WATERLOO METRO QUARTER OVER STATION DEVELOPMENT

Appendix M – Ecologically Sustainable Development Report and Sustainability Strategy

SSD-10437 Southern Precinct

Detailed State Significant Development
Development Application

Prepared for **Waterloo Developer Pty Ltd**

30 September 2020

Reference	Description
Applicable SSD Applications	SSD-10437 Southern Precinct
Author	Cundall Johnston and Partners Pty Ltd David Clark
Reviewed	Waterloo Developer Pty Ltd Matt Rawlinson Pat Garland Simon Joseph
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1. Glossary and abbreviations

Reference	Description
ACHAR	Aboriginal Cultural Heritage Assessment Report
ADG	Apartment Design Guide
AHD	Australian height datum
AQIA	Air Quality Impact Assessment
BC Act	Biodiversity Conservation Act 2016
BCA	Building Code of Australia
BC Reg	Biodiversity Conservation Regulation 2017
BDAR	Biodiversity Development Assessment Report
CEEC	critically endangered ecological community
CIV	capital investment value
CMP	Construction Management Plan
Concept DA	A concept DA is a staged application often referred to as a 'Stage 1' DA. The subject application constitutes a detailed subsequent stage application to an approved concept DA (SSD 9393) lodged under section 4.22 of the EP&A Act.
Council	City of Sydney Council
CPTED	Crime Prevention Through Environmental Design
CSSI approval	critical State significant infrastructure approval
CTMP	Construction Traffic Management Plan
DA	development application
DPIE	NSW Department of Planning, Industry and Environment
DRP	Design Review Panel
EP&A Act	Environmental Planning and Assessment Act 1979
EPA	NSW Environment Protection Authority
EPA Regulation	Environmental Planning and Assessment Regulation 2000
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999

Reference	Description
ESD	ecologically sustainable design
GANSW	NSW Government Architect's Office
GFA	gross floor area
HIA	Heritage Impact Assessment
IAP	Interchange Access Plan
LGA	Local Government Area
NCC	National Construction Code
OSD	over station development
PIR	Preferred Infrastructure Report
POM	Plan of Management
PSI	Preliminary Site Investigation
RMS	Roads and Maritime Services
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SEPP 55	State Environmental Planning Policy No 55—Remediation of Land
SEPP 65	State Environmental Planning Policy No. 65 – Design Quality of Residential Apartment Development
SRD SEPP	State Environmental Planning Policy (State and Regional Development) 2009
SREP Sydney Harbour	State Regional Environmental Plan (Sydney Harbour Catchment) 2005
SSD	State significant development
SSD DA	State significant development application
SLEP	Sydney Local Environmental Plan 2012
Transport for NSW	Transport for New South Wales
TIA	Traffic Impact Assessment
The proposal	The proposed development which is the subject of the detailed SSD DA

Reference	Description
The site	The site which is the subject of the detailed SSD DA
VIA	Visual Impact Assessment
WMQ	Waterloo Metro Quarter
WMP	Waste Management Plan
WSUD	water sensitive urban design

2. Executive summary

This planning report has been prepared by Cundall Johnston and Partners Pty Ltd (Cundall) to accompany a detailed State significant development (SSD) development application (DA) for the Southern Precinct over station development (OSD) at the Waterloo Metro Quarter site.

This report has been prepared to address the relevant conditions of the concept SSD DA (SSD 9393) and the Secretary's Environmental Assessment Requirements (SEARs) issued for the detailed SSD DA (SSD 10437).

This report concludes that the proposed Southern Precinct OSD (which includes Building 3 – Student Housing, Building 4 – Social Housing, and Cope Street Plaza) is suitable and warrants approval subject to the implementation of the following mitigation measures.

- A sustainability framework, based on the One Planet Living principles and incorporating the requirements of the rating tools, will be implemented to deliver national best practice sustainability outcomes against a range of environmental and social issues. The framework categories are:
  - Zero Carbon Energy
  - Sustainable Water
  - Waste Minimisation
  - Materials and Supply Chain
  - Land and Nature
  - Travel and Transport
  - Sustainable Food
  - Climate Risk and Adaptation
  - Health and Wellbeing
  - Ethics and Equity
  - Community and Culture

- The building will achieve national best practice sustainability demonstrated through third party certification of the following rating tools:
  - 5 Star rating – Green Star Design and As-Built rating tool v1.3
  - BASIX Energy score of ≥30
  - BASIX Water score of >40

- The precinct is also included within the whole Waterloo Metro Quarter site which will obtain the following site-wide certifications:
  - 6 star rating – Green Star Communities rating tool v1.1
  - One Planet Community – recognition by Bioregional Australia

3. Introduction

This report has been prepared to accompany a detailed State significant development (SSD) development application (DA) for the Southern Precinct over station development (OSD) at the Waterloo Metro Quarter site. The detailed SSD DA is consistent with the concept approval (SSD 9393) granted for the maximum building envelope on the site, as proposed to be modified.

The Minister for Planning, or their delegate, is the consent authority for the SSD DA and this application is lodged with the NSW Department of Planning, Industry and Environment (DPIE) for assessment.

The detailed SSD DA seeks development consent for the design, construction and operation of:

- 25-storey residential building (Building 3) comprising student accommodation, to be delivered as a mixture of studio and twin apartments with approximate capacity of 474 students
- 9-storey residential building (Building 4) above the southern station box to accommodate 70 social housing dwellings
- ground level retail tenancies including Makerspace and gymnasium lobby, and loading facilities
- level 1 and level 2 gymnasium and student accommodation communal facilities
- landscaping and private and communal open space at podium and roof top levels to support the residential accommodation
- new public open space including the delivery of the Cope Street Plaza, including vehicle access to the site via a shared way from Cope Street, expanded footpaths on Botany and Wellington streets and public domain upgrades
- signage zone locations
- utilities and service provision
- stratum subdivision (staged).

This report has been prepared in response to the requirements contained within the Secretary's Environmental Assessment Requirements (SEARs) dated 8 April 2020 and issued for the detailed SSD DA. Specifically, this report has been prepared to respond to the SEARs requirements summarised below.

Item	Description of requirement	Section reference (this report)
8	**Ecologically Sustainable Development (ESD)** The EIS shall: • detail how ESD principles (as defined in clause 7(4) Schedule 2 of the EP&A Regulation 2000) will be incorporated in the design, construction and operation of the development	7

	• include a framework (or demonstrate consistency with an approved framework) for how the proposed development will reflect national best practice sustainable building principles to improve environmental performance, including energy and water efficient design and technology, use of renewable energy and best practice in waste management strategy.	9
	• identify whether parts of student housing development may fall outside BASIX assessment, and if so, what energy efficiency solutions will be used to align with national best practice as opposed to National Construction Code Section J -Energy Efficiency (minimum standard)	9
	• demonstrate sufficient waste and recycling management facilities storage and holding areas for servicing.	Refer to EIS Appendix L – Operational Waste Management Plan

Table 1 - SEARs requirements

This report has also been prepared in response to the following conditions of consent issued for the concept SSD DA (SSD 9393) for the OSD as summarised in the table below.

Item	Description of requirement	Section reference (this report)
B18	Demonstrate how the principles of ecologically sustainable development have been incorporated into the design, construction and ongoing operation of the proposal. This shall include preparation of Environmentally Sustainable Strategies that incorporate low-carbon, high efficiency targets aimed at reducing emissions, optimising use of water, reducing waste and optimising carparking provision to maximise sustainability and minimise environmental impacts.	9
B19	The minimum performance targets for environmental performance are: (a) Precinct Overall (i) 6 star Green Star Communities Rating Tool (ii) Endorsed under One Planet Living framework (b) Commercial / Office Uses (i) 5 Star Green Star Design and As-Built Rating Tool (ii) 5.5 Star NABERS Energy (iii) 4.5 Star NABERS Water (iv) Gold certification: Shell and Core under WELL Building Standard (c) Residential Uses	8

Item	Description of requirement	Section reference (this report)
	(i) 5 Star Green Star Design and As-Built Rating Tool (ii) More than BASIX 40 Water (iii) BASIX 30 Energy	

Table 2 - Conditions of Concept Approval

This report has also been prepared to respond to the objectives and design criteria set out in Section 3R Sustainability of the Waterloo Metro Quarter Design and Amenity Guidelines dated March 2020 as summarised in the table below.

Item	Description of requirement	Section reference (this report)
Objective 1	Create an integrated sustainable infrastructure network incorporating transport facilities, public domain, water systems and vegetation	9
Objective 2	New development encourages sustainable water use practices	9
Objective 3	Reduce energy consumption, emissions and urban heat island effect and improve air quality and the absorption of carbon	9
Design Criteria 1	Comply with the performance targets specified in development consent SSD-9393	8
Design Criteria 2	Water sensitive urban design measures are incorporated to improve stormwater quality flowing into waterways	9

Table 3 – Sustainability Objectives and Design Criteria in Design and Amenity Guidelines

4. The site

The site is located within the City of Sydney Local Government Area (LGA). The site is situated about 3.3 kilometres south of Sydney CBD and eight kilometres northeast of Sydney International Airport within the suburb of Waterloo.

The Waterloo Metro Quarter site comprises land to the west of Cope Street, east of Botany Road, south of Raglan Street and north of Wellington Street (refer to Figure 1). The heritage-listed Waterloo Congregational Church at 103–105 Botany Road is within this street block but does not form a part of the Waterloo Metro Quarter site boundaries.

The Waterloo Metro Quarter site is a rectangular shaped allotment with an overall site area of approximately 1.287 hectares.

The Waterloo Metro Quarter site comprises the following allotments and legal description at the date of this report. Following consolidation by Sydney Metro (the Principal) the land will be set out in deposited plan DP1257150.

- 1368 Raglan Street (Lot 4 DP 215751)
- 59 Botany Road (Lot 5 DP 215751)
- 65 Botany Road (Lot 1 DP 814205)
- 67 Botany Road (Lot 1 DP 228641)
- 124-128 Cope Street (Lot 2 DP 228641)
- 69-83 Botany Road (Lot 1, DP 1084919)
- 130-134 Cope Street (Lot 12 DP 399757)
- 136-144 Cope Street (Lots A-E DP 108312)
- 85 Botany Road (Lot 1 DP 27454)
- 87 Botany Road (Lot 2 DP 27454)
- 89-91 Botany Road (Lot 1 DP 996765)
- 93-101 Botany Road (Lot 1 DP 433969 and Lot 1 DP 738891)
- 119 Botany Road (Lot 1 DP 205942 and Lot 1 DP 436831)
- 156-160 Cope Street (Lot 31 DP 805384)
- 107-117A Botany Road (Lot 32 DP 805384 and Lot A DP 408116)
- 170-174 Cope Street (Lot 2 DP 205942).

The detailed SSD DA applies to the Southern Precinct (the site) of the Waterloo Metro Quarter site. The site has an area of approximately 4830sqm. The subject site comprises the following allotments and legal description at the date of this report.

- 130–134 Cope Street (Lot 12 DP 399757) (Part)
- 136–144 Cope Street (Lots A-E DP 108312) (Part)
- 93–101 Botany Road (Lot 1 DP 433969 and Lot 1 DP 738891) (Part)
- 156–160 Cope Street (Lot 31 DP 805384)
- 107–117A Botany Road (Lot 32 DP 805384 and Lot A DP 408116)
- 119 Botany Road (Lot 1 DP 205942 and Lot 1 DP 436831)

- 170–174 Cope Street (Lot 2 DP 205942).

The boundaries of the overall site are identified at Figure 1, and the subject site of the detailed SSD DA is identified at Figures 2 and 3. The site is reasonably flat with a slight fall to the south.

The site previously included three to five storey commercial, light industrial and shop top housing buildings. All previous structures except for an office building at the corner of Botany Road and Wellington Street have been demolished to facilitate construction of the new Sydney Metro Waterloo station. As such the existing site is predominately vacant and being used as a construction site. Construction of the Sydney metro is currently underway on site in accordance with critical State significant infrastructure approval (CSSI 7400).

Figure 1 - Aerial image of the site
Source: Urbis

The area surrounding the site consists of commercial premises to the north, light industrial and mixed-use development to the south, residential development to the east and predominantly commercial and light industry uses to the west.

