ESD Report for State Significant Development Application: Redfern Place, 600-660 Elizabeth St

Redfern Place

Revision 06, July 2024

atelier ten

Document information

Report title: ESD Report for State Significant Development Application: Redfern Place, 600-660 Elizabeth St
Project name: Redfern Place
Project number: 2046
Digital file name: Redfern Place ESD Report
Digital file location: Z:\Shared\A10ANZFileserver\Projects\2000-2099\2046 - Redfern Place\02 Design & Analysis\ESD Report

Prepared

Prepared by: Neha Yadav
Signed:
Date: 14.05.2024

Checked

Checked by: Alison Adendorff
Signed:
Date: 16.05.2024

Approved

Approved by: Alison Adendorff
Signed:
Date: 16.05.2024

Revisions

No	Date	Approved
00	11.06.2024	Alison Adendorff
01	30.05.2024	Alison Adendorff
02	11.06.2024	Alison Adendorff
03	13.06.2024	Alison Adendorff
04	18.06.2024	Alison Adendorff
05	21.06.2024	Alison Adendorff
06	18.07.2024	Alison Adendorff

Atelier Ten
Level 7
56 Pitt Street
Sydney NSW 2000
Australia
T +61 2 9262 4500
W atelierten.com

Atelier Ten acknowledges the Traditional Owners of country throughout Australia and recognises their continuing connection to land, waters, and community. We pay our respect to them and their cultures, and to Elders past, present, and emerging.

Green Building Council Australia
Member 2020–2021

Table of Contents

Executive Summary

This report has been created to support a comprehensive State Significant Development Application aimed at securing approval for a mixed-use development at 600-660 Elizabeth Street, Redfern (Redfern Place). The development includes four buildings featuring affordable/social/specialist disability housing apartments, community facilities, commercial/office space, as well as new pathways and landscaping.

The project site is located directly opposite Redfern Oval and comprises the whole block bound by Elizabeth Street to the west, Philip Street to the south, Walker Street to the east and Kettle Street to the north, the south, Walker Street to the east and Kettle Street to the north.

This report has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) and the NSW Department of Planning and Environment Design Guide – 600-660 Elizabeth Street, Redfern (Redfern Place).

This report concludes that the proposed development is suitable and warrants approval due to the implementation of the following measures:

- Minimising energy and water use and waste generation.
- Maximising on-site renewable energy generation, water re-use and waste recycling

These will be implemented in line with the sustainability vision of the development, described under the following themes in this report:

- **Affordability:** Redfern Place is dedicated to enhancing affordability by promoting energy and water efficiency, resulting in lower utility bills for residents, and facilitating sharing opportunities within the community.
- **Healthy and Inclusive:** Redfern Place is an opportunity to support public health initiatives and provide an exceptional environment that enriches the health and wellbeing of residents, occupants, and visitors.
- **Resilient and Adaptable:** Redfern Place aims to set a precedent for forward-thinking development by addressing foreseeable risks, building resilience to disruptions, recovering quickly, and adapting to societal progress.
- **Caring for Country:** A deep connection to and understanding of the land will create a built environment with a unique identity, fostering a sense of place that is vital for attracting investment and ensuring long-term sustainability, social justice, and inclusivity. (Refer to Yerrabingin report for further details)
- **Circular Economy:** The combination of mixed-use activities and large-scale development of new infrastructure and buildings in the area presents an opportunity to create an industrial ecosystem that efficiently cycles resources internally at high value.
- **Urban Forest:** Redfern Place will enhance the indoor and outdoor spaces by intensifying the 'green zones' that extend up the building. This inclusion of indigenous ecologies will provide respite for residents, occupants, and wildlife alike.
- **Climate Positive:** Redfern Place will be constructed and operated in a manner that contributes to positive climate outcomes, including lower greenhouse gas emissions and achieving net zero carbon operations.

The sustainability performance of the project will be benchmarked against the targets set for Green Star, BASIX and NABERS for assurance and demonstration of the project's commitment to the sustainability vision.

Implementation of the design responses (mitigation measures) will render the proposed development acceptable in addressing the ESD SEARS requirements.

Table 1 Project Target Summary

Target	Status
All development • 5-star Green Star Buildings (New Tool)	Development is registered for 4 x GS Buildings projects using a Site Wide Approach: See Section 2 Assurance and Benchmarking for more detail.
Residential development • BASIX Energy 62 +5 (New Tool) • BASIX Water 40 (New Tool) • BASIX Thermal Comfort 7- Star NatHERS average. (New Tool)	BASIX Water, Energy and Thermal Comfort targets will be met or exceeded. See Section 2 Assurance and Benchmarking for more detail.
Commercial areas • NABERS Energy rating of 5.5 stars • NABERS water rating of 4.5 stars	Commercial space is on track to achieve NABERS Energy 5.5 and NABERS Water 4.5 stars, based on current documentation.

1 Introduction

1.1 General Introduction

This report accompanies a detailed State Significant Development Application that seeks approval for a mixed-use development at 600-660 Elizabeth Street, Redfern (Redfern Place). The development proposes four buildings comprising community facilities, commercial/office, affordable/social/specialist disability housing apartments and new public links and landscaping.

The project site comprises Lot 1 in DP 1249145. It has an area of approximately 10,850m^2. Part of the site currently accommodates the existing Police Citizens Youth Club (PCYC) (to be demolished and replaced). The remaining portion of the site is vacant with remnant vegetation.

- The SSDA seeks approval for redevelopment of the site, including:
- Demolition of existing buildings.
- Tree removal.
- Bulk earthworks including excavation.
- Construction of a community facility building known as Building S1.
- Construction of two residential flat buildings (known as Buildings S2 and S3) up to 14 and 10 storeys respectively, for social and affordable housing.
- Construction of a five-storey mixed use building (known as Building S4) comprising commercial uses on the ground level and social and specialist disability housing above.
- Construction of one basement level below Buildings S2, S3 and part of S4 with vehicle access from Kettle Street.
- Site-wide landscaping and public domain works including north-south and east-west pedestrian through-site link.

For a detailed project description refer to the Environmental Impact Statement prepared by Ethos Urban.

1.2 Sustainability Guidelines

The report has been prepared to align with the Sustainability Vision issued by Atelier Ten (February 2024). This document outlines the specific ESD initiatives that the project must achieve, including SEARS requirements, Design Guide requirements and benchmarking targets for various building rating tools such as Green Star and NABERS.

1.2.1 Principal Guiding Documents

There are a number of national and local authorities that require compliance for planning approval. Some of these are compulsory, some are preferential, and some are design guidelines to facilitate approval.

The main material documents which refer to sustainability performance standards include:

- BCA 2022 National Construction Code (NCC) Section J
- Environmental Planning and Assessment (EP&A) Regulation Schedule 2 Clause 7(4)
- SEARs (SSD - 51274973)
- Sydney Local Environmental Plan 2012
- Sustainable Buildings SEPP
- Design Guide – 600-660 Elizabeth Street, Redfern (NSW Govt, Oct 2023)
- LAHC Dwelling Requirements (September 2020)

1.2.2 SEARs Requirements

This report has been prepared in response to the requirements contained within the Secretary's Environmental Assessment Requirements (SEARs) dated 16 December 2022 and issued for the SSD DA. Specifically, this report has been prepared to respond to the SEARs requirements issued below.

Table 2 SEARs Requirements Summary

SEARS Section	Description of Requirement	Requirement Met	Section Reference (this report)
9. Ecologically Sustainable Development (ESD)	• Identify how ESD principles (as defined in section 193 of the EP&A Regulation) are incorporated in the design and ongoing operation of the development.	Met	See Section 3.1 ESD Principles for more detail.
	• Demonstrate how the development will meet or exceed the relevant industry recognised building sustainability and environmental performance standards	Met	See Section 3.2 Sustainability and Environmental Performance Standards for more detail.
	• 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.	Met	See Section 3.3 Energy Water and Materials for more detail

1.2.3 Design Guide – 600-660 Elizabeth Street, Redfern

The Design Guide – 600-660 Elizabeth Street, Redfern provides design and other guidance for the development within the site. It comprises a hierarchy of objectives and guidance to guide future development. Each topic area is structured to provide the user with:

a. Objectives that describe the desired outcome(s)
b. Guidance that provides advice of how the objectives can be achieved through appropriate design and development responses

This report will demonstrate that the development meets the objectives as set out in the design guide. Where it is not possible to satisfy the guidance, this report will demonstrate that the objectives are, nevertheless, met and exceeded.

Table 3 Design Guide Summary

3.9 Ecologically Sustainable Development	Objectives/ Guidance Met	Section Reference (this report)
Objectives		
a) Minimise energy and water use and waste generation. b) Maximise on-site renewable energy generation, water re-use and waste recycling	Met	See Section 4 Design Guide Requirements for more detail.
Guidance		
Development is to achieve the following minimum ratings. All development 6-Star Green Star communities rating 5-star Green Star Design and As Built (Old Tool) Residential development BASIX Energy 40 (Old Tool) BASIX Water 40 with a target to exceed by 5 points. Commercial areas NABERS Energy rating of 5.5 stars NABERS water rating of 4.5 stars	Partially met, see section on Assurance for more detail. Project is not eligible for GS Communities Rating.	See Section 4 Design Guide Requirements for more detail.
All development is to have a combination of green roofs, roof-top solar PV and communal open space on rooftops. Other areas should be designed with high albedo qualities to reflect heat	Met	See Section 4 Design Guide Requirements for more detail.
The site is to be planned to minimise paved areas and maximise stormwater infiltration. All public access paving must be permeable except where accessibility requirements restrict it.	Met	See Section 4 Design Guide Requirements for more detail.
All development is to be designed to maximise passive design approaches including provision of external sun access and shading to all apartments except where tree canopy provides shading over an extended summer period.	Met	See Section 4 Design Guide Requirements for more detail.
All apartments should have access to external clothes drying facilities, either private or communal.	Met	See Section 4 Design Guide Requirements for more detail.
All parts of the development must include piping for use of recycled water in irrigation, toilets, and the like.	Partially met – rainwater will be used for irrigation.	See Section 4 Design Guide Requirements for more detail.
Development must follow the guidance of the City of Sydney Guidelines for Waste Management in New Development	Met	See Section 4 Design Guide Requirements for more detail.
Connection into the water storage located in Redfern Park should be considered in consultation with the City of Sydney	Not applicable to project	See Section 4 Design Guide Requirements for more detail.

1.2.4 Benchmarking Tools and Guidelines

The following guidelines will be referenced throughout the project for the purposes of targeting benchmarks from various building rating tools and achieving certification, where relevant:

- Green Star Buildings (v1)
- NABERS Energy and Water
- BASIX

See Section 2 Assurance and Benchmarking for more detail.

1.3 The Site

The subject site is located in the inner-city suburb of Redfern, within the City of Sydney LGA. The site is known as Lot 1 DP1249145, has an area of approximately 10,850sqm and is located approximately 3km from the Sydney CBD.

The site is bound by Kettle Street to the north, Phillip Street to the south, Walker Street to the east and Elizabeth Street to the west. Across Elizabeth Street to the west is Redfern Oval, a significant outdoor sporting facility. The site is well served by numerous transport links including bus routes along Elizabeth Street, Redfern Station (1.2 km away) and the new Waterloo Metro Station which is expected to be operational in 2024 (1.1 km away).

Part of the site is currently occupied by a community facility operated by Police Citizens Youth Club (PCYC – building with red roof and blue outdoor court space as depicted in Aerial Photo below) which will be demolished to make way for the redevelopment of the whole site. A new community facility is part of the proposed development. The balance of the site is vacant and inaccessible to the public. The vacant land was previously occupied by 18 social homes which were demolished in 2013. This part of the site is has remained vacant since then and is now grassland with numerous trees, fenced off to the public.

1.4 The Project

The redevelopment of the site is broken down into four (4) sections or buildings as depicted in Site by Section image below. These sections will each be connected by landscaped spaces and through-site links that stitch the site more broadly into the existing urban fabric of Redfern. The site by Section breakdown is as follows:

- Section 1 (S1) - Community Centre approximately 3,542sqm which will replace the existing PCYC on site.
- Section 2 (S2) - Affordable Housing Building approximately 14,559sqm GFA and 197 apartments
- Section 3 (S3) - Homes NSW social housing building approximately 7,685sqm GFA and 108 apartments
- Section 4 (S4) - Mixed affordable and SDA housing building and Bridge Housing's office headquarters approximately 4,253sqm GFA with 39 apartments for Bridge Housing, 10 apartments for Specialist Disability Accommodation, 1 Carer's apartment, 850sqm of commercial office GFA, and 300-400 sqm Community Hub (not contributing to GFA)
- Site Wide Landscaping - These portions will each be connected by landscaped spaces that stitch the site more broadly into the existing urban fabric of Redfern. Aspect Studios as the appointed Landscape Architect have developed a landscape design solution which has been incorporated into the site-wide Concept.

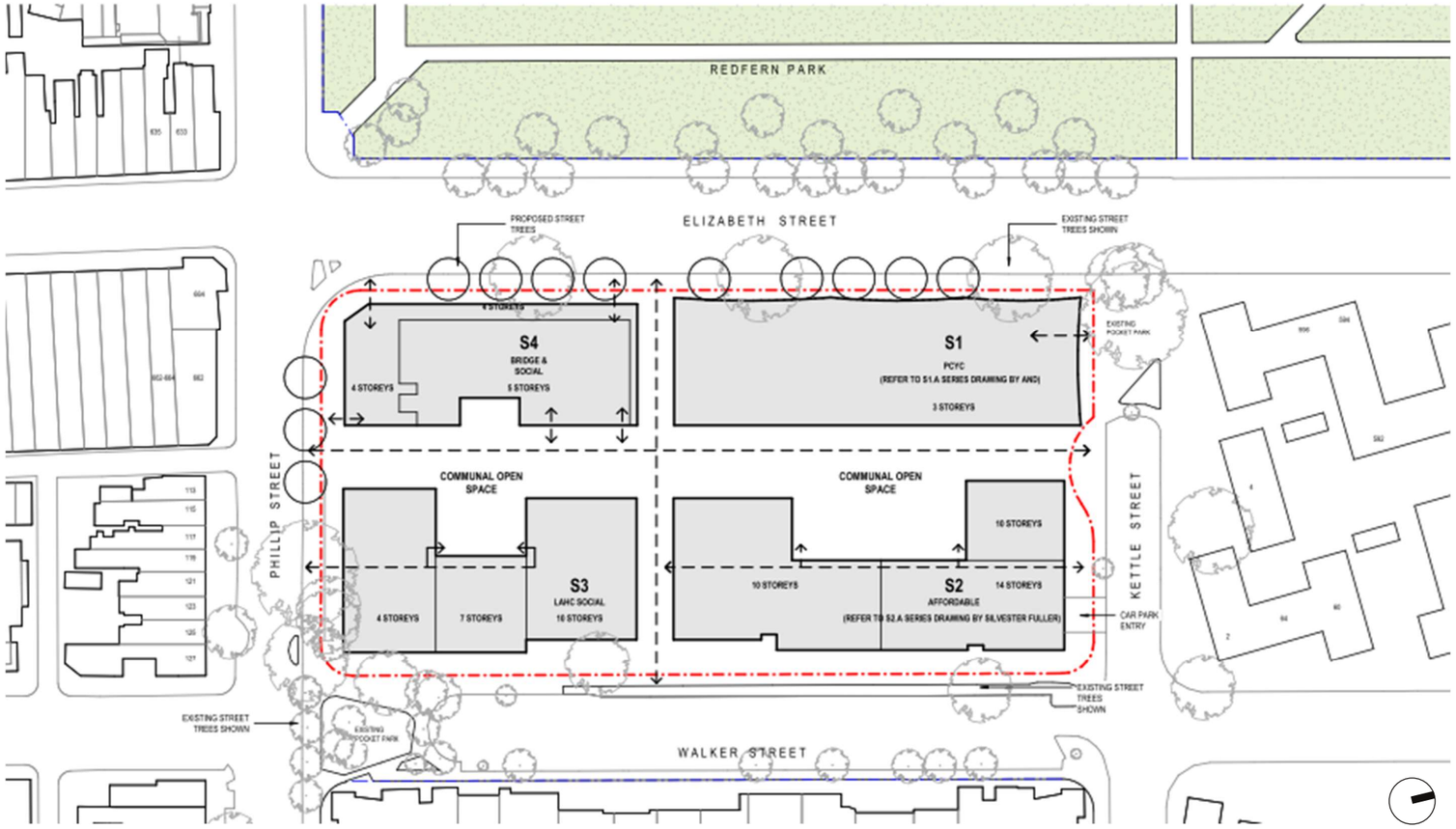


Figure 5: Site Section

2 Assurance and Benchmarking

It is imperative that sustainability objectives are backed up by an approach to assurance that gives absolute confidence that the claimed outcomes will be achieved. This requires a framework for assurance that covers the sustainability objectives and provides:

- independent review
- transparency of methodology
- accountability at each phase of the lifecycle

The benefits of using existing tools are the capacity to benchmark the project against national and global peers, and provide certainty for industry participants through the planning, procurement and delivery processes.

The type, or suite, rating tools and associated ratings targeted by any development will be a product of its organisational and stakeholder ambitions, strategic and planning context, geographic location, and target market. Rating tools typically fall into one of two categories:

- holistic sustainability tools addressing several themes
- thematic tools focusing on just one theme

Redfern Place will target the following certifications:

- Green Star Buildings 5 Star rating for each building
- NABERS Energy 5.5 Star rating for commercial office space
- NABERS Water 4.5 Star rating for commercial office space
- Residential development
  - BASIX Energy 62 + 5
  - BASIX Water 40
  - NatHERS 7 Star average
- Non-residential – Embodied Emissions Reporting

2.1 Green Star Communities

Based on the Eligibility Request R-25258 response by the GBCA issued 20 February 2024 (see Appendix A), Redfern Place has been determined as ineligible for a Green Star Communities rating per not meeting the following eligibility criteria:

- The project does not contribute to additional burdens on public transport systems or highways, nor does it involve new transport infrastructure.
- There are no public realm areas incorporated into the project for occupants or visitors. The scope is limited to private communal property.
- The development will not lead to the enhancement, diversification, or addition of local employment, social mix, or ecological value.
- No new or additional capacity in existing medical centres, schools, retail centres, places of religious worship, or similar facilities and services will be provided by the project.
- There are no provisions within the project for community-level provision of utilities or linking to other developments in the area for such purposes.
- The project is not expected to have a significant impact on existing communities and is designed to operate within existing parameters.

While the site area and the number of buildings meet the criteria for eligibility, the overall size, scale, and impact of the project make it difficult to achieve a Green Star Communities rating.

However, the development will certify each building under the Green Star Buildings tool, which will drive many sustainable design outcomes for residents and the local community including reduced energy and water use and .maximised renewable energy use.

2.2 Green Star Buildings

Green Star Buildings is the new Green Star tool and has superseded the old Green Star Design and As Built rating tool.

The four buildings at Redfern Place have each been registered for Green Star Buildings v1 with the following registration numbers:

- S1 – GS-12692B
- S2 – GS-12694B
- S3 – GS-12695B
- S4 – GS12696B

Each building is targeting a 5 Star Green Star Buildings v1 rating, see the Green Star pathway in addendum B. The development will use the site wide approach, approved by the GBCA to submit credits that apply to the entire site first, followed by the building specific credits for each building.

All buildings are being constructed within a single, distinct site boundary, and will be delivered by one head contractor, and constructed at the same time. The project teams are also being coordinated under the same contract. These project details have made the site wide approach to Green Star certification possible.

Green Star is a holistic rating tool and will assure the sustainability ambitions of Redfern Place, including minimising energy and water use and waste generation, and maximising on-site renewable energy generation, water re-use and waste recycling

Where a project is registered after 2023 the following requirements must be met to achieve a 5 Star rating:

- Climate Positive Pathway, including:
- 5 Year commitment to buy renewable electricity (for all electricity under the control of the building owner/operator)
- No fossil fuels used on site (no gas hot water heaters or gas stove tops)
- The building's energy use is at least 20% less than a reference building.
- The building has a weighted average of NatHERS 7 Stars
- The building's upfront carbon emissions are at least 20% less than those of a reference building
- 100% of carbon emissions from refrigerants must be offset.

The Climate Positive Pathway has been agreed with the project team.

2.3 BASIX and NatHERS

The BASIX online tool was used to confirm compliance against Energy, Water and Thermal Comfort Targets, based on NSW benchmark levels on a per capita basis. The BASIX Assessment is divided into three sections; Water, Thermal Comfort and Energy, each independently measuring the efficiency of the development.

The Sustainability SEPP BASIX requires a minimum target of 40% for the water section, a pass or fail for the thermal comfort section, and a minimum required target of 62% for the energy section.

Thermal Comfort targets are set by the Department of Planning in the form of heating and cooling caps. The buildings thermal physics were measured using HERO V4 Thermal Comfort Simulation Software. This calculates the expected level of energy required to heat and cool each dwelling per annum, expressed in megajoules per square metre of floor area (MJ/m2).

The proposed development has achieved the BASIX Water Target of 40%., based on the following BASIX Water Commitments:

- Install showerheads minimum rating of 4 stars-mid flow (>6 and <= 7.5 Litres/min)
- Install toilet flushing system with a minimum rating of 4 stars in each toilet
- Install tap with minimum rating of 6 stars in the kitchen
- Install taps with minimum rating of 6 stars in each bathroom
- Install rainwater tank, minimum 10,000L capacity collected from min. 3,800m² roof area across all buildings. Tank connected to – common area landscape irrigation

The energy usage of the development is calculated based on the efficiency of fixed appliances that will be used. This includes the air-conditioning system, hot water system, lighting, exhaust fans, cook top, oven, and clothes drying facilities.

The proposed residential development has achieved the Energy target of 62%, based on the following BASIX Energy Commitments:

- Hot water system: centralized electric heat pump, air sourced; COP 3.0 -3.5
- Cooling System: 1-phase non-ducted air conditioning: EER 3.0-3.5
- Heating System: 1-phase non-ducted air conditioning: EER 3.0-3.5
- Lifts: gearless traction with VVVF motor
- Induction cooktops & electric ovens
- Outdoor clothes drying lines
- Alternative Energy: 240 kW solar Photovoltaic system

Under clause 6.59 of the Sydney Local Environmental Plan 2012 (LEP 2012), a bonus floor space ratio (FSR) of up to 0.15:1 is available if the project exceeds BASIX commitments by 5 points.

The additional 5 points for energy can be met within the project. However, the additional 5 points for water cannot be met within the project constraints, particularly the proposed tenure mix including social and affordable housing managed by a not-for-profit community housing provider.

2.4 NABERS Energy and Water

NABERS is a performance-based tool that is assessed and certified annually based on metered energy and water consumption. A NABERS Commitment Agreement is a contract signed by a developer or a building owner at the design stage. The agreement outlines a commitment to design, construct, and commission a building to achieve a specific NABERS Energy rating.

To achieve the NABERS Energy rating of 5.5 stars & NABERS water rating of 4.5 stars, the project team may need to consider the following efficiency measures:

- High efficiency heat pumps
- Advanced control strategies
- Relaxed space setpoints whilst maintaining high levels of thermal comfort (PMV± 0.5)
- Economy cycle cooling
- Internal low-e blinds as base building provision.
- PV – apportioned to and feeding the commercial electrical boards.
- Electric instantaneous DHW systems to reduce reticulation losses.
- Efficient lifts (Class A) with regenerative drives.
- System design to reduce pumping / fan pressures and allow for maximum turndown.

NABERS preliminary modelling is currently being undertaken to confirm the measures required to achieve the Energy and Water ratings.

3 SEARs Requirements

3.1 SEARs ESD Principles

The Section 193 of the EP&A Regulation requires the development to address the following principles of ecologically sustainable development.

Table 4 Section 193 of EP&A Regulation Strategy

Principle	Requirements	Design Response (Mitigation Measures)
Precautionary principle	• If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. • Careful valuation to avoid irreversible damage to the environment. • An assessment of risk-weighted consequences.	• Contractor will follow best practice and develop a site-specific construction environmental management plan • Social Sustainability: Provision of EOT facilities for ease of access to and from the site during high-risk situations and to promote active transport (less fossil fuelled cars). There is currently provision for 4 showers, bike storage facilities and lockers for the use of building staff and occupants. Residents will have bicycle parking provided in the basement and visitor bicycle parking near the main entry to each building. • Operations Environmental Management Plans will be developed by the operator to avoid irreversible damage to the environment
Inter-generational equity	• The present generation should ensure the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.	• Foster community resilience through engagement with local stakeholders and participation in local community programs • Vehicle charging bays will be provided with electric vehicle charging infrastructure, with capacity provision for future increase • Targeted rooftop PV arrays on the rooftop of S1 and S4 will be utilized to power basic systems during utility disruptions, with the option for shared usage within the precinct. This energy will be used for the centralised domestic hot water heat pumps, all common area lighting and ventilation, lifts and the commercial office space energy demand • Permeable paving over areas of deep soil help to replenish the water table of the site.
Conservation of biological diversity and ecological integrity	• The conservation of biological diversity and ecological integrity should be a fundamental consideration.	• The existing site has limited biological diversity. Therefore, proposed landscaping has minimum impact on local species or ecological integrity. However, the proposed landscaping schemes will improve biological diversity and provide better environments for local ecosystems. • Irrigation systems will be designed to incorporate monitoring devices to detect sub-soil moisture, weather and other environmental data to efficiently control irrigation regimes. This is further detailed within the landscaping report. • Major materials and products will be responsibly sourced for low environmental impact with third-party accreditation. • Chiller plant and all refrigeration systems will be selected on the basis of minimising environmental impacts through the selection of low ozone depletion potential (low ODP) and low global warming potential (low GWP) refrigerants and through implementing leak detection and management measures. • Landscaping of the communal courtyards to promote green corridors and reduce heat island effects
Improved valuation, pricing and incentive mechanisms	• Environmental factors should be included in the valuation of assets and services such as: the polluter pays, users of goods and services should pay prices based on life cycles, established ESD goals should be pursued in the most cost-effective ways.	• A whole of life integrated waste management system that facilitates circular economy approach to material reduction and recycling • During building operation, minimise waste-to-landfill through the provision of recyclable waste, organics, e-waste and non-recyclable waste storage at each level of the building as appropriate • Eliminate combustion and air pollution emission sources from regularly used building systems, including heating, cooling, and hot water generation. • The buildings will be all electric and run on 100% renewable power.

3.2 Sustainability and Environmental Performance Standards

3.2.1 SEARS Requirement

Demonstrate how the development will meet or exceed the relevant industry recognised building sustainability and environmental performance standards.

3.2.2 Project Response

Redfern Place will meet and exceed relevant industry recognised building sustainability and environmental performance standards by targeting the following certifications:

- Green Star Buildings 5 Star rating for each building
- NABERS Energy 5.5 Star rating for commercial office space
- NABERS Water 4.5 Star rating for commercial office space
- Residential development
  - BASIX Energy 62 + 5
  - BASIX Water 40
  - NatHERS 7 Star average
- Non-residential – Embodied Emissions Reporting

Please see Section 2 Assurance and Benchmarking (this report) for more detail.

3.3 Energy, Water and Materials

Table 5 SEARs Requirements

Sustainability Category	Design Response (Mitigation Measures)
Greenhouse Gas Emissions	• Minimise combustion in building systems to enable zero-carbon operations through renewable power purchase. • Solar PV panels will be installed on the S1 and S4 roofs to provide renewable energy that further reduces GHG emissions. At this stage, it is estimated that approximately 240kW could be accommodated. • Reduced Urban Heat-Island Affect through increased landscaping and lighter materiality in construction.
Energy Consumption	• Integrate passive design principles: sufficient well-insulated external wall, to minimise architectural and mechanical system complexity. This has been optimised through coordination between the architect, ESD consultant and façade engineer to achieve the following outcomes: – Façade and building openings designed to maximise natural ventilation and minimal mechanical HVAC use – Horizontal and vertical passive solar shades to reduce heat loads. High performance envelope that maximises solar control while maintaining great daylight. – Glazing and structure materiality has been catered to ensure both high visual comfort and comfortable levels of solar gain. Minimises electrical lighting needs. • Operate with minimal energy input to provide low-carbon, low energy cost residences. – Future proofing to enable net-zero carbon through 100% energy and electricity via renewable sources. – Lower cost electricity for residents through an exploration of an embedded network and including extensive on site renewable energy supply. – Further coordination between ESD consultant and Building Services during Detailed Design to ensure design meets the NABERS target for benchmarking assurance. • Minimise additional peak resource loads upon local utilities and provide smart grid benefits to the network.
Water Consumption	• Water conservation considerations include fixtures and fittings selected for high WELS ratings as appropriate to minimise water consumption, low water-use species for landscaping, rainwater harvesting and re-use. • Stormwater capture and recycling on roof and within landscape. Reused for irrigation
Material Resources	• The project will be pursuing credits in Green Star that relate to the minimisation of embodied carbon and water in materials and sourced from sustainability certified manufacturers/suppliers, where possible. • Waste recycling targets of 90% for construction materials in accordance with Green Star requirements • The project will be pursuing features in the Green Star Building rating tool that relate to healthy building materials, such as low-VOC products, and development of product specifications. • Use of low-carbon concrete and cements through material specification to maximise Green Star points in the positive category, including sourcing of sustainably certified materials or through sustainable procurement processes.

4 Design Guide Requirements

Table 6 600-660 Elizabeth Street Redfern - Design Guide Summary

3.9 Ecologically Sustainable Development	Design Response
Objectives	
a) Minimise energy and water use and waste generation. b) Maximise on-site renewable energy generation, water re-use and waste recycling	• Energy, water use, and waste generation will be minimised. • Approximately 240kW of PV will be installed on the roofs of both S1 and S4, one of the biggest solar energy installations for a high-density housing development in Sydney. • Rainwater will be harvested and used to irrigate the common area landscaping. • Efficient fittings will be specified and installed to reduce water demand • The waste storage area is sized to accommodate waste sorting to support recycling
Guidance	
1. Development is to achieve the following minimum ratings. a) All development • 6-Star Green Star communities rating • 5-star Green Star Design and As Built (Old Tool) a) Residential development • BASIX Energy 40 (Old Tool) • BASIX Water 40 with a target to exceed by 5 points. b) Commercial areas • NABERS Energy rating of 5.5 stars • NABERS water rating of 4.5 stars	• The development is not eligible for a Green Star Communities rating, please see attached response to eligibility query R-25258, but will still meet the energy, water and waste objectives of the design guide. • These will be assured by each building targeting a 5 Star Green Star Buildings rating (equivalent to a 6 Star Design and As Built rating), using a Site Wide approach. • BASIX Energy will be exceeded due to the large Solar PV installation on S1 and S4 • BASIX Water will be met as per Sustainability SEPP requirements. • The Commercial office space is on track to achieve NABERS Energy 5.5 star (base building) and NABERS Water 4.5 stars based on current documentation.
2. All development is to have a combination of green roofs, roof-top solar PV and communal open space on rooftops. Other areas should be designed with high albedo qualities to reflect heat	• S2 includes landscaped planters on level 10 • S3 and S4 include areas of roof terrace with indigenous planting • S1 and S4 include roof top solar PV • The development is targeting the Green Star credit 19 Heat Resilience which requires 75% of the site area to comprise of strategies that reduce the heat island effect (vegetation, roofing materials and hardscaping elements with a relevant Solar Reflective Index).
3. The site is to be planned to minimise paved areas and maximise stormwater infiltration. All public access paving must be permeable except where accessibility requirements restrict it.	• Permeable paving will be used where practical and above deep soil to enable stormwater infiltration. See separate Landscape report for more detail.
4. All development is to be designed to maximise passive design approaches including provision of external sun access and shading to all apartments except where tree canopy provides shading over an extended summer period.	• The shading to the residential façades has been carefully designed to allow solar access during winter and shade during summer. Please see the architects plans and reports for detail.
5. All apartments should have access to external clothes drying facilities, either private or communal.	• All apartments have access to an outdoor drying line, either on a private balcony or communal terrace.
6. All parts of the development must include piping for use of recycled water in irrigation, toilets, and the like.	• Rainwater will be harvested from the roofs of the buildings and used for irrigating the communal landscape on ground floor and landscaped roof terraces
7. Development must follow the guidance of the City of Sydney Guidelines for Waste Management in New Development	• Please see the separate Operational Waste Report for detail
8. Connection into the water storage located in Redfern Park should be considered in consultation with the City of Sydney	• Following consideration, the development is not connecting to the existing water storage located in Redfern Park due to practicalities.

5 Sustainable Buildings SEPP

Table 7 Sustainable Buildings SEPP

State Environmental Planning Policy (sustainable Buildings) 2022	Design Response	Supporting Documentation
Chapter 2 Standards for residential development - BASIX		
Schedule 1 sets out the standards that apply to BASIX development • Part 1 Energy and water use – Energy Use 60% – Water Use 40% • Part 2 Thermal Performance – Max heating load per dwelling: 34.4MJ/m2 – Max cooling load per dwelling: 21.4 MJ/m2 – Max weighted average heating load: 28.1 MJ/m2 – Max weighted average cooling load: 20 MJ/m2 – Max total (heating plus cooling) weighted average load: 30MJ/m2	• Approximately 240kW of PV will be installed on the roofs of both S1 and S4, one of the biggest solar energy installations for a high-density housing development in Sydney. • Rainwater will be harvested and used to irrigate the common area landscaping. • Efficient fittings will be specified and installed to reduce water demand • High performance glazing and rationalised shading reduce the cooling and heating load of the units • BASIX Energy will be exceeded due to the large Solar PV installation on S1 and S4 • BASIX Water will be met as per Sustainability SEPP requirements. • Thermal Performance results: – Max heating load per dwelling: 28.6MJ/m2 – Max cooling load per dwelling: 20.4 MJ/m2 – Max weighted average heating load: 8.7 MJ/m2 – Max weighted average cooling load: 10.6 MJ/m2 – Max total (heating plus cooling) weighted average load: 19.3MJ/m2	• Please refer to Appendix C – NatHERS and BASIX
Chapter 3 Standards for non-residential development		
Development consent for non-residential development (1) In deciding whether to grant development consent to non-residential development, the consent authority must consider whether the development is designed to enable the following— a) the minimisation of waste from associated demolition and construction, including by the choice and reuse of building materials, b) a reduction in peak demand for electricity, including through the use of energy efficient technology, c) a reduction in the reliance on artificial lighting and mechanical heating and cooling through passive design, d) the generation and storage of renewable energy, e) the metering and monitoring of energy consumption, f) the minimisation of the consumption of potable water.	• The project is targeting 90% diversion of construction and demolition waste from landfill for Credit Achievement of Green Star Credit 2 Responsible Construction • Energy efficient lighting and mechanical plant will be designed to reduce the peak demand for electricity. • 243kW of PV will be installed on the roofs of both S1 and S4, helping to reduce peak electricity demand • Lighting will be controlled by movement and daylight sensors in common areas. • Facades have been designed to reduce reliance on mechanical heating and cooling systems through rationalised window to wall ratios, high performance glazing and rationalised shading to facades • The metering and monitoring system will be designed to meet the Green Star Buildings requirements. Accessible energy and water metering will be provided for all common uses, major uses and major sources. The meters will be connected to an automatic monitoring system that will provide continual information and be commissioned and calibrated per the most current “Validating Non-Utility Meters for NABERS ratings” protocol. • Rainwater will be harvested and used to irrigate the common area landscaping. • Efficient fittings will be specified and installed to reduce water demand • The Commercial office space is on track to achieve NABERS Energy 5.5 star (base building) and NABERS Water 4.5 stars based on current documentation.	• Please refer to separate Demolition and Construction Waste Plan • Please refer to Appendix B – Green Star Buildings V1 Appraisal
(2) Development consent must not be granted to non-residential development unless the consent authority is satisfied the embodied emissions attributable to the development have been quantified	• All buildings must achieve 20% reduction in upfront carbon to target 5 Star Green Star Buildings (for projects registered after 2023). • Material quantities have been estimated and reported in BASIX Materials section (for residential buildings) and the NABERS Embodied Emissions Materials Form (for non-residential buildings)	• Please refer to Appendix B – Green Star Buildings V1 Appraisal • Please refer to Appendix C – NatHERS and BASIX • Please refer to Appendix F – NABERS Embodied Emissions Materials Form
Other considerations for large commercial development (1) In deciding whether to grant development consent to large commercial development, the consent authority must consider whether the development minimises the use of on-site fossil fuels, as part of the goal of achieving net zero emissions in New South Wales by 2050.	• The development will be 100% electric with a commitment from day one to purchase renewable energy for the base building energy use. • All buildings must achieve the Green Star Climate Positive Pathway which includes fossil fuel free, powered by renewables, highly efficient and built with lower upfront emissions.	• Please refer to Appendix B – Green Star Buildings V1 Appraisal
(2) Development consent must not be granted to large commercial development unless the consent authority is satisfied the development is capable of achieving the standards for energy and water use specified in Schedule 3 • Energy Use ○ The standard for energy use for development for the purposes of prescribed office premises is a 5.5 star NABERS energy rating • Water Use ○ The standard for water use for large commercial development is a 3 star NABERS water rating.	• In accordance with Section 3.3(4) of the Sustainability SEPP, the development is subject to the Sydney LEP, and so the energy standards specified in Schedule 3 do not apply. However, NABERS rating of 5.5 stars is still being targeted. • The commercial office space is on track to achieve NABERS Energy 5.5 star (base building) and • NABERS Water 4.5 stars based on current documentation.	• Please refer to Appendix E - NABERS Memorandum

6 Sustainability Vision

6.1 Affordability

Redfern Place is committed to increased affordability, including increased energy and water efficiency leading to reduced energy and water bills, and providing sharing opportunities for the residents.

Principles

- Passive design and best practice systems design minimise operational energy use.
- Reduce energy demand through efficient energy systems (lighting, HVAC and hot water) and appliances.
- Reduce water demand through efficient water fittings and fixtures and appliances.

Targets

- Reduce potable water demand by about 30% compared to business as usual.
- Achieve a whole-building (including building systems) operational energy savings of 10% relative to NCC Section J and BASIX performance baseline.
- Provide space to support sharing economy practices.

6.1.1 Precinct Design

Redfern Place aims to foster a sustainable and community-centric environment through various initiatives. Spaces for sharing economy, like appliance libraries in communal areas, will encourage resource-sharing among residents. Solar-powered LED outdoor lighting will enhance public safety while minimizing energy consumption. Responsible energy use will be promoted through signage and informational campaigns.

Moreover, a centralized rainwater capture tank will be installed to retain water for irrigation, complemented by sensor-based irrigation systems adjusting watering schedules based on weather and soil conditions. Water leak detection systems integrated with the monitoring system will ensure efficient water usage. Universally accessible drinking water fountains equipped with bottle filling stations will be available in communal spaces, encouraging hydration while reducing plastic waste.

To further sustainability efforts, community programs educate residents on energy and water conservation, fostering a culture of environmental responsibility within the community. Through these integrated measures, the complex strives to create a sustainable, inclusive, and vibrant living environment for its residents.

6.1.2 Residential Design

Redfern Place prioritizes passive design strategies to minimize reliance on mechanical cooling and heating, ensuring energy efficiency and comfort for residents. Façade shading and balcony depths are optimized to maximize passive design solutions, providing both shade and ample daylight while reducing cooling energy use. Energy and water-efficient fixtures and appliances will be provided in both individual units and common areas, promoting sustainable living practices.

Spaces supporting the sharing economy, such as appliance libraries, will be explored to encourage resource-sharing among residents, further reducing environmental impact. Sharing economy programs, like appliance libraries, will be carefully managed to ensure their effectiveness and accessibility.

Rainwater will be captured from non-trafficable roof surfaces for landscape irrigation, conserving water resources. Ceiling fans will be installed in bedrooms and living rooms to enhance ventilation and comfort.

Interior lighting will be efficiently designed, with a maximum power consumption of 2W/m², while high-efficiency WELS water fixtures and fittings help minimize water usage. Each apartment is equipped with meters to monitor energy and water use, encouraging residents to track and manage their consumption.

Through these integrated measures, the complex strives to create a sustainable and vibrant living environment for its residents.

6.1.3 Commercial Office and Community Facility Design

The Community Centre and commercial office space will incorporate various strategies to enhance energy efficiency and sustainability while ensuring a comfortable environment for residents and visitors.

An energy-efficient HVAC system is specified to minimize energy demand. Mixed mode and economy mode ventilation systems allow for natural ventilation where possible, switching to mechanical ventilation only when necessary, reducing energy consumption. Façades are optimized to provide shade to glazing, reducing cooling energy use while maintaining high-quality daylighting.

The design maximizes free cooling from outdoor air through cross ventilation, and 100% economy cycle capacity. Interior lighting is efficient, with a maximum power consumption of 2W/m², and high-efficiency WELS water fixtures and fittings are installed throughout the complex.

Rainwater is captured from non-trafficable roof surfaces for landscape irrigation, conserving water resources. Water leak detection systems are installed throughout the premises, reporting to the monitoring system to promptly address any issues.

To further enhance sustainability, photovoltaic panels are included on the rooftop of S1 and S4 for on-site renewable energy generation. This energy will be used for the centralised domestic hot water heat pumps, all common area lighting and ventilation, lifts and the commercial office space energy demand. The operational energy efficiency of the buildings will be guaranteed and verified through building performance tuning for 12 months following practical completion, ensuring long-term sustainability and performance.

Figure 7: Affordability

6.2 Healthy and Inclusive

Redfern Place is an opportunity to support public health initiatives and provide an exceptional environment that enriches the health and wellbeing of residents, occupants and visitors.

Principles

- Encourage physical activity with active mobility and recreational exercise.
- Improving mental health through connection to nature, biophilia, safety, sense of belonging and enhancing social engagement.
- All built environment is fully physically accessible and inclusive.
- Public realm and amenity spaces support gathering, socialising and collaboration.

Targets

- Achieve passive thermal comfort aligned with TM59: Design methodology for the assessment of overheating risk in homes (CIBSE, 2017).
- Maintain indoor particulate count at safe levels even at bushfire events.
- The precinct is designed with best practice universal design principles
- Residential buildings designed to LHA Silver Level for liveable housing design with 15% apartments designed to Gold.
- Maximise % of apartments with living rooms receiving at least 2 hours of direct sun, as assessed using ADG method.
- Minimise areas of communal courtyards that receive no direct sunlight.

6.2.1 Precinct Design

The design of the site will prioritize accessibility, health, and community well-being. Wide footpaths will accommodate mobility aids and encourage social interaction, while building massing and form will maximize daylight to create a vibrant ground plane. Significant vegetation will not only enhance the environment but also capture airborne pollution and rooftop terraces will increase solar access to communal open space. The site will be walkable, permeable, and designed with people in mind, featuring a legible wayfinding system suitable for all abilities.

Natural materials will be celebrated through biophilic design, and universally accessible drinking water fountains with bottle filling stations will be strategically placed throughout. Clear lines of sight and visual connections will create a sense of openness and safety, while cool and healthy public spaces will offer respite. Rooftop terraces provided to all residential buildings will increase solar access to communal open space.

The streetscape will be designed to complement and enhance the surrounding built form and spaces. Design and operational strategies will offer diverse, publicly accessible amenities to support community activity and interaction.

6.2.2 Residential Design

The design will emphasize accessibility, sustainability, and occupant well-being. Generous corridor widths will accommodate mobility aids and encourage social interaction. Building massing and form will be optimized to facilitate seasonal outdoor airflow and maximize daylight on the ground plane. Significant vegetation will be integrated to capture airborne pollution and particulate matter.

Adequate shading will be provided to limit direct sunlight in habitable rooms during summer while ensuring sufficient solar gain in winter. Enhanced wall insulation with appropriate wall thickness will be incorporated, and all dwelling units will be designed to receive some direct sunlight. Low or no VOC emitting finish materials and products will be specified to maintain indoor air quality.

Thermally improved, air-tight glazing systems will be selected to ensure energy efficiency, and their installation will achieve required U-value standards. Partnerships with local service providers will be established to offer subsidized healthy food options such as fruit and vegetable boxes, promoting access to nutritious food for residents.

6.2.3 Commercial Office and Community Facility Design

The design will prioritize the well-being and comfort of occupants through several key features. Generous corridor widths will support mobility aids and encourage social interaction. Mechanical ventilation systems will provide adequate fresh air through mixed-mode operation, with air handlers equipped for additional filtration to exclude pollutants.

To maintain indoor air quality, intake locations for fresh air will be strategically located away from pollution sources, and low or no VOC emitting finish materials will be specified. Measures will be taken to prevent moisture build-up through the building envelope, including the elimination of thermal bridges and the use of vapor-permeable membranes.

High-level windows will be designed to provide daylight to gym spaces without causing uncomfortable glare.

Activated communal amenity and wellness spaces will promote interaction and well-being, with events and networking opportunities tailored to the local community and demographics.

Furthermore, a powerful aligned partnerships program will foster collaboration to support the needs of the community and enhance the overall environment.

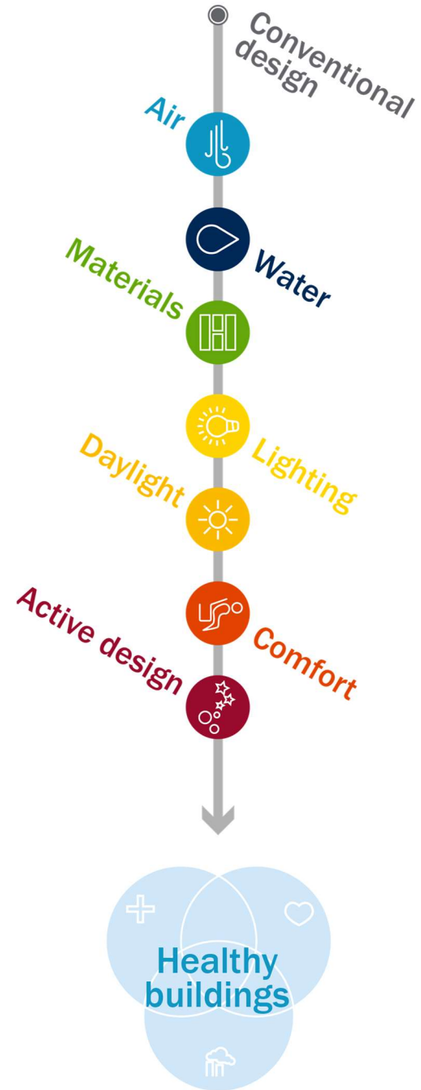


Figure 8: Pathway from Conventional Design to Healthy Buildings

6.3 Resilient and Adaptable

Redfern Place will exemplify forward looking development by mitigating exposure to foreseen risks, being resilient to disruption, recovering rapidly, and being adaptable to societal advancement.

Principles

- Resilient to short term shocks (extreme weather, utility failures).
- Adaptable to long term stresses (climate change, increasing energy costs).
- Flexible to changing market conditions and environmental performance expectations.

Targets

- Achieve passive thermal comfort aligned with TM59: Design methodology for the assessment of overheating risk in homes (CIBSE, 2017).
- Demonstrate best practice access to daylight and internal visual comfort.
- Designed for building services upgrades or supplementing of energy systems to cope with future temperature increases.
- Increase community cohesion and support the development of community and community resilience.

6.3.1 Precinct Design

The design will prioritize environmental sustainability and community resilience through various measures. Surface runoff from roofs and hardscapes will be carefully filtered through landscape treatment before discharge to waterways, minimizing pollution. On-site stormwater detention systems will handle heavy rainfall events, delaying discharge to prevent flooding.

Extensive urban street canopies will provide shade and encourage active transport, even during hot days, enhancing heat resilience. The public realm will be extensively vegetated to mitigate urban heat island effects and combat increasing peak temperatures. Landscapes will be designed to balance drought-tolerant low evapo-transpirative species with high evapo-transpirative species for local cooling.

Local vegetation and trees will be chosen to withstand forecasted environmental extremes, such as resisting bushfires. Precinct places will be designed to foster interaction, stewardship, community identity, and a sense of connectedness, thereby increasing community resilience capacity.

6.3.2 Residential Design

The design will adopt a climate-responsive approach, optimizing the building envelope for passive climate control. Rooftop planters and landscaped terraces will be incorporated where practical to mitigate urban heat island effects and combat increasing peak temperatures.

All-electric building services and kitchens will be implemented for sustainability. Targeting rooftop PV arrays to run basic systems during the day will ensure minimum functionality during utility disruptions. This energy will be used for the centralised domestic hot water heat pumps, all common area lighting and ventilation, lifts and the commercial office space energy demand.

Critical equipment and services, such as electrical equipment and switchgear, emergency power equipment, and major HVAC plant, will be located above Probable Maximum Flood (PMF) levels to prevent damage during flooding. Structures below PMF will be designed to withstand flooding.

Preliminary space for future battery standby power will be included to ensure continuous operation during emergencies. Community facilities such as communal meeting rooms, community kitchen and outdoor spaces will be integrated into the design to serve as gathering places during emergencies and interruptions in services, enhancing community resilience.

6.3.3 Commercial Office and Community Facility Design

The design will integrate several features to enhance sustainability, resilience, and occupant comfort:

Targeted rooftop PV arrays on the rooftop of S1 and S4 will be utilized to power basic systems of the commercial office during utility disruptions, with the option to incorporate the PCYC in an embedded network for the site being explored. Space will be allocated for future energy storage, whether electrical or thermal batteries, to bolster energy resilience.

Operable facade areas will be provided to allow fresh air intake during power outages, ensuring ventilation even in emergencies. The layout will be designed to be flexible, accommodating changing occupier requirements and promoting adaptability over time.

All structures below the Probable Maximum Flood (PMF) level will be designed to withstand flooding, ensuring structural integrity and safety.

Islanding capability will be enabled for on-site generation and standby power circuits, allowing limited building operations without utility power. Additionally, measures will be in place to provide clean fresh air during high pollution levels, such as during bushfire smoke events, to maintain indoor air quality and occupant health.

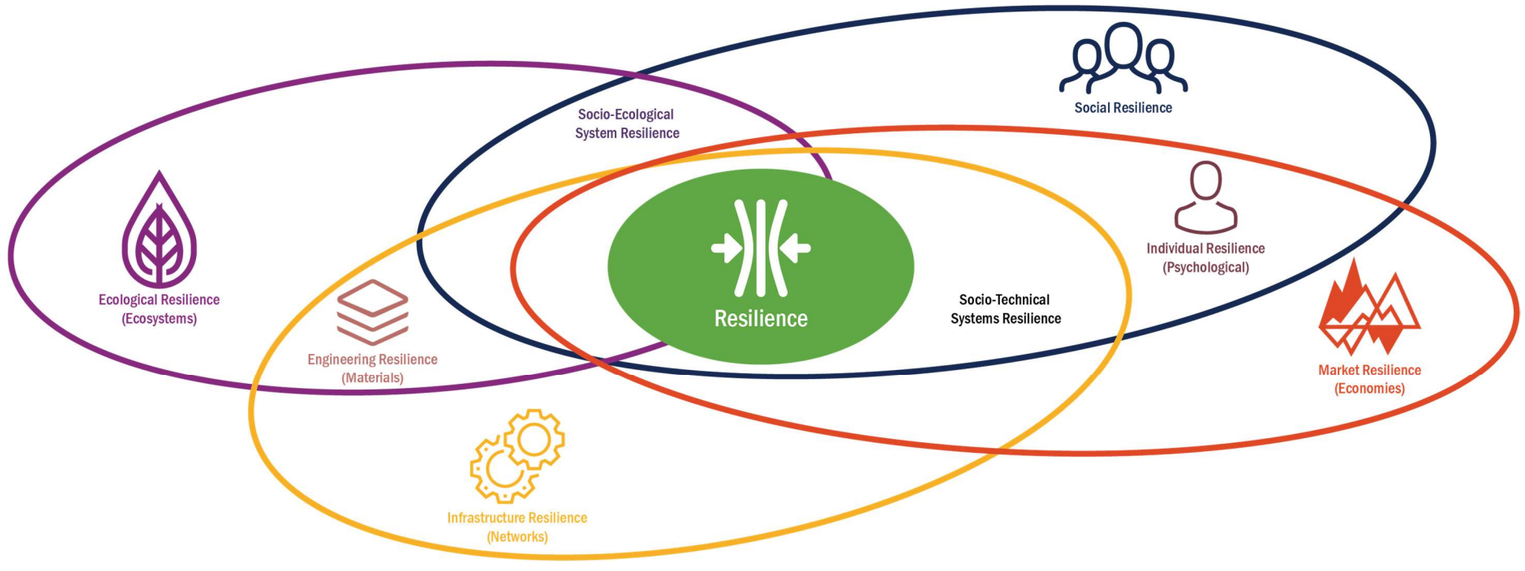


Figure 9: Multidisciplinary overview of urban resilience

6.4 Caring for Country

A strong understanding of and connection to Country will produce a building environment that has a distinct identity, shaping a unique sense of place that is necessary to attract investment and ensure longevity, social justice and inclusion.

Principles

- Acknowledge Traditional Owners (Gadigal People) and other Aboriginal peoples in the local and regional communities.
- Cultural heritage sites are protected and accessible to local Aboriginal communities for ongoing cultural practices.
- Indigenous ecosystems endemic to the local area have been regenerated.
- Indigenous culture, heritage, and knowledge of local country is embedded and evident in the built and cultivated environments of the development.
- Opportunities for Indigenous communities are regularly created through ongoing development.

Targets

- Include Indigenous designers and decision makers, especially ones with Ancestral connections to these lands, throughout the project.
- Develop project specific indicators to measure impact to Country and culture.

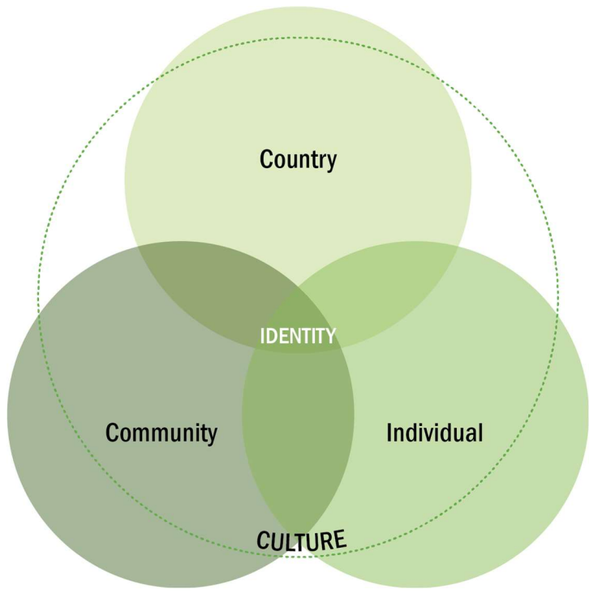
6.4.1 Precinct and Residential Design

The design team has worked with Yerrabingin to undertake a series of design jams with the local Aboriginal community to inform the project. The design approach of Redfern Place prioritizes cultural inclusivity and respect for Indigenous heritage.

There will be opportunities through the next detailed phase of design to incorporate traditional language through signage (including pronunciation, place names), Aboriginal art and native vegetation.

Bridge Housing and PCYC can explore Aboriginal employment opportunities through both delivery and operations on the site, including opportunities for educational programs for the new and existing community, connecting the diverse community and local industry to a deep sense of knowledge about the area's deep Indigenous history.

Bridge Housing has committed to providing 15% of social and affordable homes for Aboriginal households, ensuring an ongoing connection of the site with Aboriginal community members.



Reciprocal relationships with Country and community form cultural practices, which in turn shape individual identities. All are also influenced by external factors including environment, politics, and wider society.

Figure 10: Inter-relationships between Country, community, and individuals

.

6.5 Circular Economy

The mixed-use activities combined with the large-scale development of new infrastructure and building construction in the area provide an opportunity to design an industrial ecosystem that cycles resources at high value internally.

Principles

- Built environment accommodates sharing economy practices.
- Built environment enables alternative future uses buildings and landscapes.
- Buildings incorporate high percentage of recycled/renewable construction materials and products.
- Construction waste practically eliminated.
- Operational waste is separated for recovery and recycling.
- Zero organic waste to landfill.

Targets

- 90% diversion of construction waste from landfill
- Facilities for nutrient recycling compost capture and recycling
- Maximise recycled/renewable construction materials and products.
- Spaces are provided that support the sharing economy.

6.5.1 Precinct Design

The Redfern Place precinct will prioritize sustainability and circular economy principles in its design and operations:

Construction waste will be diverted from landfill, aiming for a 90% diversion rate to reduce environmental impact. Recycled and renewable construction materials and products will be maximized throughout the project to minimize resource consumption and promote sustainability.

Infrastructure for a circular economy will be provided within the precinct, supporting initiatives such as recycling, reusing, and repurposing materials. The design of public spaces and art can incorporate sustainable and circular economy principles, such as collaborating with local artists to create public art displays using disregarded car parts for example, promoting creativity and resourcefulness.

Investments will be made in shared infrastructure to support waste stream diversion to recycling, ensuring efficient and effective recycling processes within the precinct. Clear signage will be installed to educate visitors and residents on proper waste disposal practices, promoting responsible waste management and encouraging participation in recycling efforts.

6.5.2 Residential Design

The Redfern Place precinct will be designed to prioritize sustainability, community engagement, and resource efficiency:

Maximizing the use of recycled and renewable construction materials and products will reduce environmental impact and promote resource conservation. The spatial plan will allow for flexibility, enabling modification, replacement, or exchange of different functions over time to accommodate changing needs and preferences.

Bridge will explore the provision of space to support sharing economy practices, such as shared home appliances, a street library, clothing exchange, and a food bank, fostering a sense of community and reducing waste.

On-site waste management and processing facilities, including composting and organic waste recycling, will be provided to promote sustainability and minimize landfill waste. Additionally, space will be allocated for private food growing and edible landscapes on roof terraces, encouraging self-sufficiency and promoting healthy living.

Communal sharing spaces could include assets like a communal kitchen and workshops, promoting collaboration and resource sharing within the community. A communal composting bank will allow residents to deposit food scraps, further reducing waste and promoting sustainability.

Bulk buy provision schemes for residents could promote sustainable products such as fruit and vegetable boxes, encouraging environmentally friendly consumption habits.

A facility or program can be developed to enable people to swap and donate used sports and art equipment, reducing waste and promoting reuse. Furthermore, more separated waste streams, including paper, cardboard, metal, glass, hard plastic, soft plastic, and organics, will be collected from precinct residents to enhance recycling efforts and reduce landfill waste.

6.5.3 Commercial Office and Community Facility Design

The Redfern Place precinct will focus on sustainability and community engagement through various initiatives:

Maximizing recycled and renewable construction materials and products will reduce environmental impact and promote resource efficiency. Modular construction of buildings and a flexible spatial plan will allow for modification, replacement, or exchange of different functions over time, ensuring adaptability to evolving needs.

Additionally, on-site waste management and processing facilities, including composting and organic waste recycling, will be provided to promote sustainability and minimize landfill waste.

To further promote sustainability, a procurement standard will be implemented that includes the purchase of recycled content, supporting the circular economy and reducing reliance on virgin materials. Moreover, more separated waste streams will be collected from PCYC users, including paper, cardboard, metal, glass, hard plastic, soft plastic, and organics, enhancing recycling efforts and reducing overall waste.

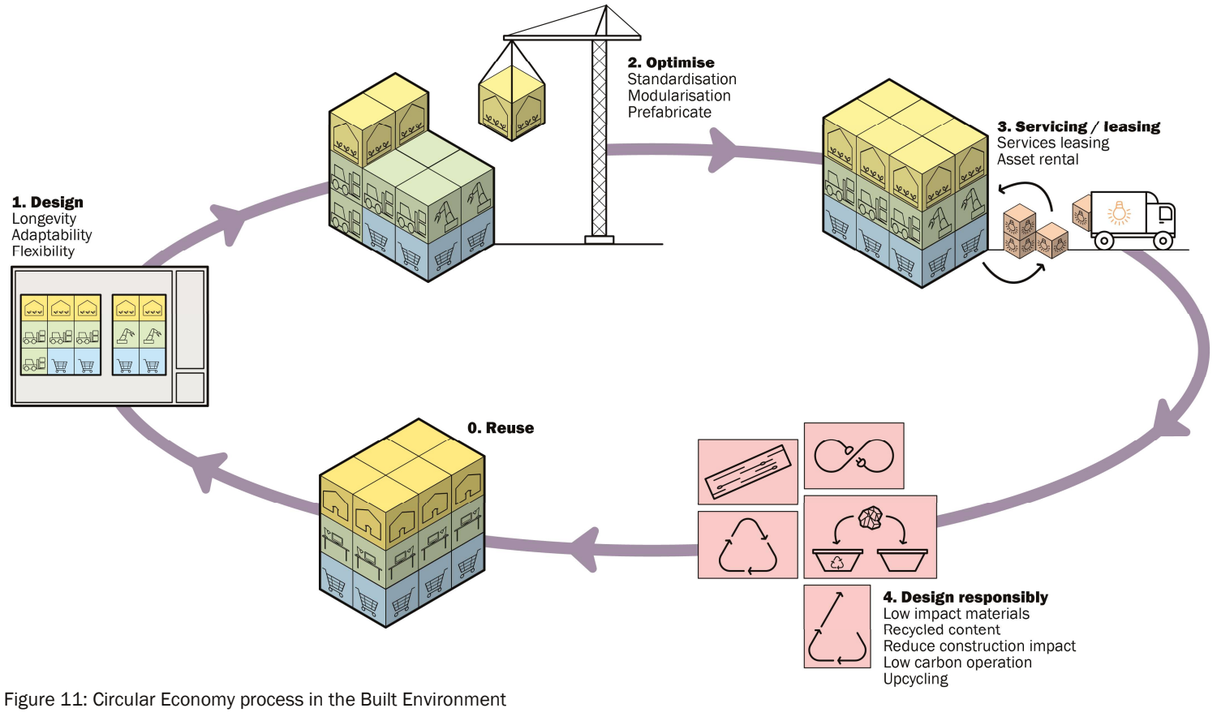


Figure 11: Circular Economy process in the Built Environment

6.6 Urban Forest

Redfern Place will intensify the 'green zones' that extend up the building. It will enhance the indoor and outdoor spaces by the inclusion of indigenous ecologies and provide respite for residents, occupants and wildlife alike.

Principles

- Enhance Urban Ecology
- Establish a biophilic environment that provides regular immersion in and contact with nature and natural systems.
- Maximise future mature tree canopy and vegetation coverage.
- Prioritise nature-based solutions wherever possible.
- Eliminate pollutant discharge into the waterways from wastewater and stormwater.

Targets

- Target minimum 15% landscaping of the project site area.
- Target the retention of significant street tress where possible.
- Create habitat for flora and fauna indigenous to Redfern or otherwise targeted by City of Sydney as ecologically significant.
- Zero habitat for pest fauna species.

6.6.1 Precinct Design

The design of the precinct will prioritize sustainable water management and biodiversity:

Surface runoff from hardscapes will be filtered through landscape treatment before discharging to waterways, reducing pollution and improving water quality. On-site stormwater detention for heavy rainfall events will delay discharge, mitigating flooding and erosion risks.

Groundwater recharge will be encouraged through permeable ground cover, contributing to sustainable water resources. Street trees will be maximally retained to provide shade, mitigate heat, and enhance biodiversity.

Vegetation layers will mimic vertical structure (stratification) to increase diversity of faunal habitat opportunities, promoting biodiversity and ecosystem resilience. Resilient ecosystems and green spaces will be provided for endemic flora and fauna, supporting local biodiversity.

Continuous canopy coverage will be prioritized along streets, pedestrian, and bicycle routes wherever possible to provide shade and enhance the urban environment. Pesticide use will be eliminated from landscape maintenance, promoting ecological health and human well-being.

Communal gardens and worm farms will be integrated into the precinct, fostering community engagement and promoting sustainable food production and waste management practices. Pollinator habitats, including flower gardens, will be incorporated to support local biodiversity and ecosystem health.

Locally sensitive, drought-tolerant plant species that require little irrigation and maintenance will be included in the landscaping, promoting water efficiency and resilience to climate change.

6.6.2 Residential Design

Redfern Place will prioritize sustainable water management and biodiversity conservation:

Surface runoff from hardscapes will be filtered through landscape treatment before discharging to waterways, reducing pollution, and improving water quality. On-site stormwater detention for heavy rainfall events will delay discharge, preventing flooding and erosion.

Street trees will be maximally retained to provide shade, improve air quality, and enhance the urban environment. Roof gardens and terraces will be incorporated to create habitat for locally indigenous flora and fauna, increasing biodiversity and providing green spaces for residents.

Communal gardens will promote community engagement and sustainable food production and waste management practices. Pollinator habitats, including flower gardens, will support local biodiversity and ecosystem health by providing food and habitat for bees and other pollinators.

Locally sensitive, drought-tolerant plant species that require little irrigation and maintenance will be integrated into the landscaping, promoting water efficiency and resilience to climate change while preserving the natural character of the area.

Residents will be encouraged to take ownership of their environment, from maintaining communal gardens to participating in habitat restoration projects and wildlife monitoring. By fostering a sense of responsibility and connection to the local ecosystem, these programs will contribute to building a resilient and environmentally conscious community.

6.6.3 Commercial Office and Community Facility Design

Redfern Place will foster environmental stewardship programs with building users and the surrounding community. These programs will aim to educate, engage, and empower residents and stakeholders in sustainable practices and environmental conservation efforts.

Through these programs, building users and community members will be encouraged to actively participate in initiatives such as waste reduction, water conservation, energy efficiency, and biodiversity conservation. Workshops, educational events, and volunteer opportunities will be organized to raise awareness about the importance of environmental stewardship and provide practical tools and knowledge for sustainable living.

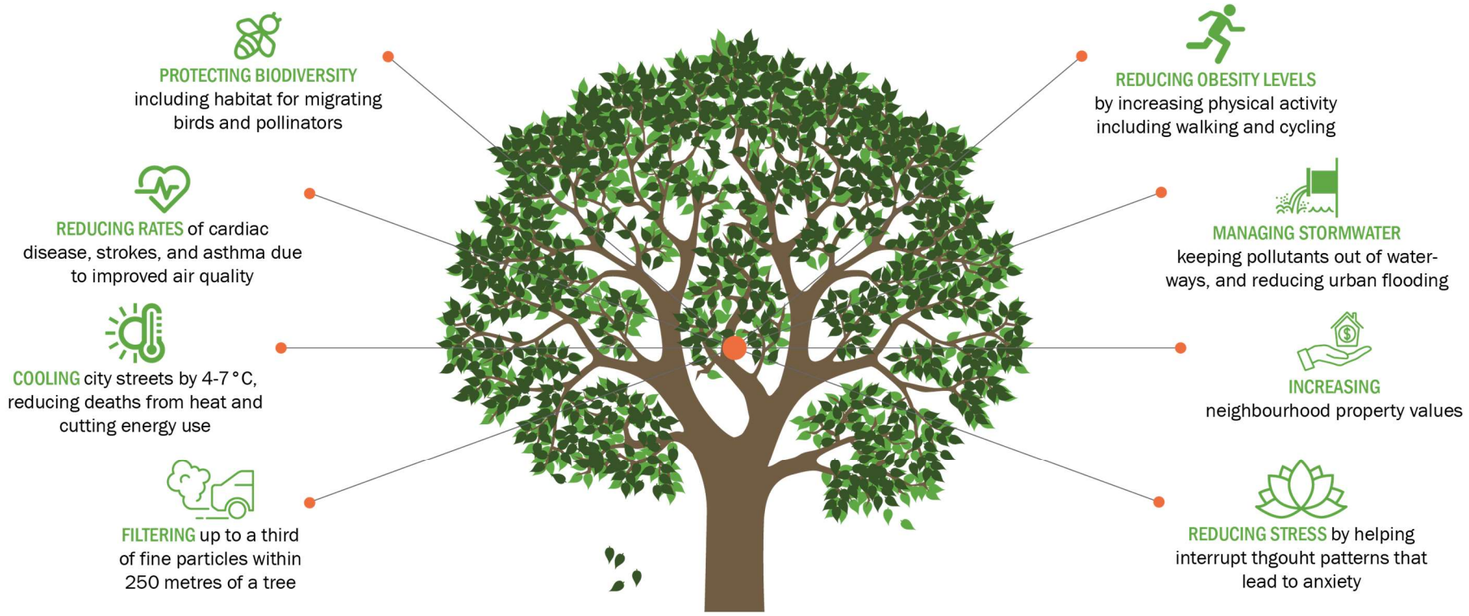


Figure 12: Benefits of Urban Biodiversity

6.7 Climate Positive

Redfern Place will be built and operated in a way that contributes to positive climate outcomes. This includes enabling net zero carbon operations.

