Granary Square, London	Urbanpixxels https://www.flexioffices.co.uk/area-guides/kings-cross
7.3.17	Clyde Warren Park, Dallas	Dillion Diers https://www.archdaily.com/298385/klyde-warren-park-the-office-of-james-burnett/50b3b962b3fc4b0cf500002b-klyde-warren-park-the-office-of-james-burnett-image
7.3.18	Sonder Boulevard, Copenhagen	Kobenhavns Kommune https://www.sla.dk/en/projects/sonderboulevard/
7.3.19	Passeig de Joan, Barcelona	Lola-Domènech http://www.landezine.com/index.php/2012/07/passeig-de-st-joan-boulevard-by-lola-domenech/passeig-de-st-joan-boulevard-by-lola-domenech-05/
7.3.20	Passeig de Joan, Barcelona	Adria Goula https://www.metalocus.es/en/news/redevelopment-passeig-de-sant-joan-phase-2
7.3.21	Edinburgh Rain Garden, Melbourne	GHD http://www.landezine.com/index.php/2012/10/edinburgh-gardens-raingarden-by-ghd-pty-ltd/
7.3.22	Baffi and Mo, Redfern	https://www.broadsheet.com.au/sydney/redfern/cafes/baffi-mo
7.3.23	804 Congress Avenue	https://www.wildflower.org/magazine/native-plants/plant-priority
7.3.24	Bourke Street Cycleway, Sydeny	https://www.governmentarchitect.nsw.gov.au/resources/case-studies/2017/11/bourke-street-cycleway
7.3.25	Bourke Street Cycleway, Sydeny	https://www.governmentarchitect.nsw.gov.au/resources/case-studies/2017/11/bourke-street-cycleway
7.3.26	Pitt Street Mall, Sydney	Brett Boardman http://tonycaroarchitecture.com.au/portfolio/pitt-street-mall/
7.3.27	'Edge of Trees' by Janet Lawrence, Sydney	Janet Lawrence http://browpicz.pw/pole-Edge-of-the-Trees-by-Janet-Laurence-and-Fiona-t.html
7.3.28	Clyde Warren Park, Dallas	Dillon Diers http://www.landezine.com/index.php/2014/11/klyde-warren-park-by-the-office-of-james-burnett/
7.3.29	Macquarie University Courtyard	Brett Boardman http://www.landezine.com/index.php/2013/04/macquarie-university-central-courtyard-by-hassell/
7.3.30	Rad Lab Pocket Park, Los Angeles	https://www.radlabsd.com/pocket-park
7.3.31	Chippendale Green, Sydney	Turf, 2020
7.3.32	Sydney Laneways Art Program, Sydney	Paul Patterson http://www.cityartsydney.com.au/artwork/forgotten-songs/
7.3.33	Bakery Lane, Brisbane	Ariana Gillrie https://www.theurbanlist.com/brisbane/a-list/brisbanes-best-laneways
7.3.34	Village Green Programming	Turf, 2020
7.3.35	Joynton Park, Zetland	Christina Brandalise https://www.weekendnotes.com/joynton-park-markets/
7.3.36	Ian Potter Wild Play, Centennial Park	https://kidbucketlist.com.au/2017/12/18/ian-potter-childrens-garden-centennial-park-sydney/
7.3.37	Menidi Edible Park, Malaysia	Little Miss Granola https://www.malaymail.com/news/eat-drink/2018/03/31/lush-garden-that-keeps-on-giving/1611427
7.3.38	Village Green Typical Section	Turf, 2020
7.3.39	Waterloo Gateway Programming	Turf, 2020
7.3.40	Bonn Square, Oxford	David Stewart Photography https://land8.com/how-bonn-square-brought-the-old-and-new-world-together/
7.3.41	Wulaba Park, Waterloo	Simon Wood http://www.landezine.com/index.php/2016/06/wulaba-park-by-sturt-noble-associates/
7.3.42	Chippendale Green, Sydney	http://www.landezine.com/index.php/2011/04/new-road-by-landscape-projects-and-gehl-architects/
7.3.43	Waterloo Common Typical Section	Turner, 2020
7.3.44	Pedestrian Boulevard Programme	Turner, 2020
7.3.45	Baffi and Mo, Redfern	https://www.broadsheet.com.au/sydney/redfern/cafes/baffi-mo
7.3.46	Sonder Boulevard, Copenhagen	TY Stange https://www.visitcopenhagen.com/copenhagen/sonder-boulevard-gdk705372
7.3.47	Hammarby Sjöstad, Stockholm	Luc Nada https://www.itdp.org/wp-content/uploads/2014/07/20.-092211_ITDP_NED_Hammarby.pdf
7.3.48	Pedestrian Boulevard typical section	Turner, 2020
7.3.49	George Street Activity Street Programming	Turner, 2020
7.3.50	Passeig de Joan, Barcelona	Adria Goula https://www.metalocus.es/en/news/redevelopment-passeig-de-sant-joan-phase-2

7.3.51	Sonder Boulevard, Copenhagen	SLA & Magnus Klitten https://www.visitcopenhagen.com/copenhagen/sonder-boulevard-gdk705372
7.3.52	Bourke Street Cycleway, Sydney	
7.3.53	George Street Activety Street Typical Section	Turner, 2020
7.3.54	New Road, Brighton 2017, UK	Gehl Architects Landezine
7.3.55	Indicative CGI: Waterloo Common and George Street	Virtual Ideas, 2020
7.3.56	New Road Brighton	Gehl Architects Landezine
7.3.57	AECCAFE, Kensington Street, Sydney	https://i2.wp.com/www10.aeccafe.com/blogs/arch-showcase/files/2016/10/Kensington-Street_-Photography-by-Kensington-Street.jpg
7.3.58	Copenhagen Cycle Strategy	http://www.cycling-embassy.dk/2017/06/01/new-figures-cycling-copenhagen-break-record/
7.3.59	Wayfinding, City of Sydney	https://www.cityofsydney.NSW.gov.au/vision/sustainable-sydney-2030/transport-and-access/liveable-green-network/wayfinding-signage
7.3.60	Waterloo Estate pedestrian network	Turf, 2020
7.3.61	Waterloo South pedestrian network	Turf, 2020
7.3.62	Waterloo Estate shared slow street network	Turf, 2020
7.3.63	Waterloo South shared slow street network	Turf, 2020
7.3.64	Waterloo Estate pedestrian boulevard	Turf, 2020
7.3.65	Waterloo South modified George Street	Turf, 2020
7.3.66	New Road, Brighton	Gehl Architects http://www.landezine.com/index.php/2011/04/new-road-by-landscape-projects-and-gehl-architects/
7.3.67	Passeig de Joan, Barcelona	Adrià Goula http://www.landezine.com/index.php/2012/07/passeig-de-st-joan-boulevard-by-lola-domenech/
7.3.68	Baffi and Mo, Redfern	Leticia Almeida https://www.broadsheet.com.au/sydney/redfern/cafes/baffi-mo
7.3.69	Eats Beats Street, 2018, Kensington Street, Sydney	Leticia Almeida, http://sydsocial.melbournesocial101.com/whats-on-101-eats-beats-street/
7.3.70	Pitt Street Mall, Sydney	Brett Boardman http://tonycaroarchitecture.com.au/portfolio/pitt-street-mall/
7.3.71	Accessible Local Movement Route	Turf, 2020
7.3.72	Van-gogh-Roosegaarde, Netherlands	Studio Roosegaarde https://www.studioroosegaarde.net/project/van-gogh-path
7.3.73	Southbank Crossing, London	Studio Walala
7.3.74	Nelson Street Cycleway, Auckland	bikefriendlynorthshore https://bikefriendlynorthshore.wordpress.com/2016/01/27/lightpath-the-nelson-street-cycleway/
7.3.75	Greenman Plus Scheme, Singapore	LTA Singapore https://www.youtube.com/watch?v=0ytbRa0gLOg
7.3.76	Passeig de St Joan, Barcelona	Adria Goula https://www.metalocus.es/en/news/redevelopment-passeig-de-sant-joan-phase-2
7.3.77	Wayfinding, City of Sydney	http://www.rossatkin.com/wp/?portfolio=responsive-street-furniture
7.3.78	Accessibility	Turner, 2020
7.3.79	Active Edges: Melbourne Laneways	Helen Page https://australiapacificvacations.com/destination/sa/
7.3.80	Views: Bryant Park, NYC	Angelito JUSAy https://bryantpark.org/the-park
7.3.81	Active Edges: Mint Plaza, San Francisco	https://www.cmgsite.com/project/mint-plaza/
7.3.82	Sightlines: Klyde Warren Park, Dallas, Texas	Liane Rochelle https://archipendium.com/en/architecture/klyde-warren-park/
7.3.83	Sightlines: Passeig de St Joan, Barcelona	Adrià Goula http://www.landezine.com/index.php/2012/07/passeig-de-st-joan-boulevard-by-lola-domenech/
7.3.84	Street Speed Reduction / Slow Shared Streets	Gehl Architects http://www.landezine.com/index.php/2011/04/new-road-by-landscape-projects-and-gehl-architects/
7.3.85	Passive Surveillance: Bonn Square	David Stewart Photography https://land8.com/how-bonn-square-brought-the-old-and-new-world-together/
7.3.86	Cycle and Pedestrian Strategy: Auckland	Auckland Transport https://www.tauranga.govt.nz/our-future/projects/tauranga-cycle-plan/cycleways-in-other-cities
7.3.87	Safety and Design, Views	Turf, 2020
7.3.88	Safety and Design, Sightlines	Turf, 2020
7.3.89	Safety and Design, Passive Surveillance	Turf, 2020
7.3.90	Safety and Design, Active Edges	Turf, 2020
7.3.91	Street Geometry	Turf, 2020