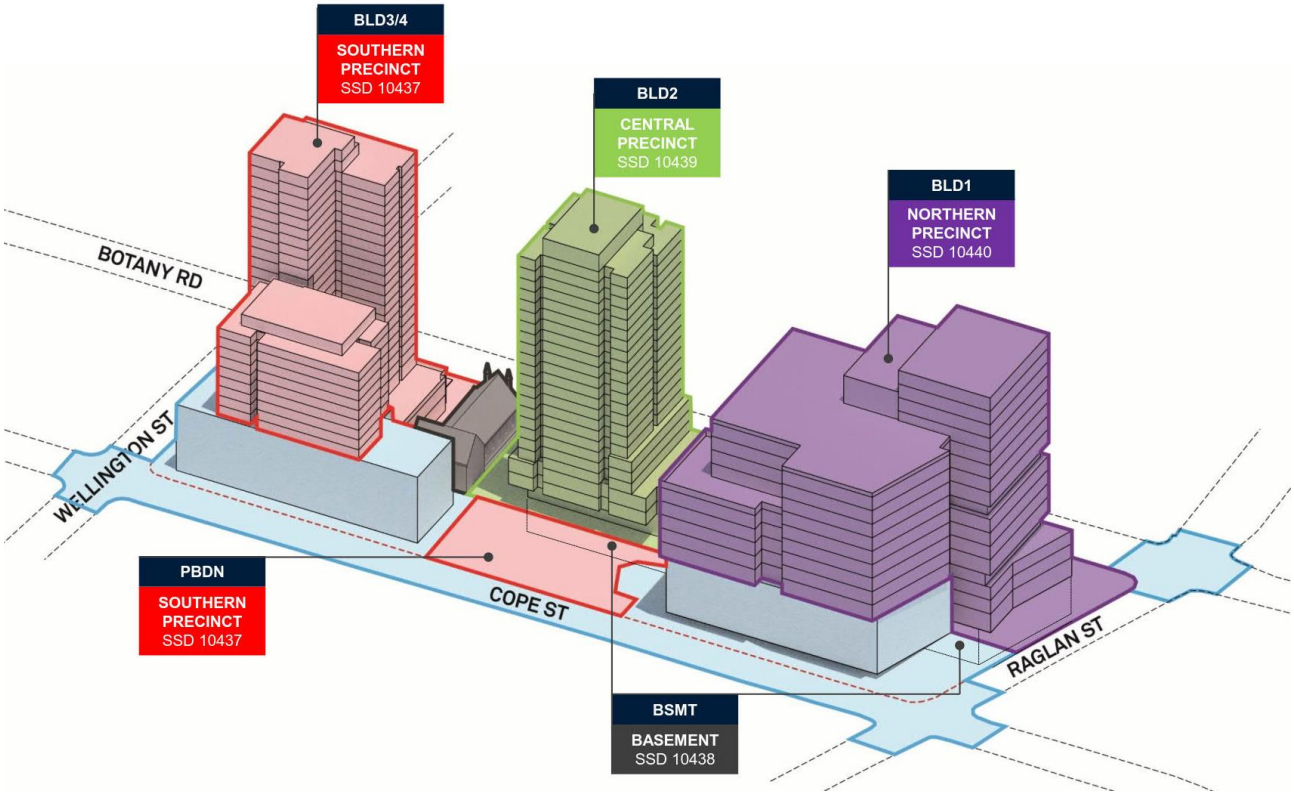


Figure 2 - Waterloo Metro Quarter site, with sub-precincts identified
Source: HASSELL

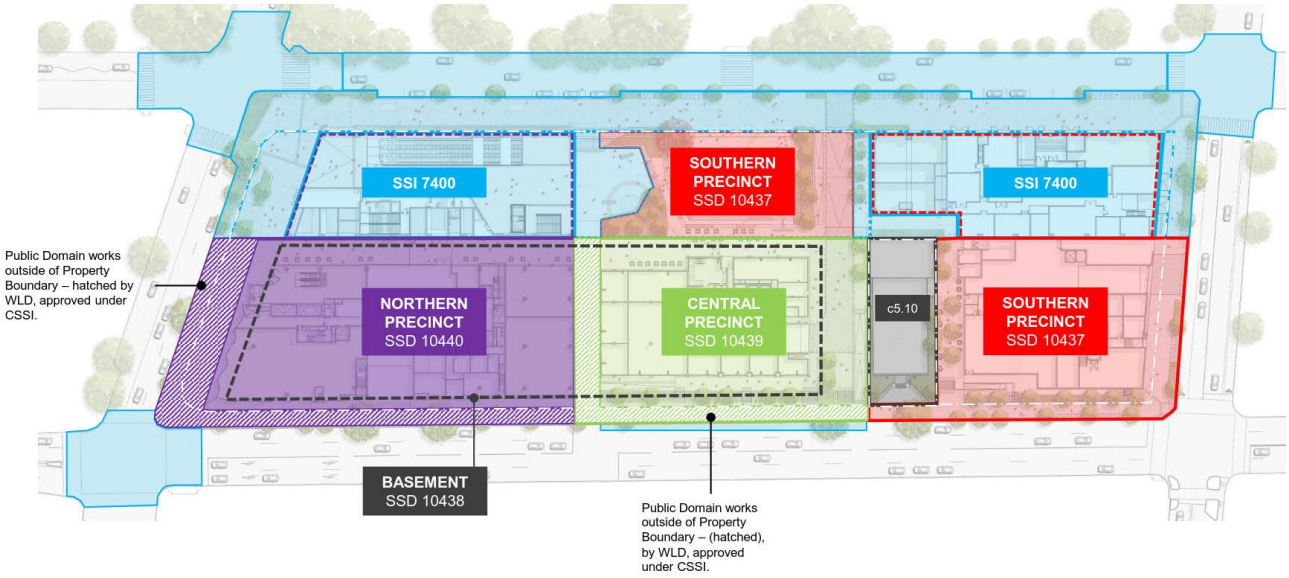


Figure 3 - Waterloo Metro Quarter site, with sub-precincts identified
Source: Waterloo Developer Pty Ltd

5. Background

5.1 About Sydney Metro

Sydney Metro is Australia's biggest public transport project. Services started in May 2019 in the city's North West with a train every four minutes in the peak. A new standalone railway, this 21st century network will revolutionise the way Sydney travels.

There are four core components:

5.1.1 Sydney Metro North West

This project is now complete and passenger services commenced in May 2019 between Rouse Hill and Chatswood, with a metro train every four minutes in the peak. The project was delivered on time and $1 billion under budget.

5.1.2 Sydney Metro City & Southwest

Sydney Metro City & Southwest project includes a new 30km metro line extending metro rail from the end of Metro Northwest at Chatswood, under Sydney Harbour, through new CBD stations and southwest to Bankstown. It is due to open in 2024 with the ultimate capacity to run a metro train every two minutes each way through the centre of Sydney.

Sydney Metro City & Southwest will deliver new metro stations at Crows Nest, Victoria Cross, Barangaroo, Martin Place, Pitt Street, Waterloo and new underground metro platforms at Central Station. In addition, it will upgrade and convert all 11 stations between Sydenham and Bankstown to metro standards.

5.1.3 Sydney Metro West

Sydney Metro West is a new underground railway connecting Greater Parramatta and the Sydney CBD. This once-in-a-century infrastructure investment will transform Sydney for generations to come, doubling rail capacity between these two areas, linking new communities to rail services and supporting employment growth and housing supply between the two CBDs.

The locations of seven proposed metro stations have been confirmed at Westmead, Parramatta, Sydney Olympic Park, North Strathfield, Burwood North, Five Dock and The Bays.

The NSW Government is assessing an optional station at Pyrmont and further planning is underway to determine the location of a new metro station in the Sydney CBD.

5.1.4 Sydney Metro Greater West

Metro rail will also service Greater Western Sydney and the new Western Sydney International (Nancy Bird Walton) Airport. The new railway line will become the transport spine for the Western Parkland City's growth for generations to come, connecting communities and travellers with the rest of Sydney's public transport system with a fast, safe and easy metro service.

The Australian and NSW governments are equal partners in the delivery of this new railway.

The Sydney Metro project is illustrated below.

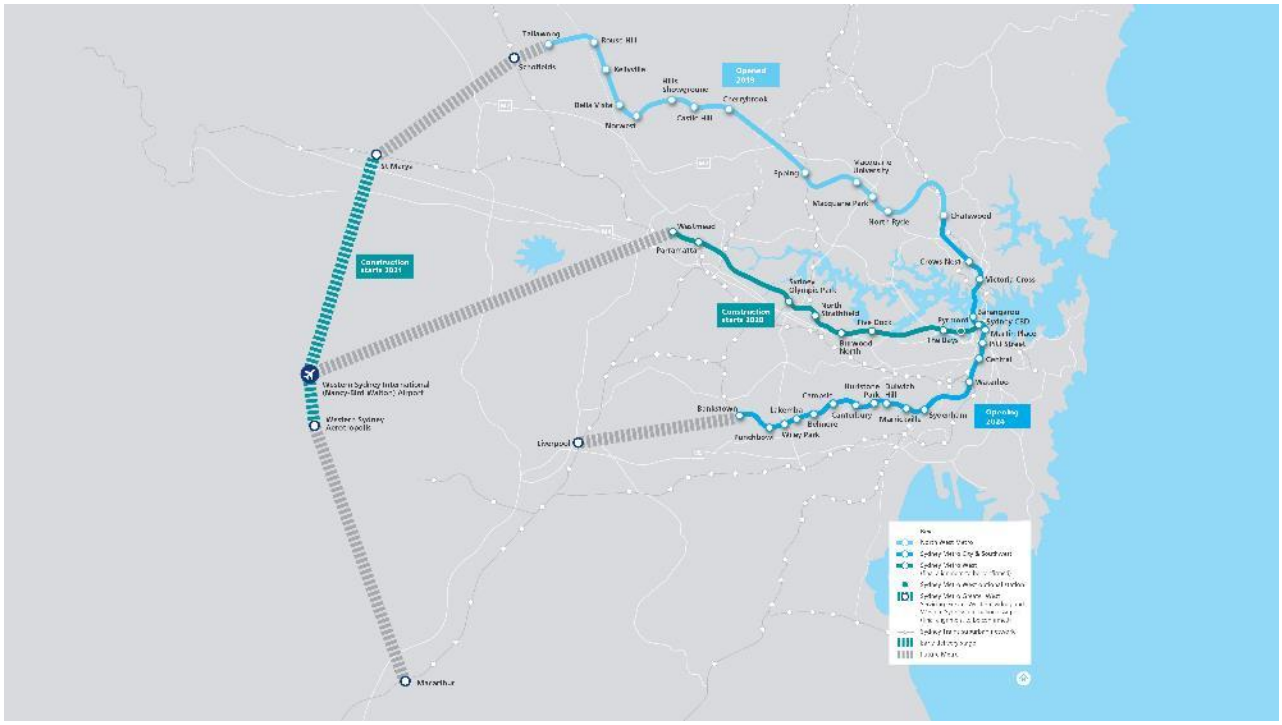


Figure 4 - Sydney Metro alignment map
Source: Sydney Metro

5.2 Sydney Metro CSSI Approval (SSI 7400)

On 9 January 2017, the Minister for Planning approved the Sydney Metro City & Southwest - Chatswood to Sydenham project as a critical State significant infrastructure (CSSI) project (reference SSI 7400) (CSSI approval). The terms of the CSSI approval includes all works required to construct the Sydney Metro Waterloo Station. The CSSI approval also includes the construction of below and above ground works within the metro station structure for appropriate integration with the OSD.

With regards to CSSI related works, any changes to the 'metro station box' envelope and public domain will be pursued in satisfaction of the CSSI conditions of approval and do not form part of the scope of the concept SSD DA or detailed SSD DA for the OSD.

Except to the extent described in the EIS or Preferred Infrastructure Report (PIR) submitted with the CSSI application, any OSD buildings and uses do not form part of the CSSI approval and will be subject to the relevant assessment pathway prescribed by the EP&A Act.

The delineation between the approved Sydney Metro works, generally described as within the two 'metro station boxes' and surrounding public domain works, and the OSD elements are illustrated in Figure 5.

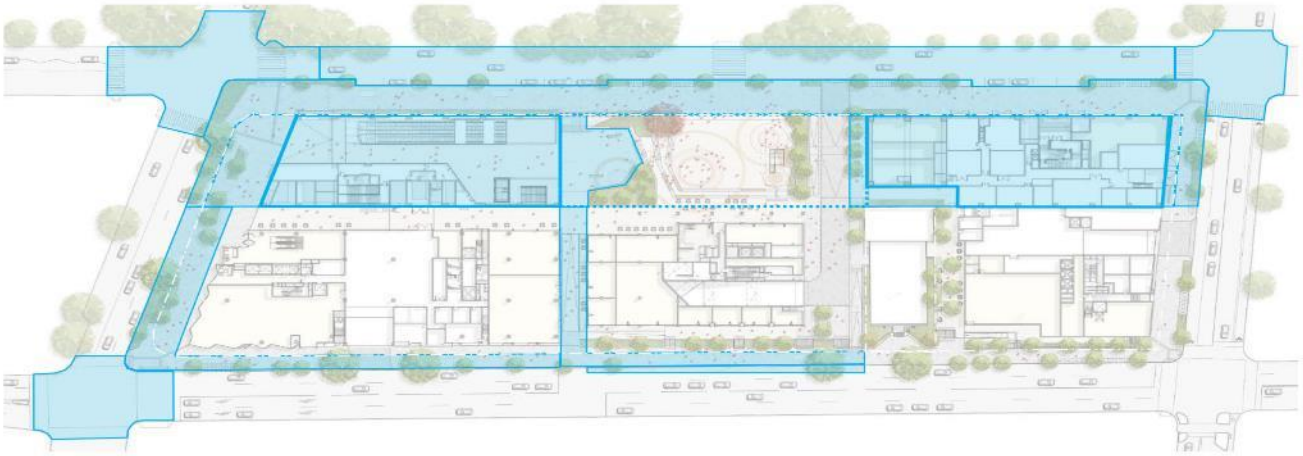


Figure 5 - CSSI Approval scope of works
Source: WL Developer Pty Ltd

5.3 Concept Approval (SSD 9393)

As per the requirements of clause 7.20 of the *Sydney Local Environmental Plan 2012* (SLEP), as the OSD exceeds a height of 25 metres above ground level (among other triggers), development consent is first required to be issued in a concept DA (formerly known as Stage 1 DA).

Development consent was granted on 10 December 2019 for the concept SSD DA (SSD 9393) for the Waterloo Metro Quarter OSD including:

- a maximum building envelope for podium, mid-rise and tower buildings
- a maximum gross floor area of 68,750sqm, excluding station floor space
- conceptual land use for non-residential and residential floor space
- minimum 12,000sqm of non-residential gross floor area including a minimum of 2,000sqm of community facilities
- minimum 5% residential gross floor area as affordable housing dwellings
- 70 social housing dwellings
- basement car parking, motorcycle parking, bicycle parking, and service vehicle spaces.

