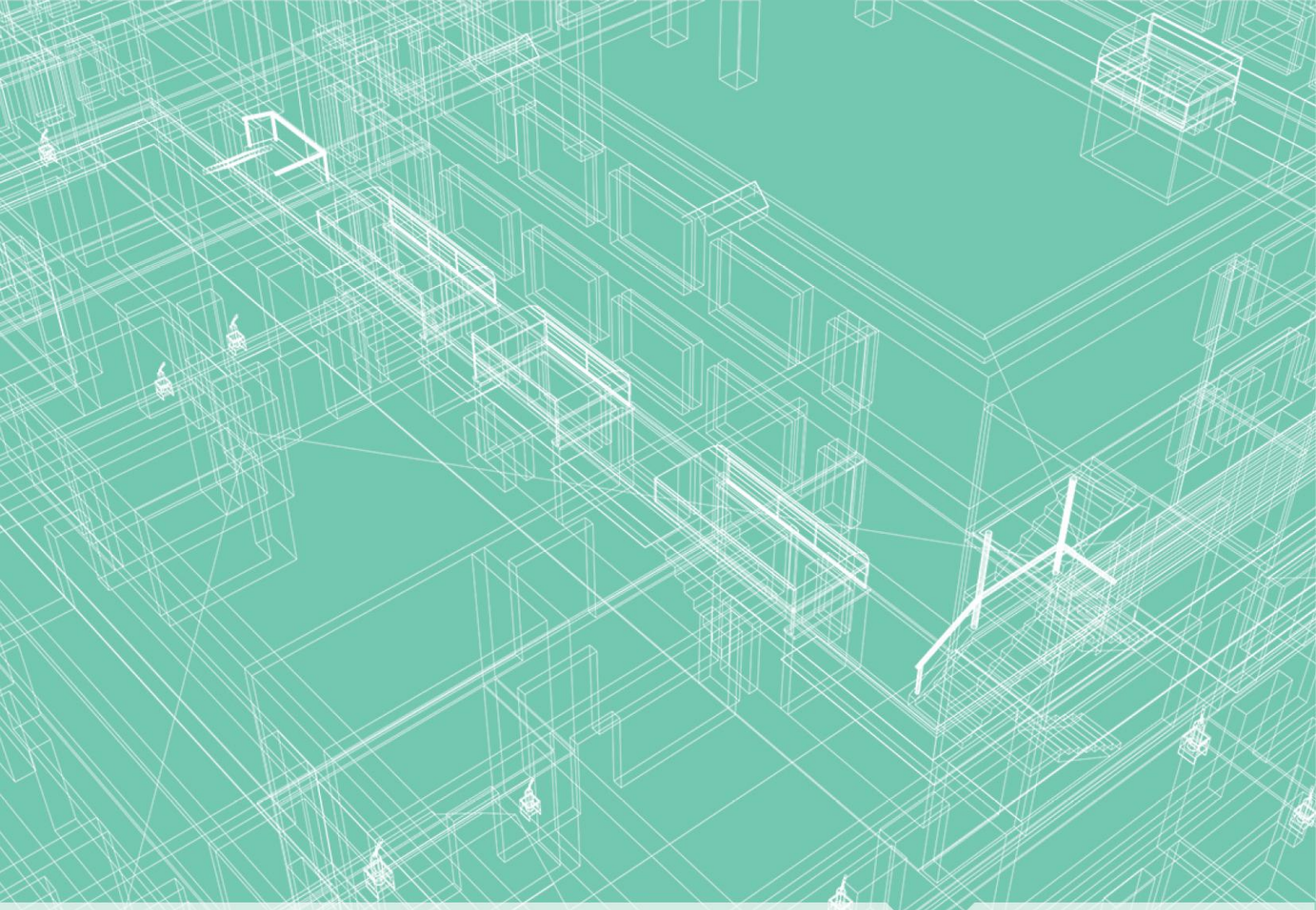

SSDA ESD REPORT

WOOLWORTHS MIXED-USE DEVELOPMENT NEUTRAL BAY

ESD SERVICE

JHA

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DOCUMENT CONTROL SHEET

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Project Name	Woolworths Mixed Use Development Neutral Bay
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	Rev B	17/06/2025
	Rev C	23/06/2025

EXECUTIVE SUMMARY

This SSDA ESD Report has been prepared by JHA Consulting Engineers to identify and summarise the Ecologically Sustainable Design (ESD) initiatives that have been proposed in the design of the mixed-use development located at 1-7 Rangers Road and 50 Yeo Street, Neutral Bay NSW 2089 to demonstrate compliance with the following planning requirements:

- Item 15 Ecologically Sustainable Development within the SEARs for SSD-82875708, including the ESD principles as defined in Section 193 of the EP&A Regulation
- State Environmental Planning Policy (Sustainable Buildings) 2022

This report should be read in conjunction with the architectural design drawings and other consultant's design reports submitted as part of the application.