7.3.92	Emergency and Maintenance Vehicle Access	Turf, 2020
7.3.93	Key Streets	Turf, 2020
7.3.94	Pedestrian Boulevard	Turf, 2020
7.3.95	Hammarby Sjöstad, Stockholm	Luc Nada https://www.itdp.org/wp-content/uploads/2014/07/20.-092211_ITDP_NED_Hammarby.pdf
7.3.96	Sonder Boulevard, Copenhagen	SLA & Magnus Klitten https://www.visitcopenhagen.com/copenhagen/sonder-boulevard-gdk705372
7.3.97	Local and connector streets	Turf, 2020
7.3.98	Baptist Street, Redfern	https://trees.cityofsydney.NSW.gov.au/location/baptist-street/ Fig. 7.3.99 Stanley Street, Southbank Brisbane Source: Dylan Evans
7.3.99	Stanley Street, Southbank Brisbane	Dylan Evans https://www.eatsouthbank.com.au/dining-guide/precincts/little-stanley-street/
7.3.100	Cope Street Metro	Turf, 2020
7.3.101	New Road, Brighton	Gehl Architects http://www.landezine.com/index.php/2011/04/new-road-by-landscape-projects-and-gehl-architects/
7.3.102	George Street, Lightrail Station, Sydney	Brett Boardman https://worldlandscapearchitect.com/sydneys-george-street-reopens-for-christmas/#.XH8joCgzY-U
7.3.103	Gateway Pedestrian Links	Turf, 2020
7.3.104	Mariahilferstrasse, Vienna	Christian Fürthner http://walk21vienna.com/conference-program/walkshops/walkshop-11/
7.3.105	Passeig de St Joan, Barcelona	Adria Goula https://www.metalocus.es/en/news/redevelopment-passeig-de-sant-joan-phase-2
7.3.106	North-South Neighbourhood Laneways	Turf, 2020
7.3.107	Sydney Laneways	Simon Wood https://architectureau.com/articles/sydney-laneways/#img=6
7.3.108	Bakery Lane, Brisbane	Hayes Anderson Lynch Architects https://specifier.com.au/urban-landscapes/
7.3.109	Pitt Street Mall, Sydney	Turf, 2020
7.3.110	Pavement & Kerb Types Plan	Turf, 2020
7.3.111	City of Sydney Concrete Unit Paver	Victorian Bluestone Quarries
7.3.112	Hamlet Blue Brick Paving	Brigitta Schyns, 2019, 2019
7.3.113	City of Sydney Concrete Unit Paver with Concrete Setts, with Hamlet Blue Brick Banding	Turf, 2020
7.3.114	Halmet Blue Brick with City of Sydney Concrete Unit Paver Type 1	Turf, 2020
7.3.115	Hamlet Blue Brick with snadstone inlay and metal inlay	Turf, 2020
7.3.116	Furniture & Elements Plan	Turf, 2020
7.3.117	Seat: Bronze powdercoated steel frame and recycled composite seat	https://www.governmentnews.com.au/jimmy-choo-just-loves-clover-moores-new-designer-rubbish-bins-for-sydney/
7.3.118	Seat: Formed concrete cube	Brett Boardman https://worldlandscapearchitect.com/sydneys-george-street-reopens-for-christmas/#.XH8joCgzY-U
7.3.119	Timber bench seating	Alexander Mayes https://www.flickr.com/photos/131202887@N06/25846580478
7.3.120	Circular Seating	Turf, 2020
7.3.121	Bollard: Bronze powdercoated aluminium	Ben Guthrie http://theguthrieproject.com/photoShare_TZA_StreetFurniture.html
7.3.122	Cycle Parking: Stainless steel	https://streetfurniture.com/au/product/semi-hoop/
7.3.123	Bin: Recycle Aluminium and Powdercoated metropolis bronze and polished stainless steel	Ben Guthrie http://theguthrieproject.com/photoShare_TZA_StreetFurniture.html
7.3.124	Tree Grate: Stainless	https://streetscape.co.nz/product/iridium-tree-grate/
7.3.125	Picnic table seating	Turf, 2020
7.3.126	Dual Burner BBQ	Turf, 2020
7.3.127	Bespoke Shelter: Powdercoated aluminium	Gustafson Guthrie Nichol http://architectsandartisans.com/a-winning-design-for-the-national-mall-2/
7.3.128	Lighting Plan	Turf, 2020
7.3.129	Endeavour Energy Lighting Pole	http://www.endeavourenergy.com.au/wps/wcm/connect/7f177dc3-d42c-4199-a3dc-0852fe054503/MDI+0024+am4.pdf?MOD=AJPERES
7.3.130	City of Sydney Bronze Smart Pole	http://tzannes.com.au/projects/city-of-sydney-public-domain-furniture/
7.3.131	Public Art / Lighting Installations	Cindy Boyce https://www.canadianinteriors.com/2016/05/04/get-big-get-small-go-raw/

7.3.132	Decorative Lighting	https://landscapeonline.com/articles/kitcheners-flexible-pedestrian-first-streetscape/13721
7.3.133	Catenary Lighting	https://www.istockphoto.com/ca/fr/photo/restaurants-%C3%A0-istanbul-de-nuit-gm157524728-11139872
7.3.134	Wall Mounted Lighting	https://www.yoursaydarebin.com.au/rezzalaneways
7.3.135	Waterloo Park	Turner, 2020
7.3.136	Water Sensitive Urban Design and Waterplay	Turf, 2020
7.3.137	Edinburgh Rain Gardens, Fitzroy, Melbourne	GHD http://www.landezine.com/index.php/2012/10/edinburgh-gardens-raingarden-by-ghd-pty-ltd/
7.3.138	Victoria Park, Sydney	Brigitta Schyns, 2019
7.3.139	Sydney Park, Sydney	Sara Reilly, 2019
7.3.148	Urban Forest and Biodiversity	Turf, 2020
7.3.149	Existing Trees Retained	Turf, 2020
7.3.150	Proposed Trees	Turf, 2020
7.3.151	Understorey	Turf, 2020
7.3.152	Street Tree Diagram	Turf, 2020
7.3.153	Angophora costata	
7.3.154	Angophora floribunda	
7.3.155	Lophostemon confertus	
7.3.156	Harpullia pendula	
7.3.157	Argyrodendron actinophyllum	
7.3.158	Eucalyptus microcorys	
7.3.159	Lophostemon confertus	
7.3.160	Syzygium paniculatum	
7.3.161	Banksia integrifolia	
7.3.162	Corymbia eximia	
7.3.163	Corymbua maculata	
7.3.164	Liriodendron tulipifera	
7.3.165	Melaleuca quinquenervia	
7.3.166	Afrocarpus falcatus	
7.3.167	Eucalyptus haemastoma	
7.3.168	Fraxinus pennsylvanica	
7.3.169	Melaleuca quinquenervia	
7.3.170	Corymbua maculata	
7.3.171	Eucalyptus pilularis	
7.3.172	Eucalyptus saligna	
7.3.173	Corymbua eximia	
7.3.174	Flindersia australis	
7.3.175	Koelreuteria paniculata	
7.3.176	Backhousia citriodora	
7.3.177	Brachychiton acerifolius	
7.3.178	Diploglottis australis	
7.3.179	Elaeocarpus eumundi	
7.3.180	Flindersia australis	
7.3.181	Livistona australis	
7.3.182	Pyrus calleryana ‘chanticleer’	
7.3.183	Robinia pseudoacacia ‘frisia’	
7.3.184	Tristaniopsis laurina luscious	
7.3.185	Waterhousia floribunda ‘Green Avenue’	
7.3.186	Tree Hierarchy	Turf, 2020
7.3.187	Corymbia maculata	
7.3.188	Eucalyptus grandis	
7.3.189	Ficus macrophylla	
7.3.190	Ficus rubiginosa	
7.3.191	Jacaranda mimosifolia	
7.3.192	Livistona australis	