Principles

- Minimise embedded (upfront) greenhouse gas emissions in construction materials and processes.
- Passive design and best practice systems design minimise operational energy use
- Enable building to operate without on-site fossil fuel combustion.
- Renewable energy through on-site sources like rooftop PV, etc. as fits the site.
- Buy renewable power for common area usage.

Targets

- Reduce embedded (upfront) emissions by 20% based on Life Cycle impacts.
- Zero fossil fuel use for regular building operations.
- Procure all remaining operating energy from renewable sources for common areas.

6.7.1 Precinct Design

The precinct will prioritize sustainability through various measures:

Onsite renewable energy generation will be maximized to reduce reliance on fossil fuels and lower carbon emissions. Regenerated landscapes will be designed to sequester carbon, contributing to carbon neutrality or even carbon negativity over time.

The use of timber and other plant-based building materials will prioritize materials that sequester carbon during their growth, further reducing the carbon footprint of construction. Low embodied carbon or recycled and reclaimed materials will also be prioritized to minimize environmental impact.

Facilitating on-site electric vehicle (EV) charging will promote sustainable transportation options and reduce greenhouse gas emissions. Opportunities for low emissions materials, such as green concrete, will be utilized in design and construction to minimize carbon emissions throughout the building lifecycle.

Recycled brick and other recovered materials will be recovered and used to reduce waste and conserve resources. Additionally, sourcing 100% renewable electricity for all commercial and common areas will further reduce the carbon footprint of the precinct, ensuring that operations are environmentally responsible.

6.7.2 Residential Design

Redfern Place will prioritize sustainability through various design strategies:

Materially efficient structural design will be employed to reduce the volume of concrete and steel, minimizing total material volume in buildings, and reducing environmental impact. Buildings will be constructed to exploit thermal mass, regulating internal temperatures efficiently.

Optimization of all façades will ensure shading of glazing to reduce cooling energy use while providing high-quality daylighting, promoting occupant comfort and energy efficiency. Landscaped green roofs will be incorporated where possible to sequester carbon and enhance environmental benefits.

Ceiling fans will be installed in bedrooms to provide additional comfort and reduce the need for mechanical cooling. Parking areas will be equipped with charging capacity in line with best practice expectations, supporting the transition to electric vehicles and reducing emissions.

Low embodied carbon materials and products will be chosen for major building systems such as structure, cladding, and foundations, minimizing carbon emissions associated with construction. Additionally, the precinct is designed as all-electric buildings, further reducing reliance on fossil fuels, and promoting sustainability.

6.7.3 Commercial Office and Community Facility Design

Redfern Place is designed with sustainability as a core principle, incorporating various strategies to minimize environmental impact and maximize energy efficiency:

Materially efficient structural design will reduce the volume of concrete and steel, minimizing total material usage in buildings. Rooftop PV arrays will be installed for on-site renewable electricity generation, reducing reliance on non-renewable energy sources.

The buildings will be all-electric, eliminating the need for fossil fuels and reducing greenhouse gas emissions. Low embodied carbon materials and products will be chosen for major building systems, such as structure, cladding, and foundations, further reducing the carbon footprint.

Design strategies will maximize the free cooling provided by outdoor air through cross ventilation and 100% economy cycle capacity where practical, reducing the need for mechanical cooling and energy consumption. Operational energy efficiency will be guaranteed and verified through building performance tuning, ensuring that the buildings perform as intended and continue to operate efficiently over time.

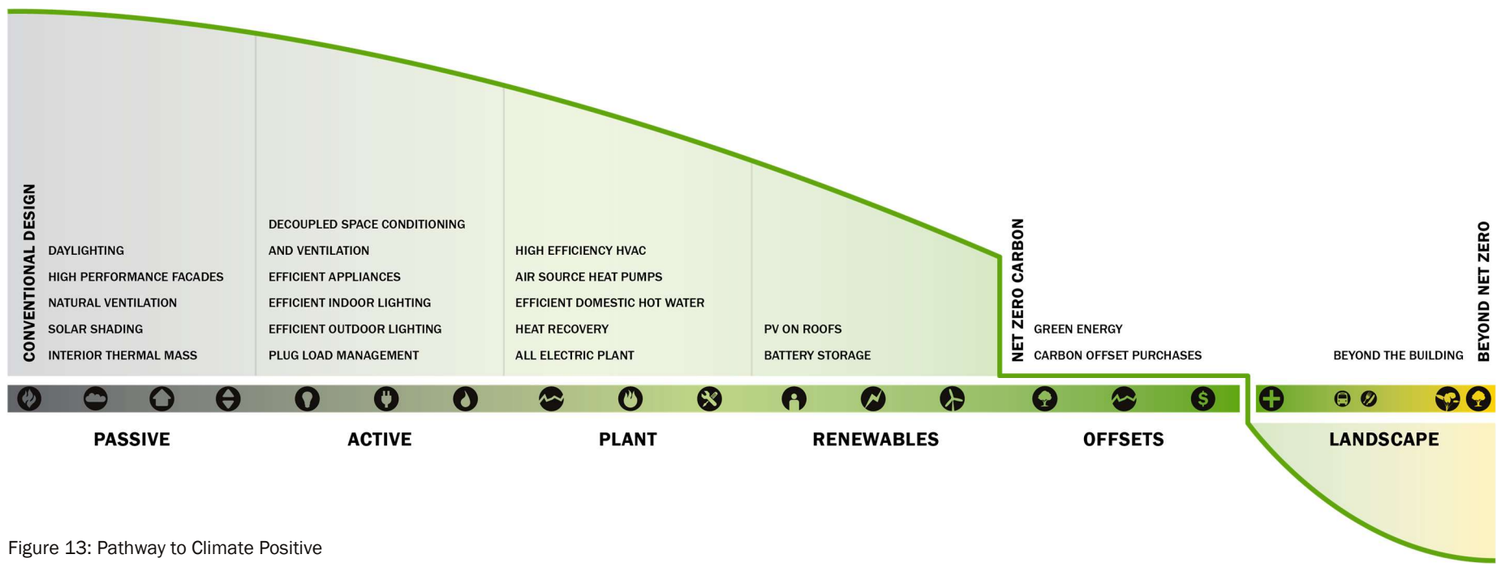


Figure 13: Pathway to Climate Positive

7 Conclusion

The Redfern Place development will meet the sustainability targets based on the requirements of the development authorities, Bridge Housing, and the necessary Standards and Codes. The sustainability performance of the project will be benchmarked against the targets set for Green Star, BASIX and NABERS for assurance and demonstration of the project's commitment to the sustainability vision.

Implementation of the design responses (mitigation measures) will render the proposed development acceptable in addressing the ESD SEARS requirements.

Appendices

Appendix A – Green Star Communities Eligibility R-25258

green building council australia

Request R-25258

Request type: Ask a question

Query Type: Eligibility Query

Date Submitted: Fri, 16 Feb 2024

Date Response Sent: Tue, 20 Feb 2024

Questions

Please provide a general description of the proposed project.

Redfern Place is located directly opposite Redfern Oval and comprises a whole street block. The total site area is 10,000m2. The development includes three social and affordable housing buildings (S2, S3 and S4) and a PCYC (S1), connected by communal open space and courtyards on the ground floor. The three residential buildings sit above a common shared basement carpark with approximately 88 car parking spaces. There will be approximately 340 units total across the three residential buildings. The residential buildings include communal facilities and amenities such as a communal kitchen and barbeque space, communal meetings rooms and a communal library on S2. Two of the residential buildings will be owned and managed by Bridge Housing (S2 and S4), with the third building (S3) managed by the NSW Land and Housing Corporation (LAHC). S4 will include commercial office space to be used by Bridge Housing on the ground floor. The four buildings are each targeting a Green Star Buildings rating (still to be registered), using a site wide approach for the credits that apply to the whole site. There will be one contractor and the 4 buildings will be constructed under a single contract, at about the same time, with a slightly phased approach.

Is the project connected to other buildings? If yes, do any of the buildings have shared services (e.g. car parking, cyclist facilities, building services, infrastructure).

The three residential buildings, S2, S3 and S4 are connected to a basement carpark. The residential buildings will share a centralised hot water system. Solar PV panels located on the PCYC roof will power common areas of all three residential buildings and the centralised hot water heat pump.

Are there multiple buildings? If yes, what is the spatial relationship between the buildings? (i.e. Do the buildings have separate entrances and/or separate street addresses? Are they connected via a concourse level?) If so, please detail.

Redfern Place includes four buildings with separate entrances. They are connected on the ground floor level with communal open space, laneways and courtyards. The spatial relationship is described on the site plan drawings attached.

Which Eligibility Criteria is the project seeking clarification on? If more than one, please state each Eligibility Criteria.

The project is seeking confirmation that it is not suitable for a Green Star Communities rating. Under the project delivery agreement with LAHC as landowner, the project is obliged to target a Green Star Communities 6 Star rating, but would like to amend this requirement. This eligibility request is to secure comments from the GBCA supporting the stance that the project is not suitable for a GS Communities rating.

Please explain what the issue is that the project is seeking clarification on?

We appreciate the opportunity to submit an eligibility request for the Redfern Place project. After careful review of the eligibility criteria provided, we believe that the project does not meet several of the outlined criteria, as detailed below: 1. The project, as scoped, does not impose any additional burdens on public transport systems or highways. There are no plans for new transport infrastructure, including roads, cycle routes, or public parking facilities. 2. The project does not incorporate areas of public realm for occupants or visitors. The scope of the project is confined to designated private communal property and does not extend to public spaces. 3. The development will not lead to the enhancement, diversification, or addition of local employment, social mix, or ecological value. While we acknowledge the importance of these factors, the project does not directly contribute to them. The scope and scale of the project are limited in this regard. 4. The project does not entail the provision of new or additional capacity in existing medical centers, schools, retail centers, places of religious worship, or similar facilities and services. The project's size and scope do not necessitate such accommodations. 5. There are no provisions within the project for community-level provision of utilities or linking to other developments in the area for such purposes. The project's scale and focus do not align with these criteria. 6. The project is not expected to have a significant impact on existing communities. It is designed to operate within existing parameters without imposing undue burdens or disruptions on surrounding communities. In light of the above considerations, we respectfully request that Redfern Place be deemed ineligible for a Green Star Communities rating per the outlined eligibility criteria. Should you require any further information or clarification, please do not hesitate to contact us.

Response

Thank you for your query seeking clarification on the eligibility of Redfern Place to receive a Green Star - Communities rating.

We note that the site area is 10,000 square metres and will comprise three social and affordable housing buildings and a community facility connected by communal open space and courtyards on the ground floor. The four buildings are each targeting a Green Star Buildings rating using a site wide approach for the credits that apply to the whole site.

While there are no size requirements imposed for Green Star – Communities project eligibility, the rating tool is designed to be used by projects when the majority of the key eligibility criteria can be applied to a precinct or development. Based on the information provided, the GBCA would agree that unfortunately the size, scale and impact of Redfern Place would make it difficult to achieve a Green Star - Communities rating and that as the development overall does not meet sufficient eligibility criteria we would not recommend it for a rating under this tool.

We are pleased to see that the development will certify under Green Star Buildings, which will drive many sustainable design outcomes for residents and the local community. We look forward to supporting the Applicant to register the buildings and working with the project team to certify this development under the Buildings tool.

****

Please note that Eligibility Queries are reviewed on a case-by-case basis and cannot be taken as precedent for any other projects. Should you have any further questions, please contact the GBCA Market Engagement team via MEteam@gbca.org.au

---

File Attachments

To view any file attachments with this final response please visit this request online here. Please note, you must be a registered user of the GBCA website and have the required access to this requests details.With the exception of assessment results, you must download these files and include it in your submission, as Assessors cannot access this link.

Appendix B - Green Star Buildings V1 Appraisal

Green Star Buildings v1	
2046 Redfern Place	
Registration Date	2023
Climate Positive Pathway	Yes
Min expectations met	Yes
Target	5 Star
Total points required	35
Total points pursued	44
Target met	Yes

5 Star	Total pursued
Total	44
Responsible	6
Healthy	11
Resilient	1
Positive	11
Places	8
People	4
Nature	2
Leadership	1

5 Star	Total pursued	Total available
Total	41	101
Responsible	6	17
Healthy	8	14
Resilient	1	8
Positive	11	30
Places	8	8
People	4	9
Nature	2	14
Leadership	1	1

				Residential pathway S2, S3 & S4			S1 Pathway						
				RESIDENTIAL PATHWAY			PCYC PATHWAY						
Outcome	Credit Category	#	Credit	Pathway Requirements	Probability of Achievement	Target level RES	Total points	Probability of Achievement-	Target level PCYC	Total points	Total points	Credit Selection Comments	Responsible Party	Contributing Parties	Site Wide Apporach
Responsible Recognises activities that ensure the building is designed, procured, built and handed over in a responsible manner. The aim is to help builders, owners, and the supply chain on the sustainability journey. The Responsible Products Framework provides additional flexibility for product suppliers to have their initiatives be recognised in Green Star, provided they fall under the principles of responsibility, transparency, stewardship, foresight or verification.	Responsible	1	Industry Development	1.1 Appoint a Green Star Accredited Professional; and 1.2 Disclose the cost of sustainable building practices to the GBCA; and 1.3 Market the building's sustainability achievements.	HIGH	CA	1	HIGH	CA	1	1	A10 appointed as GSAP	Owner	Owner, ESD	Site Wide Approach
	Responsible	2	Responsible Construction	Contractor undertakes: 0.1 Environmental management system (EMS certified) 0.2 Environmental management plan (EMP) 0.4 Sustainability training provided to 95% of all subcontractors for at least 3 days 1.1 Construction and demolition waste diversion of 90%	HIGH	CA	1	HIGH	CA	1	1	Note 90% diversion of construction waste from landfill and sustainability training to subcontractors on site.	Contractor	Contractor	Site Wide Approach
	Responsible	3	Verification and Handover	0.1 Metering and monitoring systems for energy and water 0.2 Commissioning and tuning from prior to construction to after PC. 0.3 Building Information to be provided to building owner and relevant staff 1.1 Soft landing approach; and 1.2 Independent Commissioning Agent	HIGH	CA	1	HIGH	CA	1	1	Environmental perfromance targets must be set at design stage, including monitoring strategy e.g. Owners Project Requirements or Design Intent Document. Minimum expectations include airtightness testing.	Independent Commissioning Agent	ICA, Building services, Owner	Site Wide Approach
	Responsible	4	Responsible Resource Management	0.1 Separation of waste streams at least 3 0.2 Dedicated easy to access waste storage area to account estimated waste and collection 0.3 Signoff by waste specialist and/or contractor	HIGH	ME	0	HIGH	ME	0	0	Minimum waste storage area as specified by Waste Consultant	Architect	Architect, Waste consultant, Owner	Site Wide Approach
	Responsible	5	Responsible Procurement	(Not Pursued)	LOW	(Not Pursued)	0	LOW	(Not Pursued)	0	1		Owner	Owner, ESD	Site Wide Approach
	Responsible	6	Responsible Structure	1.1 50% of all structural components (by cost) meet Resp. Products Value score ≥10	LOW	CA	3	LOW	CA	3	5	Aligns with upfront carbon requirements	Structural	Structural, Contractor	Per Building
	Responsible	7	Responsible Envelope	(Not Pursued)	LOW	(Not Pursued)	0	LOW	(Not Pursued)	0	4		Façade	Façade, Contractor	Per Building

					RESIDENTIAL PATHWAY			PCYC PATHWAY						
Outcome	Credit Category	#	Credit	Pathway Requirements	Probability of Achievement	Target level RES	Total points	Probability of Achievement-	Target level PCYC	Total points	Total points	Credit Selection Comments	Responsible Party	Contributing Parties	Site Wide Apporach
	Responsible	8	Responsible Systems	(Not Pursued)	LOW	(Not Pursued)	0	LOW	(Not Pursued)	0	2		Building services	Building Services, Contractor	Per Building
	Responsible	9	Responsible Finishes	(Not Pursued)	LOW	(Not Pursued)	0	MEDIUM	(Not Pursued)	0	2		Architect	Architect, Contractor	Per Building
Healthy Emphasises the important role the built environment has in enhancing the health and wellbeing of occupants.	Healthy	10	Clean Air	0.1 Ventilation systems attributes: Separation from pollutants-cleaning ductwork 0.2 Provision of outdoor air: 50% > min AS1668 OR maintain CO2 levels <800ppm 0.3 Exhaust or elimination of pollutants 1.1 Ventilation system attributes: access for maintenance; and 1.2 Provision of outdoor air: 100% > min AS1668 OR maintain CO2 levels ≤700ppm	HIGH	CA	2	HIGH	CA	2	2	For residential buildings: 50% improvement over AS1668.2:2012 when mechanically ventilated. 100% improvement of outdoor air for non-residential buildings.	Building Services	Building Services, ESD	Per Building
	Healthy	11	Light Quality	0.1 Lighting comfort: Flicker-free, required CRI, illuminance, uniformity etc. 0.2 Glare addressed in nominated areas 0.3 Daylight access to building occupants 1.1 Artificial Lighting solution that addresses quality, contrast etc; OR 1.2 Daylight	HIGH	CA	2	MEDIUM	CA	2	4		ESD	ESD, Architect	Per Building
	Healthy	12	Acoustic Comfort	1.1 Internal noise levels limits as per standards; and 1.2 Acoustic separation between enclosed spaces; and 1.3 Impact noise transfer through floors; and 1.4 Reverberation control as per limit in standards (non-residential only)	HIGH	CA	2	HIGH	ME	0	2	For residential buildings: meet 2 of the following 3 requirements: max internal noise levels, acoustic seperation and impact noise transfer.	Acoustic	Acoustic, ESD	Per Building
	Healthy	13	Exposure to Toxins	0.1 Paints, adhesives, sealants, and carpets; 95% (volume) meet TVOC limits 0.2 Engineered wood products; 95% (area) meet formaldehyde limits 0.3 Lead, asbestos and PCBs; hazardous materials survey, best practice removal 1.1 On site testing of TVOC and formaldehyde levels	HIGH	CA	2	HIGH	CA	2	2	Requires on site testing to confirm TVOC levels after practical completion	Contractor	Contractor, ESD	Site Wide Approach
	Healthy	14	Amenity and Comfort	1.1 Dedicated amenity rooms to promote inclusivity, mindfulness or exercise e.g. parent room, break-out room, prayer room or exercise room	MEDIUM	CA	2	HIGH	CA	2	2	Size required: 1m2 for every 10 occupants, for each building.	Architect	Architect, Owner	Per Building
	Healthy	15	Connection to Nature	1.1 Views, indoor plants and incorporation of nature-inspired design.	HIGH	CA	1	LOW	(Not Pursued)	0	2	Requires 5% of the GFA or site area (whichever is greater) allocated to nature in which occpants can directly engage with. 5% of GFA = approx 750m2.	Architect	Architect, Landscape	Per Building

					RESIDENTIAL PATHWAY			PCYC PATHWAY						
Outcome	Credit Category	#	Credit	Pathway Requirements	Probability of Achievement	Target level RES	Total points	Probability of Achievement-	Target level PCYC	Total points	Total points	Credit Selection Comments	Responsible Party	Contributing Parties	Site Wide Apporach
Resilient Demonstrates to investors and the community that risks that threaten the short- and long-term performance of the building have been considered.	Resilient	16	Climate Change Resilience	0.1 Climate change pre-screening checklist and communication to stakeholders	LOW	ME	0	LOW	ME	0	1	Resilience credits can be pursued as buffer points, if required	Owner	Owner, ESD	Site Wide Approach
	Resilient	17	Operations Resilience	(Not Pursued)	LOW	(Not Pursued)	0	LOW	(Not Pursued)	0	2		ESD	ESD, Building services, Owner	Site Wide Approach
	Resilient	18	Community Resilience	(Not Pursued)	LOW	(Not Pursued)	0	LOW	(Not Pursued)	0	1		ESD	ESD, Community engagement	Site Wide Approach
	Resilient	19	Heat Resilience	1.1 Heat island effect reduction strategies in at least 75% of the whole site area	LOW	CA	1	HIGH	CA	1	1	PCYC meets this with a low SRI roof and solar panels.	Architect	Architect, Landscape	Site Wide Approach
	Resilient	20	Grid Resilience	(Not Pursued)	LOW	(Not Pursued)	0	LOW	(Not Pursued)	0	3		Building Services	Building Services, ESD	Per Building
Positive Guides projects to meet 1.5°C trajectory goals and sets the pathway for the built environment to address its emissions fully through all scopes of emissions. The category acknowledges the value in understanding the full life cycle impacts of the building, which, in turn, can lead to better designs and material selection.	Positive	21	Upfront Carbon Emissions	0.1 Upfront carbon emissions are at least 10% less than reference building 1.1 Net Zero Path: Upfront carbon emissions are at least 20% less than reference building	HIGH	CA	3	HIGH	CA	3	6	Upfront emissions <20% than a reference. This is mandatory for 5 star ratings. A10 will start Upfront Carbon calcs in January '24. To be discussed: what impact this will have on procurement eg will oncrete be procured for whole site at once, or per building?	ESD	ESD, Design team	Per Building
	Positive	22	Energy Use	0.1 Energy use is at least 10% less than reference. 1.1 Net Zero Path: Energy use is at least 20% less than a reference building; OR NABERS 5.5 Stars with 25% modelling margin; OR NatHERS target.	HIGH	CA	3	HIGH	CA	3	6	Average of NatHERS 7 Stars for resi builidngs.	ESD	ESD, Building services	Per Building
	Positive	23	Energy Source	0.1 The building provides a Zero Carbon Action Plan 1.1 Net Zero Path: 100% of the building's electricity comes from renewable electricity	HIGH	CA	3	HIGH	CA	3	6	A10 to develop ZAP in early 2024, A10 to confirm tenant energy is excluded, and 100% renewable applies only to base building.	Owner	Owner, Building services	Per Building
	Positive	24	Other Carbon Emissions	1.1 Net Zero Path: The building owner eliminates/offsets emissions from refrigerants	HIGH	CA	2	HIGH	CA	2	4	Care must be taken to choose HVAC systems and heat pumps with low GWP refrigerants as practical/possible.	Building services	Builidng Services, ESD	Per Building
	Positive	25	Water Use	0.1 Efficient water fixtures or 15% less potable water compared to a ref. building	HIGH	ME	0	HIGH	ME	0	6	Efficient water fixtures.	Building Services	Builidng Services, Architect	Site Wide Approach

					RESIDENTIAL PATHWAY			PCYC PATHWAY						
Outcome	Credit Category	#	Credit	Pathway Requirements	Probability of Achievement	Target level RES	Total points	Probability of Achievement-	Target level PCYC	Total points	Total points	Credit Selection Comments	Responsible Party	Contributing Parties	Site Wide Apporach
	Positive	26	Life Cycle Impacts	(Not Pursued)	LOW	(Not Pursued)	0	LOW	(Not Pursued)	0	2		ESD	ESD	Per Building
Places Integrates buildings into the urban fabric and delivers places that increase social cohesion. This category celebrates where we come from and our Aboriginal and Torres Strait Islander communities and uses placemaking to give a sense of belonging to the spaces we spend time at	Places	27	Movement and Place	0.1 Showers and changing facilities for building occupants 1.1 Design and location prioritises walking, cycling, and transport options: by Introducing cyclist facilities, developing a sustainable transport plan, reducing private vehicle use and encouraging walkability.	HIGH	CA	3	HIGH	CA	3	3	EV charging points to at least 5% of all car parking spaces, and electrical infrastructure and load management plan to allow for future EV installation to 25% of all car parking spaces.	Transport	Transport, ESD	Site Wide Approach
	Places	28	Enjoyable Places	1.1 Provide memorable, beautiful, vibrant communal or public places where people want to gather and participate. 0.25 m2/occupant or 2.5% of GFA, whichever greater; and 1.1 Activation Strategy to facilitate initiation placemaking activities	HIGH	CA	2	HIGH	CA	2	2	For resi buildings: 1.75m2 per dwelling + 2.5% of non-resi GFA	Architect	Architect, Owner	Site Wide Approach
	Places	29	Contribution to Place	1.1 Design contributes to the liveability of the wider urban context and enhances the public realm. Demonstrated through Urban Context Report and public realm interface design, OR 1.2 an Independent design review	HIGH	CA	2	HIGH	CA	2	2	Urban Context Report to be developed by Arch/L.Arch. Discussion - could the DIP process be considered an Independent Design Review, and does it include the PCYC?	Architect	Architect, Landscape	Site Wide Approach
	Places	30	Culture, Heritage and Identity	1.1Design reflects and celebrates local demographics and identities, the history of the place, and any hidden or minority entities. Demonstrated through local analysis that justifies design responses, OR 1.2 through Independent Design Review	MEDIUM	CA	1	MEDIUM	CA	1	1	Credit can be met through Independent Design Review process.	Owner	Owner, Community engagement	Site Wide Approach
People Addresses the social health of the community. Promotes recognition of the multitude of people that are involved in the delivery and occupation of a building.	People	31	Inclusive Construction Practices	0.1 Gender inclusive facilities and protective equipment during construction. 0.2 Policies on-site to raise awareness, reduce discrimination, racism & bullying.	HIGH	ME	0	HIGH	ME	0	1	Gender inclusive facilities during construction.	Contractor	Contractor	Site Wide Approach
	People	32	Indigenous Inclusion	1.1 Building's design and construction celebrates Aboriginal and Torres Strait Islander people, culture and heritage by either playing an active role in the organisational RAP; OR, 1.2 Incorporating design elements using the Indigenous Design & Planning principles.	MEDIUM	CA	2	MEDIUM	CA	2	2	RAP working group and 90% of RAP targets have been met on the project	Owner	Owner, Local indigenous representative	Site Wide Approach
	People	33	Procurement and Workforce Inclusion	(Not Pursued)	LOW	(Not Pursued)	0	LOW	(Not Pursued)	0	3		Owner	Owner	Site Wide Approach
	People	34	Design for Inclusion	1.1 The building is designed and constructed to be inclusive to a diverse range of people with different needs.	HIGH	CA	2	HIGH	CA	2	3	Diverse wayfinding, inclusive spaces	Architect	Architect, Disabled community representative	Site Wide Approach
Nature Acknowledges the pressure on ecosystems and biodiversity caused from rapid urbanisation. It rewards the positive impacts of green	Nature	35	Impacts to Nature	0.1 Building was not built on, or significantly impacted, a site w/ high ecological value; and manages light pollution impacts and has a wetland management plan	HIGH	ME	0	HIGH	ME	0	2		Ecologist	Ecologist, Landscape	Site Wide Approach

					RESIDENTIAL PATHWAY			PCYC PATHWAY						
Outcome	Credit Category	#	Credit	Pathway Requirements	Probability of Achievement	Target level RES	Total points	Probability of Achievement-	Target level PCYC	Total points	Total points	Credit Selection Comments	Responsible Party	Contributing Parties	Site Wide Apporach
positive impacts of green space and biodiversity on people and urban space.	Nature	36	Biodiversity Enhancement	(Not Pursued)	LOW	(Not Pursued)	0	LOW	(Not Pursued)	0	4	1500m2 landscape area. Biodiversity Management Plan to be developed	Ecologist	Ecologist, Landscape	Site Wide Approach
	Nature	37	Nature Connectivity	(Not Pursued)	LOW	(Not Pursued)	0	LOW	(Not Pursued)	0	2		Ecologist	Landscape	Site Wide Approach
	Nature	38	Nature Stewardship	(Not Pursued)	LOW	(Not Pursued)	0	LOW	(Not Pursued)	0	2		Owner	Owner, Landscape	Site Wide Approach
	Nature	39	Waterway Protection	1.1 Annual average flow reduction (ML/yr) of 40% compared to pre-development levels and meets specified pollutants targets.	HIGH	CA	2	HIGH	CA	2	4	Civil Eng to please confirm that project meets the credit requirements, considering parking has been moved to basement and there is no parking exposed to rainfall/stormwater runoff.	Civil	Civil, Landscape	Site Wide Approach
Leadership Celebrates the implementation of innovative practices, processes and strategies that promote achievements in the built environment that are beyond the scope of the rating tool as released.	Leadership	40	Market Transformation	1.1 1.2 1.3	MEDIUM	CA	0	MEDIUM	CA	0	0	TBC	Owner	ESD	
	Leadership	41	Leadership Challenges	1.1 Fossil free construction activities 1.2 Responsible Products 1.3 Circular Economy	MEDIUM	CA	1	MEDIUM	CA	1	1	For fossil free construction activities: 20% of construction equipment is fossil fuel free, site office is powered by 100% renewable energy, and all electritiy used by the construction site is 100% renewable.	Owner	Contractor	

Appendix C – NatHERS and BASIX

NatHERS and BASIX Assessment Report

Redfern Place

Revision 1, July 2024

atelier ten

Document information

Report title:	NatHERS and BASIX Assessment Report
Project name:	Redfern Place
Project number:	2046
Digital file name:	2046_Redfern BASIX Assessment Report
Digital file location:	[Digital file location]

Prepared

Prepared by:	Alison Adendorff
Signed:	AA
Date:	30.06.2024

Revisions

No	Date	Approved
0	01.07.2024	A. Adendorff
1	01.07.2024	A. Adendorff

Atelier Ten
Level 7
56 Pitt Street
Sydney NSW 2000
Australia
T +61 2 9262 4500
W atelierten.com

Atelier Ten acknowledges the Traditional Owners of country throughout Australia and recognises their continuing connection to land, waters, and community. We pay our respect to them and their cultures, and to Elders past, present, and emerging.

Green Building Council Australia
Member 2020–2021

Contents

1 Introduction

This report accompanies a detailed State Significant Development Application that seeks approval for a mixed-use development at 600-660 Elizabeth Street, Redfern (Redfern Place). The development proposes four buildings comprising community facilities, commercial/office, affordable/social/specialist disability housing apartments and new public links and landscaping.

The project site comprises Lot 1 in DP 1249145. It has an area of approximately 10,850m2. Part of the site currently accommodates the existing Police Citizens Youth Club (PCYC) (to be demolished and replaced). The remaining portion of the site is vacant with remnant vegetation.

The SSDA seeks approval for redevelopment of the site, including:

- Demolition of existing buildings.
- Tree removal.
- Bulk earthworks including excavation.
- Construction of a community facility building known as Building S1.
- Construction of two residential flat buildings (known as Buildings S2 and S3) up to 14 and 10 storeys respectively, for social and affordable housing.
- Construction of a five-storey mixed use building (known as Building S4) comprising commercial uses on the ground level and social and specialist disability housing above.
- Construction of one basement level below Buildings S2, S3 and part of S4 with vehicle access from Kettle Street.
- Site-wide landscaping and public domain works including north-south and east-west pedestrian through-site link.

For a detailed project description refer to the Environmental Impact Statement prepared by Ethos Urban.

The BASIX online tool was used to confirm compliance against Energy, Water and Thermal Comfort Targets, based on NSW benchmark levels on a per capita basis. The BASIX Assessment is divided into three sections: Water, Thermal Comfort and Energy, each independently measuring the efficiency of the development.

BASIX requires a minimum target of 40% for the water section, a pass or fail for the thermal comfort section, and a minimum required target of 62% for the energy section.

The BASIX inputs for this project were based on the Architectural Drawings issued as part of the DA submission. The full list of drawings referenced is listed in Appendix A. Thermal Performance Upgrades and results are listed in Appendix B. The BASIX and NatHERS certificates are appended to this report in Appendix C and D respectively.

1.1 Thermal Comfort

Thermal Comfort targets are set by the Department of Planning in the form of heating and cooling caps. The buildings thermal physics are measured using HERO V4 Thermal Comfort Simulation Software. This calculates the expected level of energy required to heat and cool each dwelling per annum, expressed in megajoules per square metre of floor area (MJ/m2).

Each unit has individual heating and cooling caps applied. Accompanying these individual caps are average heating and cooling caps applied to the whole development. The average caps are lower, or harder to comply with than the individual unit caps.

1.1 Water

The proposed Development has achieved the BASIX Water Target of 40%.

The water usage of the development is calculated based on the number and efficiency of permanent fixtures and appliances such as taps, showerheads and toilet, the dish washer and clothes washing machine.

The size of the rainwater tank and number of connections may have a significant impact on the water score as does the area of gardens and lawns whether or not low water plant species are incorporated.

1.2 Energy

The proposed development has achieved the Energy target of 62% to pass this section.

The energy usage of the development is calculated based on the efficiency of fixed appliances that will be used. This includes the air-conditioning system, hot water system, lighting, exhaust fans, cook top, oven, and clothes drying facilities.

Note: Changes to the design documentation specified above can affect the results of this BASIX assessment. As a result, the report and any results outlined should be subject to a review given any design development changes.

2 Thermal Comfort Assessment

The Thermal Comfort Assessment has been carried out in accordance with the 'BASIX Thermal Performance Protocol' (Department of Planning and Environment, 1 October 2023) and the latest NatHERS Tech Note.

HERO v4 thermal comfort simulation software has been used to demonstrate compliance against the thermal comfort targets (maximum loads) for individual dwellings set for the project's Climate Zone (refer to **Table 2.1 Thermal Comfort Targets**).

Table 2.1 Thermal Comfort Targets

Climate Zone	Max. Heating Load (MJ/m2)	Max. Cooling Load (Mj/m2)
Individual Dwellings	32.9	20.4
Average All Dwellings	29.7	21.2

Note: The maximum average loads for the project must still be met in addition to meeting the maximum loads for each individual dwelling.

The results for each individual dwelling were used as inputs to the BASIX online tool to confirm the project average for all dwellings (Refer to **Table 2.2 Thermal Comfort Results**)

Table 2.2 Thermal Comfort Results

	Heating Load (MJ/m2)	Cooling Load (MJ/m2)
Individual Dwellings Maximum	28.6	20.4
Average All Dwellings	8.7	10.6
Average Star Rating	**8.2**	

The construction details outlined in **Table 2.3** were adopted as inputs to the simulation software for calculating the thermal loads for each dwelling.

Table 2.3 Inclusions Summary

Type	Construction	Additional Thermal Properties
Glazing Doors/Windows Sliding doors Awning windows Fixed	Total System performance (glazing + framing) U-Value ≤ 3.04 W/m2.K, SHGC of 0.47 (0.45/0.49) U-Value ≤ 3.42 W/m2.K, SHGC of 0.45 (0.43/0.47) U-Value ≤ 2.71 W/m2.K, SHGC of 0.41 (0.39/0.43)	Openings as drawn Windows to be weather-stripped as per AS2047
Glazing UPGRADE Sliding doors	Total System performance (glazing + framing) U-Value ≤ 3.04 W/m2.K, SHGC of 0.35 (0.33/0.37)	As per thermal comfort upgrades table Windows to be weather-stripped as per AS2047
External Walls	Brick veneer with non-reflective sarking Precast concrete, plasterboard internally FC cladding to bay windows on S3	R2.0.insulation (insulation only value)
Internal Walls to Dwellings	Plasterboard on studs	No thermal insulation required to walls within apartments.
Internal Walls to Corridors	Plasterboard on studs to corridors Concrete with plasterboard internally to lift core and basement	R2.0 insulation (insulation only value) required to walls between apartments and corridors/core R1.13 insulation (insulation only value) to walls adjacent to stairs and lifts
Internal Walls to Neighbours	Lightweight parti wall system	R2.0 insulation (insulation only value) required to walls between neighbouring apartments
Floors	Concrete slab on ground Suspended concrete slab	No insulation required to slab on ground R2.0 soffit insulation where above carpark or open below No insulation when above a neighbour Carpet to bedrooms and tiles elsewhere
Roof and Ceilings	Suspended concrete slab with dropped plasterboard ceiling Metal roof with reflective foil to bay windows	No insulation where neighbouring units are above R3.0 insulation (insulation only value) where concrete roof is above R2.0 insulation to bay window ceiling

Type	Construction	Additional Thermal Properties
Ceiling Upgrade		UPGRADE: R4.0 insulation (insulation only value) where roof is above as per thermal comfort upgrades table
Ceiling Penetrations	Ceiling fans (min 1200mm diameter)	Ceiling fans as noted on the thermal comfort upgrades table
Roof	Concrete roof, no insulation (insulation to ceiling as above) Metal roof with reflective foil to bay windows	Insulation to be installed at ceiling level R2.0 insulation to bay window ceiling
Other	- LED downlights will be modelled at a rate of 1 per 5sqm of ceiling area (for areas => 10sqm), using the default dimensions and clearance from the software. - Exhaust fans assumed to be installed in all kitchens, bathrooms and laundries. - Default dimensions and clearance will be used. - Ceiling penetrations to be sealed.	

Note: Several assumptions regarding the material and detail have been made given the stage of the development and may be amended (if required) when more information becomes available.

3 BASIX Water Compliance Requirements

The development will achieve the BASIX water target of 40% for the development, provided the following water commitments detailed below are implemented.

3.1 Common Areas and Central Systems

Table 3.1.1 Water Commitments - Common Areas and Central Systems

Common Area and Central Systems	Commitments
Alternative water supply	10,000L rainwater tank, to collect runoff from min 2,910sqm of roof area, connected to common area landscaping
Pool and Spa	There is no common pool or spa
Fixtures for Common Areas	Toilets: 4-star WELS rated Kitchen taps: 6-star WELS rated Bathroom taps: 6-star WELS rated
Fire Sprinkler System	Fire Sprinkler test water contained in a closed system for each building and combined carpark

3.2 Individual Dwellings

Table 3.2.1 Water Commitments - Private Dwellings

Private Dwellings	Commitments
Fixtures for apartments	Showerheads: 4-star WELS (>6 but <= 7.5 L/min) Toilets: 4-star WELS rated Kitchen taps: 6-star WELS rated Bathroom taps: 6-star WELS rated

4 BASIX Energy Compliance Requirements

The development will achieve the BASIX energy target of 62%, provided the following energy commitments detailed below are installed.

4.1 Common Areas and Central Systems

Table 4.1.1 Energy Commitments - Central Systems

Central Systems	Commitment
Hot Water System	Centralised electric heat pump (air sourced) hot water system with dedicated R0.75 (~32mm) internal piping insulation
Alternative Energy Supply	240kW of PV installed to the roof of S1 and S4
Lifts	Gearless traction with VVVF motor

Table 4.1.2 Energy Commitments - Common Area Ventilation

Area	Ventilation type	Control
Undercover car park area(s) - Ventilation supply and exhaust	Ventilation (supply + exhaust)	CO monitors + VSD fan
Switch room(s)	Ventilation supply only	Interlocked to light
Garbage room(s)	Ventilation exhaust only	n/a
Community room(s)	Air-conditioning system	Time clock or BMS controlled
Plant or service room(s)	Ventilation supply only	Interlocked to light
Other internal common area(s)	Ventilation supply only	Interlocked to light
Ground floor lobby type(s)	No mechanical ventilation	n/a
Hallway/lobby type(s)	No mechanical ventilation	n/a

Table 4.1.3 Energy Commitments - Common Area Lighting

Area	Primary lighting system type	Efficiency measure	BMS controlled?
Undercover car park area(s) - Ventilation supply and exhaust	LED	Zoned switching & motion sensor	No
Lift car	LED	Connected to lift call button	No
Lift motor room(s)	LED	Manual on/off switch	No
Switch room(s)	LED	Manual on/off switch	No
Garbage room(s)	LED	Manual on/off switch	No
Community room(s)	LED	Time clock & motion sensors	No
Plant or service room(s)	LED	Manual on/off switch	No
Other internal common area(s)	LED	Manual on/off switch	No
Ground floor lobby type(s)	LED	Daylight & motion sensor	No
Hallway/lobby type(s)	LED	Daylight & motion sensor	No

4.2 Individual Dwellings

Table 4.2.1 Energy Commitments - Dwellings

Dwellings	Commitment
Apartment Ventilation System	Apartment Rangehood: Individual fan, ducted to roof or façade, on/off manual switch Bathroom Exhaust: Individual fan, ducted to roof or façade, interlocked to light Laundry Exhaust: Individual fan, ducted to roof or façade, on/off manual switch
Heating and Cooling Systems	Heating: 1-phase non-ducted air conditioning to living rooms and bedrooms EER 3.0 – 3.5 Cooling: 1-phase non-ducted air conditioning to living rooms and bedrooms EER 3.0 – 3.5
Lighting	Dedicated LED fittings
Appliances	Induction cooktop & electric oven

Appendices

Appendix A Drawing Register

Appendix B Thermal Performance Upgrades Table

Appendix C BASIX Certificate

Appendix D NatHERS Summary Certificate

Appendix A Drawing Register

DRAWING NUMBER	LAYOUT NAME	REVISION
S2.A00.01	Cover Page S2	A
S2.A02.01	GA Plan - Ground	A
S2.A02.02	GA Plan – Level 1	A
S2.A02.03	GA Plan – Level 2	A
S2.A02.04	GA Plan – Level 3	A
S2.A02.05	GA Plan – Level 4	A
S2.A02.06	GA Plan – Level 5	A
S2.A02.07	GA Plan – Level 6	A
S2.A02.08	GA Plan – Level 7	A
S2.A02.09	GA Plan – Level 8	A
S2.A02.10	GA Plan – Level 9	A
S2.A02.11	GA Plan – Level 10	A
S2.A02.12	GA Plan – Level 11	A
S2.A02.13	GA Plan – Level 12	A
S2.A02.14	GA Plan – Level 13	A
S2.A02.16	GA Plan – Roof	A
S2.A06.01	Elevation - East	A
S2.A06.02	Elevation - North	A
S2.A06.03	Elevation - West	A
S2.A06.04	Elevation - South	A
S2.A06.11	Section A	A
S2.A06.12	Section B	A
S2.A06.13	Section C	A
S3.A00.01	Cover Sheet S3	A
S3.A02.00	Plan – Ground Floor	A
S3.A02.01	Plan – Level 1-3	A
S3.A02.04	Plan – Level 4	A
S3.A02.05	Plan – Level 5-6	A
S3.A02.07	Plan – Level 7-9	A
S3.A02.10	Plan – Roof	A
S3.A06.01	Elevations	A
S3.A06.02	Sections	A
S3.A06.03	Sections	A
S4.A00.01	Cover Sheet – S4	A

DRAWING NUMBER	LAYOUT NAME	REVISION
S4.A02.00	Plan Ground Floor	A
S4.A02.01	Plan – Level 1	A
S4.A02.02	Plan – Level 2-3	A
S4.A02.04	Plan – Level 4	A
S4.A02.05	Plan – Roof	A
S4.A06.01	Elevations	A
S4.A06.02	Elevations	A
S4.A06.01	Sections	A

Appendix B Thermal Performance Upgrades Table

Certificate # HR-9GTPW3-01, HR-722MC0-01, HR-GH0EKX-01							Accreditation # ABSA101518
Thermal performance specifications							
Unit Number	Number of Bedrooms	Floor area (m^2)		Predicted loads ($MJ/m^2/y$)		Star Rating	Thermal Comfort Upgrades
		Con.	Uncon.	Heat	Cool (Sens & Lat)		
Building S2							
101	1	28.6	0.0	12.2	6.5	8.2	1400mm dia ceiling fan to kitchen/dining
102	1	55.6	0.0	6.9	16.5	7.7	
103	2	76.4	0.0	5.6	10.6	8.4	
104	2	77.3	0.0	4.3	11.5	8.5	
105	2	77.3	0.0	4.7	11.6	8.4	
106	2	76.2	0.0	10.5	12.9	7.7	
107	1	67.2	0.0	9.7	8.0	8.3	
108	1	37.1	0.0	3.8	13.6	8.4	1400mm dia ceiling fan to kitchen/dining
109	1	45.3	5.6	18.1	17.2	6.3	
110	2	70.0	0.0	22.1	4.3	7.4	Glazing upgrade to sliding door; 1400mm dia ceiling fan to kitchen/dining
111	1	50.2	0.0	1.0	10.8	9.0	Glazing upgrade to sliding door; 1400mm dia ceiling fan to kitchen/dining
112	2	69.9	0.0	5.0	11.0	8.5	Glazing upgrade to sliding door
113	3	91.4	0.0	12.9	8.7	7.9	
114	2	66.0	5.6	0.6	10.2	9.2	
115	1	53.5	0.0	0.2	11.9	8.9	
201	1	27.2	5.5	0.3	14.7	8.6	1400mm dia ceiling fan to kitchen/dining
202	2	63.0	6.6	0.3	10.6	9.2	
203	1	56.4	0.0	8.8	10.7	8.2	
204	2	76.1	0.0	5.9	13.7	8.1	
205	2	79.3	0.0	2.6	11.5	8.7	
206	2	76.4	0.0	3.3	10.9	8.7	
207	2	77.3	0.0	2.1	11.7	8.8	
208	2	77.3	0.0	2.4	11.7	8.7	
209	2	76.2	0.0	9.4	8.0	8.4	
210	1	67.2	0.0	9.1	8.1	8.4	
211	1	37.1	0.0	3.7	13.6	8.4	Glazing upgrade to sliding door; 1400mm dia ceiling fan to kitchen/dining
212	1	45.3	5.6	17.7	11.2	7.1	Glazing upgrade to sliding door; 1500mm dia ceiling fan to kitchen/dining
213	2	70.0	0.0	16.9	7.1	7.6	Glazing upgrade to sliding door

Certificate # HR-9GTPW3-01, HR-722MC0-01, HR-GH0EKX-01							Accreditation # ABSA101518
Thermal performance specifications							
Unit Number	Number of Bedrooms	Floor area (m^2)		Predicted loads ($MJ/m^2/y$)		Star Rating	Thermal Comfort Upgrades
		Con.	Uncon.	Heat	Cool (Sens & Lat)		
214	1	50.2	0.0	1.4	9.5	9.2	Glazing upgrade to sliding door; 1400mm dia ceiling fan to kitchen/dining
215	2	69.9	0.0	5.2	8.5	8.8	Glazing upgrade to sliding door
216	3	91.4	0.0	12.6	7.1	8.1	
217	2	66.0	5.6	0.7	8.3	9.5	
218	1	53.5	0.0	0.5	12.7	8.8	
301	1	27.2	5.5	0.3	14.1	8.7	1400mm dia ceiling fan to kitchen/dining
302	2	62.4	7.8	1.4	9.0	9.3	
303	1	57.2	0.0	7.8	9.9	8.3	
304	2	75.9	0.0	5.2	11.4	8.4	
305	2	77.3	0.0	3.8	10.7	8.7	
306	2	76.4	0.0	4.3	9.8	8.7	
307	2	77.3	0.0	3.9	10.0	8.8	
308	2	77.3	0.0	3.9	10.1	8.7	
309	2	76.2	0.0	10.8	7.0	8.3	
310	1	67.2	0.0	13.5	7.7	7.9	
311	1	37.1	0.0	4.8	11.0	8.5	Glazing upgrade to sliding door; 1400mm dia ceiling fan to kitchen/dining
312	1	51.2	0.0	10.6	12.2	7.8	Glazing upgrade to sliding door
313	2	70.0	0.0	17.2	4.5	7.9	Glazing upgrade to sliding door; 1400mm dia ceiling fan to kitchen/dining
314	1	50.2	0.0	1.1	14.8	8.5	Glazing upgrade to sliding door; 1400mm dia ceiling fan to kitchen/dining
315	2	69.9	0.0	5.1	9.2	8.7	Glazing upgrade to sliding door
316	3	91.4	0.0	9.6	8.3	8.3	
317	2	66.0	5.6	1.1	8.4	9.4	
318	1	53.5	0.0	0.8	11.3	8.9	
401	1	27.2	5.5	0.3	13.9	8.7	1400mm dia ceiling fan to kitchen/dining
402	2	62.4	7.8	1.3	8.4	9.4	
403	1	57.2	0.0	8.3	10.0	8.3	
404	2	75.9	0.0	5.5	11.2	8.4	
405	2	77.3	0.0	4.1	10.6	8.7	
406	2	76.4	0.0	4.5	9.8	8.7	

Certificate # HR-9GTPW3-01, HR-722MC0-01, HR-GH0EKX-01							Accreditation # ABSA101518
Thermal performance specifications							
Unit Number	Number of Bedrooms	Floor area (m^2)		Predicted loads ($MJ/m^2/y$)		Star Rating	Thermal Comfort Upgrades
		Con.	Uncon.	Heat	Cool (Sens & Lat)		
407	2	77.3	0.0	4.2	9.9	8.7	
408	2	77.3	0.0	4.2	9.9	8.7	
409	2	76.2	0.0	10.8	6.7	8.4	
410	1	67.2	0.0	14.2	5.0	8.2	1400mm dia ceiling fan to kitchen/dining
411	1	37.1	0.0	4.8	11.0	8.5	1400mm dia ceiling fan to kitchen/dining
412	1	51.2	0.0	10.9	12.3	7.7	
413	2	70.0	0.0	15.5	4.7	8.1	Glazing upgrade to sliding door; 1400mm dia ceiling fan to kitchen/dining
414	1	50.2	0.0	0.8	15.4	8.4	Glazing upgrade to sliding door; 1500mm dia ceiling fan to kitchen/dining
415	2	69.9	0.0	4.5	9.7	8.7	Glazing upgrade to sliding door
416	3	91.4	0.0	7.9	9.0	8.4	
417	2	66.0	5.6	1.1	10.9	8.9	
418	1	53.5	0.0	0.9	11.7	8.9	
501	1	27.2	5.5	0.3	13.5	8.8	1400mm dia ceiling fan to kitchen/dining
502	2	62.4	7.8	1.4	8.3	9.4	
503	1	57.2	0.0	8.7	10.0	8.2	
504	2	75.9	0.0	5.7	10.9	8.4	
505	2	77.3	0.0	4.4	10.4	8.7	
506	2	76.4	0.0	4.9	9.4	8.7	
507	2	77.3	0.0	4.5	10.0	8.7	
508	2	77.3	0.0	4.4	10.0	8.7	
509	2	76.2	0.0	11.2	6.7	8.3	
510	1	67.2	0.0	14.5	5.2	8.1	1400mm dia ceiling fan to kitchen/dining
511	1	37.1	0.0	4.9	11.0	8.5	1400mm dia ceiling fan to kitchen/dining
512	1	51.2	0.0	11.3	12.0	7.7	
513	2	70.0	0.0	18.8	4.0	7.8	Glazing upgrade to sliding door; 1400mm dia ceiling fan to kitchen/dining; 1400mm dia ceiling fan to bedroom
514	1	50.2	0.0	1.3	14.2	8.6	Glazing upgrade to sliding door; 1400mm dia ceiling fan to kitchen/dining; 1400mm dia ceiling fan to bedroom
515	2	69.9	0.0	6.2	9.4	8.6	Glazing upgrade to sliding door

Certificate # HR-9GTPW3-01, HR-722MC0-01, HR-GH0EKX-01							Accreditation # ABSA101518
Thermal performance specifications							
Unit Number	Number of Bedrooms	Floor area (m^2)		Predicted loads ($MJ/m^2/y$)		Star Rating	Thermal Comfort Upgrades
		Con.	Uncon.	Heat	Cool (Sens & Lat)		
516	3	91.4	0.0	9.7	7.5	8.4	
517	2	66.0	5.6	1.1	11.5	8.9	
518	1	53.5	0.0	0.9	11.3	8.9	
601	1	27.2	5.5	0.5	12.6	8.9	1400mm dia ceiling fan to kitchen/dining
602	2	62.4	7.8	1.8	7.3	9.4	
603	1	57.2	0.0	10.6	9.8	8.1	
604	2	75.9	0.0	7.1	9.8	8.4	
605	2	77.3	0.0	5.7	9.8	8.6	
606	2	76.4	0.0	6.1	8.8	8.6	
607	2	77.3	0.0	5.8	9.1	8.6	
608	2	77.3	0.0	5.8	9.2	8.6	
609	2	76.2	0.0	12.7	5.9	8.2	
610	1	67.2	0.0	16.7	5.1	7.9	
611	1	37.1	0.0	5.6	9.7	8.6	1400mm dia ceiling fan to kitchen/dining
612	1	51.2	0.0	11.7	11.9	7.7	
613	2	70.0	0.0	15.9	4.7	8.0	Glazing upgrade to sliding door; 1400mm dia ceiling fan to kitchen/dining
614	1	50.2	0.0	1.8	14.4	8.4	Glazing upgrade to sliding door; 1400mm dia ceiling fan to kitchen/dining
615	2	69.9	0.0	7.4	8.4	8.5	Glazing upgrade to sliding door
616	3	91.4	0.0	11.8	7.3	8.2	
617	2	66.0	5.6	1.4	10.2	9.1	
618	1	53.5	0.0	1.4	10.2	9.1	
701	1	27.2	5.5	0.9	12.6	8.8	1400mm dia ceiling fan to kitchen/dining
702	2	62.4	7.8	1.5	8.2	9.4	
703	1	57.2	0.0	11.4	10.0	7.9	
704	2	75.9	0.0	7.4	9.7	8.4	
705	2	77.3	0.0	5.9	9.9	8.5	
706	2	76.4	0.0	6.4	8.6	8.6	
707	2	77.3	0.0	6.1	9.0	8.6	
708	2	77.3	0.0	6.1	9.0	8.6	
709	2	76.2	0.0	13.0	5.9	8.2	

Certificate # HR-9GTPW3-01, HR-722MC0-01, HR-GH0EKX-01							Accreditation # ABSA101518
Thermal performance specifications							
Unit Number	Number of Bedrooms	Floor area (m^2)		Predicted loads ($MJ/m^2/y$)		Star Rating	Thermal Comfort Upgrades
		Con.	Uncon.	Heat	Cool (Sens & Lat)		
710	1	67.2	0.0	17.1	7.4	7.6	
711	1	37.1	0.0	5.5	9.5	8.6	1400mm dia ceiling fan to kitchen/dining
712	1	51.2	0.0	12.1	11.8	7.6	
713	2	70.0	0.0	16.3	4.7	8.0	Glazing upgrade to sliding door; 1400mm dia ceiling fan to kitchen/dining
714	1	50.2	0.0	1.7	13.1	8.7	Glazing upgrade to sliding door; 1400mm dia ceiling fan to kitchen/dining
715	2	69.9	0.0	7.6	8.4	8.4	Glazing upgrade to sliding door
716	3	91.4	0.0	13.9	7.3	7.9	
717	2	66.0	5.6	1.4	10.2	9.1	
718	1	53.5	0.0	1.8	9.5	9.1	
801	1	27.2	5.5	1.2	12.4	8.8	1400mm dia ceiling fan to kitchen/dining
802	2	62.4	7.8	1.9	7.3	9.4	
803	1	57.2	0.0	11.6	10.0	7.9	
804	2	75.9	0.0	7.6	9.5	8.4	
805	2	77.3	0.0	6.1	9.3	8.6	
806	2	76.4	0.0	6.6	8.7	8.6	
807	2	77.3	0.0	6.3	8.7	8.6	
808	2	77.3	0.0	6.3	8.6	8.6	
809	2	76.2	0.0	13.2	5.9	8.2	
810	1	67.2	0.0	17.0	7.3	7.6	
811	1	37.1	0.0	5.6	11.4	8.4	1200mm dia ceiling fan to kitchen/dining
812	1	51.2	0.0	11.7	11.7	7.7	
813	2	70.0	0.0	19.1	4.2	7.7	Glazing upgrade to sliding door; 1400mm dia ceiling fan to kitchen/dining
814	1	50.2	0.0	1.9	13.9	8.5	Glazing upgrade to sliding door
815	2	69.9	0.0	7.5	8.3	8.5	Glazing upgrade to sliding door
816	3	91.4	0.0	13.8	7.1	8.0	
817	2	66.0	5.6	1.4	10.1	9.1	
818	1	53.5	0.0	1.9	9.6	9.1	
901	1	27.2	5.5	5.3	16.4	7.9	1400mm dia ceiling fan to kitchen/dining
902	2	62.4	7.8	5.4	9.5	8.6	
903	1	57.2	0.0	14.4	10.5	7.5	

Certificate # HR-9GTPW3-01, HR-722MC0-01, HR-GH0EKX-01							Accreditation # ABSA101518
Thermal performance specifications							
Unit Number	Number of Bedrooms	Floor area (m^2)		Predicted loads ($MJ/m^2/y$)		Star Rating	Thermal Comfort Upgrades
		Con.	Uncon.	Heat	Cool (Sens & Lat)		
904	2	75.9	0.0	12.5	10.7	7.7	
905	2	77.3	0.0	14.4	11.9	7.4	
906	2	76.4	0.0	16.4	11.0	7.3	
907	2	77.3	0.0	15.4	11.8	7.3	
908	2	77.3	0.0	15.4	11.8	7.3	
909	2	76.2	0.0	22.2	8.8	6.9	
910	1	67.2	0.0	25.2	9.4	6.4	
911	1	37.1	0.0	13.4	12.4	7.4	1400mm dia ceiling fan to kitchen/dining
912	1	51.2	0.0	19.4	9.8	7.1	
913	2	70.0	0.0	27.8	7.5	6.3	Glazing upgrade to sliding door; 1500mm dia ceiling fan to kitchen/dining
914	1	50.2	0.0	7.6	15.9	7.7	Glazing upgrade to sliding door; 1500mm dia ceiling fan to kitchen/dining; 1400mm dia ceiling fan to bedroom
915	2	69.9	0.0	15.5	11.2	7.3	Glazing upgrade to sliding door
916	3	91.4	0.0	25.4	9.9	6.3	1400mm dia ceiling fan to bedroom
917	2	66.0	5.6	6.8	12.6	8.2	
918	1	53.5	0.0	8.3	14.6	7.8	
1101	2	62.2	7.8	3.0	5.9	9.5	
1102	1	47.7	0.0	9.8	11.0	8.0	
1103	1	47.7	0.0	10.4	12.4	7.8	
1104	1	46.0	8.1	18.0	10.3	7.2	
1105	1	41.7	8.1	16.2	10.8	7.3	1400mm dia ceiling fan to kitchen/dining
1106	1	46.7	0.0	7.8	13.2	7.9	1200mm dia ceiling fan to kitchen/dining
1107	1	35.6	6.1	6.1	15.3	7.9	
1201	2	62.2	7.8	2.1	6.3	9.6	
1202	1	47.7	0.0	7.3	12.4	8.1	
1203	1	47.7	0.0	7.8	13.0	8.0	
1204	1	46.0	8.1	10.4	11.5	7.9	
1205	1	41.7	8.1	10.8	11.9	7.8	1400mm dia ceiling fan to kitchen/dining
1206	1	46.7	0.0	3.0	15.0	8.3	1200mm dia ceiling fan to kitchen/dining
1207	1	35.6	6.1	2.3	12.4	8.7	

Certificate # HR-9GTPW3-01, HR-722MC0-01, HR-GH0EKX-01							Accreditation # ABSA101518
Thermal performance specifications							
Unit Number	Number of Bedrooms	Floor area (m^2)		Predicted loads ($MJ/m^2/y$)		Star Rating	Thermal Comfort Upgrades
		Con.	Uncon.	Heat	Cool (Sens & Lat)		
1301	2	62.2	7.8	6.1	8.4	8.7	Ceiling insulation upgrade
1302	1	47.7	0.0	17.2	13.6	6.9	Ceiling insulation upgrade
1303	1	47.7	0.0	16.6	15.8	6.7	Ceiling insulation upgrade
1304	1	46.0	8.1	15.2	13.4	7.1	Ceiling insulation upgrade
1305	1	41.7	8.1	21.9	12.9	6.4	Ceiling insulation upgrade; 1400mm dia ceiling fan to kitchen/dining
1306	1	46.7	0.0	12.0	17.1	7.1	Ceiling insulation upgrade; 1400mm dia ceiling fan to kitchen/dining; 1400mm dia ceiling fan to bedroom
1307	1	35.6	6.1	6.5	15.4	7.9	Ceiling insulation upgrade
G01	2	84.1	0.0	9.1	16.9	7.4	1400mm dia ceiling fan to kitchen/dining; 1400mm dia ceiling fan to living; 1300mm dia ceiling fan to bedroom
G02	1	63.8	6.9	11.3	18.6	7.0	1400mm dia ceiling fan to kitchen/dining; 1400mm dia ceiling fan to living; 1300mm dia ceiling fan to bedroom
G03	1	50.2	0.0	1.4	13.7	8.6	1400mm dia ceiling fan to kitchen/dining; 1300mm dia ceiling fan to bedroom
G04	1	55.4	0.0	9.7	17.9	7.2	
G05	1	67.2	0.0	17.2	7.8	7.5	
G06	1	37.1	0.0	9.0	11.9	8.0	1400mm dia ceiling fan to kitchen/dining
G07	1	45.3	5.6	20.8	11.1	6.8	1400mm dia ceiling fan to kitchen/dining
G08	1	50.0	5.8	27.7	7.9	6.3	1400mm dia ceiling fan to kitchen/dining
G09	1	50.2	0.0	9.5	11.3	8.0	1400mm dia ceiling fan to kitchen/dining
G10	2	69.9	0.0	19.2	11.4	6.9	
G11	1	28.6	0.0	19.7	12.2	6.8	1200mm dia ceiling fan to kitchen/dining
G12	1	28.6	0.0	19.7	12.1	6.8	1200mm dia ceiling fan to kitchen/dining
G13	1	33.0	0.0	22.8	10.5	6.6	1200mm dia ceiling fan to kitchen/dining
G14	1	28.6	0.0	18.6	12.0	6.9	1200mm dia ceiling fan to kitchen/dining
G15	3	91.4	0.0	20.3	8.2	7.2	
G16	2	66.0	5.6	1.9	8.2	9.3	
G17	1	32.7	5.5	1.6	19.8	7.9	
Building S3							
101	2	73.7	0.0	5.6	6.9	8.9	

Certificate # HR-9GTPW3-01, HR-722MC0-01, HR-GH0EKX-01							Accreditation # ABSA101518
Thermal performance specifications							
Unit Number	Number of Bedrooms	Floor area (m^2)		Predicted loads ($MJ/m^2/y$)		Star Rating	Thermal Comfort Upgrades
		Con.	Uncon.	Heat	Cool (Sens & Lat)		
102	2	74.1	0.0	7.9	6.3	8.7	
103	1	34.4	0.0	8.6	11.8	8.1	
104	1	52.5	0.0	10.3	7.2	8.4	
105	2	76.1	0.0	7.4	9.5	8.4	
106	1	63.6	0.0	6.5	7.6	8.8	
107	1	50.9	0.0	5.2	12.1	8.4	
108	1	50.9	0.0	5.4	12.3	8.3	
109	1	50.9	0.0	5.5	11.5	8.4	
110	1	50.9	0.0	4.9	12.5	8.4	
111	1	60.8	0.0	2.5	7.9	9.3	
112	1	51.0	0.0	4.8	9.4	8.7	
113	2	76.8	0.0	2.6	13.6	8.4	
114	2	77.6	0.0	6.8	9.1	8.5	
115	1	33.7	0.0	2.8	16.1	8.2	1200mm dia ceiling fan to kitchen/dining
116	2	72.4	0.0	11.5	8.8	8.1	
201	2	73.7	0.0	6.8	4.8	9.1	
202	2	74.1	0.0	6.9	6.3	8.9	
203	1	34.4	0.0	8.7	11.6	8.1	
204	1	52.5	0.0	10.7	6.8	8.3	
205	2	76.1	0.0	7.7	9.2	8.4	
206	1	63.6	0.0	6.7	7.4	8.7	
207	1	50.9	0.0	5.2	12.4	8.3	
208	1	50.9	0.0	5.7	11.7	8.4	
209	1	50.9	0.0	6.1	11.0	8.4	
210	1	50.9	0.0	4.8	12.2	8.4	
211	1	60.8	0.0	2.8	7.8	9.2	
212	1	51.0	0.0	5.1	8.7	8.8	
213	2	76.8	0.0	2.7	13.0	8.5	
214	2	77.6	0.0	6.9	9.3	8.4	
215	1	33.7	0.0	3.3	14.2	8.3	1200mm dia ceiling fan to kitchen/dining
216	2	72.4	0.0	2.2	12.3	8.7	1200mm dia ceiling fan to kitchen/dining
301	2	73.7	0.0	11.8	6.9	8.2	

Certificate # HR-9GTPW3-01, HR-722MC0-01, HR-GH0EKX-01							Accreditation # ABSA101518
Thermal performance specifications							
Unit Number	Number of Bedrooms	Floor area (m^2)		Predicted loads ($MJ/m^2/y$)		Star Rating	Thermal Comfort Upgrades
		Con.	Uncon.	Heat	Cool (Sens & Lat)		
302	2	74.1	0.0	14.1	17.3	6.8	
303	1	34.4	0.0	19.5	15.1	6.4	
304	1	52.5	0.0	21.0	9.5	6.9	
305	2	76.1	0.0	15.9	12.4	7.2	
306	1	63.6	0.0	16.4	9.9	7.4	
307	1	50.9	0.0	5.6	11.2	8.4	
308	1	50.9	0.0	6.2	11.8	8.3	
309	1	50.9	0.0	6.5	11.1	8.3	
310	1	50.9	0.0	5.4	11.8	8.4	
311	1	60.8	0.0	3.2	7.7	9.2	
312	1	51.0	0.0	5.6	8.4	8.7	
313	2	76.8	0.0	3.2	12.4	8.6	
314	2	77.6	0.0	7.4	9.8	8.4	
315	1	33.7	0.0	2.4	19.0	7.9	1200mm dia ceiling fan to kitchen/dining
316	2	72.3	0.0	2.0	11.4	8.8	1200mm dia ceiling fan to kitchen/dining
401	3	91.6	0.0	22.6	6.4	7.1	
402	2	68.4	0.0	12.1	8.2	8.1	
403	1	50.9	0.0	8.3	11.2	8.1	
404	1	60.8	0.0	5.3	6.0	9.1	
405	1	51.0	0.0	7.8	7.5	8.6	
406	2	76.8	0.0	7.7	5.4	8.9	
407	2	77.6	0.0	12.6	5.1	8.3	
408	1	33.7	0.0	2.9	16.1	8.2	1200mm dia ceiling fan to kitchen/dining
409	2	72.3	0.0	5.0	6.5	9.1	
501	3	91.6	0.0	14.7	6.8	7.9	
502	2	67.4	0.0	12.1	8.7	8.0	
503	1	50.9	0.0	10.6	10.7	7.9	
504	1	60.8	0.0	5.9	6.1	9.0	
505	1	51.0	0.0	8.9	6.6	8.6	
506	2	76.8	0.0	8.0	5.1	8.9	
507	2	77.6	0.0	12.9	5.0	8.3	
508	1	33.7	0.0	3.2	15.7	8.2	1200mm dia ceiling fan to kitchen/dining

Certificate # HR-9GTPW3-01, HR-722MC0-01, HR-GH0EKX-01							Accreditation # ABSA101518
Thermal performance specifications							
Unit Number	Number of Bedrooms	Floor area (m^2)		Predicted loads ($MJ/m^2/y$)		Star Rating	Thermal Comfort Upgrades
		Con.	Uncon.	Heat	Cool (Sens & Lat)		
509	2	72.3	0.0	5.7	6.3	9.0	
601	3	91.6	0.0	26.0	8.4	6.4	
602	2	67.4	0.0	23.9	11.0	6.4	
603	1	50.9	0.0	23.0	13.0	6.2	
604	1	60.8	0.0	7.5	5.9	8.8	
605	1	51.0	0.0	10.8	6.0	8.4	
606	2	76.8	0.0	8.3	5.4	8.8	
607	2	77.6	0.0	13.1	5.1	8.3	
608	1	33.7	0.0	4.0	14.3	8.3	1200mm dia ceiling fan to kitchen/dining
609	2	72.3	0.0	7.3	5.9	8.8	
701	1	60.8	0.0	15.4	5.8	7.9	
702	1	51.0	0.0	11.1	6.1	8.4	
703	2	76.8	0.0	8.5	5.4	8.8	
704	2	77.6	0.0	13.0	5.4	8.3	
705	1	33.7	0.0	4.1	14.9	8.2	1200mm dia ceiling fan to kitchen/dining
706	2	72.3	0.0	7.5	5.9	8.8	
801	1	60.8	0.0	15.3	6.0	7.9	
802	1	51.0	0.0	11.0	6.4	8.4	
803	2	76.8	0.0	6.4	5.5	9.0	
804	2	77.6	0.0	7.9	5.5	8.8	
805	1	33.7	0.0	4.3	14.1	8.3	1200mm dia ceiling fan to kitchen/dining
806	2	72.3	0.0	7.7	5.9	8.8	
901	1	60.8	0.0	18.5	8.4	7.3	
902	1	51.0	0.0	13.3	8.1	7.9	
903	2	76.8	0.0	12.6	7.1	8.1	
904	2	77.6	0.0	17.6	7.8	7.4	
905	1	33.7	0.0	13.9	20.4	6.4	1200mm dia ceiling fan to kitchen/dining
906	2	72.3	0.0	16.1	7.6	7.7	
G01	2	69.8	0.0	12.7	8.3	8.0	
G02	2	75.3	0.0	21.9	12.3	6.4	
G03	1	52.5	0.0	14.5	7.8	7.8	
G04	2	76.1	0.0	6.8	10.1	8.4	

Certificate # HR-9GTPW3-01, HR-722MC0-01, HR-GH0EKX-01							Accreditation # ABSA101518
Thermal performance specifications							
Unit Number	Number of Bedrooms	Floor area (m^2)		Predicted loads ($MJ/m^2/y$)		Star Rating	Thermal Comfort Upgrades
		Con.	Uncon.	Heat	Cool (Sens & Lat)		
G05	1	63.6	0.0	5.8	7.9	8.8	
G06	1	50.9	0.0	14.7	12.9	7.2	
G07	1	50.9	0.0	15.0	12.2	7.3	
G08	1	50.9	0.0	15.1	11.4	7.3	
G09	1	50.9	0.0	14.5	13.5	7.2	
G10	1	60.8	0.0	4.0	7.1	9.1	
G11	1	51.0	0.0	5.8	8.9	8.7	
G12	2	76.8	0.0	3.4	13.9	8.4	
G13	2	77.6	0.0	12.3	5.8	8.3	
G14	1	33.7	0.0	13.9	10.2	7.6	1200mm dia ceiling fan to kitchen/dining
G15	1	62.9	0.0	28.6	7.2	6.3	
Building S4							
101	2	67.1	0.0	16.6	10.4	7.3	
102	1	56.6	0.0	9.8	6.2	8.5	
103	2	76.7	0.0	9.6	9.5	8.2	
104	1	38.1	0.0	1.5	17.9	8.2	
105	1	50.9	0.0	3.2	15.0	8.3	
106	1	50.8	0.0	3.4	15.4	8.2	
107	1	50.9	0.0	3.3	14.6	8.3	
108	1	50.8	0.0	3.6	15.1	8.2	
109	1	50.9	0.0	3.5	14.9	8.3	
110	1	50.8	0.0	3.1	15.4	8.3	
111	1	39.4	0.0	1.5	18.4	8.1	
112	2	86.1	0.0	10.2	9.7	8.1	
113	1	56.5	0.0	8.6	6.4	8.6	
114	2	67.1	0.0	14.6	7.1	7.9	
201	2	67.1	0.0	14.4	11.3	7.4	
202	1	56.6	0.0	6.2	5.8	8.9	
203	2	76.7	0.0	8.0	9.2	8.4	
204	1	38.1	0.0	1.7	17.9	8.1	
205	1	50.9	0.0	3.5	14.7	8.3	
206	1	50.8	0.0	3.1	15.0	8.3	

Certificate # HR-9GTPW3-01, HR-722MC0-01, HR-GH0EKX-01							Accreditation # ABSA101518
Thermal performance specifications							
Unit Number	Number of Bedrooms	Floor area (m^2)		Predicted loads ($MJ/m^2/y$)		Star Rating	Thermal Comfort Upgrades
		Con.	Uncon.	Heat	Cool (Sens & Lat)		
207	1	50.9	0.0	3.8	14.4	8.3	
208	1	50.8	0.0	3.6	15.4	8.2	
209	1	50.9	0.0	4.1	14.9	8.2	
210	1	50.8	0.0	3.7	15.4	8.2	
211	1	39.4	0.0	1.3	18.6	8.1	
212	2	86.1	0.0	6.0	10.1	8.4	
213	1	56.5	0.0	6.7	6.3	8.9	
214	2	67.1	0.0	15.1	6.3	7.9	
301	2	67.1	0.0	20.6	18.6	5.9	
302	1	56.6	0.0	15.0	8.6	7.7	
303	2	76.7	0.0	15.7	13.7	7.1	
304	1	38.1	0.0	2.0	19.0	7.9	
305	1	50.9	0.0	4.6	15.8	8.1	
306	1	50.8	0.0	4.1	16.1	8.1	
307	1	50.9	0.0	4.0	16.6	8.0	
308	1	50.8	0.0	4.6	15.8	8.1	
309	1	50.9	0.0	4.6	15.7	8.1	
310	1	50.8	0.0	4.6	16.3	8.0	
311	1	39.4	0.0	1.9	19.8	7.9	
312	2	86.1	0.0	5.1	10.8	8.5	
313	1	56.5	0.0	0.9	6.1	9.8	
314	2	67.1	0.0	9.6	7.2	8.4	
401	3	95.1	0.0	19.1	18.3	6.1	
402	2	76.9	0.0	16.1	15.0	6.9	
403	2	69.4	0.0	14.1	19.7	6.5	1400mm dia ceiling fan to kitchen/dining; 1200mm dia ceiling fan to bedrooms
404	1	48.0	0.0	17.6	16.4	6.4	
405	1	48.1	0.0	15.7	17.1	6.7	1400mm dia ceiling fan to kitchen/dining; 1200mm dia ceiling fan to bedroom
406	1	34.6	0.0	12.0	19.8	6.8	1500mm dia ceiling fan to kitchen/dining
407	3	88.5	0.0	8.5	10.2	8.2	
408	3	87.7	0.0	11.9	8.1	8.1	

Appendix C BASIX Certificate

BASIX® Certificate

Building Sustainability Index www.basix.nsw.gov.au

Multi Dwelling

Certificate number: 1753701M

This certificate confirms that the proposed development will meet the NSW government's requirements for sustainability, if it is built in accordance with the commitments set out below. Terms used in this certificate, or in the commitments, have the meaning given by the document entitled "BASIX Definitions" dated 10/09/2020 published by the Department. This document is available at www.basix.nsw.gov.au

Secretary
Date of issue: Monday, 01 July 2024
To be valid, this certificate must be submitted with a development application or lodged with a complying development certificate application within 3 months of the date of issue.