The detailed SSD DA seeks development consent for the OSD located within the Southern Precinct of the site, consistent with the parameters of this concept approval. Separate SSD DAs have been prepared and will be submitted for the Central Precinct, Northern Precinct and Basement Car Park proposed across the Waterloo Metro Quarter site.

A concurrent amending concept SSD DA has been prepared and submitted to the DPIE which proposed to make modifications to the approved building envelopes at the northern precinct and central building. This amending concept SSD DA does not impact the proposed development within the southern precinct.

6. Proposed development

6.1 Waterloo Metro Quarter Development

The Waterloo Metro Quarter OSD comprises four separate buildings, a basement carpark and public domain works adjacent to the Waterloo Metro station.

Separate SSD DAs will be submitted concurrently for the design, construction and operation of each building in the precinct;

- Southern precinct SSD-10437,
- Basement Car Park SSD-10438,
- Central precinct SSD-10439, and
- Northern precinct-SSD-10440.

An overview of the Development is included below for context. This detailed SSD DA seeks development consent for the design, construction and operation of the Southern Precinct.

6.1.1 Southern Precinct – Subject DA

The Southern Precinct comprises:

- 25-storey residential building (Building 3) comprising student accommodation, to be delivered as a mixture of studio and twin apartments with approximate capacity of 474 students
- 9 storey residential building (Building 4) above the southern station box to accommodate 70 social housing dwellings
- ground level retail tenancies including Makerspace and gymnasium lobby, and loading facilities
- level 1 and level 2 gymnasium and student accommodation communal facilities
- landscaping and private and communal open space at podium and roof top levels to support the residential accommodation
- new public open space including the delivery of the Cope Street Plaza, including vehicle access to the site via a shared way from Cope Street, expanded footpaths on Botany and Wellington Streets and public domain upgrades
- signage zone locations
- utilities and service provision
- stratum subdivision (staged).

6.1.2 Basement Car Park

The Basement Car Park comprises:

- 2-storey shared basement car park and associated excavation comprising
- Ground level structure
- Carparking for the Commercial Building 1, Residential Building 2, social housing Building 4, Waterloo Congregational Church and Sydney Metro
- Service vehicle bays

- commercial end of trip and bicycle storage facilities
- Retail end of trip and bicycle storage facilities
- residential storage facilities
- shared plant and services.

6.1.3 Central Precinct

The Central Precinct comprises:

- 24-storey residential building (Building 2) comprising approximately 126 market residential and 24 affordable housing apartments, to be delivered as a mixture of 1 bedroom, 2 bedroom and 3 bedroom apartments
- Ground level retail tenancies, community hub, precinct retail amenities and basement car park entry
- level 1 and level 2 community facilities (as defined in the SLEP) intended to be operated as a childcare centre
- landscaping and private and communal open space at roof top levels to support the residential accommodation
- new public open space including the delivery of the Church Square, including vehicle access to the basement via a shared way from Cope Street, expanded footpaths and public domain upgrades on Botany Road
- external licensed seating areas
- signage zone locations
- utilities and service provision
- stratum subdivision (staged).

6.1.4 Northern Precinct

The Northern Precinct comprises:

- 17-storey commercial building (Building 1) comprising Commercial floor space, with an approximate capacity of 4000 workers
- ground level retail tenancies, loading dock facilities serving the northern and central precinct including Waterloo metro station
- landscaping and private open space at podium and roof top levels to support the commercial tenants
- new public open space including the delivery of the Raglan Street Plaza, Raglan Walk and expanded footpaths on Raglan Street and Botany Road and public domain upgrades
- external licensed seating areas
- signage zone locations
- utilities and service provision
- stratum subdivision (staged).

7. ESD Principles

7.1 Definition

Clause 7(4) of Schedule 2 of the Environmental Planning and Assessment Regulation 2000, defines the principles of ecologically sustainable development as follows:

a) the precautionary principle, namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:

   (i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and

   (ii) an assessment of the risk-weighted consequences of various options,

b) inter-generational equity, namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations,

c) conservation of biological diversity and ecological integrity, namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration,

d) improved valuation, pricing and incentive mechanisms, namely, that environmental factors should be included in the valuation of assets and services, such as:

   (i) polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,

   (ii) the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,

   (iii) environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.

7.2 Response

This project responds to the above ESD principles as follows. The sustainability initiatives are described in more detail in Section 9 and include design, construction and operational initiatives.

7.2.1 Precautionary Principle

The project will present no threat of serious or irreversible environmental damage. The project will create habitat to improve the site, implement climate change adaptation principles, and apply industry best practice ESD initiatives and third party certification including Green Star Design and As-Built, Green Star Communities and One Planet Community.

An appropriate due diligence has been and will continue to be conducted along the development process to ensure the precautionary principle is satisfied. Due diligence includes conducting required studies to address all SEARs environmental requirements and all statutory provisions in all relevant planning instruments, including the Biodiversity Conservation Act 2016, relevant SEPPs and LEPs.

7.2.2 Inter-Generational Equity

The buildings and plaza will provide healthy internal and external environments for workers, residents and visitors today and in the future. The landscaping principles of habitat creation will deliver benefit to current and future generations.

The use of fossil fuels has been minimised through energy efficiency initiatives, and the buildings will have a Fossil Fuel Free transition strategy to allow the building to be powered by low carbon and/or renewable energy sources in the future to align with the NSW Government's goal of zero carbon emissions by 2050.

7.2.3 Conservation of Biological Diversity and Ecological Integrity

The site is of low ecological value and primarily contained existing buildings and paving which have been demolished to enable the construction of the new underground Sydney Metro station. An extensive landscaping strategy has been developed for the site which includes tree planting at street level, landscaping to the plaza, and green roofs on the buildings.

The selection of planting will prioritise native species, selected based on sun exposure, shading and watering needs, to suit their position in the landscape and environmental attributes of that location. Tree and understorey planting throughout the site will provide a rich diversity of endemic species. The palette has been developed to create urban ecologies which may provide habitat or food sources for native birds, bees and insects. Refer to the Landscape Report for further details.

7.2.4 Improved Valuation, Pricing and Incentive Mechanisms

The design and operation of the buildings and plaza will reduce energy and water consumption and greenhouse gas emissions. Life Cycle Costing will be used during the design process to justify capital investment and reduce ongoing impacts.

Environmental goals have been established using industry recognised rating tools which are designed to deliver beneficial environmental and social outcomes during construction and operation.

8. Environmental Performance Targets

The buildings and precinct will achieve third party certification against the following rating tools and frameworks which are consistent with national best practice environmental sustainability, Condition B19 of SSD DA (SSD 9393) and Design Criteria 1 of Section 3R Sustainability of the WMQ Design and Amenity Guidelines dated March 2020.

The buildings will achieve the following certifications:

- 5 Star rating – Green Star Design and As-Built rating tool v1.3
- BASIX Energy score of ≥30
- BASIX Water score of >40

The precinct is also included within the whole Waterloo Metro Quarter site which will obtain the following site-wide certifications:

- 6 Star rating – Green Star Communities rating tool v1.1
- One Planet Community – recognition by Bioregional Australia

Further details on the performance targets are given below.

8.1 Green Star Design and As-Built

Green Star, developed and administered by the Green Building Council of Australia (GBCA), is a set of internationally recognised rating tools that deliver independent verification of sustainable outcomes throughout the life cycle of the built environment. The GBCA's mission is to "*lead the sustainable transformation of the built environment*" and it aims to achieve this by encouraging practices that:

- Reduce the impact of climate change
- Enhance the health and quality of life of inhabitants and the sustainability of the built environment
- Restore and protect the planet's biodiversity and ecosystems
- Ensure the ongoing optimum operational performance of buildings
- Contribute to market transformation and a sustainable economy

Green Star certification is a formal process during which a building, fitout, or precinct is awarded a rating by an independent, third party assessment panel of sustainable development experts through a documentation-based assessment.

The Green Star Design and As-Built rating tool assesses the sustainability outcomes from the design and construction of new buildings or major refurbishments and rates them on a scale from 4 Stars (Best Practice) to 6 Stars (World Leadership).

The rating tool includes requirements across nine impact categories.

Management - aims to encourage and reward the adoption of practices and processes that support best practice sustainability outcomes throughout the different phases of a project's design, construction and ongoing operation.

Indoor Environment Quality - aims to encourage and reward initiatives that enhance the comfort and well-being of occupants. The credits within this category address issues such as air quality, thermal comfort and acoustic comfort.

Energy - aims to reward projects that are designed and constructed to reduce overall greenhouse emissions from operations by addressing energy demand reduction, use efficiency and generation from alternative sources.

Transport - aims to reward projects that facilitate a reduction on the dependency of private car use as an important means of reducing overall greenhouse gas emissions, as well as to encourage the provision of alternative forms of transportation.

Water - aims to encourage and reward initiatives that reduce the consumption of potable water through measures such as the incorporation of water efficient fixtures and building systems and water re-use.

Materials - aims to address the consumption of resources for the project, by encouraging the selection of low-impact materials.

Land Use and Ecology - aims to reduce the negative impacts on sites' ecological value as a result of urban development and reward projects that minimise harm and enhance the quality of local ecology.

Emissions - aims to assess the environmental impacts of 'point source' pollution generated by projects and reduce their effects on the atmosphere, watercourse and native animals.

Innovation - aims to recognise the implementation of innovative practices, processes and strategies that promote sustainability in the built environment.

The building will be designed and constructed to achieve the following rating:

Rating Tool	SSDA Condition of Consent	Project Response
Green Star Design and As-Built v1.3	5 star	5 star

Formal certification will be obtained from the GBCA within 18 months of issue of a Certificate of Occupancy.

Preliminary Green Star Pathways for the buildings have been prepared and the targeted credits are summarised in Appendix 3 – Green Star Design and As-Built Preliminary Pathway for Building 3 and Appendix 4 – Green Star Design and As-Built Preliminary Pathway for Building 4. The exact credits will be adapted and adjusted during the design development so the building will maintain

flexibility to change these credits whilst maintaining the overall target of a minimum of 60 points for a 5 star rating.

8.2 Green Star Communities

Green Star Communities is one of the suite of Green Star rating tools developed and administered by the Green Building Council of Australia (refer to Section 8.1). The tool assesses the environmental and social sustainability outcomes associated with the planning, design and construction of large scale development projects at a precinct, neighbourhood and/or community scale, and rates them on a scale from 4 Stars (45 points – Best Practice) to 6 Stars (75 points – World Leadership).

The rating tool includes requirements across the following five impact categories:

Governance - aims to encourage and recognise developers and projects that demonstrate leadership within the sector, by establishing and maintaining strong governance practices. The category promotes engagement, transparency, as well as community and industry capacity building. It also seeks to ensure that community projects are resilient to a changing climate.

Liveability - aims to encourage and recognise developments that deliver safe, accessible and culturally rich communities. The category encourages the development of healthy and active lifestyles, and rewards communities that have a high level of amenity, activity, and inclusiveness.

Economic prosperity - aims to encourage and recognise projects that promote prosperity and productivity. The category encourages affordable living and housing, investment in education and skills development, and community capacity building. This category also promotes greater productivity through emerging opportunities in the digital economy.

Environment - aims to reduce the impact of urban development on ecosystems. It encourages resource management and efficiency by promoting infrastructure, transport, and buildings, with reduced ecological footprints. The Environment category seeks to reduce the impacts of projects on land, water, and the atmosphere.

Innovation - aims to recognise the implementation of innovative practices, processes and strategies that promote sustainability in the built environment.

The Waterloo Metro Quarter site, comprising the Northern Precinct, Central Precinct, Southern Precinct, and Basement, will achieve the following rating:

Rating Tool	SSDA Condition of Consent	Project Response
Green Star Communities v1.1	6 star	6 star

Formal certification will be obtained from the GBCA within 18 months of issue of a Certificate of Occupancy for all precincts.

A Preliminary Green Star Communities Pathway for the site has been prepared and the targeted credits are summarised in Appendix 2 – Green Star Communities Preliminary Pathway. The exact credits will be adapted and adjusted during the design development so the site will maintain flexibility to change these credits whilst maintaining the overall target of a minimum of 75 points for a 6 Star rating.

8.3 One Planet Community

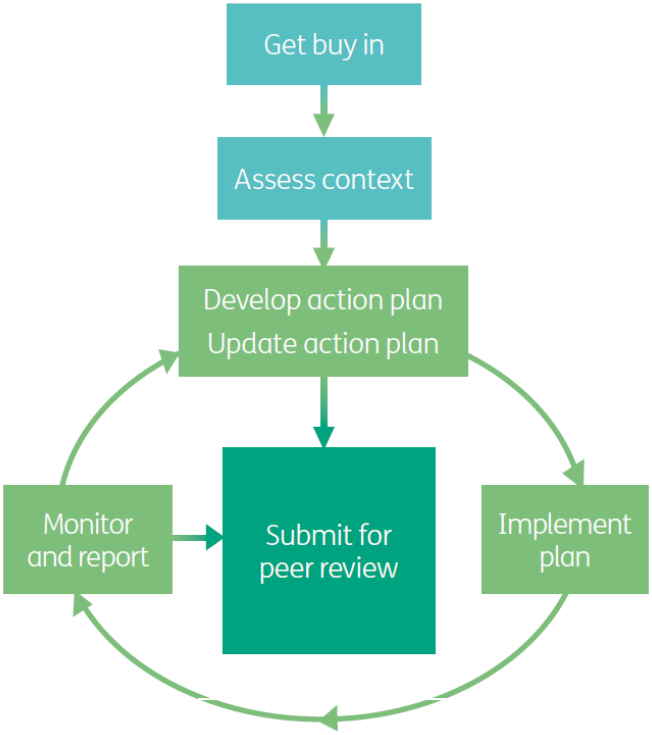
One Planet Living is a sustainability framework developed by Bioregional and the World Wildlife Fund based on ten guiding principles. It can be applied to companies and organisations, communities and destinations, cities and regions, and schools.