The ESD objectives of this project are to encourage a balanced approach to designing new facilities for the project; to be resource-efficient, cost-effective in construction and operation; and to deliver enhanced sustainability benefits concerning impacts on the environment and well-being of residents, staff, and visitors whilst providing the best possible facilities for a constructive environment.

The proposed key ESD commitments for the development are listed below:

- Sufficient exposure to daylight
- Appropriate construction and glazing selection
- Energy-efficient air-conditioning systems with control strategy and thermal comfort tuning
- Energy-efficient lighting systems
- On-site photovoltaic system
- High WELS-rated water fixtures

CONTENTS

1. INTRODUCTION

This SSDA ESD report prepared by JHA Consulting Engineers on behalf of Fabcot Pty Ltd is submitted to the Department of Planning, Housing and Infrastructure (DPHI) in support of a concurrent Rezoning Proposal and State Significant Development Application (Rezoning and SSDA) for a mixed-use development, located at 1-7 Rangers Road and 50 Yeo Street, Neutral Bay.

This concurrent Rezoning and SSDA seeks approval for:

- Demolition of all existing improvements and structures on the site.
- Construction of a part eight (8) storey, part twelve (12) storey building, for use as a mixed-use development comprising of residential, commercial and retail uses.
- Construction of a five (5) storey basement for parking and servicing, with vehicle access from Yeo Street.
- Landscaping and public domain works.
- Extension and augmentation of services and infrastructure as required.

For a further detailed project description, please refer to the Rezoning Request and Environmental Impact Statement prepared by Ethos Urban.

This report should be read in conjunction with the Rezoning Request and Environmental Impact Statement prepared by Ethos Urban, the Architectural Plans prepared by Koichi Takada Architects, and the other accompanying technical documents that form part of the State Significant Development Application.

1.1 THE SITE

The site is located at 1-7 Rangers Road and 50 Yeo Street, Neutral Bay and is legally identified as Lots 1, 2 and 3 in DP 1091373. It is situated within the North Sydney Local Government Area (LGA) on a prominent corner within the Military Road Corridor, as defined by North Sydney Council. The surrounding area is characterised by a mix of shop top housing and residential dwellings.

The site has frontage on two primary roadways, being a 75m frontage to Rangers Road, and an 89m secondary frontage to Yeo Street at the rear. The site also has rear access to Military Lane, which acts as a service lane. It currently accommodates a single storey Woolworths supermarket and adjoining bottle shop, a six (6) storey commercial building and basement car parking. The total site area is 4,207m^2.

Site Areal ; Source-Nearmaps/Ethos Urban

1.2 RELEVANT SEARS TO THIS REPORT

This SSDA ESD has been prepared in response to the Secretary's Environmental Assessment Requirements (SEARs) for the proposed development dated 24 April 2025 for SSD-82875708. Specifically, this report has been prepared to respond to those SEARs outlined in table below.

Secretary's Environmental Assessment Requirements relevant to this Report

SEAR	SEAR Description	Report Name and Section
15. 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.	Section 2 Principles of Ecologically Sustainable Development Appendix A: Environmental Pre-Screening Checklist
	Where relevant, provide an assessment of the development against the standards for non-residential development set out in Chapter 3 of *State Environmental Planning Policy (Sustainable Buildings) 2022*.	For design responses, please refer to Section 3 Sustainable Building SEPP 2022.

1.3 ESD PLANNING REQUIREMENTS

Based on the Table above, this mixed-use development is required to demonstrate compliance with the following planning requirements:

- Item 15 Ecologically Sustainable Development within the SEARs for SSD-82875708, including the ESD principles as defined in Section 193 of the EP&A Regulation
- State Environmental Planning Policy (Sustainable Buildings) 2022.

To ensure alignment with the aforementioned planning requirements, the following ESD targets are proposed:

- National Construction Code (NCC) 2022 Section J – Energy Efficiency [overall development].
- Sustainability Standards for Residential Development (BASIX) [residential and associated spaces].
- Sustainability Standards for Non-Residential Development [non-residential and associated spaces].

1.4 BUILDING & CLIMATE CLASSIFICATION

The proposed proposed mixed-use development is classified into the following:

Building type and function: Class 2, Class 5, Class 6, Class 7a and Class 7b

NCC Climate Zone: Climate Zone 5

1.5 STAKEHOLDERS CONSULTATION

The stakeholders consulted and/or contributed to the development of this report are listed below.

Stakeholders	Role
Woolworths Group Nicholas Steele, Pierre Abrahamse	Client Representative
Koichi Takada Rafe Wilson, Alfonso Nogueira Calle, Kasol Liu	Architect
Ethos Urban Renee Stavroulakis, Ben Marino	Planning
Steve Watson and Partners Josh Harvey	BCA
Neuron Ben James, Corey Munro, Lydia Angus	Services (combined)

Taylor Brammer James Heron, Nhat Walton	Landscape Architect
Salt3 Tom Bloomfield, Harry Goodman	Waste
Van der Meer Consulting Andrew Wallis, Hary Budhi, Milad Aminmansour	Civil, Structural
Holmes Richard Green, Silvia Parra	Fire
JHA Consulting Engineers Gary Tang, Tarun Thottungal	ESD

2. PRINCIPLES OF ECOLOGICALLY SUSTAINABLE DEVELOPMENT

The ESD principles as defined section 193 of the EP&A Regulation 2021 have been incorporated into the design and ongoing operation phases of the development as follows:

2.1 THE PRECAUTIONARY PRINCIPLE

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

(i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and.
(ii) an assessment of the risk-weighted consequences of various options.