NSW GOVERNMENT

Project summary	
Project name	Redfern Place S2 S3 S4
Street address	600-614 ELIZABETH STREET REDFERN 2016
Local Government Area	SYDNEY
Plan type and plan number	Deposited Plan 1249145
Lot No.	1
Section no.	-
No. of residential flat buildings	3
Residential flat buildings: no. of dwellings	355
Multi-dwelling housing: no. of dwellings	0
No. of single dwelling houses	0

Project score			
Water	✔	40	Target 40
Thermal Performance	✔	Pass	Target Pass
Energy	✔	77	Target 61
Materials	✔	-100	Target n/a

Certificate Prepared by
Name / Company Name: Atelier Ten
ABN (if applicable):

Description of project

Project address	
Project name	Redfern Place S2 S3 S4
Street address	600-614 ELIZABETH STREET REDFERN 2016
Local Government Area	SYDNEY
Plan type and plan number	Deposited Plan 1249145
Lot No.	1
Section no.	-

Project type	
No. of residential flat buildings	3
Residential flat buildings: no. of dwellings	355
Multi-dwelling housing: no. of dwellings	0
No. of single dwelling houses	0

Site details	
Site area (m²)	10850
Roof area (m²)	2910
Non-residential floor area (m²)	930
Residential car spaces	81
Non-residential car spaces	5

Common area landscape	
Common area lawn (m²)	0
Common area garden (m²)	2190
Area of indigenous or low water use species (m²)	0

Assessor details and thermal loads	
Assessor number	101518
Certificate number	HR-9GTPW3-01
Climate zone	56

Project score			
Water	✔	40	Target 40
Thermal Performance	✔	Pass	Target Pass
Energy	✔	77	Target 61
Materials	✔	-100	Target n/a

Description of project

The tables below describe the dwellings and common areas within the project

Residential flat buildings - S3, 108 dwellings, 10 storeys above ground

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
101	2	73.7	0	0	0
105	2	76.1	0	0	0
109	1	50.9	0	0	0
113	2	76.8	0	0	0
201	2	73.7	0	0	0
205	2	76.1	0	0	0
209	1	50.9	0	0	0
213	2	76.8	0	0	0
301	2	73.7	0	0	0
305	2	76.1	0	0	0
309	1	50.9	0	0	0
313	2	76.8	0	0	0
401	3	91.6	0	0	0
405	1	51	0	0	0
409	2	72.3	0	0	0
504	1	60.8	0	0	0
508	1	33.7	0	0	0
603	1	50.9	0	0	0
607	2	77.6	0	0	0
702	1	51	0	0	0
706	2	72.3	0	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
102	2	74.1	0	0	0
106	1	63.6	0	0	0
110	1	50.9	0	0	0
114	2	77.6	0	0	0
202	2	74.1	0	0	0
206	1	63.6	0	0	0
210	1	50.9	0	0	0
214	2	77.6	0	0	0
302	2	74.2	0	0	0
306	1	63.6	0	0	0
310	1	50.9	0	0	0
314	2	77.6	0	0	0
402	2	68.4	0	0	0
406	2	76.8	0	0	0
501	3	91.6	0	0	0
505	1	51	0	0	0
509	2	72.3	0	0	0
604	1	60.8	0	0	0
608	1	33.7	0	0	0
703	2	76.8	0	0	0
801	1	60.8	0	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
103	1	34.4	0	0	0
107	1	50.9	0	0	0
111	1	60.8	0	0	0
115	1	33.7	0	0	0
203	1	34.4	0	0	0
207	1	50.9	0	0	0
211	1	60.8	0	0	0
215	1	33.7	0	0	0
303	1	34.4	0	0	0
307	1	50.9	0	0	0
311	1	60.8	0	0	0
315	1	33.7	0	0	0
403	1	50.9	0	0	0
407	2	77.6	0	0	0
502	2	67.4	0	0	0
506	2	76.8	0	0	0
601	3	91.6	0	0	0
605	1	51	0	0	0
609	2	72.3	0	0	0
704	2	77.6	0	0	0
802	1	51	0	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
104	1	52.5	0	0	0
108	1	50.9	0	0	0
112	1	51	0	0	0
116	2	72.4	0	0	0
204	1	52.5	0	0	0
208	1	50.9	0	0	0
212	1	51	0	0	0
216	2	72.4	0	0	0
304	1	52.5	0	0	0
308	1	50.9	0	0	0
312	1	51	0	0	0
316	2	72.3	0	0	0
404	1	60.8	0	0	0
408	1	33.7	0	0	0
503	2	50.9	0	0	0
507	2	77.6	0	0	0
602	2	67.4	0	0	0
606	2	76.8	0	0	0
701	1	60.8	0	0	0
705	1	33.7	0	0	0
803	2	76.8	0	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)	Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)	Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)	Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
804	2	77.6	0	0	0	805	1	33.7	0	0	0	806	2	72.3	0	0	0	901	1	60.8	0	0	0
902	1	51	0	0	0	903	2	76.8	0	0	0	904	2	77.6	0	0	0	905	1	33.7	0	0	0
906	2	72.3	0	0	0	G01	2	69.8	0	0	0	G02	2	75.3	0	0	0	G03	1	52.5	0	0	0
G04	2	76.1	0	0	0	G05	1	63.6	0	0	0	G06	1	50.9	0	0	0	G07	1	50.9	0	0	0
G08	1	50.9	0	0	0	G09	1	50.9	0	0	0	G10	1	60.8	0	0	0	G11	1	51	0	0	0
G12	2	76.8	0	0	0	G13	2	77.6	0	0	0	G14	1	33.7	0	0	0	G15	1	62.9	0	0	0

Residential flat buildings - S4, 50 dwellings, 5 storeys above ground

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)	Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)	Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)	Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
101	2	67.1	0	0	0	102	1	56.6	0	0	0	103	2	76.7	0	0	0	104	1	38.1	0	0	0
105	1	50.9	0	0	0	106	1	50.8	0	0	0	107	1	50.9	0	0	0	108	1	50.8	0	0	0
109	1	50.9	0	0	0	110	1	50.8	0	0	0	111	1	39.4	0	0	0	112	2	86.1	0	0	0
113	1	56.5	0	0	0	114	2	67.1	0	0	0	201	2	67.1	0	0	0	202	1	56.6	0	0	0
203	2	76.7	0	0	0	204	1	38.1	0	0	0	205	1	50.9	0	0	0	206	1	50.8	0	0	0
207	1	50.9	0	0	0	208	1	50.8	0	0	0	209	1	50.9	0	0	0	210	1	50.8	0	0	0
211	1	39.4	0	0	0	212	2	86.1	0	0	0	213	1	56.5	0	0	0	214	2	67.1	0	0	0
301	2	67.1	0	0	0	302	1	56.6	0	0	0	303	2	76.7	0	0	0	304	1	38.1	0	0	0
305	1	50.9	0	0	0	306	1	50.8	0	0	0	307	1	50.9	0	0	0	308	1	50.8	0	0	0
309	1	50.9	0	0	0	310	1	50.8	0	0	0	311	1	39.4	0	0	0	312	2	86.1	0	0	0
313	1	56.5	0	0	0	314	2	67.1	0	0	0	401	3	95.1	0	0	0	402	2	76.9	0	0	0
403	2	69.4	0	0	0	404	1	48	0	0	0	405	1	48.1	0	0	0	406	1	34.6	0	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)	Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)	Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)	Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
407	3	88.5	0	0	0	408	3	87.7	0	0	0												

Residential flat buildings - S2, 197 dwellings, 15 storeys above ground

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)	Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)	Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)	Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
101	1	28.6	0	0	0	102	1	55.6	0	0	0	103	2	76.4	0	0	0	104	2	77.3	0	0	0
105	2	77.3	0	0	0	106	2	76.2	0	0	0	107	1	67.2	0	0	0	108	1	37.1	0	0	0
109	1	45.3	5.6	0	0	110	2	70	0	0	0	1101	2	62.2	7.8	0	0	1102	1	47.7	0	0	0
1103	1	47.7	0	0	0	1104	1	46	8.1	0	0	1105	1	41.7	8.1	0	0	1106	1	46.7	0	0	0
1107	1	35.6	6.1	0	0	111	1	50.2	0	0	0	112	2	69.9	0	0	0	113	3	91.4	0	0	0
114	2	66	5.6	0	0	115	1	53.5	0	0	0	1201	2	62.2	7.8	0	0	1202	1	47.7	0	0	0
1203	1	47.7	0	0	0	1204	1	46	8.1	0	0	1205	1	41.7	8.1	0	0	1206	1	46.7	0	0	0
1207	1	35.6	6.1	0	0	1301	2	62.2	7.8	0	0	1302	1	47.7	0	0	0	1303	1	47.7	0	0	0
1304	1	46	8.1	0	0	1305	1	41.7	8.1	0	0	1306	1	46.7	0	0	0	1307	1	35.6	6.1	0	0
201	1	27.2	5.5	0	0	202	2	63	6.6	0	0	203	1	56.4	0	0	0	204	2	76.1	0	0	0
205	2	79.3	0	0	0	206	2	76.4	0	0	0	207	2	77.3	0	0	0	208	2	77.3	0	0	0
209	2	76.2	0	0	0	210	1	67.2	0	0	0	211	1	37.1	0	0	0	212	1	45.3	5.6	0	0
213	2	70	0	0	0	214	1	50.2	0	0	0	215	2	69.9	0	0	0	216	3	91.4	0	0	0
217	2	66	5.6	0	0	218	1	53.5	0	0	0	301	1	27.2	5.5	0	0	302	2	62.4	7.8	0	0
303	1	57.2	0	0	0	304	2	75.9	0	0	0	305	2	77.3	0	0	0	306	2	76.4	0	0	0
307	2	77.3	0	0	0	308	2	77.3	0	0	0	309	2	76.2	0	0	0	310	1	67.2	0	0	0
311	1	37.1	0	0	0	312	1	51.2	0	0	0	313	2	70	0	0	0	314	1	50.2	0	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
315	2	69.9	0	0	0
401	1	27.2	5.5	0	0
405	2	77.3	0	0	0
409	2	76.2	0	0	0
413	2	70	0	0	0
417	2	66	5.6	0	0
503	1	57.2	0	0	0
507	2	77.3	0	0	0
511	1	37.1	0	0	0
515	2	69.9	0	0	0
601	1	27.2	5.5	0	0
605	2	77.3	0	0	0
609	2	76.2	0	0	0
613	2	70	0	0	0
617	2	66	5.6	0	0
703	1	57.2	0	0	0
707	2	77.3	0	0	0
711	1	37.1	0	0	0
715	2	69.9	0	0	0
801	1	27.2	5.5	0	0
805	2	77.3	0	0	0
809	2	76.2	0	0	0
813	2	70	0	0	0
817	2	66	5.6	0	0
903	1	57.2	0	0	0
907	2	77.3	0	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
316	3	91.4	0	0	0
402	2	62.4	7.8	0	0
406	2	76.4	0	0	0
410	1	67.2	0	0	0
414	1	50.2	0	0	0
418	1	53.5	0	0	0
504	2	75.9	0	0	0
508	2	77.3	0	0	0
512	1	51.2	0	0	0
516	3	91.4	0	0	0
602	2	62.4	7.8	0	0
606	2	76.4	0	0	0
610	1	67.2	0	0	0
614	1	50.2	0	0	0
618	1	53.5	0	0	0
704	2	75.9	0	0	0
708	2	77.3	0	0	0
712	1	51.2	0	0	0
716	3	91.4	0	0	0
802	2	62.4	7.8	0	0
806	2	76.4	0	0	0
810	1	67.2	0	0	0
814	1	50.2	0	0	0
818	1	53.5	0	0	0
904	2	75.9	0	0	0
908	2	77.3	0	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
317	2	66	5.6	0	0
403	1	57.2	0	0	0
407	2	77.3	0	0	0
411	1	37.1	0	0	0
415	2	69.9	0	0	0
501	1	27.2	5.5	0	0
505	2	77.3	0	0	0
509	2	76.2	0	0	0
513	2	70	0	0	0
517	2	66	5.6	0	0
603	1	57.2	0	0	0
607	2	77.3	0	0	0
611	1	37.1	0	0	0
615	2	69.9	0	0	0
701	1	27.2	5.5	0	0
705	2	77.3	0	0	0
709	2	76.2	0	0	0
713	2	70	0	0	0
717	2	66	5.6	0	0
803	1	57.2	0	0	0
807	2	77.3	0	0	0
811	1	37.1	0	0	0
815	2	69.9	0	0	0
901	1	27.2	5.5	0	0
905	2	77.3	0	0	0
909	2	76.2	0	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
318	1	53.5	0	0	0
404	2	75.9	0	0	0
408	2	77.3	0	0	0
412	1	51.2	0	0	0
416	3	91.4	0	0	0
502	2	62.4	7.8	0	0
506	2	76.4	0	0	0
510	1	67.2	0	0	0
514	1	50.2	0	0	0
518	1	53.5	0	0	0
604	2	75.9	0	0	0
608	2	77.3	0	0	0
612	1	51.2	0	0	0
616	3	91.4	0	0	0
702	2	62.4	7.8	0	0
706	2	76.4	0	0	0
710	1	67.2	0	0	0
714	1	50.2	0	0	0
718	1	53.5	0	0	0
804	2	75.9	0	0	0
808	2	77.3	0	0	0
812	1	51.2	0	0	0
816	3	91.4	0	0	0
902	2	62.4	7.8	0	0
906	2	76.4	0	0	0
910	1	67.2	0	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
911	1	37.1	0	0	0
915	2	69.9	0	0	0
G01	2	84.1	0	0	0
G05	1	67.2	0	0	0
G09	1	50.2	0	0	0
G13	1	33	0	0	0
G17	1	32.7	5.5	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
912	1	51.2	0	0	0
916	3	91.4	0	0	0
G02	1	63.8	6.9	0	0
G06	1	37.1	0	0	0
G10	2	69.9	0	0	0
G14	1	28.6	0	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
913	2	70	0	0	0
917	2	66	5.6	0	0
G03	1	50.2	0	0	0
G07	1	45.3	5.6	0	0
G11	1	28.6	0	0	0
G15	3	91.4	0	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
914	1	50.2	0	0	0
918	1	53.5	0	0	0
G04	1	55.4	0	0	0
G08	1	50	5.8	0	0
G12	1	28.6	0	0	0
G16	2	66	5.6	0	0

Description of project

The tables below describe the dwellings and common areas within the project

Common areas of the development (non-building specific)

Common area	Floor area (m²)
Undercover car park area (No. 1)	2854
Lift motor room (No. 3)	6
Garbage room (No. 1)	65
Ground floor lobby type (No. 1)	283

Common area	Floor area (m²)
Lift motor room (No. 1)	6
Lift motor room (No. 4)	6
Plant or service room (No. 1)	114
Hallway/lobby type (No. 1)	2816

Common area	Floor area (m²)
Lift motor room (No. 2)	6
Switch room (No. 1)	39
Other internal common area (No. 1)	524

Common areas of unit building - S2

Common area	Floor area (m²)
Lift bank (No. 1)	-
Lift bank (No. 4)	-

Common area	Floor area (m²)
Lift bank (No. 2)	-
Community room (No. 1)	133

Common area	Floor area (m²)
Lift bank (No. 3)	-

Schedule of BASIX commitments

1. Commitments for Residential flat buildings - S3
    - (a) Buildings
        - (i) Materials
    - (b) Dwellings
        - (i) Water
        - (ii) Energy
        - (iii) Thermal Performance
    - (c) Common areas and central systems/facilities
        - (i) Water
        - (ii) Energy

2. Commitments for Residential flat buildings - S4
    - (a) Buildings
        - (i) Materials
    - (b) Dwellings
        - (i) Water
        - (ii) Energy
        - (iii) Thermal Performance
    - (c) Common areas and central systems/facilities
        - (i) Water
        - (ii) Energy

3. Commitments for Residential flat buildings - S2
    - (a) Buildings
        - (i) Materials
    - (b) Dwellings
        - (i) Water

(ii) Energy

(iii) Thermal Performance

(c) Common areas and central systems/facilities

(i) Water

(ii) Energy

4. Commitments for common areas and central systems/facilities for the development (non-building specific)

(a) Buildings 'Other'

(i) Materials

(b) Common areas and central systems/facilities

(i) Water

(ii) Energy

Schedule of BASIX commitments

The commitments set out below regulate how the proposed development is to be carriedout. It is a condition of any development consent granted, or complying development certificate issued, for the proposed development, that BASIX commitments be complied with.

1. Commitments for Residential flat buildings - S3

(a) Buildings

(i) Materials	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The details of the proposed development on the Assessor Certificate must be consistent with the details shown in this BASIX Certificate, including the details shown in the “Floor types”, “External wall types”, “Internal wall types”, “Ceiling and roof types”, “Frames” and “Glazing” tables below.			✔
(b) The applicant must show on the plans accompanying the application for a construction certificate (or complying development certificate, if applicable), all specifications included in the tables below.		✔	
(c) The applicant must construct the floors, walls, roof, ceiling and roof, windows, glazed doors and skylights of the development in accordance with the specifications listed in the tables below. In the case of glazing, a 5% variance from the area values listed in the “Frames” and “Glazing” tables is permitted.	✔	✔	✔
(d) The applicant must show through receipts that the materials purchased for construction are consistent with the specifications listed in the below tables.			✔

Floor types			
Floor type	**Area (m2)**	**Insulation**	**Low emissions option**
suspended floor above garage, frame: suspended concrete slab	1091	fibreglass batts or roll	-
floors above habitable rooms, frame: suspended concrete slab	6594	-	none

External wall types				
External wall type	**Construction type**	**Area (m2)**	**Low emissions option**	**Insulation**
External wall type 1	concrete panel/ plasterboard,frame:light steel frame	8223	-	-

Internal wall types			
Internal wall type	**Construction type**	**Area (m2)**	**Insulation**
Internal wall type 1	plasterboard, frame:light steel frame	6532	-

Reinforcement concrete frames/columns		
Building has reinforced concrete frame/columns?	**Volume (m³)**	**Low emissions option**
yes	24547	30% cement substitute

Ceiling and roof types			
Ceiling and roof type	**Area (m²)**	**Roof Insulation**	**Ceiling Insulation**
concrete - plasterboard internal, frame: light steel frame	795	-	fibreglass batts or roll

Glazing types			Frame types				
Single glazing (m²)	**Double glazing (m²)**	**Triple glazing (m²)**	**Aluminium frames (m²)**	**Timber frames (m²)**	**uPVC frames (m²)**	**Steel frames (m²)**	**Composite frames (m²)**
-	3074	-	3074	-	-	-	-

(b) Dwellings

(i) Water	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The applicant must comply with the commitments listed below in carrying out the development of a dwelling listed in a table below.			
(b) The applicant must plant indigenous or low water use species of vegetation throughout the area of land specified for the dwelling in the "Indigenous species" column of the table below, as private landscaping for that dwelling. (This area of indigenous vegetation is to be contained within the "Area of garden and lawn" for the dwelling specified in the "Description of Project" table).	✔	✔	
(c) If a rating is specified in the table below for a fixture or appliance to be installed in the dwelling, the applicant must ensure that each such fixture and appliance meets the rating specified for it.		✔	✔
(d) The applicant must install an on demand hot water recirculation system which regulates all hot water use throughout the dwelling, where indicated for a dwelling in the "HW recirculation or diversion" column of the table below.		✔	✔
(e) The applicant must install:			
(aa) a hot water diversion system to all showers, kitchen sinks and all basins in the dwelling, where indicated for a dwelling in the "HW recirculation or diversion" column of the table below; and		✔	✔
(bb) a separate diversion tank (or tanks) connected to the hot water diversion systems of at least 100 litres. The applicant must connect the hot water diversion tank to all toilets in the dwelling.		✔	✔
(e) The applicant must not install a private swimming pool or spa for the dwelling, with a volume exceeding that specified for it in the table below.	✔	✔	
(f) If specified in the table, that pool or spa (or both) must have a pool cover or shading (or both).		✔	
(g) The pool or spa must be located as specified in the table.	✔	✔	
(h) The applicant must install, for the dwelling, each alternative water supply system, with the specified size, listed for that dwelling in the table below. Each system must be configured to collect run-off from the areas specified (excluding any area which supplies any other alternative water supply system), and to divert overflow as specified. Each system must be connected as specified.	✔	✔	✔

	Fixtures					Appliances		Individual pool				Individual spa		
Dwelling no.	All shower-heads	All toilet flushing systems	All kitchen taps	All bathroom taps	HW recirculation or diversion	All clothes washers	All dish-washers	Volume (max volume)	Pool cover	Pool location	Pool shaded	Volume (max volume)	Spa cover	Spa shaded
All dwellings	4 star (> 6 but <= 7.5 L/min)	4 star	6 star	6 star	-	not specified	not specified	-	-	-	-	-	-	-

	Alternative water source							
Dwelling no.	**Alternative water supply systems**	**Size**	**Configuration**	**Landscape connection**	**Toilet connection (s)**	**Laundry connection**	**Pool top-up**	**Spa top-up**
All dwellings	No alternative water supply	-	-	-	-	-	-	-

(ii) Energy	**Show on DA plans**	**Show on CC/CDC plans & specs**	**Certifier check**
(a) The applicant must comply with the commitments listed below in carrying out the development of a dwelling listed in a table below.			
(b) The applicant must install each hot water system specified for the dwelling in the table below, so that the dwelling's hot water is supplied by that system. If the table specifies a central hot water system for the dwelling, then the applicant must connect that central system to the dwelling, so that the dwelling's hot water is supplied by that central system.	✔	✔	✔
(c) The applicant must install, in each bathroom, kitchen and laundry of the dwelling, the ventilation system specified for that room in the table below. Each such ventilation system must have the operation control specified for it in the table.		✔	✔
(d) The applicant must install the cooling and heating system/s specified for the dwelling under the "Living areas" and "Bedroom areas" headings of the "Cooling" and "Heating" columns in the table below, in/for at least 1 living/bedroom area of the dwelling. If no cooling or heating system is specified in the table for "Living areas" or "Bedroom areas", then no systems may be installed in any such areas. If the term "zoned" is specified beside an air conditioning system, then the system must provide for day/night zoning between living areas and bedrooms.		✔	✔
(e) This commitment applies to each room or area of the dwelling which is referred to in a heading to the "Artificial lighting" column of the table below (but only to the extent specified for that room or area). The applicant must ensure that the "primary type of artificial lighting" for each such room in the dwelling is fluorescent lighting or light emitting diode (LED) lighting. If the term "dedicated" is specified for a particular room or area, then the light fittings in that room or area must only be capable of being used for fluorescent lighting or light emitting diode (LED) lighting.		✔	✔
(f) This commitment applies to each room or area of the dwelling which is referred to in a heading to the "Natural lighting" column of the table below (but only to the extent specified for that room or area). The applicant must ensure that each such room or area is fitted with a window and/or skylight.	✔	✔	✔
(g) This commitment applies if the applicant installs a water heating system for the dwelling's pool or spa. The applicant must:			
(aa) install the system specified for the pool in the "Individual Pool" column of the table below (or alternatively must not install any system for the pool). If specified, the applicant must install a timer, to control the pool's pump; and		✔	
(bb) install the system specified for the spa in the "Individual Spa" column of the table below (or alternatively must not install any system for the spa). If specified, the applicant must install a timer to control the spa's pump.		✔	
(h) The applicant must install in the dwelling:			
(aa) the kitchen cook-top and oven specified for that dwelling in the "Appliances & other efficiency measures" column of the table below;		✔	

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(bb) each appliance for which a rating is specified for that dwelling in the "Appliances & other efficiency measures" column of the table, and ensure that the appliance has that minimum rating; and (cc) any clothes drying line specified for the dwelling in the "Appliances & other efficiency measures" column of the table.		✔ ✔	✔
(i) If specified in the table, the applicant must carry out the development so that each refrigerator space in the dwelling is "well ventilated".		✔	

	Hot water	Bathroom ventilation system		Kitchen ventilation system		Laundry ventilation system	
Dwelling no.	Hot water system	Each bathroom	Operation control	Each kitchen	Operation control	Each laundry	Operation control
All dwellings	Central hot water system (No. 2)	individual fan, ducted to façade or roof	interlocked to light with timer off	individual fan, ducted to façade or roof	manual switch on/off	individual fan, ducted to façade or roof	manual switch on/off

	Cooling		Heating		Natural lighting	
Dwelling no.	living areas	bedroom areas	living areas	bedroom areas	No. of bathrooms or toilets	Main kitchen
All dwellings	1-phase airconditioning - non ducted / EER 3.0 - 3.5	1-phase airconditioning - non ducted / EER 3.0 - 3.5	1-phase airconditioning - non ducted / EER 3.0 - 3.5	1-phase airconditioning - non ducted / EER 3.0 - 3.5	0	no

	Individual pool			Individual spa		Appliances other efficiency measures				
Dwelling no.	Pool heating system	Pool Pump	Timer	Spa heating system	Timer	Kitchen cooktop/oven	Dishwasher	Clothes dryer	Indoor or sheltered clothes drying line	Private outdoor or unsheltered clothes drying line
All dwellings	-	-	-	-	-	induction cooktop & electric oven	not specified	not specified	no	yes

(iii) Thermal Performance	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The applicant must attach the certificate referred to under "Assessor details" on the front page of this BASIX certificate (the "Assessor Certificate") to the development application and construction certificate application for the proposed development (or, if the applicant is applying for a complying development certificate for the proposed development, to that application). The applicant must also attach the Assessor Certificate to the application for a final occupation certificate for the proposed development.			
(b) The Assessor Certificate must have been issued by an Accredited Assessor in accordance with the Thermal Comfort Protocol.			
(c) The details of the proposed development on the Assessor Certificate must be consistent with the details shown in this BASIX Certificate, including the details shown in the "Thermal Loads" table below.			
(d) The applicant must show on the plans accompanying the development application for the proposed development, all matters which the Thermal Comfort Protocol requires to be shown on those plans. Those plans must bear a stamp of endorsement from the Accredited Assessor, to certify that this is the case.	✔		
(e) The applicant must show on the plans accompanying the application for a construction certificate (or complying development certificate, if applicable), all thermal performance specifications set out in the Assessor Certificate, and all aspects of the proposed development which were used to calculate those specifications.		✔	
(f) The applicant must construct the development in accordance with all thermal performance specifications set out in the Assessor Certificate, and in accordance with those aspects of the development application or application for a complying development certificate which were used to calculate those specifications.		✔	✔
(g) Where there is an in-slab heating or cooling system, the applicant must: (aa) Install insulation with an R-value of not less than 1.0 around the vertical edges of the perimeter of the slab; or (bb) On a suspended floor, install insulation with an R-value of not less than 1.0 underneath the slab and around the vertical edges of the perimeter of the slab.	✔	✔	✔
(h) The applicant must construct the floors and walls of the development in accordance with the specifications listed in the table below.	✔	✔	✔
(i) The applicant must show on The plans accompanying The development application for The proposed development, The locations of ceiling fans set out in The Assessor Certificate.	✔		
(j) The applicant must show on the plans accompanying the application for a construction certificate (or complying development certificate, if applicable), the locations of ceiling fans set out in the Assessor Certificate.		✔	

	Thermal loads		
Dwelling no.	Area adjusted heating load (in MJ/m²/yr)	Area adjusted cooling load (in MJ/m²/yr)	Area adjusted total load (in MJ/m²/yr)
101	5.6	6.9	12.500
102	7.9	6.3	14.200
103	8.6	11.8	20.400
104	10.3	7.2	17.500

	Thermal loads		
Dwelling no.	Area adjusted heating load (in MJ/m²/yr)	Area adjusted cooling load (in MJ/m²/yr)	Area adjusted total load (in MJ/m²/yr)
105	7.4	9.5	16.900
106	6.5	7.6	14.100
107	5.2	12.1	17.300
108	5.4	12.3	17.700
109	5.5	11.5	17.000
110	4.9	12.5	17.400
111	2.5	7.9	10.400
112	4.8	9.4	14.200
113	2.6	13.6	16.200
114	6.8	9.1	15.900
115	2.8	16.1	18.900
116	11.5	8.8	20.300
201	6.8	4.8	11.600
202	6.9	6.3	13.200
203	8.7	11.6	20.300
204	10.7	6.8	17.500
205	7.7	9.2	16.900
206	6.7	7.4	14.100
207	5.2	12.4	17.600
208	5.7	11.7	17.400
209	6.1	11	17.100
210	4.8	12.2	17.000
211	2.8	7.8	10.600
212	5.1	8.7	13.800
213	2.7	13	15.700
214	6.9	9.3	16.200
215	3.3	14.2	17.500
216	2.2	12.3	14.500
301	11.8	6.9	18.700
302	14.1	17.3	31.400
303	19.5	15.1	34.600

	Thermal loads		
Dwelling no.	Area adjusted heating load (in MJ/m²/yr)	Area adjusted cooling load (in MJ/m²/yr)	Area adjusted total load (in MJ/m²/yr)
304	21	9.5	30.500
305	15.9	12.4	28.300
306	16.4	9.9	26.300
307	5.6	11.2	16.800
308	6.2	11.8	18.000
309	6.5	11.1	17.600
310	5.4	11.8	17.200
311	3.2	7.7	10.900
312	5.6	8.4	14.000
313	3.2	12.4	15.600
314	7.4	9.8	17.200
315	2.4	19	21.400
316	2	11.4	13.400
401	22.6	6.4	29.000
402	12.1	8.2	20.300
403	8.3	11.2	19.500
404	5.3	6	11.300
405	7.8	7.5	15.300
406	7.7	5.4	13.100
407	12.6	5.1	17.700
408	2.9	16.1	19.000
409	5	6.5	11.500
501	14.7	6.8	21.500
502	12.1	8.7	20.800
503	10.6	10.7	21.300
504	5.9	6.1	12.000
505	8.9	6.6	15.500
506	8	5.1	13.100
507	12.9	5	17.900
508	3.2	15.7	18.900
509	5.7	6.3	12.000

	Thermal loads		
Dwelling no.	Area adjusted heating load (in MJ/m²/yr)	Area adjusted cooling load (in MJ/m²/yr)	Area adjusted total load (in MJ/m²/yr)
601	26	8.4	34.400
602	23.9	11	34.900
603	23	7.5	30.500
605	10.8	6	16.800
606	8.3	5.4	13.700
607	13.1	5.1	18.200
608	4	14.3	18.300
609	7.3	5.9	13.200
701	15.4	5.8	21.200
702	11.1	6.1	17.200
703	8.5	5.4	13.900
704	13	5.4	18.400
705	4.1	14.9	19.000
801	15.3	6	21.300
802	11	6.4	17.400
803	6.4	5.5	11.900
804	7.9	5.5	13.400
805	4.3	14.1	18.400
806	7.7	5.9	13.600
901	18.5	8.4	26.900
902	13.3	8.1	21.400
903	12.6	7.1	19.700
904	17.6	7.8	25.400
905	13.9	20.4	34.300
906	16.1	7.6	23.700
G01	12.7	8.3	21.000
G02	21.9	12.3	34.200
G03	14.5	7.8	22.300
G04	6.8	10.1	16.900
G05	5.8	7.9	13.700
G06	14.7	12.9	27.600

	Thermal loads		
Dwelling no.	Area adjusted heating load (in MJ/m²/yr)	Area adjusted cooling load (in MJ/m²/yr)	Area adjusted total load (in MJ/m²/yr)
G07	15	12.2	27.200
G08	15.1	11.4	26.500
G09	14.5	13.5	28.000
G10	4	7.1	11.100
G11	5.8	8.9	14.700
G12	3.4	13.9	17.300
G13	12.3	5.8	18.100
G14	13.9	10.2	24.100
G15	28.6	7.2	35.800
All other dwellings	7.5	5.9	13.400

(c) Common areas and central systems/facilities

(i) Water	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a showerhead, toilet, tap or clothes washer into a common area, then that item must meet the specifications listed for it in the table.		✔	✔
(b) The applicant must install (or ensure that the development is serviced by) the alternative water supply system(s) specified in the "Central systems" column of the table below. In each case, the system must be sized, be configured, and be connected, as specified in the table.	✔	✔	✔
(c) A swimming pool or spa listed in the table must not have a volume (in kLs) greater than that specified for the pool or spa in the table.	✔	✔	
(d) A pool or spa listed in the table must have a cover or shading if specified for the pool or spa in the table.		✔	
(e) The applicant must install each fire sprinkler system listed in the table so that the system is configured as specified in the table.		✔	✔
(f) The applicant must ensure that the central cooling system for a cooling tower is configured as specified in the table.		✔	✔

Common area	Showerheads rating	Toilets rating	Taps rating	Clothes washers rating
All common areas	no common facility	4 star	6 star	no common laundry facility

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a ventilation system to service a common area specified in the table below, then that ventilation system must be of the type specified for that common area, and must meet the efficiency measure specified.		✔	✔
(b) In carrying out the development, the applicant must install, as the "primary type of artificial lighting" for each common area specified in the table below, the lighting specified for that common area. This lighting must meet the efficiency measure specified. The applicant must also install a centralised lighting control system or Building Management System (BMS) for the common area, where specified.		✔	✔
(c) The applicant must install the systems and fixtures specified in the "Central energy systems" column of the table below. In each case, the system or fixture must be of the type, and meet the specifications, listed for it in the table.	✔	✔	✔

Central energy systems	Type	Specification
Lift bank (No. 3)	gearless traction with V V V F motor	Number of levels (including basement): 10 number of levels from the bottom of the lift shaft to the top of the lift shaft: 11 number of lifts: 3 lift load capacity: <1001 kg
Central hot water system (No. 2)	electric heat pump – air sourced	Piping insulation (ringmain & supply risers): (a) Piping external to building: R1.0 (~38 mm); (b) Piping internal to building: R0.75 (~32 mm) (c) Unit Efficiency: 3.0 < COP <= 3.5

2. Commitments for Residential flat buildings - S4

(a) Buildings

(i) Materials	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The details of the proposed development on the Assessor Certificate must be consistent with the details shown in this BASIX Certificate, including the details shown in the “Floor types”, “External wall types”, “Internal wall types”, “Ceiling and roof types”, “Frames” and “Glazing” tables below.			✔
(b) The applicant must show on the plans accompanying the application for a construction certificate (or complying development certificate, if applicable), all specifications included in the tables below.		✔	
(c) The applicant must construct the floors, walls, roof, ceiling and roof, windows, glazed doors and skylights of the development in accordance with the specifications listed in the tables below. In the case of glazing, a 5% variance from the area values listed in the “Frames” and “Glazing” tables is permitted.	✔	✔	✔
(d) The applicant must show through receipts that the materials purchased for construction are consistent with the specifications listed in the below tables.			✔

Floor types

Floor type	Area (m2)	Insulation	Low emissions option
suspended floor above enclosed subfloor, frame: suspended concrete slab	33.8	fibreglass batts or roll	none
floors above habitable rooms, frame: suspended concrete slab	4253	-	none

External wall types

External wall type	Construction type	Area (m2)	Low emissions option	Insulation
External wall type 1	brick veneer,frame:light steel frame	4551	-	-

Internal wall types

Internal wall type	Construction type	Area (m2)	Insulation
Internal wall type 1	plasterboard, frame:light steel frame	3615	-

Reinforcement concrete frames/columns		
Building has reinforced concrete frame/columns?	Volume (m^3)	Low emissions option
yes	15628	30% cement substitute

Ceiling and roof types			
Ceiling and roof type	Area (m^2)	Roof Insulation	Ceiling Insulation
concrete - plasterboard internal, frame: light steel frame	760	-	fibreglass batts or roll

Glazing types			Frame types				
Single glazing (m^2)	Double glazing (m^2)	Triple glazing (m^2)	Aluminium frames (m^2)	Timber frames (m^2)	uPVC frames (m^2)	Steel frames (m^2)	Composite frames (m^2)
-	1701	-	1701	-	-	-	-

(b) Dwellings

(i) Water	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The applicant must comply with the commitments listed below in carrying out the development of a dwelling listed in a table below.			
(b) The applicant must plant indigenous or low water use species of vegetation throughout the area of land specified for the dwelling in the "Indigenous species" column of the table below, as private landscaping for that dwelling. (This area of indigenous vegetation is to be contained within the "Area of garden and lawn" for the dwelling specified in the "Description of Project" table).	✔	✔	
(c) If a rating is specified in the table below for a fixture or appliance to be installed in the dwelling, the applicant must ensure that each such fixture and appliance meets the rating specified for it.		✔	✔
(d) The applicant must install an on demand hot water recirculation system which regulates all hot water use throughout the dwelling, where indicated for a dwelling in the "HW recirculation or diversion" column of the table below.		✔	✔
(e) The applicant must install:			
(aa) a hot water diversion system to all showers, kitchen sinks and all basins in the dwelling, where indicated for a dwelling in the "HW recirculation or diversion" column of the table below; and		✔	✔
(bb) a separate diversion tank (or tanks) connected to the hot water diversion systems of at least 100 litres. The applicant must connect the hot water diversion tank to all toilets in the dwelling.		✔	✔
(e) The applicant must not install a private swimming pool or spa for the dwelling, with a volume exceeding that specified for it in the table below.	✔	✔	
(f) If specified in the table, that pool or spa (or both) must have a pool cover or shading (or both).		✔	
(g) The pool or spa must be located as specified in the table.	✔	✔	
(h) The applicant must install, for the dwelling, each alternative water supply system, with the specified size, listed for that dwelling in the table below. Each system must be configured to collect run-off from the areas specified (excluding any area which supplies any other alternative water supply system), and to divert overflow as specified. Each system must be connected as specified.	✔	✔	✔

	Fixtures					Appliances		Individual pool				Individual spa		
Dwelling no.	All shower-heads	All toilet flushing systems	All kitchen taps	All bathroom taps	HW recirculation or diversion	All clothes washers	All dish-washers	Volume (max volume)	Pool cover	Pool location	Pool shaded	Volume (max volume)	Spa cover	Spa shaded
All dwellings	4 star (> 6 but <= 7.5 L/min)	4 star	6 star	6 star	-	not specified	not specified	-	-	-	-	-	-	-

	Alternative water source							
Dwelling no.	**Alternative water supply systems**	**Size**	**Configuration**	**Landscape connection**	**Toilet connection (s)**	**Laundry connection**	**Pool top-up**	**Spa top-up**
All dwellings	No alternative water supply	-	-	-	-	-	-	-

(ii) Energy	**Show on DA plans**	**Show on CC/CDC plans & specs**	**Certifier check**
(a) The applicant must comply with the commitments listed below in carrying out the development of a dwelling listed in a table below.			
(b) The applicant must install each hot water system specified for the dwelling in the table below, so that the dwelling's hot water is supplied by that system. If the table specifies a central hot water system for the dwelling, then the applicant must connect that central system to the dwelling, so that the dwelling's hot water is supplied by that central system.	✔	✔	✔
(c) The applicant must install, in each bathroom, kitchen and laundry of the dwelling, the ventilation system specified for that room in the table below. Each such ventilation system must have the operation control specified for it in the table.		✔	✔
(d) The applicant must install the cooling and heating system/s specified for the dwelling under the "Living areas" and "Bedroom areas" headings of the "Cooling" and "Heating" columns in the table below, in/for at least 1 living/bedroom area of the dwelling. If no cooling or heating system is specified in the table for "Living areas" or "Bedroom areas", then no systems may be installed in any such areas. If the term "zoned" is specified beside an air conditioning system, then the system must provide for day/night zoning between living areas and bedrooms.		✔	✔
(e) This commitment applies to each room or area of the dwelling which is referred to in a heading to the "Artificial lighting" column of the table below (but only to the extent specified for that room or area). The applicant must ensure that the "primary type of artificial lighting" for each such room in the dwelling is fluorescent lighting or light emitting diode (LED) lighting. If the term "dedicated" is specified for a particular room or area, then the light fittings in that room or area must only be capable of being used for fluorescent lighting or light emitting diode (LED) lighting.		✔	✔
(f) This commitment applies to each room or area of the dwelling which is referred to in a heading to the "Natural lighting" column of the table below (but only to the extent specified for that room or area). The applicant must ensure that each such room or area is fitted with a window and/or skylight.	✔	✔	✔
(g) This commitment applies if the applicant installs a water heating system for the dwelling's pool or spa. The applicant must:			
(aa) install the system specified for the pool in the "Individual Pool" column of the table below (or alternatively must not install any system for the pool). If specified, the applicant must install a timer, to control the pool's pump; and		✔	
(bb) install the system specified for the spa in the "Individual Spa" column of the table below (or alternatively must not install any system for the spa). If specified, the applicant must install a timer to control the spa's pump.		✔	
(h) The applicant must install in the dwelling:			
(aa) the kitchen cook-top and oven specified for that dwelling in the "Appliances & other efficiency measures" column of the table below;		✔	

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(bb) each appliance for which a rating is specified for that dwelling in the "Appliances & other efficiency measures" column of the table, and ensure that the appliance has that minimum rating; and (cc) any clothes drying line specified for the dwelling in the "Appliances & other efficiency measures" column of the table.		✔ ✔	✔
(i) If specified in the table, the applicant must carry out the development so that each refrigerator space in the dwelling is "well ventilated".		✔	

	Hot water	Bathroom ventilation system		Kitchen ventilation system		Laundry ventilation system	
Dwelling no.	Hot water system	Each bathroom	Operation control	Each kitchen	Operation control	Each laundry	Operation control
All dwellings	Central hot water system (No. 3)	individual fan, ducted to façade or roof	interlocked to light with timer off	individual fan, ducted to façade or roof	manual switch on/off	individual fan, ducted to façade or roof	manual switch on/off

	Cooling		Heating		Natural lighting	
Dwelling no.	living areas	bedroom areas	living areas	bedroom areas	No. of bathrooms or toilets	Main kitchen
All dwellings	1-phase airconditioning - non ducted / EER 3.0 - 3.5	1-phase airconditioning - non ducted / EER 3.0 - 3.5	1-phase airconditioning - non ducted / EER 3.0 - 3.5	1-phase airconditioning - non ducted / EER 3.0 - 3.5	0	no

	Individual pool			Individual spa		Appliances other efficiency measures				
Dwelling no.	Pool heating system	Pool Pump	Timer	Spa heating system	Timer	Kitchen cooktop/oven	Dishwasher	Clothes dryer	Indoor or sheltered clothes drying line	Private outdoor or unsheltered clothes drying line
All dwellings	-	-	-	-	-	induction cooktop & electric oven	not specified	not specified	no	yes

(iii) Thermal Performance	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The applicant must attach the certificate referred to under "Assessor details" on the front page of this BASIX certificate (the "Assessor Certificate") to the development application and construction certificate application for the proposed development (or, if the applicant is applying for a complying development certificate for the proposed development, to that application). The applicant must also attach the Assessor Certificate to the application for a final occupation certificate for the proposed development.			
(b) The Assessor Certificate must have been issued by an Accredited Assessor in accordance with the Thermal Comfort Protocol.			
(c) The details of the proposed development on the Assessor Certificate must be consistent with the details shown in this BASIX Certificate, including the details shown in the "Thermal Loads" table below.			
(d) The applicant must show on the plans accompanying the development application for the proposed development, all matters which the Thermal Comfort Protocol requires to be shown on those plans. Those plans must bear a stamp of endorsement from the Accredited Assessor, to certify that this is the case.	✔		
(e) The applicant must show on the plans accompanying the application for a construction certificate (or complying development certificate, if applicable), all thermal performance specifications set out in the Assessor Certificate, and all aspects of the proposed development which were used to calculate those specifications.		✔	
(f) The applicant must construct the development in accordance with all thermal performance specifications set out in the Assessor Certificate, and in accordance with those aspects of the development application or application for a complying development certificate which were used to calculate those specifications.		✔	✔
(g) Where there is an in-slab heating or cooling system, the applicant must: (aa) Install insulation with an R-value of not less than 1.0 around the vertical edges of the perimeter of the slab; or (bb) On a suspended floor, install insulation with an R-value of not less than 1.0 underneath the slab and around the vertical edges of the perimeter of the slab.	✔	✔	✔
(h) The applicant must construct the floors and walls of the development in accordance with the specifications listed in the table below.	✔	✔	✔
(i) The applicant must show on The plans accompanying The development application for The proposed development, The locations of ceiling fans set out in The Assessor Certificate.	✔		
(j) The applicant must show on the plans accompanying the application for a construction certificate (or complying development certificate, if applicable), the locations of ceiling fans set out in the Assessor Certificate.		✔	

	Thermal loads		
Dwelling no.	Area adjusted heating load (in MJ/m²/yr)	Area adjusted cooling load (in MJ/m²/yr)	Area adjusted total load (in MJ/m²/yr)
101	16.6	10.4	27.000
102	9.8	6.2	16.000
103	9.6	9.5	19.100
104	1.5	17.9	19.400

	Thermal loads		
Dwelling no.	Area adjusted heating load (in MJ/m²/yr)	Area adjusted cooling load (in MJ/m²/yr)	Area adjusted total load (in MJ/m²/yr)
105	3.2	15	18.200
106	3.4	15.4	18.800
107	3.3	14.6	17.900
108	3.6	15.1	18.700
109	3.5	14.9	18.400
110	3.1	15.4	18.500
111	1.5	18.4	19.900
112	10.2	9.7	19.900
113	8.6	6.4	15.000
114	14.6	7.1	21.700
201	14.4	11.3	25.700
202	6.2	5.8	12.000
203	8	9.2	17.200
204	1.7	17.9	19.600
205	3.5	14.7	18.200
206	3.1	15	18.100
207	3.8	14.4	18.200
208	3.6	15.4	19.000
209	4.1	14.9	19.000
210	3.7	15.4	19.100
211	1.3	18.6	19.900
212	6	10.1	16.100
213	6.7	6.3	13.000
214	15.1	6.3	21.400
301	20.6	18.6	39.200
302	15	8.6	23.600
303	15.7	13.7	29.400
304	2	19	21.000
306	4.1	16.1	20.200
307	4	16.6	20.600
309	4.6	15.7	20.300

	Thermal loads		
Dwelling no.	Area adjusted heating load (in MJ/m²/yr)	Area adjusted cooling load (in MJ/m²/yr)	Area adjusted total load (in MJ/m²/yr)
310	4.6	16.3	20.900
311	1.9	19.8	21.700
312	5.1	10.8	15.900
313	0.9	6.1	7.000
314	9.6	7.2	16.800
401	19.1	18.3	37.400
402	16.1	15	31.100
403	14.1	19.7	33.800
404	17.6	16.4	34.000
405	15.7	17.1	32.800
406	12	19.8	31.800
407	8.5	10.2	18.700
408	11.9	8.1	20.000
All other dwellings	4.6	15.8	20.400

(c) Common areas and central systems/facilities

(i) Water	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a showerhead, toilet, tap or clothes washer into a common area, then that item must meet the specifications listed for it in the table.		✔	✔
(b) The applicant must install (or ensure that the development is serviced by) the alternative water supply system(s) specified in the "Central systems" column of the table below. In each case, the system must be sized, be configured, and be connected, as specified in the table.	✔	✔	✔
(c) A swimming pool or spa listed in the table must not have a volume (in kLs) greater than that specified for the pool or spa in the table.	✔	✔	
(d) A pool or spa listed in the table must have a cover or shading if specified for the pool or spa in the table.		✔	
(e) The applicant must install each fire sprinkler system listed in the table so that the system is configured as specified in the table.		✔	✔
(f) The applicant must ensure that the central cooling system for a cooling tower is configured as specified in the table.		✔	✔

Common area	Showerheads rating	Toilets rating	Taps rating	Clothes washers rating
All common areas	no common facility	4 star	6 star	no common laundry facility

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a ventilation system to service a common area specified in the table below, then that ventilation system must be of the type specified for that common area, and must meet the efficiency measure specified.		✔	✔
(b) In carrying out the development, the applicant must install, as the "primary type of artificial lighting" for each common area specified in the table below, the lighting specified for that common area. This lighting must meet the efficiency measure specified. The applicant must also install a centralised lighting control system or Building Management System (BMS) for the common area, where specified.		✔	✔
(c) The applicant must install the systems and fixtures specified in the "Central energy systems" column of the table below. In each case, the system or fixture must be of the type, and meet the specifications, listed for it in the table.	✔	✔	✔

	Common area ventilation system		Common area lighting		
Common area	**Ventilation system type**	**Ventilation efficiency measure**	**Primary type of artificial lighting**	**Lighting efficiency measure**	**Lighting control system/ BMS**
Lift bank (No. 1)	-	-	light-emitting diode	connected to lift call button	no
Lift bank (No. 2)	-	-	light-emitting diode	connected to lift call button	no
Lift bank (No. 3)	-	-	light-emitting diode	connected to lift call button	no
Lift bank (No. 4)	-	-	light-emitting diode	connected to lift call button	no
Community room (No. 1)	air conditioning system	time clock or BMS controlled	light-emitting diode	daylight sensor and motion sensor	no

Central energy systems	Type	Specification
Lift bank (No. 1)	gearless traction with V V V F motor	Number of levels (including basement): 10 number of levels from the bottom of the lift shaft to the top of the lift shaft: 11 number of lifts: 2 lift load capacity: <1001 kg
Lift bank (No. 2)	gearless traction with V V V F motor	Number of levels (including basement): 15 number of levels from the bottom of the lift shaft to the top of the lift shaft: 16 number of lifts: 2 lift load capacity: <1001 kg
Lift bank (No. 4)	gearless traction with V V V F motor	Number of levels (including basement): 4 number of levels from the bottom of the lift shaft to the top of the lift shaft: 5 number of lifts: 2 lift load capacity: <1001 kg
Central hot water system (No. 1)	electric heat pump – air sourced	Piping insulation (ringmain & supply risers): (a) Piping external to building: R1.0 (~38 mm); (b) Piping internal to building: R0.75 (~32 mm) (c) Unit Efficiency: 3.0 < COP <= 3.5
Central hot water system (No. 3)	electric heat pump – air sourced	Piping insulation (ringmain & supply risers): (a) Piping external to building: R1.0 (~38 mm); (b) Piping internal to building: R0.75 (~32 mm) (c) Unit Efficiency: 3.0 < COP <= 3.5

3. Commitments for Residential flat buildings - S2

(a) Buildings

(i) Materials	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The details of the proposed development on the Assessor Certificate must be consistent with the details shown in this BASIX Certificate, including the details shown in the “Floor types”, “External wall types”, “Internal wall types”, “Ceiling and roof types”, “Frames” and “Glazing” tables below.			✔
(b) The applicant must show on the plans accompanying the application for a construction certificate (or complying development certificate, if applicable), all specifications included in the tables below.		✔	
(c) The applicant must construct the floors, walls, roof, ceiling and roof, windows, glazed doors and skylights of the development in accordance with the specifications listed in the tables below. In the case of glazing, a 5% variance from the area values listed in the “Frames” and “Glazing” tables is permitted.	✔	✔	✔
(d) The applicant must show through receipts that the materials purchased for construction are consistent with the specifications listed in the below tables.			✔

Floor types

Floor type	Area (m2)	Insulation	Low emissions option
suspended floor above garage, frame: suspended concrete slab	1034	fibreglass batts or roll	-
suspended floor above open subfloor, frame: suspended concrete slab	300	fibreglass batts or roll	-
floors above habitable rooms, frame: suspended concrete slab	13525	-	-

External wall types

External wall type	Construction type	Area (m2)	Low emissions option	Insulation
External wall type 1	brick veneer,frame:light steel frame	11647	-	-
External wall type 2	concrete panel/ plasterboard,frame:no frame	15578	-	-

Internal wall types

Internal wall type	Construction type	Area (m2)	Insulation
Internal wall type 1	plasterboard, frame:light steel frame	12375	-

Reinforcement concrete frames/columns		
Building has reinforced concrete frame/columns?	Volume (m^3)	Low emissions option
yes	46923	30% cement substitute

Ceiling and roof types			
Ceiling and roof type	Area (m^2)	Roof Insulation	Ceiling Insulation
concrete - plasterboard internal, frame: light steel frame	1356	-	fibreglass batts or roll

Glazing types			Frame types				
Single glazing (m^2)	Double glazing (m^2)	Triple glazing (m^2)	Aluminium frames (m^2)	Timber frames (m^2)	uPVC frames (m^2)	Steel frames (m^2)	Composite frames (m^2)
-	5824	-	5824	-	-	-	-

(b) Dwellings

(i) Water	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The applicant must comply with the commitments listed below in carrying out the development of a dwelling listed in a table below.			
(b) The applicant must plant indigenous or low water use species of vegetation throughout the area of land specified for the dwelling in the "Indigenous species" column of the table below, as private landscaping for that dwelling. (This area of indigenous vegetation is to be contained within the "Area of garden and lawn" for the dwelling specified in the "Description of Project" table).	✔	✔	
(c) If a rating is specified in the table below for a fixture or appliance to be installed in the dwelling, the applicant must ensure that each such fixture and appliance meets the rating specified for it.		✔	✔
(d) The applicant must install an on demand hot water recirculation system which regulates all hot water use throughout the dwelling, where indicated for a dwelling in the "HW recirculation or diversion" column of the table below.		✔	✔
(e) The applicant must install:			
(aa) a hot water diversion system to all showers, kitchen sinks and all basins in the dwelling, where indicated for a dwelling in the "HW recirculation or diversion" column of the table below; and		✔	✔
(bb) a separate diversion tank (or tanks) connected to the hot water diversion systems of at least 100 litres. The applicant must connect the hot water diversion tank to all toilets in the dwelling.		✔	✔
(e) The applicant must not install a private swimming pool or spa for the dwelling, with a volume exceeding that specified for it in the table below.	✔	✔	
(f) If specified in the table, that pool or spa (or both) must have a pool cover or shading (or both).		✔	
(g) The pool or spa must be located as specified in the table.	✔	✔	
(h) The applicant must install, for the dwelling, each alternative water supply system, with the specified size, listed for that dwelling in the table below. Each system must be configured to collect run-off from the areas specified (excluding any area which supplies any other alternative water supply system), and to divert overflow as specified. Each system must be connected as specified.	✔	✔	✔

	Fixtures					Appliances		Individual pool				Individual spa		
Dwelling no.	All shower-heads	All toilet flushing systems	All kitchen taps	All bathroom taps	HW recirculation or diversion	All clothes washers	All dish-washers	Volume (max volume)	Pool cover	Pool location	Pool shaded	Volume (max volume)	Spa cover	Spa shaded
All dwellings	4 star (> 6 but <= 7.5 L/min)	4 star	6 star	6 star	-	not specified	not specified	-	-	-	-	-	-	-

	Alternative water source							
Dwelling no.	**Alternative water supply systems**	**Size**	**Configuration**	**Landscape connection**	**Toilet connection (s)**	**Laundry connection**	**Pool top-up**	**Spa top-up**
All dwellings	No alternative water supply	-	-	-	-	-	-	-

(ii) Energy	**Show on DA plans**	**Show on CC/CDC plans & specs**	**Certifier check**
(a) The applicant must comply with the commitments listed below in carrying out the development of a dwelling listed in a table below.			
(b) The applicant must install each hot water system specified for the dwelling in the table below, so that the dwelling's hot water is supplied by that system. If the table specifies a central hot water system for the dwelling, then the applicant must connect that central system to the dwelling, so that the dwelling's hot water is supplied by that central system.	✔	✔	✔
(c) The applicant must install, in each bathroom, kitchen and laundry of the dwelling, the ventilation system specified for that room in the table below. Each such ventilation system must have the operation control specified for it in the table.		✔	✔
(d) The applicant must install the cooling and heating system/s specified for the dwelling under the "Living areas" and "Bedroom areas" headings of the "Cooling" and "Heating" columns in the table below, in/for at least 1 living/bedroom area of the dwelling. If no cooling or heating system is specified in the table for "Living areas" or "Bedroom areas", then no systems may be installed in any such areas. If the term "zoned" is specified beside an air conditioning system, then the system must provide for day/night zoning between living areas and bedrooms.		✔	✔
(e) This commitment applies to each room or area of the dwelling which is referred to in a heading to the "Artificial lighting" column of the table below (but only to the extent specified for that room or area). The applicant must ensure that the "primary type of artificial lighting" for each such room in the dwelling is fluorescent lighting or light emitting diode (LED) lighting. If the term "dedicated" is specified for a particular room or area, then the light fittings in that room or area must only be capable of being used for fluorescent lighting or light emitting diode (LED) lighting.		✔	✔
(f) This commitment applies to each room or area of the dwelling which is referred to in a heading to the "Natural lighting" column of the table below (but only to the extent specified for that room or area). The applicant must ensure that each such room or area is fitted with a window and/or skylight.	✔	✔	✔
(g) This commitment applies if the applicant installs a water heating system for the dwelling's pool or spa. The applicant must:			
(aa) install the system specified for the pool in the "Individual Pool" column of the table below (or alternatively must not install any system for the pool). If specified, the applicant must install a timer, to control the pool's pump; and		✔	
(bb) install the system specified for the spa in the "Individual Spa" column of the table below (or alternatively must not install any system for the spa). If specified, the applicant must install a timer to control the spa's pump.		✔	
(h) The applicant must install in the dwelling:			
(aa) the kitchen cook-top and oven specified for that dwelling in the "Appliances & other efficiency measures" column of the table below;		✔	

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(bb) each appliance for which a rating is specified for that dwelling in the "Appliances & other efficiency measures" column of the table, and ensure that the appliance has that minimum rating; and (cc) any clothes drying line specified for the dwelling in the "Appliances & other efficiency measures" column of the table.		✔ ✔	✔
(i) If specified in the table, the applicant must carry out the development so that each refrigerator space in the dwelling is "well ventilated".		✔	

	Hot water	Bathroom ventilation system		Kitchen ventilation system		Laundry ventilation system	
Dwelling no.	Hot water system	Each bathroom	Operation control	Each kitchen	Operation control	Each laundry	Operation control
All dwellings	Central hot water system (No. 1)	individual fan, ducted to façade or roof	interlocked to light with timer off	individual fan, ducted to façade or roof	manual switch on/off	individual fan, ducted to façade or roof	manual switch on/off

	Cooling		Heating		Natural lighting	
Dwelling no.	living areas	bedroom areas	living areas	bedroom areas	No. of bathrooms or toilets	Main kitchen
All dwellings	1-phase airconditioning - non ducted / EER 3.0 - 3.5	1-phase airconditioning - non ducted / EER 3.0 - 3.5	1-phase airconditioning - non ducted / EER 3.0 - 3.5	1-phase airconditioning - non ducted / EER 3.0 - 3.5	0	no

	Individual pool			Individual spa		Appliances other efficiency measures				
Dwelling no.	Pool heating system	Pool Pump	Timer	Spa heating system	Timer	Kitchen cooktop/oven	Dishwasher	Clothes dryer	Indoor or sheltered clothes drying line	Private outdoor or unsheltered clothes drying line
All dwellings	-	-	-	-	-	induction cooktop & electric oven	not specified	not specified	-	-