To achieve formal recognition as a One Planet Community under Bioregional Australia's One Planet Living Program requires a three-year commitment to the development of a One Planet Action Plan, implementation and transparent reporting on the outcomes.

The One Planet Action Plan is core to the program and is created by a One Planet Integrator to respond to the opportunities and challenges specific to the time and place of the project. It comprises four key components:

- **Context Setting** – identifies the key local and global opportunities, challenges and future trends which will affect the development.
- **Visioning** – envisions how the development will make it easy and attractive for people to lead happy, healthy, sustainable lives – and how it will respond to the opportunities, challenges and future trends identified in the context setting.
- **Assessing** – a benchmark or gap analysis to identify which aspects of One Planet Living and its ten principles the development is delivering on, and what additional aspects or commitments need to be addressed.
- **Planning and Implementing** – a detailed plan for each of the ten principles setting out goals, key performance indicators, actions, opportunities, barriers and monitoring of implementation during the design, construction and operational phases of the project.

The One Planet Action Plan and supporting documentation is then submitted to Bioregional for an independent peer review, and if considered to be ambitious enough, the project will receive recognition as a One Planet Community. Bioregional do not 'endorse' projects. To maintain recognition annual reporting on actions implemented and impacts measured is undertaken in years 2 and 3 for review by Bioregional. The review includes evaluating what has been achieved, progress and to identify priorities for the next twelve months.



The Waterloo Metro Quarter site, comprising the Northern Precinct, Central Precinct, Southern Precinct, and Basement, will achieve the following recognition:

Framework	SSDA Condition of Consent	Project Response
One Planet Community	Endorsed	Recognition

Formal recognition of the One Planet Action Plan will be obtained from Bioregional Australia within 18 months of issue of a Certificate of Occupancy for all precincts.

8.4 BASIX

BASIX is the web-based planning tool developed and administered by the NSW Department of Planning and Environment. Provisions to enable the operation of BASIX are contained in the Environmental Planning and Assessment Regulation 2000 (EP&A Regulation) and State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004 (the BASIX SEPP).

For Class 2 buildings in New South Wales, BASIX replaces the NatHERS requirements in Section J0.2(a) of Volume 1 of the Building Code of Australia (BCA) 2019 for sole occupancy units.

While Class 3 buildings are typically excluded from BASIX compliance in the NSW amendments to Section J of NCC2019, the Department of Planning requires that large boarding houses, including student accommodation, obtain a BASIX certificate under an Alternative Assessment Process.

The Student Housing building and the Social Housing building will both be designed and constructed to achieve the following scores which exceed the minimum compliance requirements defined in BASIX:

Compliance	SSDA Condition of Consent	Project Response
BASIX Energy	30	30 minimum
BASIX Water	40+	41 minimum

Refer to EIS Appendix RR – BASIX Statement Part 1: Building 3 demonstrating how these targets are achieved for Building 3.

Refer to EIS Appendix RR – BASIX Statement Part 2: Building 4 demonstrating how these targets are achieved for Building 4.

9. Sustainability Framework

A modified version of the standard One Planet Living categories has been adopted as the Sustainability Framework for the project. The framework will inform design, construction and operational stages of the project. An integrated design approach will be adopted for the incorporation of sustainability measures, with input from the sustainability consultant from early planning through to construction phases.

9.1 Framework Categories

The sustainability framework impact categories are:

Zero Carbon Energy

Sustainable Water

Waste Minimisation

Materials and Supply Chain

Land and Nature

Travel and Transport

Sustainable Food

Climate Risk and Adaptation

Health and Wellbeing

Ethics and Equity

Community and Culture

9.2 Framework Alignment

The Sustainability Framework impact categories align with the various sustainability impacts identified in the following:

- Mirvac's This Changes Everything strategy
- John Holland's Approach to Sustainability
- UN Sustainable Development Goals
- Sustainable Sydney 2030 – Community Strategic Plan 2017-2021
- Concept SSD DA (SSD 9393) dated 10 December 2019
- Secretary's Environmental Assessment Requirements (SEARs) dated 8 April 2020
- Waterloo Metro Quarter Design and Amenity Guidelines – Section 3R sustainability
- Sydney Metro City and Southwest Sustainability Strategy 2017-2024 (June 2019 update)
- Green Star Design and As-Built rating tool
- Green Star Communities rating tool
- One Planet Community principles
- BASIX

The Sustainability Framework also aligns with the environmental and social impacts addressed under the various rating tools described in Section 8.

Refer to Appendix 1 – Sustainability Framework Alignment for further details on the alignment.

9.3 Framework Initiatives and Implementation

A broad range of initiatives are proposed in order to minimise consumption of resources, especially energy, water and waste, and ensure delivery of a sustainable development. These are described in the following sections and will be reviewed and refined during design development.

The initiatives will be consistent with national best practice and will contribute towards achieving the environmental performance targets described in Section 8.

The initiatives listed in the sections below will be further reviewed during design development and will be modified or enhanced as required to achieve the objectives and goals/targets stated.

Some of the initiatives described below are unique to this precinct and some are initiatives that apply across the whole Waterloo Metro Quarter site and are therefore also described in the ESD Reports for Central Precinct (SSD-10439) and Northern Precinct (SSD-10440).

9.4 Zero Carbon Energy

9.4.1 Objective

Make buildings and infrastructure energy efficient, reduce use of fossil fuels and maximise renewable energy.

9.4.2 Goals / Targets

- BASIX Energy 30

9.4.3 Initiatives

- Strategy to be prepared to phase out fossil fuels for domestic hot water in both buildings in the future.
- Passive design: Student Housing building façade designed to optimise wall/glazing ratios, provide external shading and exceed minimum Section J1 requirements of NCC 2019.
- Passive design: Social Housing building façade designed to achieve an average NatHERS rating exceeding 6.5 stars.
- Energy efficient HVAC: Ceiling fans provided in Social Housing apartments to provide comfort cooling.
- Energy efficient HVAC: Room key controls provided in student rooms to turn off AC system when rooms are vacant.
- Energy efficient lighting: LED lighting with zoned control, occupancy sensors and daylight dimming to suit the use of different spaces.
- Energy efficient lifts: energy efficient motors and regenerative braking on main lifts.
- Renewable energy: A minimum of 17.5 kW of photovoltaic panels installed on the roof of Building 3. The installation of photovoltaics to the roof of Building 4 is not permitted as it is outside the permissible development envelope.

9.5 Sustainable Water

9.5.1 Objective

Use water efficiently, protecting local water resources and reducing flooding, drought and water pollution.

9.5.2 Goals / Targets

- BASIX Water 40+

9.5.3 Initiatives

- 4 star WELS rated taps and toilets.
- 3 star WELS rated showers in student accommodation and social housing units.
- 3 star WELS rated washing machines provided in central laundry in Building 3 (student housing).
- Landscaping design and plant selection to minimise irrigation demand.
- Rainwater collection for irrigation of the landscaping.

- Water sub-metering of major water uses.
- Water Sensitive Urban Design (WSUD) to reduce stormwater run-off and water pollution will be implemented in accordance with the City of Sydney Development Control Plans – refer to the EIS Appendix O – Stormwater Management Strategy and Flood Impact Assessment.

9.6 Waste Minimisation

9.6.1 Objective

Reduce consumption and re-use and recycle to work towards minimising waste to landfill.

9.6.2 Goals / Targets

- > 90% of construction & demolition waste diverted from landfill
- Facilities to enable operational waste to be diverted from landfill

9.6.3 Initiatives

- Demolition and Construction Waste Minimisation Plan to Best Practice Green Star standards and achieve waste credit.
- Prefabrication of bathroom pods in student housing building.
- Prefabrication of façade components and service risers to reduce on-site waste generation during construction.
- Waste and recycling receptacles positioned within Cope Street Plaza for public use.
- General recycling facilities to the residential units including the use of a recycling chute.
- General recycling facilities for paper and cardboard and glass for the makerspace and gym.
- For further details on Operational Waste initiatives and strategy refer to EIS Appendix L – Operational Waste Management Plan.

9.7 Materials & Supply Chain

9.7.1 Objective

Use materials from sustainable sources, apply life cycle principles, and prioritise products with transparent, ethical supply chains.

9.7.2 Goals / Targets

- Selection of materials and products that are certified, reused or contain recycled content (> 3% by cost)
- Life Cycle Assessment to achieve >50% of Green Star LCA credits and reduce embodied carbon by minimum 10%

9.7.3 Initiatives

- Conduct life cycle assessment (LCA) to identify material selection / specification improvements during design development.

- Concrete mix to reduce embodied carbon – reduce Portland Cement content, include recycled or manufactured aggregates, and source from energy efficient supplier.
- All timber is FSC certified or equivalent.
- Hazardous material risk assessment to reduce use of toxic materials.
- Low-off gassing materials to be selected – floor finishes, joinery and painting.
- Best practice PVC compliance for formworks, pipes, flooring, blinds & cables.
- Encourage key sub-contractors to become members of the Australian Supply Chain Sustainability School (Mirvac and John Holland are both Partners with the school).
- Preference materials and suppliers with third party accreditation (social and/or environmental sustainability).

9.8 Land & Nature

9.8.1 Objective

Restore, preserve and protect land, biodiversity and natural capital for the benefit of people and wildlife.

9.8.2 Goals / Targets

- Roof areas to be provided with low native planting of ground covers and grasses, supplemented by crushed gravel and sandstone to reduce heat island effect.
- Tree canopy coverage across the precinct equivalent to 50%.

9.8.3 Initiatives

- Street tree planting.
- Deep Soil zone.
- A communal roof terrace with planting for students in Building 3 (student housing)
- A communal roof terrace with planting for residents in Building 4 (social housing)
- Native plant species selected for edible/usable properties and which may provide habitat or food sources for native birds, bees and insects.
- The maintenance of Landscaping in Cope Street Plaza will be further investigated during the community engagement process.
- External lighting to minimise night sky pollution.

For further details on land and nature initiatives refer to EIS Appendix KK – Landscape and Public Domain Report.

9.9 Travel & Transport

9.9.1 Objective

Reduce the need to travel and encourage walking, cycling and low carbon transport.

9.9.2 Goals / Targets

- Encourage cycling by residents, workers and visitors

9.9.3 Initiatives

- Safe and quick access to the Sydney Metro station.
- Secure cycle storage for students and social housing.
- No car parking for student accommodation and very limited car park parking for social housing allocated in the Basement Car Park under the buildings in the Northern and Central Precincts.
- Design vehicle intersections to prioritise pedestrian and cyclist safety.

9.10 Sustainable Food

9.10.1 Objective

Promote sustainable humane farming and healthy diets high in local, seasonal organic food and vegetable protein.

9.10.2 Goals / Targets

- Encourage retailers to provide healthy food options
- Urban food production

9.10.3 Initiatives

- Incorporate edible plants into the landscaping – refer to EIS Appendix KK – Landscape and Public Domain Report for further details.
- Provide rooftop garden terraces in both buildings for residents to grow and harvest edible plants.
- Community plan to include healthy eating and cooking classes.

9.11 Climate Risk & Adaptation

9.11.1 Objective

Apply practical actions to manage risks from climate impacts, protect communities and strengthen the resilience of the local economy.

9.11.2 Goals / Targets

- A Climate Adaptation Plan will inform the design of the project in accordance with international guidelines.

9.11.3 Initiatives

- Prepare and implement a Climate Adaptation Plan (plan to be prepared during design development) including agreeing on the climate change scenario to be adopted (2°C and/or 4°C).
- Reduce heat island effect – green roofs, street tree planting, PV panels, hard surfaces with high Solar Reflective Index (SRI).
- Passive design of facades to improve thermal performance and reduce impact of extreme weather days.
- Stormwater systems designed for increased storm frequency and intensity.

9.12 Health & Wellbeing

9.12.1 Objective

Encourage active, social, meaningful lives and provide the buildings, infrastructure and spaces to support good health and wellbeing for all ages.

9.12.2 Goals / Targets

- Fitness facilities accessible to all residents and guests

9.12.3 Initiatives

- Cycle storage to encourage healthy transport options.
- Physical and mental health programs for workers during construction.
- Access to gym on site (in Southern precinct).
- Accessible green roofs and community spaces.
- > 6.5 star NatHERS average ratings in Building 4 to improve thermal comfort above the minimum BASIX requirements (which is equivalent to 5 star NatHERS average).
- Low-off gassing materials to be selected – floor finishes, joinery and painting – to improve indoor air quality.

9.13 Ethics & Equity

9.13.1 Objective

Create safe, just and equitable places to live, work, learn & trade, and support local prosperity and fair trade.

9.13.2 Goals / Targets

- Responsible procurement policies
- Targets for employment during construction

9.13.3 Initiatives

- 70 apartments of social housing provided.
- Implement a sustainable procurement policy addressing modern slavery, child labour and other social equity and ethics issues in the project supply chain.

- Set targets for employment of disadvantaged groups during construction.
- Support of local SMEs and disadvantaged local residents including indigenous enterprise and employment.
- Affordable retail and food strategies will be implemented across the WMQ site and be accessible to residents in the Southern Precinct.
- High speed internet to support working from home.
- Design for best practice accessibility.

9.14 Community & Culture

9.14.1 Objective

Nurture local identity and heritage, empower communities and promote a culture of sustainable living.

