
Appendix S

Ecologically sustainable
development report

Parramatta Over and Adjacent Station Development Ecologically Sustainable Development Report

Appendix S

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Author	Senior Sustainability Engineer	James von Dinklage	12/09/2022
Technical Checker	Senior Sustainability Analyst	Alex Bogdanova	12/09/2022
Technical Reviewer	Technical Director, Sustainability	Marlon Kobacker	12/09/2022
Coordinator Check	Senior Environmental Advisor	Jonathon Cook	12/09/2022
Approver	SM EDA Lead	Adrian Garner	20/09/2022

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Glossary

Term	Definition
BDAR	Biodiversity development assessment report
CBD	Central business district
Concept and Stage 1 CSSI approval	SSI-10038, approved 11 March 2021, including all major civil construction works between Westmead and The Bays, including station excavation and tunnelling, associated with the Sydney Metro West metro line
Concept SSDA	A concept state significant development application, as defined in section 4.22 the EP&A Act, is a development application that sets out concept proposals for the development of a site, and for which detailed proposals for the site or for separate parts of the site are to be the subject of a subsequent development application or applications
COP	Coefficient of performance
Council	City of Parramatta Council
CSSI	Critical state significant infrastructure
DCP	Development control plan
DPE	NSW Department of Planning and Environment
EIS	Environmental impact assessment
EMP	Environmental management plan
EMS	Environmental management system
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
ESD	Ecologically sustainable development
GFA	Gross floor area
NABERS	National Australian Built Environment Rating System
NatHERS	Nationwide House Energy Rating Scheme
NCC	National construction code
OSD	Over Station Development
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State environmental planning policy
SEPP 65	State environmental planning policy No. 65 – Design Quality of Residential Apartment Development
SRD SEPP	State environmental planning policy (State and Regional Development) 2011
SSD	State significant development
Stage 2 CSSI Application	Application SSI-19238057, including major civil construction works between The Bays and Hunter Street station

Term	Definition
Stage 3 CSSI Application	Application SSI-22765520, including rail infrastructure, stations, precincts and operation of the Sydney Metro West line
Sydney Metro West	Construction and operation of a metro rail line and associated stations between Westmead and the Sydney CBD, as described in section 1.1
The site	The site which is the subject of the Concept SSDA
VKT	Vehicle Kilometres Travelled
WSUD	Water sensitive urban design
ZCAP	Zero Carbon Action Plan

Executive summary

This Ecologically Sustainable Development (ESD) report supports a Concept State Significant Development Application (Concept SSDA) submitted to the Department of Planning and Environment (DPE) pursuant to part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The Concept SSDA is made under section 4.22 of the EP&A Act.

Sydney Metro is seeking to secure concept approval for an over station development (OSD) and adjacent station development (ASD) on the Parramatta metro station site (referred to as the 'proposed development'). The proposed development will comprise three new commercial office buildings (Buildings A, C, D), and one new residential building (Building B).

The Concept SSDA seeks consent for a building envelope and mixed-use purposes, maximum building height, a maximum gross floor area (GFA), pedestrian and vehicular access, circulation arrangements and associated car parking, and the strategies and design parameters for the future detailed design of the proposed development.

This ESD report identifies and responds to relevant state and local government policy, and statutory planning instruments in support of the Concept SSDA.

The design response sets an ESD framework for the proposed development as follows:

- responds to relevant Secretary's Environmental Assessment Requirements (SEARs)
- integrates the relevant design excellence requirements detailed in the Parramatta Local Environment Plan (LEP) 2007, and the related objectives and controls of the Parramatta Development Control Plan (DCP) 2011
- addresses the high performing building requirements being considered in the Planning Proposal, Parramatta CBD, Amendment to the Parramatta LEP 2011
- considers the vision and priorities framework set out in the City of Parramatta, Environmental Sustainability Strategy 2017.

Climate responsive design

Resiliency is fundamental to decision making. Development must take account of science-based climate modelling to ensure investment in social and community infrastructure is secure and assets can serve the community long into the future.

The urban massing responds to sun path and overshadowing, wind effects and urban heat to deliver high quality private and public open space. The building envelope takes advantage of the sun path and prevailing wind conditions to enhance daylight access and drive effective natural ventilation, respectively.

High levels of direct morning sunlight are maintained throughout the year to the public open spaces, including the Civic Link. The urban massing acts to shade the public open spaces on summer afternoons, enhancing outdoor comfort and liveability. Public open spaces form part of the Concept State Significant Infrastructure (SSI) station works and have been considered to demonstrate the proposed development building envelope supports a high-quality outcome.

The north-east portion of the Civic Link receives most of the direct sunlight. Urban heat controls should be considered to maintain usability during summer. The south-east portion of the Civic Link receives less direct sunlight and acts as a cool refuge during summer. Summer breezes can permeate the public open spaces in support of the dominant north-east to south-west pedestrian movement through the Civic Link.

Buildings A, B and D act to shelter the public open spaces from cold winter winds from the south-west to west.

The dominant north-east and south-west building elevations enhance indoor daylight access. The variable seasonal wind direction and built form arrangement facilitates effective indoor natural ventilation.

The urban massing and building envelope have been evaluated to set minimum urban heat control requirements to inform detailed design.

Sustainable transport

Assessing each building individually and acknowledging Sydney Metro West (SMW) and Sydney Trains will be net zero in operation, the following targets were met:

- private vehicle use emissions reduction: 40%
- active mode encouragement: 90%
- Vehicle Kilometres Travelled (VKT) reduction: 20%
- amenity diversity: 10 amenities across five categories within 400 m of the building.

Active mode encouragement was achieved based on the adequate provision of end of trip facilities and bicycle parking spaces.

Seven categories of amenities and a total of 36 diverse amenities were identified within a 400 m radius of the proposed development. This strongly encourages walkability for workers, residents and visitors.

The sustainable transport initiatives and ready access to bus, train and metro services, and high-quality active mobility options drive private vehicle use emissions reductions of circa 60% and a VKT reduction of circa 90%.





ESD strategy

An ESD strategy has been established for SMW packages and station development. Sustainability targets and rating requirements are correlated across a range of current and emerging regulatory, policy, statutory planning and Sydney Metro requirements, and market recognised standards, drivers and trends.

The ESD strategy sets the following sustainability targets:

Climate positive	
40%	reduction in upfront carbon emissions
20%	reduction in energy use
100%	renewable energy
100%	elimination / offset of other emissions
40%	reduction in potable water use - commercial
30%	reduction in potable water use - residential
30%	reduction in life cycle impacts

The ESD strategy sets the following sustainability rating requirements:

Tool	Commercial	Residential
 greenstar	6 star Buildings	5 star Buildings
	5.5 star (+25%) NABERS Energy 5 star NABERS Water	4.5 star NABERS Energy 3.5 star NABERS Water
	-	Average 7 star NatHERS Minimum 6 star NatHERS
	-	BASIX Energy 25 BASIX Water 55 Stretch Targets: BASIX Energy 35

1 Introduction

1.1 Sydney Metro West

Sydney Metro West will double rail capacity between Greater Parramatta and the Sydney Central Business District (CBD), transforming Sydney for generations to come. The once in a century infrastructure investment will have a target travel time of about 20 minutes between Parramatta and the Sydney CBD, link new communities to rail services, and support employment growth and housing supply.

Stations have been confirmed at Westmead, Parramatta, Sydney Olympic Park, North Strathfield, Burwood North, Five Dock, The Bays, Pyrmont and Hunter Street (Sydney CBD).

Sydney Metro West station locations are shown in Figure 1-1.

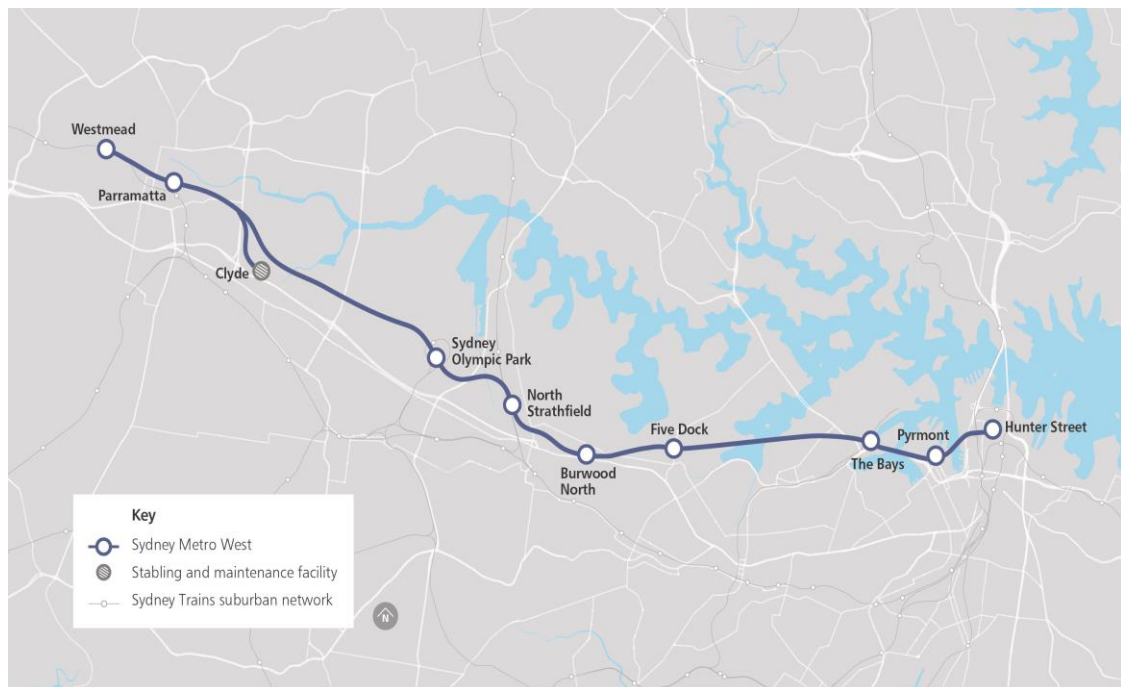


Figure 1-1 Sydney Metro West station locations

1.2 Background and planning context

Sydney Metro is seeking to deliver Parramatta metro station under a two-part planning approval process. The station fit-out infrastructure is to be delivered under a Critical State Significant Infrastructure (CSSI) application subject to provisions under division 5.2 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), whereas the over and adjacent station developments are to be delivered under a State Significant Development (SSD) subject to the provisions of part 4 of the EP&A Act.

1.2.1 Critical State Significant Infrastructure

The State Significant Infrastructure (SSI) planning approval process for the Sydney Metro West metro line, including delivery of station infrastructure, has been broken down into a number of planning application stages, comprising the following:

- Concept and Stage 1 CSSI Approval (SSI-10038) – All major civil construction works between Westmead and The Bays including station excavation, tunnelling and demolition of existing buildings (approved 11 March 2021)

- Stage 2 CSSI Application (SSI-19238057) – All major civil construction works between The Bays and Sydney CBD (approved 24 August 2022)
- Stage 3 CSSI Application (SSI-22765520) – Tunnel fit-out, construction of stations, ancillary facilities and station precincts between Westmead and Hunter Street Station, and operation and maintenance of the Sydney Metro West line (under assessment, lodged).

1.2.2 State Significant Development Application

The SSD will be undertaken as a staged development with the subject Concept State Significant Development Application (Concept SSDA) being consistent with the meaning under section 4.22 of the EP&A Act and seeking conceptual approval for a building envelope, land uses, maximum building heights, a maximum gross floor area, pedestrian and vehicle access, vertical circulation arrangements and associated car parking. A subsequent Detailed SSDA is to be prepared by a future development partner which will seek consent for detailed design and construction of the development.

1.3 Purpose and scope

This Ecologically Sustainable Development (ESD) report supports a Concept SSDA submitted to the Department of Planning and Environment (DPE) pursuant to part 4 of the EP&A Act. The Concept SSDA is made under section 4.22 of the EP&A Act.

This report has been prepared to specifically respond to the Secretary's Environmental Assessment Requirements (SEARs) issued for the Concept SSDA on 22 February 2022 which states that the environmental impact statement is to address the requirements shown in Table 1-1.

Table 1-1 SEARs to be addressed in this report

Key issue	SEARs	Addressed in
8. Ecologically Sustainable Development	Identify how ESD principles (as defined in clause 7(4) of Schedule 2 of the EP&A Regulation) are incorporated in the design and ongoing operation of the development.	Section 4
	Demonstrate how the development will meet or exceed the relevant industry recognised building sustainability and environmental performance standards.	Section 5 Section 6
	Demonstrate how the development minimises greenhouse gas emissions (reflecting the Government's goal of net zero emissions by 2050) and consumption of energy, water (including water sensitive urban design) and material resources.	Section 7 Section 8

This ESD report identifies and responds to relevant state and local government policy, and statutory planning instruments in support of the Concept SSDA.

The design response sets an ESD framework for the proposed development.

- in response to the relevant Secretary's Environmental Assessment Requirements (SEARs), the proposed development must:
 - identify how ESD principles (as defined in clause 7(4) of Schedule 2 of the EP&A Regulation) are incorporated in the design and ongoing operation of the development
 - demonstrate how the development will meet or exceed the relevant industry recognised building sustainability and environmental performance standards
 - demonstrate how the development minimises greenhouse gas emissions (reflecting the NSW Government's goal of net zero emissions by 2050) and consumption of energy, water (including water sensitive urban design) and material resources.
- in response to other relevant statutory planning instruments, the proposed development must:
 - address the high performing building requirements being considered in the Planning Proposal, Parramatta CBD, Amendment to the Parramatta LEP 2011
 - consider the vision and priorities framework set out in the City of Parramatta, Environmental Sustainability Strategy 2017.

2 The site and proposal

2.1 Site location and description

The subject application is in the Parramatta CBD, in the City of Parramatta Local Government Area (LGA). It is within the city block bounded by George Street, Church Street, Smith Street, and Macquarie Street.

The site presents a 164m long frontage to Macquarie Street, 125m frontage to George Street, 48m frontage to Church Street, and 15.5m frontage to Smith Street (in the form of Macquarie Lane).

The site location is shown in Figure 2-1 and Table 2-1.

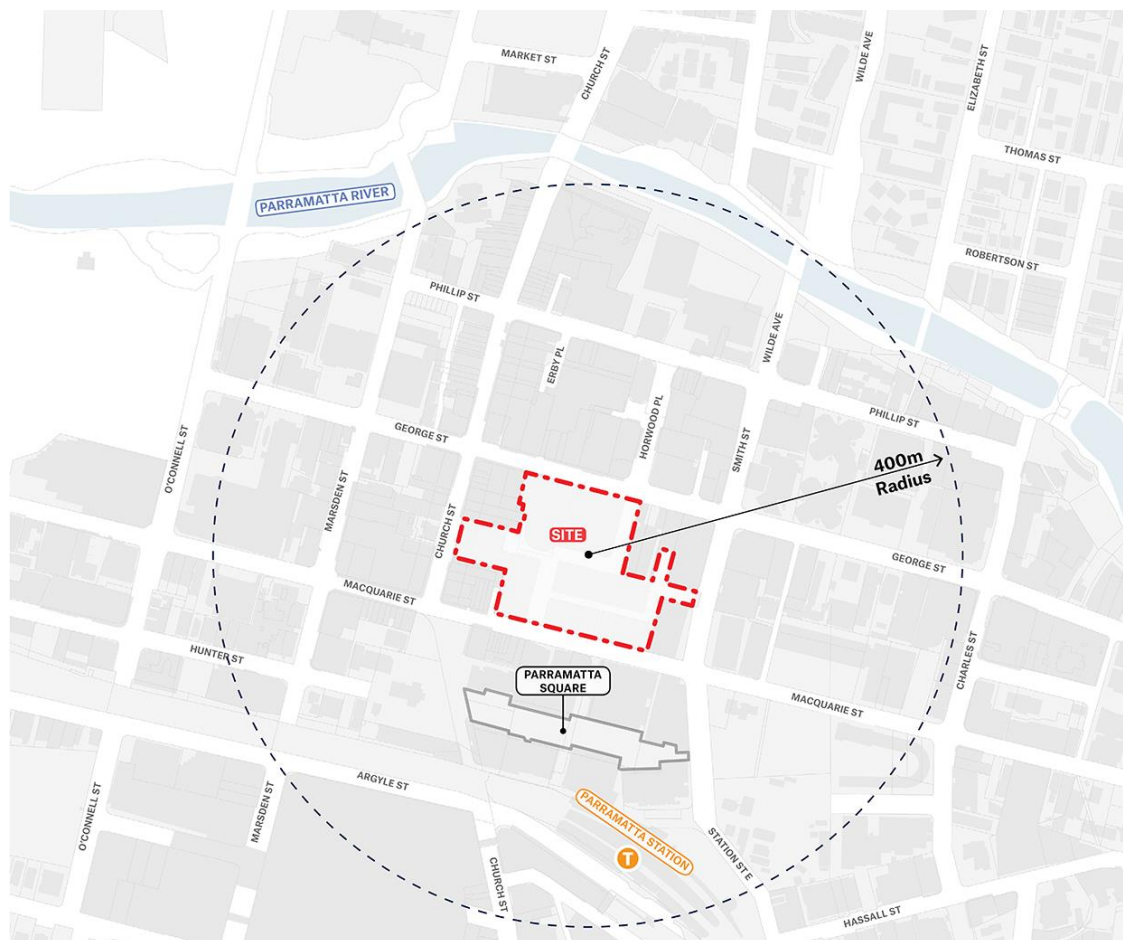


Figure 2-1 Paramatta metro station precinct location

As described in Table 2-1, the site comprises fourteen (14) different allotments of varying sizes. It is irregular in shape, with a total area of approximately 24,899m².

Table 2-1 Site legal description

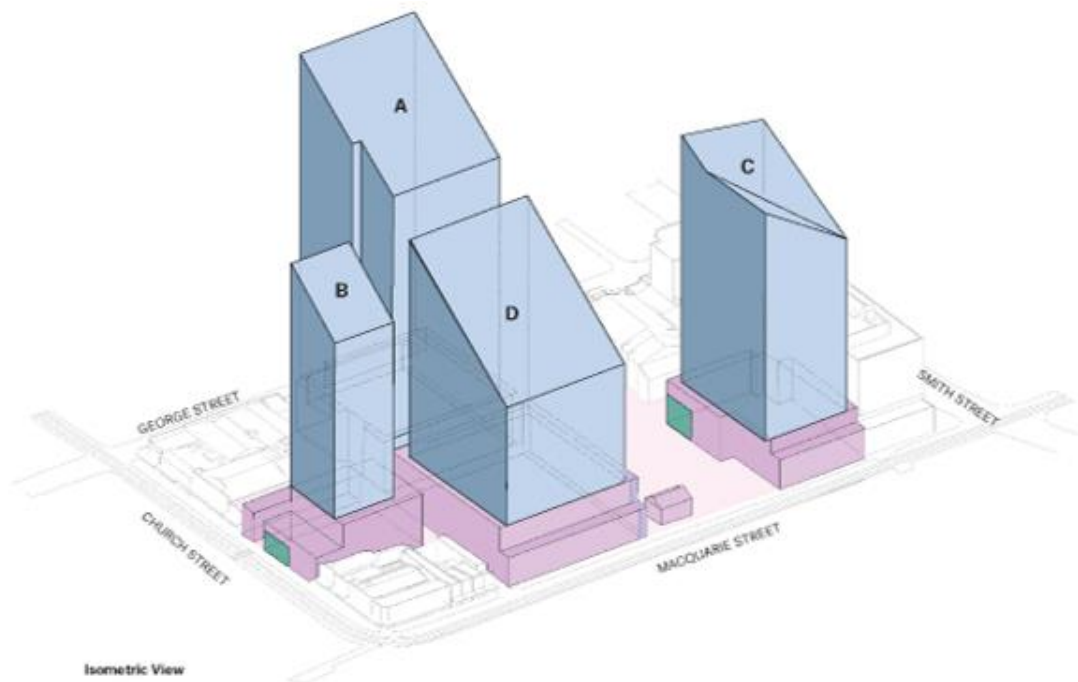
Street address	Legal description
41-59 George Street	Lot 10 in DP858392
45A George Street	Lot 2 in DP701456
61B George Street	Lot 1 in DP607181
71 George Street	Lot 100 in DP607789
220 Church Street	Lot 1 in DP1041242
222 Church Street	Lot 1 in DP702291
232 Church Street	Lot 1 in DP651992
236 Church Street	Lot 1 in DP128437
238 Church Street	Lot 2 in DP591454
48 Macquarie Street	Lot B in DP394050
58-60 Macquarie Street	Lot 1 in DP399104
62-64 Macquarie Street	Lot AY in DP400258
68 Macquarie Street	Lot 1 in DP711982
70 Macquarie Street	Lot E DP 402952
72 Macquarie Street	Lot 3 in DP218510
74 Macquarie Street	Lot H in DP405846

2.2 Overview of this proposal

The Concept SSDA will seek consent for four building envelopes as detailed in Table 2-2 and Figure 2-2

Table 2-2 Parramatta metro station proposed development overview

Item	Description
Building use	Building A: Commercial and retail Building B: Residential and retail Building C: Commercial Building D: Commercial and retail
Building Height (Number of storeys)	Building A: 38 storeys Building B: 33 storeys Building C: 26 storeys Building D: 25 storeys
Gross Floor Area (m ²)	Building A: 78,700 Building B: 20,000 Building C: 35,950 Building D: 55,350 TOTAL: 190,000
Car parking spaces	455



Legend

- | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p> Parramatta Station CSSI Approval
- Includes structure and building infrastructure and space for lift cores, access, parking, retail and building services for future OSD & ASD</p> <p> OSD & ASD Concept SSD Building Envelope - Includes OSD & ASD Areas inside the CSSI 'shell' below ground and in the podium levels</p> | <p> Metro Station Entry and Box (Indicative)</p> <p> 3m Podium Articulation Zone - refer to Design Guidelines.</p> <p> Heritage Interface Zone - refer to Design Guidelines.</p> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Figure 2-2 Proposed Concept SSDA development and CSSI scope

3 Scope of assessment

3.1 Assessment criteria

Paramatta Local Environmental Plan 2011

- consider environmental impacts, such as overshadowing (section 5.6(1)(3)(iv)) and solar access, visual comfort, wind and reflectivity (section 4.3(1)(b))
- prioritise active transport modes and improve the permeability of the pedestrian network (section 1.2(2)(d))
- adhere to the principles of ecologically sustainable development (section 1.2(2)(b),(f))
- express an excellent and integrated landscape design (section 1.2(2)(f)).

