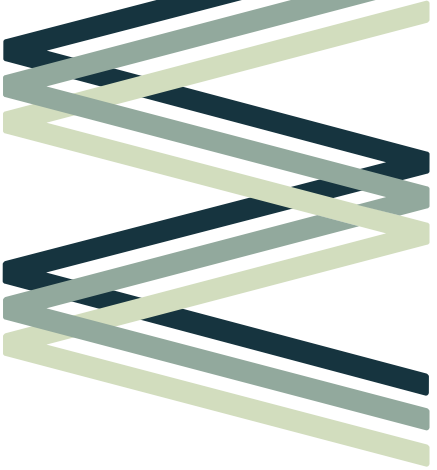


Attachment B7(d)

**Urban Design and Public Domain Study
Appendix 1 Baseline Analysis – Waterloo
Estate (South) – Land and Housing
Corporation**

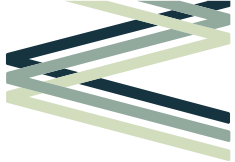


WATERLOO ESTATE WATERLOO SOUTH

URBAN DESIGN & PUBLIC DOMAIN STUDY

08 APRIL 2020

APPENDICES VOLUME 1
PLANNING PROPOSAL



QUALITY ASSURANCE

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QUALITY CONTROL

This document is for discussion purposes only unless signed and dated by a Director of Turner

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28.03.2020

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20.03.2020

REPORT DETAILS

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17018 Waterloo South: Urban Design & Public Domain Study

Date:

08 April 2020

CLIENT /



TEAM /



Fig. 0.01 Family & Culture Day, October 2015
Source: Counterpoint Community Services Facebook Page, 2018





CONTENTS

7.1	Baseline Analysis Provides detailed analysis and insights from the technical studies.	223
7.2	Options Provides a description of the options testing process.	280
7.3	Public Domain Describes how the public domain strategies work within state and local strategies.	307
7.4	Land Use, Sustainability and Resilience Proposed land uses, sustainability and resilience issues and strategies.	372
7.5	Private Domain Describes the built form strategy of the Indicative Concept Proposal and analysis of an individual lot to demonstrate consistency with ADG requirements.	390

7.1 BASELINE ANALYSIS

7.1.1	Strategic Alignment	224
7.1.2	Environment and Open Space	235
7.1.3	Transport, Streets and Connectivity	256
7.1.4	Housing Diversity and Liveability	261
7.1.5	Employment, Services, Retail, Arts and Culture	262
7.1.6	Sustainability and Infrastructure	269

**Eastern District Plan,
Greater Sydney Commission, 2018**



Fig. 714

Using the new metro station as a catalyst, the Estate provides major urban renewal, increasing housing provision a short distance from Central Sydney and other local employment centres.

Forming a bridge between regional (A Metropolis of Three Cities) and local planning policy (Sydney LEP and DCP), The Eastern District Plan establishes a number of priorities to manage economic, social and environmental growth over a 20-year period. The Plan stands as part of the Greater Sydney Commission's 'Metropolises of Three Cities' and alongside several other key district policies encompassing the metropolitan region.

Through the implementation of 10 Directions the Plan aims to support and grow international trade, further evolve the night-time economy, drive growth of the 'innovation corridor' and key health and education precincts, as well as improve infrastructure, open space access and the urban tree canopy to ensure a responsive and resilient district.

**Future Transport Strategy 2056,
Transport for NSW,**



Fig. 715

The Waterloo Metro Station will provide direct links to Central Sydney and beyond. The opportunities for the Estate include encouraging pedestrian and bicycle movement, reduction of congestion and pollution and connecting into existing active transport routes.

Continuing the ambitions of '2012 Long Term Transport Master Plan', the Future Transport Strategy looks ahead to 2056. A stronger emphasis is placed on new technology, co-design and cross agency cooperation to meet the rapidly growing demand across the State, such as the Greater Sydney Commissions 'Growth Infrastructure Compact'. Co-design will focus on closer engagement with customers, industry and communities in the formation of transport plans to ensure plans are relevant and reflective of changing community need.

**Future Directions for Social Housing in NSW
(2014), NSW Family and Community Services**



Fig. 716

The Estate 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.

Part of the 'Family and Community Services' agency's initiatives and reforms to improve their offering for those in need.

The 'Future Directions' plan provides a '10-year strategy to improve the effectiveness of social housing in NSW through three core priorities:

1. More Social Housing
2. More Opportunities, Support and Incentives to avoid / leave Social Housing
3. A Better Social Housing Experience.

These priorities will make use of the 'Social and Affordable Housing Fund' which will facilitate up to \$7billion of new social and affordable housing, all with the aim of supporting those in need of assistance, whilst also

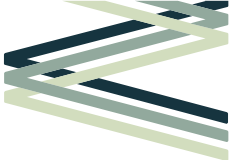
**Central to Eveleigh Urban Transformation
Strategy, Urban Growth NSW, 2016**



Fig. 717

The Estate will provide a diverse and dynamic new urban village, connected to the wider city region by a new metro station as well as supporting pedestrian and bicycle movement routes.

The 'Central to Eveleigh Corridor' is envisioned as a major growth district within Sydney. Over 50 hectares of government owned land have been split into three distinct projects including Redfern to Eveleigh, 'Central Station and Waterloo'. The strategy aims to better connect these diverse areas in support of the goals of 'Metropolises of Three Cities' (superseding 'A Plan for a Growing Sydney'), delivering new homes, businesses and public spaces. Investment in public transport, in particular railways, will stand as a key driver in this process. In doing so, inclusive growth is sought, bringing the benefits of continued prosperity to all communities whilst accommodating a growing and changing population.



Better Placed,
Government Architect NSW, 2017



Fig. 71.8

The Estate aims to welcome all through high-quality, interesting and attractive spaces whilst providing privacy and amenity to new residents.

Through 'Better Placed' the Government Architect provides guidance on both the processes and outcomes of design in support of existing planning policy and best practice. The aim is to assist built environment professionals, politicians, policy makers and communities in working together through the design process to achieve the best possible results with regard to quality, longevity and operation.

"Good design creates useable, user friendly, enjoyable and attractive places and spaces, which continue to provide value and benefits to people, the place and the natural environment over extended periods. Good design brings benefits socially, environmentally and economically, and builds on these benefits over time – it adds value." P49

Sustainable Green Grid,
Government Architect NSW, 2016



Fig. 71.9

The Estate has the opportunity to contribute to the Sydney Green Grid by providing additional open space and improved connections to the existing open space network.

The first overarching strategy for the Sydney metropolitan region focused solely on green infrastructure. From recreational spaces, to waterways, urban agriculture and ecology. The Green Grid supports the promotion, consolidation and creation of a connected network of open spaces across the Sydney region as a means of reducing environmental impact as well as maintaining Sydney's reputation as one of the world's most liveable cities.

Greener Places,
Government Architect NSW, 2017



Fig. 71.10

New open spaces, green and blue links will integrate with Sydney's wider 'Green Grid' along with hard and soft landscaping across the Estate.

The draft policy aims to promote discussion around green space policy amongst key stakeholders and the community. Greener Places outlines what green infrastructure is, its value and how it can be effectively integrated into the urban fabric using four core principles:

1. Integration: Combine green infrastructure with urban development and grey infrastructure.
2. Connectivity: Create an interconnected network of open space.
3. Multifunctionality: Deliver multiple ecosystem services simultaneously.
4. Participation: Involve stakeholders in development and implementation.

Apartment Design Guide,
NSW Department of Planning & Environment



Fig. 71.11

All residential units of the Estate will be designed to satisfy the objectives of Local and State standards by providing modern, comfortable units with private amenity space.

A key tool in establishing residential design guidance, the 'Apartment Design Guide' is empowered through the 'State Environmental Planning Policy 65: Design Quality of Residential Flat Development' (SEPP 65) and follows its predecessor the 'Residential Flat Design Code'. The guide states key suggested minimum space and amenity standards to improve liveability and longevity of apartment developments, providing detail on the nine design principles of SEPP 65.

A Liveability Framework for Sydney, NSW
 Department of Planning & Environment and
 Greater Sydney Commission, 2016



Fig. 7.112

An enjoyable and welcoming public realm, well designed residential dwellings and multiple community facilities will aim to facilitate social cohesion and the liveability of the Estate.

As Sydney continues to enjoy record economic growth which draws the focus of cross governmental attention, there is considered awareness of the need to balance this with social growth. The Liveability Framework aims to provide an understanding of social context within the growth context to ensure the city's reputation as a global leader in urban living is maintained and that the benefits of growth are spread across the social and demographic spectrum.

Create in NSW: Arts and Cultural Policy Framework (2013) Arts NSW



Fig. 7.113

A range of new community facilities, as well as formal and informal open spaces, aim to support local cultural and social activity.

A cross governmental policy to guide public funding of the arts across the entirety of NSW, focused on improving three core areas: 'Excellence, Access and Strength'. This includes support for innovation, leadership and Aboriginal culture as well building on and forming new international links. The arts form an important part of the NSW economy and access at all levels, whether across ages, abilities or skill sets is vital for its success.

City Plan 2036, City of Sydney, 2019



Fig. 7.114

The City Plan sets a vision for the next two decades of growth and development in the City.

A new net zero energy use target is established, and increased emphasis is placed on local character and infrastructure.
 The plan is a Local Strategic Planning Statement (LSP) sitting above the LEP and DCP, guiding their development with a vision that incorporates infrastructure, liveability, productivity and sustainability.

The City of Sydney's 'City Plan 2036' provides the next stages of the 'Green, Global and Connected' vision that was first formed in 2008 and later developed through 'Sustainable Sydney 2030'.

Housing for All, City of Sydney, 2019



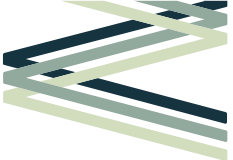
Fig. 7.115

Housing for All will guide housing delivery over the next 20 years alongside the LSPs through zoning controls, partnerships and other means, ensuring density is well placed and appropriate.

Directed by the Greater Sydney Region Plan, all local councils are required to prepare a housing plan to give clarity of vision for housing delivery.

The plan establishes priorities, objectives and actions for 56,000 dwellings by 2036, connecting into the principles of 'livability' from the LSPs.

Typically, housing is a State level concern, but LGAs use a number of routes to address local needs.



Sydney LEP 2012,
NSW Department of Planning & Environment



Fig. 7.116

The Estate will renew existing social housing whilst providing additional social (affordable rental) and market units, retail spaces, services, community facilities and open spaces.

Statutory document empowered by the Environmental Planning & Assessment Act 1979, providing subsequent power to the Development Control Plan (DCP) and supporting documents. Together these form the planning framework for direction and decision making in the City of Sydney government area.

Sydney LEP (2012) aims to reinforce the City of Sydney as the centre of the metropolitan region, encourage further growth through increased density and improved consideration of employment uses. In support of this are policies supporting growth and diversification of residential uses as well as improved infrastructure and transport.

Sydney DCP 2012,
Draft, City of Sydney

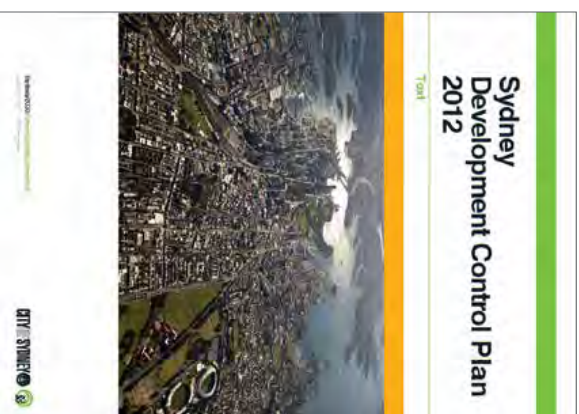


Fig. 7.117

The renewal of the Estate will integrate with existing networks whilst creating a place with a distinct identity.

Provides detailed guidance on the implementation of policy ambitions established through Sydney LEP 2012. These include the recognition and support of distinctive character areas, including heritage, and design which responds to this, the enhancement of the public realm, integration of Sustainable Sydney 2030 objectives and encouraging ecologically sustainable development.

Central Sydney Planning Strategy 2016 -2036,
Draft, City of Sydney

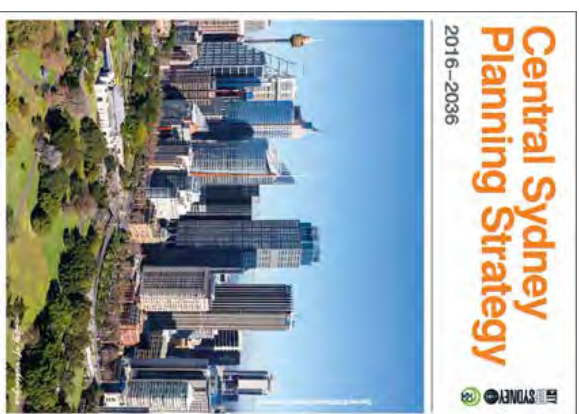


Fig. 7.118

The Estate provides a major opportunity for large scale urban renewal, increasing housing and improving the public realm.

Overarching comprehensive planning strategy for Sydney outlining how growth will be realised and managed through to 2036. Focus is given to achieving balance between residential, commercial and environmental pressures in parallel to infrastructure and transport.

Sustainable Sydney 2030,
City of Sydney, 2017



Fig. 7.119

A multi-faceted masterplan will provide a new urban village connecting to the existing fabric of Sydney providing new housing, community facilities and open spaces.

The primary strategic vision for the City of Sydney, the result of extensive community engagement forming key priorities to be realised through various policies and action plans. The core focus aligns with the Premiers 12 Priorities as well as multiple international agreements, ultimately laying the foundations for a 'green, global and connected city'. This will be achieved through expanded green links, further minimising environmental impacts and ensuring a global orientation in terms of trade and knowledge exchange.

Development Capacity Study 2019, City of Sydney

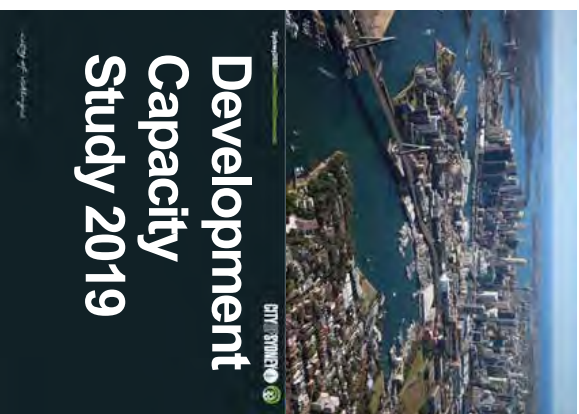


Fig. 7.1.20

The past decade has seen growth of 30,000 new dwellings and 117,000 new workers across the City. With the City projected to continue growing, the capacity study provides insight to where and how this growth can be best captured.

The study uses the 2017 Floor Space and Employment Survey to calculate potential development capacities across the City area, as well as the likelihood of development.

The study informs a range of other policy documents including 'Housing for All', to ensure projections are accurate and informed.

Digital Strategy 2017, City of Sydney



Fig. 7.1.21

Delivering a connected community that aligns itself with the wide-scale digital approach that the COS outlines.

The Sustainable Sydney 2030 vision revealed the communities desire for a smart city in the digital age. The City of Sydney (COS) Digital Strategy begins to blueprint a strategy for a digital city, being one that allows increased accessibility to technology, economical engagement and provides the amenities and services for the growing residential population.

The strategy identifies six key priorities within the blueprint. All priorities are community driven, aiming to increase skills, participation, amenity and engagement for all members of the community.

The Waterloo Estate has the opportunity to support the new digital approach to placemaking, in particular its role in engaging community and economy in the delivery.

Creative City, City of Sydney, 2014



Fig. 7.1.22

Cultural and community facilities will form a key element of the Estate.

Born out of 'Sustainable Sydney 2030', the 'Creative City Cultural Policy' is a 10-year strategic plan for directing initiatives, grants, sponsorship, infrastructure, advocacy, services and regulations in pursuit of supporting city-wide creative expression.

Liveable Green Network, City of Sydney, 2011

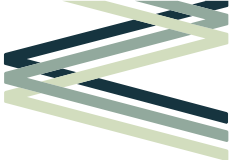


Fig. 7.1.23

The Liveable Green Network is focused on creating a connected pedestrian and cycle network to major destinations across the City and Inner Sydney area.

The Liveable Green Network is an important element of the Sustainable Sydney 2030 program that focuses on delivering a connected pedestrian and cycle network. The report identifies existing weakness and the networks and uses case study research to develop a series of solutions to completing these connections.

With a focus on active transport, the Liveable Green Network will help deliver targets 7, 8 and 9 of Sustainable Sydney 2030, by making walking and cycling more attractive, through a connected pedestrian and cycle network, with the most convenient and direct connections to major destinations across the City and Inner Sydney area at a City Wide, City Centre and Village Centre level.



Environmental Action 2016-2021,
City of Sydney, 2017

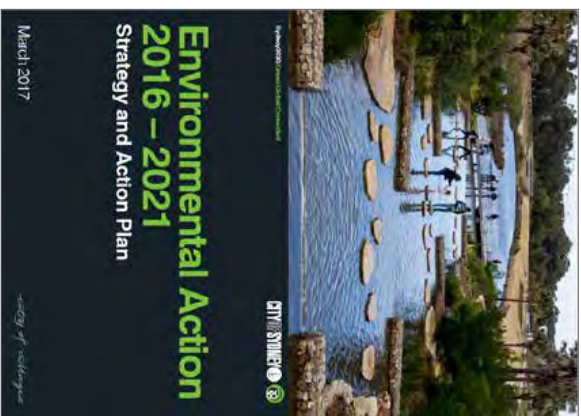


Fig. 71.24

Building orientation, designed environmental standards integrated with landscaping will minimise environmental impact.

A five-year overarching environmental plan feeding into Sustainable Sydney 2030. This plan establishes the city's aims to reduce waste, move to a low-carbon place through the use of renewable energy, improve the quality and care of the regions water resources and boost urban biodiversity.

Open Space, Sports and Recreation Needs Study, Volume 1, City of Sydney, 2016



Fig. 71.25

Integrating the findings of the Study into the Waterloo Estate will work to maximise the value, diversity and quality of the open spaces available.

The City of Sydney Open Space, Sports and Recreation Needs Study details the objectives, directions and recommendations for the future planning provisions, development and management of the city's public open space and recreation facilities.

The study revealed nine strategy directions. Of these nine directions, the Waterloo Estate has the opportunity to support:

- More open space for a growing population
- Access to recreation in the city will be inclusive and accessible for all
- Linking the network
- Involving the community
- Recreation will be environmentally sustainable

Open Space, Sports and Recreation Needs Study, Volume 2, City of Sydney, 2016



Fig. 71.26

A series of quantitative and qualitative benchmarks with criteria frameworks guide the delivery of future open space, sports and recreations provisions.

The second volume of the City of Sydney's open space study establishes benchmarks and a strategy to ensure the delivery of an interconnected network of open spaces is achievable.

The delivery plan incorporates demographic, density and preference projections to guide the scale and form of provisions with the overarching ambition of improve quality, volume and accessibility.