7.3.193	Lophostemon confertus
7.3.194	Angophora costata
7.3.195	Backhousia citriodora
7.3.196	Eucalyptus microcorys
7.3.197	Eucalyptus pilularis
7.3.198	Syncarpia glomulifera
7.3.199	Acmena smithii
7.3.200	Corymbia eximia
7.3.201	Melaleuca quinquenervia
7.3.202	Pyrus ussuriensis
7.3.203	Robinia pseudoacacia ‘Frisia’
7.3.204	Syzygium paniculatum
7.3.205	Waterhousea floribunda ‘Green Avenue’
7.3.206	Banksia integrifolia
7.3.207	Citrus lemon x reticulata
7.3.208	Citrus x meyeri
7.3.209	Citrus reticulata
7.3.210	Citrus sinensis
7.3.211	Cupaniopsis anacardioides
7.3.212	Elaeocarpus eumundii
7.3.213	Laurus nobilis
7.3.214	Prunus domestica
7.3.215	Prunus persica
7.3.216	Prunus persica var Nectarine
7.3.217	Pyrus calleryana ‘Chanticleer’
7.3.218	Tristaniopsis laurina ‘Luscious’
7.3.219	Ulmus parvifolia ‘Todd’
7.3.220	Anigozanthos manglesii
7.3.221	Asplenium australasicum
7.3.222	Aspidistra elatior
7.3.223	Banksia ericifolia
7.3224	Banksia integrifolia prostrate
7.3.225	Banksia spinulosa
7.3.226	Baumea articulata
7.3.227	Callistemon viminalis ‘Little John’
7.3.228	Callistemon ‘White Anzac’
7.3.229	Carpobrotus glaucescens
7.3.230	Cymbopogon citratus
7.3.231	Cymbopogon obtectus
7.3.232	Dianella caerulea
7.3.233	Dietes robinsoniana
7.3.234	Eleocharis sphacelata
7.3.235	Elettaria cardamomum
7.3.236	Farfugium japonicum ‘Giganteum
7.3.237	Goodenia ovata
7.3.238	Hebe inspiration
7.3.239	Lavender angustifolia ‘Munstead’
7.3.240	Lomandra longifolia
7.3.241	Loropetalum chinense
7.3.242	Philodendron ‘Xanadu’
7.3.243	Raphiolepis indica ‘Oriental Pearl’
7.3.244	Rosemarinus officinalis ‘Blue Lagoon’
7.3.245	Thymus vulgaris
7.3.246	Salvia officinalis
7.3.247	Viola hederacea
7.3.248	Westringia fruticosa

7.3.249	Xanthorrhoea spp	
7.3.250	Liriope muscari	
7.3.251	Hardenbergia violacea	
7.3.252	Hibbertia scandens	
7.3.253	Melaleuca hypericifolia 'Ulladulla Beacon'	
7.3.254	Scaevola aemula	
7.3.255	Poa spp.	
7.3.256	Themeda triandra	
7.3.257	Beacons Food Forest	Sandy Pemitz https://www.planning.org/blog/blogpost/9107338/
7.3.258	Boston Rooftop Farms, Boston	
7.3.259	Brooklyn Grange, New York City	
7.3.260	Community gardens	Turner, 2020
7.3.261	Edible Landscapes	Turner, 2020
7.3.262	Rooftop Gardens	Turner, 2020
7.3.263	Acmena smithii	
7.3.264	Angophora costata	
7.3.265	Backhousia citriodora	
7.3.266	Banksia integrifolia	
7.3.267	Diploglottis australis	
7.3.268	Livistona australis	
7.3.269	Melaleuca quinquenervia	
7.3.270	Syzygium paniculatum	
7.3.271	Banksia ericifolia	
7.3.272	Banksia integrifolia prostate	
7.3.273	Banksia spinulosa	
7.3.274	Carpobrotus glaucenscens	
7.3.275	Dianella caerulea	
7.3.276	Lomandra longifolia	
7.3.277	Viola hederacea	
7.3.278	Cirtus lemon x reticulata	
7.3.279	Citrus x meyeri	
7.3.280	Citrus reticulata	
7.3.281	Citrus sinesis	
7.3.282	Laurus nobilis	
7.3.283	Prunus domestica	
7.3.284	Prunus persica	
7.3.285	Prunus persica var. Nectarine	
7.3.286	Elettaria cardomomum	
7.3.287	Cymbopogon citratus	
7.3.288	Hebe inspiration	
7.3.289	Lavender angustifolia 'Munstead'	
7.3.290	Rosemarinus officinalis 'Blue Lagoon'	
7.3.291	Thyme vulgaris	
7.3.292	Salvia officinalis	
7.3.293	Beam Festival, Chippendale	Chippendale Creative Precinct https://www.timeout.com/sydney/things-to-do/beams-festival
7.3.294	Street Art, Redfern	https://mobile.abc.net.au/news/2017-09-27/40,000-years/8991922
7.3.295	Lata 65, Portugal	www.boredpanda.com
7.3.296	Kopupaka Reserve in Te Hauauru Park, Auckland	https://ourauckland.aucklandcouncil.govt.nz/articles/news/2019/02/five-beautiful-public-spaces-to-enjoy-this-summer/
7.3.297	Art and Site	Turf, 2020
7.3.298	Art and Community	Turf, 2020
7.3.299	Art and Environment	Turf, 2020
7.3.300	Art and Environment	Turf, 2020
7.3.301	Public Art Opportunities	Turf, 2020

7.3.302	Sydney Laneway Art Program, Sydney	Newell Harry http://www.cityartsydney.com.au/artwork/circles-in-the-round-for-miles-and-miles-1/
7.3.303	Southbank Crossing, London	
7.3.304	Walk the Walls, Caringbah	Chris Lane https://www.theleader.com.au/story/5267411/5000-share-street-art-buzz/?cs=1507
7.3.305	Pink Street, Lisbon	Gail Edwin Aguiar https://www.flickr.com/photos/gailontheweb/29073677636/in/photolist-Li9cs5-e6Jgi1
7.3.306	City of Sydney Legible Sydney	http://www.cityofsydney.nsw.gov.au/vision/sustainable-sydeny-2030/transport-and-access/liveable-green-network/wayfinding-signage
7.3.307	City of Sydney Legible Sydney	https://www.cityofsydney.NSW.gov.au/vision/sustainable-sydney-2030/transport-and-access/liveable-green-network/wayfinding-signage
7.3.308	City of Sydney Legible Sydney	https://www.cityofsydney.NSW.gov.au/vision/sustainable-sydney-2030/transport-and-access/liveable-green-network/wayfinding-signage
7.3.309	Indicative CGI: Waterloo Common facing east	Virtual Ideas, 2020

APPENDIX 7.4 LAND USE, SUSTAINABILITY AND RESILIENCE

7.4.1	Social And Community Facilities	Turner, 2020
7.4.2	Storytime	https://www.probuild.com.au, 2019
7.4.3	Library	https://dynamic.architecture.com.au
7.4.4	Bike repair workshop	LAHC, 2018
7.4.5	Activity rooms	LAHC, 2018
7.4.6	Creative arts centre	https://injalak.com, 2019
7.4.7	Creative spaces	Turner, 2019
7.4.8	Satellite health	https://www.rmycph.com.au, 2019
7.4.9	Multi-purpose recreation (youth)	LAHC, 2018
7.4.10	Learning / cultural / well-being	https://cityofsydney.nsw.gov.au, 2019
7.4.11	Retail And Other Retail	Turner, 2020
7.4.12	Supermarkets	https://esperancetide.com, 2019
7.4.13	Mini-majors	https://www.firstchoicebb.com.au, 2019
7.4.14	Other retail	http://www.thecommune.co, 2019
7.4.15	Banks / Insurance / travel	https://www.marketingmag.com.au
7.4.16	Allied / community health	LAHC, 2018
7.4.17	Active Façades In Cabramatta Encourages Street Life	Roberts Day, 2019
7.4.18	La Placita Public Space By Gehl	Http://Gehlpeople.com. 2018
7.4.19	Chippendale, Sydney	Thepeakmagazine.com. Amy Van. 2019
7.4.20	West End, Vancouver	Https://Fraseropolis.com. 2019
7.4.21	West Village, NYC	Https://www.tracysnewyorklife.com. 2019
7.4.22	Business As Usual	Roberts Day, 2019
7.4.23	Urbanity Model	Roberts Day, 2019
7.4.24	Urbanity Model	Roberts Day, 2019
7.4.25	Local existing non-residential ground floor uses	Turner, 2020
7.4.26	Local non-residential ground floor uses under Urbanity model to year 2036	Turner, 2020