Paramatta Development Control Plan 2011

- promote sustainable development through energy efficient design, construction and operation
- contribute to an overall reduction in greenhouse gas (GHG) emissions
- reduce energy bills and the whole of life cost of energy services
- maintain a high thermal comfort performance for building occupants and optimise cross ventilation
- provide sunlight access to private and public open space, and habitable rooms
- minimise the quantity of stormwater run-off
- integrate WSUD principles to maximise the treatment of stormwater run-off
- reduce the consumption of potable water, including the harvesting and reuse of rainwater and stormwater
- minimise waste generation and encourage the recycling of construction and demolition waste
- maximise recovery, recycling and reuse of operational waste
- install dual plumbing systems and make provision for a future ready connection to a recycled water network.

City of Paramatta, Environmental Sustainability Strategy 2017

- achieve a 60% emissions reduction by 2038 (based on 2015 levels)
- meet 50% of electricity demand through renewable energy by 2038
- deliver no net increase in potable water consumption by 2038 based on 2015 levels
- reduce resource consumption from 8.2 kg to 6.1 kg per person by 2038 (based on 2015 levels)
- increase diversion from landfill to 85% by 2038.

Planning Proposal, Paramatta CBD, Amendment to Paramatta LEP 2011

- For office premises demonstrate that the annual energy performance (base building) and water performance (whole building) is within the top 15% of the performance of similar existing buildings of a similar usage type in the Sydney Metropolitan region, benchmarked on a GHG emissions (CO₂e/m²) and net water demand (L/m²) basis, respectively, at the time of application.
- For residential flat buildings, comply with higher BASIX Energy and Water standards that the minimum standards nominated in the State Environmental Planning Policy (SEPP) (Building Sustainability Index: BASIX) 2004.

Department of Planning, Industry and Environment Net Zero Plan, Stage 1: 2020-2030

- drive the uptake of proven GHG emissions reduction technologies to reduce the cost of living
- empower consumers and businesses to make sustainable choices
- invest in the next wave of GHG emissions reduction innovation to ensure economic prosperity from decarbonisation.

Department of Planning, Industry and Environment Net Zero Plan Stage 1:2020-2030 (Implementation Update)

- electrify all energy uses and supply all energy uses with renewable electricity by 2030
- plan operational improvements and projects, and decarbonisation pathways for businesses
- accelerate the transformation of the built environment towards net zero emissions under a range of Net Zero Buildings initiatives that leverage NABERS (embodied and operational GHG emissions), green finance mechanisms, BASIX enhancements and the Trajectory for low energy buildings.

NSW Electric Vehicle Strategy

- ensure new buildings and precincts are 'EV ready'.

NSW Circular Economy Policy Statement

- use resources sustainably
- replace raw materials with recycled products
- minimise the use of virgin materials
- recognise that resources have value throughout multiple cycles of use and reuse
- innovate product design for longevity, reuse and recovery
- reduce the demand for new landfills
- improve the quality of collected materials, and improve sorting of these materials and reuse
- capture value from recycling resources.

NSW Climate Change Policy Framework

- achieve net zero emissions by 2050
- be more resilient to a changing climate
- reduce risks and damage to public and private assets arising from climate change
- embed climate change considerations into asset and risk management
- reduce climate change impacts on health and wellbeing
- manage impacts on natural resources, ecosystems and communities.

State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004

- encourage sustainable residential development
- achieve a minimum water savings target of 40% for residential accommodation
- achieve a minimum energy savings target of 25% for high-rise residential accommodation
- do not exceed the heating and cooling cap for thermal comfort performance for residential accommodation.

Apartment Design Guide

- provide solar access to living areas, private open space and communal open space
- provide year round solar access to public open space along with protection from strong winds
- naturally cross ventilate at least 60% of apartments in the first nine storeys of a building
- do not exceed an overall depth of 18m for cross-over or cross-through apartments
- incorporate water efficient fittings and appliances, and harvest rainwater and stormwater for reuse
- design drought-tolerant, low water use landscaping
- maximise porous and open paving materials
- integrate on-site stormwater and infiltration systems, including bio-retention systems such as rain gardens and street tree pits
- size adequate and accessible storage areas for operational waste, and facilitate ease of collection
- provide alternative waste disposal methods such as composting.

National Construction Code (NCC), Volume One, Building Code of Australia 2019

- integrate features in a building's fabric and services to facilitate the efficient use of energy
- comply with Verification Methods:
 - JV1 NABERS Energy for Offices - obtain a minimum 5.5 star NABERS Energy for Offices base building Commitment Agreement

- JV2 Green Star - register for a Green Star rating and demonstrate that the annual GHG emissions of the proposed building are less than 90% of the GHG emissions of a reference building
- JV3 Verification using a reference building - demonstrate that the annual GHG emissions of the proposed building are not more than the GHG emissions of a reference building.
- achieve a thermal comfort level of between a Predicted Mean Vote (PMV) of -1 to +1 across not less than 95% of the floor area of all occupied zones for not less than 98% of the annual hours of operation of the building
- consider the National Construction Code (NCC) 2022 public comment draft (stage 2), including more stringent whole-of-home annual energy use requirements and deemed-to-satisfy (DTS) provisions.

NABERS, The Rules, Energy and Water for Offices

- disclose the energy and water performance of assessable assets, including but not limited to offices and apartment buildings
- demonstrate credible savings in energy and water costs through the efficient design of a building's fabric and services
- represent good quality design and reflect market requirements.

Green Star Buildings Submission Guidelines

- register and obtain a Green Star Buildings rating
- meet Minimum Expectations:
 - manage environmental impacts during construction
 - verify the effective operation of building systems
 - enable practices that reduce operational waste
 - improve the indoor environment quality
 - address climate change
 - emit less GHG emissions in construction and during operation
 - achieve a water efficient operation
 - promote physical activity
 - embrace diversity
 - protect environmentally sensitive areas.
- align with the Climate Positive Pathway:
 - drive credible reductions in upfront and operational carbon
 - avoid locking in fossil fuels
 - electrify all energy uses and supply all energy uses with renewable electricity
 - offset operational carbon that cannot be eliminated using nature-based solutions, and carbon capture and storage technologies.

4 Climate responsive design

4.1 Climate analysis

Resiliency is fundamental to decision making. Development must take account of science-based climate modelling to ensure investment in social and community infrastructure is secure and assets can serve the community long into the future.

To affect sound decision making, Representative Concentration Pathway (RCP) 8.5 (high emissions scenario) climate modelling, in line with the NARClIM (NSW and ACT Regional Climate Modelling) Project, has been considered. A 2070 timeline horizon (far future) has been selected based on building design life of 40 years.

The following future climate projections impact are identified:

- maximum temperatures are projected to increase by 1.9 °C and minimum temperatures are projected to increase by 2.0 °C
- the number of cold nights will decrease
- the number of hot days (above 35 °C) is projected to increase up to an additional 10-20 days per year (refer to Figure 4-1). These increases in hot days are projected to occur mainly in spring and summer, extending into autumn
- rainfall is projected to increase in summer and autumn
- severe fire weather days are projected to increase in summer and spring.

Figure 4-1 compares the projected increase in temperatures over current conditions.

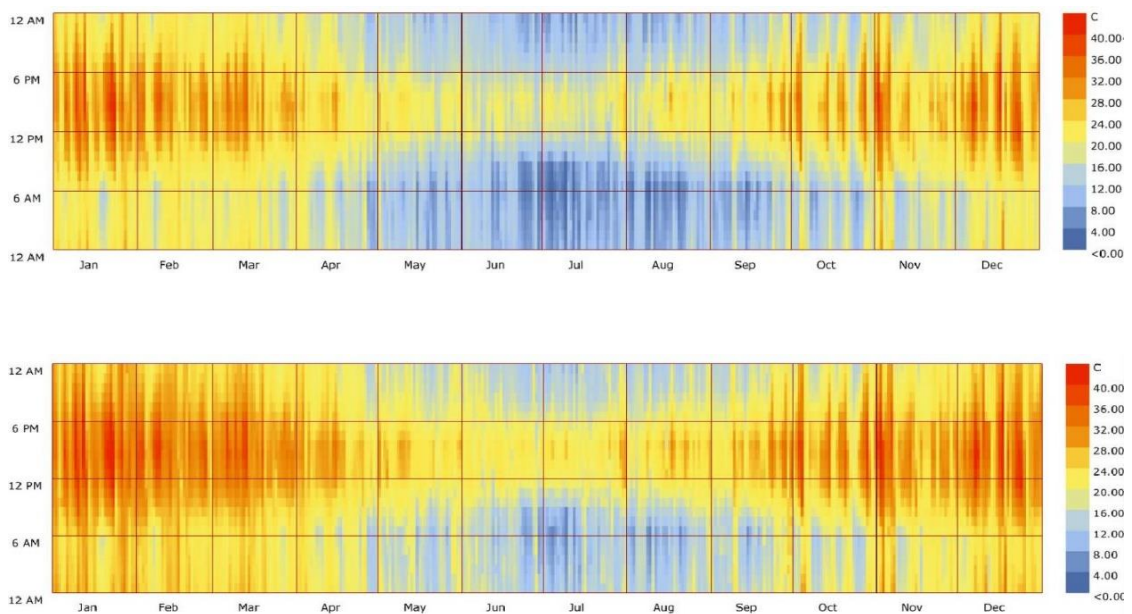


Figure 4-1 Annual hourly ambient dry bulb temperature; (current year (top); year 2070 (bottom))

4.2 Sun path

Figure 4-2 illustrates the sun path diagram for winter, mid-season and summer. Figure 4-3 presents a general arrangement plan for the proposed development.

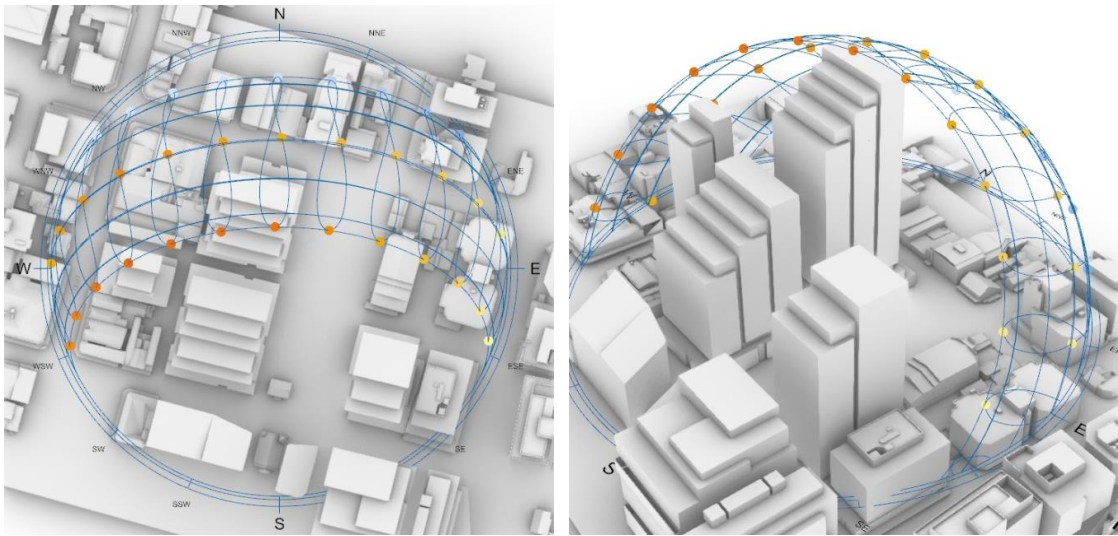


Figure 4-2 Sun path diagram; (top view (left); south-east perspective (right))

Year-long high levels of direct morning sunlight are maintained to the public open spaces, including the Civic Link. The urban massing shades the public open spaces on summer afternoons, enhancing outdoor comfort and liveability. The dominant north-east and south-west building elevations enhance indoor daylight access.

Building A has a good exposure to direct morning sunlight and is generally protected by potential development to the north-west.

Building B has a high exposure to low angle sunlight from the north-west. Measures will be required to mitigate and manage visual discomfort for residents.

Building C presents a side core arrangement to the south-east and is marginally protected by Building D to the north-west.

Building D has a good exposure to direct morning sunlight and is generally protected by Building B and potential development to the north-west.



Figure 4-3 General arrangement plan – Level 17

4.3 Wind

Wind direction varies seasonally. Weather observations and climate weather data provide an overview of annual wind speed and direction.

Wind direction varies seasonally. Weather observations and climate weather data provide an overview of annual wind speed and direction. Northeast-east-southeast-south winds are more common during summer. Winter sees a wider range of wind directions, the strongest being south-southwest-west. This is illustrated in Figure 4-4.

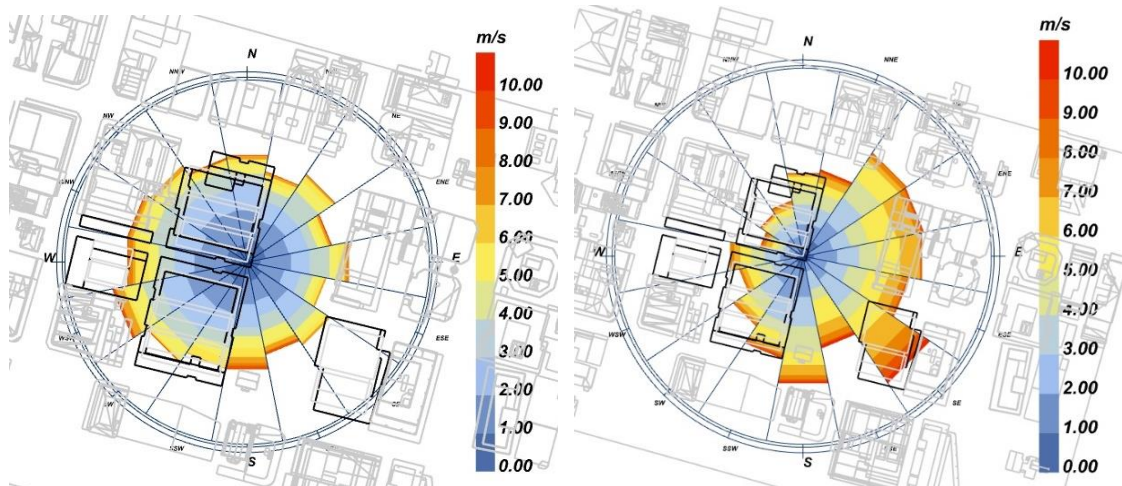


Figure 4-4 Wind rose diagram; (summer (left); winter (right))

Summer breezes can permeate the public open spaces in support of the dominant north-east and south-west pedestrian movement through the Civic Link.

Buildings A, B and D act to shelter the public open spaces from cold winter winds from the south-west to west.

The variable seasonal wind direction and built form arrangement facilitates effective indoor natural ventilation.

Figure 4-5 presents the initial wind modelling results illustrating the combined effect and relative contributions of wind from all directions. All areas see reasonably comfortable wind conditions; suitable for standing and waiting at bus stops or building entrances (teal) or longer periods of sitting such as outdoor dining or events (blue).

The results highlight that the main areas of interest are the north-west and south-east aligned pedestrian link, the Civic Link, and public open space to the north-east of Building C.

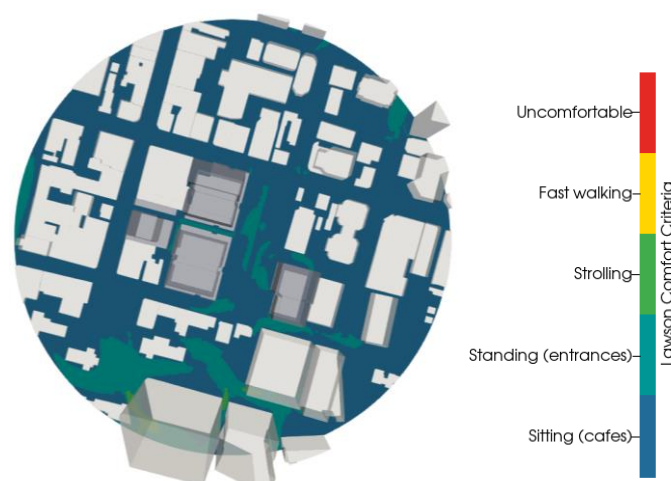


Figure 4-5 Initial wind modelling results

4.4 Sun hours

A sun hours analysis was conducted to assess direct sunlight exposure to buildings and public open spaces. Figure 4-6 and Figure 4-7 illustrate the number of direct sunlight hours received in summer and winter, respectively.

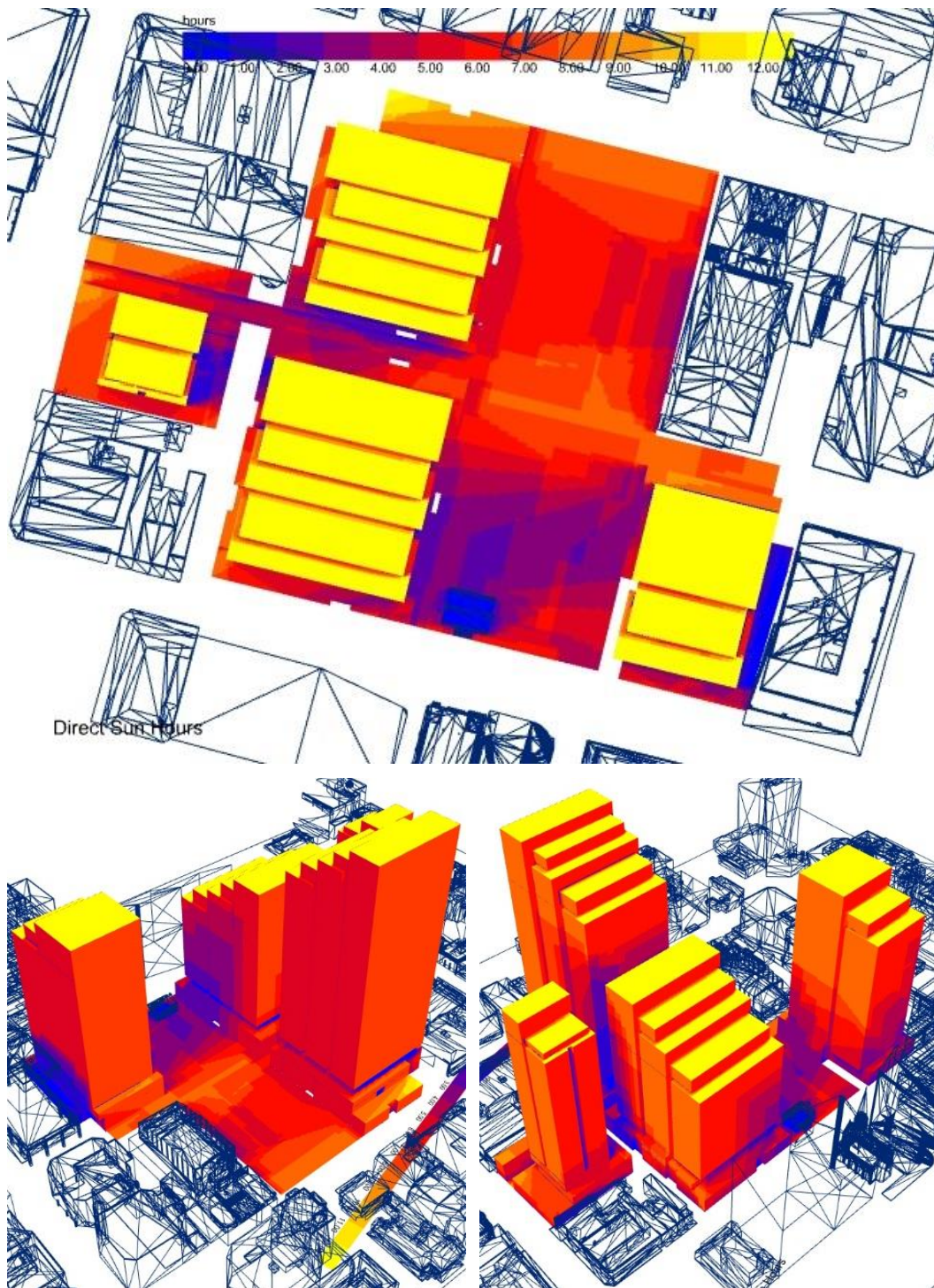


Figure 4-6 Summer sun hours; (top view (top); north-east perspective (left); south-west perspective (right))

High levels of direct sunlight are maintained throughout the year to the public open spaces, including the Civic Link. The north-east portion of the Civic Link receives the greatest proportion of direct sunlight. Urban heat controls should be considered to maintain usability during summer. The south-east portion of the Civic Link receives less direct sunlight and acts as a cool refuge during summer.

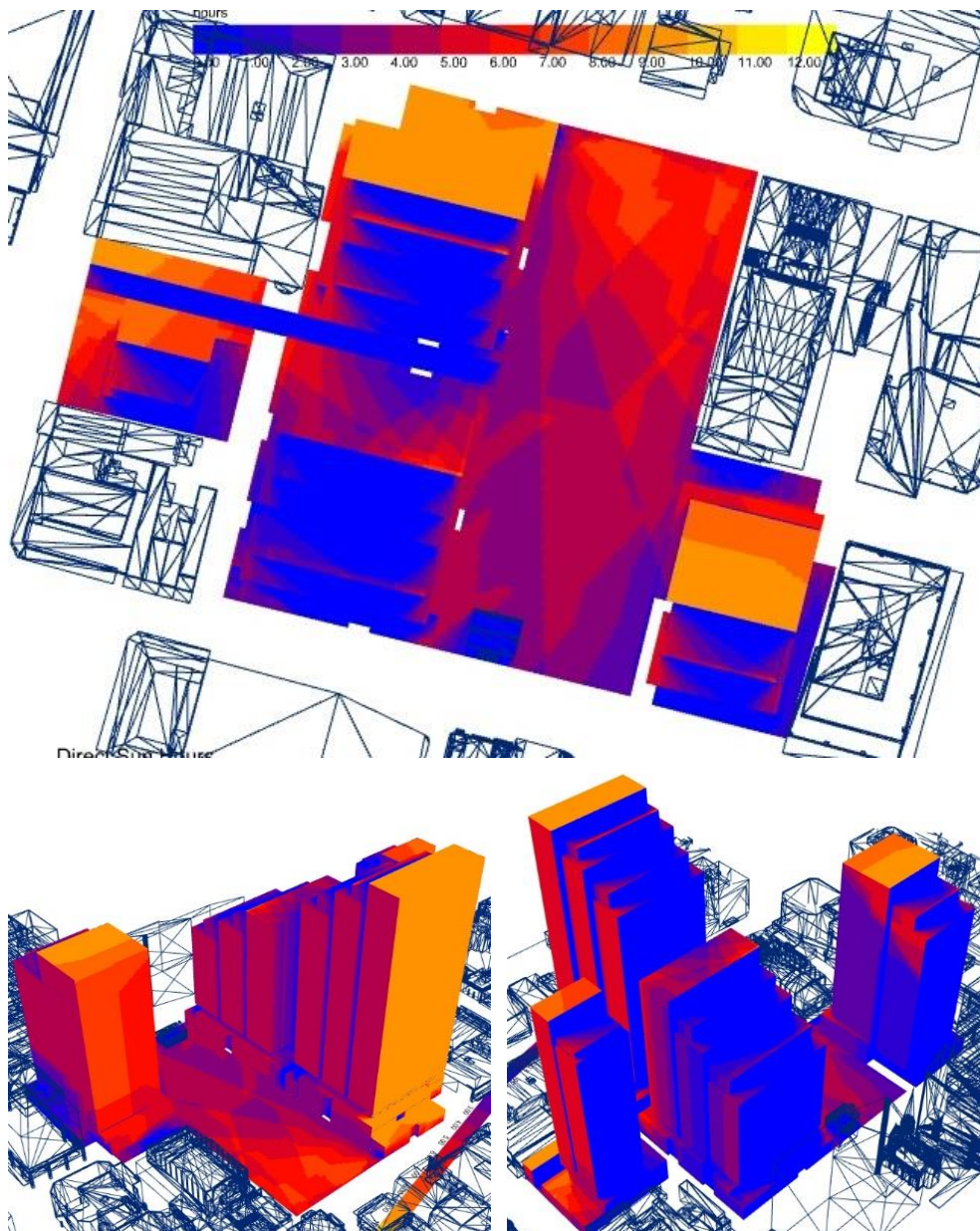


Figure 4-7 Winter sun hours; (top view (top); north-east perspective (left); south-west perspective (right))

Building A receives high levels of direct sunlight to the north-east elevation through the year. Potential development will overshadow the north-west elevation. Building integrated photovoltaic (BIPV) technology should be considered for application on the north-east elevation. Rooftop solar photovoltaic (PV) systems should only be located on the highest roof level due to overshadowing in winter.

