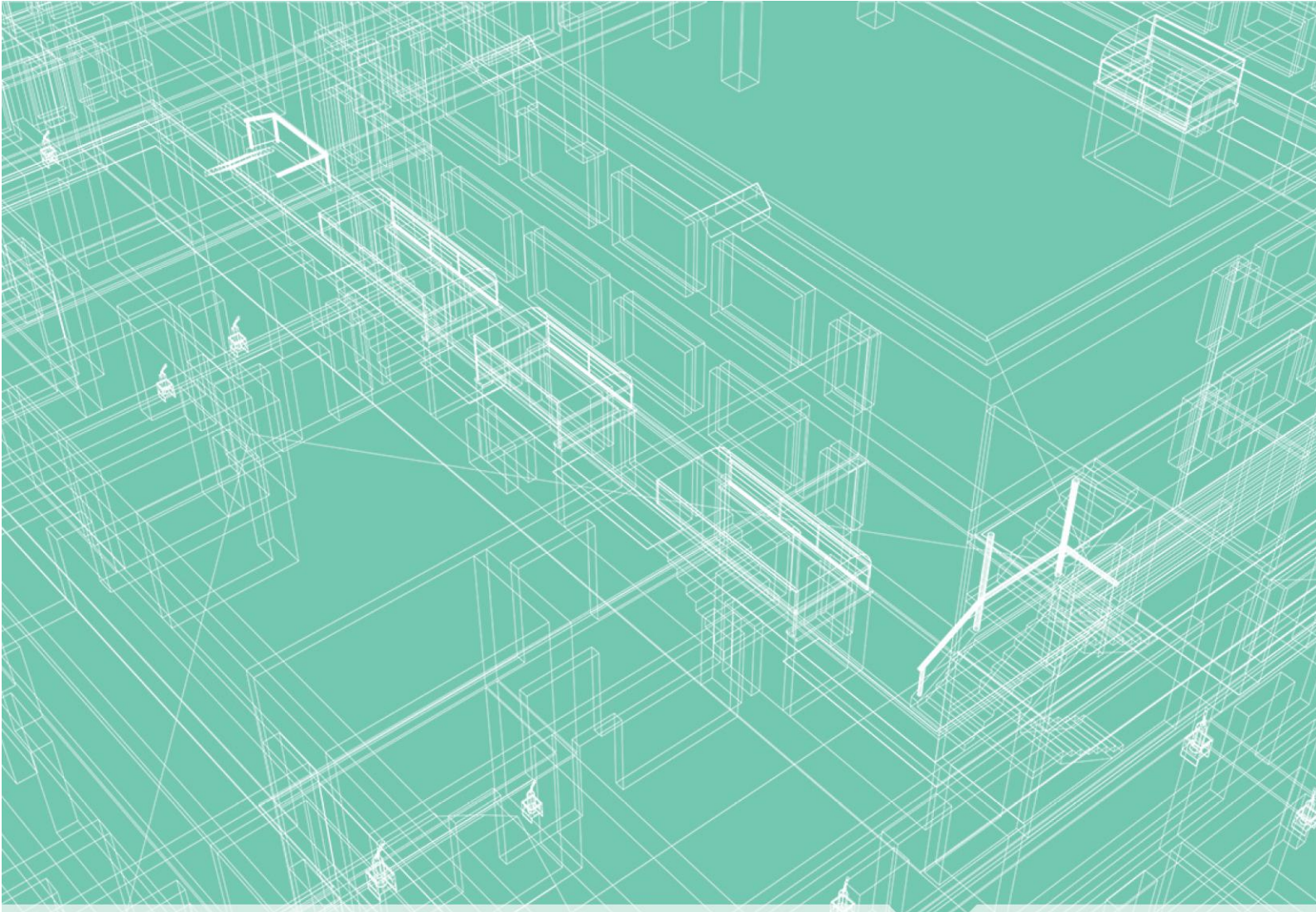

ESD SSDA REPORT

PACIFIC HIGHWAY AND WILSON STREET, CHATSWOOD

ESD SERVICES

JHA

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DOCUMENT CONTROL SHEET

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Project Name	Pacific Highway and Wilson Street, Chatswood
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	REV	B							
	DATE	09/04/2026							

EXECUTIVE SUMMARY

This ESD SSDA Report has been prepared by JHA Consulting Engineers to accompany a State Significant Development Application (**SSDA**) and concurrent Rezoning Proposal – SSD-93776214 for a mixed-use development identified at 849, 853, and 859 Pacific Highway and 2 and 8 Wilson Street, Chatswood (the **site**).

The proposal includes the construction of a mixed-use development comprising two residential flat buildings above a retail / commercial areas and a childcare centre.

The legal description of the site is outlined in Table 1 below.