PEOJECT RESPONSE:

This development is being designed in accordance with a wide range of ESD goals that pertain to the design, construction, and operational stages. The development team will ensure that the building minimises the impact on the environment in the areas of energy, water, and materials. The design will incorporate energy efficiency-favoured passive design features to minimise severe or irreversible environmental damage.

In addition to the above, an *Environmental Pre-screening Checklist* has been undertaken to include the assessment of natural and urban hazards (e.g., storms, heat waves, bushfires, extreme storms, and other weather events). Increasing resilience to natural hazards has been considered in the development so that associated costs are budgeted. Refer to the Appendix A – Environmental Pre-screening Checklist for the details of risks identified for this project and the relative responses, actions and responsibilities for high and extreme risks identified.

2.2 THE INTER-GENERATIONAL EQUITY

The principle of inter-generational equity is that the present generation should ensure the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.

PROJECT RESPONSE:

This development will not cause any significant impact on the health, diversity and productivity of the environment and will predominantly provide a community benefit in the form of increased housing supply. Employment opportunities are provided via the retail tenancies and leasing/building management/cleaning associated with the residential functions. This will be achieved by aligning the development with the following principles:

- Use of sustainable materials with low embodied emissions and low VOC values.
- Improving the biodiversity by incorporating native vegetation for landscaping.
- Incorporating water-efficient fixtures and systems to reduce water consumption and protect future water resources.
- Educating employees and occupants about sustainable practices and the importance of responsible resource use.

By following these principles and practices, the development will minimise its negative environmental impacts, reduce resource consumption, and enhance the health and productivity of the environment for the benefit of future generations.

2.3 CONSERVATION OF BIOLOGICAL DIVERSITY AND ECOLOGICAL INTEGRITY

The principle of the conservation of biological diversity and ecological integrity is that the conservation of biological diversity and ecological integrity should be a fundamental consideration.

PROJECT RESPONSE:

A Biodiversity Development Assessment Report (BDAR) will be prepared by an Accredited Biodiversity Assessor in accordance with the Biodiversity Conservation Act 2016 and Biodiversity Conservation Regulation 2017 to ensure any future development will not have a significant effect on any threatened species, endangered communities, or their habitat. Ecological integrity has been considered for development. The design will include practical strategies to increase the ecological value of the site.

2.4 IMPROVED VALUATION, PRICING AND INCENTIVE MECHANISM

The principle of improved valuation, valuation, pricing and incentive mechanisms is that environmental factors should be included in the valuation of assets and services, such as

(i) Polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement, and,
(ii) the users of goods and services should pay prices based on the full life cycle of the costs of providing the goods and services, including the use of natural resources and assets and the ultimate disposal of waste, and,
(iii) established environmental goals should be pursued in the most cost-effective way by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.

PROJECT RESPONSE:

The project team has assessed the project against the ESD frameworks that are discussed in Section 4 of this report. The construction material will be selected based on the outcomes of relative cost-benefit analysis with decisions being made based on the whole-of-life costs rather than capital expenditure only. Certified recycled and reused materials, as well as materials with low embodied energy, will be utilised where appropriate.

3. SUSTAINABLE BUILDING SEPP 2022

The NSW Government is committed to ensuring that new and renovated buildings are sustainable and resilient for future climate and bring NSW closer to net zero emissions. To achieve the goal a new State Environmental Planning Policy (Sustainable Buildings) 2022 (Sustainable Buildings SEPP) was made in August 2022 and was made effective from 1 October 2023. Based on the type of building (residential or non-residential) different sustainability standards apply as follows:

- Sustainability Standards for Residential Development (BASIX)
- Sustainability Standards for Non-Residential Development

3.1 SUSTAINABILITY STANDARDS FOR RESIDENTIAL DEVELOPMENT [BASIX]

As per the Environmental Planning and Assessment Regulation 2021, a ***BASIX building*** means a building that contains ***at least 1 dwelling*** but does not include the following:

- Hotel or motel accommodation,
- A boarding house, hostel or co-living housing that:
    - Accommodates more than 12 residents, or
    - Has a gross floor exceeding 300 square meters.

In accordance with Chapter 2.1 of Sustainable Building SEPP 2022, the SB SEPP is applicable to all ***BASIX building*** that involves:

- ***development that involves the erection, but not the relocation, of a BASIX building,***
- development that involves a change of building use by which a building becomes a BASIX building,
- development that involves the alteration of a BASIX building, if the estimated development cost is $50,000 or more,
- development for the purposes of a swimming pool or spa, or combination of swimming pools and spas, that:
    - services 1 dwelling only, and
    - has a capacity, or combined capacity, of 40,000 litres or more.