Building B receives good levels of direct sunlight to the north-west. All other elevations are generally overshadowed by Buildings A and D to the south-east, and potential development to the north-east and south-west. There is limited potential to apply BIPV technology or rooftop solar PV systems.

Building C receives good levels of direct sunlight to the north-east elevation throughout the year. There is limited potential to apply BIPV technology. Rooftop solar PV systems should only be located on the highest roof level.

Building D receives high levels of direct sunlight to the north-east to south-east corner in summer. Building B and potential development, and Building C overshadows the north-west and south-east elevations in summer, respectively. There is limited potential to apply BIPV technology or rooftop solar PV systems.

4.5 Urban heat

The City of Parramatta Council seeks to minimise solar radiation being reflected from the building facade directly to street level.

Vertical façade design objectives to mitigate the urban heat island effect are provided through architectural design excellence competitions and do not constitute controls within the DCP.

These objectives are a key consideration due to the current urban heat island effects experienced in Parramatta (see Figure 4-8).

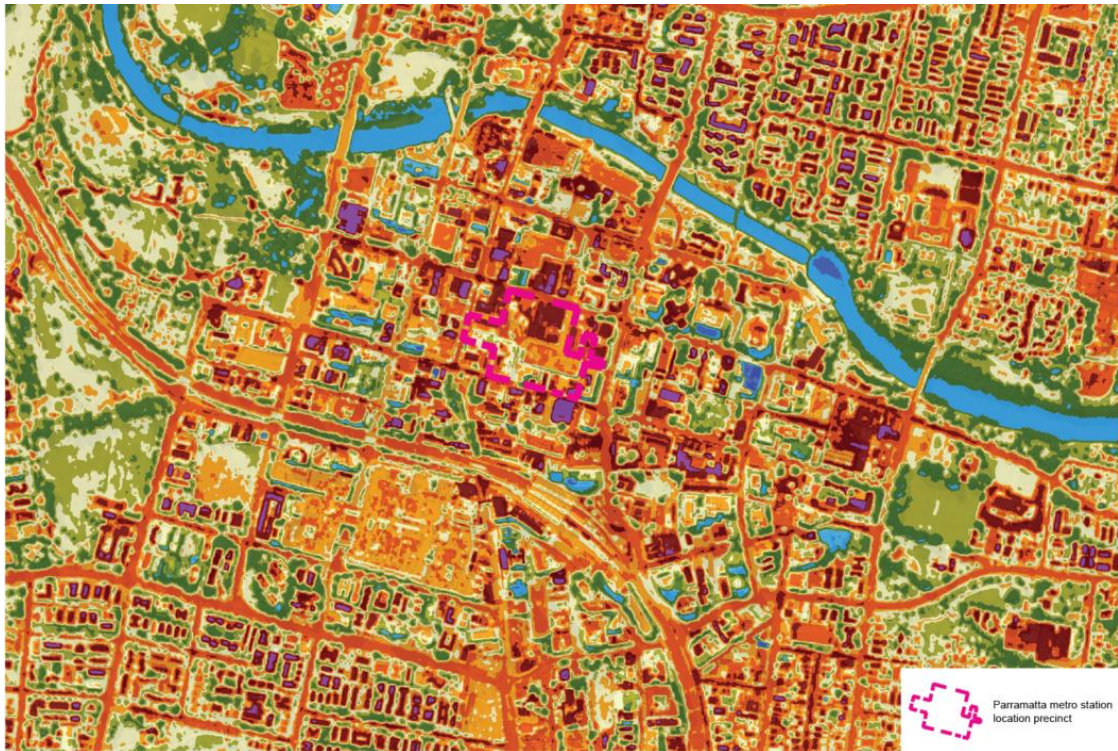


Figure 4-8: Paramatta heat map – day

Street (podium) walls that comprise glazing, metals and glossy surfaces should aim to demonstrate one or a combination of the following:

- a maximum solar reflectance of 10%
- be at least 75% shaded as calculated on 21st December on the east facade at 10am, north facade at 1pm and west facade at 4pm.

Tower walls that comprise glazing, metals and glossy surfaces should aim to demonstrate one or a combination of the following:

- a maximum solar reflectance of 10%
- be at least 30% shaded as calculated on 21st December on the east facade at 10am, north facade at 1pm and west facade at 4pm.

Shading must be provided by:

- external feature shading with a minimum SRI of 82 for horizontal shading when sloped less than 15° from the horizontal and minimum SRI of 39 when sloped greater than 15° from the horizontal
- intrinsic features of the building form such as reveals and returns
- shading from vegetation such as green walls

- opaque wall surfaces that are matte or non-reflective materials do not require shading and can be excluded.

The urban massing and building envelope have been evaluated to set minimum urban heat control requirements to inform detailed design.

Figure 4-9 illustrates the tower walls of Buildings A and C impacted by the Council's urban heat considerations. Buildings B and D are similarly affected but benefit from overshadowing from adjacent development, including potential development. The legend details high-level shading requirements (for consideration).

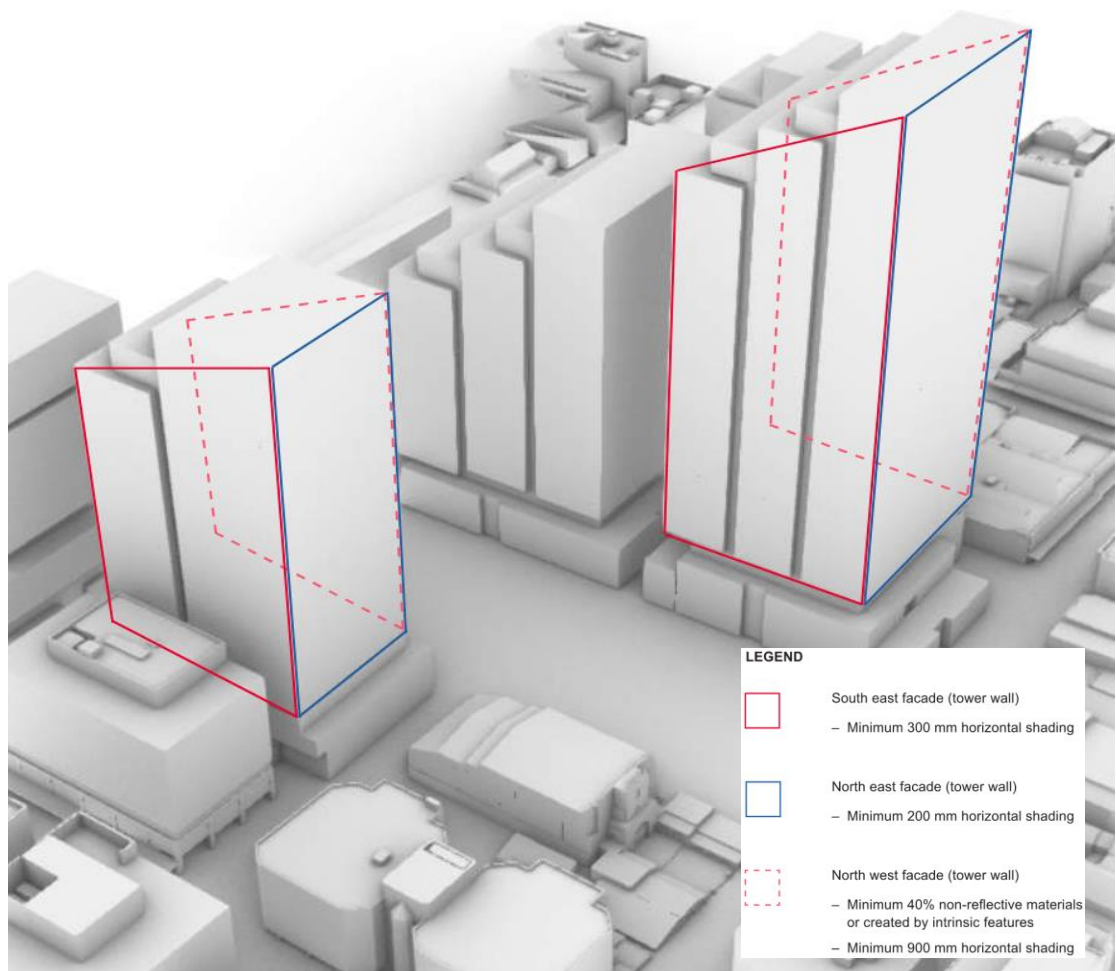


Figure 4-9 Façade performance requirements to address urban heat controls

5 Sustainability targets and rating requirements

5.1 Minimum sustainability rating requirements

An ESD strategy has been established for SMW packages and station development. Sustainability targets and rating requirements are correlated across a range of current and emerging regulatory, policy, statutory planning and Sydney Metro requirements, and market recognised standards, drivers and trends.

Minimum sustainability rating requirements for the proposed development and their justification are outlined in Table 5-1. Together with the drivers presented in section 3 and the sustainability targets detailed in section 5, an ESD framework is established for the Concept SSDA (see section Appendix A).

The energy strategy and water strategy are set out in section 6 and section 7, respectively. A sustainable transport response is outlined in section 8.

Table 5-1 Sustainability rating strategy setting out minimum requirements for the buildings proposed at Parramatta Station

Assets	Minimum rating requirement	Justification
Buildings A, C and D - Commercial Office	<ul style="list-style-type: none"> 6 star Green Star Buildings 	<ul style="list-style-type: none"> Grade A commercial office development in the Parramatta CBD
	<ul style="list-style-type: none"> 5.5 star (+25%) NABERS Energy for Offices (base building) (Commitment Agreement) (without GreenPower) 	<ul style="list-style-type: none"> Green Star Buildings, Climate Positive Pathway – Credit 22 Energy Use, Credit Achievement, NABERS Commitment Agreement pathway
	<ul style="list-style-type: none"> 5 star NABERS Water for Offices 40% less potable water consumption when compared to a reference building 	<ul style="list-style-type: none"> Planning Proposal, Parramatta CBD, Amendment to Parramatta LEP 2011 – High Performing Building Requirement Verifiable water performance (see section 7)
Buildings B - Residential	<ul style="list-style-type: none"> 5 star Green Star Buildings 	<ul style="list-style-type: none"> Sydney Metro West specification requirement
	<ul style="list-style-type: none"> 4.5 star NABERS Energy for Apartment Buildings (without GreenPower) 	<ul style="list-style-type: none"> Planning Proposal, Parramatta CBD, Amendment to Parramatta LEP 2011
	<ul style="list-style-type: none"> 3.5 star NABERS Water for Apartment Buildings 	<ul style="list-style-type: none"> Planning Proposal, Parramatta CBD, Amendment to Parramatta LEP 2011
	<ul style="list-style-type: none"> Average 7 star NatHERS rating Minimum individual 6 star NatHERS rating 	<ul style="list-style-type: none"> NCC 2022 Green Star Buildings, Climate Positive Pathway

Assets	Minimum rating requirement	Justification
	<ul style="list-style-type: none"> BASIX Energy 30 	<ul style="list-style-type: none"> Green Star Buildings, Climate Positive Pathway - Credit 22 Energy Use, Credit Achievement, Residential Pathway Verifiable energy performance (see section 5)
	<ul style="list-style-type: none"> BASIX Water 55 	<ul style="list-style-type: none"> SEPP (BASIX) 2004 Verifiable water performance (see section 7)

5.2 Climate positive

The Green Building Council of Australia (GBCA) is helping to drive the transformation of the built environment to a climate positive future. The science of climate change and an understanding of how the built environment needs to act is captured in the role and targets set in Green Star Buildings.

The Climate Positive pathway sets a Whole Life Carbon Vision that leverages the World Green Building Council's (WorldGBC's) Advancing Net Zero program that is working toward total sector decarbonisation by 2050.

Referring to Figure 5-1, the scope of the WorldGBC's Whole Life Carbon Vision considers the complete life cycle modules of those defined in EN 15978, i.e. Upfront Carbon (A1-A5), Use Stage Embodied Carbon (B1-B5), Operational Carbon (B6) and End of Life Carbon (C1-C4).

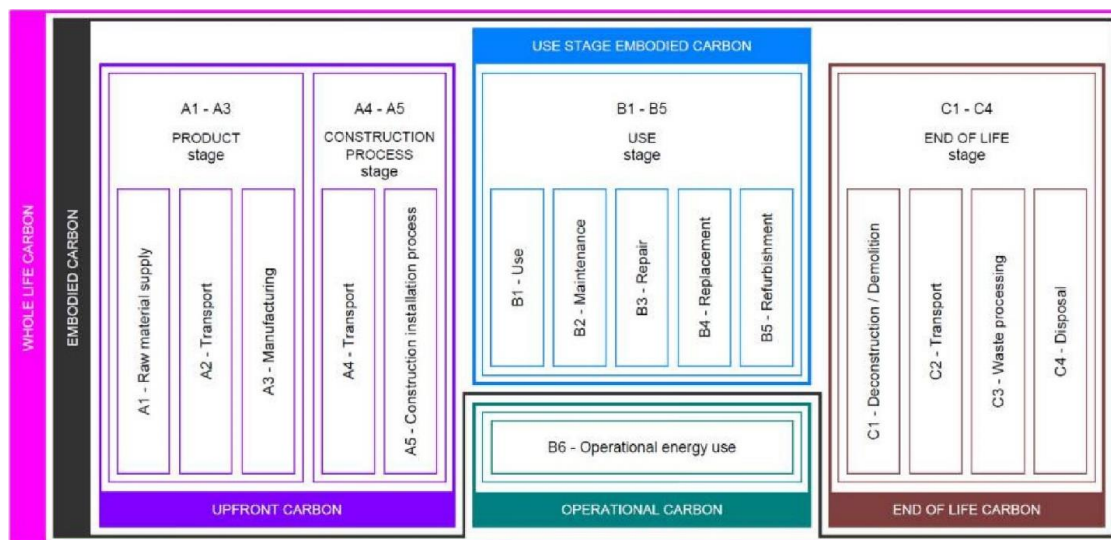


Figure 5-1 Scope of the World GBC's Whole Life Carbon Vision

The Climate Positive pathway established under the Green Star Buildings tool sets out provisions to:

Reduce

- drive credible reductions in upfront carbon and operational carbon

Eliminate

- avoid locking in fossil fuels
- install systems that use low impact refrigerants
- electrify all energy uses and purchase 100% renewable electricity

Compensate

- offset operational carbon that cannot be immediately eliminated (e.g., refrigerants and standby generator test diesel fuel use)

Neutralise

- neutralise carbon that cannot be eliminated (e.g., product and material manufacturing, use and disposal, construction activities, water supply, wastewater treatment, and waste transport and treatment) through short-term nature- based solutions, and long-term carbon capture and storage technologies.

Assuming certification will occur after 1 January 2030, the following Climate Positive Pathway requirements will apply:

- Credit 21 Upfront Carbon Emissions | Exceptional Performance | 40% reduction in upfront carbon emissions over a reference building
- Credit 22 Energy Use | Credit Achievement | 20% reduction in energy use over a reference building¹
- Credit 23 Energy Source | Minimum Expectation | preparation of a Zero Carbon Action Plan (ZCAP)
- Credit 23 Energy Source | Exceptional Performance | 100% of the building's energy comes from renewables
- Credit 24 Other Carbon Emissions | Credit Achievement | high GWP refrigerants are eliminated or offset
- Credit 24 Other Carbon Emissions | Exceptional Performance | 100% of residual embodied emissions are offset.

¹ The Credit Achievement criteria can be met by one or a combination of the:

- Reference building pathway
- NABERS Commitment Agreement pathway (available for Class 3 Hotels, Class 5 Offices and Class 6 Shopping Centres)
- Residential pathway (available to Class 2 Apartment Buildings only)

6 Energy strategy

6.1 Energy performance

Operational energy performance is a major contributor to the building life cycle carbon footprint.

This evaluation is only intended to verify that the proposed development can meet the nominated sustainability rating requirements detailed in Table 5-1 and demonstrate design excellence with respect to sustainability. The energy efficiency measures detailed in Table 6-1 and Table 6-2 should be interpreted as guidelines only. It is acknowledged that a future development partner may pursue an alternative design response under the detailed design and construction of the proposed development. Buildings A, C and D have been individually assessed against the NABERS Energy for Offices rating system.

Building B has been assessed against NatHERS, BASIX Energy and NABERS Energy for Apartment Buildings rating systems.

Preliminary building energy models have been developed for each building in accordance with the related protocols of each rating system.

6.2 Buildings A, C and D

A minimum 5.5 star (+25%) NABERS Energy for Offices rating target has been established for Buildings A, C and D.

The commercial buildings were found to meet the energy performance target based on the passive and active design measures presented in Table 6-1.

Table 6-1 Energy efficiency guidelines

Passive design measures	Active design measures
<ul style="list-style-type: none">• 50% window to wall ratio (average for all levels and elevations)• Glazing system U-value 2.8 W/m².K SHGC 0.23• 300m deep horizontal shading to the north, west and east elevations• Envelope wall system R-value 1.5 m².K/W (total R-value 3.5 m².K/W)• Spandrel system R-value 1.0 m².K/W (total R-value 3.5 m².K/W)• Envelope roof total R-value 3.2 m².K/W• Envelope floor total R-value 2.0 m².K/W• All internal conditions and operational profiles are in line with NABERS protocols	<ul style="list-style-type: none">• Active chilled beam (ACB) with constant air volume (CAV) system to the perimeter office zones• Variable air volume (VAV) system to the centre office zones• Central air handling plant (including economy cycle and demand control ventilation) separately serving the hybrid ACB and VAV heating, ventilation and air conditioning (HVAC) systems• 15% improvement in the energy efficiency ratio (EER) over Part J5.10 Refrigerant chillers (NCC 2019, section J Energy efficiency) for water-cooled chiller plant serving comfort cooling systems• A seasonal coefficient of performance (COP) > 3.5 for air-to-water polyvalent heat pump plant serving space heating and domestic hot water heating systems, and comfort cooling low load/peak load conditions

The results for Buildings A, C and D are shown in Figure 6-1, Figure 6-2 and Figure 6-3, respectively, and the figures visually detail the following performance metrics:

- Predicted monthly energy consumption by end use
- Predicted annual energy performance against the 5.5 star (+25%) NABERS Energy budget
- Visualisation of predicted annual energy consumption on a per level basis.