9.14.2 Goals / Targets

- Public Art program
- 2,000m² of community facilities will be provided across the whole precinct (shared between northern, central, and southern precincts)
- Precinct Activation Fund and Committee to curate activation

9.14.3 Initiatives

The Community initiatives are site wide and cover all three precincts together – Northern, Central and Southern.

- Community Hub Café in Central Precinct – curated with a not-for-profit organisation that will offer education in food to the underprivileged, providing social cohesion and connection in the precinct. It will also be used for the Precinct Leadership Group to meet, coordinate events and programs, and oversee activities in the central public plaza, Cope Street Plaza.
- Public Plaza (Cope Street Plaza) and Pavilion in Central Precinct as focus for local activity, interim activation and events.
- Health and Medical Centre in Northern Precinct – proposed to be 24/7 operation.
- Child care centre in Central Precinct with extended hours of operation.
- Maker Space in Southern Precinct – proposed to be accessible and community originated. It will support the sharing economy (such as through a tool exchange) and broker social relationships between the diverse housing and community groups.
- Public art program including indigenous curators, public art competitions and co-evolved works with community.
- Creative hoardings program as part of public art strategy during construction.
- Place naming and wayfinding programs to engage with local community.
- Community Place Manager will be engaged.

10. Conclusion

The proposed development complies with the ecologically sustainable development requirements set out in the SEARs dated 8 April 2020.

The proposed development meets or exceeds the conditions of consent issued for the concept SSD DA (SSD 9393) for the OSD.

The Sustainability Framework and the environmental performance targets are consistent with, and in many cases go beyond, national best practice in sustainability for developments of a similar scale and nature.

The buildings will both achieve the following third party certified performance targets:

- 5 Star rating – Green Star Design and As-Built rating tool v1.3
- BASIX Energy score of ≥30
- BASIX Water score of >40

The precinct is also included within the whole Waterloo Metro Quarter site which will obtain the following site-wide certifications:

- 6 star rating – Green Star Communities rating tool v1.1
- One Planet Community – recognition by Bioregional Australia

The Sustainability Framework, based on the One Planet Living principles and incorporating the requirements of the rating tools, includes objectives, goals/targets and a range of initiatives for each of the following categories:

- Zero Carbon Energy
- Sustainable Water
- Waste Minimisation
- Materials and Supply Chain
- Land and Nature
- Travel and Transport
- Sustainable Food
- Climate Risk and Adaptation
- Health and Wellbeing
- Ethics and Equity
- Community and Culture

11. Appendices

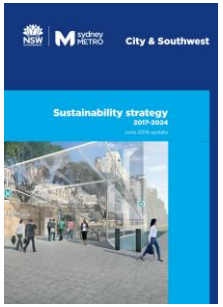
11.1 Appendix 1 – Sustainability Framework Alignment

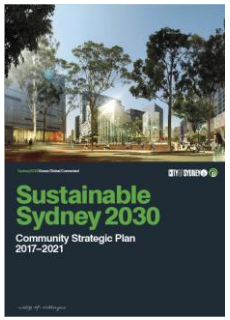
11.2 Appendix 2 – Green Star Communities Preliminary Pathway

11.3 Appendix 3 – Green Star Design and As-Built Preliminary Pathway for Building 3

11.4 Appendix 4 – Green Star Design and As-Built Preliminary Pathway for Building 4

Appendix 1: Sustainability Framework Alignment





Sustainability Framework Alignment with relevant strategies and frameworks

	Impact	Objective	Alignment with UN SDG	Mirvac This Changes Everything	John Holland Sustainability	Sydney Metro Sustainability Objectives	Sustainable Sydney 2030
	Zero Carbon Energy	Make buildings and infrastructure energy efficient, reduce use of fossil fuels and maximise renewable energy.		Energy	Climate Change Management	Carbon & energy management	2, 9
	Sustainable Water	Use water efficiently, protect local water resources and reduce flooding, drought and water pollution.		Net positive water		Water efficiency Pollution control	2, 9
	Waste Minimisation	Reduce consumption and re-use and recycle to work towards minimising waste to landfill.		Zero waste by 2030	Resource Use & Efficiency	Waste & materials consumption	2
	Materials and Supply Chain	Use materials from sustainable sources, apply life cycle principles, and prioritise products with transparent, ethical supply chains.		Materials	Resource Use & Efficiency	Waste & materials consumption Supply Chain	9
	Land and Nature	Restore, preserve and protect land, biodiversity and natural capital for the benefit of people and wildlife.		Biodiversity		Biodiversity conservation Pollution control	2
	Travel and Transport	Reduce the need to travel and encourage walking, cycling and low carbon transport.				Liveability Carbon & energy management	3, 4
	Sustainable Food	Promote sustainable humane farming and healthy diets high in local, seasonal organic food and vegetable protein.					-

	Impact	Objective	Alignment with UN SDG	Mirvac This Changes Everything	John Holland Sustainability	Sydney Metro Sustainability Objectives	Sustainable Sydney 2030
	Climate Risk and Adaptation	Apply practical actions to manage risks from climate impacts, protect communities and strengthen the resilience of the local economy.		Climate change risk	Climate Change Management	Climate Change Resilience	2
	Health and Wellbeing	Encourage active, social, meaningful lives and provide the buildings, infrastructure and spaces to support good health and wellbeing for all ages.		Wellbeing	Safety & Wellbeing	Liveability	4, 9
	Ethics and Equity	Create safe, just and equitable places to live, work, learn & trade, and support local prosperity and fair trade.		Social return Reconcilliation Affordability	Supply Chain Resilience	Workforce development Economic Liveability	1, 6, 10
	Community and Culture	Nurture local identity and heritage, empower communities and promote a culture of sustainable living.		Community engagement	Community Value	Heritage conservation Community Benefit	1, 5, 6, 9

Sustainability Framework Alignment with SEARs, SSD and rating tools

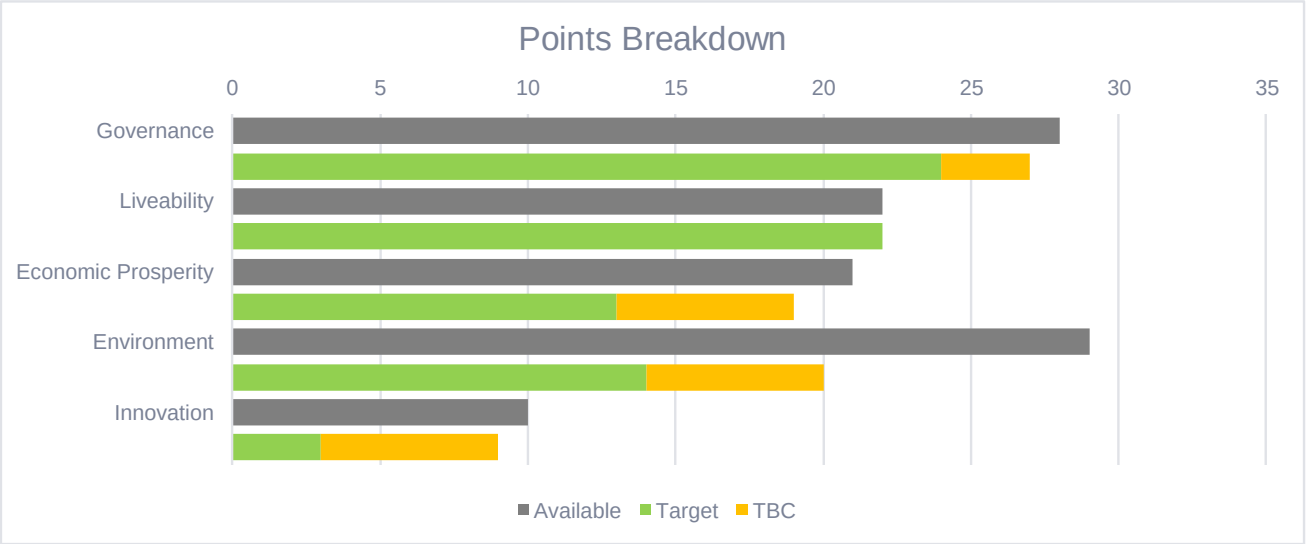
	Impact	SEARs and SSD conditions	WMQ Design & Amenity Guidelines	Green Star for Buildings v1.3	Green Star Communities	NABERS	BASIX	WELL Building Standard v2
	**Zero Carbon Energy**	Energy efficiency Renewable energy Low carbon	BASIX 30 NABERS 5.5 5% PV	Energy Management	Greenhouse gas strategy	Energy 5.5 stars	Energy 30	
	**Sustainable Water**	Water efficiency	BASIX 40+ WSUD Water Use	Water Emissions	Integrated water cycle	Water 4.5 stars	Water 40+	
	**Waste Minimisation**	Waste management	Reduce Waste	Management Materials	Construction, demolition & operational waste			
	**Materials and Supply Chain**			Materials	Life cycle assessment			Materials
	**Land and Nature**		Tree Canopy Green Roofs Biodiversity	Land Use & Ecology	Sustainable sites – reuse of land, contamination, biodiversity enhancement, light pollution			
	**Travel and Transport**	Optimise carparking	Prioritise walking, cycling & public transport	Transport	Sustainable transport & movement			Movement
	**Sustainable Food**				Access to fresh food Food production			Nourishment

	Impact	SEARs and SSD conditions	WMQ Design & Amenity Guidelines	Green Star for Buildings v1.3	Green Star Communities	NABERS	BASIX	WELL Building Standard v2
	**Climate Risk and Adaptation**		Reduce heat island effect	Management	Adaptation & resilience Heat island effect			
	**Health and Wellbeing**		Noise control Solar amenity Air quality	Indoor Environment Quality	Liveability (recreation, active lifestyles, healthy places); Access to amenities, Safe places			Air, Light, Thermal Comfort, Sound, Mind
	**Ethics and Equity**		Social housing Affordable housing	-	Community investment; Affordability; Employment & economic resilience; Education & skills development; Return on investment; Incentive programs; Digital infrastructure.			
	**Community and Culture**				Engagement; Sustainability awareness; Community facility and programs; Community development; Enhancing local culture, heritage and identity.			Community

Appendix 2: Green Star Communities Preliminary Pathway

This preliminary pathway is provided for information only and sets out one potential strategy to achieve a 6 star Green Star Communities rating for the whole Waterloo Metro Quarter site (covering Northern Precinct, Central Precinct, Southern Precinct and Basement Car Park combined).

The chart below summarises the points available and targeted in the preliminary pathway.



The final selection of credits to be pursued will be confirmed during the next design stage and will be sufficient to achieve the minimum requirements for a 6 star rating including exceeding the rating threshold of 75 points.

CATEGORY / CREDIT	AIM OF THE CREDIT / SELECTION	CODE	CREDIT CRITERIA	POINTS AVAILABLE	TARGET	TBC	COMMENT
Governance				28			
Green Star Accredited Professional	To recognise projects that engage a Green Star Accredited Professional to support the Green Star certification process.	1.0	Green Star Accredited Professional	1	1		Cundall engaged as Green Star Communities GSAP. Credit should be readily achievable.
Design Review	To encourage and recognise projects that undertake a design review process designed to facilitate sustainable urbanism.	2.1	Site Planning and Layout	4	4		Requires a comprehensive design review process, usually at client expense, with terms of reference and meetings/reporting as per the Green Star requirements. - 2 points for in-house design review - 3 points for mixed design review - 4 points for fully independent design review See: Waterloo Metro Quarter Design and Amenity Guidelines, multiple parties prepared this document inc. City of Sydney
		2.2	Urban Design	4	4		
Engagement	To encourage and recognise projects that develop and implement a comprehensive, project specific stakeholder engagement strategy early in the planning process to inform the planning and design of the plan for development.	3.1	Stakeholder Engagement Strategy	3	3		Points will likely be achieved based on strategy outlined in the Preliminary Place Story
		3.2	Strategy Implementation	3	3		
Adaptation and Resilience	To encourage and recognise projects that are resilient to the impacts of a changing climate and natural disasters.	4.1	Climate Adaptation	2	2		Cundall to prepare Climate Adaptation Plan
		4.2	Community Resilience	2		2	Community Resilience Plan includes information about risks, emergency contacts, emergency shelter locations, information for occupants to develop their own emergency plan, communication channels, disaster prevention guidelines, and supporting checklists. Should be readily achievable and low cost points, offering value and risk mitigation. Can be in form of a website
Corporate Responsibility	To encourage and recognise projects with a project applicant that has corporate responsibility as a core value.	5.1	Corporate Responsibility	1	1		Mirvac's policy suffices, John Holland TBC. Policy can be prepared
		5.2	Sustainability Reporting	2		1	Mirvac is reporting based on GRI priciples. John Holland TBC
Sustainability Awareness	To encourage and recognise those projects that enhance knowledge and understanding of its sustainability attributes.	6.1	Community Users' Guide	1	1		Develop a public Community Users' Guide describing the sustainability of the site. Assumed readily achievable and low cost point. Can be in form of a website
		6.2	Sustainability Education Facilities	1	1		Can be integrated in wayfinding strategy or be part if te community centre.
Community Participation and Governance	To encourage and recognise projects that establish mechanisms for community management arrangements for facilities and programs.	7.1	Community Facility Management	1	1		Community-led entity needs to be set up or supported. Can be part of the planned childcare, community hub or maker space on site. Facility program will be based on the entity selected for Credit 7.1
		7.2	Community Program Management	1	1		
Environmental Management	To encourage and recognise the adoption of formal environmental management practices.	8.1	Environmental Management System	1	1		Requirement for all contractors on contracts >AUD$5m to have a valid ISO14001 Certification. Only includes public areas but can be a cross credit to Design & As Built Certifications Is typically standard practice.
		8.2	Environmental Management Plan	1	1		Head Contractors to develop an EMP and all subcontractors to adhere to it. Can also be a cross credit to Design & As Buit. Is typically standard practice.
Total				28	24.0	3.0	