7.4.27	Local non-resdiential ground floor uses under Urbanity model to year 2056.	Roberts Day, 2019
7.4.28	Adaptable Ground Floor And First Floor	Roberts Day, 2019
7.4.29	Adaptable Ground Floor And First Floor	Roberts Day, 2019
7.4.30	Retail Space, Boston	Https://Linearretail.com. 2019
7.4.31	Loft Apartments, Seattle	http://www.seattle.gov/dpd/AppDoc/GroupMeetings/DRProposal3017381AgendaaID5083.pdf. 2019
7.4.32	Duke Condos, Toronto	https://www.buzzbuzzhome.com/ca/duke-condos. 2019
7.4.33	Adaptable Ground Floor And Basement	Roberts Day, 2019
7.4.34	Adaptable Ground Floor And Basement	Roberts Day, 2019
7.4.35	Paddy's Markets, Sydney	https://sydneymobile-secure.straliaweb.com.au/photo-gallery/. 2019
7.4.36	Sogo Mall, Hong Kong	http://www.discoverhongkong.com/au/shop/where-to-shop/malls-and-department-stores/sogo.jsp. 2019
7.4.37	Mr Wong, Sydney	https://merivale.com/venues/mrwong. 2019
7.4.38	Awning And Colonnade Strategy	Roberts Day, 2019
7.4.39	Colonnade (Integrated)	Roberts Day, 2019
7.4.40	Colonnade (Integrated)	Roberts Day, 2019
7.4.41	Thames Tower	http://mydn-a.com/portfolio/thames-tower/. 2019
7.4.42	Kenson Building, Ottawa	https://urbsite.blogspot.com/2014/04/?view=classic. 2019
7.4.43	Chanel Boutique Store, Hong Kong	http://butterboom.com/hk/chanel-watches-fine-jewellery-hong-kong/. 2019
7.4.44	Colonnade Additive (Post Verandah)	Roberts Day, 2019
7.4.45	Colonnade Additive (Post Verandah)	Roberts Day, 2019
7.4.46	Bendigo Verandahs	https://www.vline.com.au/Escape-with-V-Line/Preview-Event-Destination-Details?id=11. 2019
7.4.47	Angel Lane, Sydney	https://www.helioscreen.com.au/china-lane-retractable-awning-sydney.html. 2019
7.4.48	Beerhouse, Cape Town	https://idmmag.com/news/beerhouse-doorman-dies-on-long-street/. 2019
7.4.49	Awning	Roberts Day, 2019
7.4.50	Mixed-Use Building, Vancouver	https://www.skyscrapercity.com/showthread.php?t=1814301&page=4. 2019
7.4.51	Northern Plaza, Monash University	http://www.landezine.com/index.php/2017/04/a-social-setting-northern-plaza-monash-university-clayton-by-t-c-l/tcl_monash-northern-plaza_-ben-wrigley-06-rgb-72dpi/. 2019
7.4.52	Street In Athens	https://www.flickr.com/photos/22392855@N08/6049878544/. 2019
7.4.53	Awnings In Seattle	https://nacto.org/publication/urban-street-design-guide/street-design-elements/sidewalks/. 2019
7.4.54	Retractable Awning	Roberts Day, 2019
7.4.55	Angel Lane, Sydney	https://www.helioscreen.com.au/china-lane-retractable-awning-sydney.html. 2019
7.4.56	Newbury St, Boston	https://www.tripadvisor.ie/LocationPhotoDirectLink-g60745-d105255-i215577306-Newbury_Street-Boston_Massachusetts.html. 2019
7.4.57	Cafe Des Beaux Arts, Paris	https://www.thekitchn.com/10-paris-food-secrets-the-guidebooks-won-t-tell-you-about-223564. 2019
7.4.58	Sicilian Avenue	https://www.victorianawnings.co.uk/projects/commercials/sicilian-avenue. 2019
7.4.59	Basement location and connection strategy	Roberts Day, 2019
7.4.60	Typical basement entry arrangements	Roberts Day, 2019
7.4.61	Passeig De St Joan Boulevard	http://www.landezine.com/index.php/2012/07/passeig-de-st-joan-boulevard-by-lola-domenech/. 2019
7.4.62	Green Square	https://architectureau.com/articles/auda-green-square-town-centre/#img-0. 2019
7.4.63	Sankt Kjelds Quarter	https://sla.dk/en/projects/bryggervangen-sktkjelds. 2019
7.4.64	Joynton Avenue Creative Centre	https://architectureau.com/articles/green-square-cultural-precinct-breathes-new-life-into-heritage-hospital-buildings/#img-0. 2019
7.4.65	Victoria Park	https://www.cityofsydney.NSW.gov.au/explore/facilities/parks/major-parks/victoria-park. 2019
7.4.66	National University of Singapore	https://www.dezeen.com/2016/11/07/national-university-singapore-building-zero-energy-design-school/. 2019
7.4.67	Dockside Green, Canada	https://www.architravel.com/architravel/building/dockside-green/. 2019

APPENDIX 7.5 PRIVATE DOMAIN

7.5.1	Proposed Streetwall	Turner, 2020
7.5.2	Maximum Block Length	Turner, 2020
7.5.3	Reduction of block length, George & Allen, Waterloo	Turner, 2020
7.5.4	Maximum Facade Length	Turner, 2020
7.5.5	Reduction of facade length, Parkview Apartments	DKO Architects, 2017
7.5.6	Facade articulation	Turner, 2020
7.5.7	Ground floor facade articulation, The Rathbone	Scott Carver, 2017
7.5.8	Facade articulation	Turner, 2020
7.5.9	Facade articulation, Diversity, Waterloo	Turner, 2020
7.5.10	Proposed Street Level Setbacks	Turner, 2020
7.5.11	Street Level Setbacks	Turner, 2020
7.5.12	Street level setbacks, Union Balmain	Turner, 2020
7.5.13	Corner Setback	Turner, 2020
7.5.14	Street corner setbacks, Asper	Turner, 2020
7.5.15	Change Of Materials On Lower Levels	Turner, 2020
7.5.16	Change of materials, Tejon 35, Meridian	105 Architecture, 2014
7.5.17	Change Of Materials On Upper Levels	Turner, 2020
7.5.18	Change of materials, Parkview Apartments	DKO Architects, 2017
7.5.19	Proposed Upper Level Setbacks	Turner, 2020
7.5.20	Upper Level Setback	Turner, 2020
7.5.21	Upper level setbacks, Camden Courtyards	Sheppard Robson, 2017
7.5.22	Attic Level Setback	Turner, 2020
7.5.23	Attic level setback, Union Balmain	Turner, 2020
7.5.24	Change Of Facade Plane On Upper Levels	Turner, 2020
7.5.25	Change in facade plane, Tjornely, Greve	Studio Local, 2018
7.5.26	Maximum Floor Plate Size	Turner, 2020
7.5.27	The Book Company HQ, Seoul	N.E.E.D Architecture, 2017
7.5.28	Rebel 1, Warsaw	WWAA, 2013
7.5.29	Maximum Height In Storeys	Turner, 2020
7.5.30	31 Building Pueyrredón 1101	Estudio Pablo Gagliardo, 2017
7.5.31	Asnieres, Paris	Louis Paillard, 2017
7.5.32	Loose-Fit Envelope	Turner, 2020
7.5.33	Lower East Side Towers, Ny	Space 4 Architecture, 2017
7.5.34	Huma Klabin	UNA Architects, 2016
7.5.35	Maximum Floor Plate Size	Turner, 2020
7.5.36	Gramercy, HK	Aedas, 2013
7.5.37	Park Tower, Antwerp	Studio Farris Architects, 2014
7.5.38	Maximum Height In Storeys	Turner, 2020
7.5.39	The Beacon, HK	Aedas, 2017
7.5.40	Edifício Itaim	Fgmf Arquitetos, 2012
7.5.41	42 Unitt Urban Living	Basiches Arquitetos Associados, 2014
7.5.42	Loose-Fit Building Envelope	Turner, 2020
7.5.43	Solar access analysis	Turner, 2020
7.5.44	Wind tunnel model	Waterloo South Masterplan - Pedestrian Wind Environment Study
7.5.45	WSUD mitigation response	Waterloo South - Flooding and Stormwater Study, AECOM
7.5.46	Topography influences air quality	Waterloo South - Air Quality Assessment, SLR
7.5.47	Percentage of pollutant concentration relative to kerbside concentration	DoP, 2008
7.5.48	Selected lot analysis	Turner, 2020
7.5.49	SEPP 65	NSW D.P.E, 2017
7.5.50	Apartment Design Guide, 2015	NSW D.P.E, 2015
7.5.51	Planning Circular PS-17-001	NSW D.P.E, 2017
7.5.52	Sydney DCP, 2012	City of Sydney, 2012
7.5.53	Lot S	Turner, 2020
7.5.54	Lot S Massing	Turner, 2020

7.5.55	Lot S massing	Turner, 2020
7.5.56	Lot S site analysis	Turner, 2020
7.5.57	Lot S urban forest	Turner, 2020
7.5.58	Setbacks for tree retention, Joynton Avenue, Green Square	Turner, 2020
7.5.59	Urban plaza, Civic place, Green Square	
7.5.60	Lot S open space	Turner, 2020
7.5.61	Communal open space, Big Yard, Berlin	https://www.archdaily.com/793287/bigyard-zanderroth-architekten
7.5.62	Common open space on roof level, The Commons, Melbourne	https://archipreneur.com/jeremy-mcleod-nightingale-model-collaborative-movement-sustainable-affordable-housing/
7.5.63	Lot S landscaping above street level	Turner, 2020
7.5.64	Vertical village open space, The Carve Oslo	https://www.dezeen.com/2014/09/04/the-carve-tower-oslo-barcode-project-a-lab/
7.5.65	Rooftop productive garden, The Commons, Melbourne	https://archipreneur.com/jeremy-mcleod-nightingale-model-collaborative-movement-sustainable-affordable-housing/
7.5.66	Lot S ground connectivity	Turner, 2020
7.5.67	The living street, The Woonerf, The Netherlands	https://www.chicagotribune.com/opinion/ct-batavia-dutch-street-met-20140827-column.html
7.5.68	Active street corners, Surry Hills, Sydney	Turner, 2020
7.5.69	Lot S active frontages	Turner, 2020
7.5.70	Active ground plane	David Baker Architects
7.5.71	Lot S diversity	Turner, 2020
7.5.72	Lot S efficiency	Turner, 2020
7.5.73	Parking and Loading	Turner, 2020
7.5.74	Combined access and services strategy	Turner, 2020
7.5.75	Solar access	Turner, 2020
7.5.76	Solar access to primary façades - West façade	
7.5.77	Solar access to primary façades - North and East façades	
7.5.78	Solar access to communal open space - View from the West	
7.5.79	Solar access to communal open space - View from the North-East	Turner, 2020
7.5.80	Lot S building envelope plan	Turner, 2020
7.5.81	Lot S typical mid-level floor plan	Turner, 2020
7.5.82	Lot S typical tower level floor plan	Turner, 2020
7.5.83	Basement 03-04	Turner, 2020
7.5.84	Basement 01	Turner, 2020
7.5.85	Basement 01	Turner, 2020
7.5.86	Lower Ground	Turner, 2020
7.5.87	Ground Level	Turner, 2020
7.5.88	Level 01	Turner, 2020
7.5.89	Level 02	Turner, 2020
7.5.90	Level 03	Turner, 2020
7.5.91	Level 04	Turner, 2020
7.5.92	Level 05	Turner, 2020
7.5.93	Level 06	Turner, 2020
7.5.94	Level 07	Turner, 2020
7.5.95	Level 08	Turner, 2020
7.5.96	Level 09	Turner, 2020
7.5.97	Levels 10 and 12	Turner, 2020
7.5.98	Levels 11 and 13	Turner, 2020
7.5.99	Level 14	Turner, 2020
7.5.100	Level 15	Turner, 2020
7.5.101	Level 16	Turner, 2020
7.5.102	Level 17	Turner, 2020
7.5.103	Level 18	Turner, 2020
7.5.104	Levels 19, 20, 22, 26, 28 and 30	Turner, 2020
7.5.105	Levels 21, 23, 27, 29 and 31	Turner, 2020