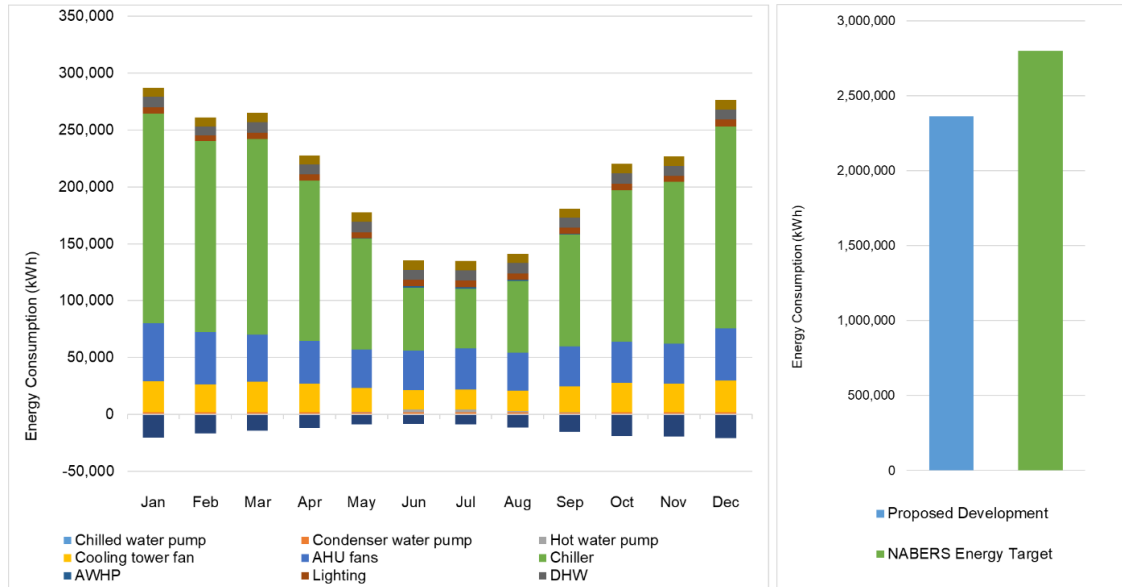


Figure 6-1 Building A energy performance; (monthly breakdown (left); annual comparison to NABERS Energy target (right))

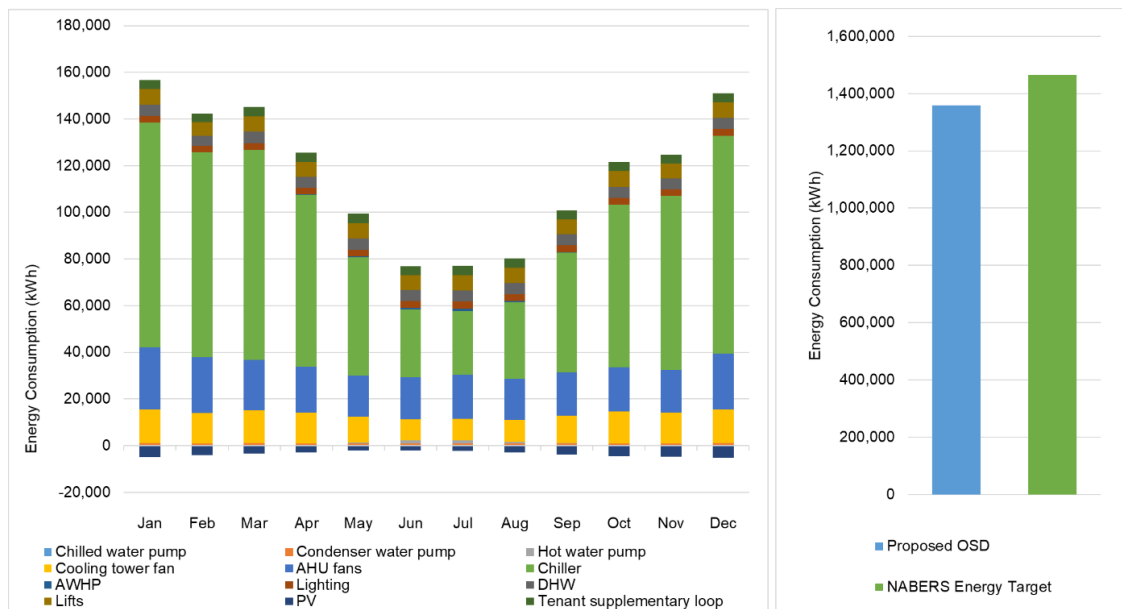


Figure 6-2 Building C energy performance; (monthly breakdown (left); annual comparison to NABERS Energy target (right))

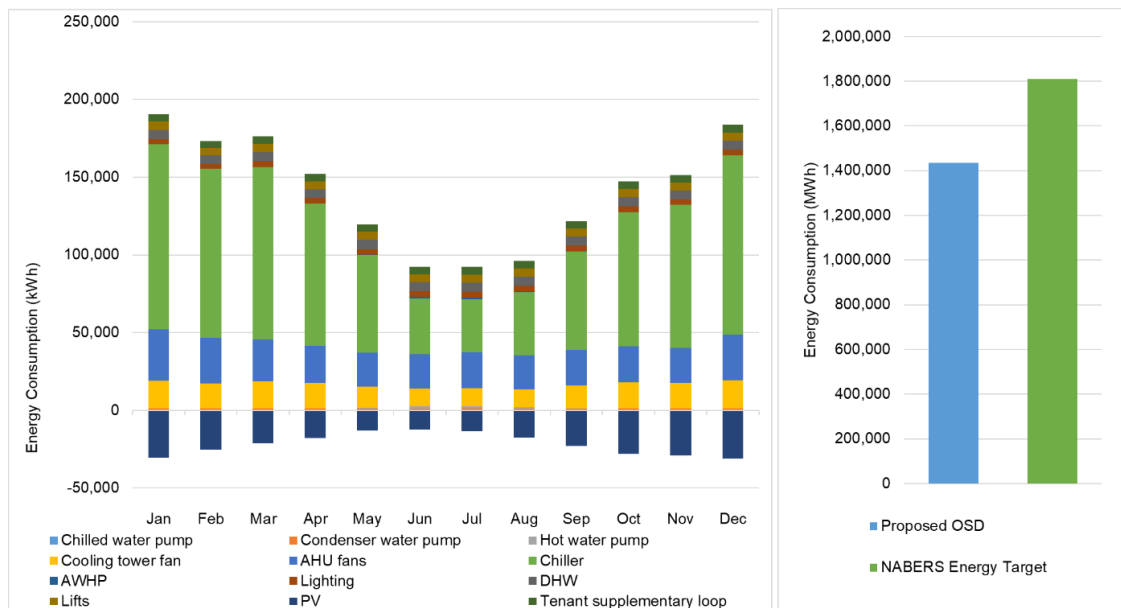


Figure 6-3 Building D energy performance; (monthly breakdown (left); annual comparison to NABERS Energy target (right))

6.3 Building B

A minimum 6 star NatHERS rating for individual residential dwellings (7 star average for Building B), BASIX Energy 30 and 4.5 star NABERS Energy for Apartment Buildings rating targets have been established for Building B.

A stretch target of BASIX Energy 35 is identified in Table 5-1 and is applicable where the:

- green Star Buildings, Climate Positive Pathway Credit 22 Energy Use, Credit Achievement, Residential Pathway is selected.

The residential building was found to meet the energy performance targets based on the passive and active design measures presented in Table 6-2.

The results for Building B are shown in Figure 6-4 and the figures visually detail the following performance metrics:

- predicted average annual thermal load against the 7 star NatHERS thermal load budget
- predicted monthly energy consumption of shared services by end use
- predicted annual energy performance of shared services against the 4.5 star NABERS Energy budget
- predicted annual energy performance against the BASIX Energy target
- visualisation of predicted annual energy consumption of shared services on a per level basis.

Table 6-2 Energy efficiency

Passive design measures	Active design measures
<ul style="list-style-type: none"> • 60% window to wall ratio • External window (fixed/openable) system U-value 3.4 W/m².K SHGC 0.30 • Glazed external door (fixed/openable) U-value 3.4 W/m².K SHGC 0.30 • Exposed window shading - 300 mm deep horizontal shading • Weather stripping - all external doors and windows • Envelope wall system R-value 1.5 m².K/W (total R-value 3.5 m².K/W) • Spandrel panel system R-value 1.0 m².K/W (total R-value 3.5 m².K/W) • Envelope roof total R-value 3.5 m².K/W • Roof colour - medium • Envelope floor total R-value 2.0 m².K/W • Floor finish - tiles (wet areas + kitchen) • Floor finish - carpet (bedrooms + living areas) • Ceiling fan - bedrooms + living areas • Ceiling light penetration - insulated 	<ul style="list-style-type: none"> • Building management system • Carpark supply and exhaust ventilation - CO sensors + VSD fans • Mechanical exhaust (bathroom + laundry) to facade - manual on / timer off • Mechanical exhaust (kitchen) to facade - manual on / off • Hallway ventilation - supply only / timeclock - providing a proportion of make-up air provision for bathroom, laundry and kitchen exhaust • Air-conditioned Ground floor lobby • Air-conditioned Community Rooms • Mechanical ventilation heat recovery (MVHR) unit in each apartment with a 60% sensible heat recovery efficiency providing minimum outdoor air ventilation and a proportion of make-up air provision for bathroom, laundry and kitchen exhaust • 4-pipe fan coil unit in each apartment for comfort cooling and space heating of habitable rooms • Central water-cooled chiller plant serving comfort cooling systems - COP > 4.5 • Central air-to-water heat pump plant serving space heating and domestic hot water heating systems - seasonal COP > 3.5 • Lighting (unit) - > 80% LED fittings in all rooms • Lighting (common areas) - LED fittings + controls • Refrigerator - 4.5 star (non-ventilated) • Dishwasher - 4.5 star • Clothes washer - 4.5 star • Clothes dryer - 4.5 star • Internal clothes drying line • Hot water piping insulation - R 1.0 K.W/m² • Vertical transportation - VVF gearless traction

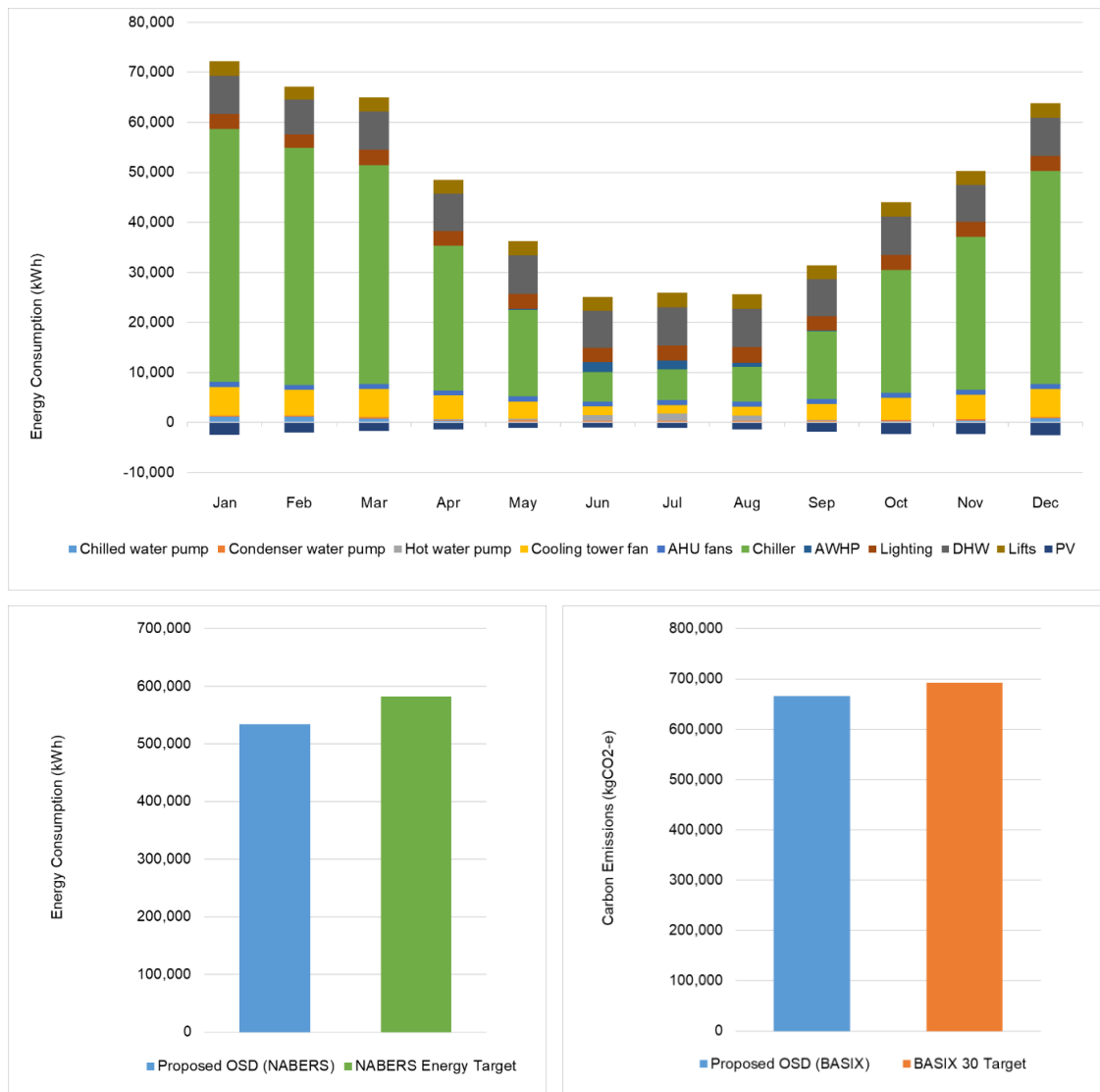


Figure 6-4 Building B energy performance; (monthly breakdown (top); annual comparison to NABERS Energy target (right); annual comparison to BASIX 30 target (left))

6.4 Renewable energy

A renewable energy feasibility study was conducted for the proposed development. This consisted of coordinated spatial planning for rooftop plant and solar PV systems (see Table 6-3). BIPV technology was not evaluated but it is recommended that this technology be considered under future approval(s) based on the findings presented in section 4.4. BIPV technology should be considered intrinsic to the facade design to optimise the indoor environment quality performance whilst delivering effective urban heat mitigation.

Table 6-3 Solar PV system capacity and yield for each building

Building	Capacity / yield
A	<ul style="list-style-type: none">• 135 kWp• 175,000 kWh
B	<ul style="list-style-type: none">• 17.5 kWp• 20,000 kWh
C	<ul style="list-style-type: none">• 35 kWp• 42,500 kWh
D	<ul style="list-style-type: none">• 200 kWp• 260,000 kWh

7 Water strategy

7.1 Water performance

To support water resilience buildings must integrate water efficiency measures and make use of alternative water sources to reduce the demand for potable water.

This evaluation is only intended to verify that the proposed development can meet the nominated sustainability rating requirements detailed in Table 5-1 and demonstrate design excellence with respect to sustainability. The water efficiency measures detailed in Table 7-1 should be interpreted as guidelines only. It is acknowledged that a future development partner may pursue an alternative design response under the detailed design and construction of the proposed development.

Buildings A, C and D have been assessed individually against the NABERS Water for Offices and Green Star Buildings (Credit 25 Water Use) rating systems.

Building B has been assessed against BASIX Water, NABERS Water for Apartment Buildings and Green Star Buildings (Credit 25 Water Use) rating systems.

Preliminary building water balance analysis has been developed for each building in accordance with the related protocols of each rating system.

7.2 Buildings A, C and D

A minimum 5 star NABERS Water rating target has been established for the commercial buildings A, C and D.

In lieu of the Green Star Buildings prescribed Water Use calculator (currently in development), the Green Star - Design & As Built (D&AB) v1.3 Potable Water Calculator, Release 7 was used to calculate the annual potable water consumption for the commercial buildings.

Buildings A, C and D were found to meet the annual potable water consumption targets presented in based on the water efficiency measures presented in Table 7-1.

The results for Buildings A, C and D are shown in Figure 7-1, Figure 7-2 and Figure 7-3, respectively, and detail the following performance metrics:

- predicted monthly water consumption by end use
- predicted annual water consumption by end use
- predicted annual water performance against the Green Star standard practice building and 5 star NABERS Water budget.

Table 7-1 Water efficiency measures

Water efficiency measures

- Toilets – 5 star WELS rating
- Urinals – 5 star WELS rating (commercial office only)
- Wash hand basin taps - 6 star WELS rating
- Kitchen taps - 6 star WELS rating
- Showers - 4 star WELS rating
- Dishwashers - 5 star WELS rating
- Clothes washers - 4 star WELS rating (residential only)
- Dual plumbing systems serving all non-potable water demands, including toilet and urinal flushing, landscape irrigation and make-up water for heat rejection systems
- 30kL rainwater tank and treatment system for rainwater harvesting and reuse to meet a proportion of the non-potable water demands
- Future ready connection for a recycled water network
- Closed circuit cooler (hybrid cooling tower) plant for heat rejection serving base building and tenant supplementary loop (commercial office only) + shared comfort cooling systems (residential only)
- Landscape design - total average crop coefficient less than 0.6
- Landscape irrigation - subsurface drip irrigation - 90% system efficiency
- Fire protection system - water is not expelled during testing

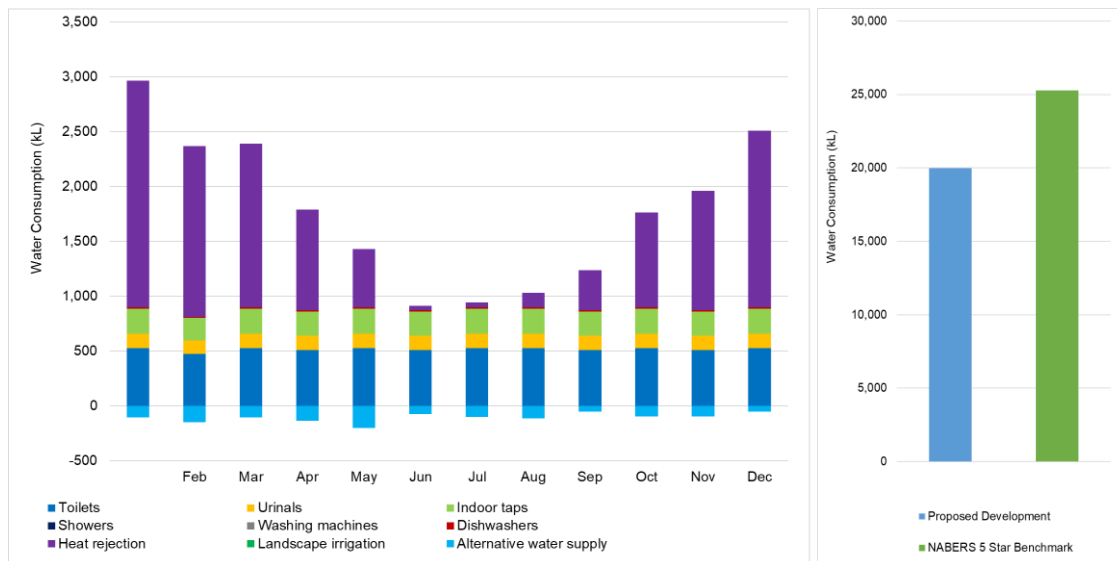


Figure 7-1 Building A water performance; (monthly breakdown (left); annual comparison to NABERS Water target (right))

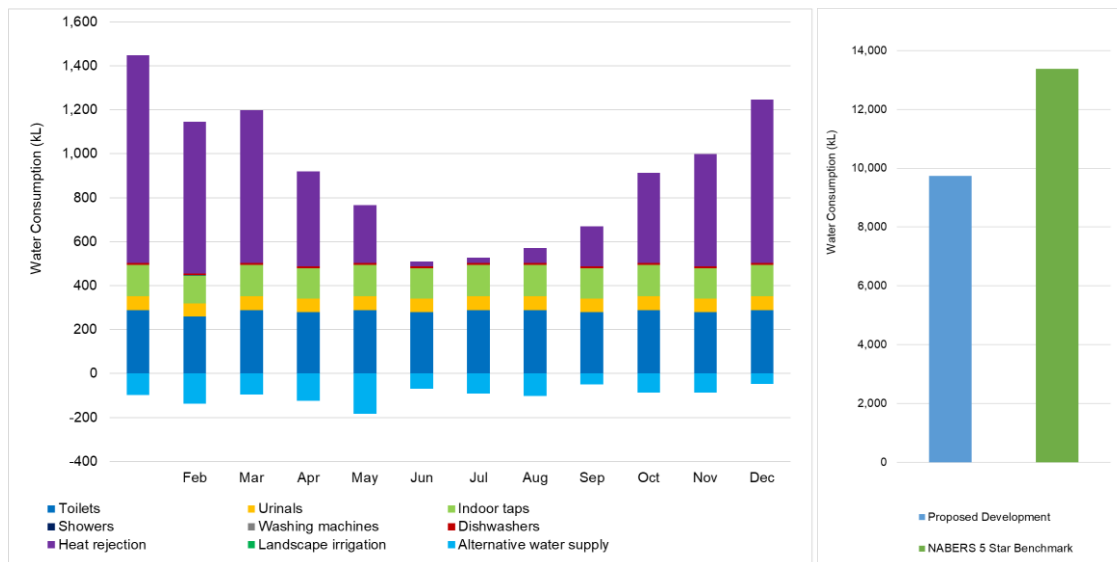


Figure 7-2 Building C water performance; (monthly breakdown (left); annual comparison to NABERS Water target (right))

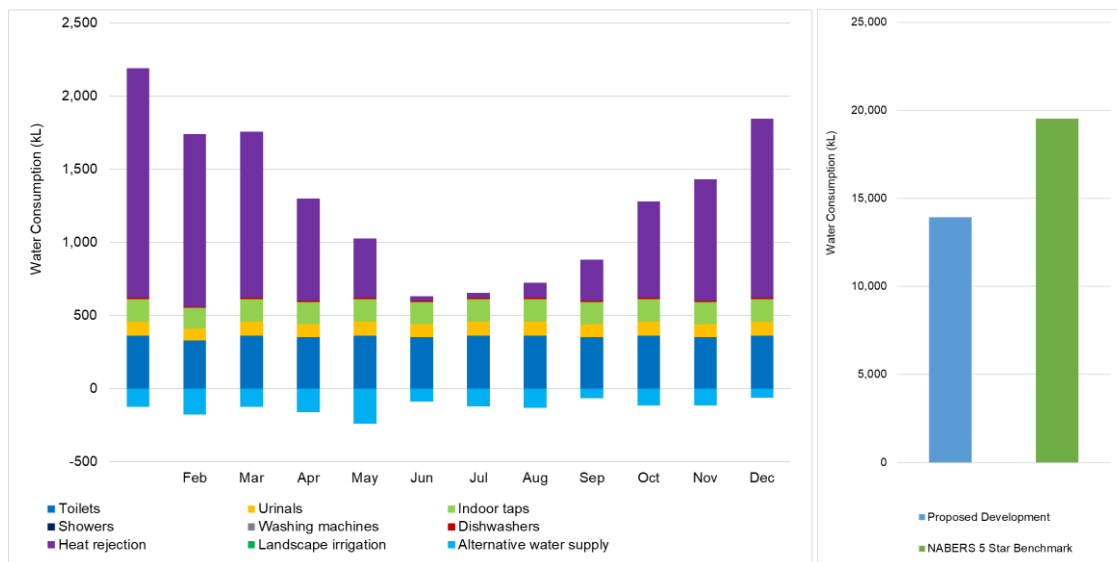


Figure 7-3 Building D water performance; (monthly breakdown (left); annual comparison to NABERS Water target (right))

7.3 Building B

A minimum 3.5 star NABERS Water for Apartments and BASIX Water 55 rating targets have been established for the residential Building B.

The Green Star D&AB v1.3 Potable Water Calculator, Release 7 was used to calculate the annual potable water consumption for the residential building.

Building B was found to meet the annual potable water consumption targets presented in Table 5-1 based on the water efficiency measures presented in Table 7-1.

The results for Building B are shown in Figure 7-4 and detail the following performance metrics:

- predicted monthly water consumption by end use
- predicted annual water consumption by end use
- predicted annual water performance against the Green Star standard practice building and 3.5 star NABERS Water budget.