Public Domain Manual,
City of Sydney, 2017



Public Domain Manual

February 2017

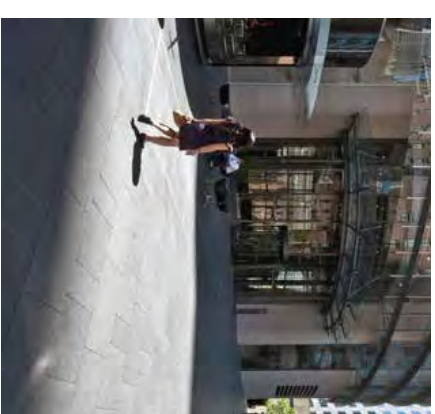


Fig. 71.27

Ensuring that the progression of the Waterloo Estate's public domain is aligned with the rules and regulations delivered by the COS in the interest of the greater community.

The City of Sydney's Public Domain Manual provides information on the process of submission, management and responsibilities of works undertaken in the public domain. The document applies to works during Construction Certificate, construction and Occupation Certificate stages.

Sydney Street Code,
City of Sydney, 2013



Fig. 71.28

Gathering a coherent understanding of the possible street typologies surrounding the Waterloo Estate can assist in developing design responses that will be more responsive, connected and sustainable when delivered.

The Sydney Streets Code is one of five code documents published by the City of Sydney. The Sydney Streets Code details the guidelines, design coordination and material palettes for works undertaken in the city's public domain. The document is suggested to be read alongside the companion document, 'Sydney Streets Code Technical Specification.'

The code details five key design principles:

1. Public space, public life
2. Promote sustainability
3. Promote inclusive design
4. Promote active transport
5. Respect distinctiveness and 'place'

Street Tree Masterplan,
City of Sydney, 2011



Fig. 71.29

Supporting the recognition that trees are one of the most significant factors in making a street a 'place.'

The City of Sydney's Street Tree Master Plan is one part of a suite of documents that will allow a more proactive management of its tree resources. With this resource, a co-ordinated and strategic approach to street trees will emerge. The plan details the street tree arrangements for city by understanding the city as a series of unique precincts. The plan also details the species selection process and the technical guidelines for planting, establishment and maintenance.

From the document, information regarding the microclimate, geological conditions and present species arrangement is provided. Understanding the given information will help drive more sustainable and complete decisions regarding the new planting around the Waterloo Estate and how it may better respond to its context.

Urban Forest Strategy,
City of Sydney, 2013



Fig. 71.30

Highlighting the need to protect and maintain existing trees, with the aim of increasing the average total canopy by 23.25% by 2030, increase species diversity and engage and educate the community.

The Urban Forest Strategy outlines the way the City will work to improve the environment, using trees, whilst managing the associated risks and costs.

The strategy names four fundamental objectives:

1. Protect and maintain the existing urban forest
2. Increase canopy cover
3. Improve urban forest diversity
4. Increase community knowledge and engagement

The strategy is an essential component of the Greening Sydney Plan which aims to achieve the benchmarks set by the Sustainable Sydney 2030. The urban forest considers all trees and vegetation located throughout the City of Sydney. The document details the actual canopy (as of 2008) of the Waterloo region at 16.0% and recognises the target canopy of 20%.

Sydney Landscape Code,
City of Sydney



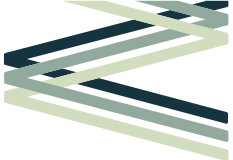
Fig. 71.31

The principles and codes within the Sydney Landscape Code are aligned with the targets set by the Sustainable Sydney 2030 vision for Sydney as a green, global and connected city, which the Waterloo Estate will contribute to.

The purpose of the Sydney Landscape Code is to guide the creation of high quality and sustainable spaces within private developments in the City of Sydney. The codes inform land owners of the correct means of contributing to the greening of the city, including the requirements for Development Application Submissions.

The code sets out five landscape design principles:

1. Promote responsive landscape environments
2. Promote sustainability
3. Create beautiful and comfortable places for people
4. Contribute to and enhance the natural environment and urban ecology
5. Promote and improve water quality



Sydney Streets Technical Specification,
City of Sydney, 2016

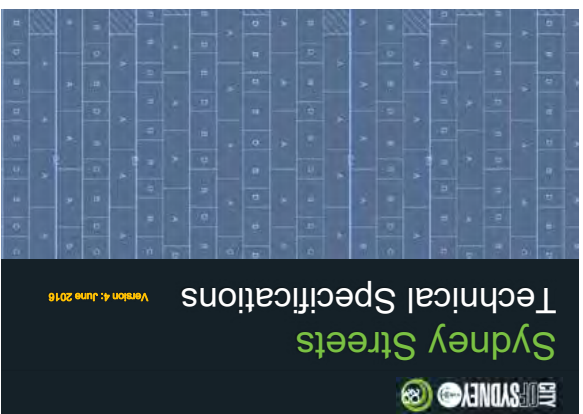


Fig. 71.32

Adhering to the specifications to ensure a high quality urban streetscape is provided.

The Sydney Streets Technical Specification sets out the technical requirements for streets and footpaths in the City of Sydney Local Government Area. The document is an accompaniment to the 'Sydney Streets Code 2013.' The specification draws on the Sustainable Sydney 2030 objectives, with the new standards intending to produce long-term maintenance benefits.

Sydney Lights Design Code,
City of Sydney, 2015



Fig. 71.33

Recognising the shift toward a more sustainable lighting strategy and the role lighting has in the creative and artistic expression of Waterloo.

The City of Sydney's Sydney Lights Code creates a coherent approach for lighting the City's public domain. The City has over 400km of roadway, over 400 parks and open space and numerous other spatial typologies, all of which require lighting to ensure safety, engagement and legibility.

Five key principles are outlined in the document:

1. Promote safety and inclusive design
2. Enhance public spaces, public life
3. Promote sustainability
4. Promote active transport
5. Respect distinctiveness and place

The Waterloo Estate has the capacity to meet all the guiding principles of the code, particularly those relating to safety, active transport and spatial distinctiveness.

Cycle Strategy and Action Plan (2007-2017),
City of Sydney, 2007

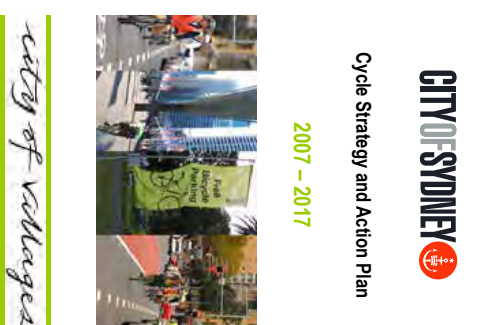


Fig. 71.34

Waterloo's public domain can contribute to the city meeting the predicted targets, including increasing the number of bicycle trips from less than 2% in 2006 to 10% by 2016.

The Cycle Strategy and Action Plan was developed by the City of Sydney following their commitment to making cycling an equal first choice transport mode. The strategy details the infrastructure requirements needed to make cycling a safer, more comfortable experience for current and potential commuters.

Alongside the infrastructure requirements, the plan outlines the importance of social initiatives. These initiatives aspire to promote an awareness of cycling as a transit method, the benefits of cycling for the community and individuals, and generally shift the occasionally negative behavioural responses that are aligned with cycling. Rethinking how cycling infrastructure is integrated into existing and proposed urban areas is essential for the Waterloo Estate which will be co-located with the new metro station.

Draft Cycle Strategy and Action Plan,
City of Sydney, 2018



Fig. 71.35

Ensuring that the streetscape and open space connections will assist in achieving the plan and principles outlined by the latest cycling strategy.

This document is a follow on from the Action Plan from 2007 - 2017. Whilst it maintains many of the existing significant principles and values from the original document, it has developed a new set of principles to move the city into a more sustainable future.

The guiding principles are:

1. Leadership and advocacy
2. Supporting businesses
3. Supporting people to ride
4. Connecting the network

**Urban Ecology Strategic Action Plan,
City of Sydney, 2014**



Fig. 7.136

Improving bio-diversity and creating a resilient and diverse urban ecosystem for the Waterloo Estate, informed by the findings and research within the Plan.

The Urban Ecology Strategic Action Plan is a supporting document to the Environmental Action 2016 – 2021 Strategy and Action Plan. The focus of this plan is to explore the potential to conserve, restore and promote local flora and fauna to increase the biodiversity within the city.

**Legible Sydney, Wayfinding Strategy,
City of Sydney, 2016**



Fig. 7.137

Delivering a Estate that is legible and safe for the existing and incoming diverse members of the community.

The Legible Sydney Wayfinding Strategy is aimed at creating a more legible public domain that will begin to encourage people to walk with comfort and confidence around the City of Sydney. The strategy develops a set of coherent responses to wayfinding, including detailing how digital technology is an important component of wayfinding moving into the future.

The Waterloo Estate must adopt contemporary wayfinding strategies to ensure it is easily accessible for those in the immediate community and those who are visiting the area. Delivering a communicable streetscape both day and night is also highly important to ensure the space remains regularly active and safe for users.

**Walking Strategy and Action Plan,
City of Sydney, 2017**

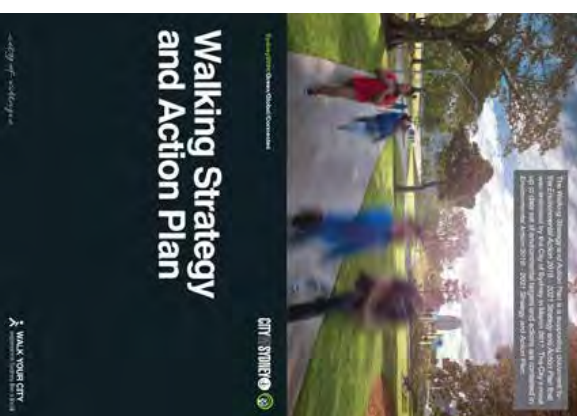


Fig. 7.138

Informing the design of the Waterloo Estate, ensuring the delivery of a walkable precinct.

The Walking Strategy and Action Plan recognises the value of a walkable city, for both the community and the environment. This document explores the walkable routes commonly undertaken by residents, and reflects on the characteristics that make this condition possible.

- There are four priorities guiding the document:
1. Make walking quick, convenient and easy
 2. Make walking inviting and interesting
 3. Make walking safe and comfortable
 4. Create a strong walking culture

**Community Garden Guidelines,
City of Sydney, 2016**

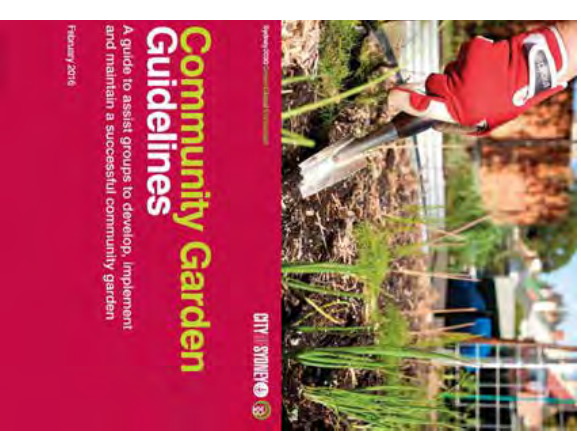


Fig. 7.139

Guiding the edible landscape initiative across the Waterloo Estate.

This document is a guide for community groups and residents to create a successful community garden in their area. Community Gardens form part of the Sustainable Sydney 2030 program and are popular ways of exploring sustainable and regenerative initiatives.

The guidelines suggest typologies for gardens based on a key set of characteristics and outline the correct method to engage authorities and community member awareness to maximise the gardens success.



Fig. 71.40 Waterloo Park: Playground provides a key open space with dense tree cover.
Source: Robert BD&P, 2018

7.1.2 ENVIRONMENT + OPEN SPACE

Waterloo has the opportunity to contribute to the Sydney Green Grid and the Liveable Green Network by providing additional open space and improved connections to the existing open space network

Within the local area of Sydney there are more than 400 parks and open spaces covering more than 188 hectares. These include regional, district, local and pocket parks, sports facilities, plazas, laneways and streets. Within a 2km radius of the Estate there are 2 major regional parks, Moore Park (115 hectares) and Sydney Park (40 hectares). Outside of this, other major parks include Prince Alfred Park, Victoria Park and Centennial Park.

Regional strategies emphasise that as Sydney grows, increased liveability will provide the context for development, and green infrastructure and open space are fundamental in the creation of the city's future. The Sydney Green Grid proposes a network of high-quality open spaces including national, regional and local parks. This network provides a framework from which open spaces are connected to the public realm. Connectivity will be achieved through green corridors, transport routes, pedestrian links and cycleways.

Major urban transformation projects, such as the renewal of the Estate, offer opportunities to provide additional open space and improve connections to the existing open space network. The focus will be in providing connections and access to existing major regional open spaces such as Moore Park, Centennial Parklands and Sydney Park to meet recreational needs and enhance liveability in these areas.

Walking times from the Estate to regional parks range from 17 to 40 minutes and can be longer due to limited, signalised crossings or busy arterial roads such as the Eastern Distributor, Cleveland Street, McEvoy Street and Botany Road. Poor amenity on these roads can deter pedestrians and cyclists from accessing these regional open spaces and reinforces the importance of district, neighbourhood and local parks and amenities in close proximity to the Estate.

EXISTING OPEN SPACE NETWORK

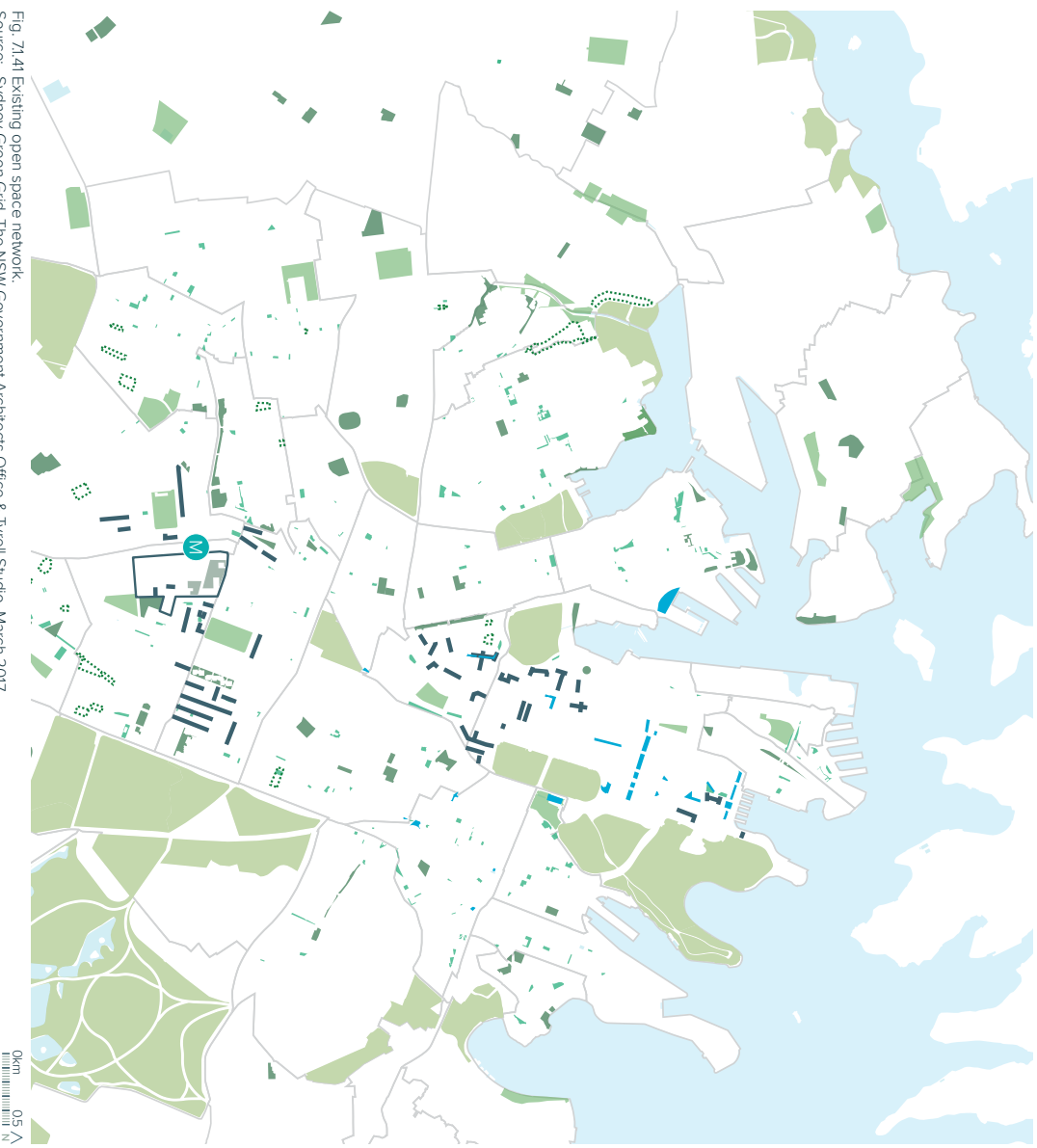
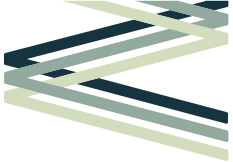


Fig. 7.1.41 Existing open space network.
Source: Sydney Green Grid, The NSW Government Architects Office & Tyrrell Studio, March 2017.
Waterloo Open Space Study Report - Draft, Clouston Associates, Dec 2017.

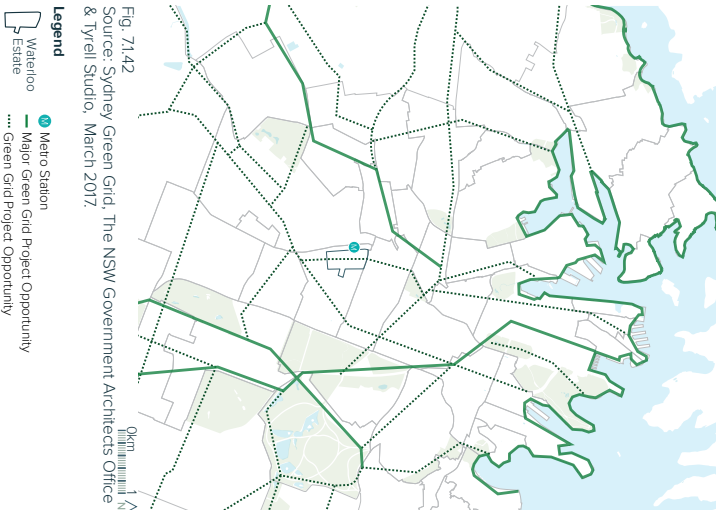
- Legend**
- Waterloo
 - Metro Station
 - Laneway
 - Regional Park
 - District Park
 - Local Park
 - Pocket Park
 - COS Future Provision
 - Civic Spaces
 - Water Bodies
 - Estate



PUBLIC DOMAIN

The Estate has the opportunity to connect and contribute to key environmental and open space regional strategies in Greater Sydney

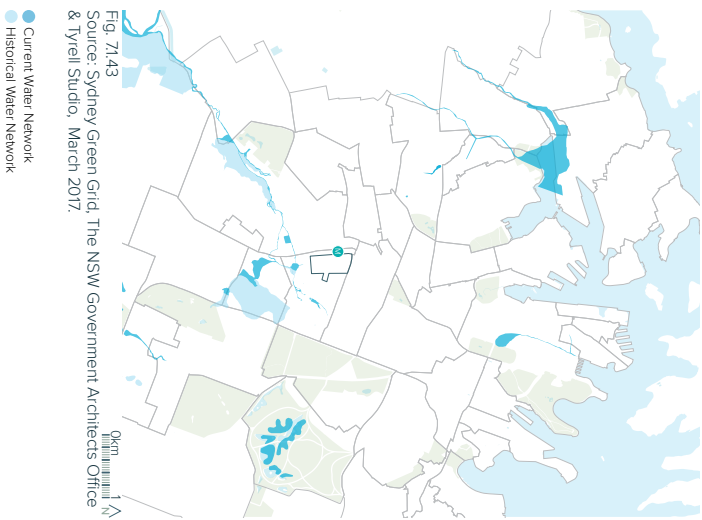
GREEN GRID



George Street has the opportunity to be developed as a major green link that connects to the Sydney Green Grid.