(iii) Thermal Performance	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The applicant must attach the certificate referred to under "Assessor details" on the front page of this BASIX certificate (the "Assessor Certificate") to the development application and construction certificate application for the proposed development (or, if the applicant is applying for a complying development certificate for the proposed development, to that application). The applicant must also attach the Assessor Certificate to the application for a final occupation certificate for the proposed development.			
(b) The Assessor Certificate must have been issued by an Accredited Assessor in accordance with the Thermal Comfort Protocol.			
(c) The details of the proposed development on the Assessor Certificate must be consistent with the details shown in this BASIX Certificate, including the details shown in the "Thermal Loads" table below.			
(d) The applicant must show on the plans accompanying the development application for the proposed development, all matters which the Thermal Comfort Protocol requires to be shown on those plans. Those plans must bear a stamp of endorsement from the Accredited Assessor, to certify that this is the case.	✔		
(e) The applicant must show on the plans accompanying the application for a construction certificate (or complying development certificate, if applicable), all thermal performance specifications set out in the Assessor Certificate, and all aspects of the proposed development which were used to calculate those specifications.		✔	
(f) The applicant must construct the development in accordance with all thermal performance specifications set out in the Assessor Certificate, and in accordance with those aspects of the development application or application for a complying development certificate which were used to calculate those specifications.		✔	✔
(g) Where there is an in-slab heating or cooling system, the applicant must: (aa) Install insulation with an R-value of not less than 1.0 around the vertical edges of the perimeter of the slab; or (bb) On a suspended floor, install insulation with an R-value of not less than 1.0 underneath the slab and around the vertical edges of the perimeter of the slab.	✔	✔	✔
(h) The applicant must construct the floors and walls of the development in accordance with the specifications listed in the table below.	✔	✔	✔
(i) The applicant must show on The plans accompanying The development application for The proposed development, The locations of ceiling fans set out in The Assessor Certificate.	✔		
(j) The applicant must show on the plans accompanying the application for a construction certificate (or complying development certificate, if applicable), the locations of ceiling fans set out in the Assessor Certificate.		✔	

	Thermal loads		
Dwelling no.	Area adjusted heating load (in MJ/m²/yr)	Area adjusted cooling load (in MJ/m²/yr)	Area adjusted total load (in MJ/m²/yr)
101	12.2	6.5	18.700
102	6.9	16.5	23.400
103	5.6	10.6	16.200
104	4.3	11.5	15.800

	Thermal loads		
Dwelling no.	Area adjusted heating load (in MJ/m²/yr)	Area adjusted cooling load (in MJ/m²/yr)	Area adjusted total load (in MJ/m²/yr)
105	4.7	11.6	16.300
106	10.5	12.9	23.400
107	9.7	8	17.700
108	3.8	13.6	17.400
109	18.1	17.2	35.300
110	22.1	4.3	26.400
1101	3	5.9	8.900
1102	9.8	11	20.800
1103	10.4	12.4	22.800
1104	18	10.3	28.300
1105	16.2	10.8	27.000
1106	7.8	13.2	21.000
1107	6.1	15.3	21.400
111	1	10.8	11.800
112	5	11	16.000
113	12.9	8.7	21.600
114	0.6	10.2	10.800
115	0.2	11.9	12.100
1201	2.1	6.3	8.400
1202	7.3	12.4	19.700
1203	7.8	13	20.800
1204	10.4	11.5	21.900
1205	10.8	11.9	22.700
1206	3	15	18.000
1207	2.3	12.4	14.700
1301	6.1	8.4	14.500
1302	17.2	13.6	30.800
1303	16.6	15.8	32.400
1304	15.2	13.4	28.600
1305	21.9	12.9	34.800
1306	12	17.1	29.100

	Thermal loads		
Dwelling no.	Area adjusted heating load (in MJ/m²/yr)	Area adjusted cooling load (in MJ/m²/yr)	Area adjusted total load (in MJ/m²/yr)
1307	6.5	15.4	21.900
201	0.3	14.7	15.000
202	0.3	10.6	10.900
203	8.8	10.7	19.500
204	5.9	13.7	19.600
205	2.6	11.5	14.100
206	3.3	10.9	14.200
207	2.1	11.7	13.800
208	2.4	11.7	14.100
209	9.4	8	17.400
210	9.1	8.1	17.200
211	3.7	13.6	17.300
212	17.7	11.2	28.900
213	16.9	7.1	24.000
214	1.4	9.5	10.900
215	5.2	8.5	13.700
216	12.6	7.1	19.700
217	0.7	8.3	9.000
218	0.5	12.7	13.200
301	0.3	14.1	14.400
302	1.4	9	10.400
303	7.8	9.9	17.700
304	5.2	11.4	16.600
305	3.8	10.7	14.500
306	4.3	9.8	14.100
307	3.9	10	13.900
308	3.9	10.1	14.000
309	10.8	7	17.800
310	13.5	7.7	21.200
312	10.6	12.2	22.800
313	17.2	4.5	21.700

	Thermal loads		
Dwelling no.	Area adjusted heating load (in MJ/m²/yr)	Area adjusted cooling load (in MJ/m²/yr)	Area adjusted total load (in MJ/m²/yr)
314	1.1	14.8	15.900
315	5.1	9.2	14.300
316	9.6	8.3	17.900
317	1.1	8.4	9.500
318	0.8	11.3	12.100
401	0.3	13.9	14.200
402	1.3	8.4	9.700
403	8.3	10	18.300
404	5.5	11.2	16.700
405	4.1	10.6	14.700
406	4.5	9.8	14.300
409	10.8	6.7	17.500
410	14.2	5	19.200
412	10.9	12.3	23.200
413	15.5	4.7	20.200
414	0.8	15.4	16.200
415	4.5	9.7	14.200
416	7.9	9	16.900
417	1.1	10.9	12.000
418	0.9	11.7	12.600
501	0.3	13.5	13.800
502	1.4	8.3	9.700
503	8.7	10	18.700
504	5.7	10.9	16.600
505	4.4	10.4	14.800
506	4.9	9.4	14.300
507	4.5	10	14.500
508	4.4	10	14.400
509	11.2	6.7	17.900
510	14.5	5.2	19.700
511	4.9	11	15.900

	Thermal loads		
Dwelling no.	Area adjusted heating load (in MJ/m²/yr)	Area adjusted cooling load (in MJ/m²/yr)	Area adjusted total load (in MJ/m²/yr)
512	11.3	12	23.300
513	18.8	4	22.800
514	1.3	14.2	15.500
515	6.2	9.4	15.600
516	9.7	7.5	17.200
517	1.1	11.5	12.600
518	0.9	11.3	12.200
601	0.5	12.6	13.100
602	1.8	7.3	9.100
603	10.6	9.8	20.400
604	7.1	9.8	16.900
605	5.7	9.8	15.500
606	6.1	8.8	14.900
607	5.8	9.1	14.900
608	5.8	9.2	15.000
609	12.7	5.9	18.600
610	16.7	5.1	21.800
611	5.6	9.7	15.300
612	11.7	11.9	23.600
613	15.9	4.7	20.600
614	1.8	14.4	16.200
615	7.4	8.4	15.800
616	11.8	7.3	19.100
701	0.9	12.6	13.500
702	1.5	8.2	9.700
703	11.4	10	21.400
704	7.4	9.7	17.100
705	5.9	9.9	15.800
706	6.4	8.6	15.000
709	13	5.9	18.900
710	17.1	7.4	24.500

	Thermal loads		
Dwelling no.	Area adjusted heating load (in MJ/m²/yr)	Area adjusted cooling load (in MJ/m²/yr)	Area adjusted total load (in MJ/m²/yr)
711	5.5	9.5	15.000
712	12.1	11.8	23.900
713	16.3	4.7	21.000
714	1.7	13.1	14.800
715	7.6	8.4	16.000
716	13.9	7.3	21.200
718	1.8	9.5	11.300
801	1.2	12.4	13.600
802	1.9	7.3	9.200
803	11.6	10	21.600
804	7.6	9.5	17.100
805	6.1	9.3	15.400
806	6.6	8.7	15.300
807	6.3	8.7	15.000
808	6.3	8.6	14.900
809	13.2	5.9	19.100
810	17	7.3	24.300
811	5.6	11.4	17.000
812	11.7	11.7	23.400
813	19.1	4.2	23.300
814	1.9	13.9	15.800
815	7.5	8.3	15.800
816	13.8	7.1	20.900
817	1.4	10.1	11.500
818	1.9	9.6	11.500
901	5.3	16.4	21.700
902	5.4	9.5	14.900
903	14.4	10.5	24.900
904	12.5	10.7	23.200
905	14.4	11.9	26.300
906	16.4	11	27.400

	Thermal loads		
Dwelling no.	Area adjusted heating load (in MJ/m²/yr)	Area adjusted cooling load (in MJ/m²/yr)	Area adjusted total load (in MJ/m²/yr)
909	22.2	8.8	31.000
910	25.2	9.4	34.600
911	13.4	12.4	25.800
912	19.4	9.8	29.200
913	27.8	7.5	35.300
914	7.6	15.9	23.500
915	15.5	11.2	26.700
916	25.4	9.9	35.300
917	6.8	12.6	19.400
918	8.3	14.6	22.900
G01	9.1	16.9	26.000
G02	11.3	18.6	29.900
G03	1.4	13.7	15.100
G04	9.7	17.9	27.600
G05	17.2	7.8	25.000
G06	9	11.9	20.900
G07	20.8	11.1	31.900
G08	27.7	7.9	35.600
G09	9.5	11.3	20.800
G10	19.2	11.4	30.600
G11	19.7	12.2	31.900
G12	19.7	12.1	31.800
G13	22.8	10.5	33.300
G14	18.6	12	30.600
G15	20.3	8.2	28.500
G16	1.9	8.2	10.100
G17	1.6	19.8	21.400
311, 411	4.8	11	15.800
407, 408	4.2	9.9	14.100
707, 708	6.1	9	15.100
907, 908	15.4	11.8	27.200

	Thermal loads		
Dwelling no.	Area adjusted heating load (in MJ/m²/yr)	Area adjusted cooling load (in MJ/m²/yr)	Area adjusted total load (in MJ/m²/yr)
All other dwellings	1.4	10.2	11.600

(c) Common areas and central systems/facilities

(i) Water	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a showerhead, toilet, tap or clothes washer into a common area, then that item must meet the specifications listed for it in the table.		✔	✔
(b) The applicant must install (or ensure that the development is serviced by) the alternative water supply system(s) specified in the "Central systems" column of the table below. In each case, the system must be sized, be configured, and be connected, as specified in the table.	✔	✔	✔
(c) A swimming pool or spa listed in the table must not have a volume (in kLs) greater than that specified for the pool or spa in the table.	✔	✔	
(d) A pool or spa listed in the table must have a cover or shading if specified for the pool or spa in the table.		✔	
(e) The applicant must install each fire sprinkler system listed in the table so that the system is configured as specified in the table.		✔	✔
(f) The applicant must ensure that the central cooling system for a cooling tower is configured as specified in the table.		✔	✔

Common area	Showerheads rating	Toilets rating	Taps rating	Clothes washers rating
All common areas	no common facility	4 star	6 star	no common laundry facility

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a ventilation system to service a common area specified in the table below, then that ventilation system must be of the type specified for that common area, and must meet the efficiency measure specified.		✔	✔
(b) In carrying out the development, the applicant must install, as the "primary type of artificial lighting" for each common area specified in the table below, the lighting specified for that common area. This lighting must meet the efficiency measure specified. The applicant must also install a centralised lighting control system or Building Management System (BMS) for the common area, where specified.		✔	✔
(c) The applicant must install the systems and fixtures specified in the "Central energy systems" column of the table below. In each case, the system or fixture must be of the type, and meet the specifications, listed for it in the table.	✔	✔	✔

	Common area ventilation system		Common area lighting		
Common area	**Ventilation system type**	**Ventilation efficiency measure**	**Primary type of artificial lighting**	**Lighting efficiency measure**	**Lighting control system/ BMS**
Lift bank (No. 1)	-	-	light-emitting diode	connected to lift call button	no
Lift bank (No. 2)	-	-	light-emitting diode	connected to lift call button	no
Lift bank (No. 3)	-	-	light-emitting diode	connected to lift call button	no
Lift bank (No. 4)	-	-	light-emitting diode	connected to lift call button	no
Community room (No. 1)	air conditioning system	time clock or BMS controlled	light-emitting diode	daylight sensor and motion sensor	no

Central energy systems	Type	Specification
Lift bank (No. 1)	gearless traction with V V V F motor	Number of levels (including basement): 10 number of levels from the bottom of the lift shaft to the top of the lift shaft: 11 number of lifts: 2 lift load capacity: <1001 kg
Lift bank (No. 2)	gearless traction with V V V F motor	Number of levels (including basement): 15 number of levels from the bottom of the lift shaft to the top of the lift shaft: 16 number of lifts: 2 lift load capacity: <1001 kg
Lift bank (No. 4)	gearless traction with V V V F motor	Number of levels (including basement): 4 number of levels from the bottom of the lift shaft to the top of the lift shaft: 5 number of lifts: 2 lift load capacity: <1001 kg
Central hot water system (No. 1)	electric heat pump – air sourced	Piping insulation (ringmain & supply risers): (a) Piping external to building: R1.0 (~38 mm); (b) Piping internal to building: R0.75 (~32 mm) (c) Unit Efficiency: 3.0 < COP <= 3.5
Central hot water system (No. 3)	electric heat pump – air sourced	Piping insulation (ringmain & supply risers): (a) Piping external to building: R1.0 (~38 mm); (b) Piping internal to building: R0.75 (~32 mm) (c) Unit Efficiency: 3.0 < COP <= 3.5

4. Commitments for common areas and central systems/facilities for the development (non-building specific)

(a) Buildings 'Other'

(i) Materials	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The details of the proposed development on the Assessor Certificate must be consistent with the details shown in this BASIX Certificate, including the details shown in the “Floor types”, “External wall types”, “Internal wall types”, “Ceiling and roof types”, “Frames” and “Glazing” tables below.			✔
(b) The applicant must show on the plans accompanying the application for a construction certificate (or complying development certificate, if applicable), all specifications included in the tables below.		✔	
(c) The applicant must construct the floors, walls, roof, ceiling and roof, windows, glazed doors and skylights of the development in accordance with the specifications listed in the tables below. In the case of glazing, a 5% variance from the area values listed in the “Frames” and “Glazing” tables is permitted.	✔	✔	✔
(d) The applicant must show through receipts that the materials purchased for construction are consistent with the specifications listed in the below tables.			✔

Floor types

Floor type	Area (m2)	Insulation	Low emissions option
garage floor, frame: concrete slab on ground	4354	-	30% cement substitute

External wall types

External wall type	Construction type	Area (m2)	Low emissions option	Insulation
External wall type 1	off form concrete,frame:no frame	4659	30% cement substitute	-

Internal wall types

Internal wall type	Construction type	Area (m2)	Insulation
Internal wall type 1	single skin masonry, frame:no frame	1742	-

Reinforcement concrete frames/columns

Building has reinforced concrete frame/columns?	Volume (m^3)	Low emissions option
yes	16109	30% cement substitute

Ceiling and roof types			
Ceiling and roof type	**Area (m²)**	**Roof Insulation**	**Ceiling Insulation**
concrete - plasterboard internal, frame: light steel frame	2354	-	-

Glazing types			Frame types				
Single glazing (m²)	**Double glazing (m²)**	**Triple glazing (m²)**	**Aluminium frames (m²)**	**Timber frames (m²)**	**uPVC frames (m²)**	**Steel frames (m²)**	**Composite frames (m²)**
-	-	-	-	-	-	-	-

(b) Common areas and central systems/facilities

(i) Water	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a showerhead, toilet, tap or clothes washer into a common area, then that item must meet the specifications listed for it in the table.		✔	✔
(b) The applicant must install (or ensure that the development is serviced by) the alternative water supply system(s) specified in the "Central systems" column of the table below. In each case, the system must be sized, be configured, and be connected, as specified in the table.	✔	✔	✔
(c) A swimming pool or spa listed in the table must not have a volume (in kLs) greater than that specified for the pool or spa in the table.	✔	✔	
(d) A pool or spa listed in the table must have a cover or shading if specified for the pool or spa in the table.		✔	
(e) The applicant must install each fire sprinkler system listed in the table so that the system is configured as specified in the table.		✔	✔
(f) The applicant must ensure that the central cooling system for a cooling tower is configured as specified in the table.		✔	✔

Common area	Showerheads rating	Toilets rating	Taps rating	Clothes washers rating
All common areas	no common facility	4 star	6 star	no common laundry facility

Central systems	Size	Configuration	Connection (to allow for...)
Central water tank - rainwater or stormwater (No. 1)	10000	To collect run-off from at least: - 2910 square metres of roof area of buildings in the development - 0 square metres of impervious area in the development - 0 square metres of garden/lawn area in the development - 0 square metres of planter box area in the development (excluding, in each case, any area which drains to, or supplies, any other alternative water supply system).	- irrigation of 2190 square metres of common landscaped area on the site - car washing in 0 car washing bays on the site
Fire sprinkler system (No. 1)	-	So that fire sprinkler test water is contained within the fire sprinkler system for re-use, rather than disposed.	-

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a ventilation system to service a common area specified in the table below, then that ventilation system must be of the type specified for that common area, and must meet the efficiency measure specified.		✔	✔
(b) In carrying out the development, the applicant must install, as the "primary type of artificial lighting" for each common area specified in the table below, the lighting specified for that common area. This lighting must meet the efficiency measure specified. The applicant must also install a centralised lighting control system or Building Management System (BMS) for the common area, where specified.		✔	✔
(c) The applicant must install the systems and fixtures specified in the "Central energy systems" column of the table below. In each case, the system or fixture must be of the type, and meet the specifications, listed for it in the table.	✔	✔	✔

	Common area ventilation system		Common area lighting		
Common area	Ventilation system type	Ventilation efficiency measure	Primary type of artificial lighting	Lighting efficiency measure	Lighting control system/ BMS
Undercover car park area (No. 1)	ventilation (supply + exhaust)	carbon monoxide monitor + VSD fan	light-emitting diode	zoned switching with motion sensor	no
Lift motor room (No. 1)	ventilation supply only	interlocked to light	light-emitting diode	manual on / manual off	no
Lift motor room (No. 2)	ventilation supply only	interlocked to light	light-emitting diode	manual on / manual off	no
Lift motor room (No. 3)	ventilation supply only	interlocked to light	light-emitting diode	manual on / manual off	no
Lift motor room (No. 4)	ventilation supply only	interlocked to light	light-emitting diode	manual on / manual off	no
Switch room (No. 1)	ventilation supply only	interlocked to light	light-emitting diode	manual on / manual off	no
Garbage room (No. 1)	ventilation exhaust only	-	light-emitting diode	manual on / manual off	no
Plant or service room (No. 1)	ventilation supply only	interlocked to light	light-emitting diode	manual on / manual off	no
Other internal common area (No. 1)	ventilation supply only	time clock or BMS controlled	light-emitting diode	manual on / manual off	no
Ground floor lobby type (No. 1)	no mechanical ventilation	-	light-emitting diode	daylight sensor and motion sensor	no
Hallway/lobby type (No. 1)	no mechanical ventilation	-	light-emitting diode	daylight sensor and motion sensor	no

Central energy systems	Type	Specification
Alternative energy supply	Photovoltaic system	Rated electrical output (min): 240 peak kW
Other	Common area clothes drying line installed?: yes	-

Notes

1. In these commitments, "applicant" means the person carrying out the development.
2. The applicant must identify each dwelling, building and common area listed in this certificate, on the plans accompanying any development application, and on the plans and specifications accompanying the application for a construction certificate / complying development certificate, for the proposed development, using the same identifying letter or reference as is given to that dwelling, building or common area in this certificate.
3. This note applies if the proposed development involves the erection of a building for both residential and non-residential purposes (or the change of use of a building for both residential and non-residential purposes). Commitments in this certificate which are specified to apply to a "common area" of a building or the development, apply only to that part of the building or development to be used for residential purposes.
4. If this certificate lists a central system as a commitment for a dwelling or building, and that system will also service any other dwelling or building within the development, then that system need only be installed once (even if it is separately listed as a commitment for that other dwelling or building).
5. If a star or other rating is specified in a commitment, this is a minimum rating.
6. All alternative water systems to be installed under these commitments (if any), must be installed in accordance with the requirements of all applicable regulatory authorities. NOTE: NSW Health does not recommend that stormwater, recycled water or private dam water be used to irrigate edible plants which are consumed raw, or that rainwater be used for human consumption in areas with potable water supply.

Legend

1. Commitments identified with a "✔" in the "Show on DA plans" column must be shown on the plans accompanying the development application for the proposed development (if a development application is to be lodged for the proposed development).
2. Commitments identified with a "✔" in the "Show on CC/CDC plans and specs" column must be shown in the plans and specifications accompanying the application for a construction certificate / complying development certificate for the proposed development.
3. Commitments identified with a "✔" in the "Certifier check" column must be certified by a certifying authority as having been fulfilled. (Note: a certifying authority must not issue an occupation certificate (either interim or final) for a building listed in this certificate, or for any part of such a building, unless it is satisfied that each of the commitments whose fulfilment it is required to monitor in relation to the building or part, has been fulfilled).

Appendix D NatHERS Summary Certificate

Nationwide House Energy Rating Scheme®
Class 2 Summary
NatHERS® Certificate No. #HR-9GTPW3-01

Generated on 19 Jun 2024 using Hero 4.0

Property

Address	S2 600-660 Elizabeth Street, REDFERN, NSW, 2016
Lot/DP	
NatHERS climate zone	56 - Mascot AMO

Accredited assessor

Name	Adam Clarke
Business name	10 Star Building Assessments
Email	admin@10sba.com
Phone	+61 481010999
Accreditation No.	101518
Assessor Accrediting Organisation	ABSA

Verification

To verify this certificate, scan the QR code or visit http://www.hero-software.com.au/pdf/HR-9GTPW3-01. When using either link, ensure you are visiting http://www.hero-software.com.au

National Construction Code (NCC) requirements

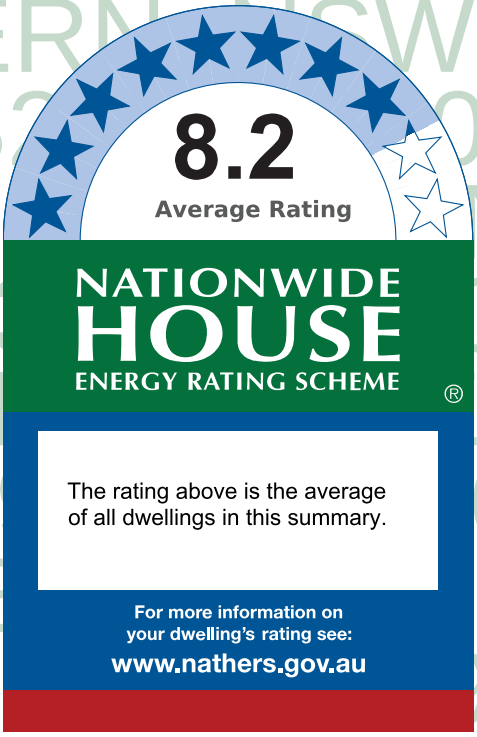
The NCC allows the use of NatHERS accredited software to comply with the energy efficiency requirements for houses (Class 1 buildings) and apartments (Class 2 sole-occupancy units and Class 4 parts of buildings). The applicable requirements for houses are detailed in Specification 42 of NCC Volume Two. For apartments the requirements are detailed in clauses J3D3 and J3D15 of NCC Volume One.

NCC 2022 includes enhanced thermal performance requirements for houses and apartments. It also includes a new whole-of-home annual energy use budget which applies to the major equipment in the home.

The NCC, and associated ABCB Standards and support material, can be accessed at www.abcb.gov.au.

Note, variations and additions to the NCC energy efficiency requirements may apply in some states and territories.

Thermal performance Star rating



NCC heating and cooling maximum loads MJ/m².yr

Limits taken from ABCB Standard 2022

	Heating	Cooling
Average load	8.5	10.4
Maximum load	27.8	19.8
Average limit	28.1	20.0
Maximum limit	34.4	21.4

Whole of Home performance rating

No Whole of Home performance rating generated for this certificate or not completed for all dwellings.

Summary of all dwellings

Certificate number and link	Unit Number	Heating load (load limit) (MJ/m².yr)	Cooling load (load limit) (MJ/m².yr)	Total load (MJ/m².yr)	Star Rating	Whole of Home Rating
HR-MYVPMS-01	1201	2.1 (34)	6.3 (21)	8.4	9.6	n/a
HR-GQJFVY-01	1202	7.3 (34)	12.4 (21)	19.7	8.1	n/a
HR-E3R75J-01	1203	7.8 (34)	13.0 (21)	20.8	8.0	n/a

Summary of all dwellings

Certificate number and link	Unit Number	Heating load (load limit) (MJ/m².yr)	Cooling load (load limit) (MJ/m².yr)	Total load (MJ/m².yr)	Star Rating	Whole of Home Rating
HR-IIISFT-01	1204	10.4 (34)	11.5 (21)	21.9	7.9	n/a
HR-U2XAKI-01	1206	3.0 (34)	15.0 (21)	18.0	8.3	n/a
HR-UOFMG6-01	1207	2.3 (34)	12.4 (21)	14.7	8.7	n/a
HR-Q8FKCS-01	401	0.3 (34)	13.9 (21)	14.2	8.7	n/a
HR-KMU8I5-01	402	1.3 (34)	8.4 (21)	9.7	9.4	n/a
HR-I25F7N-01	403	8.3 (34)	10.0 (21)	18.3	8.3	n/a
HR-YJW4EK-01	404	5.5 (34)	11.2 (21)	16.7	8.4	n/a
HR-0L5L4X-01	405	4.1 (34)	10.6 (21)	14.7	8.7	n/a
HR-9S51KT-01	406	4.5 (34)	9.8 (21)	14.3	8.7	n/a
HR-6KAX3I-01	407	4.2 (34)	9.9 (21)	14.2	8.7	n/a
HR-GQEW0R-01	408	4.2 (34)	9.9 (21)	14.1	8.7	n/a
HR-OSNLYL-01	409	10.8 (34)	6.7 (21)	17.5	8.4	n/a
HR-2SP30P-01	410	14.2 (34)	5.0 (21)	19.2	8.2	n/a
HR-E2JKJJ-01	411	4.8 (34)	11.0 (21)	15.9	8.5	n/a
HR-RMOFKQ-01	412	10.9 (34)	12.3 (21)	23.2	7.7	n/a
HR-S6UCCL-01	413	15.5 (34)	4.7 (21)	20.1	8.1	n/a
HR-AF53DT-01	414	0.8 (34)	15.4 (21)	16.2	8.4	n/a
HR-UC8FIE-01	415	4.5 (34)	9.7 (21)	14.2	8.7	n/a
HR-LCTUYG-01	416	7.9 (34)	9.0 (21)	16.9	8.4	n/a
HR-AXFWYC-01	417	1.1 (34)	10.9 (21)	12.0	8.9	n/a
HR-OL7C7V-01	418	0.9 (34)	11.7 (21)	12.5	8.9	n/a
HR-2TQQQI-01	512	11.3 (34)	12.0 (21)	23.3	7.7	n/a
HR-42FGRZ-01	712	12.1 (34)	11.8 (21)	23.8	7.6	n/a
HR-2KP2R6-01	912	19.4 (34)	9.8 (21)	29.2	7.1	n/a
HR-K2E3Y8-01	G01	9.1 (34)	16.9 (21)	26.0	7.4	n/a
HR-AN8WJV-01	G02	11.3 (34)	18.6 (21)	29.9	7.0	n/a
HR-MGPVX6-01	G03	1.4 (34)	13.7 (21)	15.2	8.6	n/a
HR-B1M5QO-01	G04	9.7 (34)	17.9 (21)	27.6	7.2	n/a
HR-Z679FG-01	G05	17.2 (34)	7.8 (21)	25.0	7.5	n/a

Summary of all dwellings

Certificate number and link	Unit Number	Heating load (load limit) (MJ/m².yr)	Cooling load (load limit) (MJ/m².yr)	Total load (MJ/m².yr)	Star Rating	Whole of Home Rating
HR-Z9S3AN-01	G06	9.0 (34)	11.9 (21)	20.9	8.0	n/a
HR-IKH3WM-01	G07	20.8 (34)	11.1 (21)	32.0	6.8	n/a
HR-4N82LV-01	G08	27.7 (34)	7.9 (21)	35.5	6.3	n/a
HR-SB22S5-01	G09	9.5 (34)	11.3 (21)	20.8	8.0	n/a
HR-ARYEMJ-01	G10	19.2 (34)	11.4 (21)	30.6	6.9	n/a
HR-56I6O0-01	G11	19.7 (34)	12.2 (21)	31.8	6.8	n/a
HR-65PSPK-01	G12	19.7 (34)	12.1 (21)	31.8	6.8	n/a
HR-A5FCI7-01	G13	22.8 (34)	10.5 (21)	33.3	6.6	n/a
HR-KBZWYL-01	G14	18.6 (34)	12.0 (21)	30.6	6.9	n/a
HR-7HR79G-01	G15	20.3 (34)	8.2 (21)	28.5	7.2	n/a
HR-9SE738-01	G16	1.9 (34)	8.2 (21)	10.0	9.3	n/a
HR-OYNHVU-01	G17	1.6 (34)	19.8 (21)	21.4	7.9	n/a
HR-QQ3TQZ-01	101	12.2 (34)	6.5 (21)	18.7	8.2	n/a
HR-N1K7RH-01	102	6.9 (34)	16.5 (21)	23.4	7.7	n/a
HR-IUPNOG-01	103	5.6 (34)	10.6 (21)	16.2	8.4	n/a
HR-64OQZ1-01	104	4.3 (34)	11.5 (21)	15.8	8.5	n/a
HR-3QO4C5-01	105	4.7 (34)	11.6 (21)	16.3	8.4	n/a
HR-I8CSA5-01	106	10.5 (34)	12.9 (21)	23.3	7.7	n/a
HR-H8YSAQ-01	107	9.7 (34)	8.0 (21)	17.7	8.3	n/a
HR-786U78-01	108	3.8 (34)	13.6 (21)	17.5	8.4	n/a
HR-4VLG04-01	109	18.1 (34)	17.2 (21)	35.3	6.3	n/a
HR-ZZBJZW-01	110	22.1 (34)	4.3 (21)	26.4	7.4	n/a
HR-5MWBJR-01	1101	3.0 (34)	5.9 (21)	8.9	9.5	n/a
HR-HPQSKA-01	1102	9.8 (34)	11.0 (21)	20.8	8.0	n/a
HR-JANK5K-01	1103	10.4 (34)	12.4 (21)	22.7	7.8	n/a
HR-Q2BAW2-01	1104	18.0 (34)	10.3 (21)	28.3	7.2	n/a
HR-OMW3UC-01	1105	16.2 (34)	10.8 (21)	27.0	7.3	n/a
HR-MXCH5W-01	1106	7.8 (34)	13.2 (21)	21.1	7.9	n/a
HR-MW5J9L-01	1107	6.1 (34)	15.3 (21)	21.4	7.9	n/a

Summary of all dwellings

Certificate number and link	Unit Number	Heating load (load limit) (MJ/m².yr)	Cooling load (load limit) (MJ/m².yr)	Total load (MJ/m².yr)	Star Rating	Whole of Home Rating
HR-RE7E5O-01	111	1.0 (34)	10.8 (21)	11.8	9.0	n/a
HR-B4SPVI-01	112	5.0 (34)	11.0 (21)	16.0	8.5	n/a
HR-B0FE3R-01	113	12.9 (34)	8.7 (21)	21.6	7.9	n/a
HR-DTDI0X-01	114	0.6 (34)	10.2 (21)	10.8	9.2	n/a
HR-F5BMXE-01	115	0.2 (34)	11.9 (21)	12.1	8.9	n/a
HR-EHYDHM-01	1205	10.8 (34)	11.9 (21)	22.8	7.8	n/a
HR-E6OQFV-01	1301	6.1 (34)	8.4 (21)	14.4	8.7	n/a
HR-JCJC5G-01	1302	17.2 (34)	13.6 (21)	30.9	6.9	n/a
HR-8AVFTW-01	1303	16.6 (34)	15.8 (21)	32.3	6.7	n/a
HR-H9VYEN-01	1304	15.2 (34)	13.4 (21)	28.6	7.1	n/a
HR-L8WEHD-01	1305	21.9 (34)	12.9 (21)	34.8	6.4	n/a
HR-S3ZTGG-01	1306	12.0 (34)	17.1 (21)	29.1	7.1	n/a
HR-601VB8-01	1307	6.5 (34)	15.4 (21)	21.9	7.9	n/a
HR-AVQURQ-01	201	0.3 (34)	14.7 (21)	15.0	8.6	n/a
HR-A2RT84-01	202	0.3 (34)	10.6 (21)	11.0	9.2	n/a
HR-KHYT3S-01	203	8.8 (34)	10.7 (21)	19.5	8.2	n/a
HR-PZZ6K8-01	204	5.9 (34)	13.7 (21)	19.6	8.1	n/a
HR-03FIBP-01	205	2.6 (34)	11.5 (21)	14.1	8.7	n/a
HR-XFEAHS-01	206	3.3 (34)	10.9 (21)	14.2	8.7	n/a
HR-YX33JI-01	207	2.1 (34)	11.7 (21)	13.7	8.8	n/a
HR-YZXLAS-01	208	2.4 (34)	11.7 (21)	14.1	8.7	n/a
HR-OU0G85-01	209	9.4 (34)	8.0 (21)	17.4	8.4	n/a
HR-E5DDPJ-01	210	9.1 (34)	8.1 (21)	17.2	8.4	n/a
HR-7LCOVA-01	211	3.7 (34)	13.6 (21)	17.3	8.4	n/a
HR-CS46KQ-01	212	17.7 (34)	11.2 (21)	28.9	7.1	n/a
HR-PH2F7H-01	213	16.9 (34)	7.1 (21)	24.0	7.6	n/a
HR-YXIHFP-01	214	1.4 (34)	9.5 (21)	10.9	9.2	n/a
HR-KJGIUV-01	215	5.2 (34)	8.5 (21)	13.7	8.8	n/a
HR-RXXH5Z-01	216	12.6 (34)	7.1 (21)	19.7	8.1	n/a

Summary of all dwellings

Certificate number and link	Unit Number	Heating load (load limit) (MJ/m².yr)	Cooling load (load limit) (MJ/m².yr)	Total load (MJ/m².yr)	Star Rating	Whole of Home Rating
HR-YYUAPB-01	217	0.7 (34)	8.3 (21)	9.0	9.5	n/a
HR-HWFUU8-01	218	0.5 (34)	12.7 (21)	13.2	8.8	n/a
HR-3UZ75K-01	301	0.3 (34)	14.1 (21)	14.4	8.7	n/a
HR-3TQGQL-01	302	1.4 (34)	9.0 (21)	10.4	9.3	n/a
HR-CDNXMK-01	303	7.8 (34)	9.9 (21)	17.7	8.3	n/a
HR-UUUPX6-01	304	5.2 (34)	11.4 (21)	16.6	8.4	n/a
HR-P2SMZ7-01	305	3.8 (34)	10.7 (21)	14.4	8.7	n/a
HR-DXW3ZV-01	306	4.3 (34)	9.8 (21)	14.1	8.7	n/a
HR-SM9YWA-01	307	3.9 (34)	10.0 (21)	13.9	8.8	n/a
HR-FEAWCS-01	308	3.9 (34)	10.1 (21)	14.0	8.7	n/a
HR-OKEQT3-01	309	10.8 (34)	7.0 (21)	17.7	8.3	n/a
HR-NENEV6-01	310	13.5 (34)	7.7 (21)	21.2	7.9	n/a
HR-7OPSJM-01	311	4.8 (34)	11.0 (21)	15.7	8.5	n/a
HR-A3Y9M9-01	312	10.6 (34)	12.2 (21)	22.8	7.8	n/a
HR-YI8DMD-01	313	17.2 (34)	4.5 (21)	21.7	7.9	n/a
HR-KH6P7J-01	314	1.1 (34)	14.8 (21)	15.9	8.5	n/a
HR-N2W6E0-01	315	5.1 (34)	9.2 (21)	14.3	8.7	n/a
HR-KZQEP4-01	316	9.6 (34)	8.3 (21)	17.9	8.3	n/a
HR-NJASGD-01	317	1.1 (34)	8.4 (21)	9.5	9.4	n/a
HR-9LFFVF-01	318	0.8 (34)	11.3 (21)	12.1	8.9	n/a
HR-6P9WXT-01	501	0.3 (34)	13.5 (21)	13.9	8.8	n/a
HR-JA84JM-01	502	1.4 (34)	8.3 (21)	9.7	9.4	n/a
HR-CL1KBE-01	503	8.7 (34)	10.0 (21)	18.6	8.2	n/a
HR-OJQSMS-01	504	5.7 (34)	10.9 (21)	16.6	8.4	n/a
HR-NVX9MN-01	505	4.4 (34)	10.4 (21)	14.8	8.7	n/a
HR-Q9XZKO-01	506	4.9 (34)	9.4 (21)	14.3	8.7	n/a
HR-SIPWFA-01	507	4.5 (34)	10.0 (21)	14.5	8.7	n/a
HR-SNX9E7-01	508	4.4 (34)	10.0 (21)	14.5	8.7	n/a
HR-T16NT0-01	509	11.2 (34)	6.7 (21)	17.8	8.3	n/a

Summary of all dwellings

Certificate number and link	Unit Number	Heating load (load limit) (MJ/m².yr)	Cooling load (load limit) (MJ/m².yr)	Total load (MJ/m².yr)	Star Rating	Whole of Home Rating
HR-SYKNFI-01	510	14.5 (34)	5.2 (21)	19.7	8.1	n/a
HR-H2UX5T-01	511	4.9 (34)	11.0 (21)	16.0	8.5	n/a
HR-09M4JK-01	513	18.8 (34)	4.0 (21)	22.7	7.8	n/a
HR-M6RVQ5-01	514	1.3 (34)	14.2 (21)	15.4	8.6	n/a
HR-GOM6FV-01	515	6.2 (34)	9.4 (21)	15.6	8.6	n/a
HR-M94583-01	516	9.7 (34)	7.5 (21)	17.1	8.4	n/a
HR-G4HH6P-01	517	1.1 (34)	11.5 (21)	12.7	8.9	n/a
HR-KZ7PL0-01	518	0.9 (34)	11.3 (21)	12.3	8.9	n/a
HR-DYOVUE-01	601	0.5 (34)	12.6 (21)	13.1	8.9	n/a
HR-SU5T8A-01	602	1.8 (34)	7.3 (21)	9.0	9.4	n/a
HR-MCPGR4-01	603	10.6 (34)	9.8 (21)	20.4	8.1	n/a
HR-Y7TA7W-01	604	7.1 (34)	9.8 (21)	16.9	8.4	n/a
HR-0OVJGT-01	605	5.7 (34)	9.8 (21)	15.5	8.6	n/a
HR-1IVSZV-01	606	6.1 (34)	8.8 (21)	14.9	8.6	n/a
HR-WZG4NV-01	607	5.8 (34)	9.1 (21)	14.9	8.6	n/a
HR-R2DSH3-01	608	5.8 (34)	9.2 (21)	15.0	8.6	n/a
HR-XDPQZJ-01	609	12.7 (34)	5.9 (21)	18.6	8.2	n/a
HR-MVAC5N-01	610	16.7 (34)	5.1 (21)	21.9	7.9	n/a
HR-OW5RRB-01	611	5.6 (34)	9.7 (21)	15.3	8.6	n/a
HR-O0NK16-01	612	11.7 (34)	11.9 (21)	23.6	7.7	n/a
HR-G1IJEF-01	613	15.9 (34)	4.7 (21)	20.6	8.0	n/a
HR-O9OML1-01	614	1.8 (34)	14.4 (21)	16.2	8.4	n/a
HR-J23ZCP-01	615	7.4 (34)	8.4 (21)	15.9	8.5	n/a
HR-8ZDW24-01	616	11.8 (34)	7.3 (21)	19.1	8.2	n/a
HR-MJ0MWJ-01	617	1.4 (34)	10.2 (21)	11.6	9.1	n/a
HR-6YUWTI-01	618	1.4 (34)	10.2 (21)	11.6	9.1	n/a
HR-4HJCJM-01	701	0.9 (34)	12.6 (21)	13.5	8.8	n/a
HR-VWG5F3-01	702	1.5 (34)	8.2 (21)	9.7	9.4	n/a
HR-6N4FW2-01	703	11.4 (34)	10.0 (21)	21.4	7.9	n/a

Summary of all dwellings

Certificate number and link	Unit Number	Heating load (load limit) (MJ/m².yr)	Cooling load (load limit) (MJ/m².yr)	Total load (MJ/m².yr)	Star Rating	Whole of Home Rating
HR-UYX1OT-01	704	7.4 (34)	9.7 (21)	17.1	8.4	n/a
HR-RJ01H6-01	705	5.9 (34)	9.9 (21)	15.9	8.5	n/a
HR-ALZOKU-01	706	6.4 (34)	8.6 (21)	15.0	8.6	n/a
HR-77RMBM-01	707	6.1 (34)	9.0 (21)	15.1	8.6	n/a
HR-2PU67Y-01	708	6.1 (34)	9.0 (21)	15.1	8.6	n/a
HR-LCXNPC-01	709	13.0 (34)	5.9 (21)	18.9	8.2	n/a
HR-F8SLB0-01	710	17.1 (34)	7.4 (21)	24.5	7.6	n/a
HR-X3NYPO-01	711	5.5 (34)	9.5 (21)	15.1	8.6	n/a
HR-KJZ6JF-01	713	16.3 (34)	4.7 (21)	21.0	8.0	n/a
HR-005UPA-01	714	1.7 (34)	13.1 (21)	14.8	8.7	n/a
HR-PU3M6K-01	715	7.6 (34)	8.4 (21)	16.0	8.4	n/a
HR-OKH1K3-01	716	13.9 (34)	7.3 (21)	21.2	7.9	n/a
HR-GKHVWN-01	717	1.4 (34)	10.2 (21)	11.5	9.1	n/a
HR-K1V6IO-01	718	1.8 (34)	9.5 (21)	11.3	9.1	n/a
HR-RKQUP6-01	801	1.2 (34)	12.4 (21)	13.6	8.8	n/a
HR-Z4YGYL-01	802	1.9 (34)	7.3 (21)	9.2	9.4	n/a
HR-EQDW8O-01	803	11.6 (34)	10.0 (21)	21.6	7.9	n/a
HR-3114O3-01	804	7.6 (34)	9.5 (21)	17.1	8.4	n/a
HR-1P090H-01	805	6.1 (34)	9.3 (21)	15.4	8.6	n/a
HR-9ZST7O-01	806	6.6 (34)	8.7 (21)	15.3	8.6	n/a
HR-DE0ZVI-01	807	6.3 (34)	8.7 (21)	15.0	8.6	n/a
HR-T6XH20-01	808	6.3 (34)	8.6 (21)	14.9	8.6	n/a
HR-WWFQK5-01	809	13.2 (34)	5.9 (21)	19.1	8.2	n/a
HR-PNDDGU-01	810	17.0 (34)	7.3 (21)	24.3	7.6	n/a
HR-KJG7J5-01	811	5.6 (34)	11.4 (21)	17.0	8.4	n/a
HR-SS08K7-01	812	11.7 (34)	11.7 (21)	23.5	7.7	n/a
HR-95IXGK-01	813	19.1 (34)	4.2 (21)	23.3	7.7	n/a
HR-P4R2ST-01	814	1.9 (34)	13.9 (21)	15.8	8.5	n/a
HR-EZPM3X-01	815	7.5 (34)	8.3 (21)	15.8	8.5	n/a

Summary of all dwellings

Certificate number and link	Unit Number	Heating load (load limit) (MJ/m².yr)	Cooling load (load limit) (MJ/m².yr)	Total load (MJ/m².yr)	Star Rating	Whole of Home Rating
HR-XOXYKO-01	816	13.8 (34)	7.1 (21)	20.9	8.0	n/a
HR-9Y65TD-01	817	1.4 (34)	10.1 (21)	11.5	9.1	n/a
HR-O5AMFG-01	818	1.9 (34)	9.6 (21)	11.4	9.1	n/a
HR-LC9ERS-01	901	5.3 (34)	16.4 (21)	21.7	7.9	n/a
HR-TA0Z1C-01	902	5.4 (34)	9.5 (21)	15.0	8.6	n/a
HR-NH51IZ-01	903	14.4 (34)	10.5 (21)	24.9	7.5	n/a
HR-MXDO49-01	904	12.5 (34)	10.7 (21)	23.2	7.7	n/a
HR-QDTEWM-01	905	14.4 (34)	11.9 (21)	26.3	7.4	n/a
HR-547ZQ4-01	906	16.4 (34)	11.0 (21)	27.5	7.3	n/a
HR-UATG98-01	907	15.4 (34)	11.8 (21)	27.2	7.3	n/a
HR-07VTNY-01	908	15.4 (34)	11.8 (21)	27.1	7.3	n/a
HR-EAPKLB-01	909	22.2 (34)	8.8 (21)	31.0	6.9	n/a
HR-UM2DZW-01	910	25.2 (34)	9.4 (21)	34.6	6.4	n/a
HR-5AORUJ-01	911	13.4 (34)	12.4 (21)	25.8	7.4	n/a
HR-MPRYZD-01	913	27.8 (34)	7.5 (21)	35.3	6.3	n/a
HR-ERKBIZ-01	914	7.6 (34)	15.9 (21)	23.5	7.7	n/a
HR-AN7SP0-01	915	15.5 (34)	11.2 (21)	26.7	7.3	n/a
HR-ZGB0YF-01	916	25.4 (34)	9.9 (21)	35.3	6.3	n/a
HR-1TVGYA-01	917	6.8 (34)	12.6 (21)	19.4	8.2	n/a
HR-L3BKH1-01	918	8.3 (34)	14.6 (21)	22.9	7.8	n/a
Averages	197x (Total)	8.5	10.4	18.9	8.2	n/a
Maximum Loads and Minimum Ratings		27.8	19.8	35.5	6.3	n/a

Explanatory notes

About the ratings

The thermal performance star rating in this Certificate is the average rating of all NCC Class 2 dwellings in an apartment block. The Whole of Home performance rating in this Certificate is the lowest rating for the apartment block. Individual unit ratings are listed in the *'Summary of all dwellings'* section of this Certificate.

NatHERS ratings use computer modelling to evaluate a home's energy efficiency and performance. They use localised climate data and standard assumptions on how people use their home to predict the energy loads and societal cost. The thermal performance star rating uses the home's building specifications, layout, orientation and fabric (i.e. walls, windows, floors, roofs and ceilings) to predict the heating and cooling energy loads. The Whole of Home performance rating uses information about the home's appliances and onsite energy production and storage to estimate the homes societal cost.
For more details about an individual dwelling's assessment, refer to the individual dwelling's NatHERS Certificate (accessible via link).

Accredited Assessors

For high quality NatHERS Certificates, always use an accredited or licenced assessor registered with an Assessor Accrediting Organisation (AAO). AAOs have strict quality assurance processes, and professional development requirements ensuring consistently high standards for assessments.

Non-accredited assessors (Raters) have no ongoing training requirements and are not quality assured.

Licensed assessors in the Australian Capital Territory (ACT) can produce assessments for regulatory purposes only, using endorsed software, as listed on the ACT licensing register.

Any queries about this report should be directed to the assessor. If the assessor is unable to address questions or concerns, contact the AAO specified on the front of this certificate.

Disclaimer

The NatHERS Certificate format is developed by the NatHERS Administrator. However, the content in certificates is entered by the assessor. It is the assessor's responsibility to use NatHERS accredited software correctly and follow the NatHERS Technical Note to produce a NatHERS Certificate.

The predicted annual energy use, cost and greenhouse gas emissions in this NatHERS Certificate are an estimate based on an assessment of the dwelling's design by the assessor. It is not a prediction of actual energy use, cost or emissions. The information and ratings may be used to compare how other dwellings are likely to perform when used in a similar way.

Information presented in this report relies on a range of standard assumptions (both embedded in NatHERS accredited software and made by the assessor who prepared this report), including assumptions about occupancy, behaviour, appliance performance, indoor air temperature and local climate.

Not all assumptions made by the assessor while using the NatHERS accredited software tool are presented in this report and further details or data files may be available from the assessor.

Nationwide House Energy Rating Scheme®
Class 2 Summary
NatHERS® Certificate No. #HR-722MC0-01

Generated on 19 Jun 2024 using Hero 4.0

Property

Address	S3 600-660 Elizabeth Street, REDFERN, NSW, 2016
Lot/DP	
NatHERS climate zone	56 - Mascot AMO

Accredited assessor

Name	Adam Clarke
Business name	10 Star Building Assessments
Email	admin@10sba.com
Phone	+61 481010999
Accreditation No.	101518
Assessor Accrediting Organisation	ABSA

Verification

To verify this certificate, scan the QR code or visit http://www.hero-software.com.au/pdf/HR-722MC0-01. When using either link, ensure you are visiting http://www.hero-software.com.au

National Construction Code (NCC) requirements

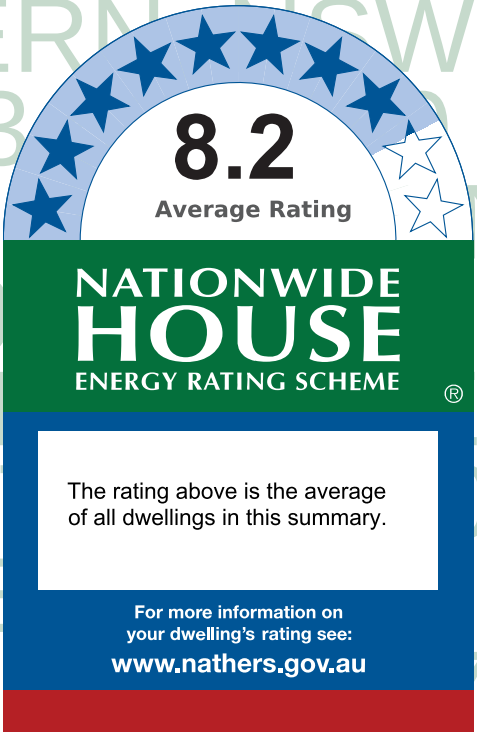
The NCC allows the use of NatHERS accredited software to comply with the energy efficiency requirements for houses (Class 1 buildings) and apartments (Class 2 sole-occupancy units and Class 4 parts of buildings). The applicable requirements for houses are detailed in Specification 42 of NCC Volume Two. For apartments the requirements are detailed in clauses J3D3 and J3D15 of NCC Volume One.

NCC 2022 includes enhanced thermal performance requirements for houses and apartments. It also includes a new whole-of-home annual energy use budget which applies to the major equipment in the home.

The NCC, and associated ABCB Standards and support material, can be accessed at www.abcb.gov.au.

Note, variations and additions to the NCC energy efficiency requirements may apply in some states and territories.

Thermal performance Star rating



NCC heating and cooling maximum loads MJ/m².yr

Limits taken from ABCB Standard 2022

	Heating	Cooling
Average load	9.4	9.4
Maximum load	28.6	20.4
Average limit	28.1	20.0
Maximum limit	34.4	21.4

Whole of Home performance rating

No Whole of Home performance rating generated for this certificate or not completed for all dwellings.

Summary of all dwellings

Certificate number and link	Unit Number	Heating load (load limit) (MJ/m².yr)	Cooling load (load limit) (MJ/m².yr)	Total load (MJ/m².yr)	Star Rating	Whole of Home Rating
HR-X5BFWE-01	001	12.7 (34)	8.3 (21)	20.9	8.0	n/a
HR-D15ACB-01	002	21.9 (34)	12.3 (21)	34.1	6.4	n/a
HR-N332CO-01	003	14.5 (34)	7.8 (21)	22.3	7.8	n/a

Summary of all dwellings

Certificate number and link	Unit Number	Heating load (load limit) (MJ/m².yr)	Cooling load (load limit) (MJ/m².yr)	Total load (MJ/m².yr)	Star Rating	Whole of Home Rating
HR-OJGUPG-01	004	6.8 (34)	10.1 (21)	16.8	8.4	n/a
HR-N0N04F-01	005	5.8 (34)	7.9 (21)	13.6	8.8	n/a
HR-WDQ8X3-01	006	14.7 (34)	12.9 (21)	27.6	7.2	n/a
HR-KG4R9Z-01	007	15.0 (34)	12.2 (21)	27.2	7.3	n/a
HR-81PMCA-01	008	15.1 (34)	11.4 (21)	26.5	7.3	n/a
HR-4TFVXR-01	009	14.5 (34)	13.5 (21)	28.0	7.2	n/a
HR-HHVPS9-01	010	4.0 (34)	7.1 (21)	11.1	9.1	n/a
HR-MDRI6S-01	011	5.8 (34)	8.9 (21)	14.7	8.7	n/a
HR-B4OXO5-01	012	3.4 (34)	13.9 (21)	17.3	8.4	n/a
HR-BL8YII-01	013	12.3 (34)	5.8 (21)	18.0	8.3	n/a
HR-VRFJZY-01	014	13.9 (34)	10.2 (21)	24.1	7.6	n/a
HR-3AOIHN-01	015	28.6 (34)	7.2 (21)	35.8	6.3	n/a
HR-45PQEK-01	101	5.6 (34)	6.9 (21)	12.5	8.9	n/a
HR-SQDSQT-01	102	7.9 (34)	6.3 (21)	14.2	8.7	n/a
HR-3YM8MN-01	103	8.6 (34)	11.8 (21)	20.4	8.1	n/a
HR-57V3XR-01	104	10.3 (34)	7.2 (21)	17.4	8.4	n/a
HR-H9K8GT-01	105	7.4 (34)	9.5 (21)	16.9	8.4	n/a
HR-RGALI4-01	106	6.5 (34)	7.6 (21)	14.0	8.8	n/a
HR-3X0HGS-01	107	5.2 (34)	12.1 (21)	17.4	8.4	n/a
HR-WCJGPC-01	108	5.4 (34)	12.3 (21)	17.7	8.3	n/a
HR-8HJ8NK-01	109	5.5 (34)	11.5 (21)	17.0	8.4	n/a
HR-WP6L2V-01	110	4.9 (34)	12.5 (21)	17.5	8.4	n/a
HR-9UAE75-01	111	2.5 (34)	7.9 (21)	10.4	9.3	n/a
HR-OLPVMF-01	112	4.8 (34)	9.4 (21)	14.2	8.7	n/a
HR-NOHG6C-01	113	2.6 (34)	13.6 (21)	16.2	8.4	n/a
HR-3SQN3S-01	114	6.8 (34)	9.1 (21)	15.9	8.5	n/a
HR-YJV4DH-01	115	2.8 (34)	16.1 (21)	18.9	8.2	n/a
HR-LBX47H-01	116	11.5 (34)	8.8 (21)	20.3	8.1	n/a
HR-BBTYYD-01	201	6.8 (34)	4.8 (21)	11.5	9.1	n/a

Summary of all dwellings

Certificate number and link	Unit Number	Heating load (load limit) (MJ/m².yr)	Cooling load (load limit) (MJ/m².yr)	Total load (MJ/m².yr)	Star Rating	Whole of Home Rating
HR-JY8RS8-01	202	6.9 (34)	6.3 (21)	13.2	8.9	n/a
HR-XCMY1Z-01	203	8.7 (34)	11.6 (21)	20.2	8.1	n/a
HR-UARFXG-01	204	10.7 (34)	6.8 (21)	17.5	8.3	n/a
HR-X41J84-01	205	7.7 (34)	9.2 (21)	16.9	8.4	n/a
HR-O3LZXO-01	206	6.7 (34)	7.4 (21)	14.2	8.7	n/a
HR-OA8XND-01	207	5.2 (34)	12.4 (21)	17.7	8.3	n/a
HR-0SF259-01	208	5.7 (34)	11.7 (21)	17.4	8.4	n/a
HR-FGLAKR-01	209	6.1 (34)	11.0 (21)	17.0	8.4	n/a
HR-F8WUJ0-01	210	4.8 (34)	12.2 (21)	17.1	8.4	n/a
HR-HOGY3G-01	211	2.8 (34)	7.8 (21)	10.6	9.2	n/a
HR-K2EHTN-01	212	5.1 (34)	8.7 (21)	13.8	8.8	n/a
HR-K7AHND-01	213	2.7 (34)	13.0 (21)	15.7	8.5	n/a
HR-36Q1XG-01	214	6.9 (34)	9.3 (21)	16.2	8.4	n/a
HR-C9O0YW-01	215	3.3 (34)	14.2 (21)	17.6	8.3	n/a
HR-6O6E8B-01	216	2.2 (34)	12.3 (21)	14.5	8.7	n/a
HR-JFKLIF-01	301	11.8 (34)	6.9 (21)	18.7	8.2	n/a
HR-DUNIAH-01	302	14.1 (34)	17.3 (21)	31.4	6.8	n/a
HR-059LK3-01	303	19.5 (34)	15.1 (21)	34.6	6.4	n/a
HR-IM63B9-01	304	21.0 (34)	9.5 (21)	30.5	6.9	n/a
HR-TCNHPC-01	305	15.9 (34)	12.4 (21)	28.3	7.2	n/a
HR-6LJXO6-01	306	16.4 (34)	9.9 (21)	26.3	7.4	n/a
HR-7Q6XU9-01	307	5.6 (34)	11.2 (21)	16.7	8.4	n/a
HR-QWGIOU-01	308	6.2 (34)	11.8 (21)	18.0	8.3	n/a
HR-ACWXNJ-01	309	6.5 (34)	11.1 (21)	17.5	8.3	n/a
HR-HAPGT2-01	310	5.4 (34)	11.8 (21)	17.2	8.4	n/a
HR-F6SIJP-01	311	3.2 (34)	7.7 (21)	10.9	9.2	n/a
HR-YJSOFZ-01	312	5.6 (34)	8.4 (21)	14.1	8.7	n/a
HR-ATGZ02-01	313	3.2 (34)	12.4 (21)	15.5	8.6	n/a
HR-0I6U3R-01	314	7.4 (34)	9.8 (21)	17.2	8.4	n/a

Summary of all dwellings

Certificate number and link	Unit Number	Heating load (load limit) (MJ/m².yr)	Cooling load (load limit) (MJ/m².yr)	Total load (MJ/m².yr)	Star Rating	Whole of Home Rating
HR-PPY9ZH-01	315	2.4 (34)	19.0 (21)	21.3	7.9	n/a
HR-HWQK6D-01	316	2.0 (34)	11.4 (21)	13.4	8.8	n/a
HR-BOA61G-01	401	22.6 (34)	6.4 (21)	29.0	7.1	n/a
HR-RT7C2T-01	402	12.1 (34)	8.2 (21)	20.2	8.1	n/a
HR-O2BSSQ-01	403	8.3 (34)	11.2 (21)	19.5	8.1	n/a
HR-NVZRNH-01	404	5.3 (34)	6.0 (21)	11.4	9.1	n/a
HR-IX5KIU-01	405	7.8 (34)	7.5 (21)	15.3	8.6	n/a
HR-7FZIRU-01	406	7.7 (34)	5.4 (21)	13.1	8.9	n/a
HR-3U14K2-01	407	12.6 (34)	5.1 (21)	17.7	8.3	n/a
HR-JHS18U-01	408	2.9 (34)	16.1 (21)	18.9	8.2	n/a
HR-TWQRY9-01	409	5.0 (34)	6.5 (21)	11.5	9.1	n/a
HR-VXLZRS-01	501	14.7 (34)	6.8 (21)	21.5	7.9	n/a
HR-3DVUF4-01	502	12.1 (34)	8.7 (21)	20.8	8.0	n/a
HR-RKUL95-01	503	10.6 (34)	10.7 (21)	21.3	7.9	n/a
HR-C7XSM2-01	504	5.9 (34)	6.1 (21)	11.9	9.0	n/a
HR-1WE9WC-01	505	8.9 (34)	6.6 (21)	15.5	8.6	n/a
HR-UBUGUQ-01	506	8.0 (34)	5.1 (21)	13.2	8.9	n/a
HR-TIBB3P-01	507	12.9 (34)	5.0 (21)	17.9	8.3	n/a
HR-4227E7-01	508	3.2 (34)	15.7 (21)	18.9	8.2	n/a
HR-UETVBK-01	509	5.7 (34)	6.3 (21)	12.0	9.0	n/a
HR-U3GU0S-01	601	26.0 (34)	8.4 (21)	34.4	6.4	n/a
HR-9Z4GTV-01	602	23.9 (34)	11.0 (21)	35.0	6.4	n/a
HR-UB1Y0Y-01	603	23.0 (34)	13.0 (21)	36.0	6.2	n/a
HR-QREEJS-01	604	7.5 (34)	5.9 (21)	13.4	8.8	n/a
HR-4QRX4W-01	605	10.8 (34)	6.0 (21)	16.8	8.4	n/a
HR-Y2P5HU-01	606	8.3 (34)	5.4 (21)	13.7	8.8	n/a
HR-MMDWSD-01	607	13.1 (34)	5.1 (21)	18.3	8.3	n/a
HR-IA7F34-01	608	4.0 (34)	14.3 (21)	18.3	8.3	n/a
HR-COM7R5-01	609	7.3 (34)	5.9 (21)	13.2	8.8	n/a

Summary of all dwellings

Certificate number and link	Unit Number	Heating load (load limit) (MJ/m².yr)	Cooling load (load limit) (MJ/m².yr)	Total load (MJ/m².yr)	Star Rating	Whole of Home Rating
HR-QMD6CW-01	701	15.4 (34)	5.8 (21)	21.1	7.9	n/a
HR-DNV4UB-01	702	11.1 (34)	6.1 (21)	17.2	8.4	n/a
HR-VMLVRF-01	703	8.5 (34)	5.4 (21)	14.0	8.8	n/a
HR-BZJD7U-01	704	13.0 (34)	5.4 (21)	18.5	8.3	n/a
HR-ML36ET-01	705	4.1 (34)	14.9 (21)	19.0	8.2	n/a
HR-CWO1QC-01	706	7.5 (34)	5.9 (21)	13.4	8.8	n/a
HR-0LWLVB-01	801	15.3 (34)	6.0 (21)	21.3	7.9	n/a
HR-2NDCSQ-01	802	11.0 (34)	6.4 (21)	17.4	8.4	n/a
HR-UVW0HT-01	803	6.4 (34)	5.5 (21)	11.8	9.0	n/a
HR-8ROG9A-01	804	7.9 (34)	5.5 (21)	13.4	8.8	n/a
HR-YV381K-01	805	4.3 (34)	14.1 (21)	18.4	8.3	n/a
HR-E6ZNHX-01	806	7.7 (34)	5.9 (21)	13.5	8.8	n/a
HR-NKXJG8-01	901	18.5 (34)	8.4 (21)	26.8	7.3	n/a
HR-XJV4KX-01	902	13.3 (34)	8.1 (21)	21.4	7.9	n/a
HR-UDIJ2J-01	903	12.6 (34)	7.1 (21)	19.7	8.1	n/a
HR-A42FBW-01	904	17.6 (34)	7.8 (21)	25.4	7.4	n/a
HR-VT2VK1-01	905	13.9 (34)	20.4 (21)	34.4	6.4	n/a
HR-RWI4D6-01	906	16.1 (34)	7.6 (21)	23.7	7.7	n/a
Averages	108x (Total)	9.4	9.4	18.9	8.2	n/a
Maximum Loads and Minimum Ratings		28.6	20.4	36.0	6.2	n/a

Explanatory notes

About the ratings

The thermal performance star rating in this Certificate is the average rating of all NCC Class 2 dwellings in an apartment block. The Whole of Home performance rating in this Certificate is the lowest rating for the apartment block. Individual unit ratings are listed in the *'Summary of all dwellings'* section of this Certificate.

NatHERS ratings use computer modelling to evaluate a home's energy efficiency and performance. They use localised climate data and standard assumptions on how people use their home to predict the energy loads and societal cost. The thermal performance star rating uses the home's building specifications, layout, orientation and fabric (i.e. walls, windows, floors, roofs and ceilings) to predict the heating and cooling energy loads. The Whole of Home performance rating uses information about the home's appliances and onsite energy production and storage to estimate the homes societal cost.
For more details about an individual dwelling's assessment, refer to the individual dwelling's NatHERS Certificate (accessible via link).

Accredited Assessors

For high quality NatHERS Certificates, always use an accredited or licenced assessor registered with an Assessor Accrediting Organisation (AAO). AAOs have strict quality assurance processes, and professional development requirements ensuring consistently high standards for assessments.

Non-accredited assessors (Raters) have no ongoing training requirements and are not quality assured.

Licensed assessors in the Australian Capital Territory (ACT) can produce assessments for regulatory purposes only, using endorsed software, as listed on the ACT licensing register.

Any queries about this report should be directed to the assessor. If the assessor is unable to address questions or concerns, contact the AAO specified on the front of this certificate.

Disclaimer

The NatHERS Certificate format is developed by the NatHERS Administrator. However, the content in certificates is entered by the assessor. It is the assessor's responsibility to use NatHERS accredited software correctly and follow the NatHERS Technical Note to produce a NatHERS Certificate.

The predicted annual energy use, cost and greenhouse gas emissions in this NatHERS Certificate are an estimate based on an assessment of the dwelling's design by the assessor. It is not a prediction of actual energy use, cost or emissions. The information and ratings may be used to compare how other dwellings are likely to perform when used in a similar way.

Information presented in this report relies on a range of standard assumptions (both embedded in NatHERS accredited software and made by the assessor who prepared this report), including assumptions about occupancy, behaviour, appliance performance, indoor air temperature and local climate.

Not all assumptions made by the assessor while using the NatHERS accredited software tool are presented in this report and further details or data files may be available from the assessor.

Nationwide House Energy Rating Scheme®
Class 2 Summary
NatHERS® Certificate No. #HR-GH0EKX-01

Generated on 19 Jun 2024 using Hero 4.0

Property

Address	S4 600-660 Elizabeth Street, REDFERN, NSW, 2016
Lot/DP	
NatHERS climate zone	56 - Mascot AMO

Accredited assessor

Name	Adam Clarke
Business name	10 Star Building Assessments
Email	admin@10sba.com
Phone	+61 481010999
Accreditation No.	101518
Assessor Accrediting Organisation	ABSA

Verification

To verify this certificate, scan the QR code or visit http://www.hero-software.com.au/pdf/HR-GH0EKX-01. When using either link, ensure you are visiting http://www.hero-software.com.au

National Construction Code (NCC) requirements

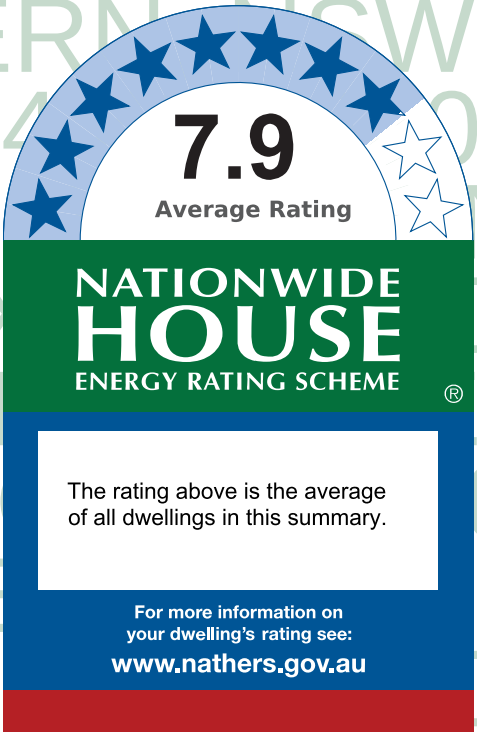
The NCC allows the use of NatHERS accredited software to comply with the energy efficiency requirements for houses (Class 1 buildings) and apartments (Class 2 sole-occupancy units and Class 4 parts of buildings). The applicable requirements for houses are detailed in Specification 42 of NCC Volume Two. For apartments the requirements are detailed in clauses J3D3 and J3D15 of NCC Volume One.