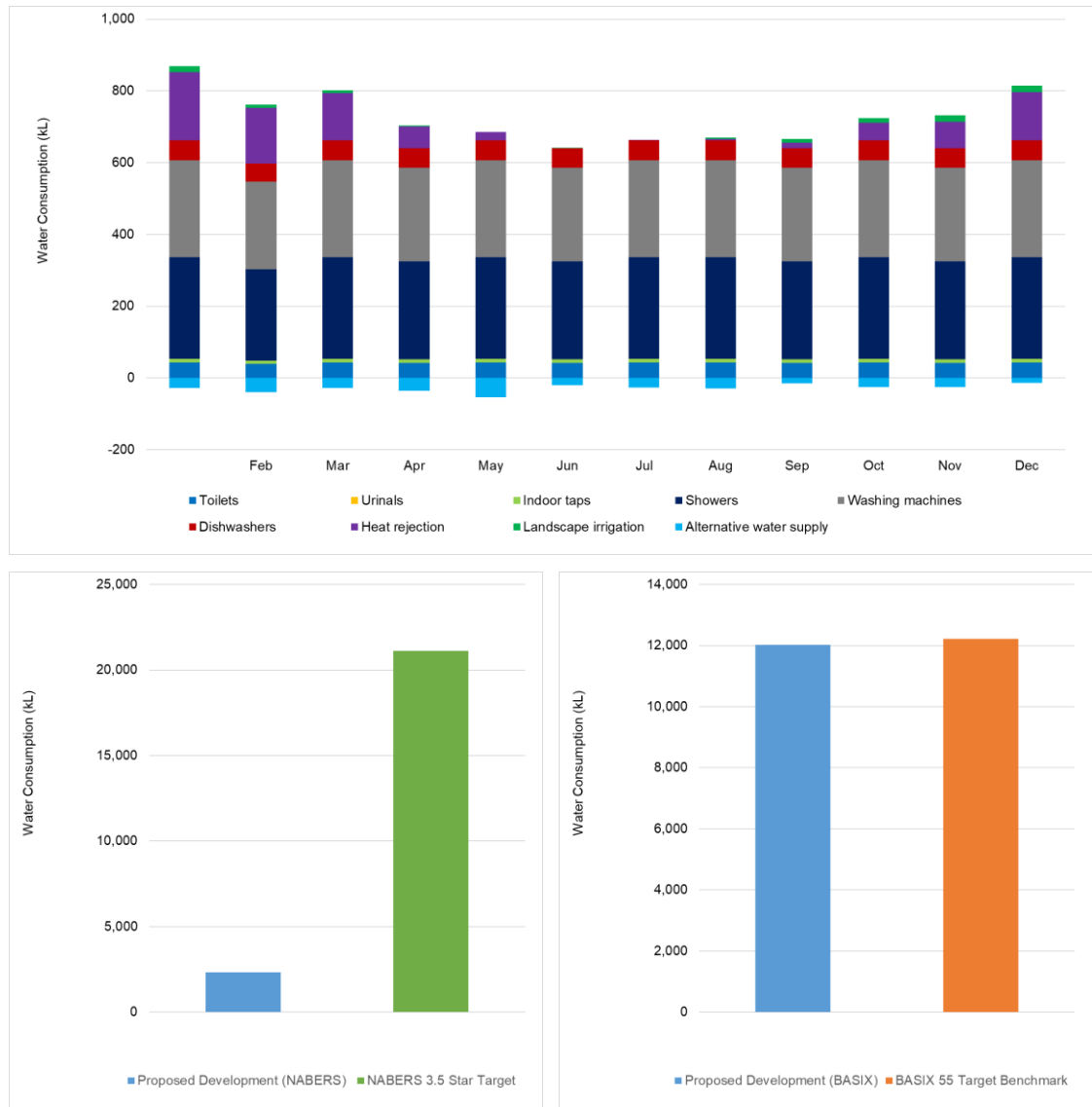


Figure 7-4 Building B water performance; (monthly breakdown (top); annual comparison to NABERS Water budget (left); annual comparison to BASIX 55 budget (right))

8 Sustainable transport

8.1 Movement and place

The City of Parramatta has set provisions that:

- prioritise active transport modes and improve the permeability of the pedestrian network
- reduce private vehicle use and encourage active, shared and public transport use.

Relevant Parramatta DCP 2011 design controls include:

- one bicycle parking space per 200 m² of floor space of commercial and retail development must be provided
- one bicycle parking space per 2 dwellings of residential development must be provided
- pedestrian through-site links must have a minimum width of 3 m and be constructed to an appropriate standard
- end of trip facilities, including showers and lockers, must be provided to adequately service the number of bicycle parking spaces required in business premises, office premises, retail and industrial development
- all bicycle parking should be in a safe and secure location that is under cover and convenient for users
- bicycle parking in the public domain must be located as close as possible to the main entrance of the building at ground level.

Under the Parramatta DCP, each building is required to provide at least one car share parking space. As the Parramatta DCP does not have any further specific guidance on number of car share parking spaces, the City of Sydney 2012 guide and 2014 amendment is used as reference, which gives the following rates in the Sydney CBD:

- 1 car share space per 50 residential car spaces
- 1 car share space per 30 commercial or retail car spaces.

To encourage residents, workers and visitors to use active, low carbon and public transport options instead of private vehicles, the criteria set out in Green Star Buildings (Credit 27 Movement and Place) must be met.

These criteria include:

Minimum expectation

- the building must include showers and changing facilities for building occupants
- these facilities must be accessible, inclusive, and located in a safe and protected space.

Credit achievement

- access for cyclists and the provision of bicycle parking facilities must be prioritised
- a Sustainable Transport Plan must be prepared and implemented
- electric vehicle (EV) charging capabilities must be integrated
- transport options that reduce the need for private fossil fuel powered vehicles must be prioritised
- the building's design and location must encourage walking.

8.2 End of trip facilities

Table 8-1 details the various building uses, associated areas and population, and the number of showers and lockers required.

Commercial and retail occupancies are based on Table D1.13 of NCC 2019.

Residential occupancy is based on apartment numbers and one person per bedroom is assumed.

The relevant Parramatta DCP 2011 design controls and Green Star Buildings (Credit 27 Movement and Place) criteria have been applied when determining the required number of showers and lockers, and bicycle parking provision. Where there is an inconsistency, the more onerous requirement must be met to ensure both DCP and Green Star Buildings requirements are met.

Table 8-1 also identifies the end of trip facilities driver for each building and its uses. The Parramatta DCP 2011 does not provision for showers and lockers in its design controls.

Table 8-1 Requirements for end of trip facilities

Building A		
Use type	Office	Retail
Area	73,969 m ²	3,497 m ²
Population	7,397	350
Required Showers	40 (Green Star)	5 (Green Star)
Required Lockers	925 (Green Star)	44 (Green Star)
Required Bike Racks	370 (DCP)	18 (DCP)
Recommended Bike Racks	380	20

Building B		
Use type	Office	Retail
Area	19,364 m ²	1,114 m ²
Population	280	111
Required Showers	Exempt	4 (Green Star)
Required Lockers	Exempt	14 (Green Star)
Required Bike Racks	73 (DCP)	6 (DCP)
Recommended Bike Racks	80	10

Building C		
Use Type	Office	Retail
Area	37,503 m ²	57,007 m ²
Population	3,750	5,701
Required Showers	22 (Green Star)	32 (Green Star)
Required Lockers	469 (Green Star)	713 (Green Star)
Required Bike Racks	188 (DCP)	286 (DCP)
Recommended Bike Racks	190	290

Building D		
Use type	Office	Retail
Area	57,007 m ²	3,760 m ²
Population	5,701	376
Required Showers	32 (Green Star)	5 (Green Star)
Required Lockers	713 (Green Star)	47 (Green Star)
Required Bike Racks	286 (DCP)	19 (DCP)
Recommended Bike Racks	290	20

8.3 Private vehicle use

The Green Star Movement and Place calculator has been applied to assess emissions reduction from transport by encouraging active and public transport use to reduce vehicle kilometres travelled. Table 8-2 details the inputs used in the Movement and Place calculator for both the proposed buildings and a baseline based on 2016 Census results.

Table 8-2 Movement and place calculator inputs

	Baseline	Proposed
Work weeks	48	48
Avoided trips	2%	2%
Average trip length	16.01 km	16.01 km

Work weeks refer to the number of normal working weeks per annum for employees. This is assumed to be 48 weeks (assuming a typical 4-week or 20-day annual leave provision).

Avoided trips refer to the tendency of employees to work from home or not take a commuting trip during a work week. This avoided trips percentage for the proposed buildings is based on Census data. The proposed avoided trips percentage is expected to increase once COVID and flexible working trends are better understood.

Average trip length is based on Statistical Area Level 2 (SA2) Census data for the development location. The baseline and proposed building average trip length are deemed equivalent.

Emissions intensity is based on the Green Star Movement and Place calculator and assumes both Sydney Trains and Sydney Metro are net zero in operation.

Table 8-3 and details the baseline and proposed mode share for commercial and residential building use for input to the Green Star Movement and Place calculator.

Baseline mode share data is based on 2016 Census data. Proposed mode share data are early estimates provided by the Transport Planners. Adjusted mode share data is based on aspirational targets that aims to encourage active mode transport in the case where the proposed does not meet the Green Star criteria.

Table 8-3 Commercial and residential mode share for different scenarios

Mode	Commercial		Residential		
	Baseline	Proposed	Adjusted	Baseline	Proposed
Train	32.35%	35.00%	34.52%	47.18%	32.00%
Bus	10.56%	15.00%	14.79%	8.23%	10.00%
Ferry	0.06%	0.00%	0.00%	0.00%	0.00%

Mode	Commercial			Residential	
	Baseline	Proposed	Adjusted	Baseline	Proposed
Tram	0.03%	5.00%	4.93%	0.06%	5.00%
Metro	0.00%	31.99%	31.55%	0.00%	22.00%
Car Driver	47.70%	5.01%	5.01%	29.98%	6.00%
Car Passenger	4.46%	0.00%	0.00%	2.53%	0.00%
Motorbike	0.00%	0.00%	0.00%	0.00%	0.00%
Bicycle	0.53%	1.00%	1.15%	0.34%	1.00%
Walk	4.31%	7.00%	8.04%	11.67%	24.00%

Assessing each building individually, the following targets were met:

- private vehicle use emissions reduction: 40%
- active mode encouragement: 90%
- Vehicle Kilometres Travelled (VKT) reduction: 20%
- amenity diversity: 10 amenities across five categories within 400m of the building.

The required bicycle parking facilities to meet or exceed the 90% active mode encouragement are presented in Table 8-1. The calculation for bicycle parking provisions is heavily reliant on the baseline active mode share (bicycle and walking). Recommended bicycle parking is presented in the case where the proposed mode share is subject to change.

As Buildings A and B share the northern basement, and Buildings C and D share the southern basement, Table 8-4 sets out the maximum permissible parking spaces, as well as the proposed provision of car parking spaces, per basement. It should be noted that all non-residential parking has been designated as commercial for the purposes of this assessment for conservatism in the road network modelling.

The proposed provision of parking is well within the maximum rates. Given the proximity of the proposed development site to a range of public transport links, the reduction in the number of spaces compared to the existing site is considered appropriate. By providing a lower number of parking spaces per residential dwelling than the maximum, residents and occupants will be discouraged from owning and using private vehicles, catalysing a shift to sustainable transport.

Table 8-4 Car parking spaces, inclusive of car share provision

Land use	Maximum spaces		Proposed spaces	
	Northern	Southern	Northern	Southern
Commercial	187	236	187	191
Residential	96	-	73	0
Car Share	-	-	9	7
Total	283	236	269	198

8.4 Electric vehicles

To ensure the proposed development can support the transition to electric vehicles, the following initiatives are addressed within the context of electrical infrastructure, and EV ready and EV capable capacity:

EV ready

- EV charging points to at least 5% of all car parking spaces
- EV charging points to all car share parking spaces (in addition to the 5% provided).

EV capable

- electrical infrastructure and a load management plan prepared to allow for future installation of EV charging to 25% of all car parking spaces (including the EV ready provision)
- a dedicated, safe, unobstructed route from the electrical supply point that allows for the future provision of all necessary electrical cabling to all car parking spaces without the need for substantial builders work in connection to the electrical cabling installation.

9 Conclusion

This report presents the results of a ESD assessment for the Concept SSDA. It has been prepared to outline sustainability targets, requirements and framework for the proposed development in response to the following:

- relevant SEARs
- integrates the relevant design excellence requirements detailed in the Parramatta Local Environment Plan (LEP) 2007, and the related objectives and controls of the Parramatta Development Control Plan (DCP) 2011
- addresses the high performing building requirements being considered in the Planning Proposal, Parramatta CBD, Amendment to the Parramatta LEP 2011
- considers the vision and priorities framework set out in the City of Parramatta, Environmental Sustainability Strategy 2017.

Precautionary principle

The Concept SSDA seeks consent for a building envelope and use for residential and commercial purposes, maximum building height, a maximum GFA, pedestrian and vehicular access, circulation arrangements and associated car parking, and the strategies and design parameters for the future detailed design of the proposed development.

No threat of serious or irreversible environmental damage is posed by the proposed development

Proactive measures to prevent environmental degradation will be included within the design, construction and operation phases of the proposed development

To deliver a high level of performance in operation, the buildings will pursue set environmental performance targets and be set up for optimum ongoing management that is supported by appropriate metering and monitoring systems.

Inter-generational equity

The proposed development will maintain the health, diversity and productivity of the environment for future generations by minimising the consumption of energy and water, and waste generation.

- implement passive design measures in Building B that achieve an average 7 star NatHERS rating for all residential dwellings and not less than an individual 6 star NatHERS rating for any residential dwelling
- embed active design measures in Building B that:
 - exceed the performance provisions of the NCC, NSW 2 Energy efficiency performance requirements
 - achieve the BASIX Energy target of 30 for high-rise residential flat buildings
 - evaluate the potential to achieve the BASIX Energy stretch target of 35
 - demonstrate that the annual energy consumption of the shared services is less than a 4.5 star NABERS Energy for Apartment Buildings budget.
- integrate passive and active design measures in Buildings A, C and D that demonstrates the annual energy consumption is less than a 5.5 star (+25%) NABERS Energy for Offices budget
- exceed the deemed to satisfy (DTS) provisions of NCC 2019, section J Energy efficiency for all retail premises

- deploy on-site renewable energy systems across all buildings
- apply water efficiency measures and alternative water reuse strategies to Building B that:
 - achieve the BASIX Water target of 55 for high-rise residential flat buildings.
 - demonstrate that the annual water consumption of the shared services is less than a 3.5 star NABERS Water for Apartment Buildings budget:
 - deliver at least a 30% reduction in annual water consumption when compared to a Green Star reference building.
 - apply water efficiency measures and alternative water reuse strategies to Buildings A, C and D that:
 - demonstrate that the annual water consumption is less than a 5 star NABERS Water for Offices budget
 - deliver at least a 40% reduction in annual water consumption when compared to a reference building.
 - divert at least 90% of construction and demolition waste from landfill
- develop a waste management plan to:
 - identify, quantify, and classify the likely waste streams generated during construction and operation
 - promote responsible source separation to reduce the amount of waste that goes to landfill by implementing convenient and efficient waste management systems.

Conservation of biological diversity and ecological integrity

The proposed development is considered highly unlikely to have significant biodiversity impacts as the development is limited to highly modified areas, containing planted native and exotic vegetation only.

The site may comprise potential and marginal foraging habitat within the broad habitat ranges of highly mobile native fauna. However, no suitable roosting or breeding habitat within the buildings to be demolished was identified.

A Biodiversity Development Assessment Report (BDAR) waiver is being sought under the CSSI application (SSI-22765520).

Environmental factors

Environmental factors are addressed by the Concept SSDA through the definition of an ESD framework.

During construction, the EMS and EMP, put in place by the main contractor, will demonstrate a formalised systematic and methodical approach to planning, implementing and auditing for environmental management.

During operation, environmental performance targets will be set and verified.

ESD Strategy





An ESD strategy has been established for Sydney Metro West packages, including associated station development. Sustainability targets and rating requirements are correlated across a range of current and emerging regulatory, policy, statutory planning and Sydney Metro requirements, including market recognised standards, drivers and trends.

These sustainability targets and requirements comprehensively demonstrate the integration of best practice sustainable building principles into the design of the proposed development.

The ESD strategy sets the following sustainability targets:

Climate positive	
40%	reduction in upfront carbon emissions
20%	reduction in energy use
100%	renewable energy
100%	elimination / offset of other emissions
40%	reduction in potable water use - commercial
30%	reduction in potable water use - residential
30%	reduction in life cycle impacts

The ESD strategy sets the following sustainability rating requirements:

Tool	Commercial	Residential
 greenstar	6 star Buildings	5 star Buildings
	5.5 star (+25%) NABERS Energy 5 star NABERS Water	4.5 star NABERS Energy 3.5 star NABERS Water
	-	Average 7 star NatHERS Minimum 6 star NatHERS
	-	BASIX Energy 25 BASIX Water 55 Stretch Targets: BASIX Energy 35

Greenhouse gas emission minimisation

The proposed development will minimise greenhouse gas emissions by:

- implement a Climate Positive pathway (see section 5.2)
- take advantage of proven emissions reduction technologies to reduce the cost of living
- drive credible reductions in Upfront Carbon and Operational Carbon
- avoid locking in fossil fuels
- install systems that use low impact refrigerants
- empower consumers and businesses to make sustainable choices by investing in the electrification of space heating services, and retail and residential cooking to accelerate the decarbonisation of the built environment
- purchase 100% renewable electricity for base building and shared services operations
- make allowance for 20% of the total electrical demand of EV charging for all car parking spaces to support future EV charging capacity.

Section 7 defines an advanced water strategy that delivers a 40% reduction in annual water consumption for Buildings A, C and D, and a 30% reduction for Building B.

Minimisation of material consumption through the life of the proposed development will be met through:

- the development of a waste management plan that addresses waste management during construction and operation
- identification and quantifying of the various waste streams which may be generated from construction and operation
- the provision of relevant management strategies for effective storage, reuse/recovery, treatment and/or disposal of waste generated
- embracing circular economy principles, transitioning away from a traditional linear economy of take, make, use and dispose.

Appendix A ESD framework

Requirement Responsible	Reference	Response
<ul style="list-style-type: none"> • Avoid, wherever practicable, serious or irreversible damage to the environment • Bear the cost of containment, avoidance or abatement of pollution and waste • Reduce environmental impacts • Use resources sustainably • Replace raw materials with recycled products • Minimise the use of virgin materials • Recognise that resources have value throughout multiple cycles of use and reuse • Innovate product design for longevity, reuse and recovery • Reduce the demand for new landfills • Improve the quality of collected materials, and improve sorting of these materials and reuse • Capture value from recycling resources • Procure products, materials and services that represent best practice environmental and social principles • Reduce resource consumption from 8.2 kg to 6.1 kg per person by 2038 (based on 2015 levels) 	<ul style="list-style-type: none"> • SEARs, EP&A Regulation, Precautionary Principle • SEARs, EP&A Regulation, Inter-Generational Equity • SEARs, EP&A Regulation, Improved Valuation, Pricing and Incentive Mechanisms • SEARs, minimise waste generation and reduce environmental impact by moving to a circular economy • NSW Circular Economy Policy Statement • City of Parramatta, Environmental Sustainability Strategy 2017 • Green Star Buildings • Credit 2 Responsible Construction (Minimum Expectation + Credit Achievement) • Credit 3 Verification and Handover (Minimum Expectation) • Credit 4 Operational Waste (Minimum Expectation) • Credit 5 Responsible Procurement (Credit Achievement) 	<ul style="list-style-type: none"> • During construction, put in place an EMS to manage environmental impacts on site and implement an EMP that covers the scope of the construction activities • Undertake a risk and opportunity assessment of the construction supply chain to identify environmental and social risks and opportunities, and implement a responsible procurement plan to mitigate and manage the identified risks • Source responsibly manufactured structure, envelope, systems and finishes products • Divert at least 90% of construction and demolition waste from landfill • During operation, optimise ongoing management through the integration of appropriate metering and monitoring systems, set environmental performance targets, design and test for airtightness, and undertake commissioning and building tuning that is independently verified • Deploy coordinated building hand over procedures with the facilities management team and building users • Develop a waste management plan to identify, quantify and classify the likely waste streams generated during construction and operation, and promote responsible source separation to reduce the

Requirement	Reference	Response
<ul style="list-style-type: none"> • Increase diversion from landfill to 85% by 2038 	<ul style="list-style-type: none"> • Credit 6 Responsible Structure (Credit Achievement) + (Exceptional Performance - commercial only) • Credit 7 Responsible Envelope (Credit Achievement) • Credit 8 Responsible Systems (Credit Achievement) • Credit 9 Responsible Finishes (Credit Achievement) + (Exceptional Performance - commercial only) • Credit 26 Life Cycle Impacts (Credit Achievement) 	<ul style="list-style-type: none"> amount of waste that goes to landfill by implementing convenient and efficient waste management systems • Demonstrate a 30% reduction in life cycle impacts from resource use over the life of the buildings when compared to standard practice

Healthy		
<ul style="list-style-type: none"> • Consider the environmental impacts, such as sustainable design, overshadowing and solar access, visual comfort, wind and reflectivity • Provide sunlight access to private and public open space, and habitable rooms • Provide solar access to living areas, private open space and communal open space • Naturally cross ventilate at least 60% of apartments in the first nine storeys of a building • Maintain a high thermal comfort performance for building occupants and optimise cross ventilation 	<ul style="list-style-type: none"> • Parramatta LEP 2011, Design Excellence • Parramatta DCP 2011 • Apartment Design Guide (residential only) • Green Star Buildings <ul style="list-style-type: none"> ○ Credit 10 Clean Air (Minimum Expectation) + (Credit Achievement - commercial only) ○ Credit 11 Light Quality (Minimum Expectation) + (Credit Achievement - commercial only) ○ Credit 12 Acoustic Comfort (Minimum Expectation + Credit Achievement) 	<ul style="list-style-type: none"> • Maintain high levels of direct morning sunlight throughout the year to the public open spaces and enhance outdoor comfort and liveability • Enhance indoor daylight access • Support the permeability of summer breezes within the public open spaces and shelter the public open spaces from cold winter winds • Facilitate effective indoor natural ventilation • Design building ventilation systems with minimum separation distances between pollution sources and outdoor air intakes • Clean all ductwork that serves the building prior to occupation • Provide adequate access to components of the ventilation systems for maintenance purposes

Requirement	Reference	Response
<ul style="list-style-type: none"> Minimise pollutants entering the building and supply adequate fresh air to maintain indoor air pollutants at acceptable levels Provide good levels of daylight and high-quality artificial lighting Provide acoustic comfort for building occupants Prevent exposure of building occupants to toxins Provide internal amenities that improve occupant experience of using the buildings Foster a connection to nature for building occupants Install dual plumbing systems and make provision for a future ready connection to a recycled water network 	<ul style="list-style-type: none"> Credit 13 Exposure to toxins (Minimum Expectation) + (Credit Achievement - commercial only) Credit 14 Amenity and Comfort (Credit Achievement - commercial only) Credit 15 Connection to Nature (Credit Achievement) 	<ul style="list-style-type: none"> Maintain carbon dioxide concentration levels below 700 parts per million at all time during the occupancy period Remove / exhaust pollutants from internal pollutant sources Achieve lighting comfort criteria and maximise access to daylight Prepare an acoustic comfort strategy and achieve acoustic comfort criteria Meet stipulated toxicity standards for paints, adhesives, sealants, carpets and engineered wood products, and conduct in-site testing to verify compliance Include a room designed to promote either inclusivity, mindfulness or exercise for building occupants
Resilient		
<ul style="list-style-type: none"> Design resilient and diverse places for enduring communities Contribute to water security and urban cooling Enhance tree canopy Evaluate site-specific climate risks and define strategies to reduce vulnerability to bushfire, flooding and extreme heat Be more resilient to a changing climate Reduce risks and damage to public and private assets arising from climate change 	<ul style="list-style-type: none"> NSW Climate Change Policy Framework Apartment Design Guide (residential only) Design and Place SEPP Parramatta LEP 2011, Design Excellence Parramatta DCP 2011 Green Star Buildings 	<ul style="list-style-type: none"> Perform a climate change risk and adaptation assessment, and manage all 'Extreme' and 'High' risks through specific design or future operational responses Mitigate urban heat island effects Evaluate and set minimum urban heat control requirements through effective building envelope shading Implement WSUD features, including tree pits, bio-retention systems, rainwater harvesting and reuse systems, on-site detention tanks with water filtration, etc.