Hence the Sustainability Standards for Residential Development (BASIX) applies to 1-7 Rangers Road and 50 Yeo Street, Neutral Bay NSW 2089. Please refer to the BASIX certificate provided separately for compliance.

3.2 SUSTAINABILITY STANDARDS FOR NON-RESIDENTIAL DEVELOPMENT

This section addresses item 15 of the industry-specific SEARs requirements to assess the development against the standards for non-residential development set out in Chapter 3 of *State Environmental Planning Policy (Sustainable Buildings) 2022*.

In accordance with Chapter 3.1 of Sustainable Building SEPP 2022, the SB SEPP is applicable to all **non-residential development** that involves:

- ***The erection of a new building, if the development has a capital investment value of $5 million or more;*** or
- Alterations, enlargement or extension of an existing building, if the development has a capital investment value of $10 million or more.

The Sustainable Building SEPP 2022 is applicable to the project, and as such will incorporate practical sustainability measures applicable to the project type.

The following sections within Chapter 3 of the Sustainable Building SEPP 2022 are not applicable for this development:

- *Chapter 3.3 Other considerations for large commercial development* as the project does not meet the definition for a Large Commercial Development.

- *Chapter 3.4 Other considerations for certain State significant development* as the project does not meet the definitions for this section.

Therefore, neither a NABERS commitment agreement nor a Net Zero Statement are required.

3.2.1 CHAPTER 3.2(1) – GENERAL SUSTAINABILITY PROVISIONS REQUIREMENTS

Chapter 3.2 (1) of Sustainable Building SEPP 2022 requires evidence that new development is designed to enable the following:

- The minimisation of waste from associated demolition and construction, including by the choice and reuse of building materials.
- A reduction in peak demand for electricity, including through the use of energy efficiency technology.
- A reduction in the reliance on artificial lighting and mechanical heating and cooling through passive design.
- The generation and storage of renewable energy.
- The metering and monitoring of energy consumption.
- The minimisation of consumption of potable water.

The following table summarises the project-specific ESD responses addressing the General Sustainability Provisions requirements.

General Sustainability Provisions	Project Specific Responses
1) The minimisation of waste from associated demolition and construction, including by the choice and reuse of building materials.	▪ Construction Waste Management Plan stating proposed strategies for minimizing waste generation, maximizing material reuse, recycling, and reprocessing, and reducing the volume of materials destined for landfill.
2) A reduction in peak demand for electricity, including through the use of energy efficiency technology.	▪ A high-efficiency air-cooled heat rejection system (surpass the minimum requirements of the NCC 2022 Section J Energy Efficiency Part J6). ▪ Energy efficient LED lighting with suitable timer controls and/or daylight/occupancy sensors as appropriate. ▪ Heat pump technology for domestic hot water
3) A reduction in the reliance on artificial lighting and mechanical heating and cooling through passive design.	▪ Appropriate insulation and a light-coloured roof will be provided. ▪ High thermal performance glazing system. ▪ Appropriate combination of external shading devices (eaves etc.) and glazing location to maximise natural daylight and winter heat gains while minimising unwanted heat gains in summer.
4) The generation and storage of renewable energy.	▪ Provision of a roof-mounted photovoltaic system (PV).
5) The metering and monitoring of energy consumption.	▪ Metering is to be provided to enable building energy/water monitoring or leak detection and recording of the on-site renewable energy equipment & on-site electric vehicle charging equipment. Accessible energy and water metering will be provided for all common uses, major uses and major sources.
6) The minimisation of consumption of potable water.	▪ Installed water-efficient fixtures and fittings meeting the minimum WELS Rating as nominated.

3.2.2 CHAPTER 3.2(2) – EMBODIED EMISSIONS

NABERS embodied emissions materials form will be prepared by the QS for this development to disclose the amount of embodied emissions attributed to the development. Please refer to the materials form provided separately.

4. SUSTAINABLE DESIGN FRAMEWORK

The sustainable design framework for this development aims to incorporate the best practice design initiatives and ESD principles into the development. The ESD initiatives and targets outlined within this framework have been compiled based on the following:

- National Construction Code (NCC) 2022 Section J – Energy Efficiency
- Sustainability Standards for Residential Development (BASIX)
- Sustainability Standards for Non-Residential Development

These ESD initiatives and targets are to be incorporated into design of the project during the detailed design by the design team.

4.1 BUILDING ENVELOPE

Intelligent design and material selection ensure that thermal comfort is not entirely achieved by mechanical means. Passive design initiatives will reduce demand on mechanical air conditioning systems resulting in a reduction in energy consumption and greenhouse gas emissions.