NCC 2022 includes enhanced thermal performance requirements for houses and apartments. It also includes a new whole-of-home annual energy use budget which applies to the major equipment in the home.

The NCC, and associated ABCB Standards and support material, can be accessed at www.abcb.gov.au.

Note, variations and additions to the NCC energy efficiency requirements may apply in some states and territories.

Thermal performance Star rating



NCC heating and cooling maximum loads MJ/m².yr

Limits taken from ABCB Standard 2022

	Heating	Cooling
Average load	7.7	13.5
Maximum load	20.6	19.8
Average limit	29.7	21.2
Maximum limit	32.9	20.4

Whole of Home performance rating

No Whole of Home performance rating generated for this certificate or not completed for all dwellings.

Summary of all dwellings

Certificate number and link	Unit Number	Heating load (load limit) (MJ/m².yr)	Cooling load (load limit) (MJ/m².yr)	Total load (MJ/m².yr)	Star Rating	Whole of Home Rating
HR-TYX31Q-01	101	16.6 (33)	10.4 (20)	27.0	7.3	n/a
HR-9HGK1K-01	102	9.8 (33)	6.2 (20)	16.0	8.5	n/a
HR-20R9EL-01	103	9.6 (33)	9.5 (20)	19.1	8.2	n/a

Summary of all dwellings

Certificate number and link	Unit Number	Heating load (load limit) (MJ/m².yr)	Cooling load (load limit) (MJ/m².yr)	Total load (MJ/m².yr)	Star Rating	Whole of Home Rating
HR-UY7YPM-01	104	1.5 (33)	17.9 (20)	19.4	8.2	n/a
HR-SDJO2G-01	105	3.2 (33)	15.0 (20)	18.2	8.3	n/a
HR-S9IHNV-01	106	3.4 (33)	15.4 (20)	18.8	8.2	n/a
HR-M3DOJ5-01	107	3.3 (33)	14.6 (20)	18.0	8.3	n/a
HR-1MCATF-01	108	3.6 (33)	15.1 (20)	18.8	8.2	n/a
HR-7ZGLXR-01	109	3.5 (33)	14.9 (20)	18.3	8.3	n/a
HR-DQMKGJ-01	110	3.1 (33)	15.4 (20)	18.5	8.3	n/a
HR-9N2O59-01	111	1.5 (33)	18.4 (20)	20.0	8.1	n/a
HR-E5PG6O-01	112	10.2 (33)	9.7 (20)	19.9	8.1	n/a
HR-4YT2T7-01	113	8.6 (33)	6.4 (20)	14.9	8.6	n/a
HR-8FC93K-01	114	14.6 (33)	7.1 (20)	21.6	7.9	n/a
HR-JFGNM5-01	201	14.4 (33)	11.3 (20)	25.7	7.4	n/a
HR-PNBPXR-01	202	6.2 (33)	5.8 (20)	12.1	8.9	n/a
HR-O4HI2R-01	203	8.0 (33)	9.2 (20)	17.2	8.4	n/a
HR-OUJROE-01	204	1.7 (33)	17.9 (20)	19.6	8.1	n/a
HR-ND7XZC-01	205	3.5 (33)	14.7 (20)	18.2	8.3	n/a
HR-BQG34Y-01	206	3.1 (33)	15.0 (20)	18.1	8.3	n/a
HR-LEP1C1-01	207	3.8 (33)	14.4 (20)	18.2	8.3	n/a
HR-IMZKNV-01	208	3.6 (33)	15.4 (20)	18.9	8.2	n/a
HR-VVXH6A-01	209	4.1 (33)	14.9 (20)	19.0	8.2	n/a
HR-7QBZZX-01	210	3.7 (33)	15.4 (20)	19.1	8.2	n/a
HR-COMTZN-01	211	1.3 (33)	18.6 (20)	19.9	8.1	n/a
HR-OH2HK1-01	212	6.0 (33)	10.1 (20)	16.1	8.4	n/a
HR-HT6E3Z-01	213	6.7 (33)	6.3 (20)	13.0	8.9	n/a
HR-8DED79-01	214	15.1 (33)	6.3 (20)	21.5	7.9	n/a
HR-POMCJL-01	301	20.6 (33)	18.6 (20)	39.2	5.9	n/a
HR-FVD6KX-01	302	15.0 (33)	8.6 (20)	23.6	7.7	n/a
HR-629XBH-01	303	15.7 (33)	13.7 (20)	29.5	7.1	n/a
HR-5W0HSM-01	304	2.0 (33)	19.0 (20)	21.1	7.9	n/a

Summary of all dwellings

Certificate number and link	Unit Number	Heating load (load limit) (MJ/m².yr)	Cooling load (load limit) (MJ/m².yr)	Total load (MJ/m².yr)	Star Rating	Whole of Home Rating
HR-CD8VYW-01	305	4.6 (33)	15.8 (20)	20.4	8.1	n/a
HR-ALMATN-01	306	4.1 (33)	16.1 (20)	20.2	8.1	n/a
HR-XXFCS5-01	307	4.0 (33)	16.6 (20)	20.6	8.0	n/a
HR-CWGGY8-01	308	4.6 (33)	15.8 (20)	20.3	8.1	n/a
HR-71R0XK-01	309	4.6 (33)	15.7 (20)	20.2	8.1	n/a
HR-9ECOIH-01	310	4.6 (33)	16.3 (20)	20.9	8.0	n/a
HR-SYEMMU-01	311	1.9 (33)	19.8 (20)	21.7	7.9	n/a
HR-6F32IM-01	312	5.1 (33)	10.8 (20)	15.9	8.5	n/a
HR-6XUIXZ-01	313	0.9 (33)	6.1 (20)	7.0	9.8	n/a
HR-1FBYC5-01	314	9.6 (33)	7.2 (20)	16.8	8.4	n/a
HR-3C18ZE-01	401	19.1 (33)	18.3 (20)	37.4	6.1	n/a
HR-JUQ652-01	402	16.1 (33)	15.0 (20)	31.2	6.9	n/a
HR-3ILLFH-01	403	14.1 (33)	19.7 (20)	33.8	6.5	n/a
HR-C0L3C5-01	404	17.6 (33)	16.4 (20)	34.0	6.4	n/a
HR-RSV61F-01	405	15.7 (33)	17.1 (20)	32.8	6.7	n/a
HR-Z5XFO5-01	406	12.0 (33)	19.8 (20)	31.8	6.8	n/a
HR-W9KG86-01	407	8.5 (33)	10.2 (20)	18.8	8.2	n/a
HR-1T0JXP-01	408	11.9 (33)	8.1 (20)	20.0	8.1	n/a
Averages	50x (Total)	7.7	13.5	21.2	7.9	n/a
Maximum Loads and Minimum Ratings		20.6	19.8	39.2	5.9	n/a

Explanatory notes

About the ratings

The thermal performance star rating in this Certificate is the average rating of all NCC Class 2 dwellings in an apartment block. The Whole of Home performance rating in this Certificate is the lowest rating for the apartment block. Individual unit ratings are listed in the *'Summary of all dwellings'* section of this Certificate.

NatHERS ratings use computer modelling to evaluate a home's energy efficiency and performance. They use localised climate data and standard assumptions on how people use their home to predict the energy loads and societal cost. The thermal performance star rating uses the home's building specifications, layout, orientation and fabric (i.e. walls, windows, floors, roofs and ceilings) to predict the heating and cooling energy loads. The Whole of Home performance rating uses information about the home's appliances and onsite energy production and storage to estimate the homes societal cost.
For more details about an individual dwelling's assessment, refer to the individual dwelling's NatHERS Certificate (accessible via link).

Accredited Assessors

For high quality NatHERS Certificates, always use an accredited or licenced assessor registered with an Assessor Accrediting Organisation (AAO). AAOs have strict quality assurance processes, and professional development requirements ensuring consistently high standards for assessments.

Non-accredited assessors (Raters) have no ongoing training requirements and are not quality assured.

Licensed assessors in the Australian Capital Territory (ACT) can produce assessments for regulatory purposes only, using endorsed software, as listed on the ACT licensing register.

Any queries about this report should be directed to the assessor. If the assessor is unable to address questions or concerns, contact the AAO specified on the front of this certificate.

Disclaimer

The NatHERS Certificate format is developed by the NatHERS Administrator. However, the content in certificates is entered by the assessor. It is the assessor's responsibility to use NatHERS accredited software correctly and follow the NatHERS Technical Note to produce a NatHERS Certificate.

The predicted annual energy use, cost and greenhouse gas emissions in this NatHERS Certificate are an estimate based on an assessment of the dwelling's design by the assessor. It is not a prediction of actual energy use, cost or emissions. The information and ratings may be used to compare how other dwellings are likely to perform when used in a similar way.

Information presented in this report relies on a range of standard assumptions (both embedded in NatHERS accredited software and made by the assessor who prepared this report), including assumptions about occupancy, behaviour, appliance performance, indoor air temperature and local climate.

Not all assumptions made by the assessor while using the NatHERS accredited software tool are presented in this report and further details or data files may be available from the assessor.

Appendix D – Section J Reports

Section J – Part J4 Compliance: S1

Redfern Place

June 2024

atelier ten

Document information

Report title:	Section J – Part J4 Compliance: S1
Project name:	Redfern Place
Project number:	2046
Digital file name:	Section J – Part J4 for Building S1
Digital file location:	Z:\Shared\A10ANZFileserver\Projects\2000-2099\2046 - Redfern Place\02 Design & Analysis\Section J - all buildings\FINAL\Section J – Part J4 for Building S1.pdf

Prepared

Prepared by:	Malachi Montellano
Signed:	MM
Date:	20.06.2024

Checked

Checked by:	Henry Jarvis
Signed:	HJ
Date:	21.06.2024

Approved

Approved by:	Alison Adendorff
Signed:	AA
Date:	21.06.2024

Revisions

No	Date	Approved
0	30.05.2024	AA
1	06.06.2024	AA
2	21.06.2024	

Atelier Ten
Level 7
56 Pitt Street
Sydney, NSW 2000
Australia
T (02) 9262 4500
W atelierten.com

Contents

Executive Summary

Atelier Ten have been engaged by Hickory Constructions Redfern Pty Ltd to provide advice for the building envelope of Redfern Place. Redfern Place a mixed-used development located at 600-660 Elizabeth Street, Redfern, NSW. The intent of the assessment is to verify the minimum performance requirements to satisfy Section J, Part J4 – Building Fabric of NCC 2022. Specifically this report provides advice for Section J4D4 (Roofs and Ceilings), J4D5 (Roof Lights), J4D6 (Walls and Windows), and J4D7 (Floors).

This report assesses building S1 (i.e., PCYC), a mixed-use building featuring communal areas, gymnasium, indoor sports court, and multi-purpose rooms. This document assesses the entire building classified as an assembly building (Class 9b). The assessment confirms that the building fabric complies with NCC 2022 Section J requirements, using the *Deemed-to-Satisfy Provisions* for compliance with Part J1 – Energy Efficiency. Evidence has been presented to demonstrate that the building fabric complies with Section J DTS requirements.

The key façade performance requirements to demonstrate compliance are outlined in the table below:

Table 1 MINIMUM GLAZING PERFORMANCE REQUIREMENTS

Orientation	Glazing Description	Performance	
		U-Value	SHGC
All	Double glazing with low-e coating	U5.0	SHGC = 0.51

Table 2 MINIMUM FABRIC PERFORMANCE REQUIREMENTS

Building Element	Performance
Envelope Walls	R-Value = 1.0
Roof and Ceiling	R-Value = 3.7
Floor	R-Value = 2.0

Project Description

Redfern Place is located at 600-660 Elizabeth Street, Redfern, NSW. Building S1 consists of a 3-story mixed used building which serves as a communal area, and includes the following amenities:

- Ground Floor:
  - Indoor sports court
  - Communal Areas
  - Meeting rooms
- Level 1:
  - Gymnastics area
  - Multi-purpose rooms
- Level 2:
  - Gymnasiums
  - Multi-purpose rooms

For this assessment, all the conditioned spaces, as marked up in Appendix A1, will be analysed for the thermal performance. The minimum Section J DTS requirements are listed below:

Table 3 Section J DTS MINIMUM REQUIREMENTS

Building Element	Component
Climate Zone	5
NCC 2022 Building Classification	9b – Assembly Building
Maximum Total System U-value (Section J4D6(1))	U2.0
Maximum Solar Admittance (Section J4D6(5))	0.13

Introduction

Report Scope

Hickory Constructions Redfern Pty Ltd have commissioned Atelier Ten to assess the building fabric required to meet the 2022 National Construction Code (NCC) Section J requirements through the *Deemed-to-Satisfy Provisions* for compliance with Part J1.

The report outlines the Section J requirements for Part J4 to determine the minimum building fabric requirements for each building at Redfern Place. The report also includes the steps undertaken to demonstrate compliance, document results and highlights the required performance for the commercial office space.

Document References

Issued by	Document	Sheet Name	Issue	Date
Architecture AND	Ground Floor / Level 1	S1.A02.01	Rev. A - SSDA	19.06.2024
	Level 2 / Roof	S1.A02.01		
	S1 Sections	S1.A02.03		
	S1 Elevations	S1.A02.04		
	S1 Area Schedule / Diagrams	S1.A02.05		

Project Address and NCC Climate Zone

The proposal consists of a 3-storey mixed-used development, located at 600-660 Elizabeth Street, Redfern, NSW 2016 – within NCC Climate Zone 5.

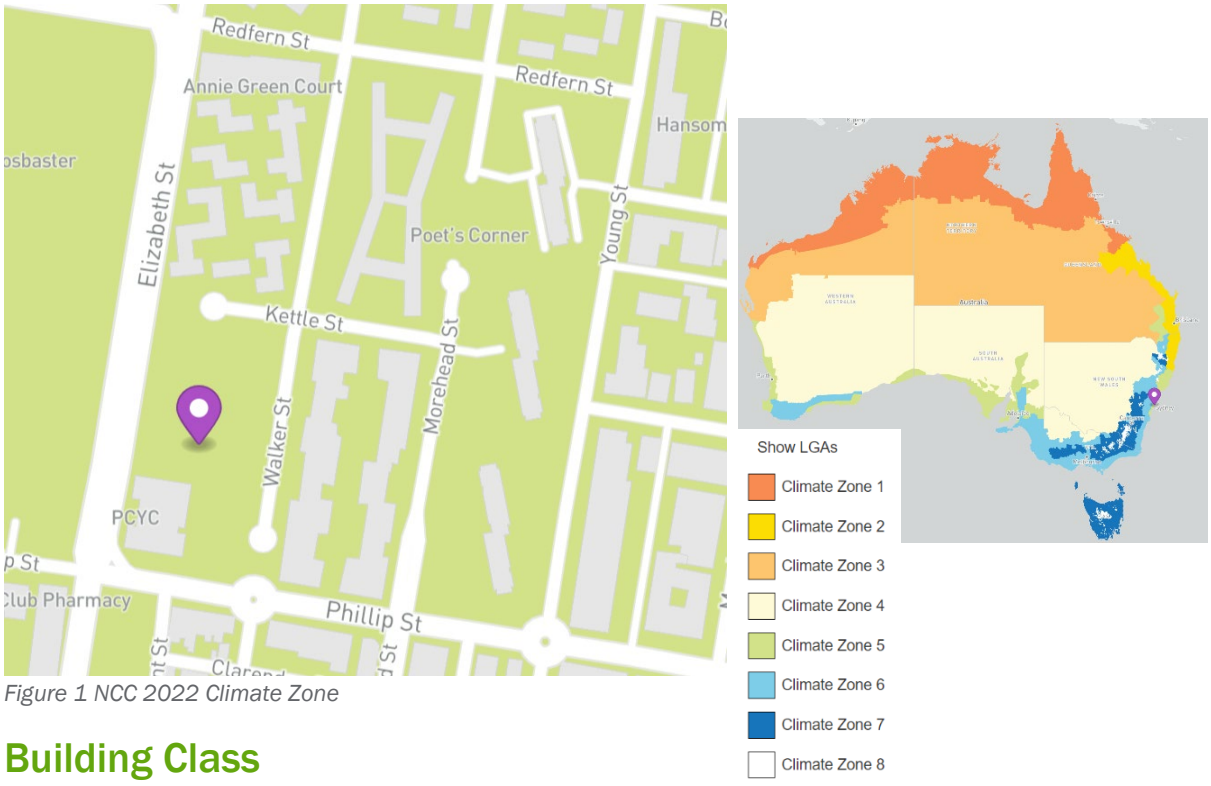


Figure 1 NCC 2022 Climate Zone

Building Class

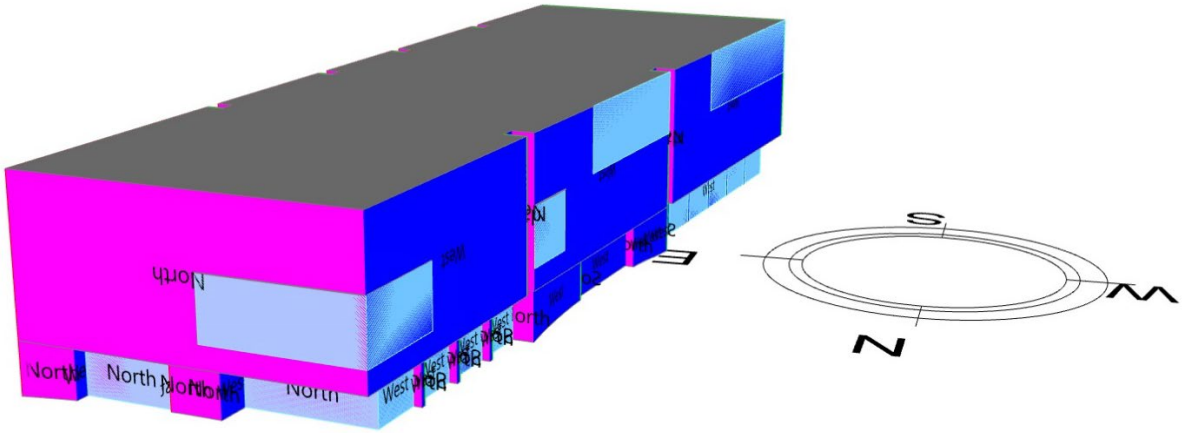
The proposal consists a total of 3'543m² of GFA, including 1'577m² in the ground floor, 786m² in Level 1, and 1'180m² in Level 2.

As per NCC Part A6 Building Classification, the assessed areas are classified as Class 9b: assembly buildings.

Model Geometry

The building has been replicated into a surface model using Rhino3D v.6 – a 3D modelling software tool widely used. A surface model was created to create simplicity, and reduce any complexities when analysing the DTS requirements for Section J – Part J4.

A simple script was created using Grasshopper – a Rhino3D plugin, used to create mathematical Boolean inputs and outputs. The NCC 2022 Section J DTS requirements and calculations was translated into a Grasshopper script, to determine the minimum U-Value and SHGC value required to comply with Section J – Part J4: Building Fabric of NCC 2022.



Section J DTS Requirement: Part J4 Breakdown

The building envelope, for the purposes of Section J, is defined as the parts of the building's fabric that separates a conditioned space (or habitable room) from:

- the exterior of the building; or
- a non-conditioned space including:
  - the floor of a rooftop plant room, lift-machine room, or the like; and
  - the floor above a carpark or warehouse; and
  - the common wall with a carpark, warehouse, or the like; or
- parts of the building's fabric that separates artificially heated or cooled spaces from:
  - the exterior of the building; or
  - other spaces that are not artificially heated or cooled.

J4D4 – Roof and Ceiling Construction

The markup in Appendix A2 indicates the extent of insulated areas for the ceiling construction as listed below:

Building Element	Required Total System R-value	Additional Requirements
Roof and Ceiling	R3.70	As per J4D4(2) of NCC 2022, the solar absorptance of the upper surface of the roof must not be more than 0.45.

J4D5 – Roof Lights

There are no roof lights for this project.

J4D6 – Walls and Glazing

The window-wall construction of the building is assessed according to (1) the thermal requirements and (2) the solar requirements.

Table 4 is a summary of the minimum building fabric requirements for the walls and glazing construction of the building envelope. Full height glazing was used mainly for entrances, with glazing height varying at the different aspects (Please refer to Appendix A3).

Shading strategies for the assessed area includes overhang from the floor above, which is as describe in detail in Appendix A3.

Table 4 BUILDING FABRIC MINIMUM REQUIREMENTS

Building Element	Performance
Overall Window-Wall Ratio	25%
Wall R-Value	R1.0
Window U-Value	U5.0
Window SHGC	0.51

Wall Requirements

As per Section J4D6((4)(a)), the wall components of a *wall-glazing construction* must achieve a minimum Total R-Value of R1.0 for walls with a window-to-wall ratio of greater than 20%. The window-wall ratio of the assessed area is described below.

Table 5 WALL-GLAZING CONSTRUCTION

	Value
Total Façade Area	3187 m2
Glazed Area	796 m2
Window-to-Wall Ratio	25%

The wall components of the thermal envelope as described in Appendix A2 must achieve a minimum of R1.0.

Glazing Requirements

The main concerns for the glazing requirements are (1) the thermal performance and (2) the solar admittance requirements. The following sections will cover the two main concerns to determine the maximum allowable glazing U-Value and compliance with Section J NCC 2022.

Thermal Requirements

As per Section J4D6(1(a)), the total system U-value of the wall-glazing construction must be less than U2.0. As the walls are specified to achieve R1.0 with a window-wall ratio as described above, the thermal requirements for the window are as follows:

Table 6 THERMAL REQUIREMENTS

	Wall Elements	Glazing Elements
R-Value	R1.0	-
U-Value	U1.0	U5.0
%	75%	25%

Solar Requirements

The maximum allowable solar admittance for the wall-glazing construction is being assessed according to Section S37C6 – Method 2 (Multiples Aspects), which calculates the Reference and Proposed *air-conditioning* energy value for the construction. Taking into account the building shading and window-wall ratio, this results in a maximum SHGC requirement of SHGC = 0.51 for the building, which demonstrates a compliant air-conditioning value.

Table 7 MAXIMUM ALLOWABLE SHGC REQUIREMENT

	Value
SHGC	0.51

The table below is a summary of the calculated Reference and Proposed wall-glazing construction solar admittance in compliance with Section S37C6 of NCC 2022.

Table 8 VERIFICATION OF COMPLIANCE WITH S37C6 – METHOD 2

	Reference	Proposed	Compliant [Y / N]
Air Conditioning Value	707.41	706.58	Yes – SC37C6

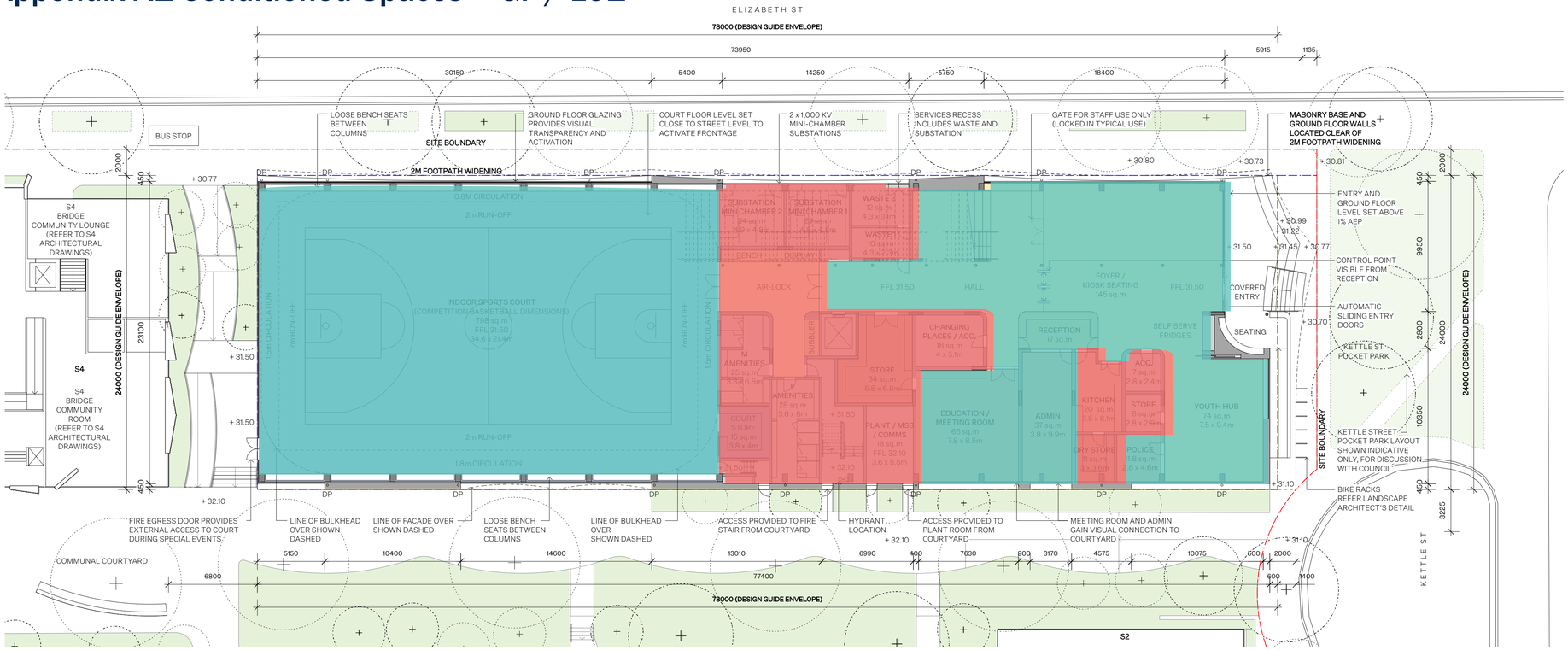
J4D7 – Floors

Insulation should be applied to areas highlighted in Appendix A2, to meet the total system R-value requirements for the floors as listed below:

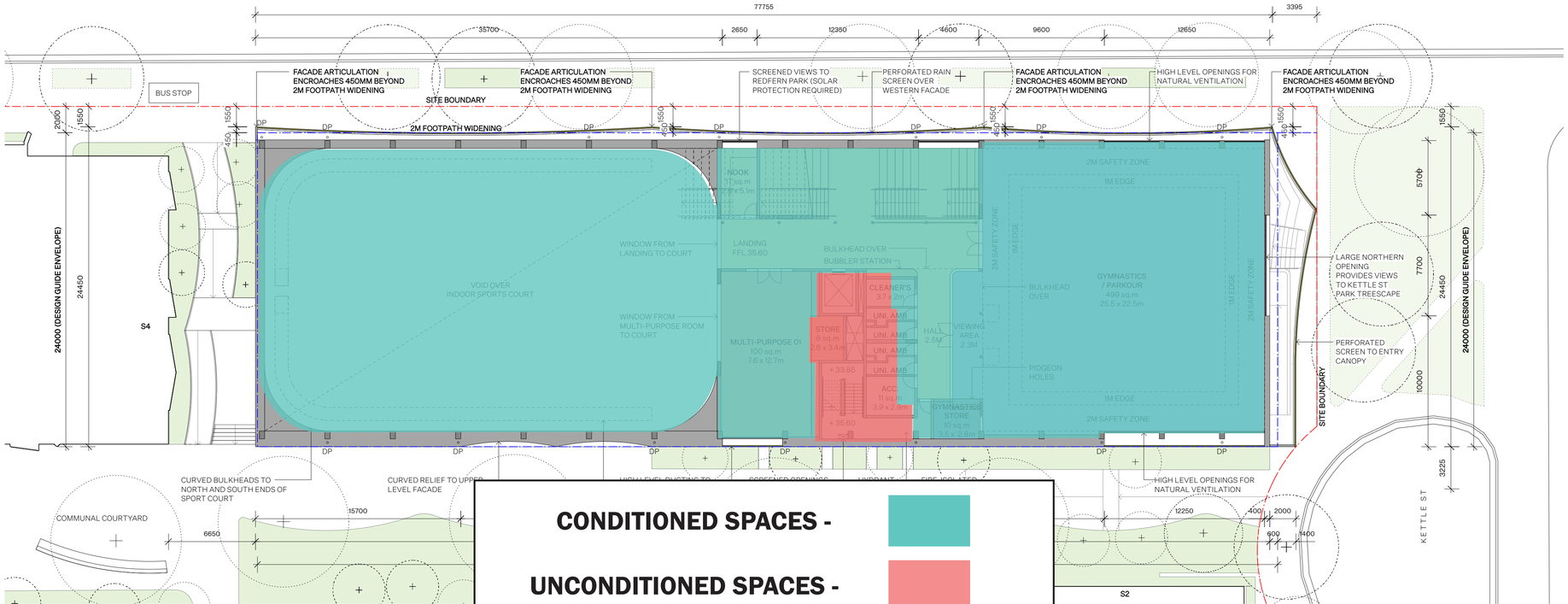
Building Element	Required Total System R-value	Notes
Floors	R2.0	As per Section J4D7(2), a slab-on-ground that does not have an in-slab heating or cooling system is considered to achieve a Total R-Value of R2.0. Soffit insulation located at the overhang gymnasium at Level 01.

Appendices

Appendix A1 Conditioned Spaces – GF / L01



01 - S1 PLAN - GROUND FLOOR 1:200



02 - S1 PLAN - FIRST FLOOR 1:200

CONDITIONED SPACES -

UNCONDITIONED SPACES -

Project Title:

Redfern Place

600-660 Elizabeth St, Redfern NSW 2106

Sheet drawn by:

ARCHITECTURE AND

REGISTERED ARCHITECT
NSW #7447
VIC #9560
TAS #1030
ACT #2607

T 02 9199 0625
W architecture-and.au
A SUITE 1, 67 ELIZABETH ST REDFERN NSW 2016

Project Architectural Team:

Architecture AND — S1 Lead Architect

SILVESTERFULLJF — S2 Lead Architect

haybail — Precinct + S3 + S4 Lead Architect

Notes:

Compliance:

- COMPLY WITH ALL RELEVANT AUTHORITIES REQUIREMENTS.
- COMPLY WITH THE BUILDING CODE OF AUSTRALIA.
- COMPLY WITH ALL RELEVANT AUSTRALIAN STANDARDS.
- DIMENSIONS IN MILLIMETRES U.N.O.
- DO NOT SCALE. USE FIGURED DIMENSIONS ONLY.
- NOTIFY ARCHITECT IF DISCREPANCY EXISTS.

Drawn By	JS
Checked By	AB
Date Printed	03/05/2024
Scale	NA @ A1

0 1 2 3 5 m

Rev	Date	Description
-	06/06/2024	DRAFT SSDA
A	19/06/2024	SSDA

Status:

SSDA

Drawing Title:

S1 PLAN - GROUND FLOOR / LEVEL 1

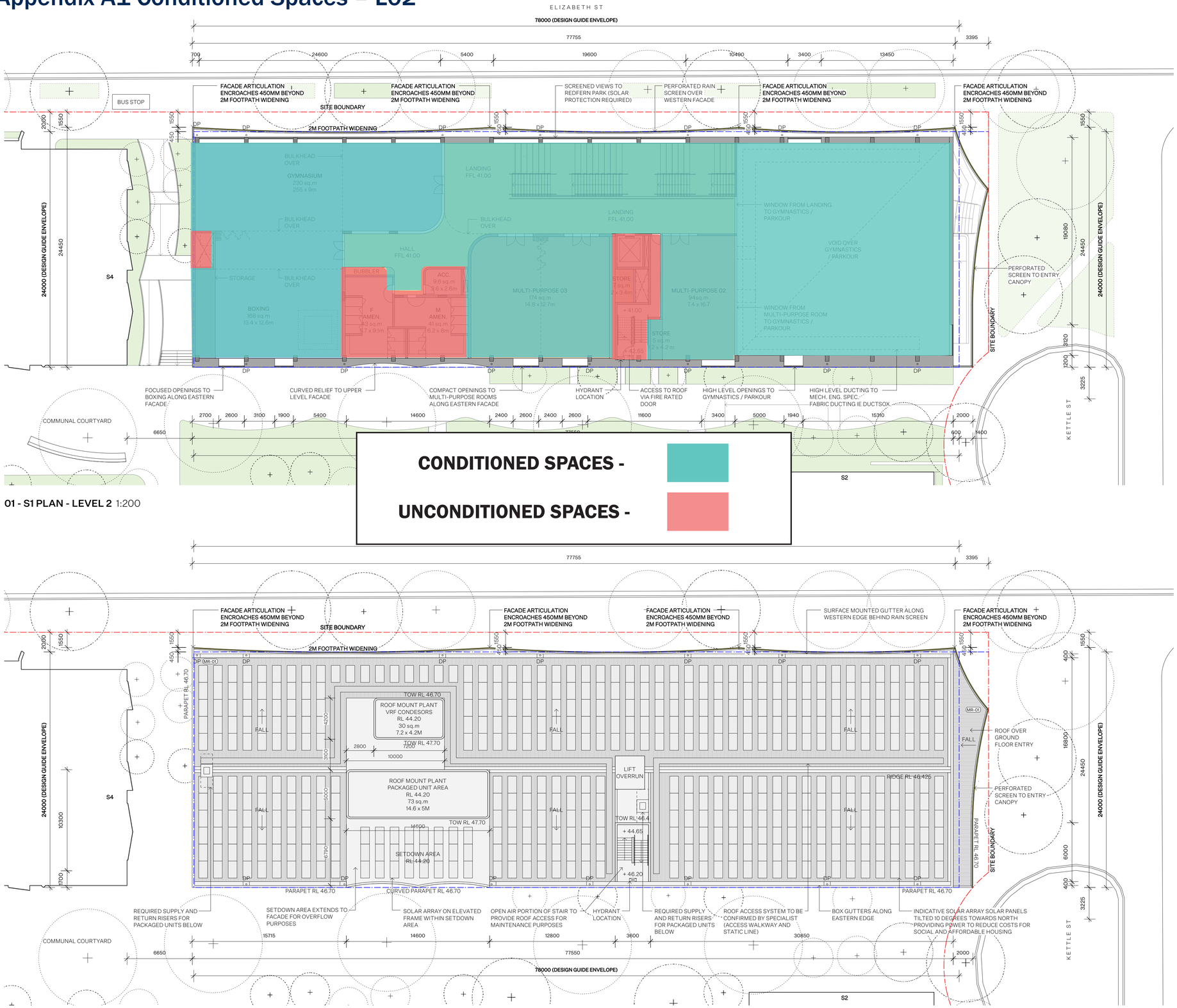
Project No. 2314

Revision A

Drawing No. S1.A02.01

Verify all figured dimensions on site before undertaking any works. Do not scale dimensions off drawings.

Appendix A1 Conditioned Spaces – L02



01 - S1 PLAN - LEVEL 2 1:200

02 - S1 PLAN - ROOF 1:200

Project Title:

Redfern Place

600-660 Elizabeth St,
Redfern NSW 2106

Sheet drawn by:

ARCHITECTURE AND

REGISTERED ARCHITECT
NSW #7447
VIC #9560
TAS #1030
ACT #2607

T 02 9199 0625
W architecture-and.au
A SUITE 1, 67 ELIZABETH ST
REDFERN NSW 2016

Project Architectural Team:

Architecture AND — S1 Lead Architect

SILVESTERRUJJF — S2 Lead Architect

hayball — Precinct + S3 + S4 Lead Architect

Notes:

Compliance:

- COMPLY WITH ALL RELEVANT AUTHORITIES REQUIREMENTS.
- COMPLY WITH THE BUILDING CODE OF AUSTRALIA.
- COMPLY WITH ALL RELEVANT AUSTRALIAN STANDARDS.
- DIMENSIONS IN MILLIMETRES.
- DO NOT SCALE. USE FIGURED DIMENSIONS ONLY.
- NOTIFY ARCHITECT IF DISCREPANCY EXISTS.

Drawn By	JS
Checked By	AB
Date Printed	03/05/2024
Scale	NA @ A1

0 1 2 3 5 m

Rev	Date	Description
-	06/06/2024	DRAFT SSDA
A	19/06/2024	SSDA

Status:

SSDA

Drawing Title:

S1 PLAN - LEVEL 2 / ROOF

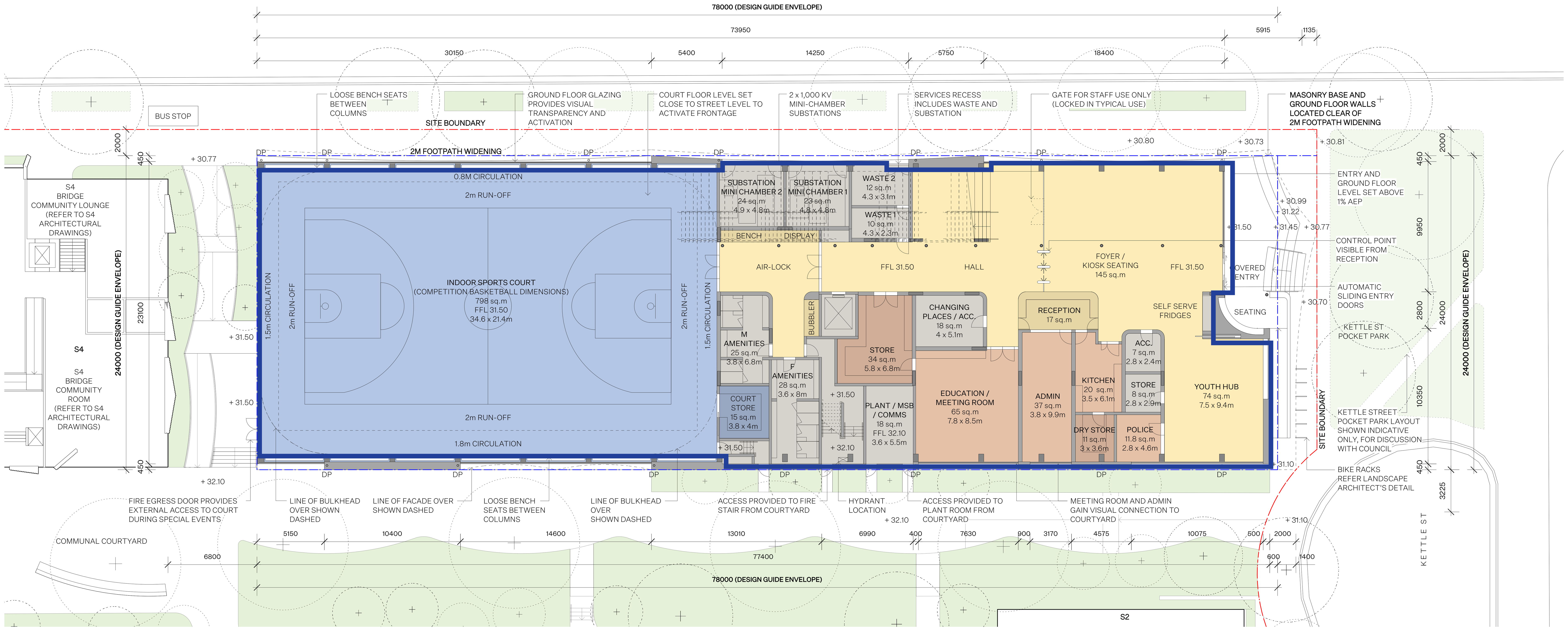
Project No. 2314

Revision A

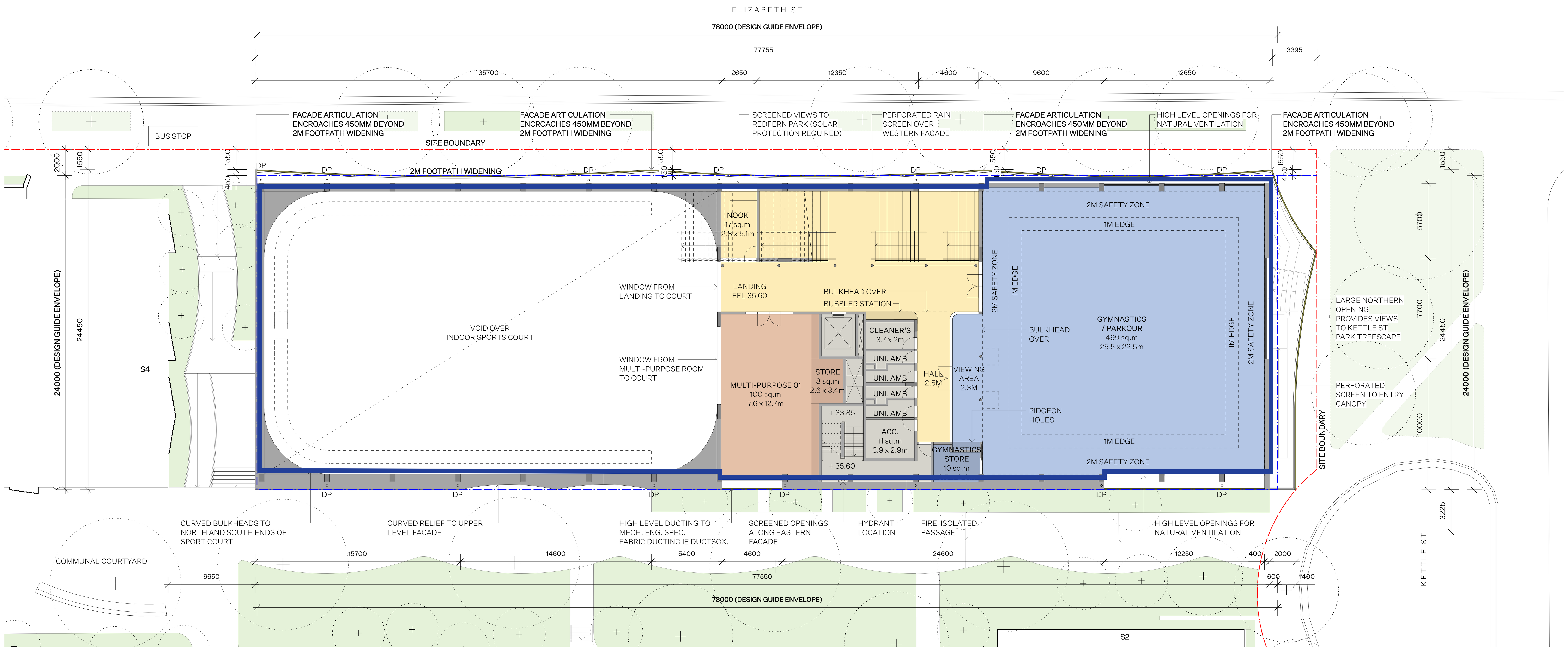
Drawing No. S1.A02.01

Verify all figured dimensions on site before undertaking any works. Do not scale dimensions off drawings.

Appendix A2 Insulation Markups – GF / L01 Walls



01 - S1 PLAN - GROUND FLOOR 1:200



02 - S1 PLAN - FIRST FLOOR 1:200

INSULATION

Ext Wall R1.0	(blue line)
Int Wall R1.0	(red line)
Roof R3.7	(orange)
Floor R2.0	(green)

Project Title: Redfern Place, 600-660 Elizabeth St, Redfern NSW 2106

Sheet drawn by: ARCHITECTURE AND

Project Architectural Team:
Architecture AND — S1 Lead Architect
SILVESTER FULLER — S2 Lead Architect
hayball — Precinct + S3 + S4 Lead Architect

Notes:

Compliance:

Drawn By	JS
Checked By	AB
Date Printed	03/05/2024
Scale	NA @ A1

Rev	Date	Description
-	06/06/2024	DRAFT SSDA
A	19/06/2024	SSDA

Status: SSDA

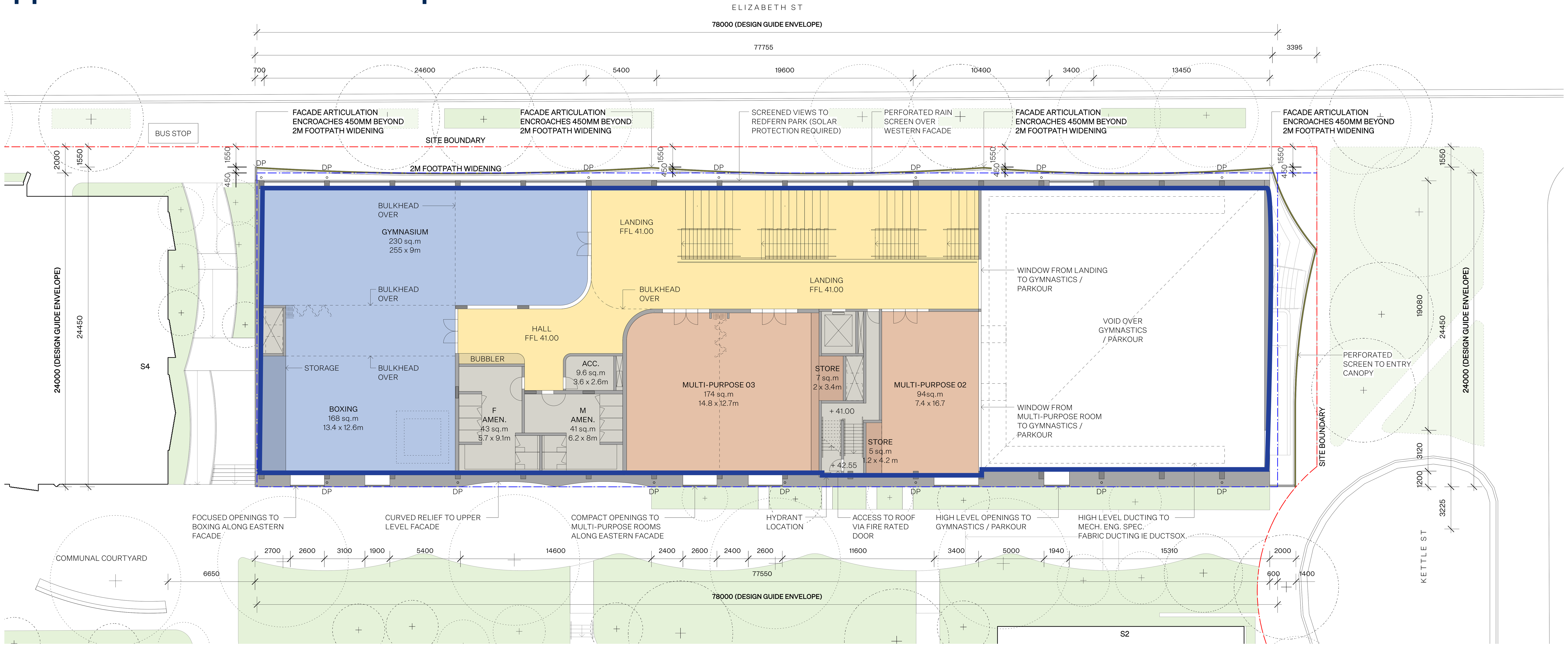
Drawing Title: S1 PLAN - GROUND FLOOR / LEVEL 1

Project No. 2314 **Revision** A

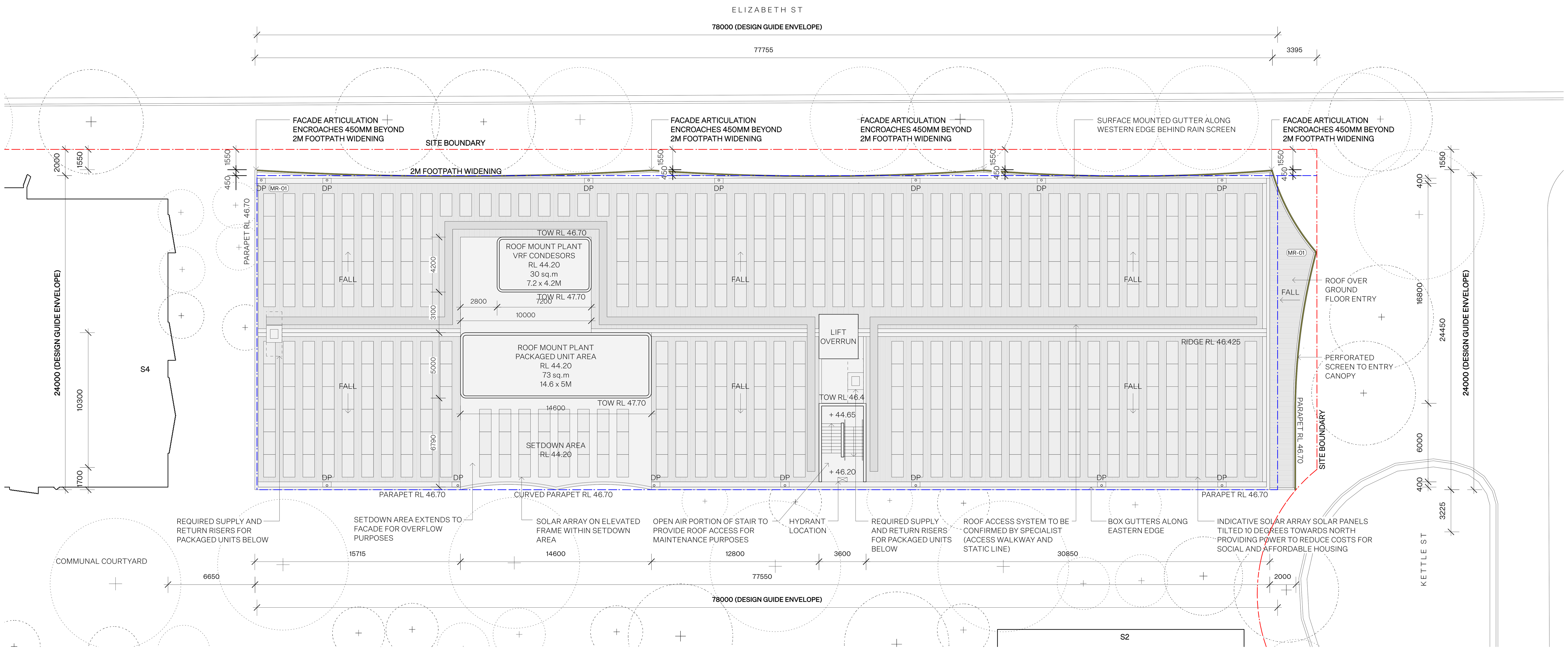
Drawing No. S1.A02.01

Verify all figured dimensions on site before undertaking any works. Do not scale dimensions off drawings.

Appendix A2 Insulation Markups – L02 Walls



01 - S1 PLAN - LEVEL 2 1:200



02 - S1 PLAN - ROOF 1:200

INSULATION

Ext Wall R1.0	(blue line)
Int Wall R1.0	(red line)
Roof R3.7	(orange)
Floor R2.0	(green)

Project Title: Redfern Place, 600-660 Elizabeth St, Redfern NSW 2106

Sheet drawn by: ARCHITECTURE AND

Project Architectural Team: Architecture AND — S1 Lead Architect; SILVESTER FULLER — S2 Lead Architect; hayball — Precinct + S3 + S4 Lead Architect

Notes:

Compliance:

Drawn By	JS
Checked By	AB
Date Printed	03/05/2024
Scale	NA @ A1

Rev	Date	Description
-	06/06/2024	DRAFT SSDA
A	19/06/2024	SSDA

Status: SSDA

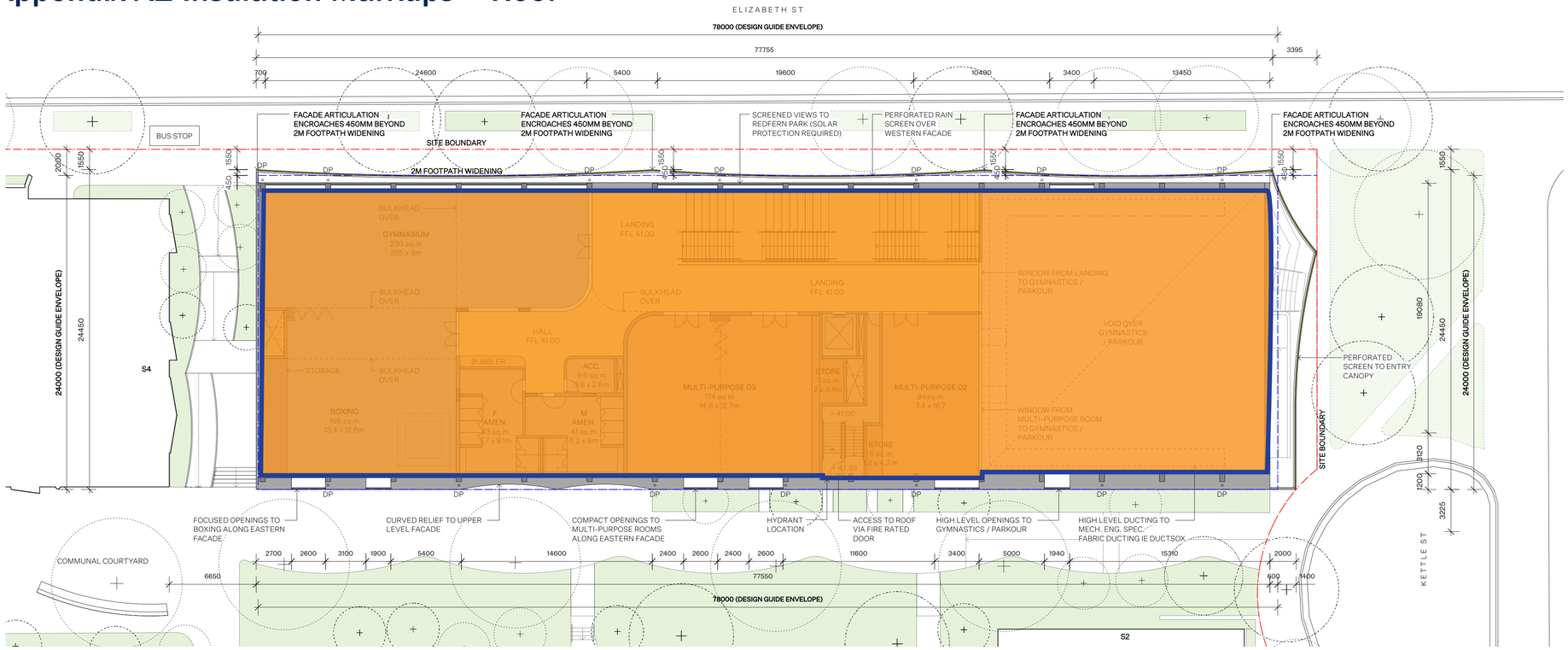
Drawing Title: S1 PLAN - LEVEL 2 / ROOF

Project No. 2314 — Revision A

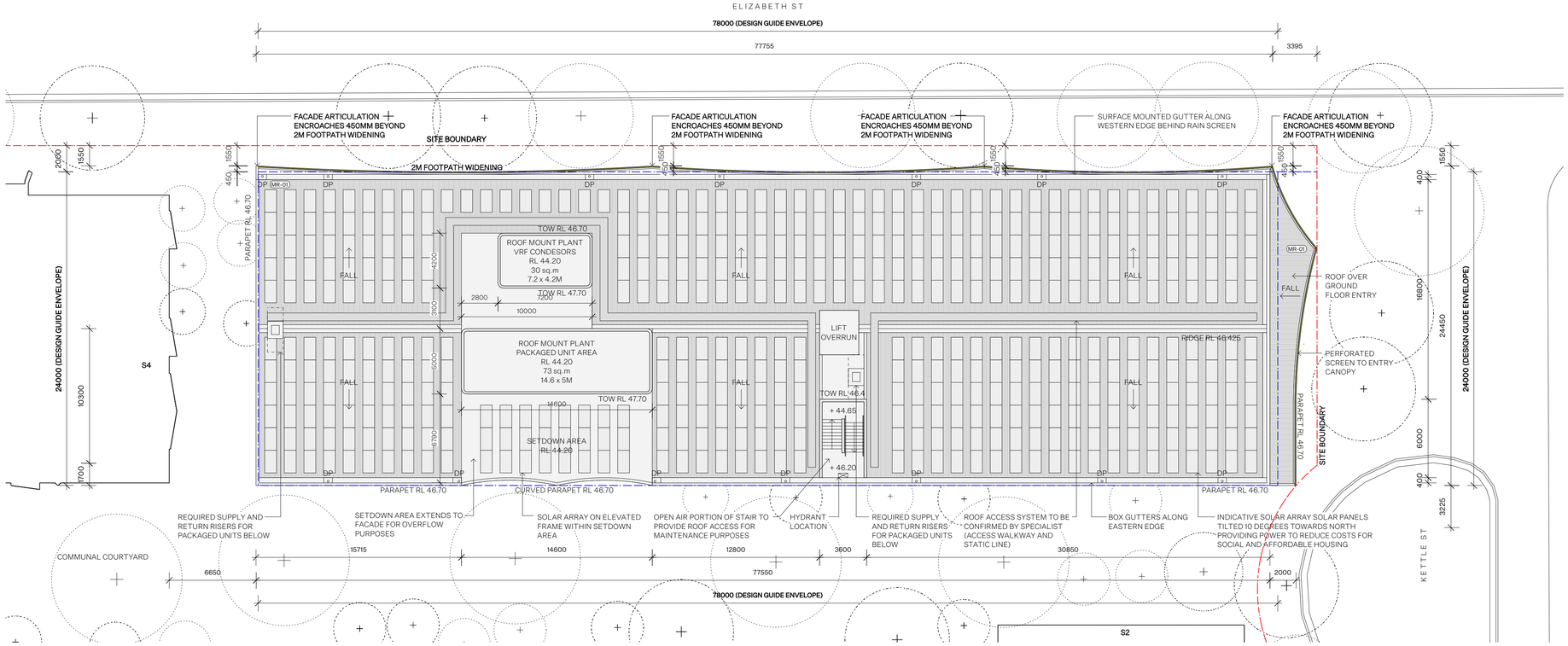
Drawing No. S1.A02.01

Verify all figured dimensions on site before undertaking any works. Do not scale dimensions off drawings.

Appendix A2 Insulation Markups – Roof



01 - S1 PLAN - LEVEL 2 1:200



02 - S1 PLAN - ROOF 1:200

Project Title:

Redfern Place

600-660 Elizabeth St,
Redfern NSW 2106

Sheet drawn by:

ARCHITECTURE AND

REGISTERED ARCHITECT
NSW #7447
VIC #9560
TAS #1030
ACT #2607

T 02 9199 0625
W architecture-and.au
A SUITE 1, 67 ELIZABETH ST
REDFERN NSW 2016

Project Architectural Team:

Architecture AND — S1 Lead Architect

SILVESTERRUFF — S2 Lead Architect

hayball — Precinct + S3 + S4 Lead Architect

Notes:

Compliance:

- COMPLY WITH ALL RELEVANT AUTHORITIES REQUIREMENTS.
- COMPLY WITH THE BUILDING CODE OF AUSTRALIA.
- COMPLY WITH ALL RELEVANT AUSTRALIAN STANDARDS.
- DIMENSIONS IN MILLIMETRES.
- DO NOT SCALE. USE FIGURED DIMENSIONS ONLY.
- NOTIFY ARCHITECT IF DISCREPANCY EXISTS.

Drawn By	JS
Checked By	AB
Date Printed	03/05/2024
Scale	NA @ A1

0 1 2 3 5 m

Rev	Date	Description
-	06/06/2024	DRAFT SSDA
A	19/06/2024	SSDA

Status:

SSDA

Drawing Title:

S1 PLAN - LEVEL 2 / ROOF

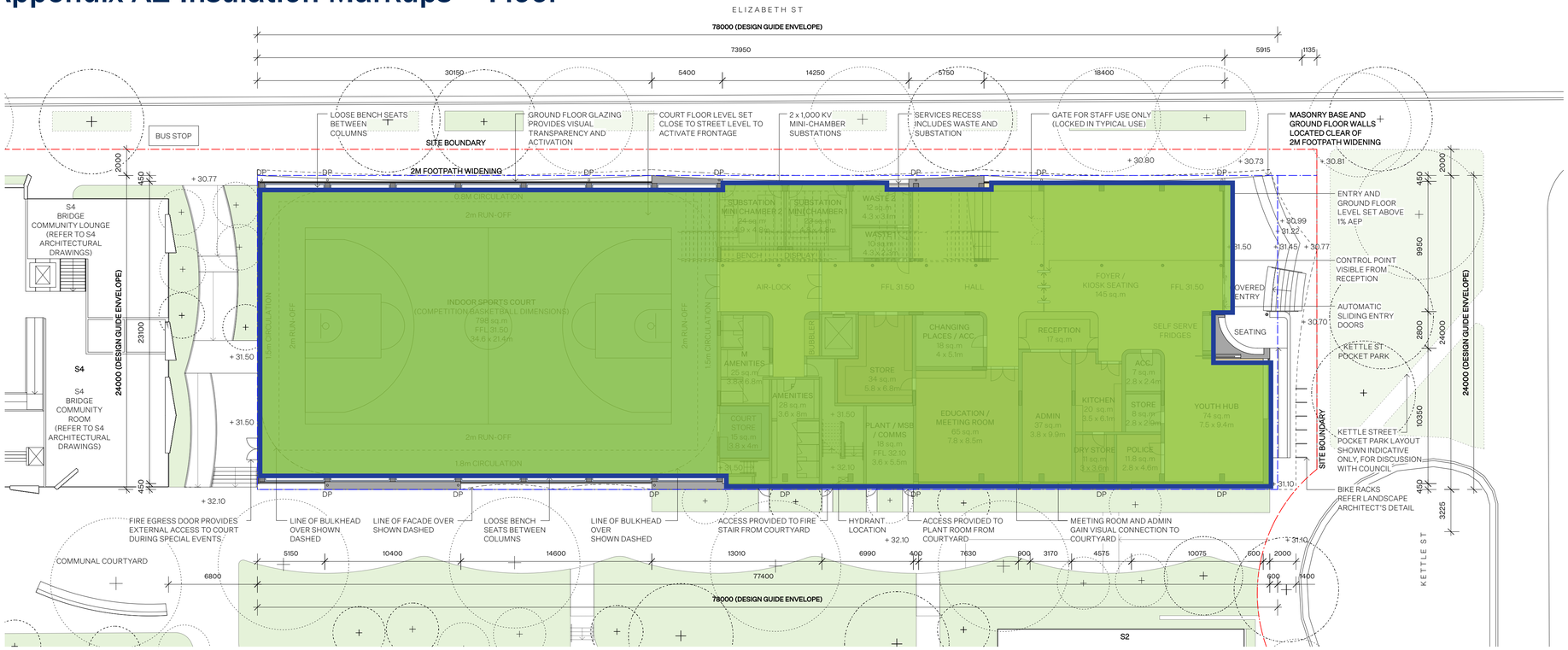
Project No. 2314

Revision A

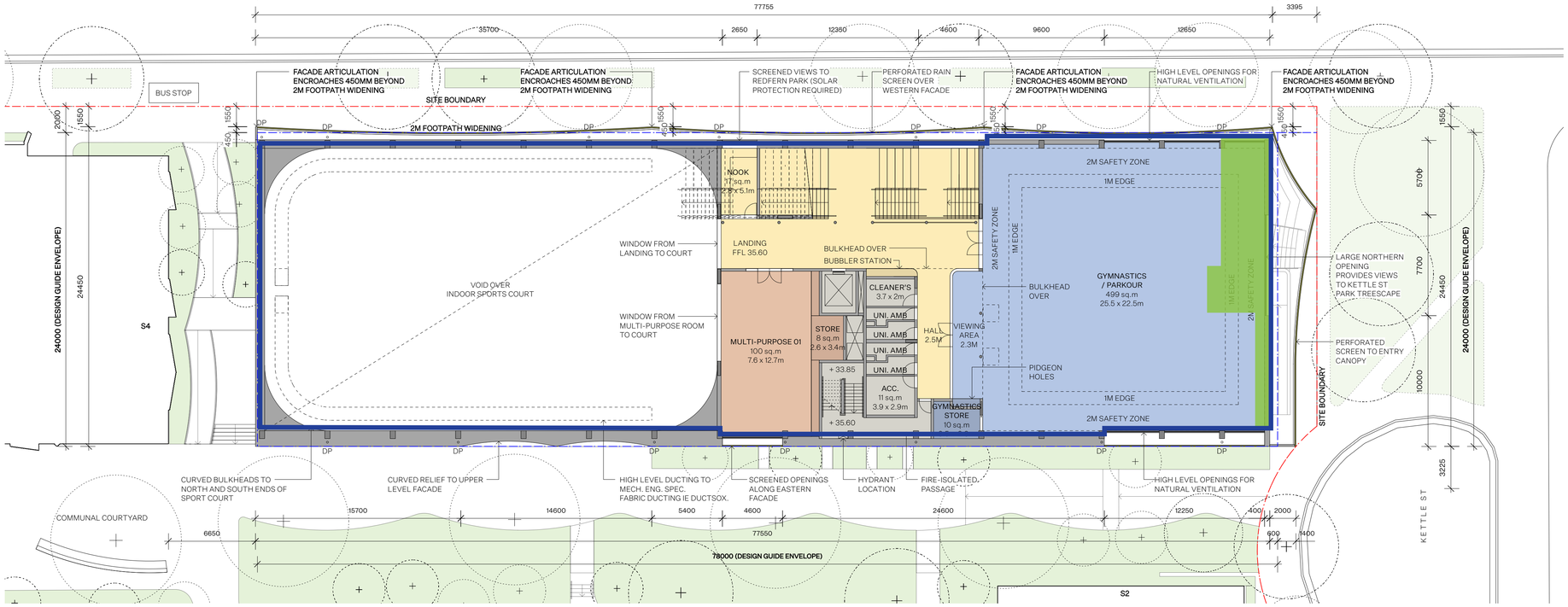
Drawing No. S1.A02.01

Verify all figured dimensions on site before undertaking any works. Do not scale dimensions off drawings.

Appendix A2 Insulation Markups – Floor



01 - S1 PLAN - GROUND FLOOR 1:200



02 - S1 PLAN - FIRST FLOOR 1:200

Project Title:

Redfern Place

600-660 Elizabeth St, Redfern NSW 2106

Sheet drawn by:

ARCHITECTURE AND

REGISTERED ARCHITECT
NSW #7447
VIC #9560
TAS #0130
ACT #2607

T 02 9199 0625
W architecture-and.au
A SUITE 1, 67 ELIZABETH ST REDFERN NSW 2016

Project Architectural Team:

Architecture AND — S1 Lead Architect

SILVESTERFULLJAMES — S2 Lead Architect

hayball — Precinct + S3 + S4 Lead Architect

Notes:

Compliance:

- COMPLY WITH ALL RELEVANT AUTHORITIES REQUIREMENTS.
- COMPLY WITH THE BUILDING CODE OF AUSTRALIA.
- COMPLY WITH ALL RELEVANT AUSTRALIAN STANDARDS.
- DIMENSIONS IN MILLIMETRES.
- DO NOT SCALE. USE FIGURED DIMENSIONS ONLY.
- NOTIFY ARCHITECT IF DISCREPANCY EXISTS.