'Bourke Street and George Street Active Transport Green Links' are identified as a Sydney Green Grid project opportunity. Under the urban renewal initiative, the Estate has the opportunity to provide additional open spaces and improve existing connections to the wider open space network. Within the Green Grid framework, George Street has the potential to become a vital link within the network. By aligning with the region's strategic initiatives, the Estate can assist with the delivery of the Metropolitan Green Grid across Greater Sydney.

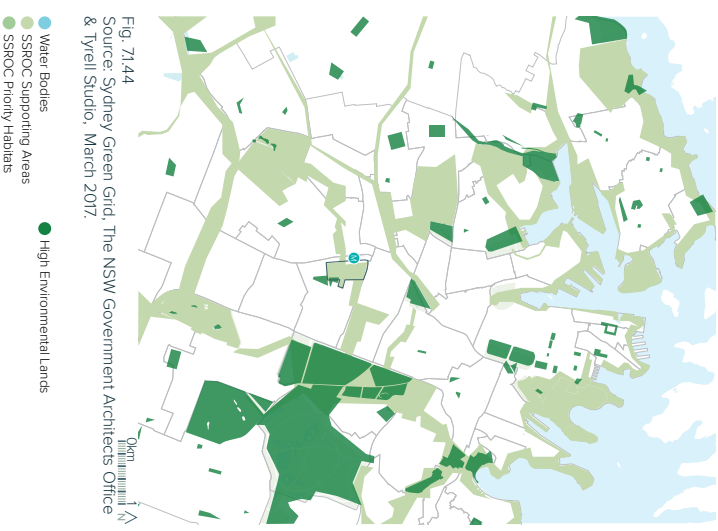
BLUE GRID



The Estate has the opportunity to provide blue-green infrastructure that connects to and reinforces the blue grid.

Historically, water has contributed to the agricultural and industrial development of the area. During the mid-nineteenth Century, Waterloo provided the water supply to swamps and creeks including Alexandria Canal (known as Shear's Creek) and Waterloo Swamp. The integration of water sensitive urban design (WSUD) strategies within the Estate as part of the water management system connects back to the cultural significance of water and will also increase the recreational value of the water infrastructure.

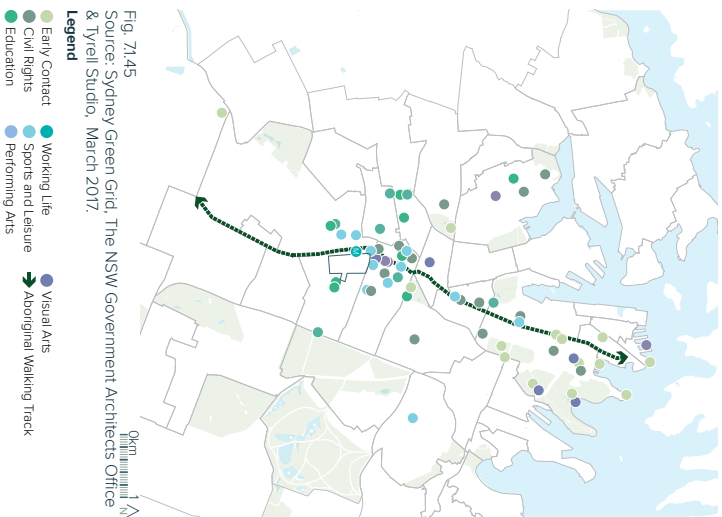
ECOLOGICAL GRID



The Estate has the opportunity to connect to existing biodiversity corridors and support threatened flora and fauna species.

The Southern Sydney Regional Organisation of Councils (SSROC) 'Connected Corridors for Biodiversity' project maps the Estate as a habitat supporting area for identified species. The corridor adjoins Waterloo Park and Waterloo Oval that have been identified as 'High Environmental Lands' for biodiversity conservation. The Estate has the opportunity to encourage the growth of landscape plantings and street trees as habitats that support mobile species such as birds and bats. By providing a connected biodiversity corridor, the movement and dispersal of ecological communities across the ecological grid will be facilitated, supporting regional strategies.

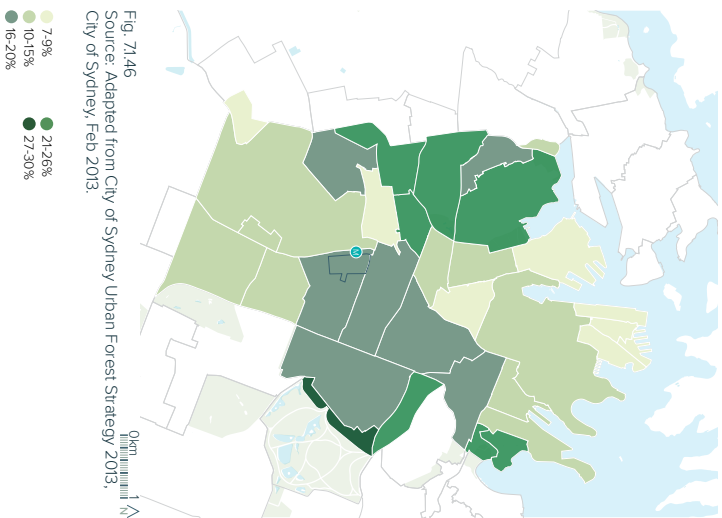
OCHRE GRID



The Estate has the opportunity to contribute to the cultural and economic development of the indigenous population.

The OCHRE Plan was established to encourage the growth of the social, economic and cultural life of Aboriginal communities. The Estate's strong Aboriginal history provides the opportunity to preserve and nurture Aboriginal culture. Local business and arts also have the opportunity to empower the Aboriginal community both economically and culturally. Understanding the significant indigenous sites within the Estate will provide opportunities for connection and integration to the OCHRE grid.

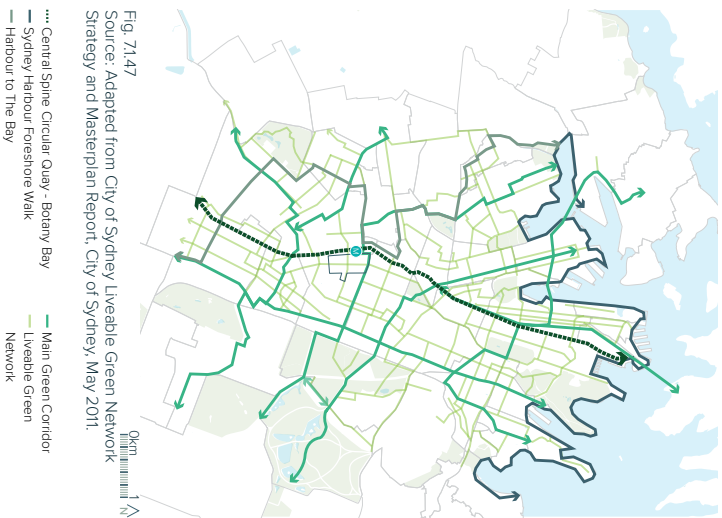
URBAN FOREST



The Estate has the opportunity to reinforce the City of Sydney's urban forest strategy through a retention strategy that respects the established street tree character, and a replantment strategy that reinforces the existing residential character of the area.

The Estate was developed from the late 1950s to the 1980s. At the time only small trees could be identified at the corner of Pitt and Philip Streets and along George Street. The large trees (such as Figs and Eucalypts) that exist within the Estate today are less than 45 years old. The Estate captures 939 existing trees located within both public and private land ownership. The trees within the site are comprised of endemic, native exotic and invasive species with a total of 111 species types within or adjacent to the Estate.

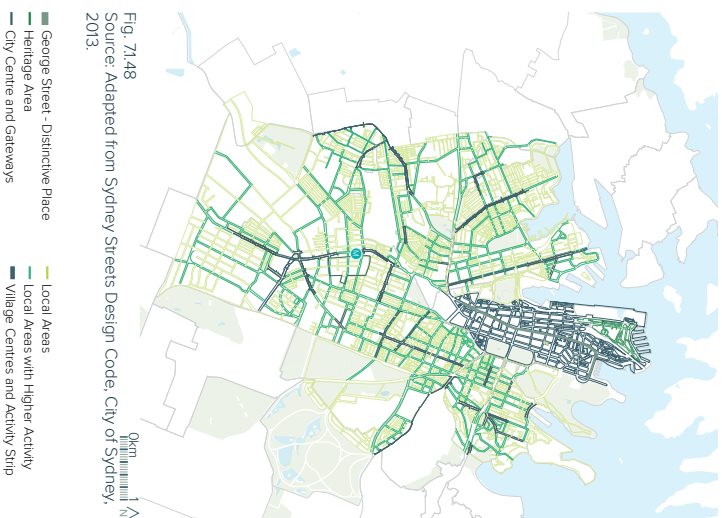
LIVEABLE GREEN NETWORK



The renewal of the Estate will contribute to the Liveable Green Network by addressing a network gap and supporting the existing public domain.

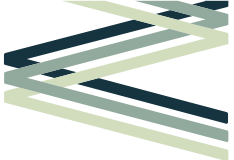
With a focus on active transport, the Liveable Green Network will help deliver targets 7, 8 and 9 of Sustainable Sydney 2030 by making walking and cycling more attractive through a connected pedestrian and cycle network with the most convenient and direct connections to major destinations across the City and Inner Sydney area. The Estate currently blocks this connectivity, the large blocks and change in levels between Pitt and George Streets creating a barrier to pedestrian movement. The existing Waterloo Green provides a barrier to cycle movement, with conflicts between residents and cyclist creating a perception that it is not safe.

CHARACTER



The approach for the public domain in the renewal of the Estate will need to be assessed based on future uses and the vision for the Estate and surrounding areas.

In local areas such as Redfern and Waterloo, squares and plazas often occur at train stations, or are created by street closures, creating social spaces for the local community and residents of the area. Within the Estate street closures at the southern ends of Cope, George and Mead Streets, have created pedestrian through site links for cyclists and small pocket plazas for leisure and social activity. However, there are limited facilities such as benches, that are often heavily shaded by existing trees, creating an unpleasant microclimate.



OPEN SPACE

Understanding the open space structure, hierarchy, use and connections within and outside the Estate boundary is key to identifying the opportunities and challenges

While there is a significant amount of open space within the Estate, much of it is underutilised and lacks definition and purpose other than to provide visual amenity and a sense of openness. The use of space is influenced by a range of factors including microclimate, accessibility (on foot, by bicycle or by wheelchairs) and use (whether the open space is for private, communal or public use).

Local parks such as Waterloo Park (including Waterloo Oval south of McEwry Street) flank the south-eastern corner of the site but provide limited use due to the steep and undulating topography.

Open space within the Estate is owned and managed by LAHC and is predominantly private or communal space for residents. The northern open lawn areas/park are publicly accessible providing facilities such as bench seating co-located under or near tree clusters. Waterloo Green, which is part of the open space network within the Estate, is publicly accessible, privately owned space. Semi-enclosed open space to the west and east of the open lawn areas provides facilities such as community gardens, barbecue areas, outdoor fitness equipment and play spaces for local residents.

LOCAL OPEN SPACE AMENITY



Fig. 71.49
Source: Clouston Associates, 2017

- Legend**
- Waterloo Estate
 - Waterloo South
 - Metro Station
 - District Park
 - Local Park
 - Pocket Park
 - Roof Garden
 - Public Sports Facilities
 - Private Sports Facilities
 - Neighbourhood Playground
 - Regional Playground
 - Publicly Accessible Open Space
 - Pocket Playground
 - Trees

Waterloo Green 1.7 Ha open space (Publicly accessible private land)

URBAN FOREST

Future ongoing and continuous planting will be required to maintain and improve canopy cover and age class distribution

Canopy cover exceeds advocated targets for the overall suburb of Waterloo however removal of large canopy trees, over the masterplan life, will have a corresponding negative effect and requires a tree replacement strategy to increase the canopy cover over time.

Figs and large Eucalypts that have been planted in close proximity to each other and adjacent buildings, have inter grown asymmetric canopies and root structures that are intertwined with adjacent built infrastructure, or other surrounding trees, creating issues for individual trees and surrounding infrastructure such as footpaths, walls, carparking and below ground drainage lines.

Retention of larger Eucalypts will assist with the delivery of mature landscapes across the site for future buildings, streets and open space, however will be challenging due to Eucalypts generally having a low tolerance of related construction disturbance.

Due to the area's sandy soils, tree root systems have developed at greater depths and distances away from trees, under existing pavements and structures, with some clearly visible on the ground surface.

Adequate space needs to be allowed for trunks and roots of both figs and larger Eucalypts to allow future expansion of young and semi mature trees. Large scale figs require ample space both above and below ground. Such issues will create challenges for developing new infrastructure including pathways.

EXISTING CANOPY COVER

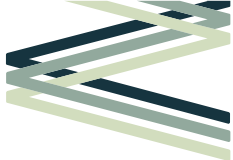


Fig. 71.50
Source: Waterloo Estate-South, Urban Forest Study, Atterra, 2020

- Legend**
- Waterloo Estate
 - Waterloo South
 - Metro Station
 - Existing Canopy Cover

0m 100m

**939 Existing trees
Canopy Cover 31%**
(Waterloo Estate)



TREES

Within Waterloo South, there are 440 High and moderate value trees, representing 47% of the overall existing trees within the Estate

There are 477 existing Low value and 22 “Should remove/ No retention” value trees, constituting 51% and 2% respectively, of the existing overall trees within the Estate. Low retention value trees are generally in poor condition, have structural defects, are small growing or commingle trees and have no historic, environmental or social significance.

Both categories of trees should be considered for replacement as part of the tree replacement strategy with more appropriate planting that contributes to a productive landscape and biodiversity.

HIGH VALUE TREES



Within Waterloo South, there are 141 existing High value trees, constituting 15% of the existing overall trees within Waterloo South.

- High retention value tree characteristics:
- Large
 - Visually prominent
 - Historically or environmental important
 - In good or very good condition
 - Part of an important group of trees
- Removal of high value trees should be avoided where possible and feasible.

MODERATE VALUE TREES



Within Waterloo South, there are 299 existing Moderate value trees, constituting 32% of the existing overall trees within Waterloo South.

- Moderate retention value tree characteristics:
- Mature with average form and vigour
 - Mature with minor defects
 - Smaller or semi-mature trees with good form and vigour
 - In good to reasonable condition
 - Of lesser value within a good grouping of trees
- Moderate value trees should be retained where possible and feasible.

FIGS



Within the Estate, there are 69 existing Fig trees, within the High to Low value categories, constituting 6% of the existing overall trees within the Estate.

Mature figs that over-shadow particular areas throughout the area have created uninviting and unusable space beneath, due to heavy shade, constant fruit and leaf fall and extensive surface root and buttress systems.

However, they do contribute to the landscape character of the Estate and High and Moderate value examples should be retained where possible and feasible.

TREE FAMILIES



Within the Estate, the tree population is dominated by four to five tree ‘families’, with one family (Myrtaceae) dominating at 47 percent, this is higher than the City of Sydney’s target of 40 percent family and 10 percent for an individual species.

Composition of tree species within the Estate are approaching or exceeding set targets and removal of sections of Myrtaceae family will need to be considered to prevent further skewing of the representation of the family.

Key species include:

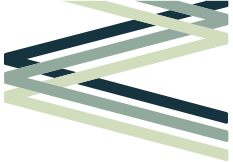
- Eucalyptus microcorys (Tallowood) (31%)
- Ficus macrocarpa var. hillii (Hills Weeping Fig) (22%)
- Corymbia maculata (Spotted Gum) (8%)
- Eucalyptus saligna (Sydney Blue Gum) (5%)
- Corymbia citriodora (Lemon Scented Gum) (5%)

BIODIVERSITY CONSTRAINTS



For further review of the retention of trees within the Estate, a tree by tree assessment will need to take into account the condition of the tree in relation to its age and lifespan, as well as its immediate existing environment, and its impact to existing and future infrastructure within the Estate. Further work will also need to take into account community consultation and the significance of the Estate’s trees to the local residents.

Classifications are based on Environment NSW standard measures of Biodiversity.



URBAN FORM

The urban character of Waterloo and surrounding areas reflects a history of ad hoc growth over time

A large part of the historic urban structure surrounding the Estate remains, including:

- Orthogonal network of streets, including the main north-south arterial roads connecting to Central Sydney and the east-west routes with a more local function.
- The fine-grained Nineteenth Century / early Twentieth Century terraces that define the interface between the Estate and the adjacent urban areas.
- The activity centres around Redfern Street and Regent Street that provide local concentrations of community facilities and places of social interaction.
- Prominent corner buildings on key streets, often denoted by a pub or other community facility exist, but no longer within the Estate boundary.
- The orientation and general arrangement of high streets in village centres suggest these calmer/slower streets interconnect between two main/high traffic roads (e.g., Redfern Street between Regent Street/ Botany Rd and Chalmers Street).

Building heights at the district scale illustrate how more recent development within the locations designated for urban renewal and positioned around transit corridors are resulting in the clustering of taller buildings, particularly around:

- Central Station / Ultimo,
- Green Square Town Centre,
- Lachlan / ACI Urban Renewal Precincts, and
- Zetland / Victoria Urban Renewal Precincts.