4.1.1 BUILDING ENVELOPE PERFORMANCE

The building fabric will be designed to meet or exceed the NCC 2022 Section J and BASIX requirements for the building envelope. The indicative results on total construction R-value requirements demonstrating compliance with NCC 2022 Section J and BASIX are provided in the below section.

This will necessitate the use of insulation to reduce heat flow and consequent heat loss in winter and heat gain in summer. This minimises the heating and cooling load demand on the air conditioning systems. Light-coloured roof material with a low solar absorptance (SA) is recommended to be used to isolate more sunlight and reduce summer heat gain. It also has the effect of reducing elevated localised temperatures (the heat island effect) and potentially will improve the efficiency of solar PV panels as they perform more efficiently in reduced temperatures.

Glazing is a major source of unwanted heat gain in the summer and can cause significant heat loss in the winter due to its low insulation performance. It is thus recommended that windows be high-performance glazing systems. Performance glazing substantially reduces heat transmission. This particularly reduces heat loss in winter; therefore, internal heat gain from equipment, lighting and people are better contained. Also, performance glazing absorbs the infrared portion of sunlight and reduces the amount of heat transferred into the conditioned space. This will correspond to a reduction of both heating and cooling loads

BUILDING FABRIC: NON-RESIDENTIAL AREAS

The building fabric will be designed in accordance with the NCC 2022 Section J Part J4. The minimum performance requirements obtained under Section J Deemed-to-Satisfy provision for the development at the proposed location (Climate Zone 5) as per the NCC 2022 Section J - Energy Efficiency are listed below.

Building Elements	Indicative NCC 2022 Requirements
Envelope Roof/Ceiling	Total R-Value of 3.7 (Downwards, Light Colour Roof Solar absorptance of the upper surface of a roof must be not more than 0.45)
Envelope Walls	Total R-Value of 1.4
Envelope Floors	Total R-Value of 2.0 (Downwards)

Note: The impact of thermal bridging must be considered within the total R-value calculation under NCC2022.

BUILDING FABRIC: RESIDENTIAL AREAS

The building fabric will be designed to meet or exceed the BASIX requirements for the building envelope.

Building Elements		Indicative BASIX Requirements
Envelope Roof/Ceiling	Ceiling with balcony or external above	Minimum of R4.0 Insulation
	Internal Ceiling	No insulation
Envelope Walls	External Walls	Minimum of R2.5 Insulation
	Party Walls	No Insulation
	Corridor Walls	Minimum of R2.5 Insulation
Envelope Floors	Exposed to outside air/unconditioned space	Minimum of R2.0 Insulation
	Apartment/common area/conditioned space below	No insulation

GLAZING: NON-RESIDENTIAL AREAS

The building will be designed to comply with NCC 2022 Section J Energy Efficiency. A Section J Part J4 DTS assessment has been carried out for the proposed development to identify the minimum requirements. Note these are not the proposed thermal specifications for the project; J1V3 assessment may be undertaken to further refine and optimise the thermal specifications in accordance with the objectives of this project during detail design.

Building Elements	Indicative NCC 2022 Requirements
All Vertical Envelope Glazing	Total U-Value=5.4 & Total SHGC=0.47 (SGU Low-E Neutral or the like)
Skylights	No skylights are proposed within non-residential areas

Note: These glazing thermal performance targets would comply with the minimum requirements coupled with 10% improvement.

GLAZING: RESIDENTIAL AREAS

For the Class 2 SOU areas the glazing will be proposed with the following minimum performance

Building Elements	Indicative BASIX Requirements
Vertical Envelope Glazing (Awning/Casement)	Total U-Value=2.9 & Total SHGC=0.44 (DGU Clear/Neutral or the like)
Vertical Envelope Glazing (Sliding/Fixed)	Total U-Value=2.9 & Total SHGC=0.51 (DGU Clear/Neutral or the like)
Skylights	Total U-Value=2.6 & Total SHGC=0.24 (DGU Velux Skylights or the like)

4.2 SHADING AND DAYLIGHTING

Solar access offers significant benefits for indoor environmental quality by providing access to natural daylight and reducing reliance on artificial lighting. However, excessive solar access, particularly direct solar radiation heat, can lead to increased HVAC energy demands and thermal discomfort. To harness the advantages of solar access while mitigating its drawbacks, passive design principles are employed.

Passive solar heating aims to harness solar heat for free heating in winter while preventing excessive heat gain in summer. Similarly, passive cooling strategies aim to block heat entry during summer months. These principles leverage site-specific solar access to optimize indoor environmental quality and reduce HVAC energy consumption through tailored shading solutions.

In the proposed building, appropriate external shading devices in the form of eaves will be strategically utilised to block the intense summer sun while allowing the lower winter sun to penetrate for passive heating. These passive design features not only enhance daylighting and external views for occupants but also reduce the need for artificial lighting, leading to improved alertness, mood, and productivity. Additionally, connecting occupants to nature through external views fosters a positive and constructive experience within the built environment.