Liveability				25			
Healthy and Active Living	To encourage and recognise projects that promote healthy and active living.	9.0	Minimum Requirement - Footpaths	-	Complies		Roads and pedestrian areas to be designed to AMCORD requirements.
		9.1	Active Lifestyle	2	2		Requires well designed walking paths, cycling facilities, etc. Will should be achieved
		9.2	Recreational Facilities	2	2		Raglan basketball courts and park and Alexandria Park with tennis courts is nearby (within 400/800m walking distance to a park/sports facility)
		9.3	Healthy Places	1	1		Checklist to be completed, based on credits 9.0-9.3
Community Development	To encourage and recognise projects that engage in and facilitate the development of the project's community.	10.0	Minimum Requirement - Community Development Plan	-	Complies		Community consultation and The Place Story developed
		10.1	Community Development Officer	1	1		One person being engaged for one day per week for 30% of the project time for community development. Likely to be achieved.
		10.2	Community Group	1	1		Can be connected to Credit 7
		10.3	Community Events	1	1		Will be based on Credits 10.0-10.2 and Credit 7
		10.4	Community Information	1	1		Will be based on Credit 10.3
Sustainable Buildings	NatHERS and Livable Housing Australia	11.1	Certified Non-Residential Buildings	-			
		11.2	NatHERS and Livable Housing Australi	4	4		All buildings will be Green Star certified. TQ may be required with the GBCA to approve the Green Star Certification Strategy for residential buildings.
Culture, Heritage and Identity	To encourage and recognise projects that celebrate and incorporate the heritage, culture and historical context of the project site, supporting communities and places with the development of a sense of place and identity.	12.1	Understanding Culture, Heritage and Identity	1	1		Heritage assessment is part of the Place Story. Report to be prepared.
		12.2	Enhancing Community Culture, Heritage and Identity	2	2		Will be part of placemaking, wayfinding, naming and other initiatives.
Walkable Access to Amenities	To encourage and recognise projects that have walkable access to a diverse number of amenities that reflect the predicted demographic of the project's community.	13.1	Walkable Access to Amenities	2	2		Wide range of amenities are in walking distance. Credit should be achieved.
Access to Fresh Food	To encourage and recognise projects that have access to fresh food locally.	14.1	Access to Fresh Food	1	1		Woolworths Redfern less than 800m from site
		14.2	Local Food Production	1	1		100m2 productive landscape per 1000 residential occupants. To be confirmed
Safe Places	To recognise projects in which the activity of planning and detailed design for land use, development and redevelopment takes into consideration designing out crime principles.	15.0	Minimum Requirement - Visibility	-	Complies		All tunnels and underpasses must have end-to-end visibility. May require a TQ with the GBCA given the type of project with underground development. Should be achievable.
		15.1	Design for Safety	2	2		A CPTED assessment will be undertaken.
Total				**22**	**22.0**	**0.0**	

Economic Prosperity				21			
Community Investment	To encourage and recognise projects investing in infrastructure within the development for community benefit.	16.1	Community Infrastructure Investment	4	4		Community Centre & Child Care Centre ($4000 per residential dwelling or $32 / m2 of non-residential). Using non-resi pathway means $32 * 40,000m2 = $1.3m
Affordability	Residential Affordability Strategies	17.1	Residential Affordability Strategies	4	4		Residential GFA is larger than non-residential. Affordable and Social Housing is provided on site.
		17.2	Non- Residential Affordability Strategie	-			
Employment and Economic Resilience	To encourage and recognise projects with local and diverse employment opportunities.	18.1	Net Percentage Increase of Local Jobs	1	1		New retail and commercial premises will likely provide an increase in jobs. An economic study to be prepared.
	Proximity to Major City – Prescriptive Pathway	18.2A	Diverse Local Employment – Performai	-			
		18.2B	Proximity to Major City – Prescriptive P	1	1		Within 5km of Sydney CBD
		18.2C	NCC Class mix – Prescriptive Pathway	-			
Education and Skills Development	To encourage and recognise projects that have access to further education and/or provide a skills and industry capacity development opportunities.	19.1	Higher Education Facilities	1	1		University of Sydney and Charles Darwin University are only 500m away.
		19.2	Skills Development Programs	1		1	Can be a training program as part of Mirvac's RAP or other initiatives
		19.3	Industry Capacity Development	1			Training and awareness in sustainability - e.g Australian Sustainable Supply Chain School
Return on Investment	To encourage and recognise holistic methods to assess the return on investment in response to the sustainability goals for the project.	20.1	Analysis of Direct Costs and Benefits	1		1	Economic assessment of the project
		20.2	Analysis of Indirect Costs and Benefits	1		1	SROI assessment of indirect costs and benefits from the project
Incentive Programs	Residential Incentives	21.1	Residential Incentives	2		2	For two points, $750 per dwelling on incentives need to be provided. To be confirmed.
		21.2	Non-residential Incentives	-			
Digital Infrastructure	To encourage and recognise projects that use digital infrastructure to create greater efficiencies in the connection of individuals with other people, goods, services, and information.	22.1	High-speed Broadband	1	1		Connect to NBN
		22.2	Wireless Local Area Network	1	1		Provide WiFi in activity centres
Peak Electricity Demand	Reduced Peak Electricity Demand - Performance Pathway	23A	Reduced Peak Electricity Demand - Performance Pathway	2		1	1 point is possible, but will need to check heat pumps impact
		23B.i	On-site Generation – Prescriptive Pathway	-			Won't achieve 30%
		23B.ii	Energy Storage – Prescriptive Pathway	-			25% peak demand shift unachievable
Total				**21**	**13.0**	**6.0**	

Environment				**29**			
Integrated Water Cycle	Water Sensitive Urban Design – Performance Pathway	24A.1	Stormwater – Performance Pathway	2	1	1	Civil engineers to confirm
		24A	Water Sensitive Urban Design – Performance Pathway	5	2	1	Large set of water saving measures will be implemented. Modelling will be required to confirm number of points achieved.
		24B.1	Alternative Water Sources - Public Open Spaces	-			
		24B.2	Alternative Water Sources - Buildings	-			
		24B.3	Stormwater Peak Discharge	-			
		24B.4	Stormwater Quality	-			
Greenhouse Gas Strategy	Greenhouse Gas Strategy – Performance Pathway	25A	Greenhouse Gas Strategy – Performance Pathway	6	1	2	2 points for 21% improvement. 3rd point for 37% improvement
		25B.1	Energy Efficiency - Infrastructure Lighting	-			
		25B.2	Energy Efficiency - Existing Buildings	-			
		25B.3	Renewable Energy Production	-			
		25B.4	District Heating and Cooling	-			
Materials	Life Cycle Assessment (LCA) – Performance Pathway	26A	Life Cycle Assessment (LCA) – Performance Pathway	5	2		An LCA required to be undertaken. Can be carried out for the whole site including buildings and used as cross credit for Design & As Built
		26B	Life Cycle Impacts – Prescriptive Pathway	-			
Sustainable Transport and Movement	Sustainable Transport and Movement: Performance Pathway	27A	Sustainable Transport and Movement: Performance Pathway	3	3		Built on top of Sydney Metro station. Lots of cycling facilities.
		27B	Sustainable Transport and Movement: Prescriptive Pathway	-			
Sustainable Sites	To encourage projects that avoid or minimise impacts on environmentally sensitive sites while recognising projects that reuse previously developed land and reclaim contaminated land using best practice remediation.	28	Conditional Requirement	-	Complies		
		28.1	Previously Developed Land	1	1		Land was previously developed.
		28.2	Best Practice Site Decontamination	1		1	Assume achieved - TBC
Ecological Value	To encourage and recognise projects that enhance the ecological value of the project site.	29.1	Change of Ecological Value	1		1	20% improvement may be possible due to green roofs. To be confirmed. Existing site had no ecology.
		29.2	Biodiversity Enhancement	1			Unlikely to be achieved.
Waste Management	To encourage and recognise projects that reduce the environmental impact of waste.	30.1	Construction, and Demolition Waste	1	1		minimum of waste to be 60% recycled or reused. Should be standard practice. 90% is targeted for buildings.
		30.2	Operational Waste	1	1		Public place and residential recycling schemes are in place. Project allows for composting/green waste scheme
Heat Island Effect	To encourage and recognise projects that implement measures to reduce heat island effect.	31.1	Heat Island Effect	1	1		Green roofs, PV and reflective roof surfaces for more than 50% of site area in plan view
Light Pollution	To encourage and recognise projects that minimise the adverse impact of light emissions.	32.1	Light Pollution	1	1		95% of external light fittings on public ground point downwards.
Total				**29**	**14.0**	**6.0**	

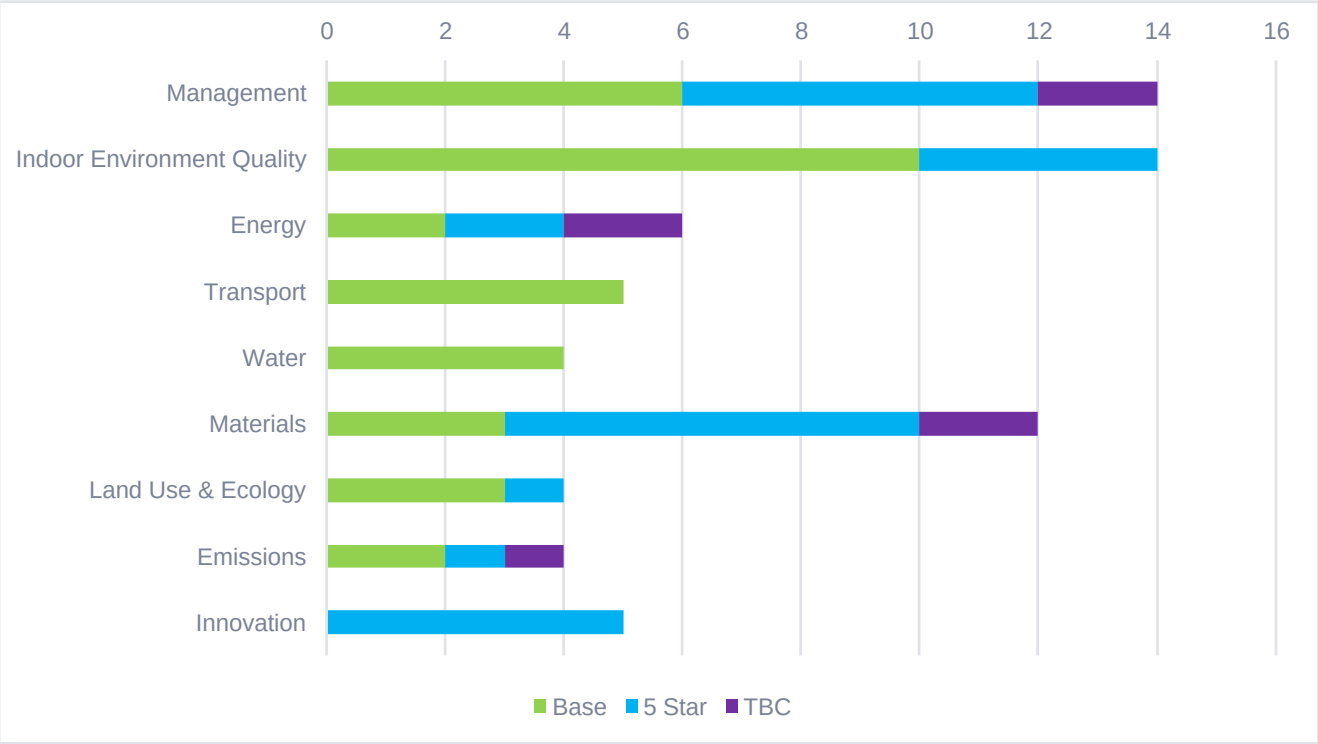
Innovation strategies and points to be confirmed.

Appendix 3: Green Star Design and As-Built Preliminary Pathway for Building 3

This preliminary pathway is provided for information only and sets out one potential strategy to achieve a 5 star Green Star Design and As-Built v1.3 rating for Building 3.

The chart below summarises the points as follows:

- Base are credits that are business-as-usual for the development team
- 5 star are credits that are currently assumed to form part of the 5 star rating strategy
- TBC are credits that will be investigated further during the next stage of design as alternatives to the current targeted 5 star credits



The final selection of credits to be pursued will be confirmed during the next design stage and will be sufficient to achieve the minimum requirements for a 5 star rating including exceeding the rating threshold of 60 points.