BUILDING HEIGHTS AT DISTRICT LEVEL

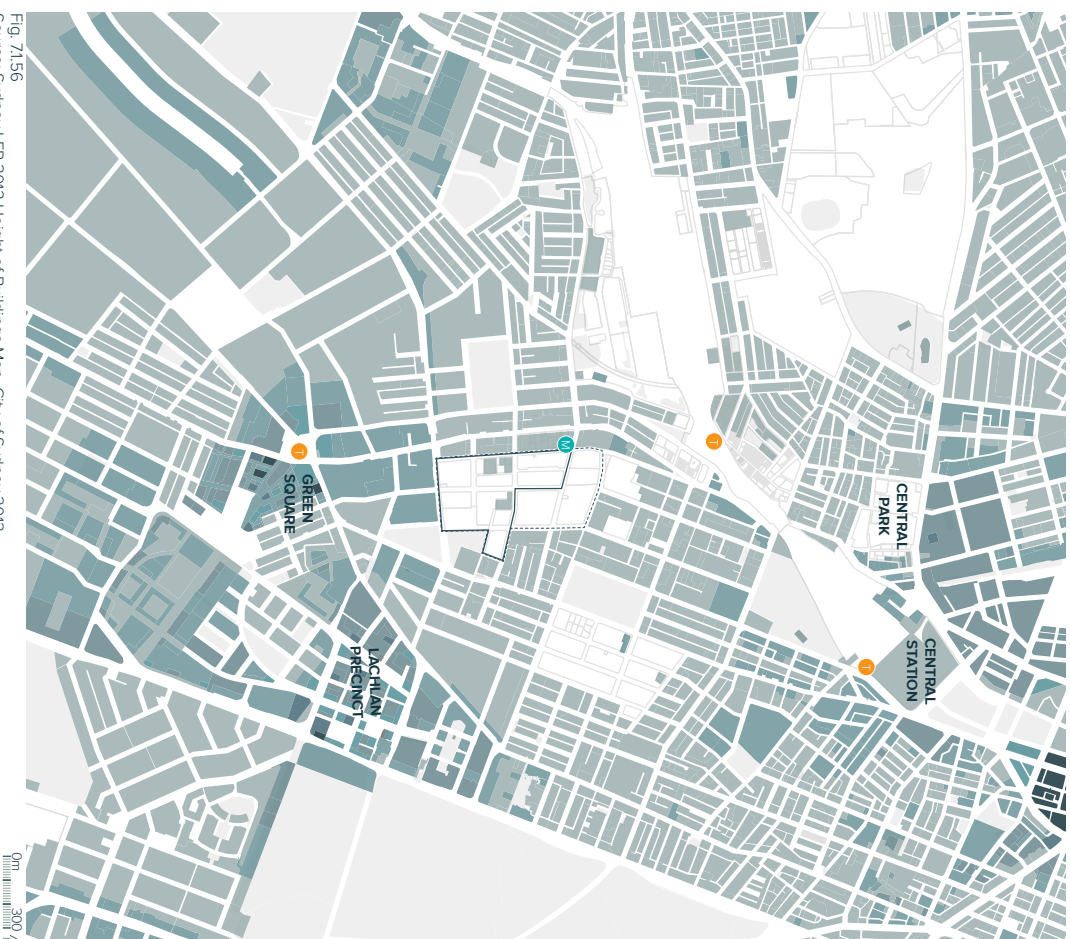


Fig. 7.1.56
Source: Sydney LEP 2012 Height of Buildings Map, City of Sydney 2012

LAND USE

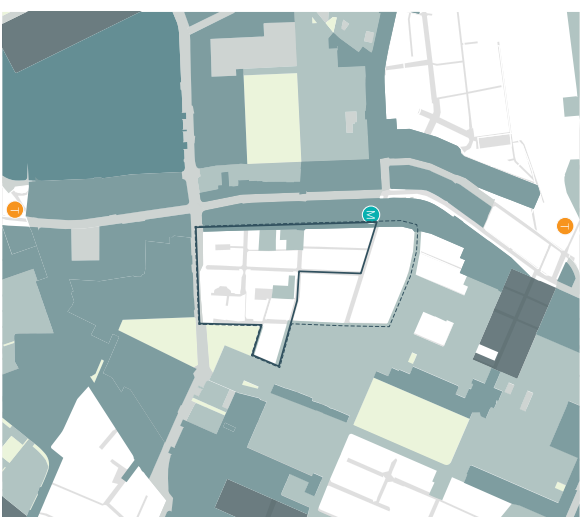
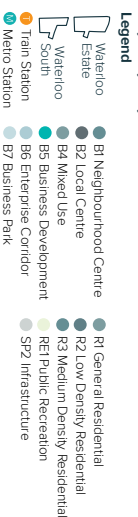


Fig. 71.57
Source: Sydney LEP 2012 Land Use Map,
City of Sydney 2012



Renewal precincts are crucial contributors to the development of the 30-minute city, with local centres vital in providing essential access to day-to-day goods and services close to where people live.

As Sydney continues to grow, existing zoning patterns will need to be revised to better reflect the changing density of these inner-city localities to ensure the 30 minute city can be successfully realised.

At present, many renewal precincts are zoned R1 General Residential and B4 Mixed Use. A mix of land-use zoning is at the heart of establishing liveable neighbourhoods and is required in renewal precincts to promote healthy, active lifestyles and social interaction that can better support the arts, creativity, cultural expression and innovation.

CHARACTER



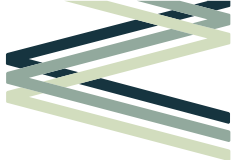
Fig. 71.58

Building Footprint

In contrast to the urban grain of its context, the Estate forms something of an 'island', disconnected from the surrounding grid of streets and the surrounding urban form.

A series of distinct 'character areas' surround the Estate:

- The heritage conservation areas.
- The railway lands around the Australian Technology Park (ATP) and Redfern Station.
- Botany Road to the west, which transitions in character south of McEvoy Street.
- The area to the south, progressively being redeveloped to multi-residential uses.



HOUSING TYPOLOGIES



Fig. 71.59

Six categories of existing building typologies are identified for the residential and non-residential buildings across the Estate.

1. Towers located to the north of the Estate
2. Slab buildings located to the north of the Estate
3. Medium density residential buildings located to the east and south of the Estate
4. Low rise walk ups located to the west and south of the Estate
5. Terrace housing located to the west of the Estate
6. Non-residential buildings including IGA X-press and other small retailers are located within the Estate.



Fig. 71.60 Tuanga Tower



Fig. 71.62 James Cook Building



Fig. 71.64 Drysdale



Fig. 71.61 Typical lowrise walk up flat building



Fig. 71.63 228-231 Cope Street.



Fig. 71.65 Waterloo Congregational Church

BUILDING HEIGHTS



There is a transition in building height within the Estate boundaries from south to north, with the tallest building located to the north, closer to Redfern Village.

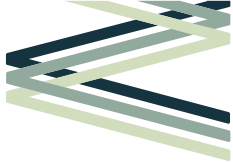
- Building heights at the Estate scale show:
- The predominance of low-rise buildings flanking the Estate's western and eastern sides except at the north.
 - The transition to medium and high-rise closer to the Redfern Street Village.
 - South of McEvoy Street more recent development of medium-rise apartment blocks.

EXISTING BLOCK STRUCTURE



The amalgamation of blocks within the Estate in the latter half of the Twentieth Century has led to a coarsening of the grid.

The urban grain resulting from the area's historical evolution, has provided the blocks that are in evidence today. Whereas much of the finer grain nature of the traditional urban fabric of the Estate's surrounding urban context remains intact, within the Estate the amalgamation of blocks in the latter half of the Twentieth Century has led to a coarsening of the grid. The result has been a reduction in the Estate's walkable permeability and its ability to accommodate a mixture of uses and evolve to changing use requirements over time.



HERITAGE AND CONSERVATION

HERITAGE CONSERVATION AREAS

The Estate is surrounded by four heritage conservation areas that reflect different cycles of the area's history



Fig. 71.68
Source: Urbis, Stage 1 Heritage Assessment Report: Waterloo Estate Study Area, Feb 2018

- Legend**
- Waterloo Estate
 - Waterloo South
 - Train Station
 - Metro Station
 - Heritage Conservation Area
 - Pressure Tunnel



Fig. 71.69 Redfern Street
Source: Urbis, 2017



Fig. 71.70 Pitt Street
Source: Pablo Codina, 2019



Fig. 71.71 George Street
Source: Urbis, 2017



Fig. 71.72 John Street
Source: Urbis, 2017

The Waterloo Heritage Conservation Area to the east has significance as early residential subdivisions of the Mount Lachlan Estate, Redfern Estate Heritage Conservation Area to the north is historically significant as an early Victorian structured subdivision covering the entire grant to William Redfern, Zealand Estate Heritage Conservation Area to the south-east is a rare early Victorian residential subdivision of the industrial south in the Waterloo Estate, developed in association with the draining of Waterloo Swamp. Alexandria Park Heritage Conservation Area to the west is significant as a remnant of the growth of the Municipality of Alexandria in the second half of the nineteenth century.

HERITAGE ITEMS



Fig. 7173 Source: Urbis, Stage 1 Heritage Assessment Report: Waterloo Estate Study Area, Feb 2018

- Legend**
- Waterloo Estate
 - Waterloo South
 - Train Station
 - Metro Station
 - Heritage Items
 - Heritage Parks
 - Pressure Tunnel



Fig. 7174 Gadrigal House Source: Turner, 2019



Fig. 7175 The Cricketers Arms Source: Urbis, 2017



Fig. 7176 Former CBC Bank Source: Google Maps, 2019



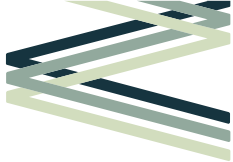
Fig. 7177 221 Pitt Street Source: Turner, 2019



Fig. 7178 The Cauliflower Hotel Source: Urbis, 2017



Fig. 7179 Mount Carmel Catholic Primary School Source: Turner, 2019



HERITAGE AND ITEMS OF INTEREST

HERITAGE ITEMS WITHIN THE ESTATE

There are a number of significant heritage items within the Estate boundaries that will need to be considered as part of the renewal process

There are five items of heritage significance within the Estate and one within the Metro Quarter adjacent to the Estate. The existing social housing buildings within the Estate, which were constructed from the 1940s through to the 1970s, have not been identified as being of heritage significance.

The following buildings are identified on the NSW Office of Environment and Heritage database:

1. The Duke of Wellington Hotel
291 George Street
2. The former Waterloo Pre-school
225-227 Cope Street and the area extending south, including Lot 4 DP 10721
3. Waterloo Congregational Church (adjacent to the Estate)
4. Terrace Houses, 229-231 Cope Street
5. Electricity Substation, 336 George Street
6. Water Pressure Tunnel



Fig. 71.81 The Duke of Wellington Hotel.



Fig. 71.82 The former Waterloo Pre-school.



Fig. 71.83 Waterloo Congregational Church



Fig. 71.84 Terrace Houses

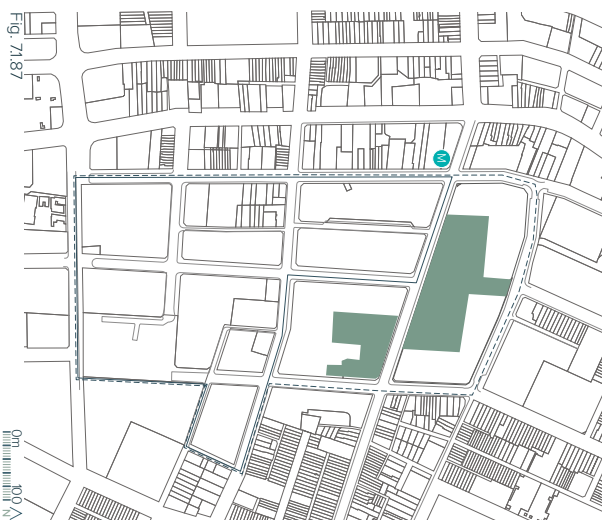


Fig. 71.85 Electricity Substation

CRITICAL INTERFACES



EXISTING PUBLICLY ACCESSIBLE OPEN SPACE



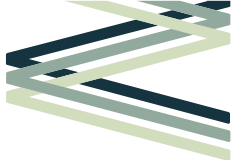
Legend

- Metro Station
- Heritage Item
- Heritage Conservation Area
- Heritage-listed Pressure Tunnel
- Critical Interfaces
- Waterloo Green
- Waterloo Estate
- Waterloo South

Within the Estate, the two major publicly accessible open spaces include Waterloo Green and the open space at the corner of Pitt and Raglan streets.



Fig. 71.88 The existing Waterloo Green
Source: Turner, 2019



EXTERNAL VIEWS

Waterloo's tower and slab blocks are the most dominant element in the existing skyline, rising above the lower scale of the traditional terraces within the Estate's immediate context

The Estate is visually contained with its edges clearly defined by boundary streets. Within the Estate boundaries there is a relatively open character, defined by:

- A grid pattern of streets.
- Large blocks.
- A high ratio of open land to built land leads to a relatively open visual quality.
- The substantial stock of large trees both in the street scape and within the lots.
- At 113 and 117 metres, the existing towers Matawai & Turanga form skyline views from elevated locations within a 2km radius.



Fig. 71.89
Source: Waterloo Visual Impact Study Stage 1 Report, Cardno, March 2020.

- Legend**
- Waterloo Estate
 - Waterloo South
 - Metro Station
 - View Direction

LONG DISTANCE VIEWS (>1KM)



Fig. 71.90 Sydney Park, hill-top facing north-east
Source: Haycraft Duloy Pty Ltd. 2019.

1



Fig. 71.91 Moore Park, facing west
Source: Haycraft Duloy Pty Ltd. 2019.

2

CLOSE DISTANCE VIEWS (UP TO 250M)



Fig. 71.94 Alexandria Park, south-west corner facing north-east
Source: Haycraft Duloy Pty Ltd. 2019.

5



Fig. 71.95 Redfern Park, north-east corner facing south-west
Source: Haycraft Duloy Pty Ltd. 2019.

6



Fig. 71.96 Redfern Park, north-east corner facing south-west
Source: Haycraft Duloy Pty Ltd. 2019.

7



Fig. 71.92 Lachlan Street and Gadigal Avenue facing west
Source: Haycraft Duloy Pty Ltd. 2019.

3



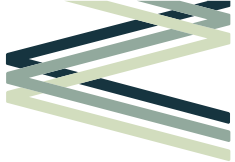
Fig. 71.93 Green Square Plaza facing north
Source: Haycraft Duloy Pty Ltd. 2019.

4



Fig. 71.97 George Street between Albert Street and Phillip Street facing south. Source: Haycraft Duloy Pty Ltd. 2019.

8



EXTERNAL VIEWS



Fig. 7.1.98
Source: Waterloo Visual Impact Study Stage 1 Report, Caradon, Nov 2020.



Fig. 71:99 Redfern Oval, south-east corner facing south-west
Source: Haycraft Duloy Pty Ltd. 2019.



Fig. 71:100 Wellington Street and Gibson Street facing west
Source: Haycraft Duloy Pty Ltd. 2019.



Fig. 71:101 Wellington Street and Beaumont Street facing west
Source: Haycraft Duloy Pty Ltd. 2019.



Fig. 71:102 Kellick Street and Gibson Street facing west
Source: Haycraft Duloy Pty Ltd. 2019.



Fig. 71:103 Waterloo Oval, south-east corner facing north-east
Source: Haycraft Duloy Pty Ltd. 2019.



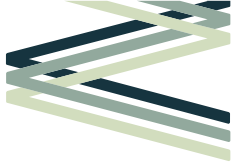
Fig. 71:104 George Street between Allen Street and Bourke Street facing north. Source: Haycraft Duloy Pty Ltd. 2019.



Fig. 71:105 Botany Road and McEvoy Street facing north-east
Source: Haycraft Duloy Pty Ltd. 2019.



Fig. 71:106 John Street between Botany Road and Cope Street facing east. Source: Haycraft Duloy Pty Ltd. 2019.



LOCAL VIEWS

Significant parts of the Estate are visually contained by street wall development along much of its eastern edge



- Local views corridors from the view analysis include:
- East – west views on Wellington and Raglan streets extend beyond the site to Botany Road and Elizabeth Street
 - North – south views are available on Cope, George and Pitt Streets. Where the original street grid pattern has been truncated by road closures (e.g. at the northern and southern extremities of Cooper Street and George Street), the arrangement of buildings has conserved these long views
 - Significant parts of the Estate are visually contained by street wall development along much of its eastern edge (from Wellington Street to Phillip Street)

LOCAL VIEWS



Fig. 7.1107
Source: Waterloo Visual Impact Study Stage 1 Report, Cardno, March 2020.

- Legend**
- Waterloo Estate
 - Waterloo South
 - Train Station
 - Metro Station
 - View Direction

CRITICAL VIEWPOINTS, CLOSE VIEWS (UP TO 250M)



17 Fig. 7.1108 Wellington Street between Botany Road and Cope Street facing east. Source: Haycraft Dulooy Pty Ltd. 2019.



18 Fig. 7.1109 Botany Road between Raglan Street and Wellington Street facing east. Source: Haycraft Dulooy Pty Ltd. 2019.



19 Fig. 7.1110 Corner Henderson Road and Botany Road. Source: Haycraft Dulooy Pty Ltd. 2019.



20 Fig. 7.1111 NCIE Oval, north-west corner facing south. Source: Haycraft Dulooy Pty Ltd. 2019.



21 Fig. 7.1112 Garden Street and Buckland Street facing east. Source: Haycraft Dulooy Pty Ltd. 2019.



22 Fig. 7.1113 Alexandria Park, north-east corner facing east. Source: Haycraft Dulooy Pty Ltd. 2019.



23 Fig. 7.1114 Alexandria Park, south-east corner facing north-east. Source: Haycraft Dulooy Pty Ltd. 2019.



24 Fig. 7.1115 Off Philip Street, west of Turanga Tower, facing south. Source: Haycraft Dulooy Pty Ltd. 2019.

CRITICAL VIEWPOINTS, INTERNAL VIEWS



25 Fig. 7.1116 George Street and Wellington Street facing south. Source: Haycraft Dulooy Pty Ltd. 2019.



26 Fig. 7.1117 Cooper Street, near Raglan Street, facing south. Source: Haycraft Dulooy Pty Ltd. 2019.

7.1.3 TRANSPORT, STREETS AND CONNECTIVITY

THE 30 MINUTE CITY

Waterloo Metro Station will connect Waterloo to the 30 minute city with the opportunity to become an active transport hub that prioritises walking and cycling

The Estate is highly connected by active transport to Central Sydney and its opportunities for jobs, services and retail. Located 3.3km (45 minutes walk, 15 minutes cycle) from the city centre (GPO, Martin Place), Green Square Town Centre, a designated strategic centre, is within 800m (10 minute walk) of the southern end of the Estate, which will provide it with even greater connectivity to local services and amenities as the centre develops.

Due to its proximity to both Redfern and Green Square stations, the Estate also has a high level of public transport connectivity to jobs within 30 minutes of the site. The new Sydney Metro station will expand the reach of this catchment both geographically and temporally, running 21 hours a day, that will provide greater flexibility for shift labour.

Dedicated and shared cycle paths link the site as far as Prince Alfred Park and Central Station. Additional connectivity around Regent Street or Devonshire Street could foreseeably extend this to the Goods Line, and thus a high quality non-motorised link to key destinations such as UTS, TAFE, ABC and the current Powerhouse Museum site along Harris Street.

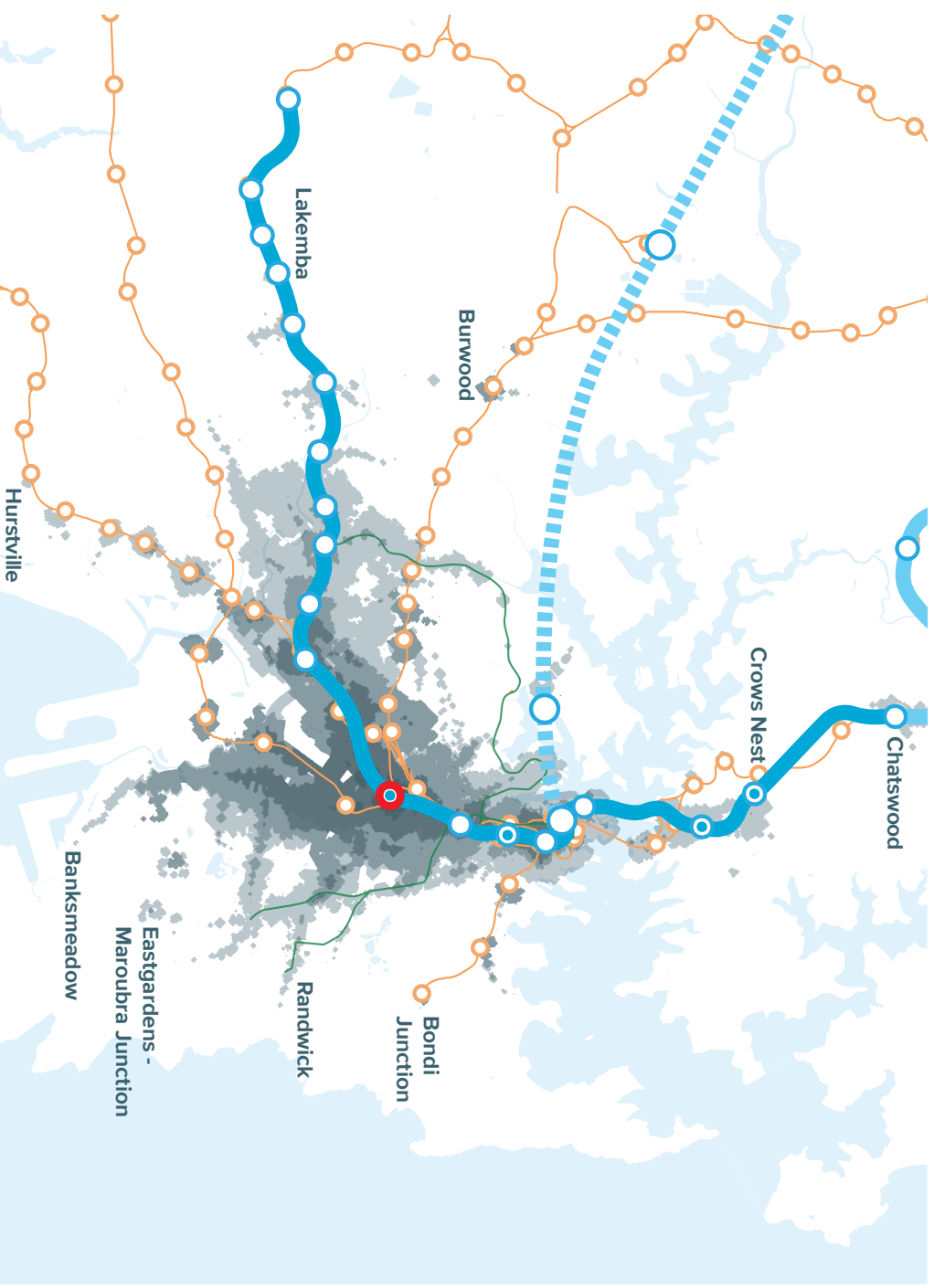


Fig. 7.1.118 Areas accessible within 30 minutes from Waterloo through walking, cycling and public transport. Source: Adapted from Eastern City District Plan, Greater Sydney Commission, March 2018.