4.3 ENERGY EFFICIENCY

Each climate zone under the Building Code has different design and conditioning requirements to minimise energy use for heating and cooling. A good balance of heating and cooling reduction techniques is required to create an energy-efficient development.

4.3.1 HEATING, COOLING AND VENTILATION SYSTEMS

The air-conditioning and ventilation systems will be designed to comply with the minimum requirements of the NCC 2022 Section J Energy Efficiency Part J6. The NCC Section J requirements for Part J6 includes minimum requirements for the energy efficient design and control of HVAC systems to reduce and recover energy.

The occupied spaces will be having high-efficiency air conditioning as required. An air-cooled heat rejection system is to be used as this will help minimise the impacts associated with harmful microbes (e.g., Legionella impact).

The control mechanisms for the air-conditioning system will be engineered to minimize energy consumption by ensuring the schedule and setpoints are appropriate to the intended operation of the buildings.

To enhance efficiency further, ductwork systems will be designed to minimize system pressure losses, thereby reducing the power required by fan motors. This includes selecting equipment that minimizes coil and fitting drops, as well as employing appropriately sized ductwork to minimize friction losses.

In spaces such as bathrooms/toilets, laundries, and equipment plant areas, natural ventilation will be prioritized wherever feasible. Mechanical ventilation will be incorporated only where necessary to ensure air quality and temperature levels.

4.3.2 LIGHTING

The lighting design will comply with NCC 2022 Section J Energy Efficiency Part J7. The illumination density will be in accordance with J7D3. To minimize energy consumption and optimize lighting efficiency, the proposed development will be using LED fittings. The energy efficient light fittings will be complemented by an automatic control system featuring timer controls, PIR occupancy sensors and/or microwave occupancy sensors as appropriate to enhance operational efficiency.

To capitalize on natural daylight, where appropriate, lighting in regularly occupied spaces will be provided with a daylight sensor to adjust artificial light output or turn lights off when sufficient natural daylight is available to the space. For larger areas, perimeter lighting will be segregated into distinct zones to maximize natural light utilization.

External luminaires will adhere to AS 4282:1997 to prevent light pollution and maintain compliance with specified benchmarks for night sky illumination. This will ensure that the project's external lighting does not contribute to light pollution in the surrounding environment and wasting energy at the same time.

4.3.3 DOMESTIC HOT WATER

The project will use heat pump-based technology for domestic hot water to generate hot water energy efficiently.

4.3.4 CONTROLS

All HVAC installed shall be controlled by the HVAC group controller. Closed spaces such as storage rooms and cleaners' cupboards are to be provided with a wall switch. For BOH areas (not task-specific areas) PIR sensors are to be provided. Voltage control (dimming) should be provided where appropriate.

4.3.5 ELECTRICITY METERING AND MONITORING

Electricity metering and sub-metering will be provided in accordance with Section J requirements to monitor and manage electricity consumption in the building. Sub-metering is to be provided to distinct locations (e.g., apartment usage, mech plant and PV generation).

4.3.6 PHOTOVOLTAICS

To reduce the building's grid electricity consumption and greenhouse gas emissions with an onsite renewable source, a roof-mounted photovoltaic system (PV) is proposed for the project. It is recommended that the PV system should be sized to cover at least 20% of the roof area of a building.

4.4 WATER CONSERVATION

The following water conservation initiatives are proposed to help reduce the use of potable water.

4.4.1 FITTINGS AND FIXTURES

Water-efficient fixtures and fittings will be installed in accordance with the Australian Government's Water Efficiency Labelling Scheme (WELS) to reduce potable water consumption. All fixtures and fittings will meet the minimum WELS Rating as specified in the table below. Commercial appliances should perform at similar levels. The final WELS rating is subject to product selection and WHS requirements.

Water Fittings / Fixtures	Minimum WELS Rating Proposed for the Buildings	Highest Available Rating (AS/NZS 6400-2016)
Showerheads	4 (>6.0, but <= 7.5L/min)	4
Toilets	4	5
Urinals	5	5
Bathroom Taps	5	6
Dishwashers (excluding commercial equipment)	4	6
Washing Machines (excluding commercial equipment)	4	6

4.4.2 WATER-SENSITIVE URBAN DESIGN

The project will implement best practices of water-sensitive design to manage stormwater runoff and reduce demand for landscape irrigation. A detailed stormwater management plan including water-sensitive urban design (WSUD) will be completed by a civil/stormwater consultant.

4.5 SUSTAINABLE MATERIALS

4.5.1 LOW VOC/LOW FORMALDEHYDE MATERIALS

Adhesives, sealants, flooring and paint products selected to have low or no Volatile Organic Compounds (VOCs) and all engineered timber used in exposed or concealed applications should have low or no formaldehyde to avoid harmful emissions that can cause illness and discomfort for the building users.

4.5.2 SUSTIANABLE PRODUCTS

The project will aim to source sustainable materials from local manufacturers thus reducing the upfront carbon and supporting the local economy. Also, certified recycled and reused materials, as well as materials with low embodied energy, will be utilised where appropriate.