7.5.106	Levels 24 and 25	Turner, 2020
7.5.107	Roof level	Turner, 2020
7.5.108	Lot S GFA analysis Basement 1 - Level 8	Turner, 2020
7.5.109	Lot S GFA analysis Level 9 - 30	Turner, 2020
7.5.110	Lot S Solar access analysis Ground - Level 9	Turner, 2020
7.5.111	Lot S Solar access analysis Level 10 - 30	Turner, 2020
7.5.112	Lot S Cross ventilation analysis Ground - Level 8	Turner, 2020
7.5.113	Lot S Indicative relation to rail tunnel and heritage pressure tunnel	Turner, 2020
7.5.114	Private sites within Waterloo South	Turner, 2020
7.5.115	221-223 Cope Street & 116 Wellington Street	Turner, 2020
7.5.116	225-227 Cope Street	Turner, 2020
7.5.117	233-239 Cope Street	Turner, 2020
7.5.118	111 Cooper Street	Turner, 2020
7.5.119	123-131 Cooper Street	Turner, 2020
7.5.120	291 George Street	Turner, 2020
7.5.121	110 Wellinton Street	Turner, 2020
7.5.122	Current controls for private sites	Turner, 2020
7.5.123	Plan of existing private sites	Turner, 2020
7.5.124	Indicative massing of existing private sites	Turner, 2020
7.5.125	private sites with potential for increased FSR under current controls	Turner, 2020
7.5.126	Indicative massing	Turner, 2020
7.5.127	Private sites best and highest use responding to current context	Turner, 2020
7.5.128	Indicative massing option 1	Turner, 2020
7.5.129	Indicative massing option 2	Turner, 2020
7.5.130	Indicative massing option 3	Turner, 2020
7.5.131	Private sites best and highest used responding to future context	Turner, 2020
7.5.132	Indicative massing option 4	Turner, 2020
7.5.133	Indicative massing option 5	Turner, 2020
7.5.134	Indicative massing option 6	Turner, 2020
7.5.135	Re-development potential as individual lots	Turner, 2020
7.5.136	Indicative massing option 7	Turner, 2020
7.5.137	Re-development potential as amalgamated lots	Turner, 2020
7.5.138	Indicative massing option 8	Turner, 2020
7.5.139	Re-development potential as amalgamated lots with tall buildings	Turner, 2020
7.5.140	Inicative massing option 9	Turner, 2020
7.5.141	Botany Road re-development potential	Turner, 2020
7.5.142	Botany Road eisting height controls	Turner, 2020
7.5.143	Solar access to future potential context between 9am - 3pm, mid-winter, south west view	Turner, 2020
7.5.144	Botany Road corridor potential built form under existing height controls	Turner, 2020
7.5.145	Solar access to future potential context between 9am - 3pm mid-winter, south west view	Turner, 2020
7.5.146	Botany Road corridor potential built form under future uplift controls	Turner, 2020

APPENDIX 7.6 CASE STUDIES

7.6.1	'Big Yard' housing, Berlin	Michael Feser photography
7.6.2	'Locally Made' markets at COMMUNE in Waterloo	Sam Ali, for The Commune
7.6.3	13th Street, Philadelphia	G. Widman photography for Visit Philadelphia
7.6.4	Melbourne CBD	Arup, 2018
7.6.5	Singapore rooftop farming	Edible Garden City
7.6.6	Waterloo resident in the community	photographed by Johnny Weeks for The Guardian (https://www.theguardian.com/australia-news/2017/jul/12/i-feel-on-the-verge-of-extinction-the-battle-for-sydneys-waterloo)
7.6.7	Better Built Form	Arup, 2018
7.6.8	Residential aged care	http://plUSArquitectura.info/?n=Contact+us
7.6.9	Tech start up	https://whatson.cityofsydney.NSW.gov.au/events/business-101-tech-start-ups
7.6.10	Jewell Station pop-up event, Melbourne	https://www.betterblock.org
7.6.11	Matavai and Turanga	photographed by Johnny Weeks for The Guardian (https://www.theguardian.com/australia-news/2017/jul/12/i-feel-on-the-verge-of-extinction-the-battle-for-sydneys-waterloo)
7.6.12	Childrens Play Space	https://www.futuristarchitecture.com/31178-classroom.html
7.6.13	Aboriginal Reference Group	http://www.cockburn.wa.gov.au/
7.6.14	Pitt Street, Sydney	Arup, 2018
7.6.15	Melbourne Laneways	Arup, 2018
7.6.16	Bread and Butter Project	http://www.thebreadandbutterproject.com/
7.6.17	Residential Aged Care	http://plUSArquitectura.info/?n=Contact+us++Residential+Aged+Care++Mercy+Health
7.6.18	107 Projects, Redfern	https://concreteplayground.com/sydney/arts-entertainment/culture/redferns-107-projects-to-run-green-squares-huge-new-creative-hub
7.6.19	Chophouse Row, Seattle	https://casestudies.uli.org/chophouse-row/
7.6.20	Chippendale Green, Sydney	Arup, 2018
7.6.21	Bush Traders	Arup, 2018
7.6.22	Bryant Park, NYC	BryantPark.org
7.6.23	Passeig de St Joan, Barcelona	Metalocus Magazine
7.6.24	Central, Sydney	Arup, 2018
7.6.25	Regent Park, Toronto	Arup, 2018
7.6.26	False Creek North, Vancouver	Arup, 2018
7.6.27	Joyce Collingwood, Vancouver	Arup, 2018
7.6.28	Belgrano, Argentina	Arup, 2018
7.6.29	Hudson Yards, New York	Arup, 2018
7.6.30	Nine Elms, London	Arup, 2018
7.6.31	Woodberry Down, London	Arup, 2018
7.6.32	Comparative Density Case Studies – International Key Plan	Arup, 2018
7.6.33	Regent Park, Toronto	Arup, 2018
7.6.34	False Creek North, Vancouver	Arup, 2018
7.6.35	Joyce Collingwood, Vancouver	Arup, 2018
7.6.36	Belgrano, Argentina	Arup, 2018
7.6.37	Hudson Yards, New York	Arup, 2018
7.6.38	Nine Elms, London	Arup, 2018
7.6.39	Woodberry Down, London	Arup, 2018
7.6.40	Revitalised Spice Alley	Arup, 2018
7.6.41	Aerial image of Green Square development	Arup, 2018
7.6.42	Massing vision of Montague, Melbourne	Arup, 2018
7.6.43	Comparative Density Case Studies – Local	Arup, 2018
7.6.44	Footprint comparison, Central Park, Sydney	Arup, 2018
7.6.45	Footprint comparison Green Square Town Centre, Sydney	Arup, 2018
7.6.46	Footprint comparison Crown Square, Sydney	Arup, 2018
7.6.47	District comparison, Waterloo and Zetland	Arup, 2018
7.6.48	District and comparison, Chippendale, Redfern And Ultimo	Turner, 2020