- Legend**
- Waterloo Estate
 - Metro Station
 - Integrated Station Development (ISD)
 - Sydney Metro Northwest, City & Southwest Line
 - Sydney Metro West Line
 - Train Station
 - Train Line
 - Light Rail Route
 - Eastern Economic Corridor
 - The 30-minute City
 - Major Development

ACTIVE TRANSPORT

PEDESTRIAN NETWORK



Fig. Z1119
Source: Adapted from City of Sydney Liveable Green Network Strategy and Masterplan Report, City of Sydney, May 2011.

Reinforcing the existing pedestrian network will be an important consideration to promote active transport modes by providing a walkable, safe and high quality public domain.

Walkability is the combination of several factors including, the walking catchment within and around the Estate, streets that are conducive to walking, and barriers to walking. The primary barriers to movement are streets above 1,000Vph for which the crossing times create a barrier to free movement. Primarily, Botany Road / Regent Street, Lawson Street and Square, and McEvoy Street act as barriers to movement.

CYCLE NETWORK

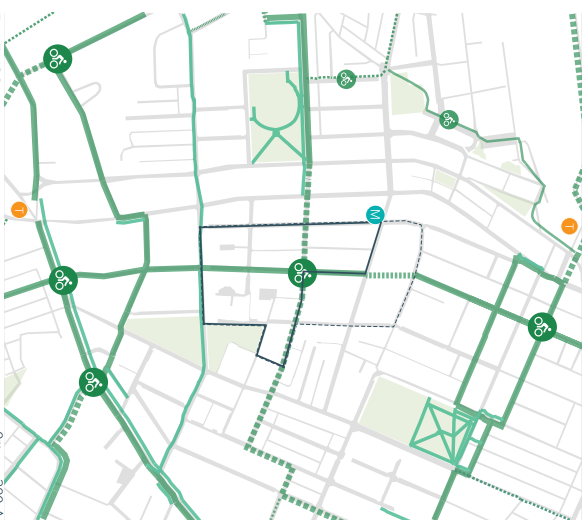


Fig. Z1120
Source: Adapted from Draft Cycling Strategy and Action Plan, City of Sydney, 2018.

By connecting to the existing and future cycle network, there is potential for active transport to play a significant role in short and medium distance trips to, from and within the Estate.

Under the City of Sydney's strategy, dedicated north-south cycle facilities are currently provided on George Street, though there is no dedicated link through Waterloo Green where cyclists are supposed to dismount. The cycle network is vital to the city's commercial health, providing access to jobs, retail and leisure activities in Sydney CBD and Green Square, the latter set to grow significantly in the future with the development of Green Square Town Centre.

BUS NETWORK



Fig. Z1121
Source: State Transit Eastern Suburbs Network Map, Transport NSW, 2019.

The Estate is well served by an interconnected bus network connecting key destinations to the east and west as well as to Central Sydney.

The bus network in and around Waterloo is heavily focused on north-south travel, particularly to Central Sydney, Botany Road is a key bus corridor connecting Central Sydney to Redfern, Waterloo, Alexandria, Green Square, Mascot and Botany. These routes are typically frequent and operate a range of hours.

Bus services also operate east-west routes, linking Randwick, Coogee, Bondi Junction, Moore Park and Kingsford to the east with Glebe, Newtown, Marrickville and Sydenham to the west. These routes serve an important cross-regional function, but are infrequent, convoluted and lengthy, reducing reliability.

TRAIN AND METRO NETWORK

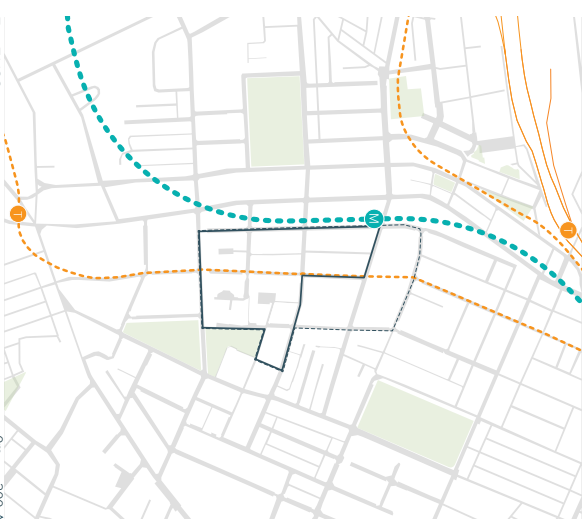
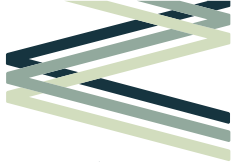


Fig. Z1122

The Estate is highly connected, with Redfern and Green Square Stations located within 400m of the Estate boundaries.

Sydney Metro City & Southwest is a new metro line under construction from Chatswood to Sydney CBD and Bankstown, that will start operating in 2024. Waterloo Station will provide enhanced connectivity to Greater Sydney with services every 4 minutes in each direction and trains every 2 minutes in peak hours carrying up to 40,000 people per hour. Approximately 3,700 people will access Waterloo Station in the AM peak hour and 2,350 would exit. In addition, recent upgrades to Redfern Station have added a second concourse and improved access and egress, bringing the entrance closer to the development area for the Redfern Station Precinct.



STREET NETWORK

NORTH-SOUTH CONNECTIVITY

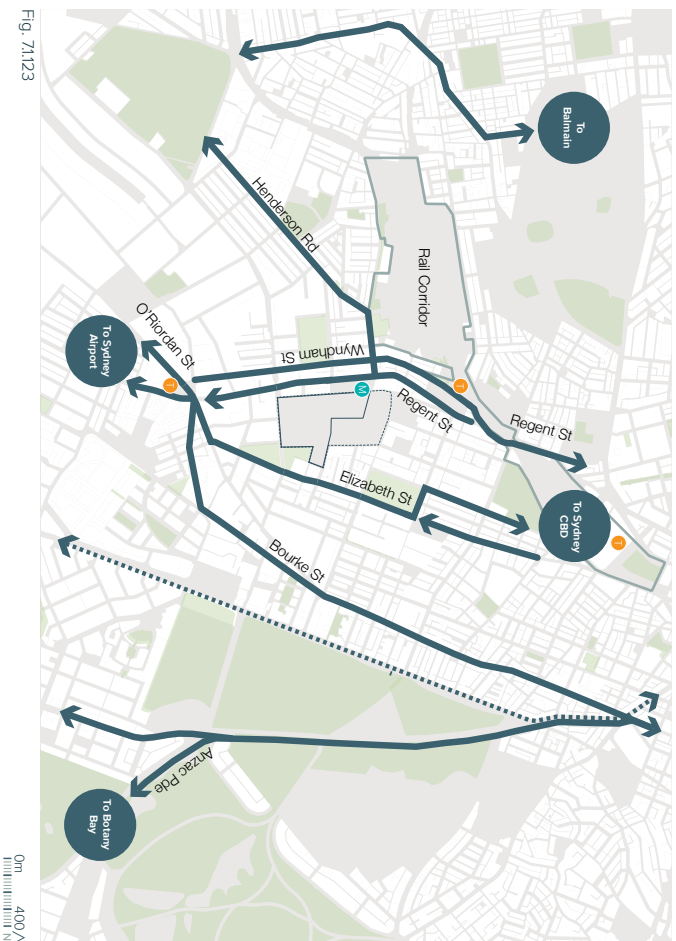


Fig. Z1123

- Legend**
- Waterloo Estate
 - Waterloo South
 - Train Station
 - Metro Station
 - Major Route
 - Motorway

The existing street network facilitates north-south pedestrian movement in the area with relative ease.

EAST-WEST CONNECTIVITY



Fig. Z1124

East-west pedestrian movement is significantly more difficult due to the nature of public transport services, the railway line and busy roads impeding movement and the perception of safety.

MCEVOY STREET WIDENING

Connectivity is a key consideration in the renewal of the Estate to promote active transport modes for increased liveability

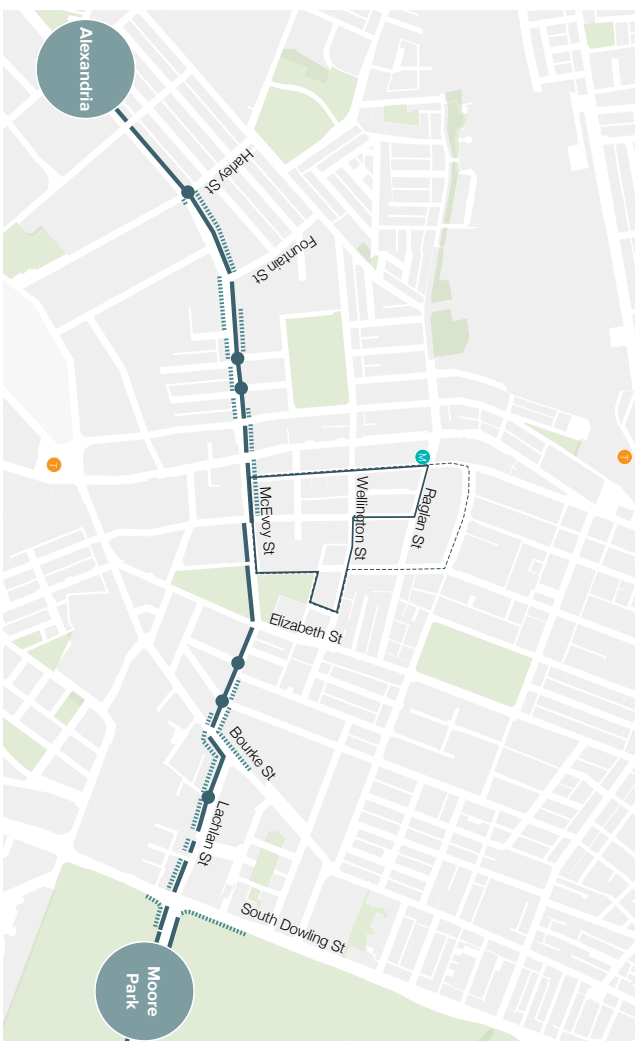


Fig. 7.1125
Source: Alexandria to Moore Park Connectivity Upgrade - Community Update, RMS, June 2017.

The Estate occupies an 'island' within an area that includes busy roads, with Botany Road, Elizabeth Street, Henderson Road and Mcevoy Street all experiencing traffic volumes greater than 1,000 vehicles per hour during the peak hour.

STREET NETWORK



Fig. 7.1126

The Alexandria to Moore Park Connectivity Upgrade will involve widening to Mcevoy Street and the expansion of road junctions, that are intended to improve traffic flows, but which could also impede pedestrian movement north-south between the Estate and Green Square.

Streets within the Estate are relatively lightly trafficked, due in part to the closure of some of the through streets to the surrounding network. Most local streets in the area have 50km/h speed limits and are two traffic plus two parking lanes wide, with some streets 40km/h zones including George Street and Redfern Street.



JAMIES COOK



Fig. 7A.27 Social gathering
Source: LAHC, 2018

7.1.4 HOUSING DIVERSITY AND LIVEABILITY

HOUSING TYPOLOGIES



EXISTING HOUSING AGE

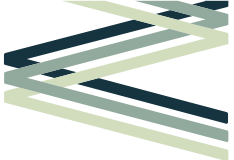


Housing typologies within the Estate are distributed across low, medium and high rise typologies.

The taller buildings, (campus style blocks) are located to the north. Medium rise building are located to the east where the topography rises up to Mount Carmel. They tend to have deeper plans and integrate private amenity space in balconies. Predominant built form includes the cross form, double cross form and short low bar type which accommodates the walk up units. Their arrangement across the Estate creates significant private communal open space and undefined street edges.

The existing housing within the Estate was primarily built between 1960s to 1980s.

- The existing buildings in the Estate were built:
- Waterloo Congregational Church: c. 1883.
 - Low-rise walk-up buildings (Madden Place): c. 1961
 - Low-rise walk-up buildings (Other): various ages
 - Terrace housing: various ages
 - Mid-rise buildings (Camellia Grove): c. 1971
 - Slab buildings (Daniel Solander, Marton, James Cooks, and Joseph Banks): c. 1974
 - Towers buildings (Turanga & Matavahi): c. 1976
 - Mid-rise buildings (Drysedale & Dobeil): c. 1982



7.1.5 EMPLOYMENT, SERVICES, RETAIL, ARTS AND CULTURE

ACTIVE FRONTAGES

Waterloo is located between the Green Square Strategic Centre and the area south of Redfern Station identified for renewal in the Eastern City District Plan

As a Strategic Centre, Green Square is expected to generate over 20,000 jobs, high levels of economic activity and be the focus of business and commercial growth, supported by new infrastructure investment in the area.

The retail and commercial offering along Regent and Redfern streets has seen a resurgence with the increase in creative industries and small bars and restaurants. This resurgence is limited along the north-south thoroughfare of Regent Street/Botany Road which lacks the presence of a cohesive main street and lack of identifiable commercial centre. With the predominate residential land uses and few immediate economic uses, the Estate's challenge is to link this community with the established economic centres by increasing links either north towards Redfern or south to Green Square. Between Botany Road and Central Station railway, the

Australian Technology Park (ATP) occupies a significant land holding, but lacks integration with the centres of Redfern and Waterloo. The ATP is centred on a number of re-purposed heritage buildings complemented by a number of large floor-plate commercial buildings, developed from the late 1990's as a destination for knowledge workers, technological companies and university expansion.

Adjacent to Redfern Station are the twin GCA towers previously used for commercial, emergency services and education purposes and currently being adapted and retrofitted as residential apartments.



Fig. 7.1.30 Source: Adapted from Sydney DCP 2012 Active Frontages Map, City of Sydney, 2012.

Legend

-  Waterloo Estate
-  Waterloo South
-  Train Station
-  Metro Station
-  View Direction

NEIGHBOURHOOD RETAIL

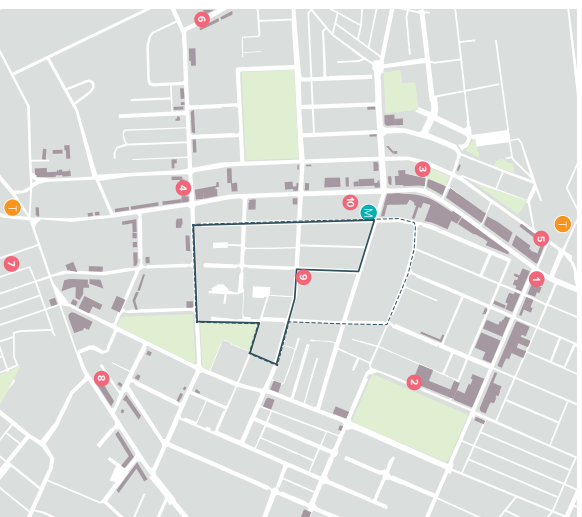


Fig: Z1131
Source: Waterloo South Economic development, local retail and services study, Macroplan Dimasi, 2020

Legend

- Waterloo Estate
- Waterloo South
- Train Station
- Metro Station
- Neighbourhood Retail
- 1 Redfern Village
- 2 Woolworths Redfern
- 3 IGA Waterloo
- 4 IGA Alexandria
- 5 SPAR
- 6 Woolworths Alexandria
- 7 Woolworths Green Square
- 8 Miracle Mart Supermarket
- 9 IGA X-press
- 10 Proposed Waterloo Metro Supermarket

The Estate's predominantly residential character acts as a buffer between the two growing commercial centres of Redfern and Green Square and the employment and urban services land at Green Square-Mascot.

Redfern Street Village is to the north of the Estate and comprises a retail and convenience strip along Redfern Street. To the west of the Estate, the existing retail strip along Botany Road and Regent Street extends to Redfern Station. This includes food and beverage premises and large-format factory outlets. Industrial and commercial uses with large-format warehouses and factory outlets are located south of MCEVOY Street.

LOCAL RETAIL

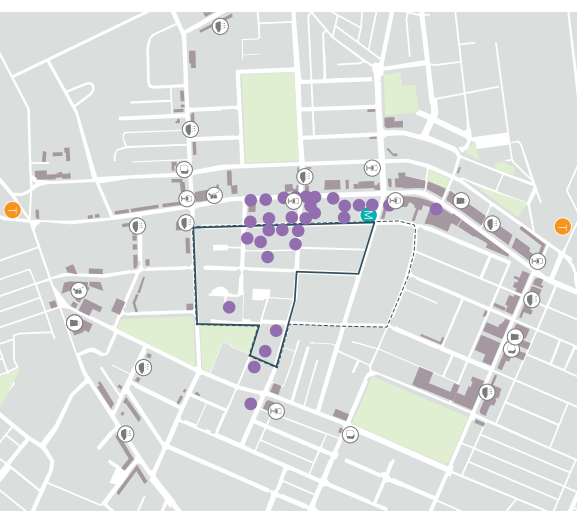
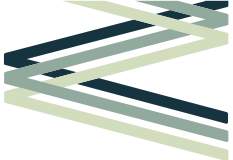


Fig: Z1132
Source: Waterloo South Economic development, local retail and services study, Macroplan Dimasi, 2020

- Local Businesses
- Neighbourhood Businesses

The majority of registered businesses located in or close to the Estate are situated along Botany Road.

There are approximately 103 GST registered businesses in close proximity to the Estate. Most businesses are in Transport, Postal and Warehousing, Professional, Scientific and Technical Service and Construction.



COMMUNITY SERVICES AND FACILITIES

COMMUNITY SERVICES

The majority of facilities that serve the existing community's needs are located outside the Estate boundaries

One kilometre is considered to be the maximum distance most people will walk to reach a local destination. Within this catchment, a broad range of facilities constitute the area's social infrastructure and form the existing community's 'kit of parts'.