Requirement	Reference	Response
<ul style="list-style-type: none"> • Embed climate change considerations into asset and risk management • Reduce climate change impacts on health and wellbeing • Reduce heat island effect • Provide year-round solar access to public open space along with protection from strong winds • Manage impacts on natural resources, ecosystems and communities • Respond to acute shocks and chronic stresses that affect operations • Support the clean transition of the electricity grid 	<ul style="list-style-type: none"> ○ Credit 16 Climate Change Resilience (Minimum Expectation + Credit Achievement) ○ Credit 17 Operations Resilience (Credit Achievement) ○ Credit 19 Heat Resilience (Credit Achievement) ○ Credit 20 Grid Resilience (Credit Achievement) 	<ul style="list-style-type: none"> • Support water resilience through the integration of water efficiency measures and using alternative water sources to reduce the demand for potable water • Incorporate diverse and appropriate planting, bio-filtration gardens, appropriately planted shading trees, areas for community gardens, and green roofs and walls • Scale trees, and balance evergreen and deciduous trees to provide shading in summer and sunlight access in winter, and shade structures, such as pergolas for balconies and courtyards • Select plants suited to the site conditions, including drought and wind tolerance, seasonal changes and sunlight access, soil conditions and plant longevity • Conduct an operations resilience assessment to identify a set of clear operations resilience objectives and performance goals that: • Consider interdependent infrastructure systems, networks, services and assets • Identify vulnerability • Outline emergency response procedures • Assess building survivability in the case of a blackout and provide a measure of survivability to account for its design purpose • Demonstrate the building can reduce its electricity peak demand by 10% based on on-site technology and/or load shedding strategies
Positive		

Requirement	Reference	Response
<ul style="list-style-type: none"> • Ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations • Drive the uptake of proven GHG emissions reduction technologies to reduce the cost of living • Empower consumers and businesses to make sustainable choices • Invest in the next wave of GHG emissions reduction innovation to ensure economic prosperity from decarbonisation • Electrify all energy uses and supply all energy uses with renewable electricity by 2030 • Plan operational improvements and projects, and decarbonisation pathways for businesses • Accelerate the transformation of the built environment towards net zero emissions • Provide a pathway to net zero emissions by 2050 • Adhere to the principles of ecologically sustainable development • Promote sustainable development through energy efficient design, construction and operation • Contribute to an overall reduction in greenhouse gas (GHG) emissions 	<ul style="list-style-type: none"> • SEARs, EP&A Regulation, Inter-Generational Equity • SEARs, integrate best practice sustainable building principles • Net Zero Plan Stage 1: 2020 - 2030 • Net Zero Plan Stage 1: 2020 - 2030, Implementation Update • SEPP (BASIX) 2004 • NCC 2019 • Trajectory for low energy buildings • Design and Place SEPP • PLEP 2007, Design Excellence • Planning Proposal, Parramatta CBD, Amendment to the Parramatta LEP 2011 • Parramatta DCP 2011 • City of Parramatta, Environmental Sustainability Strategy 2017 • Green Star Buildings • Credit 21 Upfront Carbon Emissions (Minimum Expectation + Credit Achievement + Exceptional Performance) • Credit 22 Energy Use (Minimum Expectation + Credit Achievement) • Credit 23 Energy Source (Minimum Expectation + Credit Achievement + Exception Performance) 	<ul style="list-style-type: none"> • Building B: <ul style="list-style-type: none"> ○ Achieve an average 7 star NatHERS rating for all residential dwellings and not less than an individual 6 star NatHERS rating for any residential dwelling ○ Exceed the performance provisions of the NCC, NSW 2 Energy efficiency performance requirements ○ Achieve the BASIX Energy target and a BASIX Water 55 score for high-rise residential flat buildings ○ Demonstrate that the annual energy and water consumption of the shared services is less than a 4.5 star NABERS Energy for Apartment Buildings and 3.5 star NABERS Water for Apartment Buildings budget, respectively ○ Deliver a 30% reduction in annual water consumption when compared to a reference building • Buildings A, C and D: <ul style="list-style-type: none"> ○ Demonstrate that the annual energy and water consumption is less than a 5.5 star (+25%) NABERS Energy for Offices and 5 star NABERS Water for Offices budget, respectively ○ Deliver a 40% reduction in annual water consumption when compared to a reference building • Climate Positive Pathway (all buildings): <ul style="list-style-type: none"> ○ Achieve a 40% reduction in upfront carbon emissions over a reference building

Requirement	Reference	Response
<ul style="list-style-type: none"> • Reduce energy bills and the whole of life cost of energy services • Reduce the consumption of potable water, including the harvesting and reuse of rainwater and stormwater • Integrate best practice sustainable building principles to improve environmental performance, including energy and water efficient design, and renewable energy • Achieve a 60% emissions reduction by 2038 (based on 2015 levels) • Meet 50% of electricity demand through renewable energy by 2038 • Deliver no net increase in potable water consumption by 2038 based on 2015 levels 	<ul style="list-style-type: none"> • Credit 24 Other Carbon Emissions (Credit Achievement + Exceptional Performance) • Credit 25 Water Use (Minimum Expectation) 	<ul style="list-style-type: none"> ○ Demonstrate a 20% reduction in energy use over a reference building ○ Prepare a ZCAP ○ Source 100% of the building's energy from renewables ○ Eliminate or offset high GWP refrigerants ○ Offset 100% of residual embodied emissions
Places		
<ul style="list-style-type: none"> • Prioritise active transport modes and improve the permeability of the pedestrian network • Reduce private vehicle use and encourage active, shared and public transport use • Ensure new buildings and precincts are 'EV ready' 	<ul style="list-style-type: none"> • Parramatta LEP 2011, Design Excellence • Parramatta DCP 2011 • NSW Electric Vehicle Strategy • Green Star Buildings <ul style="list-style-type: none"> ○ Credit 27 Movement and Place (Minimum Expectation and Credit Achievement) ○ Credit 28 Enjoyable Places (Credit Achievement) ○ Credit 29 Contribution to Place (Credit Achievement) 	<ul style="list-style-type: none"> • Reduce the emissions attributed to private vehicle use by 40% and VKT by 20% • Encourage walkability by demonstrating there are a range of diverse amenities within 400 m • Limit speed to 10 km/h for roads within the site • Improve active mode uses by 90% • Include showers and changing facilities for building occupants • Make facilities accessible and inclusive, and locate in a safe and protected space • Prioritise cyclists and access to bicycle parking facilities

Requirement	Reference	Response
	<ul style="list-style-type: none"> ○ Credit 30 Culture, Heritage and Identity (Credit Achievement) 	<ul style="list-style-type: none"> • Prepare and implement a Sustainable Transport Plan • Integrate EV charging capabilities and make allowance for 20% of the total electric demand of EV charging for all car parking spaces • Prioritise transport initiatives that reduce the need for private fossil fuel powered vehicles • Encourage walkability • Provide publicly accessible spaces that are enjoyable and support community activity and interaction • Prepare an activation strategy • Undertake independent design reviews at key points in the development of the design
People		
<ul style="list-style-type: none"> • Promote diversity, and reduce physical and mental health impacts through effective construction practices • Celebrate Aboriginal and Torres Strait Islander people, culture and heritage • Facilitate workforce participation and economic development of disadvantaged and under-represented groups • Welcome a diverse population and their needs 	<ul style="list-style-type: none"> • Green Star Buildings <ul style="list-style-type: none"> ○ Credit 31 Inclusive Construction Practices (Minimum Expectation) ○ Credit 32 Indigenous Inclusion (Credit Achievement) ○ Credit 33 Procurement and Workforce Inclusion (Credit Achievement - commercial only) ○ Credit 34 Design of Inclusion (Credit Achievement) 	<ul style="list-style-type: none"> • Put in place on-site facilities, implement policies and undertake training to address gender inclusivity, discrimination, racism, bullying, mental health, and drug and alcohol awareness • Demonstrate that the Australian Indigenous Design Charter guiding principles are incorporated in the design of the buildings • Develop and implement a social procurement strategy that directs at least 2% of a building's total contract value to generate employment opportunities for disadvantaged and under-represented groups • Design and construct the buildings to enable easy navigation and enjoyment by stakeholders of diverse ages, genders and abilities
Nature		

Requirement	Reference	Response
<ul style="list-style-type: none"> • Conserve biological diversity and ecological integrity • Express an excellent and integrated landscape design • Minimise the quantity of stormwater run-off • Integrate WSUD principles to maximise the treatment of stormwater run-off • Manage impacts on natural resources, ecosystems and communities • Design drought-tolerant, low water use landscaping • Maximise porous and open paving materials • Integrate on-site stormwater and infiltration systems, including bio-retention systems such as rain gardens and street tree pits • Integrate green infrastructure 	<ul style="list-style-type: none"> • SEARs, EP&A Regulation, Conservation of Biological Diversity and Ecological Integrity • SEARs, manage stormwater through WSUD features • NSW Climate Change Policy Framework • Apartment Design Guide (residential only) • Design and Place SEPP • Parramatta LEP 2011, Design Excellence • Parramatta DCP 2011 • Green Star Buildings <ul style="list-style-type: none"> ○ Credit 36 Biodiversity Enhancement (Credit Achievement - commercial only) • Credit 39 Waterway Protection (Credit Achievement) + (Exceptional Performance - commercial only) 	<ul style="list-style-type: none"> • Promote WSUD features for the site, including tree pits, bio-retention systems, rainwater harvesting and reuse systems, on-site detention tanks with water filtration, etc. • Incorporate diverse and appropriate planting, bio-filtration gardens, appropriately planted shading trees, areas for community gardens, and green roofs and walls • Select plants suited to the site conditions, including drought and wind tolerance, seasonal changes and sunlight access, soil conditions and plant longevity • Provide a sufficient area of landscaping (horizontal and/or vertical) • Prepare and put in place a biodiversity management plan • Reduce the average annual stormwater discharge by 40% (80% for commercial) across the site • Meet stormwater pollution reduction targets

Appendix B Sustainability rating tools

RESIDENTIAL



BASIX



5 star Green Star Buildings

Average 7 star NatHERS
Minimum 6 star NatHERS

BASIX Energy 30
BASIX Water 55

Stretch target: BASIX Energy
35

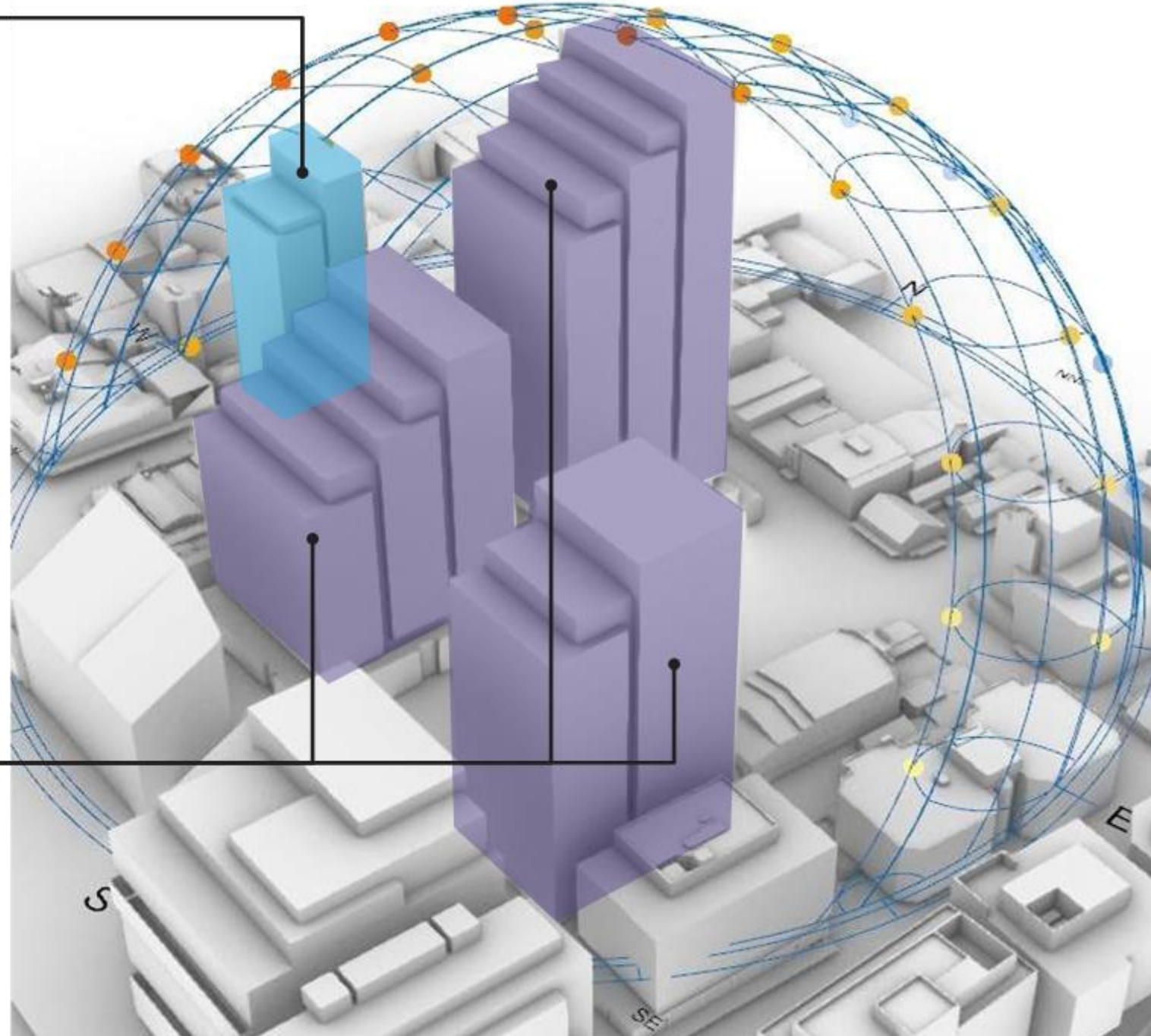
4.5 star NABERS Energy
3.5 star NABERS Water

COMMERCIAL



6 star Green Star Buildings

5.5 star (+25%) NABERS
Energy
5 star NABERS Water





Climate Positive

40%	reduction in upfront carbon emissions
20%	reduction in energy use
100%	renewable energy
100%	elimination / offset of other emissions
40%	reduction in potable water use - commercial
30%	reduction in potable water use – residential
30%	reduction in life cycle impacts



Manage environmental impacts during construction Be verified to work
Enable practices that reduce operational waste
Drive supply chain transformation



Have improved air
Have improved light
Have improved acoustics
Have improved products Connect people to nature



Be built with climate change in mind
Have capacity to bounce back from shocks and stresses



Promote physical activity
Create safe, enjoyable, integrated and comfortable places

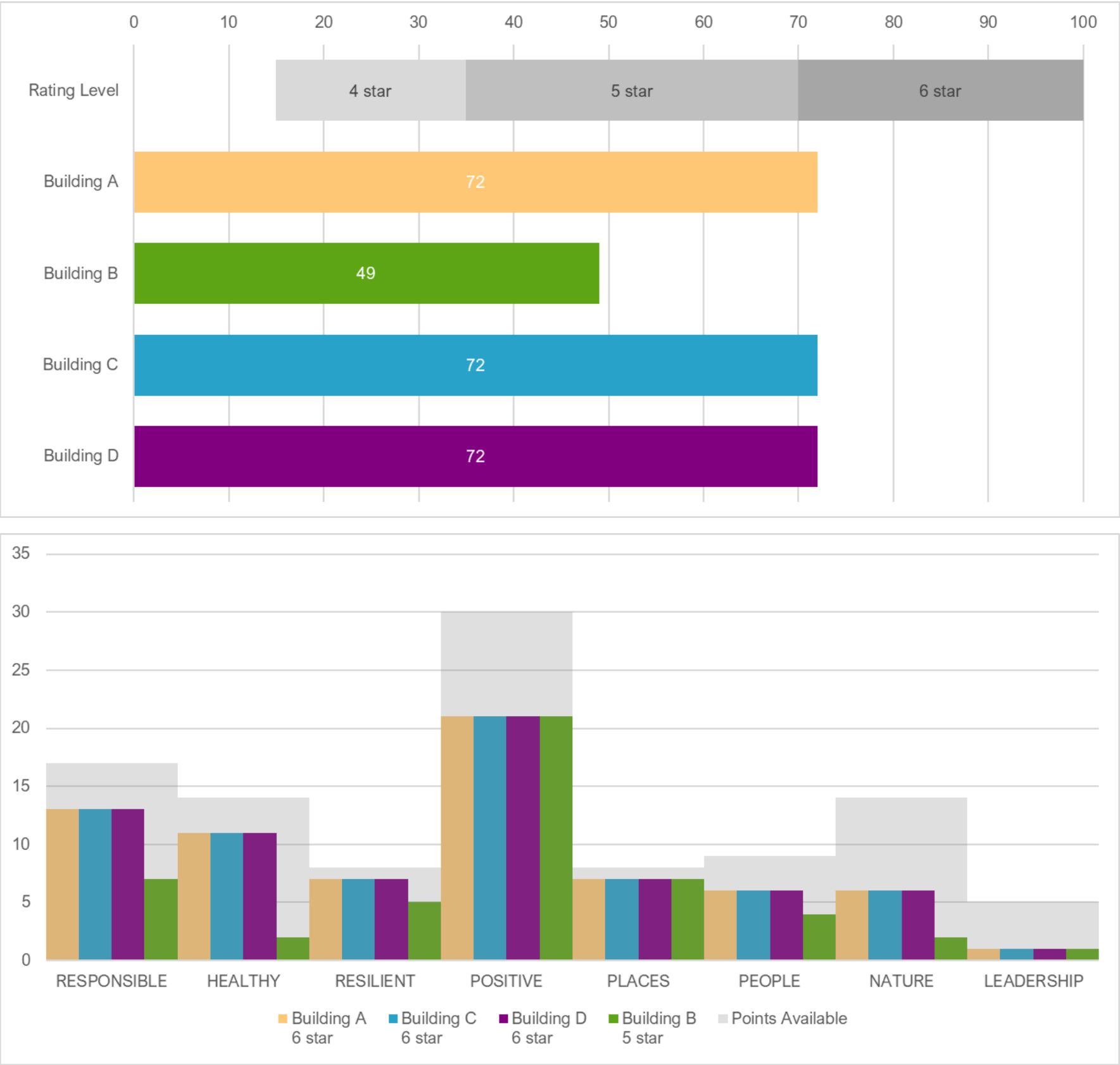


Embrace the diversity of our population
Address the social health of the community



Protect environmentally significant areas
Create biodiverse green spaces

Appendix C Green Star scorecard





Date	31.03.2022
Revision	B
Author	JvD
Tool	v1 Rev B

	Green Star rating	Minimum expectations met	Climate Positive Pathway met
Building A	6 star	Yes	Yes
Building B	5 star	Yes	Yes
Building C	6 star	Yes	Yes
Building D	6 star	Yes	Yes

Credit Title	Aim of Credit	Criteria No.	Criteria Title	Credit Requirements Summary <i>For full criteria refer to Green Star for Buildings Submission Guidelines</i>	Points Available	Building A 6 star	Building B 5 star	Building C 6 star	Building D 6 star	Comment / Reference
RESPONSIBLE										
Industry Development	The development facilitates industry transformation through partnership, collaboration and data sharing.	Credit Achievement; meet all three of the following criteria:								
		1.1	Green Star Accredited Professional	A Green Star AP must be contractually engaged as part of the core project team for the duration of the project.	1	1	1	1	1	
		1.2	Financial Transparency	The project team discloses the cost of sustainable building practices of the project, including design, construction and documentation to the GBCA.						
		1.3	Marketing Sustainability Achievements	Information on the sustainability initiatives that the building targeted must be provided to enable it being featured on the GBCA's website. The project team must outline how the building will detail its sustainability achievements to its stakeholders (typical building occupants and visitors). The Green Star Certification achieved for the project must be prominently displayed in a location that is visible to the public.						
Responsible Construction	The builder's construction practices reduce impacts and promote opportunities for improved environmental and social outcomes.	Minimum Expectation; meet all four of the following criteria:								
		2.1	Environmental Management System	Builder must have an Environmental Management System (EMS) certified to a recognised standard, such as AS/NZS ISO 14001, BS 7750 or the European Community's EMAS.	ME	ME	ME	ME	ME	
		2.2	Environmental Management Plan	The Environmental Management Plan (EMP) must be project specific and cover the scope of construction activities. It must be implemented from the start of construction and include all works within the project scope.						
		2.3	Construction and Demolition Waste	Projects must divert at least 80% of construction and demolition waste from landfill. A Disclosure Statement is required from waste contractors and processing facilities outlining how the company and their reporting aligns with the <i>Green Star Construction and Demolition Waste Reporting Criteria</i> .						
		2.4	Sustainability Training	The Builder must provide the following training to 95% of all contractors and subcontractors present on site for at least three (3) days: • Information on the sustainable building certification(s) sought, including: – the sustainability attributes of the building and their benefits; – the value of certification; and – the role site worker(s) play in delivering a sustainable building.						
		Credit Achievement; in addition to the Minimum Expectation, meet the following criteria:								
		2.5	Construction and Demolition Waste Diversion	Projects must divert at least 90% of construction and demolition waste from landfill. A Disclosure Statement is required from waste contractors and processing facilities outlining how the company and their reporting aligns with the <i>Green Star Construction and Demolition Waste Reporting Criteria</i> .	1	1	1	1	1	