CATEGORY / CREDIT	AIM OF THE CREDIT / SELECTION	CODE	CREDIT CRITERIA	CORE POINTS AVAILABLE	Base	5 Star	TBC	Included in Project	COMMENTS
Management				14					
Green Star AP	To recognise the appointment and active involvement of a Green Star Accredited Professional in order to ensure that the rating tool is applied effectively and as intended.	1.0	Accredited Professional	1	1				Cundall meet this requirement.
Commissioning and Tuning	To encourage and recognise commissioning, handover and tuning initiatives that ensure all building services operate to their full potential.	2.0	Environmental Performance Targets	-	Yes				Prepare Design Intent Report including building services information energy, water and IEQ targets, metering and monitoring.
		2.1	Services and Maintainability Review	1	1				Undertake services and maintainability review of nominated services during design stage.
		2.2	Building Commissioning	1	1				Commissioning specification by building services engineer. Commissioning plan by Contractor. Air Permeability Testing required.
		2.3	Building Systems Tuning	1		1			12 month engagement to review performance and fine tune systems with final tuning report following. Include in Defects Liability Period process.
		2.4	Independent Commissioning Agent	1			1		Appoint ICA from schematic design onward to oversee commissioning.
Adaptation and Resilience	To encourage and recognise projects that are resilient to the impacts of a changing climate and natural disasters.	3.0	Implementation of a Climate Adaptation Plan	2		2			Develop a Climate Adaptation Plan and implement recommendations.
Building Information	To recognise the development and provision of building information that facilitates understanding of a building's systems, operation and maintenance requirements, and	4.1	Building Information	1	1				Produce comprehensive O&M manuals and Building User Information.
Commitment to Performance	To recognise practices that encourage building owners, building occupants and facilities management teams to set targets and monitor environmental performance in a collaborative way.	5.1	Environmental Building Performance	1		1			Iglu to confirm commitments for reporting
		5.2	End of Life Waste Performance	1			1		Iglu must commit to extending the life of the finishes to all common areas to at least 10 years, barring minor wear and tear or minor repairs
Metering and Monitoring	To recognise the implementation of effective energy and water metering and monitoring systems.	6.0	Metering	-	Yes				Metering of major energy & water uses.
		6.1	Monitoring Systems	1	1				Monitoring of major energy & water uses.
Construction Environmental Management	To reward projects that use best practice formal environmental management procedures during construction.	7.0	Environmental Management Plan	-	Yes				Develop Best Practice CEMP.
		7.1	Formalised Environmental Management System	1	1				Contractor to have a certified EMS to ISO14001.
		7.2	High Quality Staff Support	1		1			Support for mental and physical health outcomes on site and which enhance site worker's knowledge of sustainability.
Operational Waste	Performance Pathway	8A	Performance Pathway - Specialist Plan	1		1			Waste consultant prepares a specialist WMP. Include in design separate bins and best practice storage area for landfill, recycling (paper & cardboard, glass & plastic) and 1 other (e.g. organics, e-waste, batteries, etc)
		8B	Prescriptive Pathway - Facilities	0					
Total				**14**	**6**	**6**	**2**		

Indoor Environment Quality				17					
Indoor Air Quality	To recognise projects that provide high air quality to occupants.	9.1	Ventilation System Attributes	1	1				Air intakes (mechanical and natural) located away from pollution sources. Access to both sides of mech vent coils & filters. Ductwork cleaned prior to occupation.
		9.2	Provision of Outdoor Air	2	0				Apartments will be air-conditioned.
		9.3	Exhaust or Elimination of Pollutants	1	1				Separate exhaust of emissions (cooking, printing, vehicle etc).
Acoustic Comfort	To reward projects that provide appropriate and comfortable acoustic conditions for occupants.	10.1	Internal Noise Levels	1		1			Acoustic consultant to confirm
		10.2	Reverberation	1		1			Acoustic consultant to confirm
		10.3	Acoustic Separation	1		1			Acoustic consultant to confirm
Lighting Comfort	To encourage and recognise well-lit spaces that provide a high degree of comfort to users.	11.0	Minimum Lighting Comfort	-	Yes				LED lighting with >12 bit resolution and CRI > 80
		11.1	General Illuminance and Glare Reduction	1	1				Lighting designer to confirm compliance with credit requirements.
		11.2	Surface Illuminance	1	1				At least one wall in each living space, kitchen and bedrooms are provided with at least one specific wall-washing or a wall mounted fitting.
		11.3	Localised Lighting Control	1	1				Local lighting control with dimming
Visual Comfort	To recognise the delivery of well-lit spaces that provide high levels of visual comfort to building occupants.	12.0	Glare Reduction	-	Yes				Shading and/or blinds for all windows. Requires blinds to be included in the base building cost plan.
		12.1	Daylight	2	1	1			Daylight analysis required to confirm.
		12.2	Views	1	1				Calculations required to confirm.
Indoor Pollutants	To recognise projects that safeguard occupant health through the reduction in internal air pollutant levels.	13.1	Paints, Adhesives, Sealants and Carpets	1	1				Specify low VOC products
		13.2	Engineered Wood Products	1	1				Specify low formaldehyde products
Thermal Comfort	To encourage and recognise projects that achieve high levels of thermal comfort.	14.1	Thermal Comfort	1	1				Thermal comfort modelling required
		14.2	Advanced Thermal Comfort	1	0				
Total				17	10	4	0		

Energy				22					
Greenhouse Gas Emissions	E. Modelled Performance Pathway	15A.0	Conditional Requirement: Prescriptive Pathway	-					
		15A.1	Building Envelope	0					
		15A.2	Glazing	0					
		15A.3	Lighting	0					
		15A.4	Ventilation and Air-conditioning	0					
		15A.5	Domestic Hot Water	0					
		15A.6	Transition Plan	0					
		15A.7	Fuel Switching	0					
		15A.8	On-site Storage	0					
		15A.9	Vertical Transportation	0					
		15A.10	Off-site Renewables (Accredited GreenPower)	0					
		15B.0	Conditional Requirement: NatHERS Pathway	-					
		15B.1	NatHERS Pathway	0					
		15C.0	Conditional Requirement: BASIX Pathway	-					
		15C.1	BASIX Pathway	0					
		15D.0	Conditional Requirement: NABERS Pathway	-					
		15D.1	NABERS Energy Commitment Agreement Pathway	0					
		15E.0	Conditional Requirement	-	Yes				
		15E.1	GHG Emissions Reduction – Prescriptive Pathway	20	2	2	2		Efficient systems, services, facades and appliances. PV on rooftop.
Peak Electricity Demand Reduction	Performance Pathway	16A	Prescriptive Pathway - On-site Energy Generation	0					
		16B	Performance Pathway - On-site Energy Generation	2	0				Modelling check will be undertaken however on-site rooftop PV may not be sufficient to achieve this.
Total				**22**	**2**	**2**	**2**		

Transport				8					
Sustainable Transport	Prescriptive Pathway	17A.1	Performance Pathway	0					
		17B.1	Access by Public Transport	3	3				Built on Sydney Metro
		17B.2	Reduced Car Parking Provision	0					No car parking provided
		17B.3	Low Emission Vehicle Infrastructure	0					No car parking provided
		17B.4	Active Transport Facilities	1	1				Provide secure bike parking for residents, visitors and any staff.
		17B.5	Walkable Neighbourhoods	1	1				CBD location automatically complies.
Total				5	5	0	0		

Water				12					
Potable Water	Performance Pathway	18A.1	Potable Water - Performance Pathway	12	4				Water-efficient landscape and irrigation, Reuse fire test water, Rainwater collection for reuse required.
		18B.1	Sanitary Fixture Efficiency	0					
		18B.2	Rainwater Reuse	0					
		18B.3	Heat Rejection	0					
		18B.4	Landscape Irrigation	0					
		18B.5	Fire System Test Water	0					
Total				12	4	0	0		

Materials				14					
Life Cycle Impacts	Performance Pathway - Life Cycle Assessment	19A.1	Comparative Life Cycle Assessment	6		3			Improve on life cycle impact of the building through better material choices, Portland cement replacement, recycled products etc.
		19A.2	Additional Life Cycle Impact Reporting	4		2	2		As above with additional reporting and more integrated process.
		19B.1	Concrete	0					
		19B.2	Steel	0					
		19B.3	Building Reuse	0					
		19B.4	Structural Timber	0					
Responsible Building Materials	To reward projects that include materials that are responsibly sourced or have a sustainable supply chain.	20.1	Structural and Reinforcing Steel	1		1			Source from "responsible steel maker" and at least 60% of all reinforcing bar and mesh is produced using energy-reducing processed in its manufacture.
		20.2	Timber Products	1	1				Specify certified timber.
		20.3	Permanent Formwork, Pipes, Flooring, Blinds and Cables	1	1				90% Best Practice PVC by cost
Sustainable Products	To encourage sustainability and transparency in product specification.	21.0	Product Transparency and Sustainability	3		1			3% of products by cost are reused, have recycled content and/or have environmental certification (EPD, third party cert, stewardship program)
Construction and Demolition Waste	Percentage Benchmark	22.0	Reporting Accuracy	-	Yes				Waste Disclosure statements must be provided from Contractor and Facilities that will be used.
		22A	Fixed Benchmark	0					
		22B	Percentage Benchmark	1	1				A fixed benchmark of waste generated or a percentage reduction in landfill. TBC
Total				14	3	7	2		

Land Use & Ecology				6					
Ecological Value	To reward projects that improve the ecological value of their site.	23.0	Endangered, Threatened or Vulnerable Species	-	Yes				Protect vulnerable species on site.
		23.1	Ecological Value	3	1	1			Depends on landscaping extent - Requires ecological value calculator to be completed.
Sustainable Sites	To reward projects that choose to develop sites that have limited ecological value, re-use previously developed land and remediate contaminate land.	24.0	Conditional Requirement	-	Yes				Not an ecologically sensitive site.
		24.1	Reuse of Land	1	1				Previously developed land.
		24.2	Contamination and Hazardous Materials	1	0				TBC
Heat Island Effect	To encourage and recognise projects that reduce the contribution of the project site to the heat island effect.	25.0	Heat Island Effect Reduction	1	1				Green roofs. Reflective roofs materials. Hard landscaping to have SRI > 34.
Total				6	3	1	0		

Emissions				5					
Stormwater	To reward projects that minimise peak stormwater flows and reduce pollutants entering public sewer infrastructure.	26.1	Stormwater Peak Discharge	1	1				Stormwater discharge to not exceed current site discharge.
		26.2	Stormwater Pollution Targets	1		1			Achieve credit above and implement stormwater quality measures.
Light Pollution	To reward projects that minimise light pollution.	27.0	Light Pollution to Neighbouring Bodies	-	Yes				Design to avoid night sky pollution - AS4282:1997 as minimum
		27.1	Light Pollution to Night Sky	1	1				A specified reduction in light pollution has been achieved by the project.
Microbial Control	To recognise projects that implement systems to minimise the impacts associated with harmful microbes in building systems.	28.0	Legionella Impacts from Cooling Systems	1	0			No	
Refrigerant Impacts	To encourage operational practices that minimise the environmental impacts of refrigeration equipment.	29.0	Refrigerants Impacts	1			1		Refrigerant calculator to be completed.
Total				5	2	1	1		

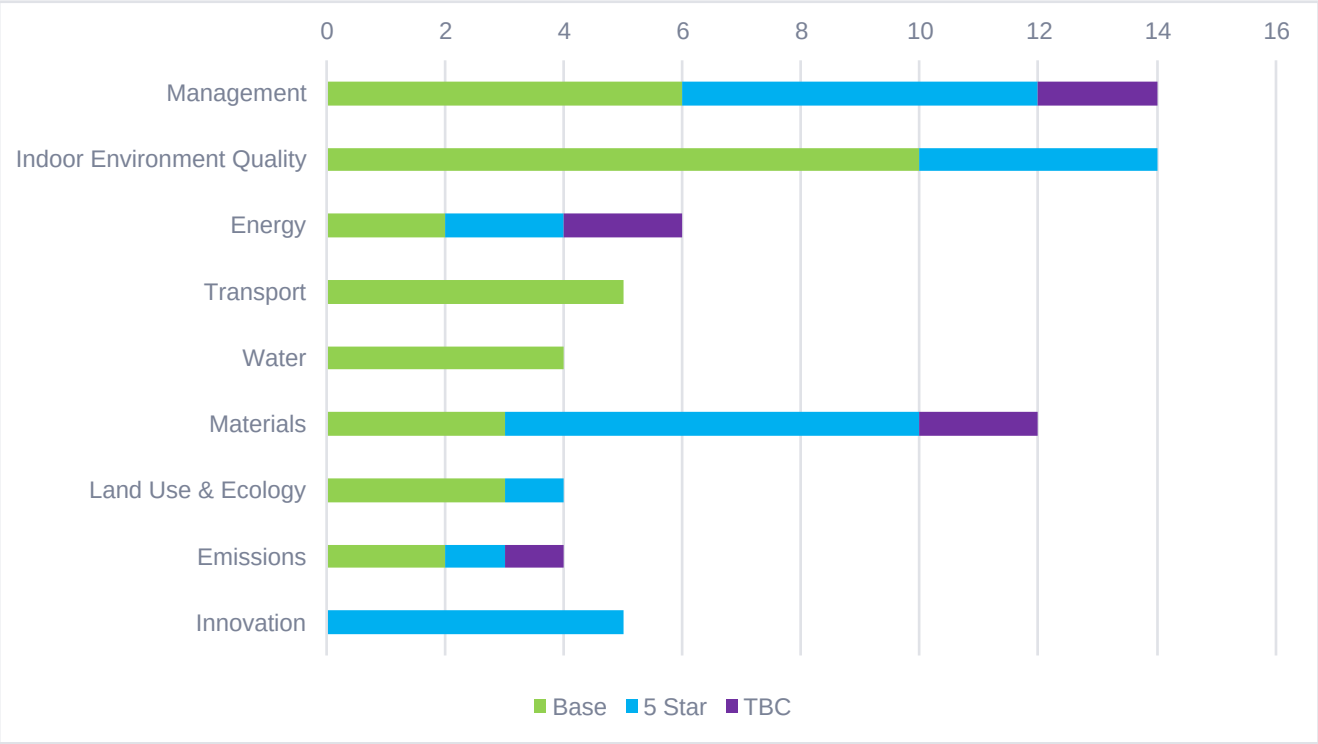
Innovation				10					
Innovative Technology or Process	The project meets the aims of an existing credit using a technology or process that is considered innovative in Australia or the world.	30A	Innovative Technology or Process	10					
Market Transformation	The project has undertaken a sustainability initiative that substantially contributes to the broader market transformation towards sustainable development in Australia or in the world.	30B	Market Transformation			1			
Improving on Green Star Benchmarks	The project has achieved full points in a Green Star credit and demonstrates a substantial improvement on the benchmark required to achieve full points.	30C	Improving on Green Star Benchmarks			2			
Innovation Challenge	Where the project addresses an sustainability issue not included within any of the Credits in the existing Green Star rating tools.	30D	Innovation Challenge			1			
Global Sustainability	Project teams may adopt an approved credit from a Global Green Building Rating tool that addresses a sustainability issue that is currently outside the scope of this Green Star	30E	Global Sustainability			1			
Total				10	0	5	0		

Appendix 4: Green Star Design and As-Built Preliminary Pathway for Building 4

This preliminary pathway is provided for information only and sets out one potential strategy to achieve a 5 star Green Star Design and As-Built v1.3 rating for Building 4.