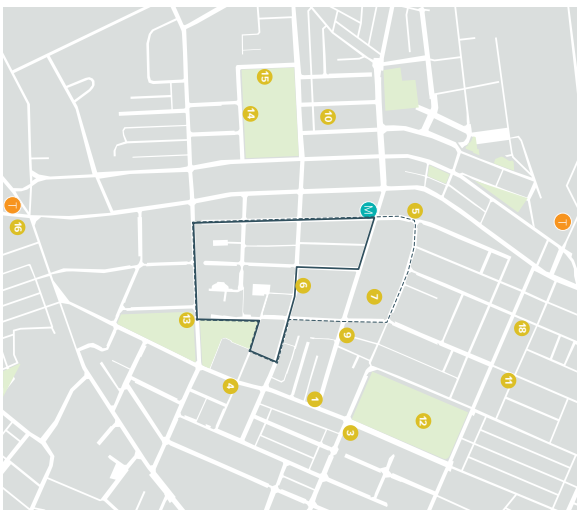


Fig. Z1133
Source: Waterloo South Economic development, local retail and services study, Macropian Dimasi, 2020

- Legend**
- **Community Services**
 - 1 Catholic Community Services NSW
 - 3 RCYC
 - 4 Waterloo Library
 - 5 The Salvation Army
 - 7 Waterloo Public Housing Action Group
 - 9 Metro Station
 - 10 Alexandria Town Hall
 - 11 Redfern Town Hall
 - 12 Redfern Oval
 - 13 Waterloo Oval
 - 14 Alexandria Park Community Centre
 - 15 Redfern Park Tennis Court
 - 16 Green Square Library

Although there are a broad range of facilities within the walking catchment serving the community's varying needs, only two services are located within the Estate boundary.

The Estate is well served by emergency and justice services. This includes the NSW Fire and Rescue stations located at Redfern, Central Sydney, Darlinghurst and Alexandria; NSW Ambulance stations located at Eveleigh, Paddington and Camperdown; NSW Police, including the Central Local Area Command, Surry Hills Local Area Command and Redfern Local Area Command.

ABORIGINAL COMMUNITY SERVICES

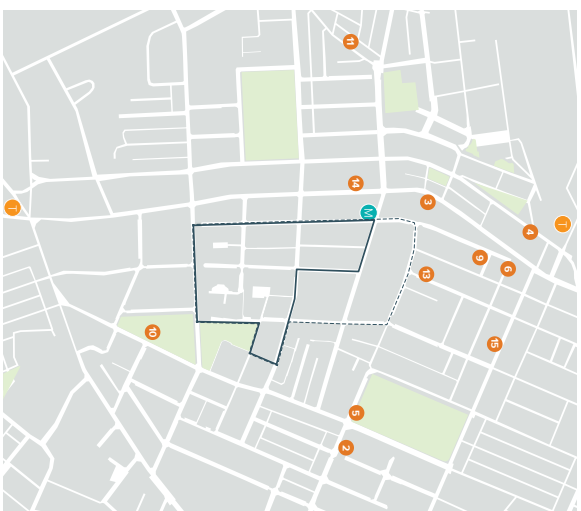


Fig. Z1134
Source: Waterloo South Economic development, local retail and services study, Macropian Dimasi, 2020

- **Aboriginal Community Services**
- 2 South Sydney Aboriginal Corporation
- 3 Resource Centre
- 4 First Peoples Disability Network
- 5 Aboriginal Employment Centre Corporation
- 6 Aboriginal Employment Centre Corporation
- 9 Wyanga Aboriginal Aged Care Program
- 10 Weave Youth and Community Services
- 11 Allanna Wirramucca Aboriginal Home Care
- 13 Naiton Centre of Indigenous Excellence
- 14 Aurora Education Foundation
- 15 Aboriginal Medical Service Co-operative Ltd
- 3 Redfern Aboriginal Child Care
- 4 James Cahill Pre-school

There are a range of community services outside the Estate boundaries that serve the specific needs of the existing Aboriginal community within the Estate.

The Aboriginal Medical Service is a multidisciplinary health care facility that provides acute and primary health to the local indigenous communities but is not restricted to the local community.

FAMILY SERVICES

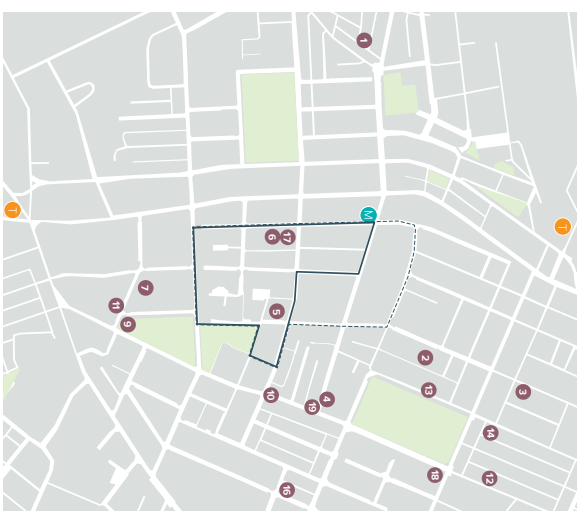


Fig. Z1135
Source: Waterloo South Economic development, local retail and services study, Macropian Dimasi, 2020

- 5 Lois Barker Child & Family Learning Centre
- 6 Waterloo Long Day Care
- 7 The Green Elephant Early Learning Centre
- 9 South Sydney Youth Services
- 10 The Fact Tree Youth Services
- 11 The Fact Tree and Community Services
- 12 Younglings
- 13 The Salvation Army Aged Care Plus
- 14 Aged Care Support Services
- 16 Fredrick House
- 17 Co-operative Home Care
- 18 Annie Green Court
- 19 The Mount Carmel Catholic Primary School
- 2 Central Sydney Invasive English High School

The area to the east of the Estate is well serviced by youth and elderly services, with social infrastructure targeting youth located in Waterloo, Redfern and Alexandria and health facilities to serve the ageing population of the Estate.

Youth services are vital for disadvantaged youth as they create access to support services and enable participation in recreation and leisure programs. However, with a growing population, there will be increased demand for sport and recreation amongst other activities. Existing services that cater to the ageing population are located within close proximity to the Estate. These range from aged care services to social and leisure programs. Most of the health-related care delivered to older people is provided directly by the SLHD Aged Care and Rehabilitation (AC&R) service.

EDUCATION

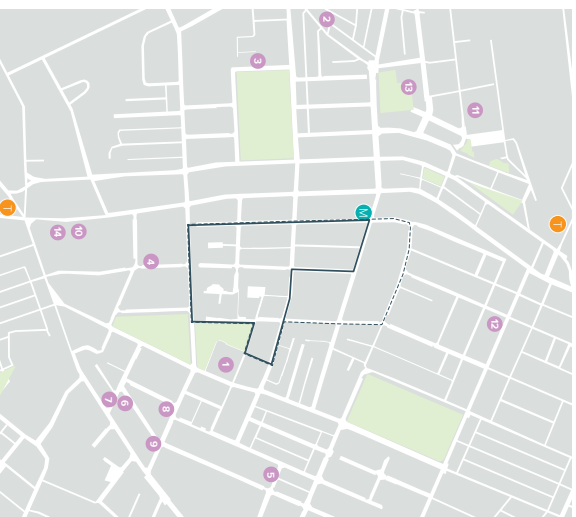


Fig. 7.1136 Waterloo South Economic development, local retail and services study, Macropian Dimasi, 2020

- Legend**
- 3 Alexandria Park Community School
 - 4 Eastern Gymnastics Academy
 - 5 Hilling International Leadership College
 - 6 La Botzheque Academie-Sydney
 - 7 Taylor's College
 - 8 Waterloo Green Academy
 - 10 Green Square Public School
 - 11 Bevelgh Works
 - 12 Education, Training and Employment Australia
 - 13 TOP Education Institute
 - 14 Czech & Slovak School of Sydney
- Health**
- 1 Redfern Community Health Centre
 - 2 Healthcare Family Medical Centre
 - Redfern Station Medical Centre

Primary and secondary educational facilities serve the Waterloo community, including the Alexandria Park Community School and Our Lady of Mount Carmel Catholic Primary School.

Access to education is a vital pillar of social infrastructure. Other schools in the vicinity include specialised schools such as the Cleveland Street Intensive English High School. A new 14-storey high school will be built on Cleveland Street for 1200 students and is expected to open in 2020, further enhancing the provision of social infrastructure in the area to meet the demands of the future population.

HEALTH

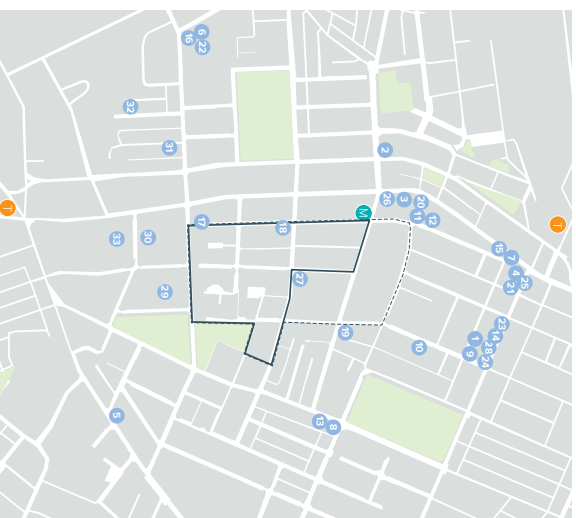


Fig. 7.1137 Waterloo South Economic development, local retail and services study, Macropian Dimasi, 2020

- 3 Green Square Health
- 4 Fountain Street General Practice
- 5 Civic Medical Centre
- 6 Dr Ian Sanger
- 7 The Byre Surgery
- 9 Sydney South West Area Health Service
- 10 Repeat House
- 11 MIV Dentistry
- 12 300 Redfern Smiles
- 13 Redfern Dental
- 14 151 Degree Dental
- 15 Hurst Stephanie Psychologists Solo
- 17 Consultant Psych
- 18 Rebecca Rose Psychology, Waterloo
- DSA Specialist Intervention Services
- 19 Opensey House

The Estate is well served by a range of health services near that include two major health and medical centres and four hospitals.

The Estate is located in the NSW Health Sydney Local Health District (SLHD). The SLHD owns and operates the Redfern Community Health Centre (CHC) on Redfern Street. It is located next door to the Aboriginal Medical Centre and provides prevention, early intervention, assessment, treatment, health maintenance and continuing care services. The closest public hospitals to the Waterloo Estate include St Vincent's Hospital (Darlinghurst), Royal Prince Alfred Hospital (Camperdown) and Prince of Wales and Sydney Children's Hospital (Randwick).

OPEN SPACE

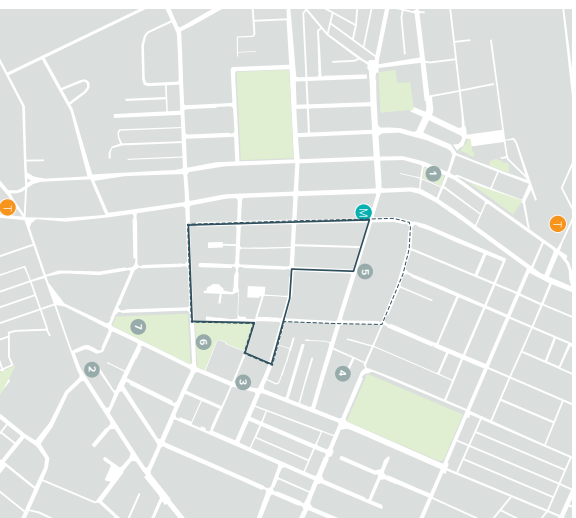


Fig. 7.1138 Waterloo South Economic development, local retail and services study, Macropian Dimasi, 2020

- 19 Uplift Psychological Services Redfern
- 20 MyLife Psychologicals
- 21 George Valdes Allied Health
- 22 Viewpoint Optical
- 23 Contemporary Central Redfern
- 24 The Eye Centre
- 25 Sirens Pharmacy
- 26 Godcross Pharmacy
- 27 Alexandria Physio & Pilates
- 28 Bonnet Boxing Club
- 29 Anytime Fitness
- 30 Crossfit Sydney
- 31 45 Training Health Club
- 32 Crossfit Sydney
- 33 Open Space
- Daniel Donovan Park

There is a network of public open spaces within walking distance of the Estate. Although there is a large area of open space within the Estate boundaries that is publicly accessible, it is all privately owned.

With a growing population, there will be increased demand for open space for sport and recreation amongst other activities in addition to the existing public open spaces surrounding the Estate. The City of Sydney's Open Space, Sports and Recreation Needs Study (2016) outlines the need for a new public open space which will be provided as part of the renewal of the Estate.

COMMUNITY GARDENS

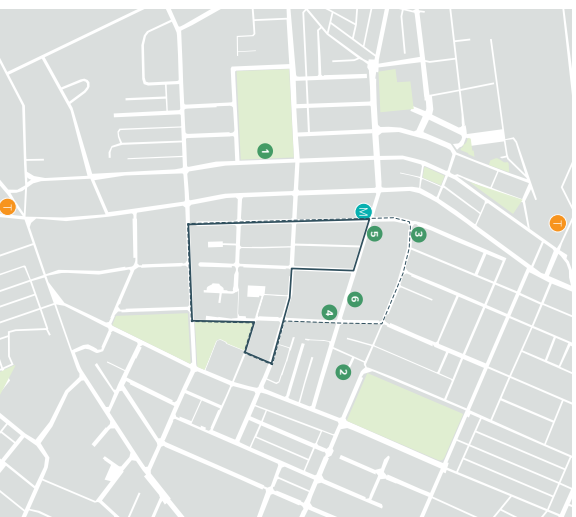
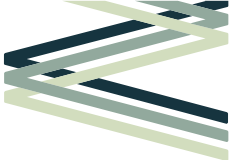


Fig. 7.1139 Waterloo South Economic development, local retail and services study, Macropian Dimasi, 2020

- Short Street Reserve
- 1 The Eden Community Garden
- 2 Waterloo Community Gardens - Cook
- 3 Waterloo Community Gardens - Marlon
- 4 Waterloo Community Gardens - Scollar
- 5 Waterloo Community Gardens - Sharp Park
- 6 Waterloo Community Gardens
- 7 Alexandria Park and Community Garden

There are a number of existing community gardens located within the northern half of the Estate.

There are a number of existing community gardens within the Estate boundaries that are run and managed by local social housing residents.



ARTS AND CULTURE

Waterloo's cultural life has a long history, stretching back to the traditional way of life of the Aboriginal people

Waterloo's cultural infrastructure includes both the physical facilities and services that are carried out within these facilities. 1123 cultural assets and resources have been mapped in the Waterloo Cultural Map that include:

- Community Arts and Cultural Facilities
- Aboriginal Arts and Cultural Facilities
- Creative Industries
- Public Art Spaces
- Open Space and Leisure
- Places of Worship
- Key Festival and Event Venues.

Although the existing Estate has limited arts and cultural facilities, the area is rich in its local community culture, shown through the range of art networks, public art and creative spaces within close proximity to the Estate boundaries.

ARTS AND CULTURE

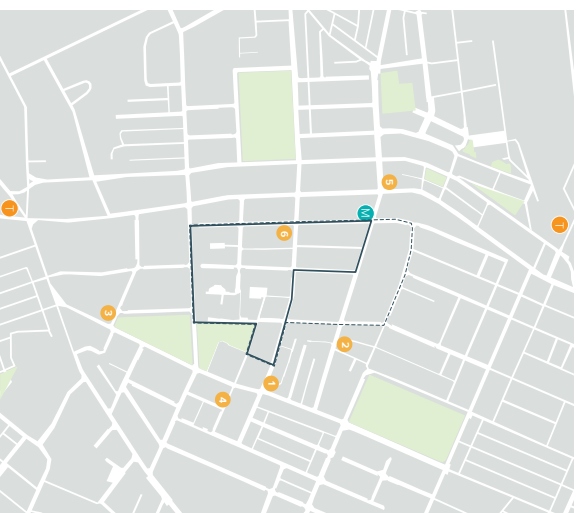


Fig. Z1140
Source: Waterloo South Public Art Plan, Milne Stonehouse & Sue Boaden, 2020

Legend

- Community Arts and Culture
- 1 The Fact Tree Youth Service
- 2 The Factory Community Centre
- 3 Weave Waterloo Community Centre
- 4 Waterloo Library
- 5 FBI Bado 94.5FM/NFP
- 6 Ethnic Communities' Council of NSW
- Aboriginal Arts and Culture
- 7 Balisori Gallery
- 8 Gaijal Information Service & Koori Bado
- 9 Aboriginal Dance Theatre Redfern
- 10 Thea Wirror
- 11 Aboriginal and Pacific Art Gallery
- 12 Aboriginal Catholic Ministry
- 13 Aurora Education Foundation (The Aurora Project)
- Public Art
- 14 Architectural fountains with accretion
- 15 Cast iron anchor
- 16 Entrance mosaic, Waterloo Estate Community Gardens - Cook
- 17 Matavai building interior decoration
- 18 Mosaic in Waterloo Park
- 19 Mural on facade of Nussnow Gallery building
- 20 Turanga building interior decoration
- 21 TJ Hickey Park with anticipated memorial
- 22 The 'Rock'
- 23 Captain Cook's Sundial and Pegque
- 24 Mural in deused baseball court Wellington Street

Six community centres are located within the walking catchment of the Estate, providing a range of art and cultural activities. These are provided and managed both by local government as well as non-profit organisations.

The Fact Tree Youth Service offers a variety of living skills programs and workshops targeted towards young people. The Factory Community Centre located on Raglan Street next to the Estate provides public art and creative arts workshops. Within the Estate, the Ethnic Communities' Council of NSW promotes the development of a multicultural community. Waterloo Library offers cultural education through cultural programs and collections. The City of Sydney's Cultural Plan and Community Wellbeing Indicators 2016 identifies the need for additional cultural facilities and programs to meet the demands of the growing population.

ABORIGINAL ARTS AND CULTURE

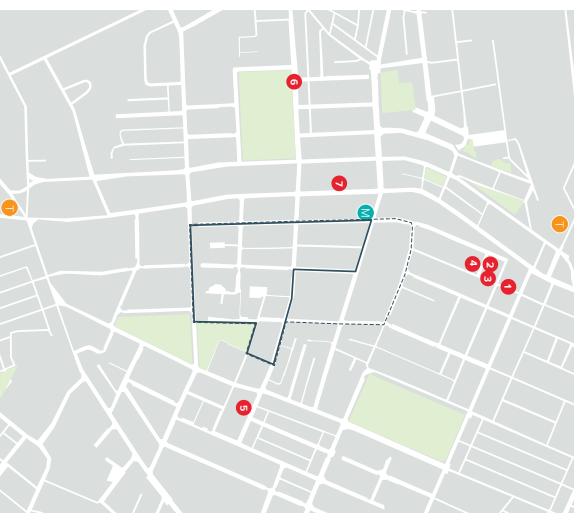


Fig. Z1141
Source: Waterloo South Public Art Plan, Milne Stonehouse & Sue Boaden, 2020

Legend

- Aboriginal Arts and Culture
- 1 Balisori Gallery
- 2 Gaijal Information Service & Koori Bado
- 3 Aboriginal Dance Theatre Redfern
- 4 Thea Wirror
- 5 Aboriginal and Pacific Art Gallery
- 6 Aboriginal Catholic Ministry
- 7 Aurora Education Foundation (The Aurora Project)

Seven cultural facilities within the walking catchment of the Estate promote Indigenous arts and culture. These include gallery spaces, non-profit organisations and creative industries.