Credit Title	Aim of Credit	Criteria No.	Criteria Title	Credit Requirements Summary <i>For full criteria refer to Green Star for Buildings Submission Guidelines</i>	Points Available	Building A 6 star	Building B 5 star	Building C 6 star	Building D 6 star	Comment / Reference
Verification and Handover	The building has been optimised and handed over to deliver a high level of performance in operation.	Minimum Expectation; meet all three of the following criteria:								
		3.1	Metering and Monitoring	The building must have accessible energy and water metering for all common uses, major uses, and major sources. The meters must be connected to a monitoring system capable of capturing and processing the data produced by the meters. The meters and monitoring systems must: • Provide continual information (up to 1-hour interval readings); • Be commissioned and validated per the most current 'Validating Non-Utility Meters for NABERS Ratings' protocol, or National Measurement Institute (NMI) standards; • Be capable of identifying inaccuracies in the meter network and producing alerts. Inaccuracies are defined as those over meter tolerances based on their metering accuracy class (e.g. 'Class 1' meters shall not have inaccuracies of more than 1% due to metering accuracy class); and • Be sufficient to support future achievement of a NABERS rating.	ME	ME	ME	ME	ME	
		3.2	Commissioning and Tuning	The project team must perform the following prior to construction: • Set environmental performance targets; and • Perform a services and maintainability review; During construction and practical completion: • Commission the building; and • Engage building tuning service provider; After practical completion: • Tune the building over the next 12 months.	1					
		3.3	Building Information	The project team must provide the following to the building owner: • Operations and maintenance information for all nominated building systems; • A building log book developed in line with CIBSE TM31: Building Log Book Toolkit before practical completion of the project; and • Building user information.						
		Credit Achievement; in addition to the Minimum Expectation, meet one or both (Building Services Value > \$20M) of the following criteria:								
		3.4	Soft Landings Approach	Implement Stages 1 - 4 of the <i>Soft Landing Framework Australia and New Zealand</i> .						
Operational Waste	Operational waste is able to be recovered in a safe and easy manner.	3.5	Independent Commissioning Agent	An ICA must be appointed to advise, monitor, and verify the commissioning and tuning of the nominated building systems throughout the design, tender, construction, commissioning and tuning phases.						
		Minimum Expectation; meet all three of the following criteria:								
		4.1	Collection of Waste Streams	The building must provide bins or storage containers to building occupants to enable them to separate their waste. These bins must be labelled and easy to access, and evenly distributed throughout the building. They must also allow for segregating the following, as a minimum: • General waste going to landfill; • Recycling streams to be collected by the building's waste collection service, including: – Paper and cardboard; – Glass; and – Plastic; and • One other waste stream representing at least 1% of the total annual operational waste (by volume) of the building. This may include collecting any of the following waste types: organics, e-waste, batteries, etc. Any other single waste stream (except food waste) that represents more than 5% of total annual operational waste (by volume) must also be accounted for.	ME	ME	ME	ME	ME	
		4.2	Dedicated Waste Storage Area	A dedicated area, or areas, for the storage and collection of the applicable waste streams must be provided. The storage area must be sized to accommodate all bins or containers, for all applicable waste streams, for at least one collection cycle. The storage area(s) must have easy and safe access by collection vehicles.	ME	ME	ME	ME	ME	
Responsible Procurement	The procurement process for all products, materials, and services follows best practice environmental and social principles.	4.3	Sign-off by Waste Specialist and/or Contractor	A waste specialist and/or contractor must sign-off on the designs to confirm they are adequately sized and located for the safe and convenient storage and collection of the waste streams identified.						
		Credit Achievement; meet both of the following criteria:								
		5.1	Risk and Opportunity Assessment	The project team must undertake a risk and opportunities assessment of its supply chain to identify environmental and social risks and opportunities. The project must provide a narrative on how it has actively addressed one risk and one opportunity.	1	1	1	1	1	
Responsible Structure	The building's structure is comprised of responsibly manufactured products.	5.2	Responsible Procurement Plan	The project must develop and implement a plan to mitigate and manage identified risks and drive implementation of identified opportunities. This can be part of an organisational plan or a standalone plan.						
		Credit Achievement								
		6.1	Good Practice Products	50% of all structural components (by cost) meet a Responsible Products Value score of at least 10.	3	3	3	3	3	
		Exceptional Performance								
		6.2	Best Practice Products or Good Practice Products	In addition to 6.1, one of the following must be met: • 10% of all products in the structure (by cost) meet a Responsible Products Value score of at least 15; or • 80% of all products in the structure (by cost) meet a Responsible Products Value score of at least 10.	2	2		2	2	

Credit Title	Aim of Credit	Criteria No.	Criteria Title	Credit Requirements Summary <i>For full criteria refer to Green Star for Buildings Submission Guidelines</i>	Points Available	Building A 6 star	Building B 5 star	Building C 6 star	Building D 6 star	Comment / Reference	
Responsible Envelope	The building's envelope is comprised of responsibly manufactured products.	Credit Achievement									
		7.1	Good Practice Products	30% of all building envelope components (by cost) meet a Responsible Products Value score of at least 10.	2	2		2	2		
		Exceptional Performance									
		7.2	Best Practice Products or Good Practice Products	In addition to 7.1, one of the following must be met: • 10% of all products in the building envelope (by cost) meet a Responsible Products Value score of at least 15; or • 60% of all products in the building envelope (by cost) meet a Responsible Products Value score of at least 10.	2						
Responsible Systems	The building's mechanical, electrical, hydraulic and transport systems are comprised of responsibly manufactured products.	Credit Achievement									
		8.1	Good Practice Products	20% of all active building systems (by cost) meet a Responsible Products Value score of at least 6.	1	1		1	1		
		Exceptional Performance									
		8.2	Best Practice Products or Good Practice Products	In addition to 8.1, one of the following must be met: • 5% of all active building systems (by cost) meet a Responsible Products Value score of at least 11; or • 35% of all active building systems (by cost) meet a Responsible Products Value score of at least 6.	1						
Responsible Finishes	The building's internal finishes are comprised of responsibly manufactured products.	Credit Achievement									
		9.1	Good Practice Products	40% of all internal building finishes (by area) meet Responsible Products Value score of at least 7.	1	1	1	1	1		
		Exceptional Performance									
		9.2	Best Practice Products or Good Practice Products	In addition to 9.1, one of the following must be met: • 10% of all internal building finishes (by area) meet a Responsible Products Value score of at least 12; or • 60% of all internal building finishes (by area) meet a Responsible Products Value score of at least 7.	1	1		1	1		
RESPONSIBLE Total					17	13	7	13	13		
HEALTHY											
Clean Air	Pollutants entering the building are minimised, and a high level of fresh air is provided to ensure levels of indoor pollutants are maintained at acceptable levels.	Minimum Expectation; meet all three of the following criteria:									
		10.1	Ventilation System Attributes	• Separation from pollutants: the building ventilation systems must be designed to comply with ASHRAE Standard 62.1:2013 or AS 1668:2012 (whichever is greater) regarding minimum separation distances between pollution sources and outdoor air intakes; and • Cleaning ductwork: all ductwork that serves the building must be cleaned prior to occupation in accordance with a recognised standard.	ME	ME	ME	ME	ME		
		10.2	Provision of Outdoor Air	Outdoor air is provided at a rate 50% greater than the minimum required by AS1668.2-2012, or CO ₂ concentrations are maintained below 800ppm at all times during the occupancy period.							
		10.3	Exhaust or Elimination of Pollutants	It must be demonstrated that pollutants from printing and photocopying equipment, cooking processes and equipment are limited from the nominated area by either: • Removing the source of pollutants; or • Exhausting the pollutants directly to the outside.							
		Credit Achievement; in addition to the Minimum Expectation, meet both of the following criteria:									
		10.4	Ventilation System Attributes	Any mechanical ventilation system within the building must provide adequate access to both sides of all moisture and debris-catching components for maintenance within the air distribution system.	2	2		2	2		
		10.5	Provision of Outdoor Air	For mechanically ventilated or mix mode spaces, outdoor air is provided at a rate 100% greater than the minimum required by AS1668.2-2012, or CO ₂ concentrations are maintained below 700ppm at all times during the occupancy period.							

Credit Title	Aim of Credit	Criteria No.	Criteria Title	Credit Requirements Summary <i>For full criteria refer to Green Star for Buildings Submission Guidelines</i>	Points Available	Building A 6 star	Building B 5 star	Building C 6 star	Building D 6 star	Comment / Reference
Light Quality	The building provides good daylight and its lighting is of high quality.	Minimum Expectation; meet all three of the following criteria:								
		11.1	Lighting Comfort	Lighting within the building must meet the following criteria: • All lighting must be flicker-free; • Light sources must have a minimum Colour Rendering Index (CRI) average R1 to R8 of 85 or higher, and have a CRI R9 of 50 or higher; • Light sources must meet best practice illuminance levels for each task within each space type with a maintained illuminance that meets the levels recommended in AS/NZS 1680.1:2006 series applicable to the project type and including maintenance; • The maintained illuminance values must achieve a uniformity of no less than that specified in Table 3.2 of AS/NZS 1680.1:2006, with a maintenance factor method as defined in AS/NZS 1680.4.; and • All light sources must have a minimum of 3 MacAdam Ellipses.	ME	ME	ME	ME	ME	
		11.2	Glare from Light Sources	Bare light sources must be fitted with baffles, louvers, translucent diffusers, ceiling design, or other means that obscures the direct light source from all viewing angles of occupants, including occupants looking directly upwards. Refer the Submission guidelines for more prescriptive pathways.						
		11.3	Daylight	The project team is required to show how the building's design: • Maximises the number of occupants that are in or near daylight areas during their daily activities for all building types; • Ensures regularly occupied spaces are in reasonable proximity to glazed façades, windows or skylights; • Controls or mitigates glare in the daylight spaces; • Maximises daylight to spaces that prioritise learning, healing, and living: – For schools, how all classrooms have access to a view and daylight; – For hospitals, how all patient areas have access to a view and daylight; and – For apartments, how in 95% of all apartments, the living rooms and all bedrooms have access to a view and daylight; and • Provides building occupants with unrestricted access to daylight indoor common spaces.						
		Credit Achievement; at least one criteria must be met (2 points) Exceptional Performance; both criteria must be met (2 points)								
		11.4	Artificial Lighting	• The walls within the field of view of occupants in regularly occupied spaces must have an average surface reflectance value of 0.70 and an average surface illuminance of at least 50% of the horizontal illuminance levels required for task. This requirement does not apply to green walls or to coloured/patterned/biophilic feature walls that make up less than 20% of the field of view of the occupants; and • Vertical illuminance in workspaces: ensure that 50% of the horizontal task illuminance reaches the average eye height for 90% of primary spaces using a vertical illuminance calculation grid. The illuminance values must be calculated in accordance with AS/NZS 1680 series for the relevant task. Where unknown, a conservative estimate can be used.	4					
		11.5	Daylight	For non-residential buildings, at least 40% of the nominated area averaged across the building must receive high levels of daylight with no less than 20% on any floor or tenancy (whichever is smaller). For residential buildings, 60% of the combined living and bedroom area of each apartment unit must comply with the daylight requirements. Kitchens are not included in the calculations. The daylight levels must also be present in at least 20% of the area of each bedroom and living area.		2		2	2	
Acoustic Comfort	The building provides acoustic comfort for building occupants.	Minimum Expectation								
		12.1	Acoustic Comfort Strategy	An Acoustic Comfort Strategy must be prepared describing how the building design will deliver acoustic comfort to the building occupants. It must address: • Quiet enjoyment of space; • Functional use of space; • Control of intrusive or high levels of noise; • Privacy; • Noise Transfer; and • Speech intelligibility.	ME	ME	ME	ME	ME	
		Credit Achievement; base build (commercial) criteria 12.2 and 12.3; residential criteria 12.2, 12.3 and 12.4:								
		12.2	Maximum Internal Noise Levels	Internal ambient noise levels in the nominated areas must be no greater than the upper range value relevant to the activity type in each space as recommended in the current AS/NZS 2107:2016.	2	2	2	2	2	
		12.3	Acoustic Separation	The project must address noise transmission between enclosed spaces within the nominated area demonstrated through privacy or sound insulation.						
		12.4	Impact Noise Transfer	Impact noise transfer must be measured in accordance with ISO 16283-2 through a floor where: • Floors are located above regularly occupied areas; and • Adjacent spaces belonging to different tenancies.						

Credit Title	Aim of Credit	Criteria No.	Criteria Title	Credit Requirements Summary <i>For full criteria refer to Green Star for Buildings Submission Guidelines</i>	Points Available	Building A 6 star	Building B 5 star	Building C 6 star	Building D 6 star	Comment / Reference
Exposure to Toxins	The building's occupants are not directly exposed to toxins in the spaces they spend time in.	Minimum Expectation; meet all three of the following criteria:								
		13.1	Paints, Adhesives, Sealants and Carpets	At least 95% of internally applied paints, adhesives, sealants (by volume) and carpets (by area) must meet stipulated 'Total Volatile Organic Compounds (TVOC) Limits'.	ME	ME	ME	ME	ME	
		13.2	Engineered Wood Products	Either no new engineered wood products are used in the building or at least 95% (by area) of all engineered wood products meet specified formaldehyde emission limits.						
		13.3	Banned or Highly Toxic Materials	A comprehensive hazardous materials survey must be carried out. Asbestos, lead or PCBs have been stabilised or removed and disposed in accordance with best practice guidelines; or the survey concluded that no hazardous materials were found in any existing buildings or structures on the project site.						
		Credit Achievement								
		13.4	On-site Testing	In addition to the Minimum Expectation, on-site testing must be undertaken to verify the following limits: • TVOC = 0.27 ppm; • Formaldehyde = 0.02 ppm; and • At least three samples are to be taken per floor and at least six (6) floors must be sampled. These must be representative of where the occupants are likely to spend a majority of their time.	2	2		2	2	
Amenity and Comfort	The building provides internal amenities that improve occupant experience of using the building.	Credit Achievement								
		14.1	Amenity Rooms	The building includes one or several rooms designed to promote either inclusivity, mindfulness or exercise for staff or occupants. For a room(s) to qualify, it must be classified as per below: • Parent room; • Relaxation, meditation or prayer room; or • Exercise room; and The room size to be provided must be as follows: • The size of the room is calculated at a ratio of 1m² per every 10 occupants or staff; and • The room must be no smaller than 10m².	2	2		2	2	
Connection to Nature	The building fosters connection to nature for building occupants.	Credit Achievement; Views + either Plants & Nature-inspired design or Interaction with Nature Exceptional Performance; all criteria								
		15.1	Views	At least 60% of the nominated area has a clear line of sight to a high quality internal or external view. All floor areas within 8m from a compliant view can be considered to meet this credit criterion.	2	1		1	1	
		15.2	Plants & Nature-inspired Design	Plants are provided in primary occupied spaces at a rate of one or more plants, in pots with a soil surface area totalling at least 500cm², every 10m² of the nominated area. An ongoing maintenance plan must be established to ensure plant health is maintained. Five nature inspired design interventions must be provided in alignment with the following principles: • Elements that provide differing natural sensory experiences; • Elements that reflect natural and cultural patterns and forms; • Using natural materials; and • Large scale and holistically incorporated natural motifs and art.						
		15.3	Interaction with Nature	Occupants can interact with nature either inside the building, or externally through a green façade (or wall) or garden. At least 5% of the building's floor area/or site area (whichever is greater) must be planted area (either vertical or horizontal). The allocated area must be accessible and have the necessary infrastructure to allow the activity to occur (for example water source/taps for irrigation, storage area for tools and equipment).						
HEALTHY Total					14	11	2	11	11	

Credit Title	Aim of Credit	Criteria No.	Criteria Title	Credit Requirements Summary <i>For full criteria refer to Green Star for Buildings Submission Guidelines</i>	Points Available	Building A 6 star	Building B 5 star	Building C 6 star	Building D 6 star	Comment / Reference
RESILIENT										
Climate Change Resilience	The building has been built to respond to the direct and indirect impacts of climate change.	Minimum Expectation								
		16.1	Climate Change Pre-screening Checklist	Project team members must consider potential impacts from climate change when completing the checklist including, but not limited to: • Direct damage or failure of project components; • Accelerated deterioration of project components or reduced design life; • Reduced operating capacity; • Climate hazard impacts to surrounding areas (e.g. impacting access and egress); • Impacts to the health and wellbeing of building occupants and other relevant stakeholders; and • Indirect risks from impacts to other interdependent systems and services (e.g. transport networks, power, water, telecommunications).	ME	ME	ME	ME	ME	
		Credit Achievement; in addition to the Minimum Expectation, meet both the following criteria:								
		16.2	Climate Change Risk and Adaptation Assessment	A suitably qualified professional must undertake a climate change risk and adaptation assessment and author a report.	1	1	1	1	1	
		16.3	Managing Risks	The project team must ensure risks are addressed as follows: • All risks rated as 'Extreme' must be addressed through specific design responses; • All risks rated as 'High' must be addressed through design or future operational responses; and • Regardless of risk rating, at least two risks identified in the assessment must be addressed by specific design responses.						
Operations Resilience	The building can respond to acute shocks and chronic stresses that can affect its operations over time.	Credit Achievement; meet all three of the following criteria:								
		17.1	Comprehensive Risk Assessment	The suitably qualified professional authoring the operations resilience assessment must • Identify a set of clear resilience objectives and performance goals for the project and provide a diverse range of actions; • Collaborate with key internal and external project stakeholders to identify and confirm the relevant acute shocks and chronic stresses likely to impact the functionality of the project and its ability to meet performance goals; • Identify and confirm a range of interdependent infrastructure systems, networks, services and assets on which the project is likely to rely and interface with; • Identify key areas of system vulnerability, specifically how these may be affected by the identified shocks and stresses and as result may impact the project through reduced capacity and/or functionality; and • Outline emergency response procedures in the event of an identified shock event/natural disaster impacting the project and the local community. • Consult with relevant authorities with regards to evacuation procedures and emergency actions.	2	2		2	2	
		17.2	Managing Risks	• All risks rated as 'Extreme' must be addressed through specific design responses. • All risks rated as 'High' must be addressed through design or future operational responses. • Regardless of risk rating, at least two risks identified in the assessment must be addressed by specific design responses.						
		17.3	Addressing Power Loss	Project team must assess building's survivability in the case of a blackout, then designed to account for its design purpose and provide a measure of survivability.						
Community Resilience	The building contributes to improving the resilience of the community.	Credit Achievement								
		18.1	Community Resilience Plan	The project team must develop a community resilience plan that: • Defines its surrounding local community, and the groups which rely on or interact directly or indirectly with the building. In addition to considering tenants and visitors, this must identify key vulnerable communities; • Identifies resilience objectives and goals associated with servicing the community; • Identifies social considerations affecting the community; • Identifies acute shocks and chronic stresses that impact the project's function and ability to service the community (including climate-related shocks and stresses if the Climate Change Resilience credit is not targeted); • Demonstrates how the development of actions (physical and non-physical responses) to manage the impact from shocks and stresses is in response to the outcomes of community engagement; • Shows how the two most significant impacts identified are dealt with specifically through the building's design; and • Identifies how material shocks and stresses identified for the building may impact on these stakeholders by considering a clear set of social indicators	1					

Credit Title	Aim of Credit	Criteria No.	Criteria Title	Credit Requirements Summary <i>For full criteria refer to Green Star for Buildings Submission Guidelines</i>	Points Available	Building A 6 star	Building B 5 star	Building C 6 star	Building D 6 star	Comment / Reference
Heat Resilience	The building reduces its impact on heat island effect.	Credit Achievement								
		19.1	Heat Island Reduction	Design responses to mitigate urban heat island. 75% of the site area to be one or a combination of: • Vegetation; • Green roofs; • Roofing materials, including shading structures, having the following: – For roof pitched <15° – a three-year SRI of minimum 64; or – For roof pitched >15° – a three-year SRI of minimum 34. • Unshaded hard-scaping elements with a three-year SRI of minimum 34 or an initial SRI of minimum 39; • Hardscaping elements shaded by overhanging vegetation; and • Water bodies and/or water courses. The area of site that is shaded by permanent structures at noon local time at the summer solstice are also deemed compliant.	1	1	1	1	1	
Grid Resilience	The building contributes to the functioning of the grid as it transitions to a higher level of renewable energy capacity.	Credit Achievement; meet one criteria or a combination of Active Generation and Storage Systems and Demand Response criteria:								
		20.1	Active Generation and Storage Systems	The building has the capacity to reduce its electricity peak demand by 10% of the building's annual peak electricity demand for at least a one-hour period. The peak demand reduction can occur through • thermal storage solutions (such as chilled water storage systems); • electricity storage solutions (batteries); or • renewable on-site generation. Building management system (BMS) must include a demand management dashboard that shows the peak demand target, current, historical demand, alongside the critical performance characteristics. The BMS must also have the capacity to accept external control signals to enable signing up to current or future demand response programs.	3	3	3	3	3	
		20.2	Demand Response	The demand response strategy must show how at least 10% of the building's annual peak electricity demand is being shed without affecting occupant amenity (comfort, lighting, movement) as outlined in credits Light Quality, and Amenity and Comfort for at least 4 hours.						
		20.3	Passive Design Solutions	• The building's facade demonstrates a 10% improvement over a reference building modelled to Section J requirements of the National Construction Code 2019, or the version of the code applicable to the building's construction, whichever is later. The calculation must follow either Method 2 in the wall/glazing calculator or use a JV3 model; and • The building is mostly naturally ventilated (that is, the building has no mechanical cooling or heating for 80% of the building's occupiable area); and • The building's occupiable area is less than 3,000m².						
RESILIENCE Total					8	7	5	7	7	
POSITIVE										
Upfront Carbon Emissions	The building's upfront carbon emission contributions from materials and products have been reduced and offset.	Minimum Expectation								
		21.1	Reducing Upfront Carbon Emissions	Emits 10% less upfront carbon emissions compared to a reference building	ME	ME	ME	ME	ME	
		Credit Achievement; in conjunction with the Minimum Expectation, meet the following criteria:								
		21.2	Reducing Upfront Carbon Emissions	Emits 20% less upfront carbon emissions compared to a reference building	3	3	3	3	3	
		21.3	Offsetting Demolition Works	Demolition works are offset						
Exceptional Performance; in conjunction with the Credit Achievement, meet the following criteria:										
		21.4	Reducing Upfront Carbon Emissions	Emits 40% less upfront carbon emissions compared to a reference building	3	3	3	3	3	5 and 6 star Climate Positive Pathway Certification > 2030
Energy Use	The building has low energy consumption.	Minimum Expectation; Reference Building Pathway criteria 22.1; NABERS Commitment Agreement Pathway criteria 22.2								
		22.1	Reference Building Pathway	The building uses 10% less energy compared to a reference building, excluding on-site renewable energy generation systems connected behind the meter.	ME	ME	ME	ME	ME	
		22.2	NABERS Commitment Agreement	The building has a NABERS Energy Commitment Agreement to achieve a 5.5 star NABERS Energy for Offices (base building) rating.						
		Credit Achievement; Reference Building Pathway criteria 22.3; NABERS Commitment Agreement Pathway criteria 22.4								
		22.3	Reference Building Pathway	The building uses 20% less energy compared to a reference building.	3	3	3	3	3	5 and 6 star Climate Positive Pathway Certification > 2030
		22.4	NABERS Commitment Agreement	The building has a NABERS Energy Commitment Agreement to achieve a 5.5 star (with 25% modelling margin) NABERS Energy for Offices (base building) rating.						
		Exceptional Performance; Reference Building Pathway criteria 22.5; NABERS Commitment Agreement Pathway criteria 22.6								
		22.5	Reference Building Pathway	The building uses 30% less energy compared to a reference building.	3					
		22.6	NABERS Commitment Agreement	The building has a NABERS Energy Commitment Agreement to achieve a 6 star NABERS Energy for Offices (base building) rating.						