7.6.49	District and comparison, Darlinghurst, Potts Point, Kings Cross, Rushcutter Bay And Elizabeth Bay	Turner, 2020
7.6.50	District and comparison, Darlington, Chippendale and Redfern	Turner, 2020
7.6.51	Comparative Density Case Studies - By Project Key Plan	Turner, 2020
7.6.52	Project comparison, City Quarter, Camperdown	Googlemaps, 2019
7.6.53	City Quarter, Camperdown	Turner, 2020
7.6.54	Project comparison, St Margaret's, Surry Hills	Googlemaps, 2019
7.6.55	St Margaret's, Surry Hills	Cox, 2016
7.6.56	Project comparison Quadrant, Broadway	Googlemaps, 2019
7.6.57	Quadrant, Broadway	Cox, 2016
7.6.58	Project comparison, Central Park, Sydney	Googlemaps, 2019
7.6.59	Central Park, Sydney	Cox, 2016
7.6.60	Project comparison, Darling Square, Sydney	Googlemaps, 2019
7.6.61	Darling Square, Sydney	Cox, 2016
7.6.62	Social spaces along a key pedestrian route	Metalocus Magazine
7.6.63	Varied vegetation softens the urban landscape	SLA
7.6.64	Natural shading from mature trees	City Of Sydney
7.6.65	Integrated bio-drainage	ArchitectureAu.com.au
7.6.66	Dedicated cycle-ways promote active transport	Sydneycycleways.net
7.6.67	Street furniture and planting	Recodenow.org
7.6.68	Using landscape and design to articulate heritage	Ramboll
7.6.69	A mix of landscaping creates intereset and relief	Townsend Landscape Architects
7.6.70	Usingl public space for performance and ceremony	Sydney.com
7.6.71	Integrating civic uses as space and urba nanchors	City Of Sydney
7.6.72	Open space active with all age groups	Office Of James Burnett
7.6.73	Pocket pack activation for local communities	Rad Lab
7.6.74	Dispersed activation promoting new businesses	Matthew Gindlesperger
7.6.75	Mint Plaza, San Francisco, USA	Friends Of Mint Plaza
7.6.76	Bonn Square, Oxford, UK	Graeme Massie Architects
7.6.77	Centenary Square, Parramatta, Australia	Landzine.com
7.6.78	Besiktas Fish Market, Istanbul, Turkey	Gad Architecture
7.6.79	Granary Square, London, UK	Townshend Landscape Architects
7.6.80	Haus Am Rietpark, Zurich, Switzerland	Atelier WW
7.6.81	Wulaba Park, Sydney, Australia	City Of Sydney
7.6.82	Chippendale Green, Sydney, Australia	Aila NSW
7.6.83	Margaret Mahy Family Playground, Christchurch, New Zealand	Christchurch City Libraries
7.6.84	Bryant Park, New York, USA	Bryantpark.org
7.6.85	Hyde Park North, Sydney, Australia	Time Out Sydney
7.6.86	Goyder Square, Palmerston, Nt, Australia	Byrne Consultants
7.6.87	Rauora Park, Christchurch, New Zealand	Park Life
7.6.88	Singapore	Woha Architects
7.6.89	Dockside Green, Victoria, Canada	Toronto Star Newspapers
7.6.90	One Central Park, Sydney, Australia	Arcspace.com
7.6.91	Incredible edible farm, City of Irvine	Incredible Edible Farm Facebook
7.6.92	Edible Park, Medini, Malaysia	Medini Green Parks Facebooks
7.6.93	Beacon Food Forest, Seattle	Inhabitat
7.6.94	Pierce's Park, Baltimore, USA	Mahan Rykiel Associated Inc
7.6.95	Ian Potter Wildplay Garden, Sydney, Australia	Aspect Studios
7.6.96	Sydney Park, St Peters, Sydney, Australia	Architecture Au
7.6.97	Shell Cove Public School Bush Tucker Garden, Shellharbour, Australia	Illawarra Mercury
7.6.98	Eco Carlton Project, Melbourne, Australia	Carlton Community Website
7.6.99	Incredible Edible Garden, Todmodern, UK	Incredible Edible Network
7.6.100	Urban Orchard Program, Austin	Culturemap.com

7.6.101	Camperdown Commons, Sydney, Australia	Time Out Sydney
7.6.102	London College Of Fashion Dye Garden, London, UK	Cordwainers Garden Blog
7.6.103	Natural Dye Garden, University Of North Texas, USA	University Of North Texas
7.6.104	Gotham Greens, Brooklyn	Gotham Greens Farms LLC
7.6.105	Square Roots, Brooklyn, USA	6Sqft.com
7.6.106	Brooklyn Grange, New York, USA	Brooklyn Grange Farm
7.6.107	Pasona Headquarters, Tokyo, Japan	Inhabitat.com
7.6.108	Food Forest, Colorado, USA	Fallingfruit.com
7.6.109	Printing Press rooftop park, Brooklyn, USA	Terrain NYC Landscape Architecture
7.6.110	Rooftop Farm, Australian Technology Park, Sydney, Australia	CommercialRealEstate.com.ay
7.6.111	Human scale and experience	ref: https://issuu.com/stipoteam/docs/ebook_the.city.at.eye.level_english
7.6.112	City Public Realm	ref: https://www.cityoflondon.gov.uk/services/environment-and-planning/city-public-realm/Documents/city-public-realm-supplementary-planning-document-july-2016.pdf
7.6.113	Global street design guide, Global Designing Citites Initiative	ref: https://globaldesigningcities.org/publication/global-street-design-guide/
7.6.114	Urban design guidelines, Seattle integrated alley handbook	ref: https://nacto.org/docs/usdg/activating_alleys_for_a_lively_city_fialko.pdf
7.6.115	Van-Gogh-Roosegaarde Bicycle Path	Studio Roosegaarde
7.6.116	Pitt Street Mall, Sydney	Architecture Au
7.6.117	Copenhagen Cycle Strategy	Dissing And Weitling Architecture
7.6.118	Passeig De St Joan, Barcelona, Spain	Metalocus Magazine
7.6.119	Istiklal Street, Beyoglu, Istanbul	Globalblue.com
7.6.120	La Rambla, Barcelona, Spain	Deposit Photos
7.6.121	New Road, Brighton, UK	Gehl
7.6.122	Sight Lines For Roadworks, UK	Ross Atkin Associates
7.6.123	Nelson Street Cycleway, Auckland, New Zealand	Alamy Stock Photo
7.6.124	Beach Road Cycleway, Auckland, New Zealand	Contractor Magazine
7.6.125	Green Man Plus Scheme, Singapore	LTA Singapore
7.6.126	20 Minute neighbourhoods, Portland, USA	City of Portland
7.6.127	Plan Melbourne 20 minute neighbourhoods	Victorian Department of Environment, Land, Water and Planning
7.6.128	Bakery Lane	https://www.bakerylane.com.au/
7.6.129	Kensington Street	kensingtonstreet.com.au
7.6.130	Greening Laneways, Melbourne	City of Melbourne
7.6.131	Bulletin Place, Sydney	http://www.cushwakeproperty.com.au/property/2-bulletin-place-sydney-nsw-2000/4402
7.6.132	Steam Mill Lane, Darling Square	https://www.aspect-studios.com/au/project/steam-mill-lane/
7.6.133	Llankelly Place, Potts Point	https://www.thesydneyconnection.com.au/blog/2016/3/8/7j3dy6avc25opuph44arqeg3qpd8zt
7.6.134	Central Lane, Melbourne	https://www.timeout.com/melbourne/things-to-do/the-best-laneways-and-arcades-in-melbourne
7.6.135	Delancey Street, Philadelphia	https://www.visitphilly.com/media-center/photos-videos/
7.6.136	St. Christopher's Place, London Crime Prevention And Urban Design Resource Manual, Act, Australia	http://www.cherryawards.com/ThingsToDo/609/Things-to-do-in-London-St-Christopher-s-Place-Interesting-areas-Coffee-time
7.6.137	Crime prevention and urban design resoure manual, ACT, Australia	ACT Department Of Urban Services
7.6.138	Cities Safer By Design, V1.0, World Resources Institute	World Resources Institute
7.6.139	Safe Streets, Safe City, Calgary, Canada	Calgary Safety Council
7.6.140	CPTED, Queensland, Australia	Queensland Government
7.6.141	Venice	Business Insider
7.6.142	Kings Cross Masterplan, London, UK	Travelandleisure.com
7.6.143	One Love City, Aarhus, Denmark	Sunshineseeker.com
7.6.144	Fitzroy Community Food Centre, Melbourne, Australia	Localfoodconnect.org
7.6.145	Brickbottom Artists Co-Operative, Boston, USA	Brickbottom Artists Association
7.6.146	Idea Store, London, UK	Adjaye Associates
7.6.147	Bromley By Bow Centre, London, UK	Cityseeker.com