Waterloo Estate has a strong existing Aboriginal presence in its local community and culture as well as in its history. Despite this, there is a lack of programs and facilities that showcase and inform the public about Aboriginal culture and history. The City of Sydney's Eora Economic Development Plan supports future actions for Waterloo that promote learning, understanding and celebration of Aboriginal culture.

PUBLIC ART

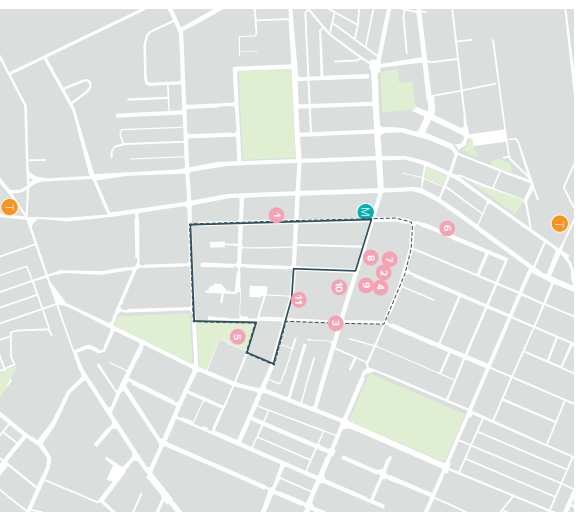


Fig. Z1142
Source: Waterloo South Public Art Plan, Milne Stonehouse & Sue Boaden, 2020

Legend

- Public Art
- 1 Architectural fountains with accretion
- 2 Cast iron anchor
- 3 Entrance mosaic, Waterloo Estate Community Gardens - Cook
- 4 Matavai building interior decoration
- 5 Mosaic in Waterloo Park
- 6 Mural on facade of Nussnow Gallery building
- 7 Turanga building interior decoration
- 8 TJ Hickey Park with anticipated memorial
- 9 The 'Rock'
- 10 Captain Cook's Sundial and Pegque
- 11 Mural in deused baseball court Wellington Street

Eleven public art installations are within the walking catchment of the Estate. These include monuments, murals and mosaics in the public domain as well as the interior design and furniture within the Matavai and Turanga.

Most of the public art within the Estate was commissioned before 2005. This includes wall murals and heritage installations created by local residents and artists. These artworks represent the significant local culture influenced by the local community.

There are opportunities to include innovative media such as projections and LED displays as part of the public art strategy. The reuse, decommission and renewal of current artwork collection should also be considered.

CREATIVE INDUSTRIES

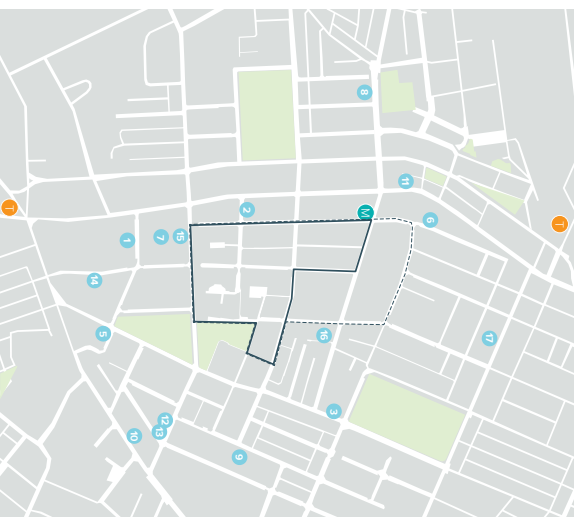


Fig. Z1143
Source: Waterloo South Public Art Plan, Milne Stonehouse & Sue Boaden, 2020

- **Creative Industries**
- 1 CMH Hairs Architects
- 2 David Mitchell Architects Pty Ltd
- 3 Hannah Glen Architects
- 4 Wilkinson & Associates Architects Pty Ltd
- 5 Darren Knight Gallery
- 6 Nussey Gallery
- 7 AMBUUSH Gallery
- 8 Jopua Gallery
- 9 Artbank Sydney
- 10 Mathias Media
- 11 SLOr Window Gallery
- 12 Sydney Film School
- 13 International Screen Academy
- 14 May Space
- 15 The Green Square Centre
- 16 Orchard Gallery
- 17 1027 Projects

There are a number of creative and cultural businesses within walking distance of the Estate. These span thirteen industry sectors: advertising, architecture, design, visual arts, music, performing arts, publishing, screen and radio.

Waterloo's history and heritage is evidenced by the wide range of creative industries including artisan work, engineering production, digital business initiatives and craft-based industry.

Despite the growing creative clusters around the Estate at Green Square and Redfern Village, the area currently lacks support facilities, activities and programs that contribute to the local cultural economy. Despite the emerging co-working cultural spaces in nearby suburbs, the creative infrastructure in Waterloo operates in isolation.

PLACES OF WORSHIP

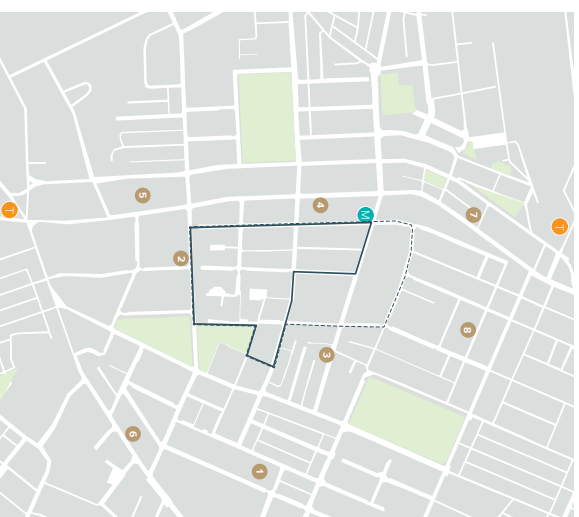


Fig. Z1144
Source: Waterloo South Public Art Plan, Milne Stonehouse & Sue Boaden, 2020

- **Places of Worship**
- 1 Hilsong Church Waterloo Campus
- 2 Green Square Masjid
- 3 South Sydney United Church
- 4 Waterloo Congregational Church
- 5 Yiu Ming Temple
- 6 Grace City Church
- 7 United Church Tonga Parish
- 8 St Vincent de Paul's Catholic Church

There are at least eight places of worship within the walking catchment of the Estate, to service a broad range of religious affiliations.

KEY FESTIVALS AND EVENTS

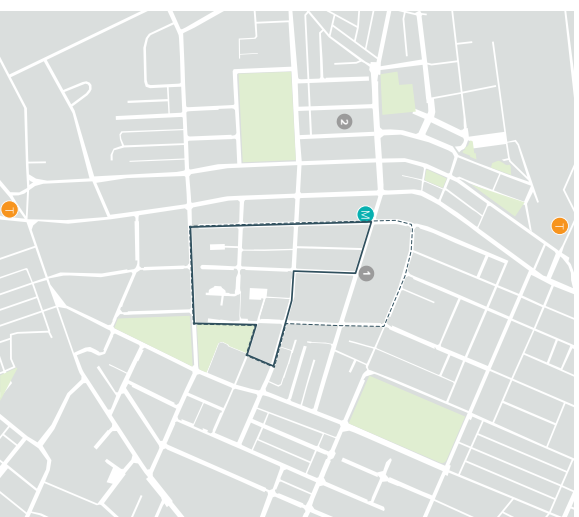


Fig. Z1145
Source: Waterloo South Public Art Plan, Milne Stonehouse & Sue Boaden, 2020

- **Key Festivals + Events**
- 1 Redfern Waterloo Pop Day
- 2 Milkcrate Theatre

There are two key events within the walking catchment of the Estate, including one within the Estate.

DAY / NIGHT ACTIVITIES

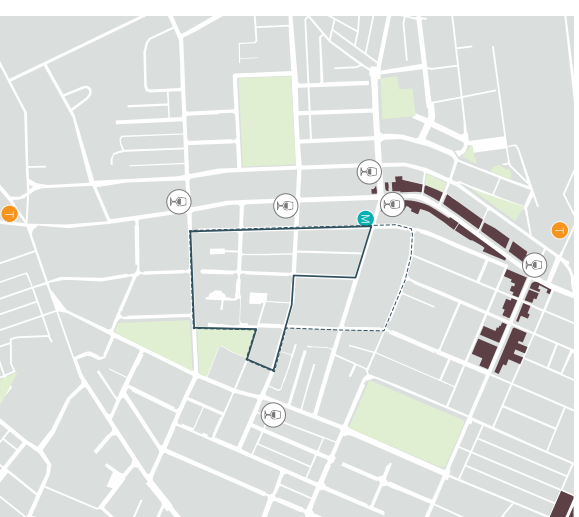


Fig. Z1146
Source: Waterloo South Economic development, local retail and services study, Macropian Dimasi, 2020

- ② **Day / Night Activities**
- Neighbourhood Businesses

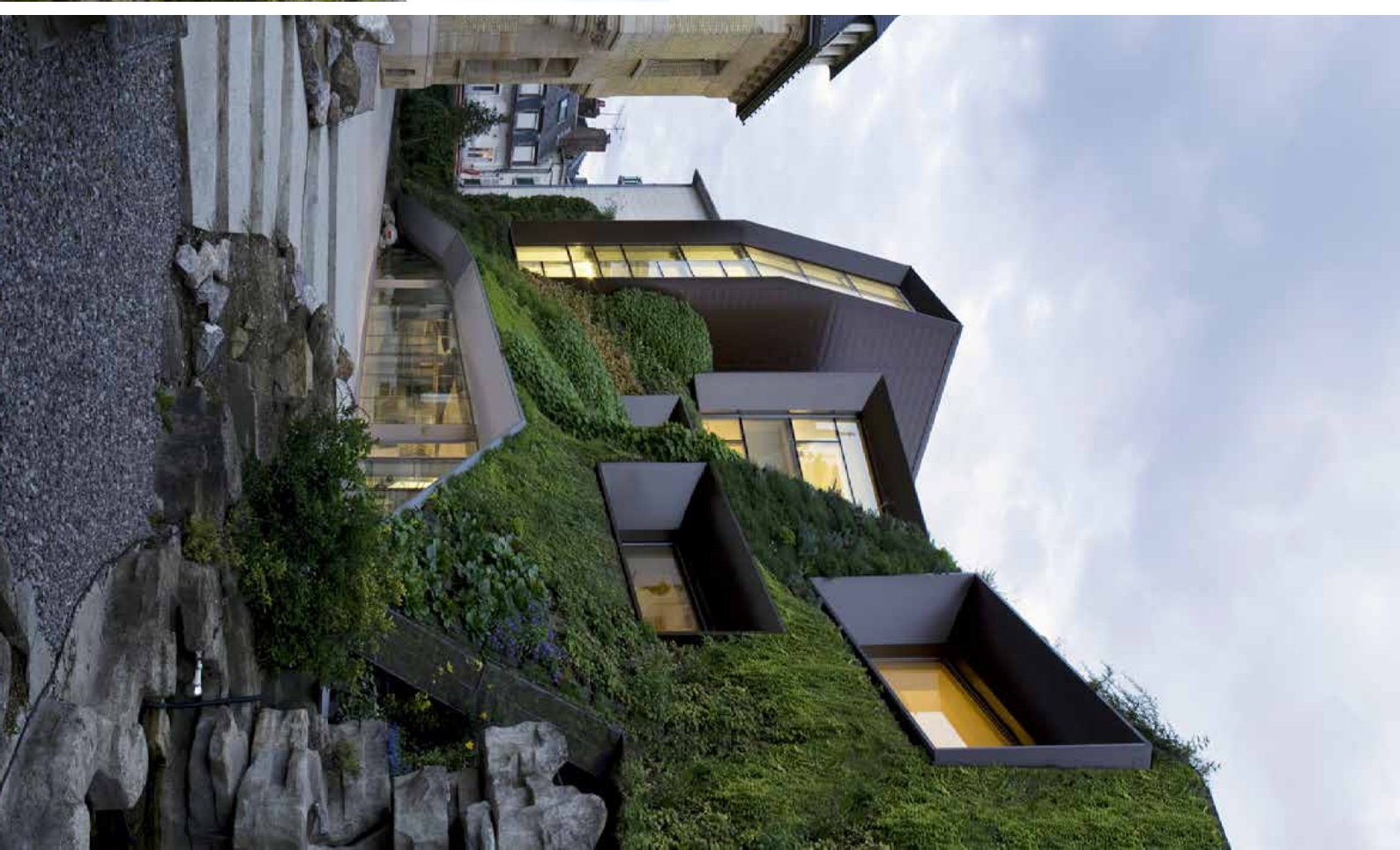
The Estate has the opportunity to build upon the existing night economy in Redfern Street.

Waterloo's existing night time economy is focused on a small number of local pubs. Most of the evening economy is outside the Estate boundaries, centred on Redfern Street and Regent Street (extending to the lot immediately south of Henderson Road). Both are defined as a Local Centre Area in the City of Sydney's Late Night Trading Premises DCP. These areas have the potential to support an increase in night time activity, particularly where a number of commercial premises are vacant or underutilised. On weekends a number of premises trade to midnight. Since the DCP was prepared, a number of new small bars and restaurants have enhanced the evening economy of Redfern.



Fig. 71147 Regional Chamber of Commerce and Industry, Pleadie
Source: Designboom, Danny Hudson, 2012

2019 PLANNING PROPOSAL - 08.04.2020



7.1.6 SUSTAINABILITY AND INFRASTRUCTURE



Fig. 71148 Solar roof panels
Source: Green Roofs Australasia, 2019



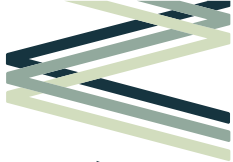
Fig. 71149 Bioswale
Source: Carvalho & Good, PLCC, 2019



Fig. 71150 Vertical garden by Patrick Blanc
Source: Inhabitat, 2019

The sustainability study identifies that future development at Waterloo South will need to:

- Address ecologically sustainable development principles within a precautionary approach, the consideration of inter-generational equity, the conservation of biological diversity and the embedding of environmental factors in the valuation of assets and services.
- Align with the Greater Sydney Commission's objectives for a productive, liveable and sustainable Sydney through smart and sustainable planning for the Eastern City District.
- Align with the City of Sydney's Sustainable Sydney 2030 targets and the actions detailed in the Environmental Action Plan and Energy Master Plans.
- Go beyond BASIX targets and demonstrate best practice particularly with regards to affordable living considerations.
- Integrate climate change mitigation and adaptation urban design strategies to account for more extreme heatwaves, intense storms and localised flooding
- Consider mitigation strategies that include green walls and façades, green pavements, bio-retention systems, rain gardens, street plantings, open spaces and parks.
- Consider transport for NSW (TTNSW) actions regarding electric vehicles, transit oriented development (TOD) and the commitment to prioritise walking and cycling.
- Consider minimisation of energy, water and resource use. Water use to maximise social and economic benefits for the community and align with the Environmental, Planning and Assessment Act's (EP&A's) environmental protection license requirements.
- Encourage water conservation programs (eg. demand management, leak management) and efficiency measures at Estate level.



AIRPORT OPERATION CONSTRAINTS

The PANS-OPS and the RTCC/MVA constraints limit the potential maximum permissible building height including crane heights

There are two height constraints that will limit the maximum permissible building height (including cranes) that would be approved by aviation authorities due to the Estate's proximity to the airport:

- **Obstacle Limitations Surface (OLS)** ranging from 55 - 84m - The OLS is a surface which defines the airspace surrounding Sydney Airport that must be protected from obstacles to ensure aircraft flying in good weather during the initial and final stages of flight can do so safely. If this threshold limit is exceeded, it triggers further impact assessments.
- **126.4m PANS-OPS** - The PANS-OPS Circling Surface for Category A & B Aircraft covers the majority of the Estate. This is the published flight procedures.
- **152.4m Radar Terrain Clearance Chart / Minimum Vector Altitude (RTCC/MVA)** covers a small portion of the Estate at the north-east corner.

PRESCRIBED AIRSPACE LIMITS



Fig. 7.1151 Source: Waterloo South Planning Proposal - Aeronautical Impact Assessment, Strategic Airspace, 2020

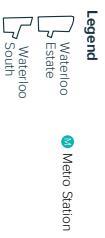
- Legend**
- Waterloo Estate
 - Waterloo South
 - Train Station
 - Metro Station
 - RTCC Limit RL 152.4 AHD
 - Pans-ops Limit RL 126.4 AHD
 - 10-20 Events > 70DB
 - 20-30 Events > 70DB

GEOTECHNICAL

TOPOGRAPHY



Fig. 71152 Topography.
Source: Waterloo - Geotech and Contamination Study, AECOM, 2020

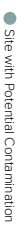


The Estate sits above a Botany Sands aquifer

CONTAMINATION



Fig. 71153 Areas with potential contamination.
Source: Waterloo - Geotech and Contamination Study, AECOM, 2020



None of the existing sites within the Estate have been identified with the potential to contain contaminants that impact soil and groundwater conditions but further investigations should be undertaken.

List of identified sites with potential contaminants:

No.	Site	Distance
1	Formerly Gas n Go Alexandria (fully redeveloped into residential apartments)	119m
2	Alexandria Gardens (under assessment)	64m
3	Proposed Construction Site (regulation under CLM Act not required)	21m
4	Callex Alexandria Service Station (regulation under CLM Act not required)	180m



WATER

ALEXANDRIA CANAL CATCHMENT

Flooding is an issue that will need to be considered in future developments within the Estate

Flood management measures will need to be implemented in the Estate as outlined in the Alexandria Canal Floodplain Risk Management Study (2014).

The majority of flooding within the Alexandria Canal catchment is characterised by overland flow with:

- Critical storm duration between one and three hours across the catchment.
- Peak of the flood within 30-60 minutes after the start of the storm.
- Short duration "flash" flooding that does not allow sufficient time to evacuate residents from homes.

The existing formal drainage systems consist of:

- Overland flow paths through kerb and gutter systems.
- Local drainage system owned and maintained by the City of Sydney.
- Trunk drainage system owned by Sydney Water Corporation discharging to Shear's Creek, Alexandria Canal and Cooks River.