Drawn By	JS
Checked By	AB
Date Printed	03/05/2024
Scale	NA @ A1

0 1 2 3 5 m

Rev	Date	Description
-	06/06/2024	DRAFT SSDA
A	19/06/2024	SSDA

Status:

SSDA

Drawing Title:

S1 PLAN - GROUND FLOOR / LEVEL 1

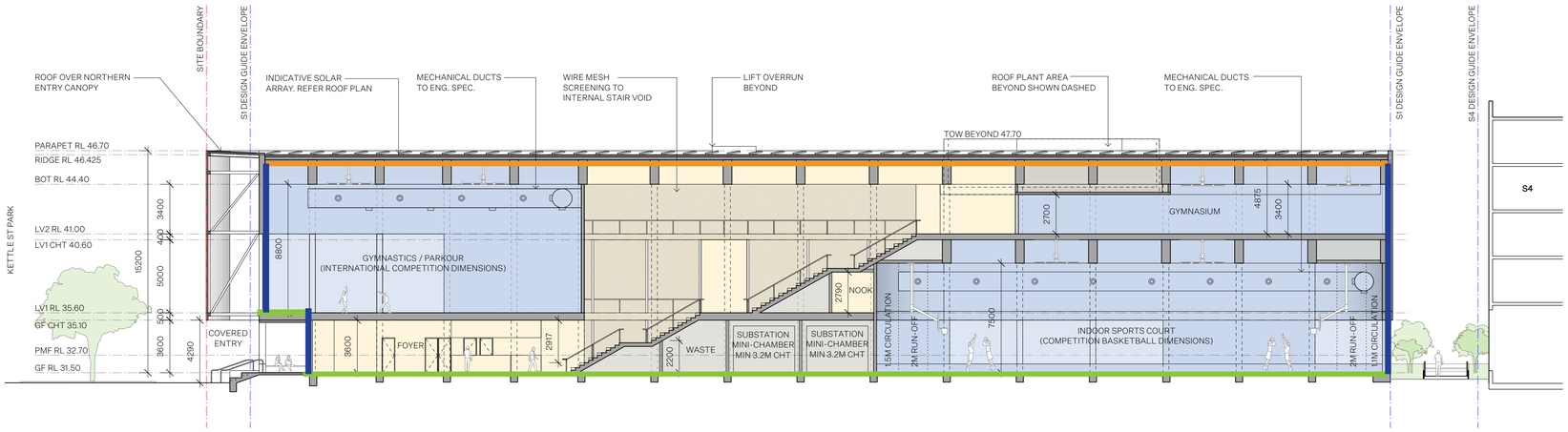
Project No. 2314

Revision A

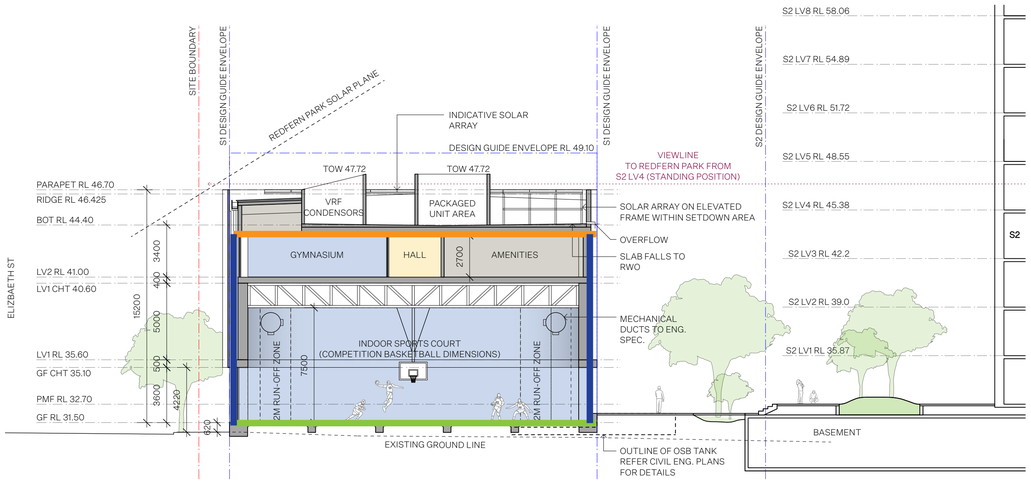
Drawing No. S1.A02.01

Verify all figured dimensions on site before undertaking any works. Do not scale dimensions off drawings.

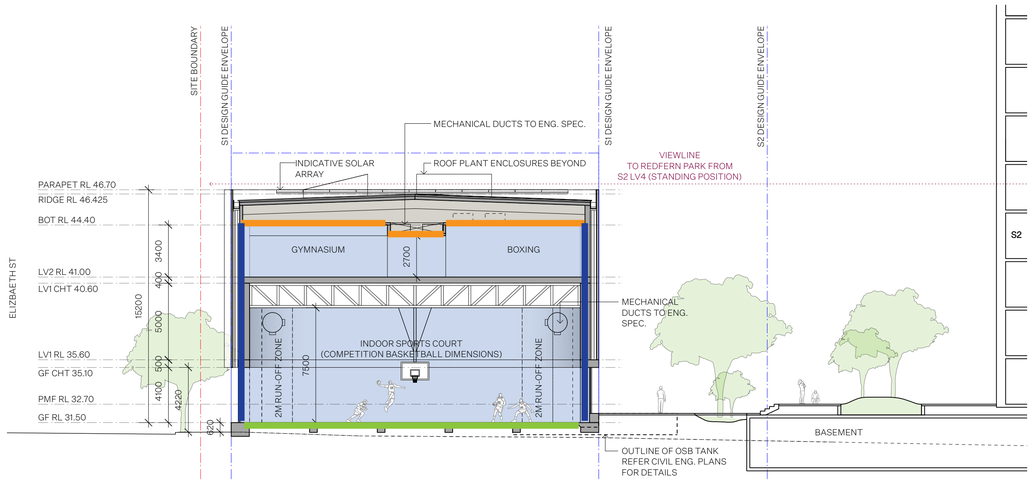
Appendix A2 Insulation Markups – Section



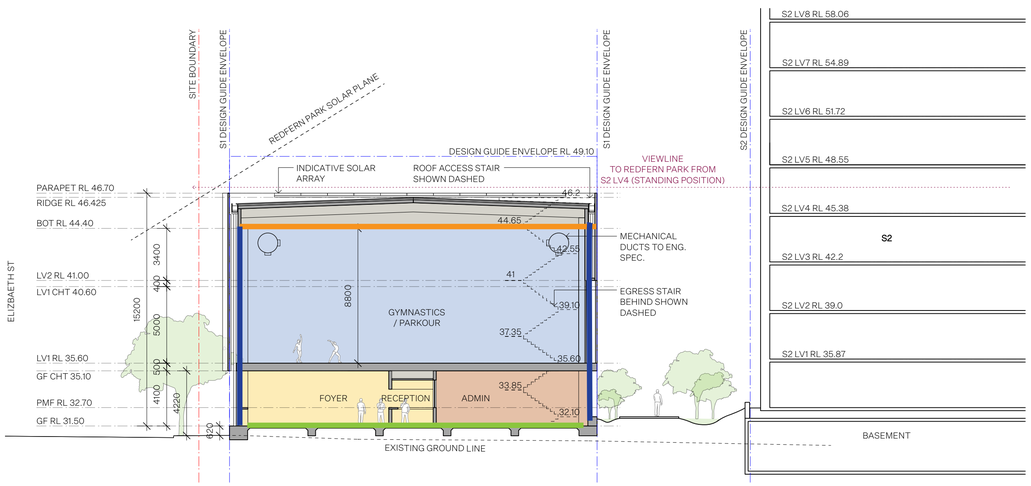
01 - S1 SECTION - LONG SECTION 1:200



02 - S1 SECTION - ROOF MOUNT PLANT 1:200



03 - S1 SECTION - MULTI-COURT 1:200



04 - S1 PLAN - GYMNASTICS 1:200

INSULATION

- **Ext Wall R1.0**
- **Int Wall R1.0**
- **Roof R3.7**
- **Floor R2.0**

Project Title:
Redfern Place
600-660 Elizabeth St,
Redfern NSW 2106

Sheet drawn by:
ARCHITECTURE AND
REGISTERED ARCHITECT
NSW #7447
VIC #9560
TAS #3310
ACT #3007
T 02 9199 0625
W architecture-and.au
A SUITE 1, 617 ELIZABETH ST REDFERN NSW 2016

Project Architectural Team:
Architecture AND — S1 Lead Architect
SILVESTERFULLJAMES — S2 Lead Architect
hayball — Precinct + S3 + S4 Lead Architect

Notes:

Compliance:
- COMPLY WITH ALL RELEVANT AUTHORITIES REQUIREMENTS.
- COMPLY WITH THE BUILDING CODE OF AUSTRALIA.
- COMPLY WITH ALL RELEVANT AUSTRALIAN STANDARDS.
- DIMENSIONS IN MILLIMETRES.
- DO NOT SCALE, USE FIGURED DIMENSIONS ONLY.
- NOTIFY ARCHITECT IF DISCREPANCY EXISTS.

Drawn By JS
Checked By AB
Date Printed 03/05/2024
Scale NA @ A1

0 1 2 3 5 m

Rev	Date	Description
-	06/06/2024	DRAFT SSDA
A	19/06/2024	SSDA

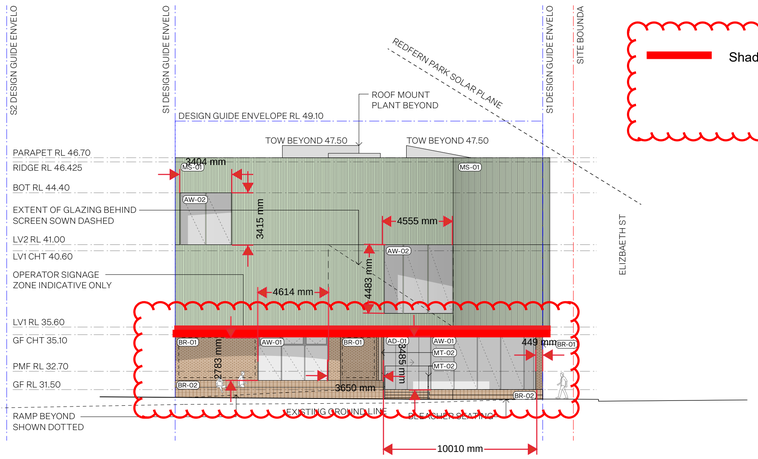
Status: SSDA

Drawing Title: S1 SECTIONS

Project No. 2314
Revision A
Drawing No. S1.A02.03

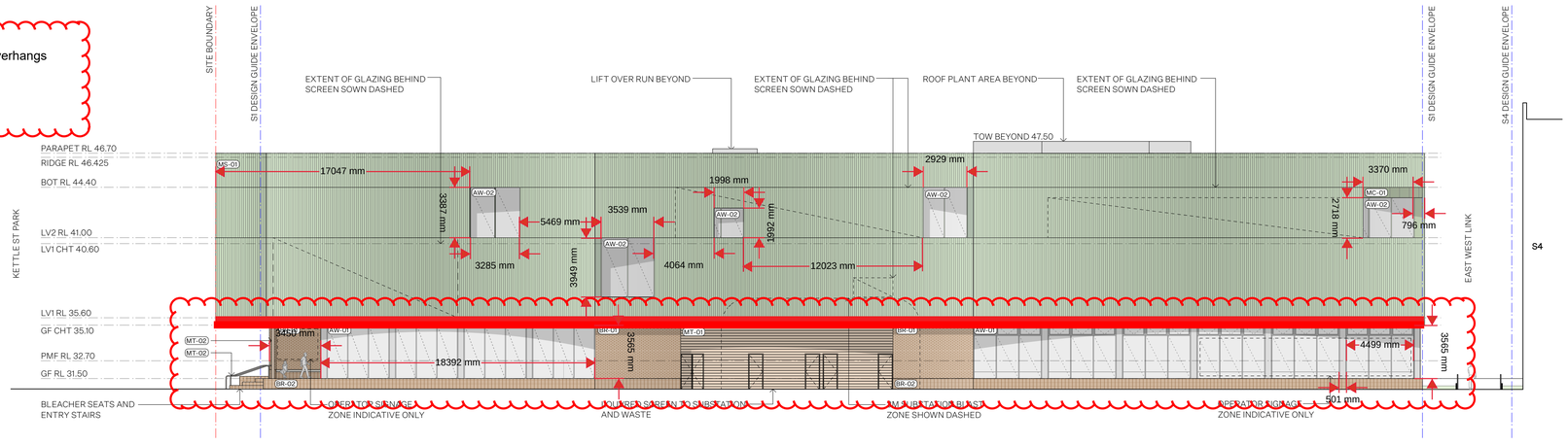
Verify all figured dimensions on site before undertaking any works. Do not scale dimensions off drawings.

Appendix A3 Shades and Glazing Markup

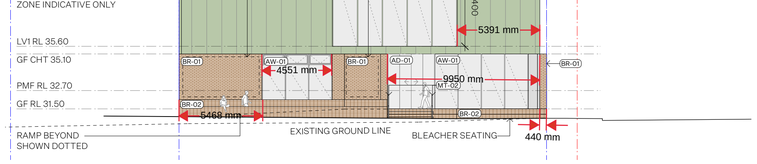


Shading from overhangs

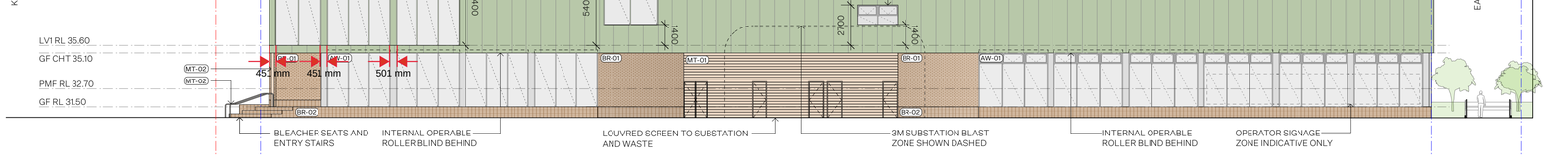
01 - S1 ELEVATION - NORTH 1:200
(REFER ELEVATION 03 FOR WALL SURFACE BEHIND SCREEN)



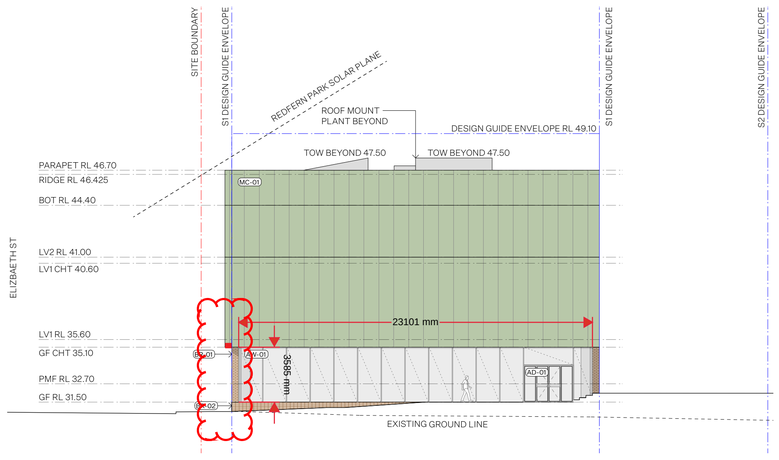
02 - S1 ELEVATION - WEST 1:200
(REFER ELEVATION 04 FOR WALL SURFACE BEHIND SCREEN)



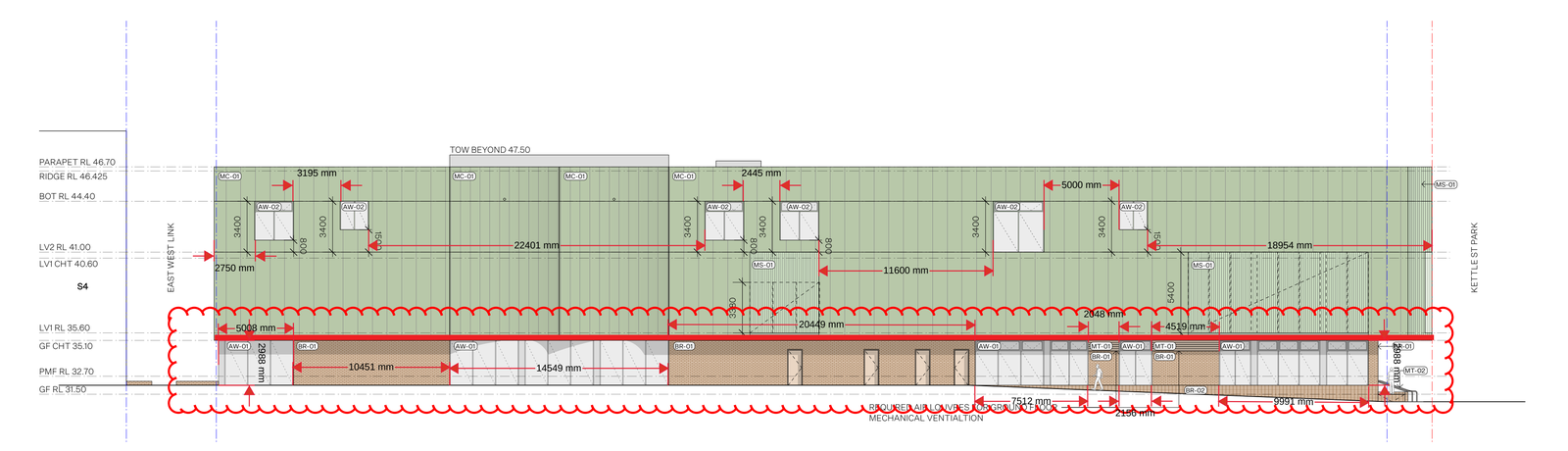
03 - S1 ELEVATION BEHIND SCREEN - NORTH 1:200



04 - S1 ELEVATION BEHIND SCREEN - WEST 1:200



05 - S1 ELEVATION - SOUTH 1:200



06 - S1 ELEVATION - EAST 1:200

Project Title:
Redfern Place
600-660 Elizabeth St,
Redfern NSW 2106

Sheet drawn by:
ARCHITECTURE AND
REGISTERED ARCHITECT
NSW #7447
VIC #9560
TAS #1030
ACT #2627
T 02 9699 0925
W architecture-and.au
A SUITE 1, 67 ELIZABETH ST REDFERN NSW 2016

Project Architectural Team:
Architecture AND — S1 Lead Architect
SILVESTER FULLER — S2 Lead Architect
hayball — Precinct + S3 + S4 Lead Architect

Notes:

Compliance:
- COMPLY WITH ALL RELEVANT AUTHORITIES REQUIREMENTS.
- COMPLY WITH THE BUILDING CODE OF AUSTRALIA.
- COMPLY WITH ALL RELEVANT AUSTRALIAN STANDARDS.
- DO NOT SCALE DRAWINGS.
- DO NOT SCALE, USE NOTATED DIMENSIONS ONLY.
- NOTIFY ARCHITECT IF DISCREPANCY EXISTS.

Drawn By JS
Checked By AB
Date Printed 03/05/2024
Scale NA @ A1

0 1 2 3 5 m

Rev	Date	Description
-	06/06/2024	DRAFT SSDA
A	19/06/2024	SSDA

Status:
SSDA

Drawing Title:
S1 ELEVATIONS

Project No. 2314
Revision A
Drawing No. S1.A02.04

Verify all figured dimensions on site before undertaking any works. Do not scale dimensions off drawings.

Section J – Part J4 Compliance: S2

Redfern Place

June 2024

atelier ten

Document information

Report title:	Section J – Part J4 Compliance: S2
Project name:	Redfern Place
Project number:	2046
Digital file name:	Section J – Part J4 for Building S2
Digital file location:	Z:\Shared\A10ANZFileserver\Projects\2000-2099\2046 - Redfern Place\02 Design & Analysis\Section J - all buildings\FINAL\Section J – Part J4 for Building S2.pdf

Prepared

Prepared by:	Malachi Montellano
Signed:	MM
Date:	20.06.2024

Checked

Checked by:	Henry Jarvis
Signed:	HJ
Date:	21.06.2024

Approved

Approved by:	Alison Adendorff
Signed:	AA
Date:	21.06.2024

Revisions

No	Date	Approved
0	28.05.2024	AA
1	06.06.2024	AA
2	21.06.2024	

Atelier Ten
7/56 Pitt Street
Sydney, NSW 2000
Australia
T (02) 9262 4500
W atelierten.com

Contents

Executive Summary

Atelier Ten have been engaged by Hickory Constructions Redfern Pty Ltd to provide advice for the building envelope of Redfern Place. Redfern Place a mixed-used development located at 600-660 Elizabeth Street, Redfern, NSW. The intent of the assessment is to verify the minimum performance requirements to satisfy Section J, Part J4 – Building Fabric of NCC 2022. Specifically, this report provides advice for Section J4D4 (Roofs and Ceilings), J4D5 (Roof Lights), J4D6 (Walls and Windows), and J4D7 (Floors).

This report assesses building S2, a mixed-use building featuring fourteen storeys of residential apartments, and a communal area on the tenth level. This document assesses the communal areas (Class 9b). The assessment confirms that the building fabric complies with NCC 2022 Section J requirements, using the *Deemed-to-Satisfy Provisions* for compliance with Part J1 – Energy Efficiency. Evidence has been presented to demonstrate that the building fabric complies with Section J DTS requirements.

The key façade performance requirements to demonstrate compliance are outlined in the table below:

Table 1 MINIMUM GLAZING PERFORMANCE REQUIREMENTS

Orientation	Glazing Description	Performance	
		U-Value	SHGC
All	Double glazing with low e coating	U3.92	SHGC = 0.557

Table 2 MINIMUM FABRIC PERFORMANCE REQUIREMENTS

Building Element	Performance
Envelope Walls	R-Value = 1.0
Roof and Ceiling*†	R-Value = 3.7
Floor†	R-Value = 2.0

* Ceiling insulation is to be used for the assessed areas due to the residential spaces located above.
† Note that the insulation levels should be the greater of the value given and the value specified in the thermal assessment of the apartments assessed elsewhere.

Project Description

Redfern Place is located at 600-660 Elizabeth Street, Redfern, NSW. Building S2 consists of a 14-story mixed used building – a communal space on the tenth floor, 3 levels of residential spaces above, and 10 levels of residential spaces below. For this assessment, only the conditioned communal space will be analysed for the thermal performance. The minimum Section J DTS requirements are listed below:

Table 3 Section J DTS MINIMUM REQUIREMENTS

Building Element	Component
Climate Zone	5
NCC 2022 Building Classification*	2 – Residential
Maximum Total System U-value (Section J4D6(1))	U2.0
Maximum Solar Admittance (Section J4D6(5))	0.13

* Common area has been assessed as Class 9b to ensure its use reflects the method of assessment.

Introduction

Report Scope

Hickory Constructions Redfern Pty Ltd have commissioned Atelier Ten to assess the building fabric required to meet the 2022 National Construction Code (NCC) Section J requirements through the *Deemed-to-Satisfy Provisions* for compliance with Part J1.

The report outlines the Section J requirements for Part J4 to determine the minimum building fabric requirements for each building at Redfern Place. The report also includes the steps undertaken to demonstrate compliance, document results and highlights the required performance for the commercial office space.

Document References

Issued by	Document	Sheet Name	Issue	Date
Silvester Fuller	GA Plan – Level 10	S2.A02.11	Rev. A - SSDA	19.06.2024
	Section – A	S2.A06.11		
	Section - C	S2.A06.13		

Project Address and NCC Climate Zone

The proposal consists of a 14-storey mixed-used development, located at 600-660 Elizabeth Street, Redfern, NSW 2016 – within NCC Climate Zone 5.

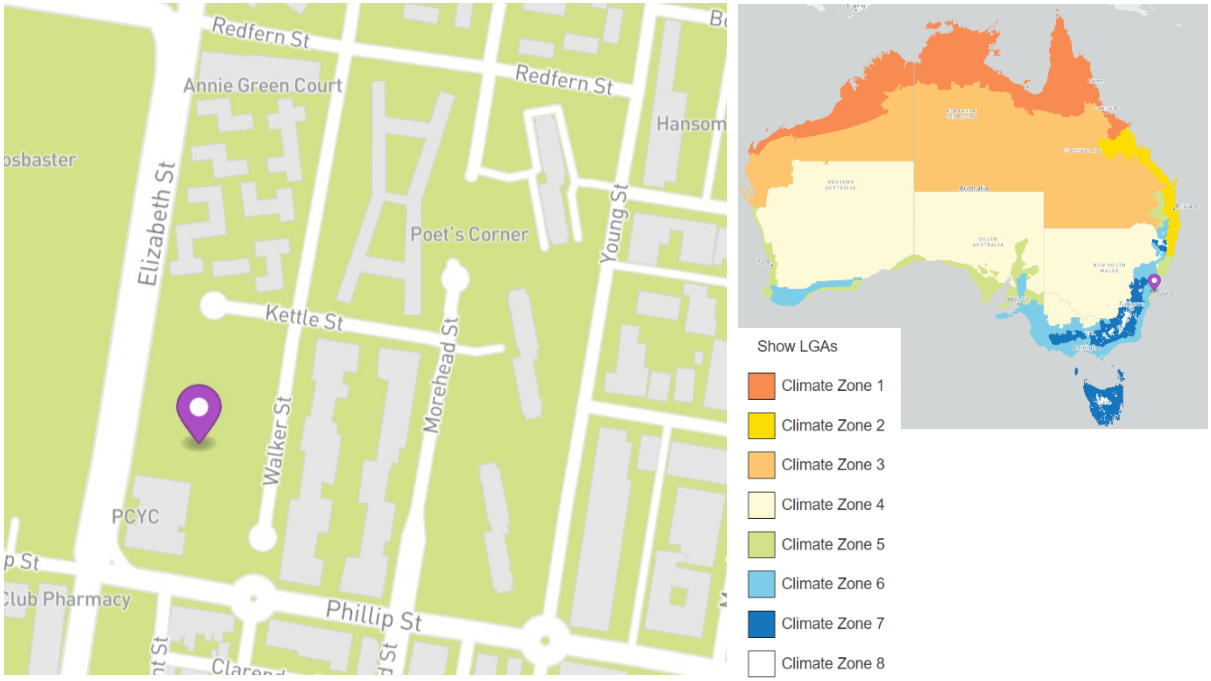


Figure 1 NCC 2022 Climate Zone

Building Class

The proposal consists of 128m² of communal space located on the tenth floor, and 3 storeys of residential spaces above and 10 storeys of residential spaces below. The residential thermal performance is not being assessed in these spaces.

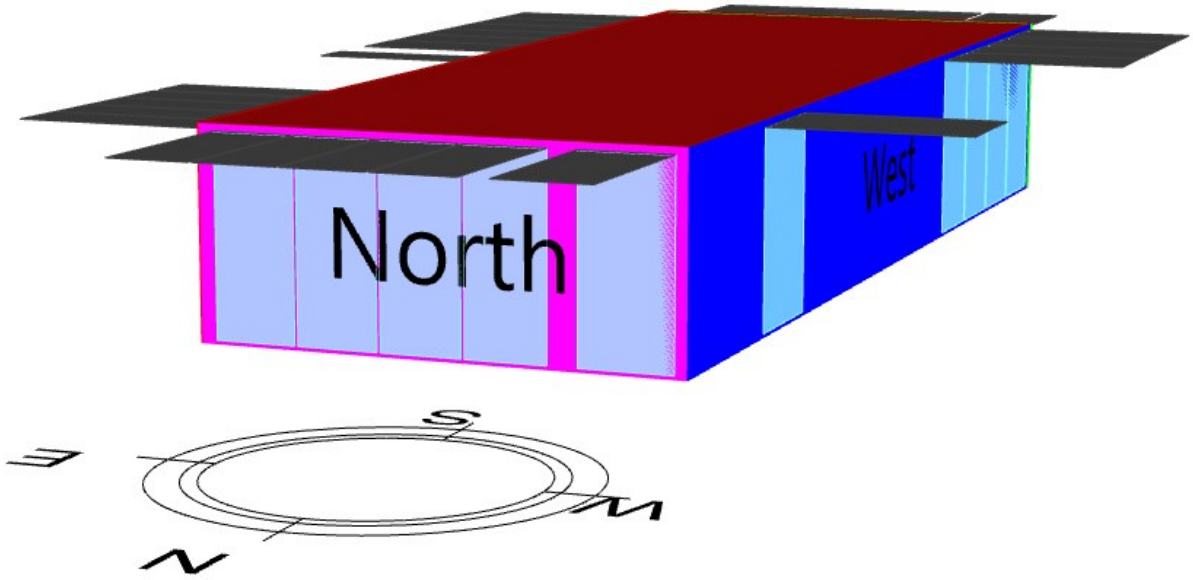
As per NCC Part A6 Building Classification, the assessed areas are classified as Class 2: Residential, and as such the communal areas have no thermal comfort requirements. Atelier Ten has prepared this report to

address thermal comfort in these spaces. As this is a common area, Atelier Ten has assessed it as a Class 9b to ensure its use reflects the method of assessment.

Model Geometry

The building has been replicated into a surface model using Rhino3D v.6 – a 3D modelling software tool widely used. A surface model was created to create simplicity, and reduce any complexities when analysing the DTS requirements for Section J – Part J4.

A simple script was created using Grasshopper – a Rhino3D plugin, used to create mathematical Boolean inputs and outputs. The NCC 2022 Section J DTS requirements and calculations was translated into a Grasshopper script, to determine the minimum U-Value and SHGC value required to comply with Section J – Part J4: Building Fabric of NCC 2022.



Section J DTS Requirement: Part J4 Breakdown

The building envelope, for the purposes of Section J, is defined as the parts of the building's fabric that separates a conditioned space (or habitable room) from:

- the exterior of the building; or
- a non-conditioned space including:
  - the floor of a rooftop plant room, lift-machine room, or the like; and
  - the floor above a carpark or warehouse; and
  - the common wall with a carpark, warehouse, or the like; or
- parts of the building's fabric that separates artificially heated or cooled spaces from:
  - the exterior of the building; or
  - other spaces that are not artificially heated or cooled.

J4D4 – Roof and Ceiling Construction

The spaces both above and below the tested area are conditioned Class 2 spaces whose energy efficiency has been reported elsewhere. As such, according to the NCC envelope definition for the purposes of section J, the boundary condition is considered adiabatic and does not require further insulation.

Building Element	Required Total System R-value	Additional Requirements
Ceiling	N/A	Solar absorptance is not-applicable as the floors above are residential.

J4D5 – Roof Lights

There are no roof lights for this project.

J4D6 – Walls and Glazing

The window-wall construction of the building is assessed according to (1) the thermal requirements and (2) the solar requirements.

Table 4 is a summary of the minimum building fabric requirements for the walls and glazing construction of the building envelope (Please refer to Appendix A.3).

The assessed areas have various applied shading strategies and horizontal shade depths. This is provided by shade extrusions or by way of overhang from the floor above. Shading is described in detail in Appendix A.3.

Table 4 BUILDING FABRIC MINIMUM REQUIREMENTS

Building Element	Performance
Overall Window-Wall Ratio	34%
Wall R-Value	R1.0
Window U-Value	U3.92
Window SHGC	0.557

Wall Requirements

As per Section J4D6((4)(a)), the wall components of a *wall-glazing construction* must achieve a minimum Total R-Value of R1.0 for walls with a window-to-wall ratio of greater than 20%. The window-wall ratio of the assessed area is described below.

Table 5 WALL-GLAZING CONSTRUCTION

	Value
Total Façade Area – external wall construction only	119 m2
Total Façade Area – including internal wall construction	196 m2
Glazed Area	67 m2
Window-to-Wall Ratio (excluding internal walls)	56%
Overall Window-to-Wall Ratio	34%

The wall components of the thermal envelope as described in Appendix A.2 must achieve a minimum of R1.0.

Glazing Requirements

The main concerns for the glazing requirements are (1) the thermal performance and (2) the solar admittance requirements. The following sections will cover the two main concerns to determine the maximum allowable glazing U-Value and compliance with Section J NCC 2022.

Thermal Requirements

As per Section J4D6(1(a)), the total system U-value of the wall-glazing construction must be less than U2.0. As the walls are specified to achieve R1.0 with a window-wall ratio as described above, the thermal requirements for the window are as follows:

Table 6 THERMAL REQUIREMENTS

	Wall Elements	Glazing Elements
R-Value	R1.0	-
U-Value	U1.0	U3.92
%	66%	34%

Solar Requirements

The maximum allowable solar admittance for the wall-glazing construction is being assessed according to Section S37C6 – Method 2 (Multiples Aspects), which calculates the Reference and Proposed *air-conditioning* energy value for the construction. Taking into account the building shading and window-wall ratio, this results in a maximum SHGC requirement of SHGC = 0.55 for the building, which demonstrates a compliant air-conditioning value.

Table 7 MAXIMUM ALLOWABLE SHGC REQUIREMENT

	Value
SHGC	0.557

The table below is a summary of the calculated Reference and Proposed wall-glazing construction solar admittance in compliance with Section S37C6 of NCC 2022.

Table 8 VERIFICATION OF COMPLIANCE WITH S37C6 – METHOD 2

	Reference	Proposed	Compliant [Y / N]
Air Conditioning Value	26.41	26.40	Yes – SC37C6

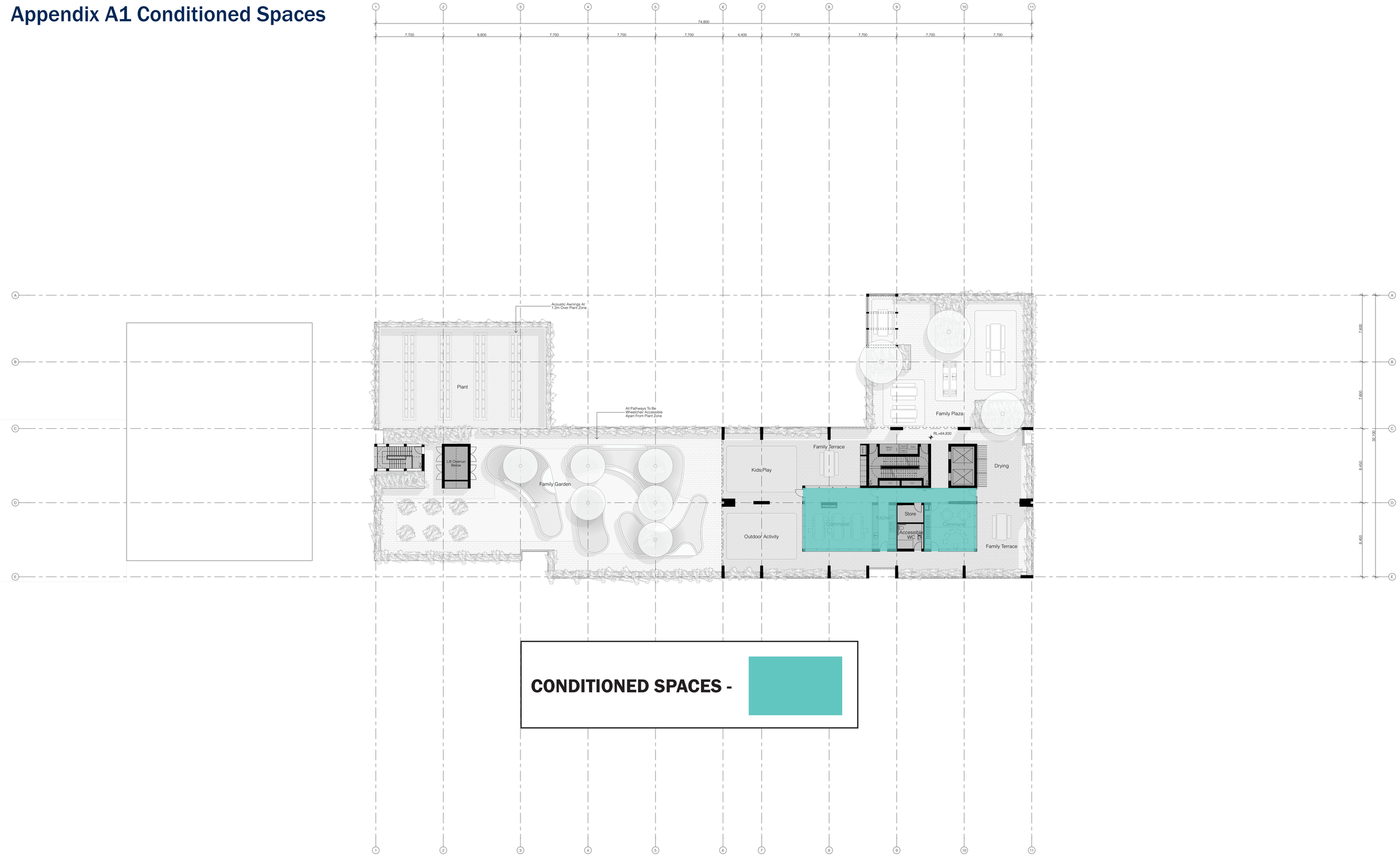
J4D7 – Floors

The spaces both above and below the tested area are conditioned Class 2 spaces whose energy efficiency has been reported elsewhere. As such, according to the NCC envelope definition for the purposes of section J, the boundary condition is considered adiabatic and does not require further insulation.

Building Element	Required Total System R-value	Notes
Floors	N/A	Floor and ceiling components are adiabatic, as the floor levels above and below are conditioned spaces (i.e., Class 2 buildings)

Appendices

Appendix A1 Conditioned Spaces



CONDITIONED SPACES -

Project Title:

Redfern Place

600-660 Elizabeth St,
Redfern NSW 2106

Sheet drawn by:

SILVESTER FULLER

Silvester Fuller Pty Ltd
12 Little Riley Street
Surry Hills NSW 2010 Australia

T +61 (0)2 9360 1122
mail@silvesterfuller.com
www.silvesterfuller.com

Penny Fuller NSW ARB 7889
Jad Silvester NSW ARB 8027

ABN 31 127 430 719

Project Architectural Team:

Architecture AND — **S1 Lead Architect**

SILVESTER FULLER — **S2 Lead Architect**

haybail — **Precinct + S3 + S4 Lead Architect**

Notes:

Drawn By	RF
Checked By	PF
Date Printed	19.06.2024
Scale	1:200 @ A1

Rev	Date	Description
A	19.06.2024	Issued For SSDA

Status:

STATE SIGNIFICANT DEVELOPMENT APPLICATION

Drawing Title:

GA Plan - Level 10

Project No. 180

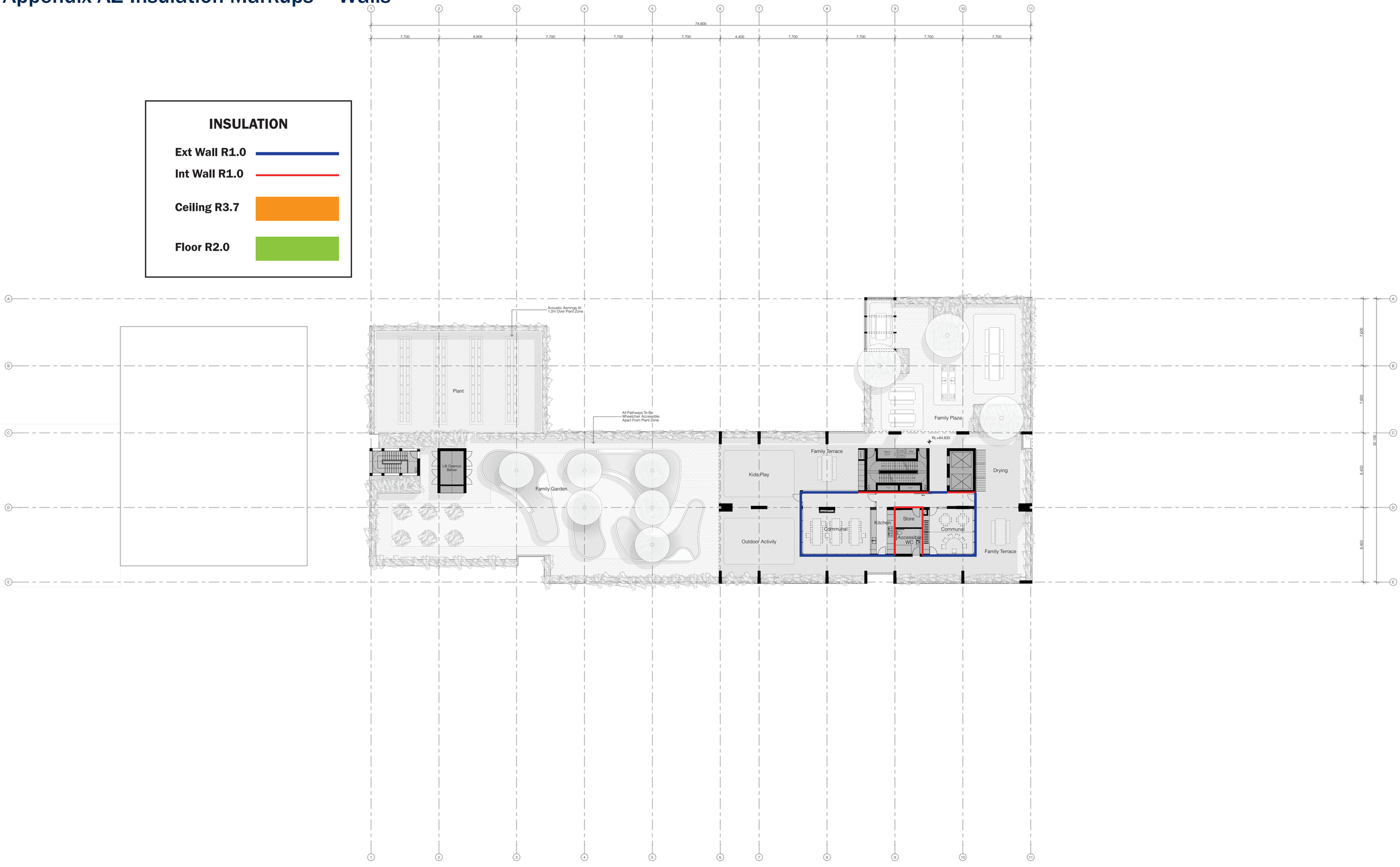
Revision A

Drawing No.

S2.A02.11

Verify all figured dimensions on site before undertaking any works. Do not scale dimensions off drawings.

Appendix A2 Insulation Markups – Walls



Project Title:

Redfern Place

600-660 Elizabeth St,
Redfern NSW 2106

Sheet drawn by:

SILVESTER FULLER

Silvester Fuller Pty Ltd
12 Little Riley Street
Surry Hills NSW 2010 Australia

T +61 (0)2 9360 1122
mail@silvesterfuller.com
www.silvesterfuller.com

Penny Fuller NSW ARB 7889
Jad Silvester NSW ARB 8027

ABN 31 127 430 719

Project Architectural Team:

Architecture AND — **S1 Lead Architect**

SILVESTER FULLER — **S2 Lead Architect**

haybail — **Precinct + S3 + S4 Lead Architect**

Notes:

Drawn By	RF
Checked By	PF
Date Printed	19.06.2024
Scale	1:200 @ A1

Rev	Date	Description
A	19.06.2024	Issued For SSDA

Status:

STATE SIGNIFICANT DEVELOPMENT APPLICATION

Drawing Title:

GA Plan - Level 10

Project No. 180

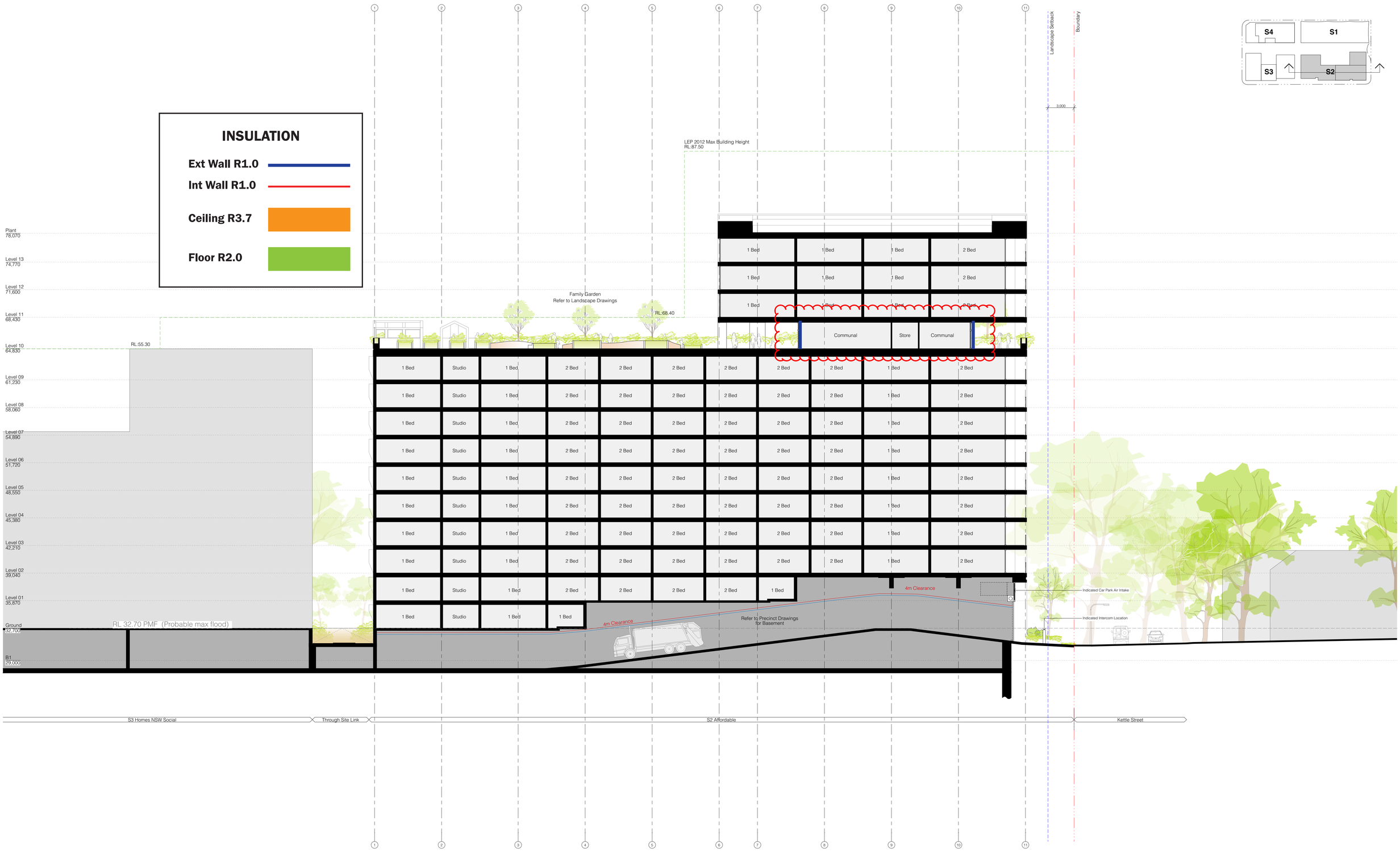
Revision A

Drawing No.

S2.A02.11

Verify all figured dimensions on site before undertaking any works. Do not scale dimensions off drawings.

Appendix A2 Insulation Markups – Section View



Project Title:

Redfern Place

600-660 Elizabeth St,
Redfern NSW 2106

Sheet drawn by:

SILVESTER FULLER

Silvester Fuller Pty Ltd
12 Little Riley Street
Surry Hills NSW 2010 Australia

T +61 (0)2 9360 1122
mail@silvesterfuller.com
www.silvesterfuller.com

Penny Fuller NSW ARB 7889
Jad Silvester NSW ARB 8027

ABN 31 127 430 719

Project Architectural Team:

Architecture AND — **S1 Lead Architect**

SILVESTER FULLER — **S2 Lead Architect**

hayball — **Precinct + S3 + S4 Lead Architect**

Notes:

Drawn By	RF
Checked By	PF
Date Printed	19.06.2024
Scale	1:200 @ A1

Rev	Date	Description
A	19.06.2024	Issued For SSDA

Status:

STATE SIGNIFICANT DEVELOPMENT APPLICATION

Drawing Title:

Section - A

Project No. 180

Revision A

Drawing No.

S2.A06.11

Verify all figured dimensions on site before undertaking any works. Do not scale dimensions off drawings.

Appendix A2 Insulation Markups – Section View

Project Title:

Redfern Place

600-660 Elizabeth St,
Redfern NSW 2106

Sheet drawn by:

SILVESTER FULLER

Silvester Fuller Pty Ltd
12 Little Riley Street
Surry Hills NSW 2010 Australia

T +61 (0)2 9360 1122
mail@silvesterfuller.com
www.silvesterfuller.com

Penny Fuller NSW ARB 7889
Jad Silvester NSW ARB 8027

Project Architectural Team:

Architecture AND — **S1 Lead Architect**

SILVESTER FULLER — **S2 Lead Architect**

haybail — **Precinct + S3 + S4 Lead Architect**

Notes:

Drawn By	RF
Checked By	PF
Date Printed	19.06.2024
Scale	1:200 @ A1

Rev	Date	Description
A	19.06.2024	Issued For SSDA

Status:

STATE SIGNIFICANT DEVELOPMENT APPLICATION

Drawing Title:

Section - C

Project No. 180

Revision A

Drawing No. S2.A06.13

Verify all figured dimensions on site before undertaking any works. Do not scale dimensions off drawings.

Appendix A3 Shading + Glazing Markup

Material Key

01 Brickwork - Warm Coloured
02 Pre-cast Concrete - Warm Coloured Concrete
03 Pre-cast Concrete - Terracotta Coloured Concrete
04 Metal Work / Glazing Frame - Mid Bronze Colour
05 Metal Work - Light Bronze Colour
06 Metal Work / Glazing Frame - Dark Copper Colour
07 Paving - Warm Coloured to match Brickwork
08 Paving - Terracotta Coloured Paving
09 Planter - Terracotta Coloured Modular Planter

Project Title:

Redfern Place

600-660 Elizabeth St,
Redfern NSW 2106

Sheet drawn by:

SILVESTER FULLER

Silvester Fuller Pty Ltd
12 Little Riley Street
Surry Hills NSW 2010 Australia

T +61 (0)2 9360 1122
mail@silvesterfuller.com
www.silvesterfuller.com

Penny Fuller NSW ARB 7889
Jad Silvester NSW ARB 8027

ABN 31 127 430 719

Project Architectural Team:

Architecture AND — **S1 Lead Architect**
SILVESTER FULLER — **S2 Lead Architect**
hayball — **Precinct + S3 + S4 Lead Architect**

Notes:

Drawn By	RF
Checked By	PF
Date Printed	19.06.2024
Scale	1:200 @ A1

Rev	Date	Description
A	19.06.2024	Issued For SSDA

Status:
STATE SIGNIFICANT DEVELOPMENT APPLICATION

Drawing Title:
Elevation - East

Project No. 180
Revision A
Drawing No. S2.A06.01

Verify all figured dimensions on site before undertaking any works. Do not scale dimensions off drawings.

Appendix A3 Shading + Glazing Markup

Material Key

01 Brickwork - Warm Coloured
02 Pre-cast Concrete - Warm Coloured Concrete
03 Pre-cast Concrete - Terracotta Coloured Concrete
04 Metal Work / Glazing Frame - Mid Bronze Colour
05 Metal Work - Light Bronze Colour
06 Metal Work / Glazing Frame - Dark Copper Colour
07 Paving - Warm Coloured to match Brickwork
08 Paving - Terracotta Coloured Paving
09 Planter - Terracotta Coloured Modular Planter

Project Title:

Redfern Place

600-660 Elizabeth St,
Redfern NSW 2106

Sheet drawn by:

SILVESTER FULLER

Silvester Fuller Pty Ltd
12 Little Riley Street
Surry Hills NSW 2010 Australia

T +61 (0)2 9360 1122
mail@silvesterfuller.com
www.silvesterfuller.com

Penny Fuller NSW ARB 7889
Jad Silvester NSW ARB 8027

ABN 31 127 430 719

Project Architectural Team:

Architecture AND — S1 Lead Architect
SILVESTER FULLER — S2 Lead Architect
hayball — Precinct + S3 + S4 Lead Architect

Notes:

Drawn By	RF
Checked By	PF
Date Printed	19.06.2024
Scale	1:200 @ A1

Rev	Date	Description
A	19.06.2024	Issued For SSDA

Status:

STATE SIGNIFICANT DEVELOPMENT APPLICATION

Drawing Title:

Elevation - North

Project No. 180

Revision A

Drawing No. S2.A06.02

Verify all figured dimensions on site before undertaking any works. Do not scale dimensions off drawings.

Appendix A3 Shading + Glazing Markup

Material Key

01 Brickwork - Warm Coloured
02 Pre-cast Concrete - Warm Coloured Concrete
03 Pre-cast Concrete - Terracotta Coloured Concrete
04 Metal Work / Glazing Frame - Mid Bronze Colour
05 Metal Work - Light Bronze Colour
06 Metal Work / Glazing Frame - Dark Copper Colour
07 Paving - Warm Coloured to match Brickwork
08 Paving - Terracotta Coloured Paving
09 Planter - Terracotta Coloured Modular Planter

Project Title:

Redfern Place

600-660 Elizabeth St,
Redfern NSW 2106

Sheet drawn by:

SILVESTER FULLER

Silvester Fuller Pty Ltd
12 Little Riley Street
Surry Hills NSW 2010 Australia

T +61 (0)2 9360 1122
mail@silvesterfuller.com
www.silvesterfuller.com

Penny Fuller NSW ARB 7889
Jad Silvester NSW ARB 8027

ABN 31 127 430 719

Project Architectural Team:

Architecture AND — **S1 Lead Architect**
SILVESTER FULLER — **S2 Lead Architect**
hayball — **Precinct + S3 + S4 Lead Architect**

Notes:

Drawn By	RF
Checked By	PF
Date Printed	19.06.2024
Scale	1:200 @ A1

Rev	Date	Description
A	19.06.2024	Issued For SSDA

Status:

STATE SIGNIFICANT DEVELOPMENT APPLICATION

Drawing Title:

Elevation - West

Project No. 180

Revision A

Drawing No. S2.A06.03

Verify all figured dimensions on site before undertaking any works. Do not scale dimensions off drawings.

Appendix A3 Shading + Glazing Markup

Material Key

- 01 Brickwork - Warm Coloured
- 02 Pre-cast Concrete - Warm Coloured Concrete
- 03 Pre-cast Concrete - Terracotta Coloured Concrete
- 04 Metal Work / Glazing Frame - Mid Bronze Colour
- 05 Metal Work - Light Bronze Colour
- 06 Metal Work / Glazing Frame - Dark Copper Colour
- 07 Paving - Warm Coloured to match Brickwork
- 08 Paving - Terracotta Coloured Paving
- 09 Planter - Terracotta Coloured Modular Planter

Project Title:

Redfern Place

600-660 Elizabeth St,
Redfern NSW 2106

Sheet drawn by:

SILVESTER FULLER

Silvester Fuller Pty Ltd
12 Little Riley Street
Surry Hills NSW 2010 Australia

T +61 (0)2 9360 1122
mail@silvesterfuller.com
www.silvesterfuller.com

Penny Fuller NSW ARB 7889
Jad Silvester NSW ARB 8027

ABN 31 127 430 719

Project Architectural Team:

Architecture AND — **S1 Lead Architect**

SILVESTER FULLER — **S2 Lead Architect**

haybail — **Precinct + S3 + S4 Lead Architect**

Notes:

Drawn By	RF
Checked By	PF
Date Printed	19.06.2024
Scale	1:200 @ A1

Rev	Date	Description
A	19.06.2024	Issued For SSDA

Status:

STATE SIGNIFICANT DEVELOPMENT APPLICATION

Drawing Title:

Elevation - South

Project No. 180

Revision A

Drawing No.

S2.A06.04

Verify all figured dimensions on site before undertaking any works. Do not scale dimensions off drawings.

Section J – Part J4 Compliance: S4

Redfern Place

June 2024

atelier ten

Document information

Report title:	Section J – Part J4 Compliance: S4
Project name:	Redfern Place
Project number:	2046
Digital file name:	Section J – Part J4 for Building S4
Digital file location:	Z:\Shared\A10ANZFileserver\Projects\2000-2099\2046 - Redfern Place\02 Design & Analysis\Section J - all buildings\FINAL\Section J – Part J4 for Building S4.pdf"

Prepared

Prepared by:	Malachi Montellano
Signed:	MM
Date:	20.06.2024

Checked

Checked by:	Henry Jarvis
Signed:	HJ
Date:	21.06.2024

Approved

Approved by:	Alison Adendorff
Signed:	AA
Date:	21.06.2024

Revisions

No	Date	Approved
0	28.05.2024	Alison Adendorff
1	06.06.2024	Alison Adendorff
2	21.06.2024	

Atelier Ten
7/56 Pitt Street
Sydney, NSW 2000
Australia
T (02) 9262 4500
W atelierten.com

Contents

Executive Summary

Atelier Ten have been engaged by Hickory Constructions Redfern Pty Ltd to provide advice for the building envelope of Redfern Place. Redfern Place a mixed-used development located at 600-660 Elizabeth Street, Redfern, NSW. The intent of the assessment is to verify the minimum performance requirements to satisfy Section J, Part J4 – Building Fabric of NCC 2022. Specifically this report provides advice for Section J4D4 (Roofs and Ceilings), J4D5 (Roof Lights), J4D6 (Walls and Windows), and J4D7 (Floors).

This report assesses building S4, a mixed-use building featuring ground floor office space, ground floor communal space, and four storeys of residential apartments. This document assesses the office space (Class 5) and the communal areas (Class 9b). The assessment confirms that the building fabric complies with NCC 2022 Section J requirements, using the *Deemed-to-Satisfy Provisions* for compliance with Part J1 – Energy Efficiency. Evidence has been presented to demonstrate that the building fabric complies with Section J DTS requirements.

The key façade performance requirements to demonstrate compliance are outlined in the table below:

Table 1 MINIMUM GLAZING PERFORMANCE REQUIREMENTS

Orientation	Glazing Description	Performance	
		U-Value	SHGC
All	Thermally broken double glazing; low-e	U3.29	SHGC = 0.285

Table 2 MINIMUM FABRIC PERFORMANCE REQUIREMENTS

Building Element	Performance
Envelope Walls	R-Value = 1.0
Roof and Ceiling*	R-Value = 3.7
Floor	R-Value = 2.0

*Ceiling insulation is to be used for the assessed areas due to the residential spaces located above.

Project Description

Redfern Place is located at 600-660 Elizabeth Street, Redfern, NSW. Building S4 consists of a 5-story mixed used building – the ground floor as a commercial office space and communal area, and 4 levels of residential spaces above. For this assessment, only the commercial office, and communal space will be analysed for the thermal performance. The minimum Section J DTS requirements are listed below:

Table 3 Section J DTS MINIMUM REQUIREMENTS

Building Element	Component
Climate Zone	5
NCC 2022 Building Classification	5 – Office
	9b – Assembly space
Maximum Total System U-value (Section J4D6(1))	U2.0
Maximum Solar Admittance (Section J4D6(5))	0.13

Introduction

Report Scope

Hickory Constructions Redfern Pty Ltd have commissioned Atelier Ten to assess the building fabric required to meet the 2022 National Construction Code (NCC) Section J requirements through the *Deemed-to-Satisfy Provisions* for compliance with Part J1.

The report outlines the Section J requirements for Part J4 to determine the minimum building fabric requirements for each building at Redfern Place. The report also includes the steps undertaken to demonstrate compliance, document results and highlights the required performance for the commercial office space.

Document References

Issued by	Document	Sheet Name	Issue	Date
Hayball	S4 Plan – Ground Floor	S4.A02.00	Rev A - SSDA	19.06.2024
	S4 Plan – Level 01	S4.A02.01		
	Building Elevations	S4.A06.01		
	Building Sections	S4.A06.02		

Project Address and NCC Climate Zone

The proposal consists of a 5-storey mixed-used development, located at 600-660 Elizabeth Street, Redfern, NSW 2016 – within NCC Climate Zone 5.

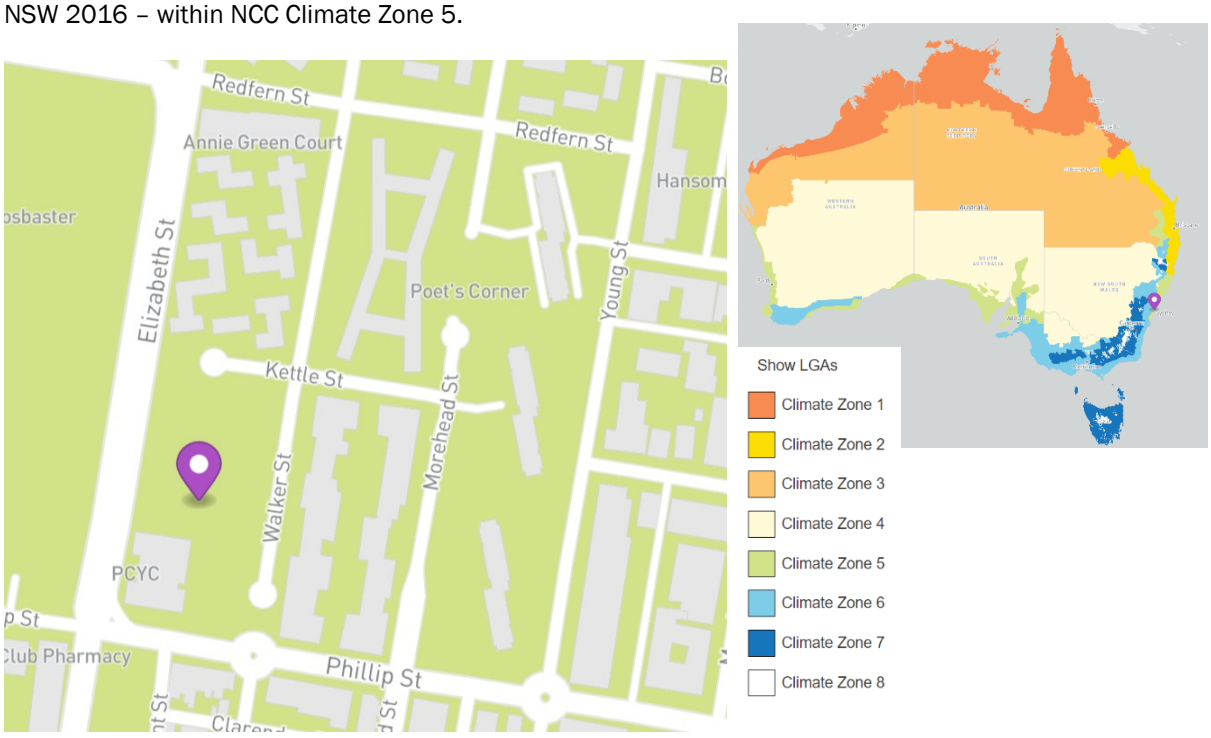


Figure 1 NCC 2022 Climate Zone

Building Class

The proposal consists of 840m² of commercial office space with a 35m² lobby area, and 165m² of communal space located on the ground floor, and 4 storeys of residential spaces above. The residential thermal performance is not being assessed in this report.

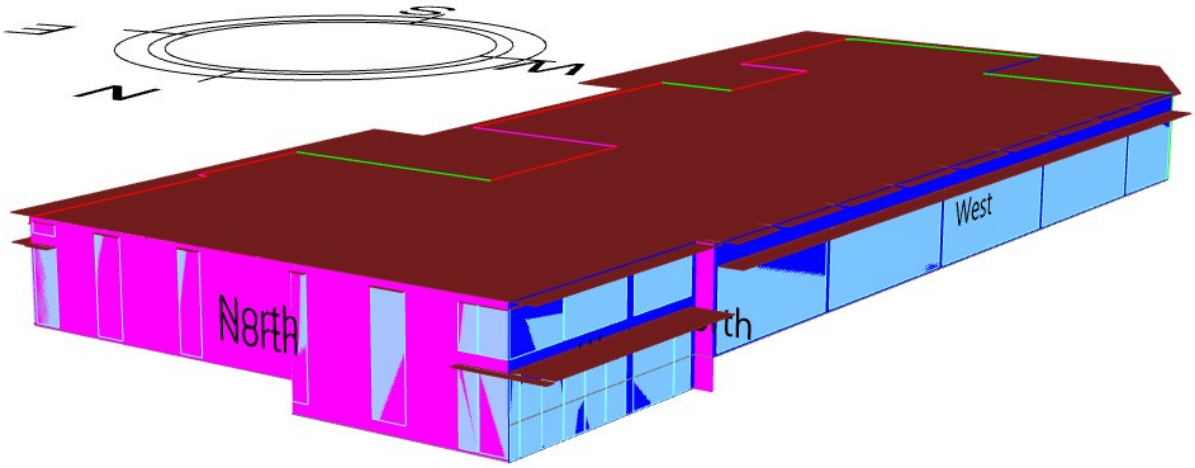
As per NCC Part A6 Building Classification, the assessed areas are classified as Class 5 Building: Office and Class 9b: assembly buildings.

It is noted that the thermal and solar requirements for both of these building types under the NCC 2022 deemed-to-satisfy requirements are the same in Climate Zone 5, and as such the assessed area is being treated as a single thermal volume.

Model Geometry

The building has been replicated into a surface model using Rhino3D v.6 – a 3D modelling software tool widely used. A surface model was created to create simplicity, and reduce any complexities when analysing the DTS requirements for Section J – Part J4.

A simple script was created using Grasshopper – a Rhino3D plugin, used to create mathematical Boolean inputs and outputs. The NCC 2022 Section J DTS requirements and calculations was translated into a Grasshopper script, to determine the minimum U-Value and SHGC value required to comply with Section J – Part J4: Building Fabric of NCC 2022.



Section J DTS Requirement: Part J4 Breakdown

The building envelope, for the purposes of Section J, is defined as the parts of the building's fabric that separates a conditioned space (or habitable room) from:

- the exterior of the building; or
- a non-conditioned space including:
  - the floor of a rooftop plant room, lift-machine room, or the like; and
  - the floor above a carpark or warehouse; and
  - the common wall with a carpark, warehouse, or the like; or
- parts of the building's fabric that separates artificially heated or cooled spaces from:
  - the exterior of the building; or
  - other spaces that are not artificially heated or cooled.

J4D4 – Roof and Ceiling Construction

The markup in Appendix A.2 indicates the extent of insulated areas for the ceiling construction as listed below. Note that the insulation levels should be the greater of the value given below and the value specified in the thermal assessment of the apartments, assessed elsewhere:

Building Element	Required Total System R-value	Additional Requirements
Ceiling	R3.70	Solar absorptance must not be more than 0.45 wherever there are roof/ceiling insulations (i.e., balcony areas from levels above).

J4D5 – Roof Lights

There are no roof lights for this project.

J4D6 – Walls and Glazing

The window-wall construction of the building is assessed according to (1) the thermal requirements and (2) the solar requirements.