7.6.148	East Sydney Early Learning Centre, Sydney, Australia	Andrew Burges Architects
7.6.149	Library At The Dock, Melbourne, Australia	City Of Melbourne
7.6.150	Public Space Booking, Helsinki, Finland	Oodi Helsinki
7.6.151	Chophouse Row, Seattle, USA	sklarchitects.com
7.6.152	Chophouse Row, Seattle, USA	sklarchitects.com
7.6.153	Second Street District, Austin, USA	www.austincityguide.com
7.6.154	Nulu, Louisville, USA	https://cdn.everfest.com/uploads/festival_series/hosted_cover_photo/nulu-festival-louisville-ky.jpg?v=1538645435
7.6.155	Distillery Historic District, Toronto, Canada	https://thesustainablecity.files.wordpress.com/2012/10/distillery-for-web.jpg
7.6.156	Wynwood Arts District, Miami, USA	https://i.pinimg.com/originals/05/31/c3/0531c324750f995ceed0da40361ebb13.jpg
7.6.157	Muru Mittigar, Penrith, Australia	https://murumittigar,.com.au
7.6.158	Collingwood Arts Precinct, Melbourne, Australia	www.miglicdean.com.au
7.6.159	Hotlzmarkt, Berlin, Germany	allesgerman.com/
7.6.160	Chippendale, Sydney, Australia	http://turfdesign.com/wp-content/uploads/2017/01/00-Lumessence-1024x683-1024x683.jpg
7.6.161	Street Art Initiative, Valparaiso, Chile	https://upscapetravel.com/wp-content/uploads/2017/12/Walking-tour-of-Valparaiso-Chile.jpg
7.6.162	Pow Wow, Various Locations	http://a.espncdn.com/combiner/i?img=/photo/2013/0220/as_scene_PowWow2013_01.jpg&w=800
7.6.163	Walk The Walls Street Art Festival, Sydney, Australia	https://www.theleader.com.au/story/5261369/updated-photos-street-art-festival-a-huge-success/#slide=6
7.6.164	Indigenous Portraits By Matt Adnate, Various Locations, Australia	https://www.welcometocountry.org/adnates-aboriginal-mural-journey/
7.6.165	Beams Festival, Sydney, Australia	https://www.kensingtonstreet.com.au/wp-content/uploads/2017/03/eAB6R0627_1600x900px.jpg?x92611
7.6.166	Pink Street, Lisbon, Portugal	gailatlarge.com
7.6.167	First Nation Dance Rites, Sydney Australia	www.sydneyoperahouse.com
7.6.168	Malta Festival Ponzan, Poznan, Poland	www.inyourpocket.com
7.6.169	Parramatta Lanes	www.parraparents.com.au
7.6.170	Sydney Public Art	http://www.fionamcintoshart.com.au/test2/wp-content/uploads/2014/02/James-Angus-Day-in-Day-Out.jpg
7.6.171	Lata 65, Lisbon, Portugal	www.boredpanda.com
7.6.172	Festa, Christchurch, New Zealand	www.thebigidea.nz
7.6.173	Laneway Art Program, Sydney, Australia	https://live.staticflickr.com/3903/14628524498_2ec7b4c7c9_b.jpg
7.6.174	Bush Traders, Darwin	anindilyakwaarts.com.au
7.6.175	Noarlunga Downs wetland trail, Adelaide	www.walkingsa.org.au
7.6.176	Stadning by Tunnerminnerwait and Maulboyheenner, Mlebourne	www.brookandrew.com
7.6.177	Reconciliation Place, Canberra	www.wikimedia.org
7.6.178	Wellington Gateway Sculpture, Wellington	http://www.waal.co.nz
7.6.179	Kopupaka Park, Auckland, New Zealand	isthmus.co.nz
7.6.180	Ngarara Place, Melbourne	www.greenawayarchitects.com.au
7.6.181	Barrangal Dyara (Skin and Bones), Sydney	www.artgallery.nsw.gov.au
7.6.182	Gathering Circle, Spirit Green, Thunder Bay, Canada	aasarchitecture.com
7.6.183	111 Lincoln Road, Miami, USA	Herzog and De Meuron
7.6.184	Delta District, City of Vinge, Denmark	SLA Landscape Architects
7.6.185	Rebuild by Design, New York, USA	Rebuild By Design
7.6.186	Enghaveparken, Copenhagen, Denmark	Tredje Natur
7.6.187	Benthemplein water square, Rotteram, Netherlands	De Urbanisten
7.6.188	Strategic Flood Masterplan, Copenhagen, Denmark	Landzine
7.6.189	Sankt Kjelds Quarter, Copenhagen Denmark	Tredje Natur

APPENDIX 7.7 ARCHITECTURAL DRAWINGS

PP-100-001	Location Plan	Turner, 2020
PP-100-002	Context Plan	Turner, 2020
PP-100-003	Site Analysis	Turner, 2020
PP-100-004	Masterplan	Turner, 2020
PP-100-005	Land Dedication	Turner, 2020
PP-100-006	Building Envelope	Turner, 2020
PP-100-007	Setbacks	Turner, 2020
PP-100-008	Non-Residential Uses	Turner, 2020
PP-100-009	Tree Retention Plan	Turner, 2020
PP-100-010	Tree Replenishment Plan	Turner, 2020
PP-120-001	Building Envelope Elevation Cope Street	Turner, 2020
PP-120-002	Building Envelope Elevation 9m Laneway	Turner, 2020
PP-120-003	Building Envelope Elevation 9m Laneway	Turner, 2020
PP-120-004	Building Envelope Elevation George Street	Turner, 2020
PP-120-005	Building Envelope Elevation George Street	Turner, 2020
PP-120-006	Building Envelope Elevation 9m Laneway	Turner, 2020
PP-120-007	Building Envelope Elevation 9m Laneway	Turner, 2020
PP-120-008	Building Envelope Elevation Pitt Street	Turner, 2020
PP-120-009	Building Envelope Elevation Raglan Street	Turner, 2020
PP-120-010	Building Envelope Elevation Wellington Street	Turner, 2020
PP-120-011	Building Envelope Elevation Wellington Street	Turner, 2020
PP-120-012	Building Envelope Elevation Kellick / Reeves Street	Turner, 2020
PP-120-013	Building Envelope Elevation Kellick / Reeves Street	Turner, 2020
PP-120-014	Building Envelope Elevation John Street	Turner, 2020
PP-120-015	Building Envelope Elevation John Street	Turner, 2020
PP-120-016	Building Envelope Elevation 9m Laneway	Turner, 2020
PP-120-017	Building Envelope Elevation John Street	Turner, 2020
PP-120-018	Building Envelope Elevation 9m Laneway	Turner, 2020
PP-120-019	Building Envelope Elevation Pitt Street	Turner, 2020
PP-120-020	Building Envelope Elevation McEvoy Street	Turner, 2020
PP-120-021	Building Envelope Elevation Pitt Street	Turner, 2020
PP-120-022	Building Envelope Elevation 9m Laneway	Turner, 2020
PP-130-001	Building Envelope Section 1	Turner, 2020
PP-130-002	Building Envelope Section 2	Turner, 2020
PP-130-003	Building Envelope Section 3	Turner, 2020
PP-130-004	Building Envelope Section 4	Turner, 2020
PP-130-005	Building Envelope Section 5	Turner, 2020
PP-130-006	Building Envelope Section 6	Turner, 2020
PP-130-007	Building Envelope Section 7	Turner, 2020
PP-130-008	Building Envelope Section 8	Turner, 2020
PP-900-001	Indicative CGI Cope Street facing north, Waterloo Village Green pavilion	Virtual Ideas, 2020
PP-900-002	Indicative CGI George Street facing north, Community hub plaza	Virtual Ideas, 2020
PP-900-003	Indicative CGI George Street pocket park facing north-west	Virtual Ideas, 2020
PP-900-004	Indicative CGI Waterloo Common facing east	Virtual Ideas, 2020
PP-900-005	Indicative CGI Waterloo Village Green community garden	Virtual Ideas, 2020
PP-900-006	Indicative CGI Waterloo Village Green facing north-west	Virtual Ideas, 2020
PP-900-007	Indicative CGI Waterloo Common facing north-west, activity area	Virtual Ideas, 2020
PP-900-008	Indicative CGI Waterloo Village Green ‘Big Roof’	Virtual Ideas, 2020

APPENDIX 7.8 YIELD AND STAGING

7.8.1	Building Area Assumptions	Turner, 2020
7.8.2	O'Dea Masterplan Building Area Summary	Turner, 2020
7.8.3	Waterloo South within the existing Estate	Turner, 2020
7.8.4	Indicative development parcels	Turner, 2020
7.8.5	Indicative basement extent	Turner, 2020
7.8.6	Soft and hard landscaping on private terraces	Turf, 2020
7.8.7	Soft and hard landscaping on private terraces	Turf, 2020
7.8.8	Planter boxes on balconies	Turf, 2020
7.8.9	Planter boxes planted with ground covers and creepers	Turf, 2020
7.8.10	Vertical gardens on building facade	Turf, 2019
7.8.11	Indicative staging sequence	Turner, 2020

APPENDIX 7.9 SOLAR ANALYSIS

7.9.1	Apartment Design Guide	Department of Planning and Environment
7.9.2	City of Sydney DCP 2012	City of Sydney
7.9.3	Waterloo Metro Quarter Draft DCP 2018	Urban Growth NSW Development Corporation
7.9.4	Cope Street interface	Turner, 2020
7.9.5	Raglan Street interface	Turner, 2020
7.9.6	Pitt Street interface	Turner, 2020
7.9.7	Kellick Street interface to Waterloo Park	Turner, 2020
7.9.8	Aeronautical limits extruded	Turner, 2020
7.9.9	Solar access planes for existing context	Turner, 2020
7.9.10	Indicative envelope with solar planes to existing context subtracted	Turner, 2020
7.9.11	Indicative envelope with proposed open spaces subtracted	Turner, 2020
7.9.12	Indicative envelope with existing and future stret network subtracted	Turner, 2020
7.9.13	Indicative solar envelope	Turner, 2020
7.9.14	City of Sydney SVF	Turner, 2020
7.9.15	SVF Methodology	Turner, 2020
7.9.16	Waterloo South SVF study	Turner, 2020
7.9.17	Sunlight to streets	Turner, 2020
7.9.18	Solar access to public spaces	Turner, 2020
7.9.19	Solar access to developments	Turner, 2020
7.9.20	Solar access to communal open space	Turner, 2020
7.9.21	Sun path for Waterloo at Winter Solstics, Spring and Autumn Equinox and Summer Solstice	Turner, 2020
7.9.22	The parametric process	Turner, 2020
7.9.23	The 3D model ready for analysis	Turner, 2020
7.9.24	Plugging in the surfaces to be analysed	Turner, 2020
7.9.25	Solar access analysis	Turner, 2020