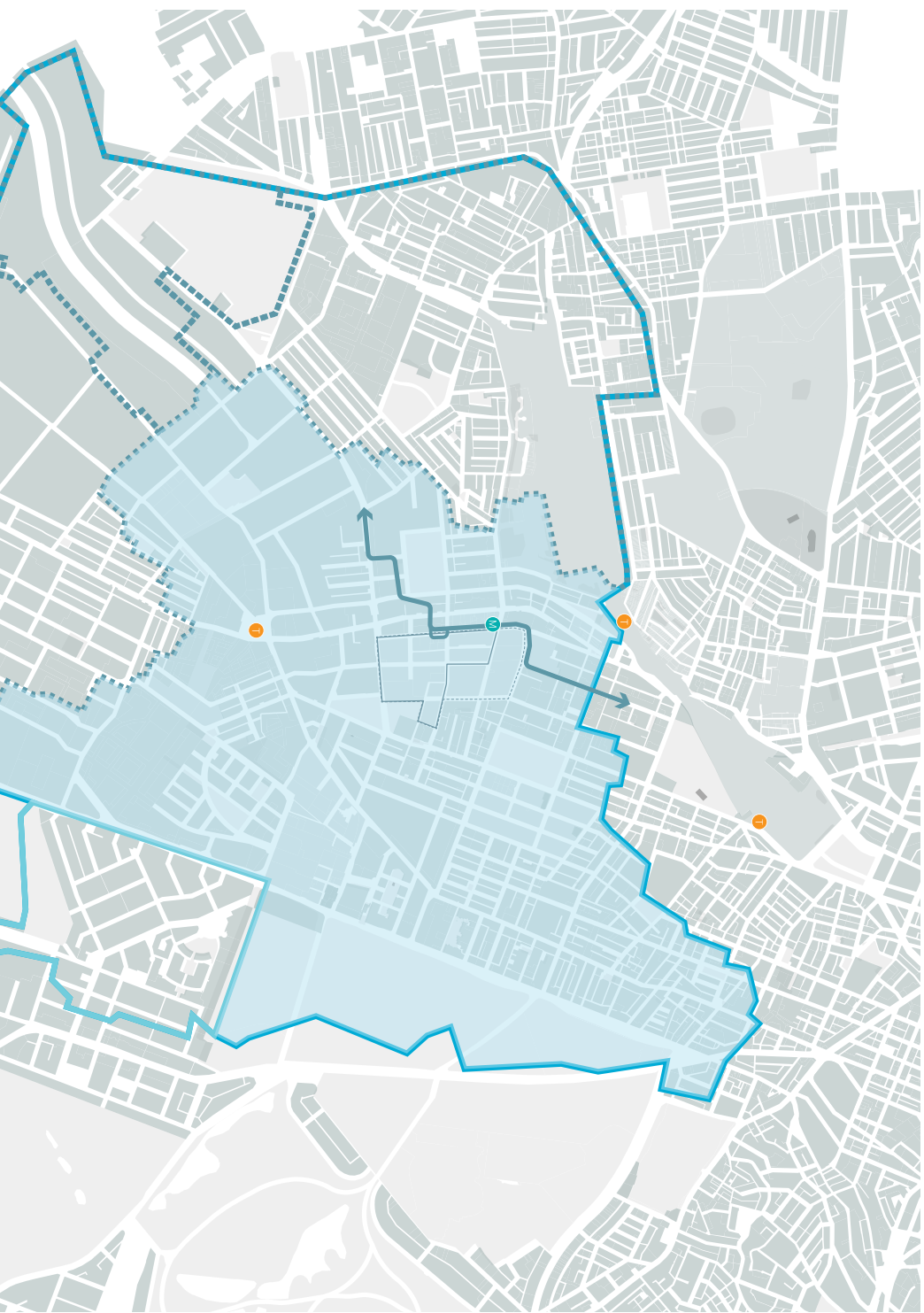


Fig. 71154
Source: Waterloo South - Flooding and Stormwater Study, AECOM, 2020

EXISTING OPEN CHANNEL

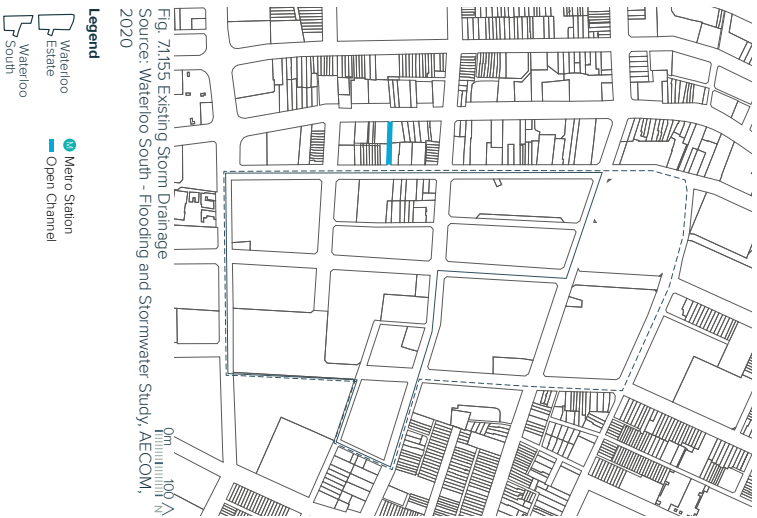


Fig. 7.1155 Existing Storm Drainage
Source: Waterloo South - Flooding and Stormwater Study, AECOM, 2020

- Legend**
- Metro Station
 - Open Channel
 - Waterloo Estate
 - Waterloo South

Primary sources of flooding can be attributed to a number of issues, the most notable is the trunk drainage system being outlet constrained at the Cope Street open channel.

100YR ARI FLOOD LEVELS

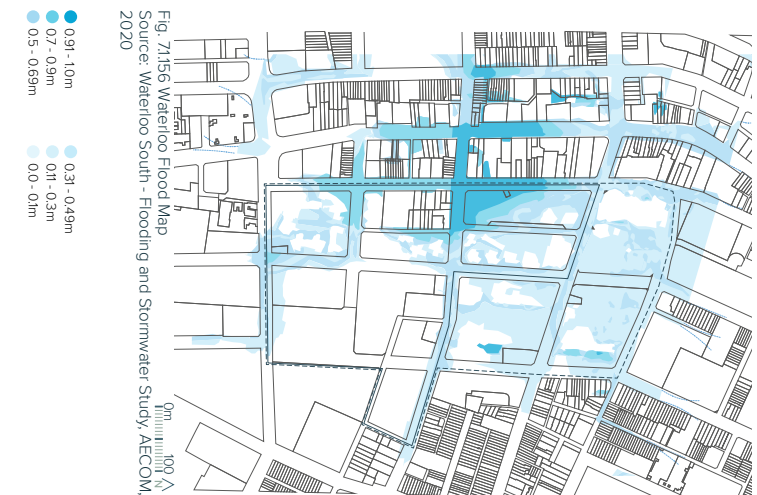


Fig. 7.1156 Waterloo Flood Map
Source: Waterloo South - Flooding and Stormwater Study, AECOM, 2020

- 0.91 - 1.0m
- 0.7 - 0.9m
- 0.5 - 0.69m
- 0.31 - 0.49m
- 0.11 - 0.3m
- 0.0 - 0.1m

The majority of the Estate is located in a flood plain with a high risk of 'flash flooding'. Future development will need to be designed to meet freeboard levels.

WSUD

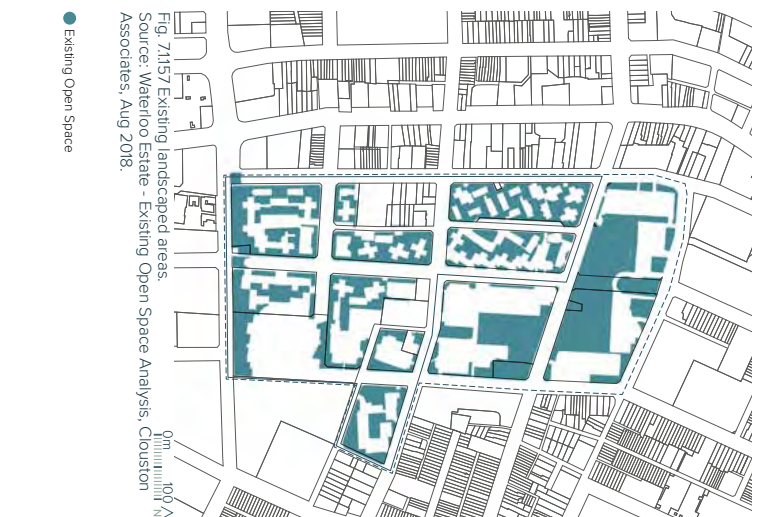


Fig. 7.1157 Existing Landscaped areas.
Source: Waterloo Estate - Existing Open Space Analysis, Clouston Associates, Aug 2018.

- Existing Open Space

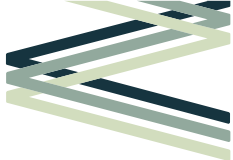
The Estate contains a large proportion of grassed open area (approximately 30% compared to 5% in the Metro Quarter) that acts as informal flood storage during major storm events.

Landscaped open areas have the capacity to act as informal flood storage during major storm events as part of the Water Sensitive Urban Design (WSUD) strategy.



Fig. 7.1158 Existing open channel at Cope Street
Source: Turner, 2018.

- The City of Sydney's Interim Floodplain Management Policy sets out the requirements for the management of flood risk for all new developments within the LGA. This ensures:
- New development will not experience undue flood risk and,
- existing development will not be adversely flood affected through increased damage or hazards created by new development.



MICROCLIMATE

Solar access to public open spaces and existing context will need to consider City of Sydney and ADG amenity requirements

OVERSHADOWING

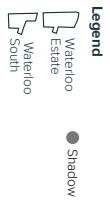
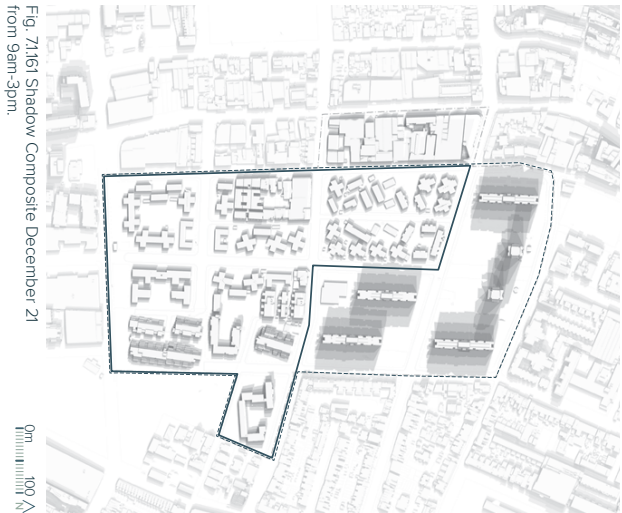


Fig. 71159 Shadow Composite June 21 from 9am-3pm.

Fig. 71160 Shadow Composite September/ March 21 from 9am-3pm.

Fig. 71161 Shadow Composite December 21 from 9am-3pm.

AIR QUALITY

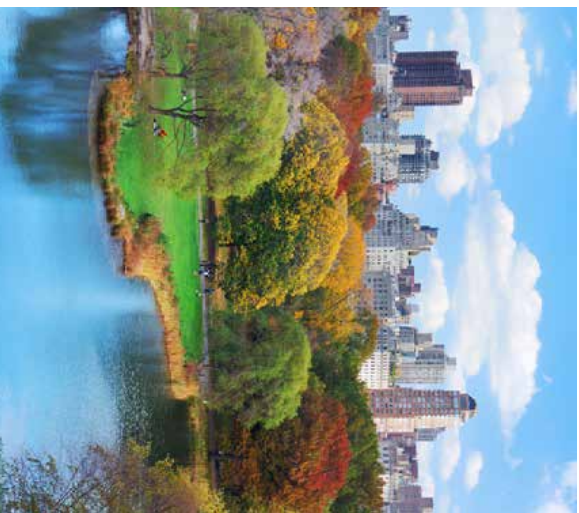


Fig. 71162
Source: <http://www.metroplia.com>

Air quality within the Estate is mainly influenced by emissions from road transport on streets like Botany Road and McEvoy Street.

Future detailed air quality dispersion modelling will determine the air quality impacts on the surrounding sensitive locations. Air quality management strategies will to be a consideration in the development of the masterplan.

NOISE

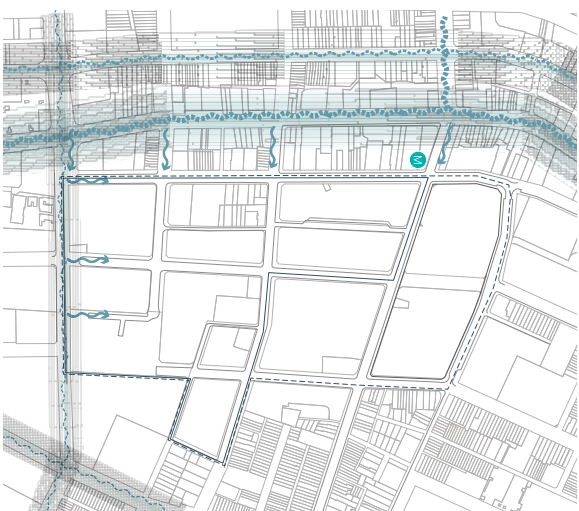
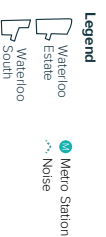


Fig. 71163 Day time noise sources
Source: Waterloo - Geotech and Contamination Study, AECOM, 2020



Existing background noise on McEvoy Street and Botany Road exceeds current standards for residential accommodation due to high vehicle numbers.

Local conditions and noise sources at the local level include noise generated by the traffic flowing along McEvoy Street as a result of the large and regular volume of traffic and those generated by heavy vehicles. Existing buildings in the Estate and adjoining streets act as barriers to noise permeability. Where practical, landscaping and vegetation should be provided as both visual and physical barriers from roads.

WIND

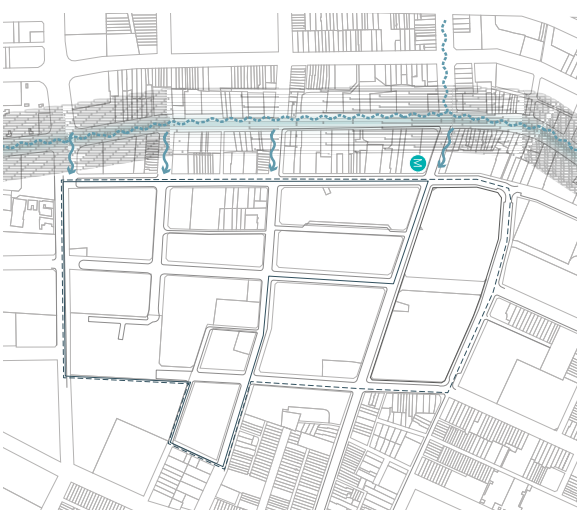


Fig. 71164 Night time noise sources
Source: Waterloo - Geotech and Contamination Study, AECOM, 2020

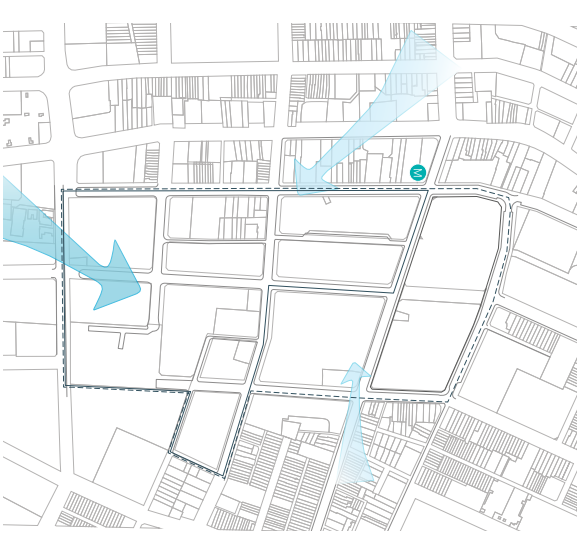
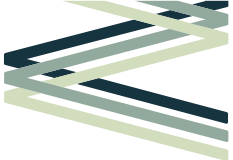


Fig. 71165 Prevailing winds
Source: Waterloo South Masterplan - Pedestrian Wind Environment Study, Windtech, 2020



The prevailing winds that impact the Estate are the southerly and westerly winds. These impacts will potentially need to be addressed through wind mitigation strategies.

- Key wind impacts include:
- Southerly winds are the most frequent and strongest wind for the Sydney region.
 - Westerly winds are most frequent during winter and usually a cold wind that could cause discomfort in outdoor areas.
 - North-easterly winds occur most frequently during the warmer months of the year for the Sydney region, and are typically milder than southerly or westerly winds.
 - The exposed nature of the existing site creates adverse wind conditions around medium to high buildings.



INFRASTRUCTURE

Changes to the current street grid will need to consider the extensive layers of utilities that criss-cross the Estate

There are a range of existing utilities and services infrastructure located throughout the Estate. These include:

- Potable water
- Waste water
- Electrical
- Gas
- Telecom
- Waste

Main service routes are located along Cope, Wellington and George streets. Potential diversions, removal or reticulation of existing and potential connection to, external utilities will need to consider advice from the relevant authorities.

The current street network accommodates all main utility service routings for the Estate. Proposed major utilities such as the proposed electrical trunk lead in feeder cables from the Zetland substation will continue to utilise the street network. Any variation or expansion of the current street grid needs to be coordinated with the extensive layers of utilities throughout the Estate.

A number of different telecommunications providers currently service the area, including NBN, Nextgen, Optus, Telstra, Verizon and Vocus Fibre. Waste servicing is currently provided by the City of Sydney.

Further site investigations, modelling and consultation with the relevant authority will need to be undertaken on existing and future demand on utilities.



Fig 7.1166 Existing utility routes
Source: Waterloo - Utilities and Servicing Study, AECOM, 2020

- Legend**
- Waterloo Estate
 - Waterloo South
 - Metro Station
 - Water
 - Waste
 - Electricity
 - Gas

WATER



- Legend**
- Waterloo Estate
 - Waterloo South
 - Metro Station
- **Water**
 1. 2475 SCL B/L Pressure Tunnel & Shaft
 2. Existing 500mm diameter CCL main
 3. Existing 450mm diameter CCL main
 4. Existing 300mm diameter CCL main
 5. Existing 250mm diameter CCL main
 6. Existing 225mm diameter CCL main

Drinking water is supplied by Sydney Water from the Prospect and / or Kurnell systems via the Potts Hill Reservoirs and Crown Street Reservoir

- Key existing potable network infrastructure includes:
- A DN450mm Cast iron cement lined (CICL) main running along Cope Street and McEvoy Street.
 - A DN300mm CICL main running along Raglan Street and continuing south along George Street.
 - A number of other small reticulation mains ranging in size from DN100mm to DN250mm servicing existing properties within and adjacent to the Estate.
 - A DN2475 Steel cement lined / internal bitumen line (SCL/B/L) Pressure Tunnel & Shaft crossing the southern portion of the site.

WASTE



- **Waste**
 1. Existing 600mm diameter main
 2. Existing 450mm diameter main
 3. Existing 400mm diameter main
 4. Existing 225mm diameter

Waste water facilities are provided by Sydney Water through the Malabar Sewage treatment plant network

- The existing internal wastewater network primarily consists of:
- A DN600mm Vitrified clay (VC) main running along Cope Street (western boundary of the site), between Wellington Street and McEvoy Street
 - A DN400 VC running south along Cope Street
 - A number of smaller reticulation mains ranging in size from DN225mm to DN300mm servicing individual building lots

ELECTRICITY



- **Electricity**
 1. Existing Connection to trunk lead-in feeder alignment
 2. New Ausgrid feeder from Zealand Substation (ZN188)

Electricity servicing to the Estate is provided by Ausgrid via cables from the nearby Zealand Zone substation

- A number of existing electrical assets within the site boundary include:
- A large concentration of low voltage (LV) distribution cables and conduits within George Street, McEvoy Street, Wellington Street and Elizabeth Street.
 - Existing overhead power running along George, Cooper, Cope, Pitt, Raglan, Philip, Wellington and John Streets, except Mead Street.
 - A number of above-ground distribution substations stepping down the 11kV supply located on McEvoy, George, Cope, Phillip, Raglan and Pitt Street.

GAS



- **Gas**
 1. Existing 100mm diameter main
 2. Existing 75mm diameter main
 3. Existing 50mm diameter main
 4. Existing 30mm diameter main

Jemena currently supplies gas to the area through existing gas mains

- The extensive network of gas mains within the Estate include:
- An external secondary trunk main (1,050kPa) that lies approximately 150m from the south boundary at the intersection of George and Allen Streets.
 - A number of medium pressure 210kPa network mains that service existing buildings.