4.6 WASTE

Waste collection and disposal play an important role in the protection of the environment and the health of the population in the modern world. A waste management plan will be prepared to assess and monitor the waste management process during the construction and demolition, as well as a waste-produced during occupation within the development. The waste management plan shall incorporate how to minimise the amount of waste generated, maximise the reuse, recycling and reprocessing of construction waste materials and minimise the volume of materials disposed to landfill. Refer to the waste consultant report for details.

5. CONCLUSION

This ESD report has identified and summarised the Ecologically Sustainable Design (ESD) initiatives for the mixed-use development, located at 1-7 Rangers Road and 50 Yeo Street, Neutral Bay, in support of a State Significant Development Application (SSD-63324208) and in accordance with Item 15 of the SEARs issued by the Department of Planning, Housing and Infrastructure (DPHI).

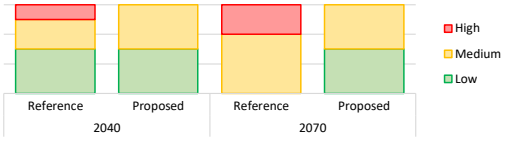
Through the inclusion of the sustainability initiatives outlined within this report, the project addresses the SEARs for SSD-63324208, the requirements of the State Environmental Planning Policy (Sustainable Buildings) 2022 and of the Environmental Planning and Assessment (EP&A) Regulation 2000.

To ensure alignment with the aforementioned planning requirements, the ESD targets followed the National Construction Code (NCC) 2022 Section J – Energy Efficiency (overall development), the Sustainability Standards for Residential Development (BASIX) (residential and associated spaces) and the Sustainability Standards for Non-Residential Development (non-residential and associated spaces).

6. APPENDIX A: ENVIRONMENTAL PRE-SCREENING CHECKLIST

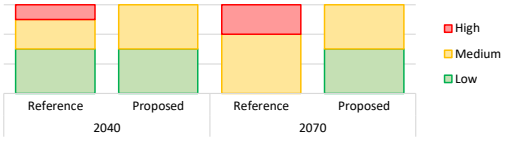
JHA

WoW Mixed-Use Neutral Bay- Risk Profile



			Pre-adaptation Actions								Post-adaptation Actions						
			2040			2070					2040			2070			
Climate Variables & Hazards	**Climate Projections**	**Potential Climate Impacts**	**Consequence** *(2040)*	**Likelihood** *(2040)*	**Risk** *(2040)*	**Consequence** *(2070)*	**Likelihood** *(2070)*	**Risk** *(2070)*	**Responsible Parties**	**Adaptation Measures**	**Consequence** *(Residual 2040)*	**Likelihood** *(Residual 2040)*	**Risk** *(Residual 2040)*	**Consequence** *(Residual 2070)*	**Likelihood** *(Residual 2070)*	**Risk** *(Residual 2070)*	**Summary of how measures reduce risks**
Hotter and dryer conditions result in higher frequency and/or severity of URBAN HEAT ISLAND effects	The projected climate scenarios indicate a summer that will be warmer and hotter in the near future. There is no strong consensus on whether rainfall will become wetter or drier in the near future, but the hotter temperature may increase the intensity of urban heat island effects.	DIRECT: **Increased urban heat risk** due to warmer to hotter conditions may cause a direct impact on the: - Energy efficiency of the building by increasing the cooling energy requirement, and; - Health and well-being of the building occupants.	Moderate	Likely	High	Major	Likely	High	Landscape Architect	**Landscape:** Improving the vegetation on site by planting more indigenous species. Providing water bodies. **Arch:** Providing roofs with a light colour and providing landscaped areas. Ensure the building is well sealed to minimise risks of heat infiltration.	Minor	Likely	Medium	Minor	Likely	Medium	The risk and impact of the urban heat island effect on the building and the building occupants will be reduced if strategies to improve the microclimate of the site are implemented.
Hotter and dryer conditions resulting in higher frequency and/or severity of BUSHFIRE events	On balance, the projected climate scenarios indicate summers that will be warmer in the near future and becoming hotter and possibly drier later. Under these projected scenarios, the likelihood and severity of bushfire events will be increased.	DIRECT: **Increased bushfires risk** due to warmer to hotter conditions may increase **exposure to smoke** and particulate for staff, residents and visitors, impacting health. In addition, **smoke and embers** may **damage** the air conditioning system.	Minor	Possible	Medium	Moderate	Possible	Medium	Mechanical Developer	**Mech**: Filters and smoke isolation (facade) are as per minimum compliance (separating floor to floor etc.), more features can always be added to improve the system. **Operation:** Project may consider an emergency plan in case of smoke leading to low air quality, e.g. a resident guide and increased air filtration and cleaning frequency during periods of low air quality.	Minor	Possible	Medium	Minor	Possible	Medium	The risk and impact of smoke on occupants will be reduced by good management practice implemented. New building standards ensure buildings are well sealed. The impact of poor air quality will be reduced if less outside air is brought in during these periods. Increased filtration cleaning will mean the filters effectiveness is now limited during these periods.
Hotter and dryer conditions resulting in higher frequency and/or duration of HEATWAVES/ EXTREME HEAT (over 35 degree Celsius)	The projected climate scenarios indicate that the max daily temperature will be hotter and warmer in the near future and the humidity has no change or small decrease. In these projected scenarios, the risk of heat waves will be increased.	DIRECT: Heatwaves/Extreme heat will **increase demand for the HVAC system** and may **impact the ability of the HVAC system** to maintain the thermal comfort of occupants due to capacity constraints.	Moderate	Possible	Medium	Moderate	Likely	High	Architect ESD	**Arch**: Incorporate passive thermal design principles in the design and construction of the building such as appropriate levels of shading devices and thermal insulation. **ESD**: Building to target reduction in energy use. Reduction will be achieved through efficiency systems, building fabric optimization and onsite PV array on roof. The solutions will help to reduce the peak load, and therefore the HVAC system strain.	Moderate	Possible	Medium	Moderate	Possible	Medium	The incorporation of passive thermal design principles will help mitigate extreme heat risks in the near future. Energy efficiency and an appropriate PV system will help ensure the HVAC system will be capable of handling more extreme temperatures in the far future.