The chart below summarises the points as follows:

- Base are credits that are business-as-usual for the development team
- 5 star are credits that are currently assumed to form part of the 5 star rating strategy
- TBC are credits that will be investigated further during the next stage of design as alternatives to the current targeted 5 star credits



The final selection of credits to be pursued will be confirmed during the next design stage and will be sufficient to achieve the minimum requirements for a 5 star rating including exceeding the rating threshold of 60 points.

CATEGORY / CREDIT	AIM OF THE CREDIT / SELECTION	CODE	CREDIT CRITERIA	CORE POINTS AVAILABLE	Base	5 Star	TBC	Included in Project	COMMENTS
Management				14					
Green Star AP	To recognise the appointment and active involvement of a Green Star Accredited Professional in order to ensure that the rating tool is applied effectively and as intended.	1.0	Accredited Professional	1	1				Cundall meet this requirement.
Commissioning and Tuning	To encourage and recognise commissioning, handover and tuning initiatives that ensure all building services operate to their full potential.	2.0	Environmental Performance Targets	-	Yes				Prepare Design Intent Report including building services information energy, water and IEQ targets, metering and monitoring.
		2.1	Services and Maintainability Review	1	1				Undertake services and maintainability review of nominated services during design stage.
		2.2	Building Commissioning	1	1				Commissioning specification by building services engineer. Commissioning plan by Contractor. Air Permeability Testing required.
		2.3	Building Systems Tuning	1		1			12 month engagement to review performance and fine tune systems with final tuning report following. Include in Defects Liability Period process.
		2.4	Independent Commissioning Agent	1			1		Appoint ICA from schematic design onward to oversee commissioning.
Adaptation and Resilience	To encourage and recognise projects that are resilient to the impacts of a changing climate and natural disasters.	3.0	Implementation of a Climate Adaptation Plan	2		2			Develop a Climate Adaptation Plan and implement recommendations.
Building Information	To recognise the development and provision of building information that facilitates understanding of a building's systems, operation and maintenance requirements, and	4.1	Building Information	1	1				Produce comprehensive O&M manuals and Building User Information.
Commitment to Performance	To recognise practices that encourage building owners, building occupants and facilities management teams to set targets and monitor environmental performance in a collaborative way.	5.1	Environmental Building Performance	1		1			Strata management must commit to environmental performance targets for common areas and services through an internal requirement (policy, guideline, or environmental management plan) that targets are set and measured. This formal commitment
		5.2	End of Life Waste Performance	1			1		Strata management must commit to extending the life of the finishes to all common areas to at least 10 years, barring minor wear and tear or minor repairs
Metering and Monitoring	To recognise the implementation of effective energy and water metering and monitoring systems.	6.0	Metering	-	Yes				Metering of major energy & water uses.
		6.1	Monitoring Systems	1	1				Monitoring of major energy & water uses.
Construction Environmental Management	To reward projects that use best practice formal environmental management procedures during construction.	7.0	Environmental Management Plan	-	Yes				Develop Best Practice CEMP.
		7.1	Formalised Environmental Management System	1	1				Contractor to have a certified EMS to ISO14001.
		7.2	High Quality Staff Support	1		1			Support for mental and physical health outcomes on site and which enhance site worker's knowledge of sustainability.
Operational Waste	Performance Pathway	8A	Performance Pathway - Specialist Plan	1		1			Waste consultant prepares a specialist WMP. Include in design separate bins and best practice storage area for landfill, recycling (paper & cardboard, glass & plastic) and 1 other (e.g. organics, e-waste, batteries, etc)
		8B	Prescriptive Pathway - Facilities	0					
Total				14	6	6	2		

Indoor Environment Quality				17					
Indoor Air Quality	To recognise projects that provide high air quality to occupants.	9.1	Ventilation System Attributes	1	1				Air intakes (mechanical and natural) located away from pollution sources. Access to both sides of mech vent coils & filters. Ductwork cleaned prior to occupation.
		9.2	Provision of Outdoor Air	2	0				Apartments will be air-conditioned.
		9.3	Exhaust or Elimination of Pollutants	1	1				Separate exhaust of emissions (cooking, printing, vehicle etc).
Acoustic Comfort	To reward projects that provide appropriate and comfortable acoustic conditions for occupants.	10.1	Internal Noise Levels	1		1			Acoustic consultant to confirm
		10.2	Reverberation	1		1			Acoustic consultant to confirm
		10.3	Acoustic Separation	1		1			Acoustic consultant to confirm
Lighting Comfort	To encourage and recognise well-lit spaces that provide a high degree of comfort to users.	11.0	Minimum Lighting Comfort	-	Yes				LED lighting with >12 bit resolution and CRI > 80
		11.1	General Illuminance and Glare Reduction	1	1				Lighting designer to confirm compliance with credit requirements.
		11.2	Surface Illuminance	1	1				At least one wall in each living space, kitchen and bedrooms are provided with at least one specific wall-washing or a wall mounted fitting.
		11.3	Localised Lighting Control	1	1				Local lighting control with dimming
Visual Comfort	To recognise the delivery of well-lit spaces that provide high levels of visual comfort to building occupants.	12.0	Glare Reduction	-	Yes				Shading and/or blinds for all windows. Requires blinds to be included in the base building cost plan.
		12.1	Daylight	2	1	1			Daylight analysis required to confirm.
		12.2	Views	1	1				Calculations required to confirm.
Indoor Pollutants	To recognise projects that safeguard occupant health through the reduction in internal air pollutant levels.	13.1	Paints, Adhesives, Sealants and Carpets	1	1				Specify low VOC products
		13.2	Engineered Wood Products	1	1				Specify low formaldehyde products
Thermal Comfort	To encourage and recognise projects that achieve high levels of thermal comfort.	14.1	Thermal Comfort	1	1				Average 7-Star NatHERS rating.
		14.2	Advanced Thermal Comfort	1	0				Average 8-Star NatHERS rating.
Total				17	10	4	0		

Energy				22					
Greenhouse Gas Emissions	E. Modelled Performance Pathway	15A.0	Conditional Requirement: Prescriptive Pathway	-					
		15A.1	Building Envelope	0					
		15A.2	Glazing	0					
		15A.3	Lighting	0					
		15A.4	Ventilation and Air-conditioning	0					
		15A.5	Domestic Hot Water	0					
		15A.6	Transition Plan	0					
		15A.7	Fuel Switching	0					
		15A.8	On-site Storage	0					
		15A.9	Vertical Transportation	0					
		15A.10	Off-site Renewables (Accredited GreenPower)	0					
		15B.0	Conditional Requirement: NatHERS Pathway	-					
		15B.1	NatHERS Pathway	0					
		15C.0	Conditional Requirement: BASIX Pathway	-					
		15C.1	BASIX Pathway	0					
		15D.0	Conditional Requirement: NABERS Pathway	-					
		15D.1	NABERS Energy Commitment Agreement Pathway	0					
		15E.0	Conditional Requirement	-	Yes				
		15E.1	GHG Emissions Reduction – Prescriptive Pathway	20	2	2	2		Efficient systems, services, facades and appliances. PV on rooftop.
Peak Electricity Demand Reduction	Performance Pathway	16A	Prescriptive Pathway - On-site Energy Generation	0					
		16B	Performance Pathway - On-site Energy Generation	2	0				Modelling check will be undertaken however on-site rooftop PV may not be sufficient to achieve this.
Total				**22**	**2**	**2**	**2**		

Transport				8					
Sustainable Transport	Prescriptive Pathway	17A.1	Performance Pathway	0					
		17B.1	Access by Public Transport	3	3				Built on Sydney Netro
		17B.2	Reduced Car Parking Provision	0					No car parking provided
		17B.3	Low Emission Vehicle Infrastructure	0					No car parking provided
		17B.4	Active Transport Facilities	1	1				Provide secure bike parking for residents, visitors and any staff.
		17B.5	Walkable Neighbourhoods	1	1				CBD location automatically complies.
Total				5	5	0	0		

Water				12					
Potable Water	Performance Pathway	18A.1	Potable Water - Performance Pathway	12	4				BASIX 40, Water-efficient landscape and irrigation, Reuse fire test water, Rainwater collection for reuse required.
		18B.1	Sanitary Fixture Efficiency	0					
		18B.2	Rainwater Reuse	0					
		18B.3	Heat Rejection	0					
		18B.4	Landscape Irrigation	0					
		18B.5	Fire System Test Water	0					
Total				12	4	0	0		

Materials				14					
Life Cycle Impacts	Performance Pathway - Life Cycle Assessment	19A.1	Comparative Life Cycle Assessment	6		3			Improve on life cycle impact of the building through better material choices, Portland cement replacement, recycled products etc.
		19A.2	Additional Life Cycle Impact Reporting	4		2	2		As above with additional reporting and more integrated process.
		19B.1	Concrete	0					
		19B.2	Steel	0					
		19B.3	Building Reuse	0					
		19B.4	Structural Timber	0					
Responsible Building Materials	To reward projects that include materials that are responsibly sourced or have a sustainable supply chain.	20.1	Structural and Reinforcing Steel	1		1			Source from "responsible steel maker" and at least 60% of all reinforcing bar and mesh is produced using energy-reducing processed in its manufacture.
		20.2	Timber Products	1	1				Specify certified timber.
		20.3	Permanent Formwork, Pipes, Flooring, Blinds and Cables	1	1				90% Best Practice PVC by cost
Sustainable Products	To encourage sustainability and transparency in product specification.	21.0	Product Transparency and Sustainability	3		1			3% of products by cost are reused, have recycled content and/or have environmental certification (EPD, third party cert, stewardship program)
Construction and Demolition Waste	Percentage Benchmark	22.0	Reporting Accuracy	-	Yes				Waste Disclosure statements must be provided from Contractor and Facilities that will be used.
		22A	Fixed Benchmark	0					
		22B	Percentage Benchmark	1	1				A fixed benchmark of waste generated or a percentage reduction in landfill. TBC
Total				14	3	7	2		

Land Use & Ecology				6					
Ecological Value	To reward projects that improve the ecological value of their site.	23.0	Endangered, Threatened or Vulnerable Species	-	Yes				Protect vulnerable species on site.
		23.1	Ecological Value	3	1	1			Depends on landscaping extent - Requires ecological value calculator to be completed.
Sustainable Sites	To reward projects that choose to develop sites that have limited ecological value, re-use previously developed land and remediate contaminate land.	24.0	Conditional Requirement	-	Yes				Not an ecologically sensitive site.
		24.1	Reuse of Land	1	1				Previously developed land.
		24.2	Contamination and Hazardous Materials	1	0				TBC
Heat Island Effect	To encourage and recognise projects that reduce the contribution of the project site to the heat island effect.	25.0	Heat Island Effect Reduction	1	1				Green roofs. Reflective roofs materials. Hard landscaping to have SRI > 34.
Total				6	3	1	0		

Emissions				5					
Stormwater	To reward projects that minimise peak stormwater flows and reduce pollutants entering public sewer infrastructure.	26.1	Stormwater Peak Discharge	1	1				Stormwater discharge to not exceed current site discharge.
		26.2	Stormwater Pollution Targets	1		1			Achieve credit above and implement stormwater quality measures.
Light Pollution	To reward projects that minimise light pollution.	27.0	Light Pollution to Neighbouring Bodies	-	Yes				Design to avoid night sky pollution - AS4282:1997 as minimum
		27.1	Light Pollution to Night Sky	1	1				A specified reduction in light pollution has been achieved by the project.
Microbial Control	To recognise projects that implement systems to minimise the impacts associated with harmful microbes in building systems.	28.0	Legionella Impacts from Cooling Systems	1	0			No	
Refrigerant Impacts	To encourage operational practices that minimise the environmental impacts of refrigeration equipment.	29.0	Refrigerants Impacts	1			1		Refrigerant calculator to be completed.
Total				5	2	1	1		

Innovation				10					
Innovative Technology or Process	The project meets the aims of an existing credit using a technology or process that is considered innovative in Australia or the world.	30A	Innovative Technology or Process	10					
Market Transformation	The project has undertaken a sustainability initiative that substantially contributes to the broader market transformation towards sustainable development in Australia or in the world.	30B	Market Transformation			1			
Improving on Green Star Benchmarks	The project has achieved full points in a Green Star credit and demonstrates a substantial improvement on the benchmark required to achieve full points.	30C	Improving on Green Star Benchmarks			2			
Innovation Challenge	Where the project addresses an sustainability issue not included within any of the Credits in the existing Green Star rating tools.	30D	Innovation Challenge			1			
Global Sustainability	Project teams may adopt an approved credit from a Global Green Building Rating tool that addresses a sustainability issue that is currently outside the scope of this Green Star	30E	Global Sustainability			1			
Total				10	0	5	0		