Table 4 is a summary of the minimum building fabric requirements for the walls and glazing construction of the building envelope. Full height glazing was used mainly for entrances, with glazing height varying at the different aspects (Please refer to Appendix A.3).

The assessed areas have various applied shading strategies and horizontal shade depths. This is provided by shade extrusions or by way of overhang from the floor above. Shading is described in detail in Appendix A.3. The vertical shading elements included as a feature of the building design are not considered as part of the Section J DTS strategy as DTS only considers horizontal shading. However, they will still provide a degree of further shading to the building, which will marginally improve the solar admittance performance.

Table 4 BUILDING FABRIC MINIMUM REQUIREMENTS

Building Element	Performance
Overall Window-Wall Ratio	44%
Wall R-Value	R1.0
Window U-Value	U3.29
Window SHGC	0.285

Wall Requirements

As per Section J4D6((4)(a)), the wall components of a *wall-glazing construction* must achieve a minimum Total R-Value of R1.0 for walls with a window-to-wall ratio of greater than 20%. The window-wall ratio of the assessed area is described below.

Table 5 WALL-GLAZING CONSTRUCTION

	Value
Total Façade Area – external only	530 m2
Total Façade Area – including internal	737 m2
Glazed Area	321 m2
Window-to-Wall Ratio (excluding internal walls)	61%
Overall Window-to-Wall Ratio	44%

The wall components of the thermal envelope as described in Appendix A.2 must achieve a minimum of R1.0.

Glazing Requirements

The main concerns for the glazing requirements are (1) the thermal performance and (2) the solar admittance requirements. The following sections will cover the two main concerns to determine the maximum allowable glazing U-Value and compliance with Section J NCC 2022.

Thermal Requirements

As per Section J4D6(1(a)), the total system U-value of the wall-glazing construction must be less than U2.0. As the walls are specified to achieve R1.0 with a window-wall ratio as described above, the thermal requirements for the window are as follows:

Table 6 THERMAL REQUIREMENTS

	Wall Elements	Glazing Elements
R-Value	R1.0	-
U-Value	U1.0	U3.29
%	56%	44%

Solar Requirements

The maximum allowable solar admittance for the wall-glazing construction is being assessed according to Section S37C6 – Method 2 (Multiples Aspects), which calculates the Reference and Proposed *air-conditioning* energy value for the construction. Taking into account the building shading and window-wall ratio, this results in a maximum SHGC requirement of SHGC = 0.326 for the building, which demonstrates a compliant air-conditioning value.

Table 7 MAXIMUM ALLOWABLE SHGC REQUIREMENT

	Value
SHGC	0.285

The table below is a summary of the calculated Reference and Proposed wall-glazing construction solar admittance in compliance with Section S37C6 of NCC 2022.

Table 8 VERIFICATION OF COMPLIANCE WITH S37C6 – METHOD 2

	Reference	Proposed	Compliant [Y / N]
Air Conditioning Value	119.45	119.19	Yes – SC37C6

J4D7 – Floors

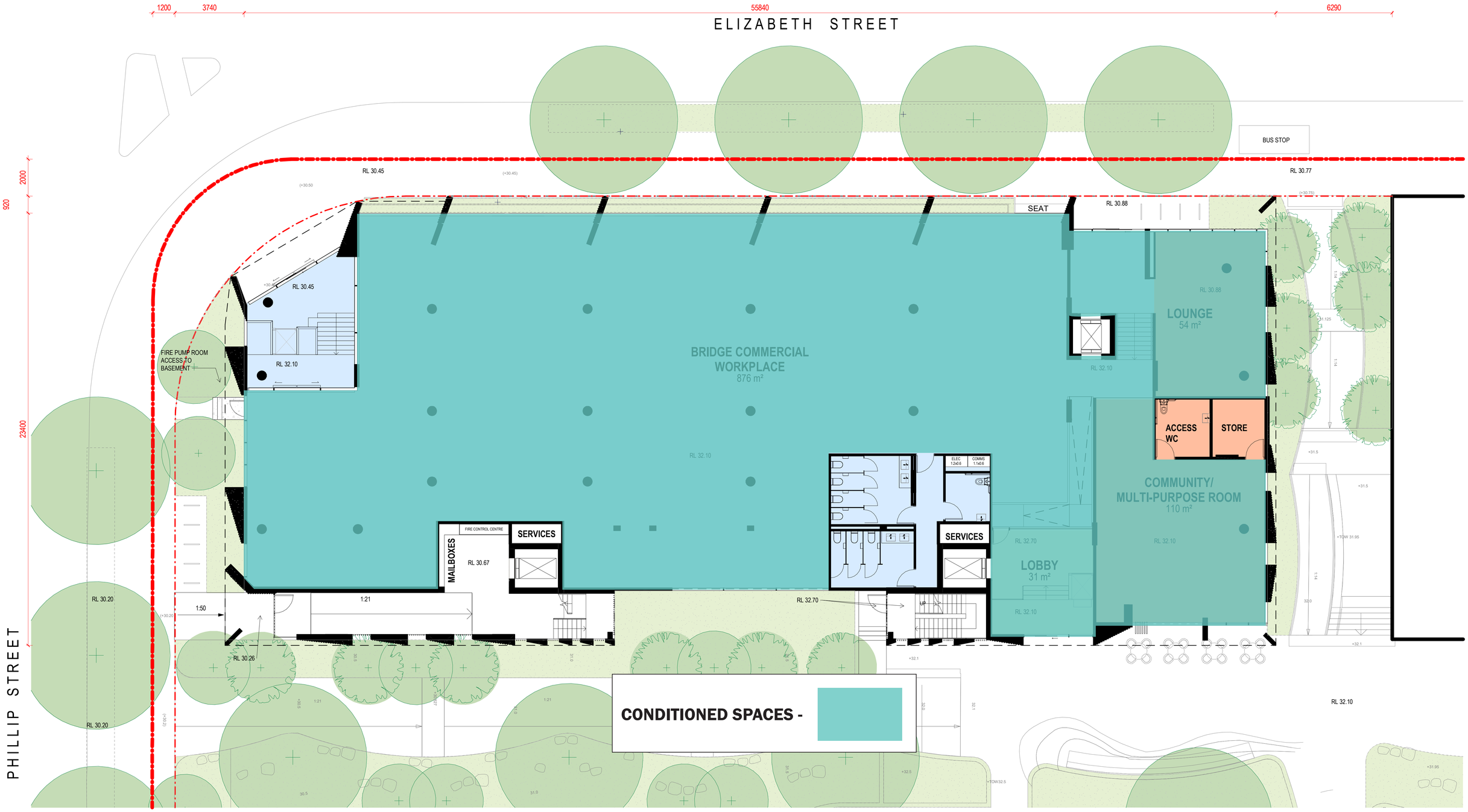
Insulation should be applied to areas highlighted in Appendix A.2, to meet the total system R-value requirements for the floors as listed below:

Building Element	Required Total System R-value	Notes
Floors	R2.0	As per Section J4D7(2), a slab-on-ground that does not have an in-slab heating or cooling system is considered to achieve a Total R-Value of R2.0.

Appendices

Appendix A Markups

Appendix A1 Conditioned Spaces



Project Title:
600-660 Elizabeth Street,
Redfern (Redfern Place)

Sheet drawn by:

hayball

Melbourne	Sydney	Brisbane	Canberra
Level 1 250 Flinders Lane Melbourne VIC 3000 T +61 3 9699 3644	Ground Floor 11-17 Buckingham Street Surry Hills NSW 2010 T +61 2 9660 9329	Level 5, 293 Queen Street, Brisbane Qld 4000 T +61 7 3211 9821	Level 1, 33 Allara Street, Canberra ACT 2601 T +61 2 9660 9329

ABN: 84006394261 NSW Nominated Architects: David Tordoff 8028

Project Architectural Team:

Architecture AND — S1 Lead Architect
SILVESTERFULLER — S2 Lead Architect
hayball — Precinct + S3 + S4 Lead Architect

Notes:

Drawn By	JC
Checked By	DT
Date Printed	19/06/2024 6:06:34 PM
Scale	1 : 100@ A1

0 1 2 3 5 m

Rev	Date	Description
A	19/06/2024	SSDA

Status:
STATE SIGNIFICANT
DEVELOPMENT APPLICATION

Drawing Title:
S4 PLAN - GROUND FLOOR

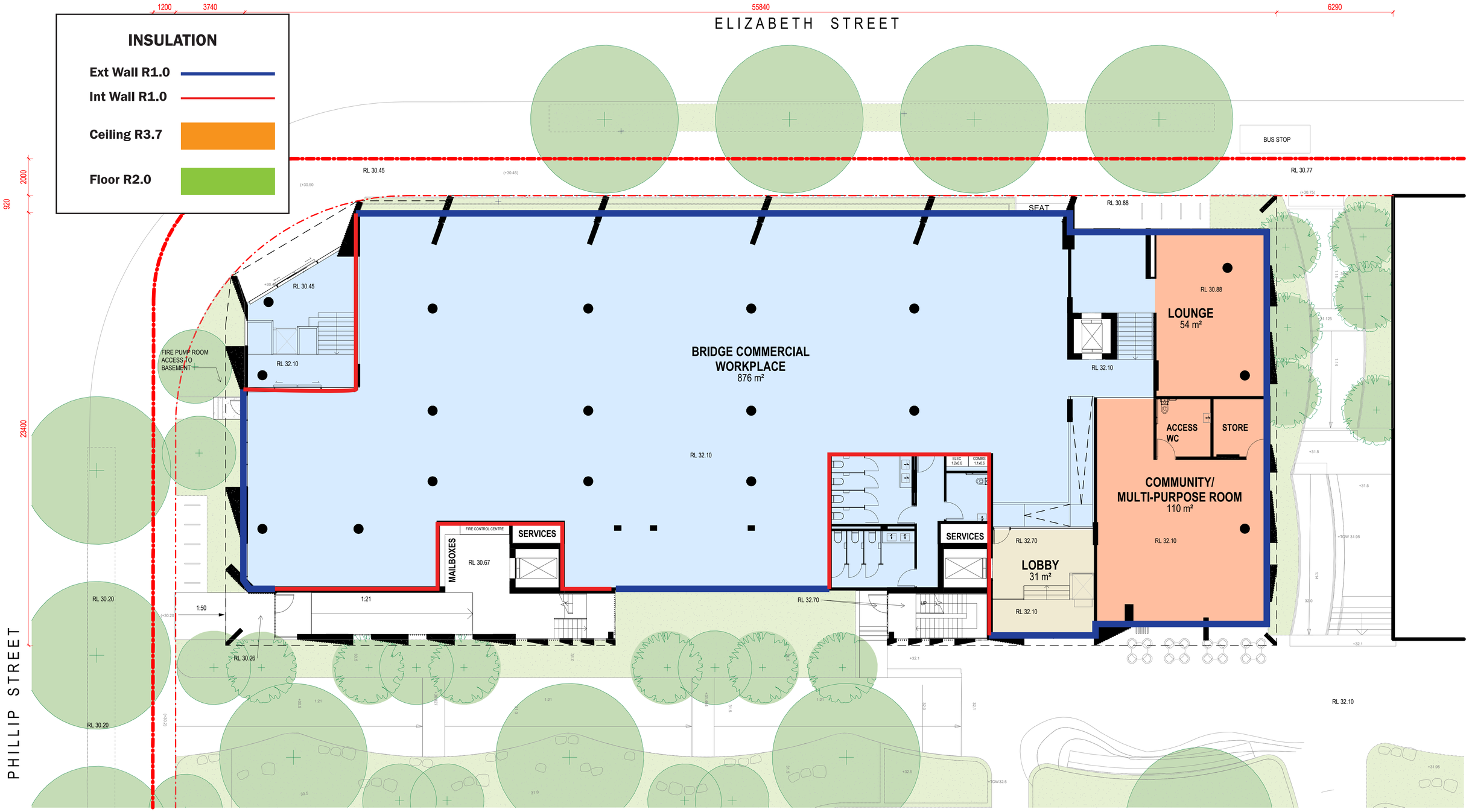
Project No.
2610

Revision
A

Drawing No.
S4.A02.00

Verify all figured dimensions on site before undertaking any works. Do not scale dimensions off drawings.

Appendix A2. Insulation Markups – Walls



Project Title: 600-660 Elizabeth Street, Redfern (Redfern Place)	**Sheet drawn by:** hayball **Melbourne** Level 1, 250 Flinders Lane, Melbourne VIC 3000, T +61 3 9699 3644 **Sydney** Ground Floor, 11-17 Buckingham Street, Surry Hills NSW 2010, T +61 2 9660 9329 **Brisbane** Level 5, 293 Queen Street, Brisbane Qld 4000, T +61 7 3211 9821 **Canberra** Level 1, 33 Allara Street, Canberra ACT 2601, T +61 2 9660 9329 ABN: 84006394261 NSW Nominated Architects: David Tordoff 8028	**Project Architectural Team:** Architecture AND — S1 Lead Architect SILVESTERFULLER — S2 Lead Architect hayball — Precinct + S3 + S4 Lead Architect	**Notes:**	**Drawn By** JC **Checked By** DT **Date Printed** 19/06/2024 6:06:34 PM **Scale** 1 : 100@ A1 0 1 2 3 5 m

Rev	Date	Description
A	19/06/2024	SSDA

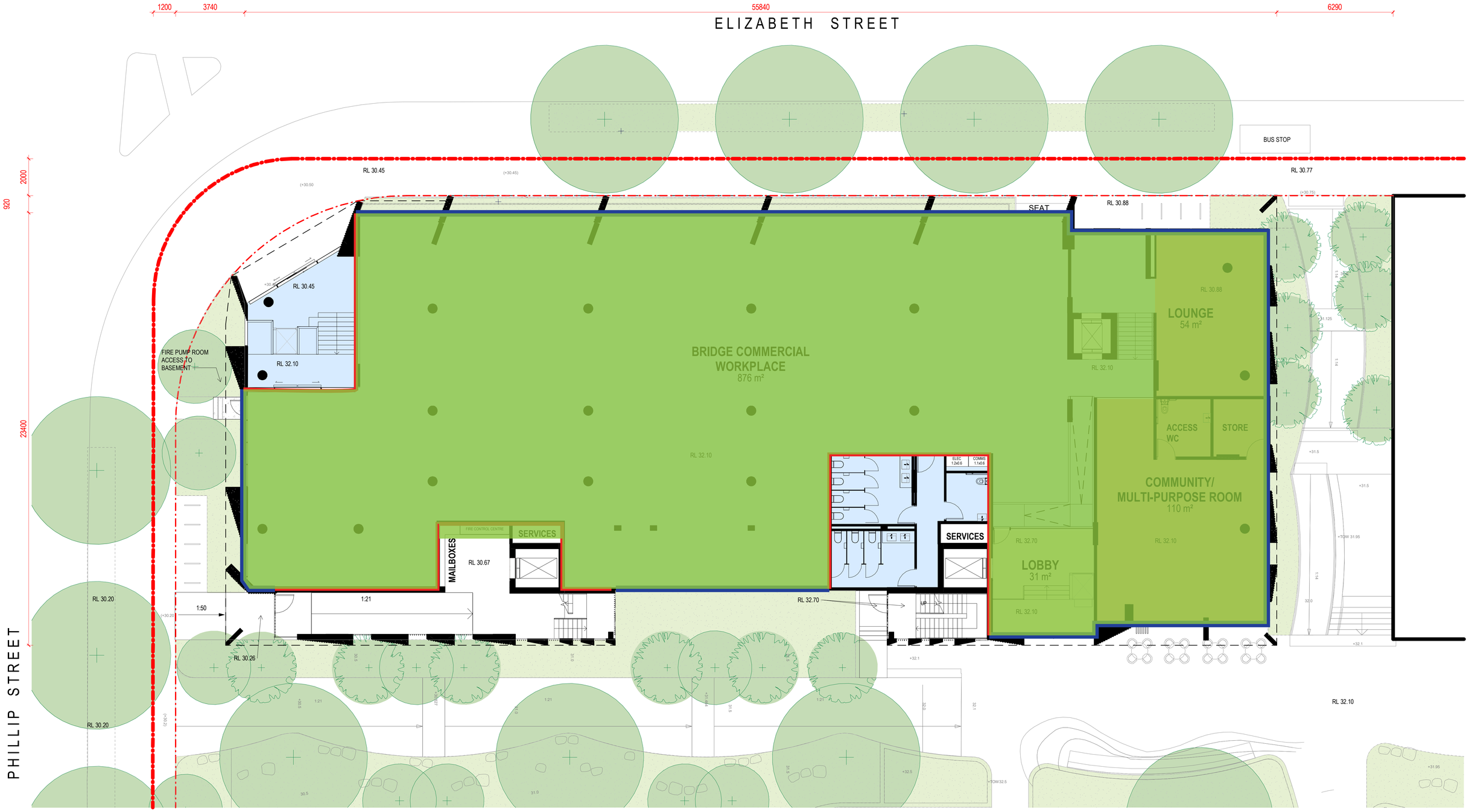
Status: STATE SIGNIFICANT DEVELOPMENT APPLICATION

Drawing Title: S4 PLAN - GROUND FLOOR

Project No. 2610 **Revision** A

Drawing No. S4.A02.00

Appendix A2. Insulation Markups – Floors (Ground Floor)



Project Title:
600-660 Elizabeth Street, Redfern (Redfern Place)

Sheet drawn by:

hayball

Melbourne
Level 1
250 Flinders Lane
Melbourne VIC 3000
T +61 3 9699 3644

Sydney
Ground Floor
11-17 Buckingham Street
Surry Hills NSW 2010
T +61 2 9660 9329

Brisbane
Level 5,
293 Queen Street,
Brisbane Qld 4000
T +61 7 3211 9821

Canberra
Level 1,
33 Allara Street,
Canberra ACT 2601
T +61 2 9660 9329

ABN: 84006394261 NSW Nominated Architects: David Tordoff 8028

Project Architectural Team:

Architecture AND — S1 Lead Architect
SILVESTERFULLER — S2 Lead Architect
hayball — Precinct + S3 + S4 Lead Architect

Notes:

Drawn By	JC
Checked By	DT
Date Printed	19/06/2024 6:06:34 PM
Scale	1 : 100@ A1

0 1 2 3 5 m

Rev	Date	Description
A	19/06/2024	SSDA

Status:
STATE SIGNIFICANT DEVELOPMENT APPLICATION

Drawing Title:
S4 PLAN - GROUND FLOOR

Project No.
2610

Revision
A

Drawing No.
S4.A02.00

Verify all figured dimensions on site before undertaking any works. Do not scale dimensions off drawings.

Appendix A2. Insulation Markups – Floors (Level 1)

Project Title:
600-660 Elizabeth Street,
Redfern (Redfern Place)

Sheet drawn by:

Melbourne
Level 1
250 Flinders Lane
Melbourne VIC 3000
T +61 3 9699 3644

Sydney
Ground Floor
11-17 Buckingham Street
Surry Hills NSW 2010
T +61 2 9660 9329

Brisbane
Level 5,
293 Queen Street,
Brisbane Qld 4000
T +61 7 3211 9621

Canberra
Level 1,
33 Allara Street,
Canberra ACT 2601
T +61 2 9660 9329

ABN: 84006394261 NSW Nominated Architects: David Tordoff 8028

Project Architectural Team:
Architecture AND — S1 Lead Architect
SILVESTERFULLER — S2 Lead Architect
hayball — Precinct + S3 + S4 Lead Architect

Notes:

Drawn By	JC
Checked By	DT
Date Printed	19/06/2024 6:06:47 PM
Scale	1 : 100@ A1

0 1 2 3 5 m

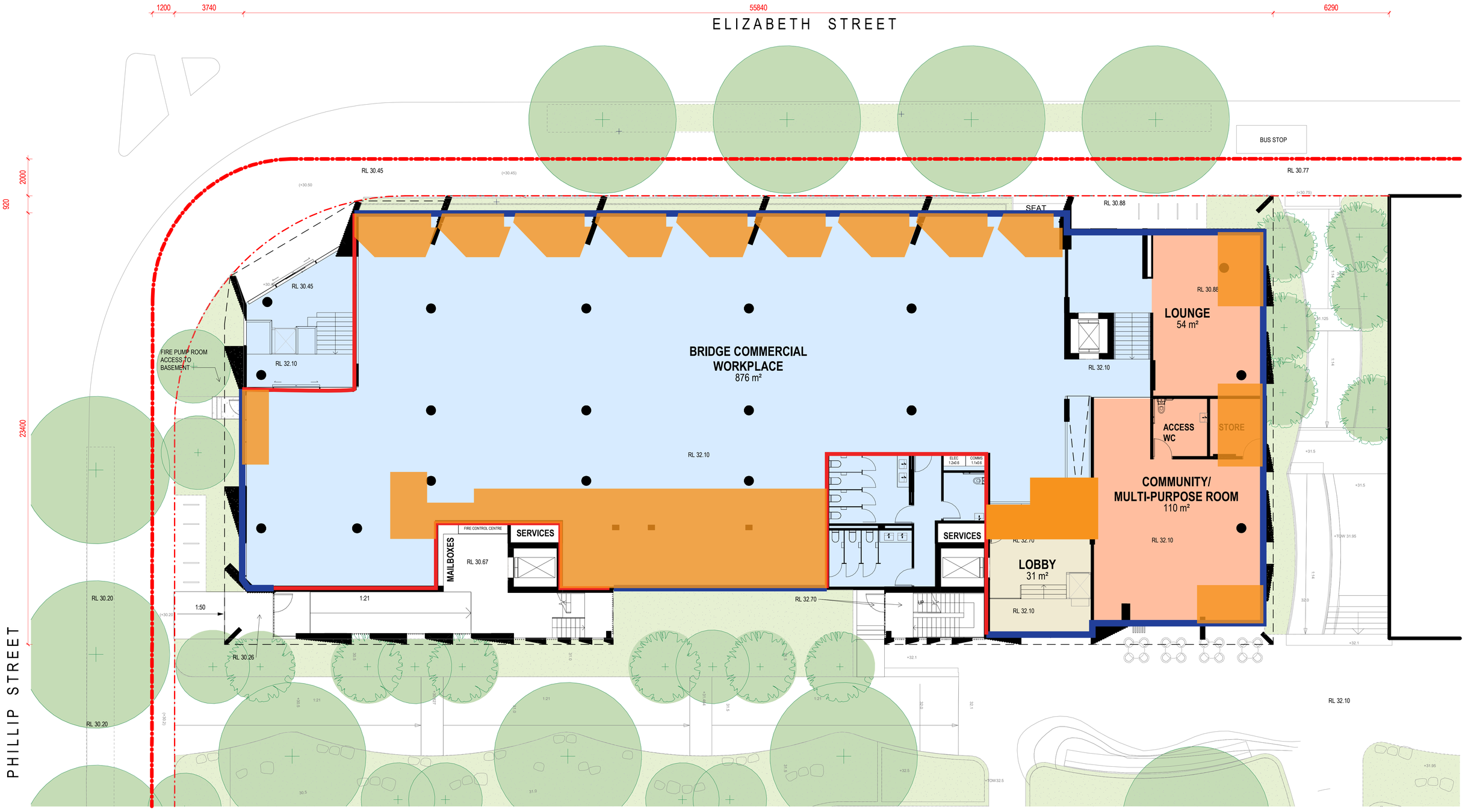
Rev	Date	Description
A	19/06/2024	SSDA

Status:
STATE SIGNIFICANT
DEVELOPMENT APPLICATION

Drawing Title:
S4 PLAN - LEVEL 1

Project No. 2610
Revision A
Drawing No. S4.A02.01

Appendix A2. Insulation Markups – Ceiling



Project Title:
600-660 Elizabeth Street,
Redfern (Redfern Place)

Sheet drawn by:

hayball

Melbourne
Level 1
250 Flinders Lane
Melbourne VIC 3000
T +61 3 9699 3644

Sydney
Ground Floor
11-17 Buckingham Street
Surry Hills NSW 2010
T +61 2 9660 9329

Brisbane
Level 5,
293 Queen Street,
Brisbane Qld 4000
T +61 7 3211 9821

Canberra
Level 1
33 Allara Street,
Canberra ACT 2601
T +61 2 9660 9329

ABN: 84006394261 NSW Nominated Architects: David Tordoff 8028

Project Architectural Team:

Architecture AND — S1 Lead Architect
SILVESTERFULLER — S2 Lead Architect
hayball — Precinct + S3 + S4 Lead Architect

Notes:

Drawn By	JC
Checked By	DT
Date Printed	19/06/2024 6:06:34 PM
Scale	1 : 100@ A1

0 1 2 3 5 m

Rev	Date	Description
A	19/06/2024	SSDA

Status:
STATE SIGNIFICANT
DEVELOPMENT APPLICATION

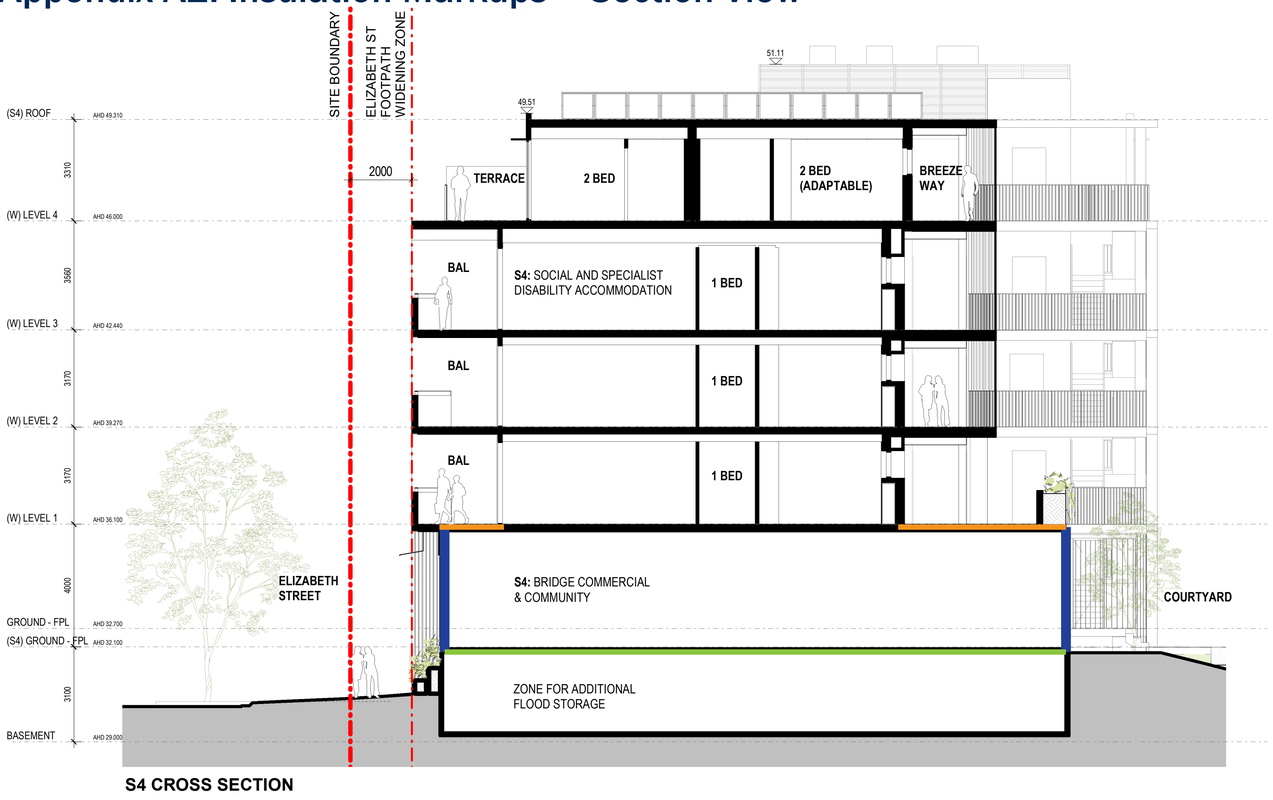
Drawing Title:
S4 PLAN - GROUND FLOOR

Project No. 2610

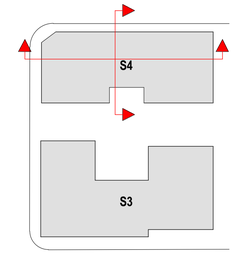
Revision A

Drawing No.
S4.A02.00

Appendix A2. Insulation Markups – Section View

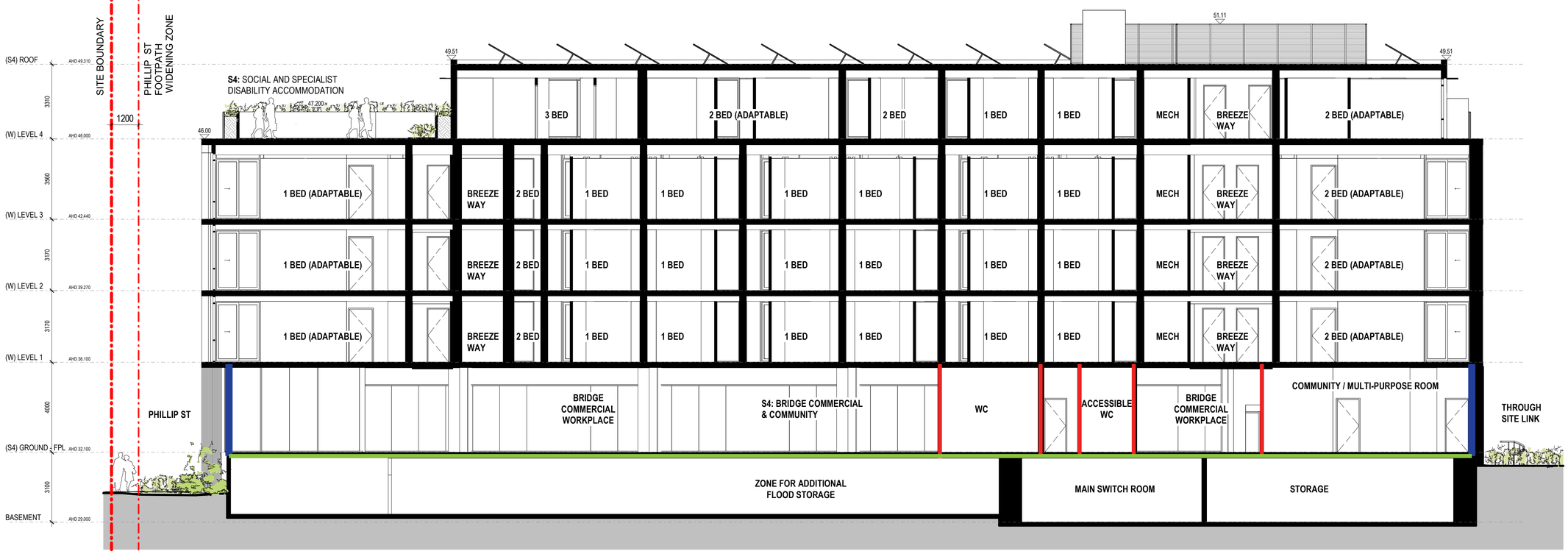


S4 CROSS SECTION



INSULATION

- Ext Wall R1.0
- Int Wall R1.0
- Ceiling R3.7
- Floor R2.0



S4 LONG SECTION

Project Title:
600-660 Elizabeth Street, Redfern (Redfern Place)

Sheet drawn by:

hayball

Melbourne: Level 1, 250 Flinders Lane, Melbourne VIC 3000, T +61 3 9699 3644
Sydney: Ground Floor, 11-17 Buckingham Street, Surry Hills NSW 2010, T +61 2 9660 9329
Brisbane: Level 5, 293 Queen Street, Brisbane Qld 4000, T +61 7 3211 9821
Canberra: Level 1, 33 Allara Street, Canberra ACT 2601, T +61 2 9660 9329

ABN: 84006394261 NSW Nominated Architects: David Tordoff 8028

Project Architectural Team:
Architecture AND — S1 Lead Architect
SILVESTERFULLER — S2 Lead Architect
hayball — Precinct + S3 + S4 Lead Architect

Notes:

Drawn By	Author
Checked By	Checker
Date Printed	19/06/2024 6:09:11 PM
Scale	1 : 100@ A1

0 1 2 3 5 m

Rev	Date	Description
A	19/06/2024	SSDA

Status:
STATE SIGNIFICANT DEVELOPMENT APPLICATION

Drawing Title:
BUILDING SECTIONS

Project No. 2610
Revision A
Drawing No. S4.A06.02

Appendix A3. Shades and Glazing Markup

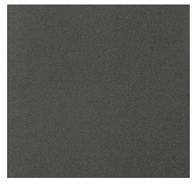
MATERIAL LEGEND

S4-BR-01
DRY PRESSED BRICK

S4-BR-02
CORBELLED BRICK

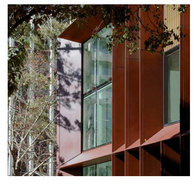
S4-BR-03
DRY PRESSED MASONRY

S4-FC-01
LIGHTWEIGHT FIBRE CEMENT BOARD - CHARCOAL



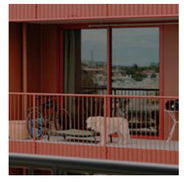
S4-AL-01
POWDERCOATED ALUMINIUM WINDOW FRAMES IN CHARCOAL COLOUR

S4-AL-02
POWDER COATED ALUMINIUM WINDOWS / AWNING IN REDDISH-BROWN COLOUR



S4-AL-03
ALUMINIUM ACOUSTIC PANELS

S4-MT-01
METAL FIN SCREEN / BALUSTRADE POWDER COATED IN REDDISH-BROWN COLOUR



S4-MT-02
METAL CLADDING IN REDDISH-BROWN COLOUR

S4-MT-03
METAL FIN BALUSTRADE WITH SOLID METAL BACK PLATE

S4-GL-01
CLEAR GLAZING

S4-CON-01
STAINED CONCRETE

Project Title:
600-660 Elizabeth Street, Redfern (Redfern Place)

Sheet drawn by:
hayball

Melbourne
Level 1
250 Flinders Lane
Melbourne VIC 3000
T +61 3 9699 3644

Sydney
Ground Floor
11-17 Buckingham Street
Surry Hills NSW 2010
T +61 2 9660 9329

Brisbane
Level 5
293 Queen Street,
Brisbane Qld 4000
T +61 7 3211 9821

Canberra
Level 1
33 Allara Street,
Canberra ACT 2601
T +61 2 9660 9329

ABN: 84006394261 NSW Nominated Architects: David Tordoff 8028

Project Architectural Team:
Architecture AND — S1 Lead Architect
SILVESTERBULLER — S2 Lead Architect
hayball — Precinct + S3 + S4 Lead Architect

Notes:

Drawn By	JC
Checked By	DT
Date Printed	19/06/2024 6:08:42 PM
Scale	1 : 250@ A1

0 1 2 3 5 m

Rev	Date	Description
A	19/06/2024	SSDA

Status:
STATE SIGNIFICANT DEVELOPMENT APPLICATION

Drawing Title:
BUILDING ELEVATIONS

Project No. 2610
Revision A
Drawing No. S4.A06.01

Appendix E – NABERS Memorandum

NABERS Memorandum

Redfern Place
Revision 00
26/06/2024

To:
CC:
From: ATELIER TEN
Subject: NABERS for Bridge Commercial Office

Executive Summary

Hickory Constructions Redfern Pty Ltd have commissioned Atelier Ten to provide a NABERS Energy Estimation report during the concept design phase for Redfern Place located at 600-660 Elizabeth Street, Redfern, NSW. The project is targeting a 5.5-Star NABERS Base Building Commitment Agreement, and this report outlines the energy estimation undertaken in accordance with the Handbook for Estimating NABERS Ratings Version 3.0 and the NABERS rules for Energy and Water for Offices Version 5.1. A summary of the energy breakdown can be found in Table 1, these are based on estimations and assumptions as per the Model Inputs RFI (Issued 16-04-2024), those within the NABERS Handbook and baseline aligned with NCC 2022 where applicable.

TABLE 1 ENERGY BREAKDOWN

	Energy buffer	Area weighting	Electricity (kWh/y)	Electricity (kWh/m2/y)	% breakdown
Common Area Lighting	20%	-	3,091	3.5	6.0%
Carpark Energy - Lighting + Ventilation	20%	-	1,944	2.2	3.8%
Exterior Lighting	-	-	4,923	5.6	9.5%
HVAC Heating	20%	9%	6,070	6.9	11.7%
HVAC Cooling	20%	9%	11,937	13.6	23.1%
HVAC Heat rejection	20%	9%	1,149	1.3	2.2%
HVAC Fans	20%	9%	5,844	6.7	11.3%
Miscellaneous Fans	-	-	2,628	3.0	5.1%
Vertical Transportation	-	-	3,702	4.2	7.2%
Tenant Supplementary Cooling	-	-	1,314	1.5	2.5%
Office DHW	-	-	4,350	5.0	8.4%
Basement Support Spaces - Plant Rooms, Waste Room	-	-	2,413	2.8	4.7%
Hydraulic pumps	-	-	1,051	1.2	2.0%
Safety, Security & Emergency	-	-	1,314	1.5	2.5%
Total (kWh/y)			**51,730**		

This round of analysis includes energy buffer (column 2). This is the additional buffer factored in for the energy end use due to the assumptions considered for HVAC systems, Carpark and Common Area Lighting. These will be updated over the subsequent design phases when more detailed design information is made available. Further, for specific energy end use which were simulated using an energy model an area weighting (column 3) adjustment was carried out to account for difference in the modelled area to the actual design floor area.

TABLE 2 BUILDING ENERGY PERFORMANCE SUMMARY

Summary	
Emissions Factor	0.850
NABERS 5.5-Star Target (From Reverse Calculator)	54,374
Estimated Building Performance	51,730
Margin (Without PV)	5%

Introduction

The bridge commercial office component of Building S4 for the Redfern Place development is committed to achieving a 5.5-Star NABERS Energy for Office (Base Building) rating as per the development targets. This memo informs the project team on the rating process and how it will affect the design development and operation of the building. It also communicates some of the key risks to be cognisant of as the design progresses.

NABERS is a performance-based, operational rating and therefore offers a level of rigour and QA that extends all the way through from design to operation. This sets it apart from many of the other benchmarking tools used in industry. NABERS requires 12 months of operational data (taken from authority meters with appropriate exclusions) and assessment by an accredited NABERS Assessor to determine the certified rating.

The project is targeting a Base Building Rating under the NABERS Energy for Offices rating tool. This covers all central services provided by the base building, including heating and cooling, lifts, common area lighting, etc. Information on detailed energy inclusion can be found within the NABERS rules for Energy and Water for Offices Version 5.1.

The Commitment Agreement Process

The role of the design team is to ensure the building is designed to be capable of achieving the targeted NABERS rating. This is assured by the third-party quality-assured NABERS Commitment Agreement process which has the following steps:

- A contract is signed between the developer and NABERS stating intent to achieve a rating. At this point, the developer can market the intended NABERS rating subject to limitations.
- An Independent Design Reviewer is engaged by the developer to validate the design and ensure the building is capable of achieving the targeted NABERS star rating in operation. The Independent Design Reviewer is chosen from selection of qualified people. This is typically done at tender documentation to ensure the design is sufficiently developed but can still accommodate changes if required. Following a successful review by the IDR, the rating can be marketed with less limitations.

This preliminary assessment has been completed using the new online Reverse Calculator tool. This Reverse Calculator provides accurate results on benchmarking and only the online version is supported for assessments.

Roles and Responsibilities

Delivering a building with the ability to achieve the targeted rating in operation is a collaborative process requiring input from multiple parties. Atelier Ten have provided a list of responsibilities for each of the project team members to ensure that all parties understand the process and their required contribution.

- Client – define and inform likely operating scenario if differ significantly from NABERS default assumptions. Engage independent design reviewer (IDR) and sign NABERS Commitment Agreement. Ensure head contractor is contractually required to deliver NABERS Energy rating..
- Atelier Ten – represent building design in an energy model. Collaborate with all stakeholders to improve design where opportunities exist. Advise on energy impact of design decisions and advise on energy efficiency risks and opportunities. Complete report that is reviewed by IDR.
- Building Services (mechanical, electrical, hydraulic, BMCS, VT) – work collaboratively with Atelier Ten to ensure energy modelling can be undertaken throughout the design process. Adjust design as required to ensure energy efficiency. Make energy efficiency a key decision-making parameter and ensure requirements are clearly communicated to sub-contractors.
- Independent Commissioning Agent (ICA) –engaged by the developer to review design and ensure commissioned to design intent. Facilitate Soft Landings framework such that all stakeholders are present in design decisions.
- Builder / Head Contractor –ensure that Value Engineering processes enhance and do not sacrifice energy efficiency initiatives. Actively seek efficiency through tender processes with subcontractors.
- Building operator / Facilities manager - engage throughout design as part of soft landings framework. Ensure maintenance items are carried out when raised through fault detection and diagnostics (FDD) or other. Monitor performance in operation and flag any risks to targeted rating.

Energy Coverage - Inclusion & Exclusion

FIGURE 1 NABERS ENERGY COVERAGE - GREEN (INCLUDED) = COMMERCIAL OFFICE, RED (EXCLUDED) = COMMON STAIRS, COMMUNAL AREAS AND LOUNGE

Energy Coverage Inclusion: Areas in green represent the commercial office areas and its support spaces within the development that will be included in the energy coverage for NABERS Base Building.

Energy Coverage Inclusion (Shared Facilities & Shared Services): The energy associated with shared facilities like carparks, end of trip facilities has been included in the energy end use calculation. The assumptions and methodologies used has been updated have been updated in table 3 below.

Energy Coverage Exclusion: The energy associated with areas marked in red is excluded. These are spaces that are accessible to public and/or to the residents and is not exclusive to the usage of the commercial office staff. We have received inputs on the usage of spaces like the Lounge to be accessible for public, but only during the commercial office hours, and the Community / Multipurpose Room being made accessible to the residents of Redfern Place, but not for the wider public. Whilst this image is reflective of the current scheme, the principles of demarcation are applicable to any updated schemes in the future.

Extensive metering will need to be provided such that end use energy associated with the community and residential components of the building can be excluded from the rating boundary in entirety. Atelier Ten will assist the design team to ensure that the metering system will enable effective energy demarcation.

Building Energy Model

The Bridge Commercial Workplace have been modelled in detail as per the architectural drawing package provided by Hayball (received 20.05.2024). All the spaces in the ground level of block S4 have been modelled in detail. This includes representing the walls, glazing and its associated thermal properties in greater detail in line with the Section J assessment carried out. Those spaces being conditioned but excluded from the energy coverage at the ground level (S4 Block) are maintained between 21 and 24 degrees Celsius with associated time of operation. The surrounding buildings (i.e., S1, S2 and S3), and the residential spaces above the bridge commercial office have been modelled as simple blocks and applied with appropriate conditioning profiles, this helps to optimize simulation time, while allowing impacts of overshadowing and heat transfer to be accounted (Figure 2).

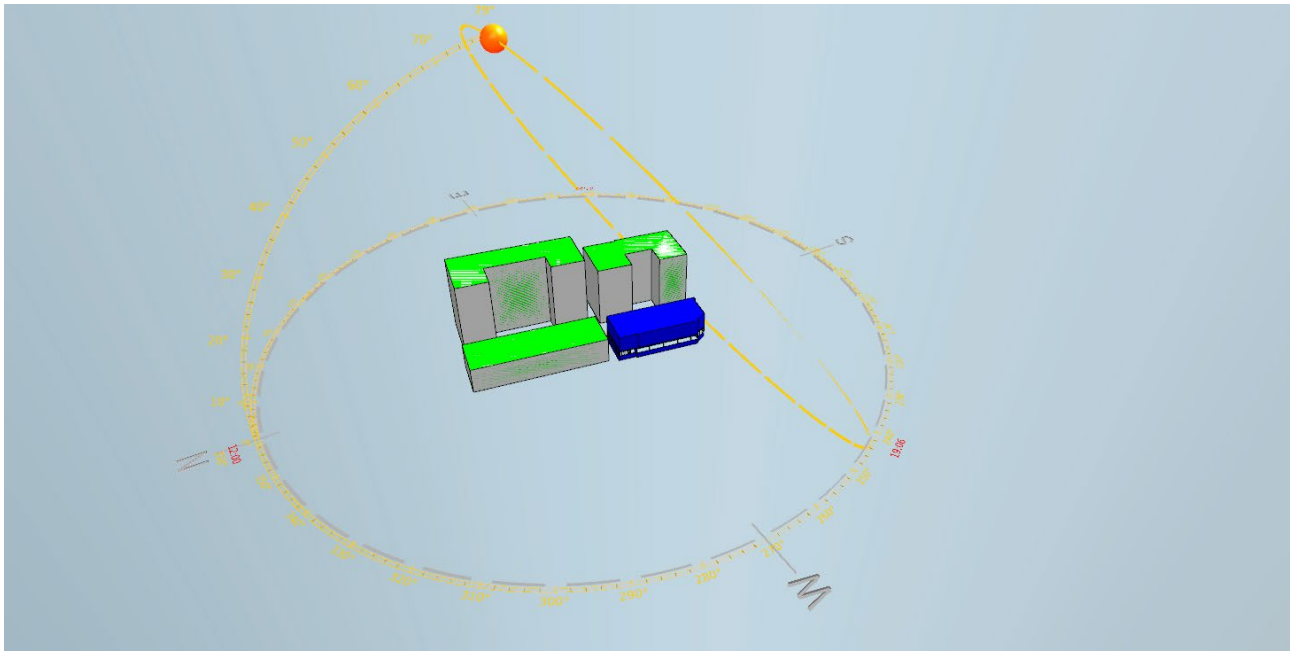


FIGURE 2 ENERGY MODEL REPRESENTATION – COMMERCIAL OFFICE & ADJACENT BUILDINGS

The modelled construction details for the proposed building, including glazing and insulation values, are presented in Table 3, and are referenced from the NCC 2022 Section J Part J4 (Building Fabric) compliance carried out.

TABLE 3 BUILDING ENVELOPE

Element	Project Specification
Roof and Ceiling	Total R-value: 3.7 m2·K/W
Roof Lights	NA
Walls – External	Total R-value: 1.0 m2·K/W
Walls – Internal	Total R-value: 1.0 m2·K/W
Glazing	Total U-value: 3.29 W/m2·K Total SHGC: 0.285
Floors	Total R-value: 2.0 m2·K/W

NABERS Energy Budget

Using the NABERS Reverse Calculator for Office Energy (v27.2), the following emissions budget can be defined for the project. This is the maximum allowable emissions to achieve for a 5.5 Star NABERS Energy rating in operation. The NLA used in the below table is associated with the bridge commercial office as shown in Appendix A.

TABLE 4 NABERS REVERSE CALCULATOR INPUTS AND OUTPUTS

Targeted Rating	5.5 Stars
Building Postcode	2016
Hours each week with occupancy levels of 20% or more	50
Estimated Net Lettable Area of the Commercial Office (m2)	876
Maximum Allowable Annual Energy Consumption (kWh)	54,374
Maximum total greenhouse emissions (Scope 1,2 & 3) (kgCO2/annum)	42,955

NABERS Energy Performance

From the assessment carried out at concept design, the office development showcases ability to meet the NABERS target with a minimal margin (Refer Table 1 Energy Breakdown). The details of the end use breakdown are presented in Figure 3. Table 5 below details the calculation method and assumptions for each energy end use. At this stage there isn't sufficient detail to undertake detailed simulation and energy prediction of all systems which necessitated to apply assumptions and energy buffer.

The method of calculation for this memo also allows identification of risks and the opportunities to achieve the targeted 5.5 Star NABERS Energy benchmark and inform design team. For example, energy consumption associated with Cooling is significant (23% of total annual consumption), therefore high performance should be considered to reduce cooling demand and the design team should engage with suppliers at early stage to assess the most energy efficient selection, configuration, and control of heating, cooling, and fresh air supply. Atelier Ten based on the engagement, will work with all relevant consultants to assess, and optimise the energy performance of the façade and systems throughout the Design Development stage.

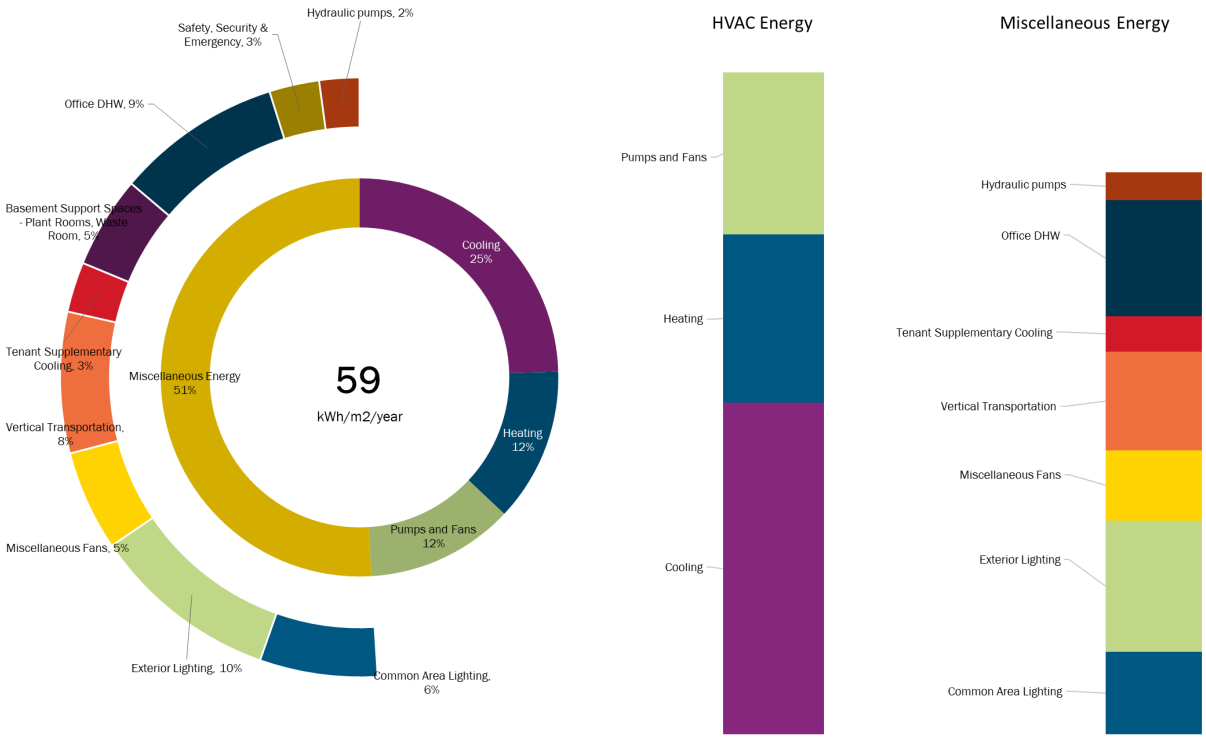


FIGURE 3 PRELIMINARY ENERGY END USE BREAKDOWN

TABLE 5 NABERS ENERGY PERFORMANCE METHODOLOGY AND ASSUMPTIONS

End Use	Method	Comments
HVAC Heating	Simulated	Assumed annualised System COP of 4.0 for the VRF System. Whilst this level of performance is achievable, further analysis must be undertaken with regards to VRF selection, sizing, and zoning. The part load performance was based on a default air-source VRF curve available within the software. This will be reviewed over the future design phases.
HVAC Cooling	Simulated	Assumed annualised System COP of 3.6 for the VRF System Whilst this level of performance is achievable, further analysis must be undertaken with regards to plant arrangements, selection, and control. The part load performance was based on a default air-source VRF curve available within the software. This will be reviewed over the future design phases.
HVAC Fans	Simulated	Assumed indoor fan coil units with variable air volume as the design explores to incorporate it. The VSD performance was based on a default VSD fan curve available within the software. This will be reviewed over the future design phases.
Tenant Supplementary Cooling	Estimate	Assumed 1.5kWh/m2 net floor area. TBC on receipt of services schedules. Estimate based on similar buildings.
Common Area Lighting	Estimate	Light Power Density (LPD) taken from NCC 2022 Table J7D3(a) – Assumed NABERS Handbook v3.0 Table A.2.4.1, Table A2.4.2 and Table A.2.4.3 – All support spaces assumed to be operational based on a similar operational profile (Lighting – Limited Control).
Exterior Lighting	Estimate	Light energy for exterior lighting is based on methodology within Green Star Energy Use Calculation Guide V1 Table 67 – Assumed Category P1 with a LPD of 7.1W/m – Building perimeter measured from drawings.

End Use	Method	Comments
		The estimations will be updated over the design development phase once more information on exterior lighting design and operations are available.
Miscellaneous Fans	Estimate	Assumed 3 kWh/m2 net floor area. TBC on receipt of services schedules. Estimate based on similar buildings.
Vertical Transportation	Estimate	Calculation based Bannister Method for lift energy calculation. – Assumed to be serving Ground Floor and Level 1. To be updated over in the future design phases based on NABERS ruling of shared facilities and services.
Domestic Hot Water	Estimate	Current demand – Bathroom Sinks – 3 Usages Per Hour – 4.5L/min. Operational for 9 hours a day and 5 days a week. Energy estimation considers distribution and storage losses. Direct electric instantaneous system COP of 1 has been considered.
Hydraulic Pumping	Benchmark	Assumed 1.2 kWh/m^2 net floor area. TBC on receipt of services schedules and to be updated in future design phases.
Basement Support Spaces – Plant Rooms/ Waste Room	-	Assumed 5% of the overall energy. TBC and updated over the future design phases based on NABERS ruling of shared facilities and services.
Generator	-	NA
Safety, Security & Emergency	-	Assumed 1.5 kWh/m^2 net floor area. TBC on receipt of services schedules and to be updated in future design phases.
Carpark	Estimate	A proportional apportionment of energy has been done taking basis from carpark energy of previous commercial projects. It is normalized to 10 carparks which are currently being dedicated for the commercial office.
PV	Excluded	Contribution from PV have been excluded for this current phase of assessment.

Key Risks and Opportunities

Table 6 below describes the key risks and opportunities that should be quantified and considered through design development.

TABLE 6 KEY RISKS AND OPPORTUNITIES

Category	Risk / Opportunity	Item	Description
HVAC	Opportunity	Air Side	AHUs with VAV Zones: VRF Air Handling Units (AHU) with VAV zoning could be explored in future design phase. This would improve efficiency as it could incorporate economy cycle and more robust control on outdoor air intake based on indoor CO2 levels.
	Risk	Spatial	Impacts on net lettable area. AHU system with internal zone VAV system would increase ductwork, potentially increase riser space, and space requirement for locating the AHU.
Domestic hot water	Risk	System Selection and Performance	Domestic hot water has been assumed to be provided by an instantaneous electric heating system with a COP of 1. Further investigation Is required to consider alternate systems like heat pumps with better efficiencies.
Onsite Generation	Risk	Roof PV	Rooftop solar PV are proposed for the project which would be seen as a shared energy source for the development. It will be a key to achieving the target 5.5-star NABERS

Category	Risk / Opportunity	Item	Description
			rating as the design progresses. More detailed investigation should be conducted through detailed design phase and evaluate apportionment for the office segment for offset accounting.
Shared Services & Facilities	Risk	Basement Shared Amenities, Lifts, Carparks	A key number of shared services and facilities are expected to be shared with the adjoining residential developments. Extensive metering will be required to apportion energy to the applicable shared services and to exclude energy consumption for those outside of the NABERS energy coverage. The metering design should be reviewed by Atelier Ten to ensure that non-essential energy is not carried by the Office Base Building rating.

Additional Risks and Opportunities

Table 7 below describes additional risks and opportunities that should be quantified and considered through design development.

TABLE 7 ADDITIONAL RISKS AND OPPORTUNITIES

Category	Risk / Opportunity	Item	Description
HVAC	Opportunity	Airside heat recovery	Airside heat recovery to reduce heating and cooling loads. Will be more beneficial in reducing peaks which will reduce system capacity and lower operational energy. This would require consideration of VRF AHUs where recovery is feasible to integrate.
	Opportunity	Thermal Comfort Control	Control of space conditions to thermal comfort (operative temperature) as opposed to traditional air temperatures of 22.5 +- 1.5°C. This could allow for air temperatures up to 25.5 - 26°C, say, for summer comfort band limits.
	Opportunity	Sensors	Select and install high quality sensors with warranted reliability and accuracy would contribute to closing the performance gap between simulation and operation and potentially allow for reduced contingency to ensure achievability
	Risk	Run Hours	Where out-of-hours conditioning is likely to drive very low load, supplementary systems should be considered to avoid VRF condensing units to operate. An example could be server equipment requiring cooling in winter outside of commercial office hours could be operated by DX systems.
Lighting	Opportunity	Daylight responsive lighting Occupancy responsive lighting	All lighting should be daylight responsive to reduce energy consumption. All lighting in common areas should adopt motion sensor control to minimize energy consumption during low to no occupancy periods.
Metering	Risk	Energy metering for NABERS demarcation	Due to mixed-use nature of the development, extensive metering will be required to apportion energy to the appropriate ratings for shared services and exclude energy consumption for those outside of the energy coverage. The metering design should be reviewed by Atelier Ten to ensure that non-essential energy is not carried by the Office Base Building rating.

Conclusions and Recommendations

Based on the preliminary NABERS analysis carried out, the project is likely to achieve the target NABERS 5.5 Star rating with minimal energy margin (only a 5% energy margin above the energy benchmark) at this stage. The clients, the building services engineers, and Atelier Ten must ensure stakeholders understand their roles and responsibility in order to deliver the rating in operation. A series of workshops with the relevant consultants should occur during design development phase.

With a high proportion of energy demand coming from heating and cooling, particular attention should be paid to the VRF system selections. This would provide benefit not only in achieving the NABERS benchmark but also the contribute to the Green Star pathway the project targets.

Atelier Ten will continue to update and refine the energy model with the assistance from other consultants to determine baseline energy performance of the design and quantify potential improvements as identified above to ensure the targeted rating can be achieved.

Appendix A – Energy Modelling Inputs

NABERS Modelling: Model Inputs (Based on RFI & NABERS Defaults)

NABERS for Commercial Spaces – Energy Modelling inputs

A key first step to undertaking the concept design phase NABERS energy modelling for the project was to get a sense of the likely operational parameters for the building through getting inputs from the design team using a NABERS Input RFI document, as well as applying the NABERS defaults where appropriate. The intent was important to have the inputs represent a realistic view of the project's operational patterns as possible.

The target rating for the commercial office is a minimum NABERS 5.5 Star Rating.

HVAC - Hours of Operation

The table below outlines the HVAC operational hours and system used for the commercial office spaces and those spaces included within the NABERS energy coverage.

Table 1 HVAC - Operating Schedule

Area	Operational Hours	HVAC System
Corridors, Lobby (Those within NABERS Energy Coverage)	NABERS Default Office HVAC Profile	Air Cooled VRF (Heating & Cooling)
Bridge Commercial Workplace	NABERS Default Office HVAC Profile	Air Cooled VRF (Heating & Cooling)
Communal amenities (lounge & kitchen) -if included in NABERS scope	Excluded from NABERS Energy Coverage.	NA
Community amenities (multi-purpose) -if included in NABERS scope	Excluded from NABERS Energy Coverage.	NA

Lighting – Hours of Operation & Control

The table below outlines the lighting schedule used in the modelling. It includes the intended lighting control system where applicable.

Table 2 Lighting operational schedule

Area	Operational Hours	Controls Strategy	Comments
Corridors, Lobby (Those within NABERS Energy Coverage)	Table A.2.4.1, Table A2.4.2 and Table A.2.4.3 of NABERS	Limited lighting control	Assumed based on NABERS Handbook v3.0
Bridge Commercial Workplace	Table A.2.4.1, Table A2.4.2 and Table A.2.4.3 of NABERS	Limited lighting control	Assumed based on NABERS Handbook v3.0
Communal amenities (lounge & kitchen)	Excluded		
Community amenities (multi-purpose)	Excluded		

Space Loads – Commercial Office and Support Spaces

The table below outlines the inputs we have used for space loads.

Table 3 Space Loads

Parameter	Input
People | Lighting I Equipment Power	As per NABERS Handbook 3.0 & NCC 2022
Operational Profiles	As per NABERS Default

Air Conditioning System

The table below outlines the information used in modelling the HVAC system.

Table 4 HVAC System Parameters

Parameter	Input / Value (to Confirm)	Remark
Type of Air Distribution System	Commercial Office Floor: Air Cooled Centralised VRF with FCU serving the spaces.	System confirmed with Neuron
Design Supply Temp (Cool)	14 degrees	10-degree delta T
Design Supply Temp (Heat)	32 degrees	10-degree delta T
Minimum Flow (For Indoor FCU)	40% of Max Flow	Variable volume AHU
Control Deadband	2 degrees	No heating or cooling if space between 21 and 23 Degrees. Fan will be operational
Cooling system	VRF	Capacity derived from autosizing
Heating system	VRF	Capacity derived from autosizing
Indoor FCU Fan Power & Flow	Flow – Based on autosizing Power - Green Star Fan Power Estimation	Assumptions to be taken where necessary
CO2 setpoint	No CO2 Control for Outdoor Air	From Neuron: Limited controllability given ducted outside are to VRF FCU
FA Supply (l/s/person)	10	Updated based on AS 1668
Economy Cycle	No Economy Cycle	From Neuron: Excluded
Oversizing Factor	15%	Assumed
Infiltration	0.35 ACH (Operational Times) 0.7 ACH (Other Times)	

HVAC Setpoints

The table below outlines the proposed HVAC system and its operational settings and usage

Table 5 HVAC Setpoints

Area	Heating & Cooling Setpoint
BOH	NA (Mechanical Ventilation)
Corridors and Lobby (Conditioned) (Those within NABERS Energy Coverage)	Conditioned during Operational Hours to 21-24°C.
Bridge Commercial Workplace	Conditioned during Operational Hours to 21-24°C.
Communal amenities (lounge & kitchen) (Adjoining Spaces – Outside NABERS Energy Coverage)	Conditioned during Operational Hours to 21-24°C.
Community amenities (multi-purpose) (Adjoining Spaces – Outside NABERS Energy Coverage)	Conditioned during Operational Hours to 21-24°C.

Appendix F – NABERS Embodied Emissions Materials Form

S1

Step 1: About the building

Fill out blue cells

Building location and site data	Value	Unit	Note	Comment
Building address	600-660 Elizabeth Street			
Postcode	2016		Required	Postcode of building
Town/city	REDFERN		Town/city/suburb/region automated from postcode (may not give exact town name)	Town/city/suburb/region of the building site.
Distance to nearest major city/town	6	km	Enter for rural/regional locations only	Declare the shortest route by road to your site from the centre of your nearest major city (>100,000 people). The route must be traversable by a semitrailer truck.
Project stage	Development Application		Required	Stage of development
New build or major renovation?	New build		Required	
Brownfield or greenfield site?	Brownfield		Required	

Floor area by NCC building classification	Gross (GFA)	Net (NLA/NSA/UFA)	Unit	Note	
Please enter all floor areas relevant to your building. Leave areas blank if not applicable. Please enter Gross Floor Area (GFA) for all building classifications. Please also enter the corresponding net area (Net Lettable Area, Net Sellable Area or Usable Floor Area) where it is commonly used for that building classification.					
Class 1a: Detached residential buildings			m²	Required for Class 1a: Detached residential houses, townhouses	Gross Floor Area (GFA), as defined by the AIQS Australian Cost Management Manual
Class 1b: Boarding houses and hostels			m²	Required for Class 1b: Boarding house, guest house, hostel	Net area (Net Lettable Area, Net Sellable Area, Usable Floor Area), as defined by the PCA's Method of Measurement
Class 2: Multi-unit residential buildings			m²	Required for Class 2: Multi-unit residential, including apartment buildings	
Class 3: Other residential buildings			m²	Required for Class 3: Other residential buildings	
Class 4: Residential inside non-residential			m²	Required for Class 4: Residential building inside a non-residential building, e.g., caretaker residence	
Class 5: Office buildings			m²	Required for Class 5: Office building	
Class 6: Retail buildings			m²	Required for Class 6: Retail building, e.g., shop, restaurant, café	
Class 7a: Carparks			m²	Required for Class 7a: Carparks	
Class 7b: Warehouse-type buildings			m²	Required for Class 7b: Warehouses, wholesalers and storage facilities	
Class 8: Industrial buildings			m²	Required for Class 8: Industrial buildings, e.g., factories and workshops	
Class 9a: Healthcare buildings			m²	Required for Class 9a: Healthcare, e.g., hospitals, clinics, day surgeries	
Class 9b: Civic buildings	4,135	3,916	m²	Required for Class 9b: Civic buildings, e.g., theatres, civic centres, train stations	
Class 9c: Aged care and personal care buildings			m²	Required for Class 9c: Aged care and personal care	
Class 10a: Non-habitable buildings			m²	Required for Class 10a: Non-habitable buildings including sheds, carports and private garages	
Class 10b: Miscellaneous structures			m²	Required for Class 10b: Miscellaneous structures, including fences, masts, antennas, retaining walls and swimming pools	
Class 10c: Bushfire shelters			m²	Required for Class 10c: Bushfire shelters not attached to a Class 1a building	
Total	4,135	3,916	m²	Required: Sum of m² inputs must be more than 0.	

Project information	Value	Unit	Note	
Total cost of project	22,998,270	AUD excl. GST	Required	Include labour, materials, transport, plant, equipment and professional fees. Exclude GST, land, finance, escalation and other costs.
Building design life	80	years	Required	If uncertain, enter 50 years
Estimated envelope life	60	years	Optional	
Estimated replacement cycle for mechanical services	15	years	Optional	
Estimated replacement cycle for vertical transportation	20	years	Optional	

Dimensions of the building and the site	Value	Unit	Note	
Site area	3,431	m²	Required	Total area of site to external boundary.
Shared services or infrastructure	Yes		Required	Indicate if there are shared services that the building utilises, or shared foundations, basement or podium
Building footprint area	1,712	m²	Required	Total floor area of the ground floor measured to the outside edge of the floorplate.
Typical floor area (if different to building footprint area)	1,712	m²	Only needed if different to row above	
Typical floor perimeter	203	m	Required	
Area of external carpark (not included in GFA)	0	m^2	Required. Enter 0 if not applicable.	
Area of external hardstand (not included in GFA)	0	m^2	Required. Enter 0 if not applicable.	
Area of other hard landscaping (not included in GFA)	0	m^2	Required. Enter 0 if not applicable.	Include all other impervious areas. For example, patios, paths and driveways (not already included in carparks and hardstands above).
Number of floors/storeys above ground, including ground floor	2	no.	Required	
Number of floors/storeys below ground	0	no.	Required. Enter 0 if not applicable.	
Number of floors/storeys of car parking	1	no.	Required. Enter 0 if not applicable.	
Total height above ground	16	m	Required	Measured from the average finished grade to the highest point of the building, excluding protrusions (lighting rods, masts, chimneys, etc.)

Structural material choices	Value	Unit	Note	
Foundation type	Piles		Required	
Frame type (dominant)	Reinforced concrete		Required	
Suspended floor type (typical)	Reinforced concrete		Only needed for multi-storey buildings	
Describe low carbon materials specified in your building (e.g. green concrete, low carbon bricks)	Low carbon concrete / high performance glazing		Required	
Describe recycled content specified in your building (e.g. recycled steel)	Reclaimed Salvaged Material from PCYC building - These materials are recovered from old buildings and reused in new construction. Examples include reclaimed bricks, wood, and metal. / Sustainable insulation Material made from recycled paper / wool and cotton.		Required	

S1

Step 2: Quantity of materials

Complete all blue cells that are applicable to the building. Leave items that aren't applicable blank.