WoW Mixed-Use Neutral Bay- Risk Profile



			Pre-adaptation Actions								Post-adaptation Actions							
			2040			2070					2040			2070				
Climate Variables & Hazards	**Climate Projections**	**Potential Climate Impacts**	**Consequence *(2040)***	**Likelihood *(2040)***	**Risk *(2040)***	**Consequence *(2070)***	**Likelihood *(2070)***	**Risk *(2070)***	**Responsible Parties**	**Adaptation Measures**	**Consequence *(Residual 2040)***	**Likelihood *(Residual 2040)***	**Risk *(Residual 2040)***	**Consequence *(Residual 2070)***	**Likelihood *(Residual 2070)***	**Risk *(Residual 2070)***	**Summary of how measures reduce risks**
Hotter and dryer conditions resulting in higher frequency and/or duration of <u>HEATWAVES/ EXTREME HEAT</u> (over 35 degree Celsius)	The projected climate scenarios indicate that the max daily temperature will be hotter and warmer in the near future and the humidity has no change or small decrease. In these projected scenarios, the risk of heat waves will be increased.	DIRECT: Heatwaves/Extreme heat may impact the **operation of electrical equipment, finishes and infrastructure**s as temperature exceeds design limits.	Minor	Unlikely	Low	Minor	Possible	Medium	Electrical Civil Arch Landscape	**Elec**: In the near future, current temperature ratings for electrical equipment should be able to cope with projected temperature increases relevant to the component's design life. **Civil:** Ensure Civil design specifies paving/ hardscapes that can cope with increased temperatures to reduce cracking/ buckling. In the far future, equipment should be gradually upgraded as required to cope with more extreme conditions. **Landscape/Arch:** Providing dedicated "Cool outdoor areas" where the building occupants can take shelter during extremely hot days when the power fails should be explored by the design team. This cool area should utilise passive design principles to moderate temperature during extreme days. Secondly, this cool area should consider ways to harness the cooling power of water to provide additional cooling. For example, provide shaded outdoor areas with drinking fountains as cool shelters during an extreme heat event.	Minor	Unlikely	Low	Minor	Unlikely	Low	Appropriate upgrade of electrical equipment at their end of their service life will help ensure system will be capable of handling more extreme temperatures in the far future.
Hotter and dryer conditions resulting in higher frequency and/or duration of <u>HEATWAVES/ EXTREME HEAT</u> (over 35 degree Celsius)	The projected climate scenarios indicate that the max daily temperature will be hotter and warmer in the near future and the humidity has no change or small decrease. In these projected scenarios, the risk of heat waves will be increased.	INDIRECT: **Increased water demand** from both landscaping and occupants.	Minor	Unlikely	Low	Minor	Possible	Medium	Architect Landscape	**Arch**: Fixtures will be low flow rated to reduce potable water demand. **Landscape:** Selection of planting from landscape architect to consider resilient indigenous plants that require less watering than other species.	Insignificant	Unlikely	Low	Insignificant	Possible	Low	Reduction in water demand reduces dependency on potable water.
Hotter and wetter conditions increasing severity of extreme <u>STORM/ WIND</u> events (by providing more fuel to increase the wind speeds of storms)	There is no strong consensus whether it will become wetter or drier in the near future, but hotter temperature may impact on the severity of storm and wind events.	DIRECT: Extreme weather causing **damage to external equipment/façade and roof finishes.**	Minor	Unlikely	Low	Minor	Possible	Medium	Architect Façade	**Arch:** Plant rooms have their own skin w/ screen wall and will reduce particulates and protect from hail damage. **Facade:** External fabric is a durable finish.	Minor	Rare	Low	Minor	Unlikely	Low	Plant-room and finishes designed to account for extreme weather events.