Credit Title	Aim of Credit	Criteria No.	Criteria Title	Credit Requirements Summary <i>For full criteria refer to Green Star for Buildings Submission Guidelines</i>	Points Available	Building A 6 star	Building B 5 star	Building C 6 star	Building D 6 star	Comment / Reference
Energy Source	The building's energy comes from renewables.	Minimum Expectation								
		23.1	Zero Carbon Action Plan	The project team must develop a Zero Carbon Action Plan for the building. The plan must be signed off by the building owner or developer and included in any operational documents for the building. The Zero Carbon Action Plan must include a target date by when the building is expected to operate as net zero carbon. The Zero Carbon Action Plan must cover all energy consumption, procurement, and generation and cannot rely on procuring renewable fuels as its only solution. It must also include infrastructure provided for tenants or future occupants such as gas installations for cooking.	ME	ME	ME	ME	ME	
		Credit Achievement								
		23.2	Renewable Electricity	All electricity under the control of the building owner or operator must be accounted for and sourced from renewables.	3	3	3	3	3	
		Exceptional Performance								
		23.3	Renewable Energy	All energy under the control of the building owner/operator and all non-electricity energy provided for uses that are not under the building owner's control must be sourced from renewables.	3	3	3	3	3	5 and 6 star Climate Positive Pathway Certification > 2030
Other carbon emissions	The building's other carbon emissions, such as those from refrigerants, are eliminated or offset.	Credit Achievement								
		24.1	Eliminating or Offsetting Refrigerants	All refrigerants from building systems or domestic appliances provided by the building must be captured in the credit. This includes where fridges or freezers are provided as part of a fitout package in a residential setting. There are two pathways available: • Eliminates high-GWP refrigerants from the building; or • Offsets 100% of carbon emissions from refrigerants.	2	2	2	2	2	
		Exceptional Performance								
		24.2	Other Emissions	The project must calculate and offset: • Emissions for refrigerants; • Emissions from the building's electricity use (as determined in the Energy Use credit) multiplied by the grid coefficient (unless the Energy Source Credit Achievement is met, in which case these emissions are zero); • Emissions from the building's energy use as determined in the Energy Use credit (unless the Energy Source Exceptional Performance is met, in which case these emissions are zero); • Upfront carbon emissions as determined in the Upfront carbon emissions credit; • Emissions from module A5 construction equipment use, and utilities during construction on site (unless the Life Cycle Impacts calculator was used for the Upfront Carbon Emissions credit); • Life cycle emissions from modules B and C as calculated in Life Cycle Impacts; • Construction waste emissions; and • Any other carbon emissions over 1% of the total carbon emissions profile for the building.	2	2	2	2	2	5 and 6 star Climate Positive Pathway Certification > 2030
Water use	The building has low water consumption.	Minimum Expectation; meeting one of the following criteria:								
		25.1	Sanitary Fixture and Appliance Efficiency	All fixtures and water-using appliances installed within the project's scope must, at a minimum, meet the prescribed WELS ratings.	ME	ME	ME	ME	ME	
		25.2	Reducing Water Use	Uses 15% less potable water compared to a reference building through the GBCA's Water Use Calculator.						
		Credit Achievement; in conjunction with the Minimum Expectation, meet both of the following criteria:								
		25.3	Reducing Water Use	Uses 45% less potable water compared to a reference building through the GBCA's Water Use Calculator.	3					
		25.4	Recycled Water Infrastructure	Building must have infrastructure for recycled water in a district or location where local council or water authorities (or similar) have planned for installation of recycled water infrastructure.						
		Exceptional Performance; in conjunction with Credit Achievement, meet the following criteria:								
		25.5	Reducing Water Use	Uses 75% less potable water compared to a reference building through the GBCA's Water Use Calculator.	3					
Life Cycle Impacts	The building has lower environmental impacts from key resources over its lifespan than a typical building.	Credit Achievement								
		26.1	Life Cycle Impacts	The project demonstrates a 30% reduction in life cycle impacts when compared to standard practice.	2	2	2	2	2	
POSITIVE Total					30.0	21	21	21	21	

Credit Title	Aim of Credit	Criteria No.	Criteria Title	Credit Requirements Summary <i>For full criteria refer to Green Star for Buildings Submission Guidelines</i>	Points Available	Building A 6 star	Building B 5 star	Building C 6 star	Building D 6 star	Comment / Reference
PLACES										
Movement and Place	The building's design and location encourages occupants and visitors to use active, low carbon, and mass transport options instead of private vehicles.	Minimum Expectation; meet both of the following criteria:								
		27.1	Changing Facilities	The project must provide adequate facilities for regular occupants (not for visitors), including: • Showers; and • Lockers.	ME	ME	ME	ME	ME	
		27.2	Accessible, Inclusive, and Located in a Safe and Protected Place	Upon accessing, pedestrians and cyclists must be protected from the elements and other vehicles. Access must be safe, with consideration given to avoiding steep gradients, surface grip levels, and visibility around tight corners.						
		Credit Achievement; in conjunction with the Minimum Expectation, meet all four of the following criteria:								
		27.3	Bicycle Parking Facilities	The building's access must prioritise walking and cycling options. This means the building's access must be well lit, weather protected and separated from vehicles.	3	3	3	3	3	
		27.4	Sustainable Transport	• The project team must prepare and implement a Sustainable Transport Plan. The requirements must be reflected in the design of the building's facilities and ongoing operational processes; and • Provide EV charging point to at least 5% of all car parking spaces, all car sharing parking spaces, infrastructure and load management plan for future 25% of all car parking spaces, and dedicated routes for future provision of electrical cabling.						
		27.5	Reducing Private Vehicle Use	Complete the Movement and Place Calculator and demonstrate at least: • Emission reduction: 40% • Active mode encouragement: 90% • VKT reduction: 20%						
		27.6	Encouraging Walkability	Building's design and location must encourage walking to and from a number of amenities. This means designing roads within the site boundary to prioritise pedestrians, and either providing within, or being located close to, a number of amenities.						
Enjoyable Places	The building provides places that are enjoyable and inclusive.	Credit Achievement; meet both of the following criteria:								
		28.1	Publically Accessible Places	The project provides new, publicly accessible spaces that are enjoyable and support community activity and interaction - 0.25 m²/occupant or 2.5% of GFA, whichever is greater.	2	2	2	2	2	
		28.2	Activation Strategy	An activation strategy must be provided to ensure placemaking continues after practical completion. The strategy must demonstrate how the future occupants and the wider community can contribute to the place activation.						
Contribution to Place	The building's design makes a positive contribution to the quality of the public environment.	Credit Achievement, meet one of the following criteria:								
		29.1	Urban Context Report	Provide an urban context report and demonstrate how building's design responds to it.	2					
		29.2	Independent Design Review	Design reviews are held at key points in the development of the design. At a minimum, these must occur as follows: • Design Review during concept/schematic design stage, to ensure that proponents can take advantage of the advice offered at a time where the design is flexible enough to accommodate change without impacting on time and cost constraints; • A subsequent review when the design has been further progressed. This review session will typically occur during design development; and • At building permit stage (after development approval) a further check must take place by the Design Review Panel Chair or delegate, to ensure that the final design reflects approved development application and any relevant conditions related to design quality.						
Culture, Heritage and Identity	The building reflects local culture, heritage and identity.	Credit Achievement, meet one of the following criteria:								
		30.1	Community Led Design Response	The project team must show that they have undertaken local analysis to identify culture, heritage and identity unique to the project site and area. The project team must undertake community engagement as part of this local analysis, the project must reflect local identity, culture and heritage in the design of the building in a publicly demonstrable way. This can be achieved through: • Community art or placemaking projects; • Selection of suppliers/designers of artwork or cultural elements; • Building elements that tell stories of the past and heritage; and • Spaces and uses that reflect the local identities	1					
		30.2	Independent Design Review	Design reviews are held at key points in the development of the design. At a minimum, these must occur as follows: • Design Review during concept/schematic design stage, to ensure that proponents can take advantage of the advice offered at a time where the design is flexible enough to accommodate change without impacting on time and cost constraints; • A subsequent review when the design has been further progressed. This review session will typically occur during design development; and • At building permit stage (after development approval) a further check must take place by the Design Review Panel Chair or delegate, to ensure that the final design reflects approved development application and any relevant conditions related to design quality.						
PLACES Total					8	7	7	7	7	

Credit Title	Aim of Credit	Criteria No.	Criteria Title	Credit Requirements Summary <i>For full criteria refer to Green Star for Buildings Submission Guidelines</i>	Points Available	Building A 6 star	Building B 5 star	Building C 6 star	Building D 6 star	Comment / Reference
PEOPLE										
Inclusive Construction Practices	The builder's construction practices promotes diversity and reduces physical and mental health impacts.	Minimum Expectation								
		31.1	On-site Facilities, Policies and Training	The head contractor must ensure the following is provided, or available, on-site: • Separate gender inclusive bathroom facilities and changing amenities with a high degree of privacy; and • Diverse gender-specific fit-for-purpose personal protective equipment (PPE) for diverse body sizes and types. The head contractor must: • Implement policies to address issues of discrimination, racism, and bullying on-site; • Introduce on-site redress procedures for any relevant breaches, and corrective measures to be put in place should any incident be identified; • Empower a diverse lead team to manage these policies on-site, and • Provide training to all contractors and sub-contractors on these policies (as per below). The head contractor must provide the following training to 95% of all contractors and subcontractors present on site for at least three days: • Information on drug and alcohol awareness and mental health; and • Information on policies implemented on discrimination, racism, and bullying on site.	ME	ME	ME	ME	ME	
		Credit Achievement; in conjunction with the Minimum Expectation, meet all three of the following criteria:								
		31.2	Needs Analysis	The responsible party should carry a needs analysis of site workers and contractors to determine appropriate actions. The policies and programs should be relevant to all construction workers on site for the full duration of construction.	1					
		31.3	Physical and Mental Health Programs	The head contractor must show that they have introduced programs and solutions to address at least five of the following: • Suicide prevention; • Healthy eating and active living; • Reduce harmful alcohol and tobacco consumption and avoid drug use; • Increased social cohesion, community and cultural participation; • Understanding depression; • Preventing violence and injury; • Decreased psychological stress; • Finding fulfilment at work or mindful meditation; and • Other issues identified in the Needs Analysis. A mix of programs is acceptable. The programs must cover at least 80% of the workforce that have attended the site for more than three days from commencement on site to practical completion. The programs or solutions can be implemented directly by the head contractor or through partnerships with mental and physical health organisations.						
		31.4	Evaluating the Program's Effectiveness	The project must provide an evaluation report to the client and sub-contractors with the following information: • Information on the programs or initiatives that were delivered, including information on dates, attendance, and available languages; and • A review on whether the programs delivered the intended outcomes including recommendations for improving future delivery of these programs.						
Indigenous inclusion	The building celebrates Aboriginal and Torres Strait Islander people, culture and heritage.	Credit Achievement; meet one of the following criteria:								
		32.1	Reconciliation Action Plan	Project team must demonstrate that: • A key member of the Project Team is part of the organisational RAP Working Group; • At least 90% of the RAP targets have been met on the project; and • All implemented actions related to the RAP are publicly reported on the Project's website.	2	2	2	2	2	
		32.2	Inclusion of Indigenous Design	The project team must demonstrate that the Australian Indigenous Design Charter guiding principles are incorporated in the design of the building including: • How local Aboriginal and Torres Strait Islander communities have been engaged throughout the design development; • How the project has been designed to acknowledge and recognise the Indigenous culture of the site; and • How information on the reconciliation and cultural values of the project will be made available to the public, visitors and building tenants in the operational phase of the project's life.						

Credit Title	Aim of Credit	Criteria No.	Criteria Title	Credit Requirements Summary <i>For full criteria refer to Green Star for Buildings Submission Guidelines</i>	Points Available	Building A 6 star	Building B 5 star	Building C 6 star	Building D 6 star	Comment / Reference
Procurement and Workforce Inclusion	The building's construction facilitates workforce participation and economic development of disadvantaged and under-represented groups.	Credit Achievement; meet both of the following criteria:								
		33.1	Social Procurement Strategy	The project team must develop and implement a social procurement strategy or plan (this can be part of an overall project procurement plan/strategy) that directs at least 2% of the building's total contract value to generate employment opportunities for disadvantaged and under-represented groups.	2	2		2	2	
		33.2	Employment Opportunities	Generate employment opportunities for disadvantaged and under-represented groups either: • Directly, through workforce targets; or • Indirectly, through social procurement. A combination of these strategies can be used to achieve the credit, as long as the total dollar spend on the above activities is equal to or greater than the required 2% value of the building's total contract value.						
		Exceptional Performance; meet both of the following criteria:								
		33.1	Social Procurement Strategy	The project team must develop and implement a social procurement strategy or plan (this can be part of an overall project procurement plan/strategy) that directs at least 4% of the building's total contract value to generate employment opportunities for disadvantaged and under-represented groups.	1					
		33.2	Employment Opportunities	Generate employment opportunities for disadvantaged and under-represented groups either: • Directly, through workforce targets; or • Indirectly, through social procurement. A combination of these strategies can be used to achieve the credit, as long as the total dollar spend on the above activities is equal to or greater than the required 4% value of the building's total contract value.						
Design for Inclusion	The building is welcoming to a diverse population and is welcoming to their needs.	Credit Achievement								
		34.1	Inclusive Design	The building's design and construction must be able to be navigated and enjoyed by stakeholders of diverse ages, genders, and abilities. This applies to common spaces, bathroom facilities and amenities provided within the building. This must include: • Equal access to the building: Provide equitable, appealing, safe, and secure access in a manner that does not segregate or stigmatise users through all principal entrance points and main thoroughfares inside and outside the building; • Diverse wayfinding: Introduce visual, physical, olfactory, and auditory solutions to help individuals navigate the site in a safe and enjoyable manner; and • Inclusive spaces: Introduce internal and external spaces for a diverse range of users, including parents, family restrooms, emergency rooms, quiet rooms and social interaction rooms. These rooms must be accessible to all users.	2	2	2	2	2	
		Exceptional Performance; in conjunction with the Minimum Expectation, meet the following criteria:								
		34.2	Needs Analysis	A Needs Analysis is conducted, meeting the following requirements: • The project team must consult with distinct community types to develop a needs analysis that will influence the project during the design phase; • Consultation must be undertaken early in the design process and include a balanced cross-section of representation of the target group • Consultation must be considerate and relevant to the project • The consultation process must generate a report that is then used to influence the design of the project As a result of the needs analysis, the building must show how it aligns with best practice guidelines, such as the Design for Dignity Guidelines: Principles for Beyond Compliance Accessibility in Urban Regeneration.	1					
PEOPLE Total					9	6	4	6	6	

Credit Title	Aim of Credit	Criteria No.	Criteria Title	Credit Requirements Summary <i>For full criteria refer to Green Star for Buildings Submission Guidelines</i>	Points Available	Building A 6 star	Building B 5 star	Building C 6 star	Building D 6 star	Comment / Reference
NATURE										
Impacts to Nature	Ecological value is conserved and protected	Minimum Expectation; meet all three of the following criteria:								
		35.1	Ecologically Sensitive Sites	At the date of purchase or option contract, land clearing does not occur on the site as a result of the building, infrastructure, or construction works on the following: <ul style="list-style-type: none">• Old-growth forest;• Prime agricultural land;• Any wetland listed as being of 'High National Importance';• Aspects considered 'Matters of National Environmental Significance' listed under the Environmental Protection and Biodiversity Conservation Act (1999).	ME	ME	ME	ME	ME	
		35.2	Managing Light Pollution Impacts	<ul style="list-style-type: none">• Light pollution to neighbouring bodies: all outdoor lighting on the project complies with AS 4282:1997 Control of the obtrusive effects of outdoor lighting.• Light pollution to night sky: one of the following specified reductions in light pollution must be achieved by the project:<ul style="list-style-type: none">- Control of upward light output ratio (ULOR); or- Control of direct illuminance.						
		35.3	Wetland Management Plan	The site-specific Wetland Management Plan must be prepared by a qualified Ecologist or other qualified professional and include requirements for ongoing quarterly monitoring, annual reporting and management of the wetland ecosystem for a minimum of five years. The plan must be exhibited to the public on the applicant's website, or the local council's offices or library, for a minimum of 24 months.						
		Credit Achievement; in conjunction with the Minimum Expectation, meet both of the following criteria:								
		35.4	Protecting Ecological Values	<ul style="list-style-type: none">• Context report: understand the site's historical and current ecological context by documenting the site's current ecological values by type and biomass.• Protecting ecology: show how ecological values will be protected.	2					
		35.5	Retaining High Biodiversity Values	If deemed necessary by an Ecologist, at least 50% of existing site with high biodiversity value is retained.						
Biodiversity Enhancement	The building's landscape enhances the biodiversity of the site and off site	Credit Achievement: meet all three of the following criteria:								
		36.1	Landscape Area	At a minimum, external landscape in the building, whether horizontal or vertical must be provided at a ratio of either 15% of the site area or at a ratio of 1:500 of the GFA, whichever is larger. Vertical or horizontal landscapes are acceptable.	2	2		2	2	
		36.2	Diversity of Species	<ul style="list-style-type: none">• Landscape must be shown to be diverse and include multiple species/genus/etc.• Greater than 60% of plants must be indigenous and the site must include at least one significant (nesting) tree or equivalent habitat provision per 500m² of landscaped area.• No invasive species are allowed, as per the Australian Weeds Strategy 2017 to 2027.						
		36.3	Biodiversity Management Plan	A suitably qualified professional must prepare the plan must outline key actions that need to be undertaken in order to maintain the ecological integrity of biodiversity on the site, whether this is existing or that created as part of the development.						
		Exceptional Performance; in conjunction of the Minimum Expectation, meet both of the following criteria:								
		36.4	Landscape Area	As a minimum, external landscape in the building, whether horizontal or vertical must be provided at a ratio of either 30% of the site area or at a ratio of 1:300 of GFA, whichever is larger. Vertical or horizontal landscapes are acceptable.	2					
		36.5	Diversity of Species	<ul style="list-style-type: none">• Landscape must be shown to be diverse and include multiple species/genus/etc.• An ecologist must review, assess and verify how the choice of landscaping and biodiversity is diverse and resilient to climate change impacts, thereby increasing the longevity of the landscape.• Greater than 80% of plants must be indigenous and the site must include at least one significant (nesting) tree or equivalent habitat provision per 250m² of landscaped area.• No invasive species are allowed, as per the Australian Weeds Strategy 2017 to 2027.• The site must preserve, restore and/or support vulnerable ecosystem through planting critically endangered and/or endangered plant species which are native to the bioregion.						
Nature Connectivity	Wildlife movement is facilitated within and adjacent to the site.	Credit Achievement								
		37.1	Species Connectivity	The site may include any of the following strategies: <ul style="list-style-type: none">• Landscaping: Where connectivity is being achieved through landscaping, this must be contiguous with existing, restored and new habitats. As a minimum requirement for habitat connectedness, the conservation area must make up at least 25% of the total external area within the building's site boundary. To be eligible, this must be at least 182m²; or• Infrastructure: Design features such as a canopy bridge, wildlife tunnels, green roofs, amphibian tunnels and green infrastructure are used to connect nature on site to adjacent natural areas, which are either existing, restored or new.	2					

Credit Title	Aim of Credit	Criteria No.	Criteria Title	Credit Requirements Summary For full criteria refer to Green Star for Buildings Submission Guidelines	Points Available	Building A 6 star	Building B 5 star	Building C 6 star	Building D 6 star	Comment / Reference
Nature Stewardship	Biodiversity is restored beyond the building site.	Credit Achievement; meet all four of the following criteria:								
		38.1	Area of Restoration or Protection	The area of restoration must be equivalent to the total GFA of the development, or site area, whichever is greater.	2					
		38.2	Location of Restoration or Protection Activities	Land for restoration must be in Australia and restored to equivalent ecological value of the site before any development occurred. The location of the land designated for the offsite restoration must not be in the development boundary.						
		38.3	Activities to Protect or Restore	Achieving the credit can be done by either: • The project owner protecting or restoring an area offsite themselves; or • The project owner supports an organisation that restores an area on their behalf.						
		38.4	Legislated Requirements	Where the project is required to purchase biodiversity offsets, invest in land restoration, restore land, or similar, as part of an EPBC action, development approval, or other legislated requirements, these actions cannot be used to demonstrate compliance with this credit.						
Waterway Protection	Local waterways are protected, and the impacts of flooding and drought are reduced	Credit Achievement; meet both of the following criteria:								
		39.1	Stormwater Volume	Demonstrate a reduction in average annual stormwater discharge (ML/yr) of 40% across the whole site.	2	2	2	2	2	
		39.2	Pollution Reduction Targets	All stormwater discharged from site meets: Total Suspended Solids 85%; Gross Pollutants 90%; Total Nitrogen 45%; Total Phosphorus 65%						
		Exceptional Performance; in conjunction with the Minimum Expectation, meet both of the following criteria:								
		39.1	Stormwater Volume	Demonstrate a reduction in average annual stormwater discharge (ML/yr) of 80% across the whole site.	2	2		2	2	
		39.2	Pollution Reduction Targets	All stormwater discharged from site meets: Total Suspended Solids 90%; Gross Pollutants 95%; Total Nitrogen 60%; Total Phosphorus 70%						
NATURE Total					14	6	2	6	6	
LEADERSHIP										
Market Transformation	Celebrates initiatives or outcomes that are deemed new and break barriers, and in turn inspire others to follow.	Credit Achievement, up to 5 points available								
		40.1	Innovative Initiatives	To claim points, the project team must show that an initiative is innovative by demonstrating that the technology or process is not commonly used within Australia's building industry globally, depending on the context of the innovation claimed. Projects must demonstrate these initiatives align with the following GBCA scoring metrics: • Control of outcome: the initiative delivers a guaranteed outcome • Length of impact: the initiative delivers long-lasting impacts • Scale of impact: the scale of impact is significant. For example, the outcome may satisfy multiple UN Sustainable Development Goals • Transformation potential: the initiative has the potential to transform an industry or sector • Value generation: the initiative can deliver benefits to both stakeholders (e.g. building owner or occupants) as well as the general public	5	1	1	1	1	Climate Postive Pathway
Leadership Challenges	Promotes achievements that are considered leading practice in Australia.	Credit Achievement								
		41.1	Leadership Challenges	Projects teams can target as many Leadership Challenges as they wish. Leadership Challenges will be uploaded to the GBCA website as they are developed. All criteria as listed on the Leadership Challenge must be met to claim reward.	Unlimited					
LEADERSHIP Total					5	1	1	1	1	

	Points Available	Building A 6 star	Building B 5 star	Building C 6 star	Building D 6 star
RESPONSIBLE	17	13	7	13	13
HEALTHY	14	11	2	11	11
RESILIENT	8	7	5	7	7
POSITIVE	30	21	21	21	21
PLACES	8	7	7	7	7
PEOPLE	9	6	4	6	6
NATURE	14	6	2	6	6
SUB-TOTAL POINTS	100	71	48	71	71
LEADERSHIP	5	1	1	1	1
TOTAL SCORE	105	72	49	72	72
4 Star - 15-34 score 5 Star - 35-70 score 6 Star - 70+ score					