Fill out blue cells

Material category	Sub-category 1	Sub-category 2	Sub-category 3	Value	Unit of measure	Comment	AIQS ACMM Code	ICMS3 (Level 3 Codes Construction)
Structure								
The structural parts of the building that are below ground (substructure) and above ground (superstructure). This includes fill below the substructure, foundations, basement levels, suspended floors, wall structure, roof structure, stairs, lift shafts and balconies. It excludes external areas such as hardstands, carparks, patios, etc.								
Coverage of structural material spend	-	-	-	80	%	Required. Coverage of spend for structural elements entered below. Minimum requirement = 80%. Exclude head contractor preliminaries and margins.		
Concrete in-situ	≤10 MPa	-	-	0.0	m³	Please enter reinforcing steel as part of "Reinforcing steel" below	01_SB or 02-11	02 or 03
Concrete in-situ	>10 MPa to ≤20 MPa	-	-	0.0	m³	Please enter reinforcing steel as part of "Reinforcing steel" below	01_SB or 02-11	02 or 03
Concrete in-situ	>20 MPa to ≤32 MPa	-	-	0.0	m³	Please enter reinforcing steel as part of "Reinforcing steel" below	01_SB or 02-11	02 or 03
Concrete in-situ	>32 MPa to ≤40 MPa	-	-	0.0	m³	Please enter reinforcing steel as part of "Reinforcing steel" below	01_SB or 02-11	02 or 03
Concrete in-situ	>40 MPa to ≤50 MPa	-	-	1,734.0	m³	Please enter reinforcing steel as part of "Reinforcing steel" below	01_SB or 02-11	02 or 03
Concrete in-situ	>50 MPa to ≤60 MPa	-	-	0.0	m³	Please enter reinforcing steel as part of "Reinforcing steel" below	01_SB or 02-11	02 or 03
Concrete in-situ	>60 MPa to ≤80 MPa	-	-	0.0	m³	Please enter reinforcing steel as part of "Reinforcing steel" below	01_SB or 02-11	02 or 03
Concrete in-situ	>80 MPa to ≤100 MPa	-	-	0.0	m³	Please enter reinforcing steel as part of "Reinforcing steel" below	01_SB or 02-11	02 or 03
Concrete in-situ	>100 MPa	-	-	0.0	m³	Please enter reinforcing steel as part of "Reinforcing steel" below	01_SB or 02-11	02 or 03
Concrete pre-cast panel	-	-	-	0.0	m³	Please enter reinforcing steel in relevant line items below. If not known at DA stage, please make your best estimate. If not known at CC stage, please ask your supplier.	01_SB or 02-11	02 or 03
Concrete block	Hollow core	-	-	0.0	m³	Enter as cubic metres, calculated as (area in m²) * (thickness in mm / 1000). Please include all block fill concrete and all reinforcing steel in relevant line items above/below.	01_SB	02 or 03
Concrete block/brick	Solid	-	-	0.0	m³	Enter as cubic metres, calculated as (area in m²) * (thickness in mm / 1000)	01_SB	02 or 03
Concrete block/brick	Solid AAC	-	-	0.0	m³	Solid Aerated Autoclaved Concrete (AAC) block. Enter as cubic metres, calculated as (area in m²) * (thickness in mm / 1000).	01_SB	02 or 03
Mortar	-	-	-	2	kg		01_SB	02 or 03
Reinforcing steel	Bar & mesh	-	-	188,192	kg	**Include all reinforcing steel bar/mesh in the building's structure in this row.** Usually this is calculated as kg/m³ per concrete element and then summed. Example: 10 m³ of 40 MPa concrete @ 100 kg/m³ + 5 m³ of 50 MPa concrete @ 150 kg/m³ = 1,750 kg reinforcing steel.	01_SB or 02-11	02 or 03
Reinforcing steel	Fibre & strand	-	-	24,012	kg	**Include all steel fibre reinforcing and steel strand in the building's structure in this row.**	01_SB or 02-11	02 or 03
Structural steel	Hot rolled structural	-	-	250	t	Examples include universal beams, universal columns and welded beams	01_SB	02 or 03
Structural steel	Cold formed structural	-	-	0	t	Examples include C purlins, Z purlins and all light gauge steel framing	01_SB	02 or 03
Structural steel	Other welded structural	-	-	0	t		01_SB	02 or 03
Structural steel	Plate	-	-	0	t	Include any allowance for connections here	01_SB	02 or 03
Structural steel	Sheet	-	-	0	t		01_SB	02 or 03
Stainless steel	-	-	-	0	t	Primarily for engineered timber structure connections	02_11	02 or 03
Reinforced concrete piles	Concrete	-	-	593	m³	Please enter reinforcing steel in the line below. If not known at DA stage, please make your best estimate. If not known at CC stage, please ask your supplier.	01_SB	02 or 03
Reinforced concrete piles	Steel reinforcing			88,977	kg	If not known at DA stage, please make your best estimate. If not known at CC stage, please ask your supplier.	01_SB	02 or 03
Steel piles	-	-	-	0	t	Where concrete and reinforcing steel are also used, enter these in the rows above.	01_SB	02 or 03
Timber poles/piles	-	-	-	0.0	m³	Where concrete and reinforcing steel are also used, enter these in the rows above.	01_SB	02 or 03
Timber (solid)	Sawn softwood	-	-	0.0	m³		02_11	02 or 03
Timber (solid)	Sawn hardwood	-	-	0.0	m³		02_11	02 or 03
Timber (engineered)	CLT	-	-	0.0	m³		02_11	02 or 03
Timber (engineered)	Glulam	-	-	0.0	m³		02_11	02 or 03
Timber (engineered)	LVL	-	-	0.0	m³		02_11	02 or 03
Timber (engineered)	OSB	-	-	0.0	m³	Enter as cubic metres, calculated as (area of wall in m²) * (thickness in mm / 1000)	02_11	02 or 03
Brick	Heat cured	-	-	0	m³	Enter as cubic metres, calculated as (area of wall in m²) * (thickness in mm / 1000)	02_11	02 or 03
Structural Insulated Panel (SIP)	Steel outer	-	-	0	m²		01_SB	02 or 03
Structural Insulated Panel (SIP)	Aluminium outer	-	-	0	m²		01_SB	02 or 03
Structural Insulated Panel (SIP)	Engineered timber outer	-	-	0	m²		01_SB	02 or 03
Fill	-	-	-	0	t	Include purchased material only. Exclude site-won material.	01_SB	01
Sand & gravel	-	-	-	0	t	Include purchased material only. Exclude site-won material and sand/gravel in concrete.	01_SB	01
Waterproofing membrane	Bituminous	-	-	0	m²		01_SB	01 or 02 or 03
Waterproofing membrane	Polyethylene	-	-	0	m²		01_SB	01 or 02 or 03
Other structural (Describe and add unit >>)		-	-	0.0		Please enter a description for any structural material that does not fit a predefined classification		
Other structural (Describe and add unit >>)		-	-	0.0		Please enter a description for any structural material that does not fit a predefined classification		
Other structural (Describe and add unit >>)		-	-	0.0		Please enter a description for any structural material that does not fit a predefined classification		
Envelope								
The skin of the building that separates the internal building from the external environment. This includes the roof cladding, wall cladding, windows, doors and internal/external shading. It also includes insulation and the internal wall lining of envelope walls.								
Coverage of envelope material spend	-	-	-	80	%	Required. Coverage of spend for the envelope items you have entered below. Minimum requirement = 80%. Exclude head contractor preliminaries and margins.		

Roof cladding	Profiled steel	-	-	1,520	m²	Enter as m² of roof area. Exclude allowances for overlap in the roofing sheets. This row includes all metal-coated and pre-painted steel sheets where steel is the base metal. Examples include: galvanised steel, zinc-aluminium (zincalume) coated steel and zinc-aluminium-magnesium (ZAM) coated steel, whether painted or unpainted.	05_RF	03 or 04
Roof cladding	Profiled aluminium	-	-	1,867	m²	Enter as m² of roof area. Exclude allowances for overlap in the roofing sheets. This row also includes pre-painted aluminium sheets.	05_RF	03 or 04
Roof cladding	Profiled zinc	-	-	0	m²	Enter as m² of roof area. Exclude allowances for overlap in the roofing sheets. This row also includes pre-painted zinc sheets.	05_RF	03 or 04
Roof cladding	Membrane	-	-	1,520	m²	Enter as m² of roof area. Exclude allowances for overlap in the membrane sheets.	05_RF	03 or 04
Roof cladding	Tiles (traditional clay)	-	-	0	m²	Enter as m² of roof area. Exclude allowances for overlap between the tiles.	05_RF	03 or 04
Roof cladding	Tiles (concrete)	-	-	0	m²	Enter as m² of roof area. Exclude allowances for overlap between the tiles.	05_RF	03 or 04
Roof cladding	Other (Please describe >>)		-	0	m²	Please enter a description for any roofing that does not fit a predefined classification	05_RF	03 or 04
Wall cladding	Bricks (heat cured)	-	-	325	m²	Enter as m² of wall area. Heat-cured bricks use a kiln or furnace to raise the brick temperature above ambient temperature during curing process.	06_EW	03 or 04
Wall cladding	Bricks (air dried)	-	-	0	m²	Enter as m² of wall area. Air-dried bricks are cured using ambient temperature.	06_EW	03 or 04
Wall cladding	Bricks (under fired)	-	-	0	m²	Enter as m² of wall area.	06_EW	03 or 04
Wall cladding	Bricks (concrete)	-	-	0	m²	Enter as m² of wall area	06_EW	03 or 04
Wall cladding	Mortar and render	-	-	0	kg		06_EW	03 or 04
Wall cladding	Profiled steel	-	-		m²	Enter as m² of wall area. Exclude allowances for overlap in the cladding sheets, offcuts, etc. This row includes all metal-coated and pre-painted steel sheets where steel is the base metal. Examples include: galvanised steel, zinc-aluminium (zincalume) coated steel and zinc-aluminium-magnesium (ZAM) coated steel, whether painted or unpainted.	06_EW	03 or 04
Wall cladding	Profiled aluminium	-	-	2,002	m²	Enter as m² of wall area. Exclude allowances for overlap in the cladding sheets, offcuts, etc. This row also includes pre-painted aluminium sheets.	06_EW	03 or 04
Wall cladding	Profiled zinc	-	-	0	m²	Enter as m² of wall area. Exclude allowances for overlap in the cladding sheets, offcuts, etc. This row also includes pre-painted zinc sheets.	06_EW	03 or 04
Wall cladding	GRC cladding	-	-	0	m²	Enter as m² of wall area. GRC = Glass Reinforced Concrete.	06_EW	03 or 04
Wall cladding	Timber weatherboards	-	-	0	m²	Enter as m² of wall area. Exclude allowances for overlap between weatherboards, offcuts, etc.	06_EW	03 or 04
Wall cladding	Fibre cement board	-	-	0	m²	Enter as m² of wall area. Exclude allowances for offcuts, etc.	06_EW	03 or 04
Wall cladding	Terracotta	-	-	0	m²	Enter as m² of wall area. Exclude allowances for offcuts, etc.	06_EW	03 or 04
Wall cladding	Brick tiles / veneers	-	-	0	m²	Enter as m² of wall area. Exclude allowances for offcuts, etc.	06_EW	03 or 04
Wall cladding	Plasterboard	-	-	0	m²	Enter as m² of wall area. Exclude allowances for offcuts, etc. Include both external wall linings and internal wall linings for envelope walls.	12_WF or 06_EW	03 or 04
Wall cladding	Plywood	-	-	0.0	m²	Enter as m² of wall area. Exclude allowances for offcuts, etc. Include both external wall linings and internal wall linings for envelope walls.	12_WF or 06_EW	03 or 04
Wall cladding	Other (Please describe >>)		-	0.0	m²	Please enter a description for any wall cladding that does not fit a predefined classification	06_EW or 12_WF	03 or 04
Windows & doors	Aluminium frame	Single glazed	-	978	m²	Include all single glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	Aluminium frame	Double glazed	-	0	m²	Include all double glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	Aluminium frame	Triple glazed	-	0	m²	Include all triple glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	Timber frame	Single glazed	-	0	m²	Include all single glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	Timber frame	Double glazed	-	0	m²	Include all double glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	Timber frame	Triple glazed	-	0	m²	Include all triple glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	uPVC frame	Single glazed	-	0	m²	Include all single glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	uPVC frame	Double glazed	-	0	m²	Include all double glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	uPVC frame	Triple glazed	-	0	m²	Include all triple glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	Frameless	Single glazed		0	m²	Include all single glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	Frameless	Double glazed		0	m²	Include all double glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	Frameless	Triple glazed		0	m²	Include all triple glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	Other (Please describe >>)		-	0	m²	Please enter a description for any windows or doors that do not fit a predefined classification	07_WW or 08_ED	03 or 04
Curtain wall	Single skin façade	Glazed panel	Single glazed	0	m²	Please declare all single-skin façade area in this section. All double-skin façade area should be entered in the next section. Include all single glazing, including standard, toughened, laminated and low-E	06_EW	03 or 04
Curtain wall	Single skin façade	Glazed panel	Double glazed	0	m²	Include all double glazing, including standard, toughened, laminated and low-E	06_EW	03 or 04
Curtain wall	Single skin façade	Glazed panel	Triple glazed	0	m²	Include all triple glazing, including standard, toughened, laminated and low-E	06_EW	03 or 04
Curtain wall	Single skin façade	Opaque panel	Aluminium cladding	0	m²		06_EW	03 or 04
Curtain wall	Single skin façade	Opaque panel	GRC cladding	0	m²	GRC = Glass-fibre Reinforced Concrete	06_EW	03 or 04
Curtain wall	Single skin façade	Opaque panel	Insulated shadow box	0	m²		06_EW	03 or 04
Curtain wall	Single skin façade	Opaque panel	Brick cladding	0	m²		06_EW	03 or 04
Curtain wall	Single skin façade	Opaque panel	Stone cladding	0	m²		06_EW	03 or 04
Curtain wall	Double skin façade	Glazed panel	Single glazed	0	m²	Please declare all double-skin façade area in this section. Please declare as the area of the curtain wall and do not enter the inner and outer skins twice. Include all single glazing, including standard, toughened, laminated and low-E.	06_EW	03 or 04
Curtain wall	Double skin façade	Glazed panel	Double glazed	0	m²	The type of glazing refers to the building's envelope wall, not including the outer skin	06_EW	03 or 04
Curtain wall	Double skin façade	Glazed panel	Triple glazed	0	m²	The type of glazing refers to the building's envelope wall, not including the outer skin	06_EW	03 or 04
Curtain wall	Double skin façade	Opaque panel	Aluminium cladding	0	m²		06_EW	03 or 04
Curtain wall	Double skin façade	Opaque panel	GRC cladding	0	m²	GRC = Glass-fibre Reinforced Concrete	06_EW	03 or 04
Curtain wall	Double skin façade	Opaque panel	Insulated shadow box	0	m²		06_EW	03 or 04
Curtain wall	Double skin façade	Opaque panel	Brick cladding	0	m²		06_EW	03 or 04

Curtain wall	Double skin façade	Opaque panel	Stone cladding	0	m²		06_EW	03 or 04
Curtain wall	Other (Please describe >>)		-	0	m²	Please enter a description for any curtain wall that does not fit a predefined classification	06_EW	03 or 04
Stick-framed wall system	Aluminium frame	Glazed section	Single glazed	0	m²	Include all single glazing, including standard, toughened, laminated and low-E	06_EW	03 or 04
Stick-framed wall system	Aluminium frame	Glazed section	Double glazed	0	m²	Include all double glazing, including standard, toughened, laminated and low-E	06_EW	03 or 04
Stick-framed wall system	Aluminium frame	Glazed section	Triple glazed	0	m²	Include all triple glazing, including standard, toughened, laminated and low-E	06_EW	03 or 04
Stick-framed wall system	Aluminium frame	Opaque section	Aluminium cladding	0	m²		06_EW	03 or 04
Stick-framed wall system	Aluminium frame	Opaque section	GRC cladding	0	m²	GRC = Glass-fibre Reinforced Concrete	06_EW	03 or 04
Stick-framed wall system	Aluminium frame	Opaque section	Insulated shadow box	0	m²		06_EW	03 or 04
Stick-framed wall system	Aluminium frame	Opaque section	Brick cladding	0	m²		06_EW	03 or 04
Stick-framed wall system	Aluminium frame	Opaque section	Stone cladding	0	m²		06_EW	03 or 04
Stick-framed wall system	Steel frame	Glazed section	Single glazed	0	m²	Include all single glazing, including standard, toughened, laminated and low-E	06_EW	03 or 04
Stick-framed wall system	Steel frame	Glazed section	Double glazed	0	m²	Include all double glazing, including standard, toughened, laminated and low-E	06_EW	03 or 04
Stick-framed wall system	Steel frame	Glazed section	Triple glazed	0	m²	Include all triple glazing, including standard, toughened, laminated and low-E	06_EW	03 or 04
Stick-framed wall system	Steel frame	Opaque section	Aluminium cladding	0	m²		06_EW	03 or 04
Stick-framed wall system	Steel frame	Opaque section	GRC cladding	0	m²	GRC = Glass-fibre Reinforced Concrete	06_EW	03 or 04
Stick-framed wall system	Steel frame	Opaque section	Insulated shadow box	0	m²		06_EW	03 or 04
Stick-framed wall system	Steel frame	Opaque section	Brick cladding	0	m²		06_EW	03 or 04
Stick-framed wall system	Steel frame	Opaque section	Stone cladding	0	m²		06_EW	03 or 04
Stick-framed wall system	Other (Please describe >>)		-	0	m²	Please enter a description for any wall system that does not fit a predefined classification	06_EW	03 or 04
Wall louvre system	Aluminium	-	-	61	m²		06_EW	03 or 04
External shading system	Aluminium frame	Aluminium cladding	-	1,270	m²	Please enter as m² of shaded area = linear metres * (width in mm / 1000)	06_EW	03 or 04
External shading system	Aluminium frame	GRC cladding	-	0	m²	Please enter as m² of shaded area = linear metres * (width in mm / 1000). GRC = Glass-fibre Reinforced Concrete.	06_EW	03 or 04
External shading system	Aluminium frame	Terracotta cladding	-	0	m²	Please enter as m² of shaded area = linear metres * (width in mm / 1000)	06_EW	03 or 04
External shading system	Aluminium frame	Stone cladding	-	0	m²	Please enter as m² of shaded area = linear metres * (width in mm / 1000)	06_EW	03 or 04
External shading system	Aluminium frame	Pre-cast concrete	-	0	m²	Please enter as m² of shaded area = linear metres * (width in mm / 1000)	06_EW	03 or 04
External shading system	Aluminium frame	Timber	-	0	m²	Please enter as m² of shaded area = linear metres * (width in mm / 1000)	06_EW	03 or 04
External shading system	Aluminium frame	Glass (opague)	-	0	m²	Please enter as m² of shaded area = linear metres * (width in mm / 1000)	06_EW	03 or 04
External shading system	Aluminium frame	Steel	-	0	m²	Please enter as m² of shaded area = linear metres * (width in mm / 1000)	06_EW	03 or 04
External shading system	Other (Please describe >>)		-	0	m²	Please enter as m² of shaded area = linear metres * (width in mm / 1000)	06_EW	03 or 04
Roller doors	Steel profile	-	-	0	m²	Please note unit is square metres, not quantity	08_ED	03 or 04
Roller doors	Hardwood over steel	-	-	0	m²	Please note unit is square metres, not quantity	08_ED	03 or 04
Roller doors	Softwood over steel	-	-	0	m²	Please note unit is square metres, not quantity	08_ED	03 or 04
Revolving doors	Glass/aluminium/steel	-	-	0	no.		08_ED	03 or 04
Fire-rated doors	Engineered timber	-	-	0	no.	Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2.	08_ED	03 or 04
Fire-rated doors	Steel	-	-	2	no.	Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2.	08_ED	03 or 04
Fire-rated doors	Aluminium/glass	-	-	6	no.	Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2.	08_ED	03 or 04
Insulation	Glass wool / fibreglass	-	-	3,500.0	m²	Please include both wall and ceiling insulation	05_RF or 06_EW	03 or 04
Insulation	Stone wool	-	-	0.0	m²	Please include both wall and ceiling insulation	05_RF or 06_EW	03 or 04
Insulation	Polyester	-	-	0.0	m²	Please include both wall and ceiling insulation	05_RF or 06_EW	03 or 04
Insulation	Expanded polystyrene	-	-	0.0	m²	Please include both wall and ceiling insulation	05_RF or 06_EW	03 or 04
Insulation	Other (Please describe >>)		-	0.0	m²	Please include both wall and ceiling insulation	05_RF or 06_EW	03 or 04
Other (Please describe and add unit >>)		-	-	0.0		Please enter a description for any envelope material that does not fit a predefined classification		
Other (Please describe and add unit >>)		-	-	0.0		Please enter a description for any envelope material that does not fit a predefined classification		
Other (Please describe and add unit >>)		-	-	0.0		Please enter a description for any envelope material that does not fit a predefined classification		

Permanent internal walls and doors

Walls and doors within the building that are either structural or designed to be permanent.

Coverage of material spend on permanent internal walls and doors				20	%	Enter the % coverage of spend for the items you have entered below. There is no minimum requirement: enter what you know. This should include all structural walls. Exclude head contractor preliminaries and margins.		
Interior wall (permanent)	Steel (light framing)	-	-	3	t		09_NW	03 or 04
Interior wall (permanent)	Timber framing	-	-	0.0	m³		09_NW	03 or 04
Interior wall (permanent)	AAC panel (reinforced)	-	-	0.0	m²	Panels of autoclaved aerated concrete (AAC) with reinforcing steel. E.g., Hebel.	09_NW or 12_WF	03 or 04
Interior wall (permanent)	Concrete-filled steel panel	-	-	0.0	m²	Panels made from a steel sheet outer with an aerated concrete core. E.g., Speedpanel.	09_NW or 12_WF	03 or 04
Interior wall (permanent)	Plasterboard	-	-	450	m²	Enter as single-layer equivalent. If using 2 layers, multiply the area by 2.	09_NW or 12_WF	03 or 04
Interior wall (permanent)	Plywood	-	-	0.0	m²	Enter as single-layer equivalent. If using 2 layers, multiply the area by 2.	09_NW or 12_WF	03 or 04
Interior wall (permanent)	Fibre cement sheet	-	-	80.0	m²	Enter as single-layer equivalent. If using 2 layers, multiply the area by 2.	09_NW or 12_WF	03 or 04
Interior wall (permanent)	Insulation	-	-	800.0	m²		09_NW or 12_WF	03 or 04
Interior wall (permanent)	Glass	-	-	150.0	m²		09_NW or 12_WF	03 or 04
Interior wall (permanent)	Other (Please describe >>)		-	0	m²	Please enter a description for any internal wall that does not fit a predefined classification	09_NW or 12_WF	03 or 04
Internal door (permanent)	Aluminium/glass	-	-	5	no.	Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2.	11_ND	03 or 04
Internal door (permanent)	Timber/glass	-	-	20	no.	Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2.	11_ND	03 or 04
Internal door (permanent)	Timber solid lightweight	-	-	0	no.	Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2.	11_ND	03 or 04
Internal door (permanent)	Fire resistant	-	-	3	no.	Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2.	11_ND	03 or 04

Internal door (permanent)	Steel	-	-	0	no.	Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2.	11_ND	03 or 04
Internal door (permanent)	Other (Please describe >>)		-	0	no.	Please enter a description for any internal door that does not fit a predefined classification	11_ND	03 or 04
Other (Please describe and add unit >>)		-	-	0.0		Please enter a description for any material that does not fit a predefined classification		
Other (Please describe and add unit >>)		-	-	0.0		Please enter a description for any material that does not fit a predefined classification		
Other (Please describe and add unit >>)		-	-	0.0		Please enter a description for any material that does not fit a predefined classification		

Services

				Unit of measure				
Building services included within the main building contract. If the building components that are the subject of the development application or the construction certificate are base building only, then only enter these items. If you cannot split services by type, please enter them all in the "Other services" category at the bottom. Enter all values as material costs in dollars.								
Mechanical services	-	-	-	1,688,240	AUD excl. GST	Where possible, enter material costs excluding labour, plant, equipment, margins and taxes	28_SS	05
Vertical transportation	-	-	-	138,628	AUD excl. GST	Where possible, enter material costs excluding labour, plant, equipment, margins and taxes	28_SS	05
Electrical services	-	-	-	1,190,000	AUD excl. GST	Electrical services including the main power supply, backup generators, security and communications. Excluding solar installations. Where possible, enter material costs excluding labour, plant, equipment, margins and taxes.	26_LP	05
Solar photovoltaic installations	-	-	-	200,000	AUD excl. GST	Where possible, enter material costs excluding labour, plant, equipment, margins and taxes	26_LP_LPGP	05
Plumbing/hydraulic services	-	-	-	594,120	AUD excl. GST	Where possible, enter material costs excluding labour, plant, equipment, margins and taxes	18_PD and 19_WS	05 or 06
Fire services				455,492	AUD excl. GST	Where possible, enter material costs excluding labour, plant, equipment, margins and taxes	25_FPSS04 or 39 XWAW_03 or 41_XF	05
Other services (Please describe)		-	-		AUD excl. GST	Please group all other services here, meaning that coverage will always be 100% for services. Enter only the material costs (excluding labour, plant, equipment, margins and taxes).	29_SS or multiple	

External works

The materials associated with hard landscaping and outbuildings on the site but outside the building envelope. This includes hardstands, carparks, driveways, covered walkways, decks, patios, awnings, fences, gates, etc. Soft landscaping should be excluded.								
Coverage of spend on external works	-	-	-	80	%	Required. Coverage of spend for external works (excluding soft landscaping) entered below. Minimum requirement = 80%. Exclude head contractor preliminaries and margins.		
Asphalt	-	-	-	0	t		33_XR	07
Concrete in-situ	≤10 MPa	-	-	0.0	m³	Please enter reinforcing steel as part of "Reinforcing steel" below	33_XR or 34_XN or 35_XB or 36_XL	07
Concrete in-situ	>10 MPa to ≤20 MPa	-	-	8.0	m³	Please enter reinforcing steel as part of "Reinforcing steel" below	33_XR or 34_XN or 35_XB or 36_XL	07
Concrete in-situ	>20 MPa to ≤32 MPa	-	-	0.0	m³	Please enter reinforcing steel as part of "Reinforcing steel" below	33_XR or 34_XN or 35_XB or 36_XL	07
Concrete in-situ	>32 MPa to ≤40 MPa	-	-	0.0	m³	Please enter reinforcing steel as part of "Reinforcing steel" below	33_XR or 34_XN or 35_XB or 36_XL	07
Concrete in-situ	>40 MPa to ≤50 MPa	-	-	0.0	m³	Please enter reinforcing steel as part of "Reinforcing steel" below	33_XR or 34_XN or 35_XB or 36_XL	07
Concrete in-situ	>50 MPa	-	-	0.0	m³	Please enter reinforcing steel as part of "Reinforcing steel" below	33_XR or 34_XN or 35_XB or 36_XL	07
Pavers, bricks and blocks	Concrete	-	-	1	m²		33_XR	07
Pavers, bricks and blocks	Clay	-	-	20	m²		33_XR	07
Reinforcing steel	Bar & mesh	-	-	5	kg	**Include all reinforcing steel bar/mesh in the external works in this row.** Usually this is calculated as kg/m³ per concrete element and then summed. Example: 10 m³ of 40 MPa concrete @ 100 kg/m³ + 5 m³ of 50 MPa concrete @ 150 kg/m³ = 1,750 kg reinforcing steel.	33_XR or 34_XN or 35_XB or 36_XL	07
Reinforcing steel	Fibre & strand	-	-	0	kg	**Include all steel fibre reinforcing and steel strand in the external works in this row.**	33_XR or 34_XN or 35_XB or 36_XL	07
Structural steel	-	-	-	0	t		02_11	07
Structural aluminium	-	-	-	0	t	Includes structures, louvre systems, etc.	35_XB	07
External roof/wall cladding	Polycarbonate	-	-	0	m²	Enter as profiled polycarbonate sheet that would ordered, including allowance for overlap	35_XB	07
External roof/wall cladding	PVC	-	-	0	m²	Enter as profiled PVC sheet that would ordered, including allowance for overlap	35_XB	07
External roof/wall cladding	Bitumen sheet	-	-	0	m²	Enter as bituminous sheet that would ordered, including allowance for overlap	35_XB	07
External roof/wall cladding	Steel profile	-	-		m²	Enter as profiled steel sheet that would ordered, including allowance for overlap	35_XB	07
Fill	-	-	-	207	m3	Include purchased material only. Exclude site-won material.	33_XR or 34_XN or 35_XB or 36_XL	07
Sand & gravel	-	-	-	0	t	Include purchased material only. Exclude site-won material and sand/gravel in concrete.	33_XR or 34_XN or 35_XB or 36_XL	07
Timber (solid)	Sawn softwood	-	-	0.0	m³		33_XR or 34_XN or 35_XB or 36_XL	07
Timber (solid)	Sawn hardwood	-	-	0.0	m³		33_XR or 34_XN or 35_XB or 36_XL	07
Timber (engineered)	CLT	-	-	0.0	m³		33_XR or 34_XN or 35_XB or 36_XL	07
Timber (engineered)	Glulam	-	-	0.0	m³		33_XR or 34_XN or 35_XB or 36_XL	07
Timber (engineered)	LVL	-	-	0.0	m³		33_XR or 34_XN or 35_XB or 36_XL	07
Timber (engineered)	OSB	-	-	0.0	m³		33_XR or 34_XN or 35_XB or 36_XL	07
Fabric (awning/sunshade)				0.0	m²		35_XB or 36_XL	07
Other (Please describe and add unit >>)		-	-			Please enter a description for any external works that does not fit a predefined classification		
Other (Please describe and add unit >>)		-	-			Please enter a description for any external works that does not fit a predefined classification		
Other (Please describe and add unit >>)		-	-			Please enter a description for any external works that does not fit a predefined classification		

S1

Step 3: Certifier details

Fill out blue cells

The material quantities must be determined through an itemised list of building materials (such as a bill of quantities) and certified by a quantity surveyor, designer, engineer or NABERS Assessor.

Person that completed this form	Value	Note
Name	Tom Drazina	Required
Company	Hickory Constructions Redfern Pty Ltd as trustee for the Hickory Constructions Redfern Unit Trust	Required
ABN	12960938352	
Profession	Main Contractor	Required
Qualification or registration	Bachelor of Construction, UTS	Required

Person that certified the details in this form	Value	Note
Name	Kelvin Perrie	Required
Company	MBMpl	Required
ABN	74 099 962 231	
Profession	Quantity Surveyor	Required
Qualification or registration	Bachelor of Construction Mgt and Property, UNSW	Required

Confirmation of certification	Value	Note
Are 80% of material costs captured for the building's structure, envelope and external works?	Yes	Required
If no - why not?		

Additional comments from data provider

Additional comments of certifier

Attach this Excel spreadsheet to your development application or construction certificate application.

S4

Step 1: About the building

Fill out blue cells

Building location and site data	Value	Unit	Note	Comment
Building address	600-660 Elizabeth Street			
Postcode	2016		Required	Postcode of building
Town/city	REDFERN		Town/city/suburb/region automated from postcode (may not give exact town name)	Town/city/suburb/region of the building site.
Distance to nearest major city/town	6	km	Enter for rural/regional locations only	Declare the shortest route by road to your site from the centre of your nearest major city (>100,000 people). The route must be traversable by a semitrailer truck.
Project stage	Development Application		Required	Stage of development
New build or major renovation?	New build		Required	
Brownfield or greenfield site?	Brownfield		Required	

Floor area by NCC building classification	Gross (GFA)	Net (NLA/NSA/UFA)	Unit	Note	
Please enter all floor areas relevant to your building. Leave areas blank if not applicable. Please enter Gross Floor Area (GFA) for all building classifications. Please also enter the corresponding net area (Net Lettable Area, Net Sellable Area or Usable Floor Area) where it is commonly used for that building classification.					
Class 1a: Detached residential buildings			m²	Required for Class 1a: Detached residential houses, townhouses	Gross Floor Area (GFA), as defined by the AIQS Australian Cost Management Manual
Class 1b: Boarding houses and hostels			m²	Required for Class 1b: Boarding house, guest house, hostel	Net area (Net Lettable Area, Net Sellable Area, Usable Floor Area), as defined by the PCA's Method of Measurement
Class 2: Multi-unit residential buildings			m²	Required for Class 2: Multi-unit residential, including apartment buildings	
Class 3: Other residential buildings			m²	Required for Class 3: Other residential buildings	
Class 4: Residential inside non-residential			m²	Required for Class 4: Residential building inside a non-residential building, e.g., caretaker residence	
Class 5: Office buildings		1,250	m²	Required for Class 5: Office building	
Class 6: Retail buildings			m²	Required for Class 6: Retail building, e.g., shop, restaurant, café	
Class 7a: Carparks			m²	Required for Class 7a: Carparks	
Class 7b: Warehouse-type buildings			m²	Required for Class 7b: Warehouses, wholesalers and storage facilities	
Class 8: Industrial buildings			m²	Required for Class 8: Industrial buildings, e.g., factories and workshops	
Class 9a: Healthcare buildings			m²	Required for Class 9a: Healthcare, e.g., hospitals, clinics, day surgeries	
Class 9b: Civic buildings			m²	Required for Class 9b: Civic buildings, e.g., theatres, civic centres, train stations	
Class 9c: Aged care and personal care buildings			m²	Required for Class 9c: Aged care and personal care	
Class 10a: Non-habitable buildings			m²	Required for Class 10a: Non-habitable buildings including sheds, carports and private garages	
Class 10b: Miscellaneous structures			m²	Required for Class 10b: Miscellaneous structures, including fences, masts, antennas, retaining walls and swimming pools	
Class 10c: Bushfire shelters			m²	Required for Class 10c: Bushfire shelters not attached to a Class 1a building	
Total	0	1,250	m²	Required: Sum of m² inputs must be more than 0.	

Project information	Value	Unit	Note	
Total cost of project		AUD excl. GST	Required	Include labour, materials, transport, plant, equipment and professional fees. Exclude GST, land, finance, escalation and other costs.
Building design life	80	years	Required	If uncertain, enter 50 years
Estimated envelope life	60	years	Optional	
Estimated replacement cycle for mechanical services	15	years	Optional	
Estimated replacement cycle for vertical transportation	20	years	Optional	

Dimensions of the building and the site	Value	Unit	Note	
Site area		m²	Required	Total area of site to external boundary.
Shared services or infrastructure	Yes		Required	Indicate if there are shared services that the building utilises, or shared foundations, basement or podium
Building footprint area	1,250	m²	Required	Total floor area of the ground floor measured to the outside edge of the floorplate.
Typical floor area (if different to building footprint area)	1,250	m²	Only needed if different to row above	
Typical floor perimeter	162	m	Required	
Area of external carpark (not included in GFA)	0	m^2	Required. Enter 0 if not applicable.	
Area of external hardstand (not included in GFA)	0	m^2	Required. Enter 0 if not applicable.	
Area of other hard landscaping (not included in GFA)	0	m^2	Required. Enter 0 if not applicable.	Include all other impervious areas. For example, patios, paths and driveways (not already included in carparks and hardstands above).
Number of floors/storeys above ground, including ground floor	1	no.	Required	
Number of floors/storeys below ground	1	no.	Required. Enter 0 if not applicable.	
Number of floors/storeys of car parking	1	no.	Required. Enter 0 if not applicable.	
Total height above ground	4	m	Required	Measured from the average finished grade to the highest point of the building, excluding protrusions (lighting rods, masts, chimneys, etc.)

Structural material choices	Value	Unit	Note	
Foundation type	Piles		Required	
Frame type (dominant)	Reinforced concrete		Required	
Suspended floor type (typical)	Reinforced concrete		Only needed for multi-storey buildings	
Describe low carbon materials specified in your building (e.g. green concrete, low carbon bricks)	Low carbon concrete / high performance glazing		Required	
Describe recycled content specified in your building (e.g. recycled steel)	Sustainable insulation Material made from recycled paper / wool and cotton.		Required	

Step 2: Quantity of materials

Complete all blue cells that are applicable to the building. Leave items that aren't applicable blank.

Fill out blue cells

Material category	Sub-category 1	Sub-category 2	Sub-category 3	Value	Unit of measure	Comment	AIQS ACMM Code	ICMS3 (Level 3 Codes Construction)
Structure								
The structural parts of the building that are below ground (substructure) and above ground (superstructure). This includes fill below the substructure, foundations, basement levels, suspended floors, wall structure, roof structure, stairs, lift shafts and balconies. It excludes external areas such as hardstands, carparks, patios, etc.								
Coverage of structural material spend	-	-	-	80	%	Required. Coverage of spend for structural elements entered below. Minimum requirement = 80%. Exclude head contractor preliminaries and margins.		
Concrete in-situ	≤10 MPa	-	-	0.0	m³	Please enter reinforcing steel as part of "Reinforcing steel" below	01_SB or 02-11	02 or 03
Concrete in-situ	>10 MPa to ≤20 MPa	-	-	0.0	m³	Please enter reinforcing steel as part of "Reinforcing steel" below	01_SB or 02-11	02 or 03
Concrete in-situ	>20 MPa to ≤32 MPa	-	-	0.0	m³	Please enter reinforcing steel as part of "Reinforcing steel" below	01_SB or 02-11	02 or 03
Concrete in-situ	>32 MPa to ≤40 MPa	-	-	0.0	m³	Please enter reinforcing steel as part of "Reinforcing steel" below	01_SB or 02-11	02 or 03
Concrete in-situ	>40 MPa to ≤50 MPa	-	-	464.0	m³	Please enter reinforcing steel as part of "Reinforcing steel" below	01_SB or 02-11	02 or 03
Concrete in-situ	>50 MPa to ≤60 MPa	-	-	0.0	m³	Please enter reinforcing steel as part of "Reinforcing steel" below	01_SB or 02-11	02 or 03
Concrete in-situ	>60 MPa to ≤80 MPa	-	-	0.0	m³	Please enter reinforcing steel as part of "Reinforcing steel" below	01_SB or 02-11	02 or 03
Concrete in-situ	>80 MPa to ≤100 MPa	-	-	0.0	m³	Please enter reinforcing steel as part of "Reinforcing steel" below	01_SB or 02-11	02 or 03
Concrete in-situ	>100 MPa	-	-	0.0	m³	Please enter reinforcing steel as part of "Reinforcing steel" below	01_SB or 02-11	02 or 03
Concrete pre-cast panel	-	-	-	0.0	m³	Please enter reinforcing steel in relevant line items below. If not known at DA stage, please make your best estimate. If not known at CC stage, please ask your supplier.	01_SB or 02-11	02 or 03
Concrete block	Hollow core	-	-	0.0	m³	Enter as cubic metres, calculated as (area in m²) * (thickness in mm / 1000). Please include all block fill concrete and all reinforcing steel in relevant line items above/below.	01_SB	02 or 03
Concrete block/brick	Solid	-	-	0.0	m³	Enter as cubic metres, calculated as (area in m²) * (thickness in mm / 1000)	01_SB	02 or 03
Concrete block/brick	Solid AAC	-	-	0	m³	Solid Aerated Autoclaved Concrete (AAC) block. Enter as cubic metres, calculated as (area in m²) * (thickness in mm / 1000).	01_SB	02 or 03
Mortar	-	-	-	0	kg		01_SB	02 or 03
Reinforcing steel	Bar & mesh	-	-	57,991	kg	**Include all reinforcing steel bar/mesh in the building's structure in this row.** Usually this is calculated as kg/m³ per concrete element and then summed. Example: 10 m³ of 40 MPa concrete @ 100 kg/m³ + 5 m³ of 50 MPa concrete @ 150 kg/m³ = 1,750 kg reinforcing steel.	01_SB or 02-11	02 or 03
Reinforcing steel	Fibre & strand	-	-	8,174	kg	**Include all steel fibre reinforcing and steel strand in the building's structure in this row.**	01_SB or 02-11	02 or 03
Structural steel	Hot rolled structural	-	-	0	t	Examples include universal beams, universal columns and welded beams	01_SB	02 or 03
Structural steel	Cold formed structural	-	-	0	t	Examples include C purlins, Z purlins and all light gauge steel framing	01_SB	02 or 03
Structural steel	Other welded structural	-	-	0	t		01_SB	02 or 03
Structural steel	Plate	-	-	0	t	Include any allowance for connections here	01_SB	02 or 03
Structural steel	Sheet	-	-	0	t		01_SB	02 or 03
Stainless steel	-	-	-	0	t	Primarily for engineered timber structure connections	02_11	02 or 03
Reinforced concrete piles	Concrete	-	-	51	m³	Please enter reinforcing steel in the line below. If not known at DA stage, please make your best estimate. If not known at CC stage, please ask your supplier.	01_SB	02 or 03
Reinforced concrete piles	Steel reinforcing			7,630	kg	If not known at DA stage, please make your best estimate. If not known at CC stage, please ask your supplier.	01_SB	02 or 03
Steel piles	-	-	-	0	t	Where concrete and reinforcing steel are also used, enter these in the rows above.	01_SB	02 or 03
Timber poles/piles	-	-	-	0.0	m³	Where concrete and reinforcing steel are also used, enter these in the rows above.	01_SB	02 or 03
Timber (solid)	Sawn softwood	-	-	0.0	m³		02_11	02 or 03
Timber (solid)	Sawn hardwood	-	-	0.0	m³		02_11	02 or 03
Timber (engineered)	CLT	-	-	0.0	m³		02_11	02 or 03
Timber (engineered)	Glulam	-	-	0.0	m³		02_11	02 or 03
Timber (engineered)	LVL	-	-	0.0	m³		02_11	02 or 03
Timber (engineered)	OSB	-	-	0.0	m³	Enter as cubic metres, calculated as (area of wall in m²) * (thickness in mm / 1000)	02_11	02 or 03
Brick	Heat cured	-	-	0	m³	Enter as cubic metres, calculated as (area of wall in m²) * (thickness in mm / 1000)	02_11	02 or 03
Structural Insulated Panel (SIP)	Steel outer	-	-	0	m²		01_SB	02 or 03
Structural Insulated Panel (SIP)	Aluminium outer	-	-	0	m²		01_SB	02 or 03
Structural Insulated Panel (SIP)	Engineered timber outer	-	-	0	m²		01_SB	02 or 03
Fill	-	-	-	0	t	Include purchased material only. Exclude site-won material.	01_SB	01
Sand & gravel	-	-	-	0	t	Include purchased material only. Exclude site-won material and sand/gravel in concrete.	01_SB	01
Waterproofing membrane	Bituminous	-	-	0	m²		01_SB	01 or 02 or 03
Waterproofing membrane	Polyethylene	-	-	0	m²		01_SB	01 or 02 or 03
Other structural (Describe and add unit >>)		-	-	0.0		Please enter a description for any structural material that does not fit a predefined classification		
Other structural (Describe and add unit >>)		-	-	0.0		Please enter a description for any structural material that does not fit a predefined classification		
Other structural (Describe and add unit >>)		-	-	0.0		Please enter a description for any structural material that does not fit a predefined classification		
Envelope								
The skin of the building that separates the internal building from the external environment. This includes the roof cladding, wall cladding, windows, doors and internal/external shading. It also includes insulation and the internal wall lining of envelope walls.								
Coverage of envelope material spend	-	-	-	80	%	Required. Coverage of spend for the envelope items you have entered below. Minimum requirement = 80%. Exclude head contractor preliminaries and margins.		

Roof cladding	Profiled steel	-	-	1,580	m²	Enter as m² of roof area. Exclude allowances for overlap in the roofing sheets. This row includes all metal-coated and pre-painted steel sheets where steel is the base metal. Examples include: galvanised steel, zinc-aluminium (zincalume) coated steel and zinc-aluminium-magnesium (ZAM) coated steel, whether painted or unpainted.	05_RF	03 or 04
Roof cladding	Profiled aluminium	-	-	0	m²	Enter as m² of roof area. Exclude allowances for overlap in the roofing sheets. This row also includes pre-painted aluminium sheets.	05_RF	03 or 04
Roof cladding	Profiled zinc	-	-	0	m²	Enter as m² of roof area. Exclude allowances for overlap in the roofing sheets. This row also includes pre-painted zinc sheets.	05_RF	03 or 04
Roof cladding	Membrane	-	-	1,580	m²	Enter as m² of roof area. Exclude allowances for overlap in the membrane sheets.	05_RF	03 or 04
Roof cladding	Tiles (traditional clay)	-	-	0	m²	Enter as m² of roof area. Exclude allowances for overlap between the tiles.	05_RF	03 or 04
Roof cladding	Tiles (concrete)	-	-	0	m²	Enter as m² of roof area. Exclude allowances for overlap between the tiles.	05_RF	03 or 04
Roof cladding	Other (Please describe >>)		-	0	m²	Please enter a description for any roofing that does not fit a predefined classification	05_RF	03 or 04
Wall cladding	Bricks (heat cured)	-	-	0	m²	Enter as m² of wall area. Heat-cured bricks use a kiln or furnace to raise the brick temperature above ambient temperature during curing process.	06_EW	03 or 04
Wall cladding	Bricks (air dried)	-	-	0	m²	Enter as m² of wall area. Air-dried bricks are cured using ambient temperature.	06_EW	03 or 04
Wall cladding	Bricks (under fired)	-	-	1,156	m²	Enter as m² of wall area.	06_EW	03 or 04
Wall cladding	Bricks (concrete)	-	-	0	m²	Enter as m² of wall area	06_EW	03 or 04
Wall cladding	Mortar and render	-	-	0	kg		06_EW	03 or 04
Wall cladding	Profiled steel	-	-	0	m²	Enter as m² of wall area. Exclude allowances for overlap in the cladding sheets, offcuts, etc. This row includes all metal-coated and pre-painted steel sheets where steel is the base metal. Examples include: galvanised steel, zinc-aluminium (zincalume) coated steel and zinc-aluminium-magnesium (ZAM) coated steel, whether painted or unpainted.	06_EW	03 or 04
Wall cladding	Profiled aluminium	-	-	0	m²	Enter as m² of wall area. Exclude allowances for overlap in the cladding sheets, offcuts, etc. This row also includes pre-painted aluminium sheets.	06_EW	03 or 04
Wall cladding	Profiled zinc	-	-	287	m²	Enter as m² of wall area. Exclude allowances for overlap in the cladding sheets, offcuts, etc. This row also includes pre-painted zinc sheets.	06_EW	03 or 04
Wall cladding	GRC cladding	-	-	0	m²	Enter as m² of wall area. GRC = Glass Reinforced Concrete.	06_EW	03 or 04
Wall cladding	Timber weatherboards	-	-	0	m²	Enter as m² of wall area. Exclude allowances for overlap between weatherboards, offcuts, etc.	06_EW	03 or 04
Wall cladding	Fibre cement board	-	-	115	m²	Enter as m² of wall area. Exclude allowances for offcuts, etc.	06_EW	03 or 04
Wall cladding	Terracotta	-	-	0	m²	Enter as m² of wall area. Exclude allowances for offcuts, etc.	06_EW	03 or 04
Wall cladding	Brick tiles / veneers	-	-	0	m²	Enter as m² of wall area. Exclude allowances for offcuts, etc.	06_EW	03 or 04
Wall cladding	Plasterboard	-	-	0	m²	Enter as m² of wall area. Exclude allowances for offcuts, etc. Include both external wall linings and internal wall linings for envelope walls.	12_WF or 06_EW	03 or 04
Wall cladding	Plywood	-	-	0.0	m²	Enter as m² of wall area. Exclude allowances for offcuts, etc. Include both external wall linings and internal wall linings for envelope walls.	12_WF or 06_EW	03 or 04
Wall cladding	Other (Please describe >>)		-	0.0	m²	Please enter a description for any wall cladding that does not fit a predefined classification	06_EW or 12_WF	03 or 04
Windows & doors	Aluminium frame	Single glazed	-	2,000	m²	Include all single glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	Aluminium frame	Double glazed	-	0	m²	Include all double glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	Aluminium frame	Triple glazed	-	0	m²	Include all triple glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	Timber frame	Single glazed	-	0	m²	Include all single glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	Timber frame	Double glazed	-	0	m²	Include all double glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	Timber frame	Triple glazed	-	0	m²	Include all triple glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	uPVC frame	Single glazed	-	0	m²	Include all single glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	uPVC frame	Double glazed	-	0	m²	Include all double glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	uPVC frame	Triple glazed	-	0	m²	Include all triple glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	Frameless	Single glazed		0	m²	Include all single glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	Frameless	Double glazed		0	m²	Include all double glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	Frameless	Triple glazed		0	m²	Include all triple glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	Other (Please describe >>)		-	0	m²	Please enter a description for any windows or doors that do not fit a predefined classification	07_WW or 08_ED	03 or 04
Curtain wall	Single skin façade	Glazed panel	Single glazed	0	m²	Please declare all single-skin façade area in this section. All double-skin façade area should be entered in the next section. Include all single glazing, including standard, toughened, laminated and low-E	06_EW	03 or 04
Curtain wall	Single skin façade	Glazed panel	Double glazed	0	m²	Include all double glazing, including standard, toughened, laminated and low-E	06_EW	03 or 04
Curtain wall	Single skin façade	Glazed panel	Triple glazed	0	m²	Include all triple glazing, including standard, toughened, laminated and low-E	06_EW	03 or 04
Curtain wall	Single skin façade	Opaque panel	Aluminium cladding	0	m²		06_EW	03 or 04
Curtain wall	Single skin façade	Opaque panel	GRC cladding	0	m²	GRC = Glass-fibre Reinforced Concrete	06_EW	03 or 04
Curtain wall	Single skin façade	Opaque panel	Insulated shadow box	0	m²		06_EW	03 or 04
Curtain wall	Single skin façade	Opaque panel	Brick cladding	0	m²		06_EW	03 or 04
Curtain wall	Single skin façade	Opaque panel	Stone cladding	0	m²		06_EW	03 or 04
Curtain wall	Double skin façade	Glazed panel	Single glazed	0	m²	Please declare all double-skin façade area in this section. Please declare as the area of the curtain wall and do not enter the inner and outer skins twice. Include all single glazing, including standard, toughened, laminated and low-E.	06_EW	03 or 04
Curtain wall	Double skin façade	Glazed panel	Double glazed	0	m²	The type of glazing refers to the building's envelope wall, not including the outer skin	06_EW	03 or 04
Curtain wall	Double skin façade	Glazed panel	Triple glazed	0	m²	The type of glazing refers to the building's envelope wall, not including the outer skin	06_EW	03 or 04
Curtain wall	Double skin façade	Opaque panel	Aluminium cladding	0	m²		06_EW	03 or 04
Curtain wall	Double skin façade	Opaque panel	GRC cladding	0	m²	GRC = Glass-fibre Reinforced Concrete	06_EW	03 or 04
Curtain wall	Double skin façade	Opaque panel	Insulated shadow box	0	m²		06_EW	03 or 04
Curtain wall	Double skin façade	Opaque panel	Brick cladding	0	m²		06_EW	03 or 04

Curtain wall	Double skin façade	Opaque panel	Stone cladding	0	m²		06_EW	03 or 04
Curtain wall	Other (Please describe >>)		-	0	m²	Please enter a description for any curtain wall that does not fit a predefined classification	06_EW	03 or 04
Stick-framed wall system	Aluminium frame	Glazed section	Single glazed	0	m²	Include all single glazing, including standard, toughened, laminated and low-E	06_EW	03 or 04
Stick-framed wall system	Aluminium frame	Glazed section	Double glazed	0	m²	Include all double glazing, including standard, toughened, laminated and low-E	06_EW	03 or 04
Stick-framed wall system	Aluminium frame	Glazed section	Triple glazed	0	m²	Include all triple glazing, including standard, toughened, laminated and low-E	06_EW	03 or 04
Stick-framed wall system	Aluminium frame	Opaque section	Aluminium cladding	0	m²		06_EW	03 or 04
Stick-framed wall system	Aluminium frame	Opaque section	GRC cladding	0	m²	GRC = Glass-fibre Reinforced Concrete	06_EW	03 or 04
Stick-framed wall system	Aluminium frame	Opaque section	Insulated shadow box	0	m²		06_EW	03 or 04
Stick-framed wall system	Aluminium frame	Opaque section	Brick cladding	0	m²		06_EW	03 or 04
Stick-framed wall system	Aluminium frame	Opaque section	Stone cladding	0	m²		06_EW	03 or 04
Stick-framed wall system	Steel frame	Glazed section	Single glazed	0	m²	Include all single glazing, including standard, toughened, laminated and low-E	06_EW	03 or 04
Stick-framed wall system	Steel frame	Glazed section	Double glazed	0	m²	Include all double glazing, including standard, toughened, laminated and low-E	06_EW	03 or 04
Stick-framed wall system	Steel frame	Glazed section	Triple glazed	0	m²	Include all triple glazing, including standard, toughened, laminated and low-E	06_EW	03 or 04
Stick-framed wall system	Steel frame	Opaque section	Aluminium cladding	0	m²		06_EW	03 or 04
Stick-framed wall system	Steel frame	Opaque section	GRC cladding	0	m²	GRC = Glass-fibre Reinforced Concrete	06_EW	03 or 04
Stick-framed wall system	Steel frame	Opaque section	Insulated shadow box	0	m²		06_EW	03 or 04
Stick-framed wall system	Steel frame	Opaque section	Brick cladding	0	m²		06_EW	03 or 04
Stick-framed wall system	Steel frame	Opaque section	Stone cladding	0	m²		06_EW	03 or 04
Stick-framed wall system	Other (Please describe >>)		-	0	m²	Please enter a description for any wall system that does not fit a predefined classification	06_EW	03 or 04
Wall louvre system	Aluminium	-	-	0	m²		06_EW	03 or 04
External shading system	Aluminium frame	Aluminium cladding	-	0	m²	Please enter as m² of shaded area = linear metres * (width in mm / 1000)	06_EW	03 or 04
External shading system	Aluminium frame	GRC cladding	-	30	m²	Please enter as m² of shaded area = linear metres * (width in mm / 1000). GRC = Glass-fibre Reinforced Concrete.	06_EW	03 or 04
External shading system	Aluminium frame	Terracotta cladding	-	0	m²	Please enter as m² of shaded area = linear metres * (width in mm / 1000)	06_EW	03 or 04
External shading system	Aluminium frame	Stone cladding	-	0	m²	Please enter as m² of shaded area = linear metres * (width in mm / 1000)	06_EW	03 or 04
External shading system	Aluminium frame	Pre-cast concrete	-	0	m²	Please enter as m² of shaded area = linear metres * (width in mm / 1000)	06_EW	03 or 04
External shading system	Aluminium frame	Timber	-	0	m²	Please enter as m² of shaded area = linear metres * (width in mm / 1000)	06_EW	03 or 04
External shading system	Aluminium frame	Glass (opague)	-	0	m²	Please enter as m² of shaded area = linear metres * (width in mm / 1000)	06_EW	03 or 04
External shading system	Aluminium frame	Steel	-	0	m²	Please enter as m² of shaded area = linear metres * (width in mm / 1000)	06_EW	03 or 04
External shading system	Other (Please describe >>)		-	0	m²	Please enter as m² of shaded area = linear metres * (width in mm / 1000)	06_EW	03 or 04
Roller doors	Steel profile	-	-	9	m²	Please note unit is square metres, not quantity	08_ED	03 or 04
Roller doors	Hardwood over steel	-	-	0	m²	Please note unit is square metres, not quantity	08_ED	03 or 04
Roller doors	Softwood over steel	-	-	0	m²	Please note unit is square metres, not quantity	08_ED	03 or 04
Revolving doors	Glass/aluminium/steel	-	-	0	no.		08_ED	03 or 04
Fire-rated doors	Engineered timber	-	-	0	no.	Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2.	08_ED	03 or 04
Fire-rated doors	Steel	-	-	10	no.	Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2.	08_ED	03 or 04
Fire-rated doors	Aluminium/glass	-	-	0	no.	Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2.	08_ED	03 or 04
Insulation	Glass wool / fibreglass	-	-	0.0	m²	Please include both wall and ceiling insulation	05_RF or 06_EW	03 or 04
Insulation	Stone wool	-	-	0.0	m²	Please include both wall and ceiling insulation	05_RF or 06_EW	03 or 04
Insulation	Polyester	-	-	0.0	m²	Please include both wall and ceiling insulation	05_RF or 06_EW	03 or 04
Insulation	Expanded polystyrene	-	-	0.0	m²	Please include both wall and ceiling insulation	05_RF or 06_EW	03 or 04
Insulation	Other (Please describe >>)		-	0.0	m²	Please include both wall and ceiling insulation	05_RF or 06_EW	03 or 04
Other (Please describe and add unit >>)		-	-	0.0		Please enter a description for any envelope material that does not fit a predefined classification		
Other (Please describe and add unit >>)		-	-			Please enter a description for any envelope material that does not fit a predefined classification		
Other (Please describe and add unit >>)		-	-			Please enter a description for any envelope material that does not fit a predefined classification		

Permanent internal walls and doors

Walls and doors within the building that are either structural or designed to be permanent.

Coverage of material spend on permanent internal walls and doors				20	%	Enter the % coverage of spend for the items you have entered below. There is no minimum requirement: enter what you know. This should include all structural walls. Exclude head contractor preliminaries and margins.		
Interior wall (permanent)	Steel (light framing)	-	-	5	t		09_NW	03 or 04
Interior wall (permanent)	Timber framing	-	-	0.0	m³		09_NW	03 or 04
Interior wall (permanent)	AAC panel (reinforced)	-	-	0.0	m²	Panels of autoclaved aerated concrete (AAC) with reinforcing steel. E.g., Hebel.	09_NW or 12_WF	03 or 04
Interior wall (permanent)	Concrete-filled steel panel	-	-	0.0	m²	Panels made from a steel sheet outer with an aerated concrete core. E.g., Speedpanel.	09_NW or 12_WF	03 or 04
Interior wall (permanent)	Plasterboard	-	-	6,282	m²	Enter as single-layer equivalent. If using 2 layers, multiply the area by 2.	09_NW or 12_WF	03 or 04
Interior wall (permanent)	Plywood	-	-	500.0	m²	Enter as single-layer equivalent. If using 2 layers, multiply the area by 2.	09_NW or 12_WF	03 or 04
Interior wall (permanent)	Fibre cement sheet	-	-	420.0	m²	Enter as single-layer equivalent. If using 2 layers, multiply the area by 2.	09_NW or 12_WF	03 or 04
Interior wall (permanent)	Insulation	-	-	6,282.0	m²		09_NW or 12_WF	03 or 04
Interior wall (permanent)	Glass	-	-	350.0	m²		09_NW or 12_WF	03 or 04
Interior wall (permanent)	Other (Please describe >>)		-	0	m²	Please enter a description for any internal wall that does not fit a predefined classification	09_NW or 12_WF	03 or 04
Internal door (permanent)	Aluminium/glass	-	-	158	no.	Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2.	11_ND	03 or 04
Internal door (permanent)	Timber/glass	-	-	0	no.	Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2.	11_ND	03 or 04
Internal door (permanent)	Timber solid lightweight	-	-	0	no.	Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2.	11_ND	03 or 04
Internal door (permanent)	Fire resistant	-	-	10	no.	Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2.	11_ND	03 or 04

Internal door (permanent)	Steel	-	-	0	no.	Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2.	11_ND	03 or 04
Internal door (permanent)	Other (Please describe >>)	roller door	-	1	no.	Please enter a description for any internal door that does not fit a predefined classification	11_ND	03 or 04
Other (Please describe and add unit >>)		-	-	0.0		Please enter a description for any material that does not fit a predefined classification		
Other (Please describe and add unit >>)		-	-	0.0		Please enter a description for any material that does not fit a predefined classification		
Other (Please describe and add unit >>)		-	-	0.0		Please enter a description for any material that does not fit a predefined classification		

Services

					Unit of measure			
Building services included within the main building contract. If the building components that are the subject of the development application or the construction certificate are base building only, then only enter these items. If you cannot split services by type, please enter them all in the "Other services" category at the bottom. Enter all values as material costs in dollars.								
Mechanical services	-	-	-	195,192	AUD excl. GST	Where possible, enter material costs excluding labour, plant, equipment, margins and taxes	28_SS	05
Vertical transportation	-	-	-		AUD excl. GST	Where possible, enter material costs excluding labour, plant, equipment, margins and taxes	28_SS	05
Electrical services	-	-	-	212,197	AUD excl. GST	Electrical services including the main power supply, backup generators, security and communications. Excluding solar installations. Where possible, enter material costs excluding labour, plant, equipment, margins and taxes.	26_LP	05
Solar photovoltaic installations	-	-	-	50,000	AUD excl. GST	Where possible, enter material costs excluding labour, plant, equipment, margins and taxes	26_LP_LPGP	05
Plumbing/hydraulic services	-	-	-	0	AUD excl. GST	Where possible, enter material costs excluding labour, plant, equipment, margins and taxes	18_PD and 19_WS	05 or 06
Fire services				128,742	AUD excl. GST	Where possible, enter material costs excluding labour, plant, equipment, margins and taxes	25_FPSS04 or 39 XWAW_03 or 41_XF	05
Other services (Please describe)		-	-	0	AUD excl. GST	Please group all other services here, meaning that coverage will always be 100% for services. Enter only the material costs (excluding labour, plant, equipment, margins and taxes).	29_SS or multiple	

External works

The materials associated with hard landscaping and outbuildings on the site but outside the building envelope. This includes hardstands, carparks, driveways, covered walkways, decks, patios, awnings, fences, gates, etc. Soft landscaping should be excluded.								
Coverage of spend on external works	-	-	-	80	%	Required. Coverage of spend for external works (excluding soft landscaping) entered below. Minimum requirement = 80%. Exclude head contractor preliminaries and margins.		
Asphalt	-	-	-	0	t		33_XR	07
Concrete in-situ	≤10 MPa	-	-	0.0	m³	Please enter reinforcing steel as part of "Reinforcing steel" below	33_XR or 34_XN or 35_XB or 36_XL	07
Concrete in-situ	>10 MPa to ≤20 MPa	-	-	0.0	m³	Please enter reinforcing steel as part of "Reinforcing steel" below	33_XR or 34_XN or 35_XB or 36_XL	07
Concrete in-situ	>20 MPa to ≤32 MPa	-	-	140.0	m³	Please enter reinforcing steel as part of "Reinforcing steel" below	33_XR or 34_XN or 35_XB or 36_XL	07
Concrete in-situ	>32 MPa to ≤40 MPa	-	-	0.0	m³	Please enter reinforcing steel as part of "Reinforcing steel" below	33_XR or 34_XN or 35_XB or 36_XL	07
Concrete in-situ	>40 MPa to ≤50 MPa	-	-	0.0	m³	Please enter reinforcing steel as part of "Reinforcing steel" below	33_XR or 34_XN or 35_XB or 36_XL	07
Concrete in-situ	>50 MPa	-	-	0.0	m³	Please enter reinforcing steel as part of "Reinforcing steel" below	33_XR or 34_XN or 35_XB or 36_XL	07
Pavers, bricks and blocks	Concrete	-	-	0	m²		33_XR	07
Pavers, bricks and blocks	Clay	-	-	0	m²		33_XR	07
Reinforcing steel	Bar & mesh	-	-	3	kg	**Include all reinforcing steel bar/mesh in the external works in this row.** Usually this is calculated as kg/m³ per concrete element and then summed. Example: 10 m³ of 40 MPa concrete @ 100 kg/m³ + 5 m³ of 50 MPa concrete @ 150 kg/m³ = 1,750 kg reinforcing steel.	33_XR or 34_XN or 35_XB or 36_XL	07
Reinforcing steel	Fibre & strand	-	-	0	kg	**Include all steel fibre reinforcing and steel strand in the external works in this row.**	33_XR or 34_XN or 35_XB or 36_XL	07
Structural steel	-	-	-	0	t		02_11	07
Structural aluminium	-	-	-	0	t	Includes structures, louvre systems, etc.	35_XB	07
External roof/wall cladding	Polycarbonate	-	-	400	m²	Enter as profiled polycarbonate sheet that would ordered, including allowance for overlap	35_XB	07
External roof/wall cladding	PVC	-	-	115	m²	Enter as profiled PVC sheet that would ordered, including allowance for overlap	35_XB	07
External roof/wall cladding	Bitumen sheet	-	-	0	m²	Enter as bituminous sheet that would ordered, including allowance for overlap	35_XB	07
External roof/wall cladding	Steel profile	-	-	0	m²	Enter as profiled steel sheet that would ordered, including allowance for overlap	35_XB	07
Fill	-	-	-	10	t	Include purchased material only. Exclude site-won material.	33_XR or 34_XN or 35_XB or 36_XL	07
Sand & gravel	-	-	-	5	t	Include purchased material only. Exclude site-won material and sand/gravel in concrete.	33_XR or 34_XN or 35_XB or 36_XL	07
Timber (solid)	Sawn softwood	-	-	0.0	m³		33_XR or 34_XN or 35_XB or 36_XL	07
Timber (solid)	Sawn hardwood	-	-	0.0	m³		33_XR or 34_XN or 35_XB or 36_XL	07
Timber (engineered)	CLT	-	-	0.0	m³		33_XR or 34_XN or 35_XB or 36_XL	07
Timber (engineered)	Glulam	-	-	0.0	m³		33_XR or 34_XN or 35_XB or 36_XL	07
Timber (engineered)	LVL	-	-	0.0	m³		33_XR or 34_XN or 35_XB or 36_XL	07
Timber (engineered)	OSB	-	-	0.0	m³		33_XR or 34_XN or 35_XB or 36_XL	07
Fabric (awning/sunshade)				0.0	m²		35_XB or 36_XL	07
Other (Please describe and add unit >>)		-	-	0.0		Please enter a description for any external works that does not fit a predefined classification		
Other (Please describe and add unit >>)		-	-	0.0		Please enter a description for any external works that does not fit a predefined classification		
Other (Please describe and add unit >>)		-	-	0.0		Please enter a description for any external works that does not fit a predefined classification		

S4

Step 3: Certifier details

Fill out blue cells

The material quantities must be determined through an itemised list of building materials (such as a bill of quantities) and certified by a quantity surveyor, designer, engineer or NABERS Assessor.

Person that completed this form	Value	Note
Name	Tom Drazina	Required
Company	Hickory Constructions Redfern Pty Ltd as trustee for the Hickory Constructions Redfern Unit Trust	Required
ABN	12960938352	
Profession	Main Contractor	Required
Qualification or registration	Bachelor of Construction, UTS	Required

Person that certified the details in this form	Value	Note
Name	Kelvin Perrie	Required
Company	MBMpl	Required
ABN	74 099 962 231	
Profession	Quantity Surveyor	Required
Qualification or registration	Bachelor of Construction Mgt and Property, UNSW	Required

Confirmation of certification	Value	Note
Are 80% of material costs captured for the building's structure, envelope and external works?	No	Required
If no - why not?	Level of detail of documentation not available at this time.	

Additional comments from data provider

Additional comments of certifier

Attach this Excel spreadsheet to your development application or construction certificate application.