7.9.26	Data can be displayed graphically or numerically	Turner, 2020
7.9.27	Detailed solar analysis of selected lots	Turner, 2020
7.9.28	Confirming solar access to open spaces	Turner, 2020
7.9.29	Existing and future interfaces to Waterloo Estate	Turner, 2020
7.9.30	Existing and future interfaces to Waterloo Estate	Turner, 2020
7.9.31	Waterloo Park	Turner, 2019
7.9.32	Raglan Street Plaza	Narratives, 2018
7.9.33	Village Green	Virtual Ideas, 2020
7.9.34	Waterloo Park winter solstice 9am	Turner, 2020
7.9.35	Waterloo Park winter solstice 10am	Turner, 2020
7.9.36	Waterloo Park winter solstice 11am	Turner, 2020
7.9.37	Waterloo Park winter solstice 12am	Turner, 2020
7.9.38	Waterloo Park winter solstice 1pm	Turner, 2020
7.9.39	Waterloo Park winter solstice 2pm	Turner, 2020
7.9.40	Waterloo Park winter solstice 3pm	Turner, 2020
7.9.41	Waterloo Oval winter solstice 9am	Turner, 2020
7.9.42	Waterloo Oval winter solstice 10am	Turner, 2020
7.9.43	Waterloo Oval winter solstice 11am	Turner, 2020
7.9.44	Waterloo Oval winter solstice 12pm	Turner, 2020
7.9.45	Waterloo Oval winter solstice 1pm	Turner, 2020
7.9.46	Waterloo Oval winter solstice 2pm	Turner, 2020
7.9.47	Waterloo Oval winter solstice 3pm	Turner, 2020
7.9.48	Waterloo Village Green winter solstice 9am	Turner, 2020
7.9.49	Waterloo Village Green winter solstice 10am	Turner, 2020
7.9.50	Waterloo Village Green winter solstice 11am	Turner, 2020
7.9.51	Waterloo Village Green winter solstice 12pm	Turner, 2020
7.9.52	Waterloo Village Green winter solstice 1pm	Turner, 2020
7.9.53	Waterloo Village Green winter solstice 2pm	Turner, 2020
7.9.54	Waterloo Village Green winter solstice 3pm	Turner, 2020
7.9.55	Raglan Street Plaza winter solstice 9am	Turner, 2020
7.9.56	Raglan Street Plaza winter solstice 10am	Turner, 2020
7.9.57	Raglan Street Plaza winter solstice 11am	Turner, 2020
7.9.58	Raglan Street Plaza winter solstice 12pm	Turner, 2020
7.9.59	Raglan Street Plaza winter solstice 1pm	Turner, 2020
7.9.60	Raglan Street Plaza winter solstice 2pm	Turner, 2020
7.9.61	Raglan Street Plaza winter solstice 3pm	Turner, 2020
7.9.62	Summer solstice 9am	Turner, 2020
7.9.63	Summer solstice 10am	Turner, 2020
7.9.64	Summer solstice 11am	Turner, 2020
7.9.65	Summer solstice 12pm	Turner, 2020
7.9.66	Summer solstice 1pm	Turner, 2020
7.9.67	Summer solstice 2pm	Turner, 2020
7.9.68	Summer solstice 3pm	Turner, 2020
7.9.69	Spring / Autumn equinox 9am	Turner, 2020
7.9.70	Spring / Autumn equinox 10am	Turner, 2020
7.9.71	Spring / Autumn equinox 11am	Turner, 2020
7.9.72	Spring / Autumn equinox 12pm	Turner, 2020
7.9.73	Spring / Autumn equinox 1pm	Turner, 2020
7.9.74	Spring / Autumn equinox 2pm	Turner, 2020
7.9.75	Spring / Autumn equinox 3pm	Turner, 2020
7.9.76	Winter solstice 9am	Turner, 2020
7.9.77	Winter solstice 10am	Turner, 2020
7.9.78	Winter solstice 11am	Turner, 2020
7.9.79	Winter solstice 12pm	Turner, 2020
7.9.80	Winter solstice 1pm	Turner, 2020
7.9.81	Winter solstice 2pm	Turner, 2020

7.9.82	Winter solstice 3pm	Turner, 2020
7.9.83	Adjacent context	Turner, 2020
7.9.84	Adjacent context Raglan Street facing west	Turner, 2020
7.9.85	Adjacent context, Botany Road facing north-east	Turner, 2020
7.9.86	Adjacent context, Pitt Street	Turner, 2020
7.9.87	Adjacent context, Waterloo Metro Quarter	Urban Growth, 2018
7.9.88	Adjacent context, Waterloo Estate	Arup, 2018
7.9.89	Existing interfaces to Waterloo Estate	Turner, 2020
7.9.90	Solar access to existing context between 9am - 3pm winter	Turner, 2020
7.9.91	Neighbouring residential buildings solar analysis	Turner, 2020
7.9.92	Solar access to existing context between 9am - 3pm mid-winter	Turner, 2020
7.9.93	Future interfaces to Waterloo Estate	Turner, 2020
7.9.94	Solar access to future potential context between 9am - 3pm mid-winter, south-west view	Turner, 2020
7.9.95	Solar access to future potential context between 9am - 3pm mid-winter, north-east view	Turner, 2020
7.9.96	Waterloo Estate preferred masterplan	Turner, 2020
7.9.97	Solar access to the preferred masterplan between 9am - 3pm mid-winter, south-west view	Turner, 2020
7.9.98	Solar access to the preferred masterplan between 9am - 3pm mid-winter, north-east view	Turner, 2020
7.9.99	Selected lots for detailed analysis	Turner, 2020
7.9.100	Lot S direct sunlight to facades mid-winter	Turner, 2020
7.9.101	Percentage of primary facades (east, north and west) that receives in. 2 hours direct sunlight from 9am - 3pm mid-winter	Turner, 2020
7.9.102	Lot S solar analysis diagrams based on indicative block planning	Turner, 2020
7.9.103	Winter solstice 9am	Turner, 2020
7.9.104	Winter solstice 10am	Turner, 2020
7.9.105	Winter solstice 11am	Turner, 2020
7.9.106	Winter solstice 12pm	Turner, 2020
7.9.107	Winter solstice 1pm	Turner, 2020
7.9.108	Winter solstice 2pm	Turner, 2020
7.9.109	Winter solstice 3pm	Turner, 2020
7.9.110	Spring and Autumn equinox 9am	Turner, 2020
7.9.111	Spring and Autumn equinox 10am	Turner, 2020
7.9.112	Spring and Autumn equinox 11am	Turner, 2020
7.9.113	Spring and Autumn equinox 12pm	Turner, 2020
7.9.114	Spring and Autumn equinox 1pm	Turner, 2020
7.9.115	Spring and Autumn equinox 2pm	Turner, 2020
7.9.116	Spring and Autumn equinox 3pm	Turner, 2020
7.9.117	Summer solstice 9am	Turner, 2020
7.9.118	Summer solstice 10am	Turner, 2020
7.9.119	Summer solstice 11am	Turner, 2020
7.9.120	Summer solstice 12pm	Turner, 2020
7.9.121	Summer solstice 1pm	Turner, 2020
7.9.122	Summer solstice 2pm	Turner, 2020
7.9.123	Summer solstice 3pm	Turner, 2020

APPENDIX 7.10 ASSESSMENT

7.10.1	Big roof gathering space within the village green	Virtual Ideas, 2020
7.10.2	Waterloo South's 3 character sub-precinct areas	Turner, 2020
7.10.3	Waterloo's place character	Turner, 2020
7.10.4	The public domain defines the street level experience	Turner, 2020
7.10.5	The street level experience	Turner, 2020
7.10.6	The local level experience	Turner, 2020
7.10.7	The neighbourhood level experience	Turner, 2020
7.10.8	Waterloo South will deliver key public domain elements	Turner, 2020
7.10.9	A new urban village	Turner, 2020
7.10.10	Retail, services, community and cultural uses	Turner, 2020
7.10.11	Retention of existing trees	Virtual Ideas, 2020
7.10.12	Green Star rating tools proposed for Waterloo South	Green Building Council
7.10.13	A green arrival from the metro station Village Gree	Turner, 2020
7.10.14	Public open space network	Turner, 2020
7.10.15	Private open space network	Turner, 2020
7.10.16	Solar access to public open space	Turner, 2020
7.10.17	Solar access to communal open space	Turner, 2020
7.10.18	Solar access to developments	Turner, 2020
7.10.19	Passive survailance	Virtual Ideas, 2020
7.10.20	Providing opportunities for social interaction	Virtual Ideas, 2020
7.10.21	Community and cultural facilities located along accessible route	Turner, 2020
7.10.22	Communal open spaces supports public open space network	Turner, 2020
7.10.23	Diversity of built form; low to mid-rise buildings	Turner, 2020
7.10.24	Diversity of built form; taller buildings	Turner, 2020
7.10.25	Built form responds to future local context	Virtual Ideas, 2020
7.10.26	Waterloo Common activity zone	Virtual Ideas, 2020
7.10.27	Waterloo Common communiyu hub	Virtual Ideas, 2020