Table 1 – Legal description

Street Address	Legal Description
849, 853, and 859 Pacific Highway and 2 and 8 Wilson Street, Chatswood	Lots 1-5 DP1310282

This report has been prepared to address the Secretary's Environmental Assessment Requirements (**SEARs**) issued for the project (SSD-93776214).

This report concludes that the proposed development is suitable and warrants approval subject to the implementation of the following planned management and mitigation measures:

- ESD principles are incorporated in the design and ongoing operation of the development as outlined in this report.
- Sustainability Standards for Residential Development (BASIX) are incorporated in the design and ongoing operation of the development as detailed in this report and the BASIX Certificate.
- Sustainability Standards for Non-Residential Development set out in Chapter 3 of State Environmental Planning Policy (Sustainable Buildings) 2022 are incorporated in the design and ongoing operation of the development as detailed in this report.

ECOLOGICALLY SUSTAINABLE DESIGN

This ESD SSDA Report identifies and summarises the Ecologically Sustainable Design (ESD) initiatives that have been proposed in the design of the development to demonstrate compliance with the following planning requirements:

- Item 15 Ecologically Sustainable Development within Industry Specific SEARs for SSD-93776214, 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 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
- High-performance façade with efficient building fabric
- 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 report has been prepared in support of a State Significant Development Application (SSDA) and concurrent Rezoning Proposal – SSD-93776214 – at 849, 853, and 859 Pacific Highway and 2 and 8 Wilson Street, Chatswood.

1.1 PURPOSE OF THIS REPORT

This report has been prepared in response to the requirements contained within the Secretary's Environmental Assessment Requirements (SEARs) dated 29 September 2025 and issued for the SSDA (SSD-93776214). Specifically, this report has been prepared to respond to the SEARs requirement and government agency comments issued below.

Table 2 – SEARs Requirements & Government Agency Comments

Item	Description of Requirement	Section Reference
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 2.3* *Appendix A: Environmental Pre-screening Checklist*
SEARs Requirement	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.	*Refer to Section 3 Sustainable Buildings SEPP 2022.*

1.2 PROJECT DESCRIPTION

The proposed development involves the construction and operation of a new mixed-use building comprising:

- Internal fitout of nine basement levels (+ mezzanine above B1, and lift pits below B9), including driveway access from O'Brien Street, car parking, bicycle and motorcycle parking, waste rooms, loading docks, OSD tank and back-of-house areas;
- A two-storey podium accommodating retail and commercial uses, residential communal open space and amenities, and a new child care centre;
- Two modulated residential buildings above the podium providing a total of 552 residential apartments, including 72 affordable rental housing dwellings, with associated amenities;
- Public domain works including landscaping, street trees and publicly accessible open space; and
- Reticulation of site services and infrastructure including electricity, telecommunications, gas, water and sewer.

1.3 THE SITE

The site is located at 849, 853, and 859 Pacific Highway and 2 and 8 Wilson Street, Chatswood within the Willoughby Local Government Area (LGA). The site has an irregular shaped configuration and an area of 4,294 sqm (excluding the parcel of land zoned SP2 Infrastructure). The site is bound by Wilson Street (to north), O'Brien Street (to south), Pacific Highway (to west), and the T1 North Shore and Western Line, T9 Northern Line, and Metro North-West Line (to east).

All buildings on the site have been demolished in accordance with DA-2024/19 and the site is currently vacant.

The site is located within the suburb of Chatswood in the Willoughby Local Government Area. Chatswood is located 6km north of the Sydney CBD within Sydney's Lower North Shore. The site is in proximity and highly accessible to the commercial centres of North Sydney and Macquarie Park.

The site is located at the north-western extent of the Chatswood CBD within convenient walking distance of local amenities, facilities, and services. The area is well advanced in its transition from an older style commercial precinct into a thriving mixed-use area characterised by commercial and residential land uses.

An aerial of the site is provided in Figure 1 below.

Figure 1 – Aerial of the site, Source: Urbis (Nearmap)

1.4 BUILDING CLASSIFICATIONS

The development contains the following building classes.

Area	NCC class
Basements	Class 7a/7b
Commercial/Retail	Class 5/Class 6
Childcare	Class 9b
Communal Spaces	Class 2 Common Area
Sole Occupancy Units	Class 2

1.5 REFERENCE DOCUMENTS

Architectural Drawings: PBD Architects

Project: Pacific Highway and Wilson Street, Chatswood | Project No.: 2308_1

Title	Drawing No	Revision	Date
Project Information Sheet 01	HDA001	REV 01	27/03/2026
Project Information Sheet 01	HDA002	REV 01	20/03/2026
Site Analysis	HDA003	REV 01	20/03/2026
Site Plan	HDA004	REV 01	20/03/2026
GA Plan - Basement 10	HDA101	REV 01	20/03/2026
GA Plan - Basement 9	HDA102	REV 01	20/03/2026
GA Plan - Basement 3-8 Typical	HDA108	REV 01	20/03/2026
GA Plan - Basement 2	HDA109	REV 01	20/03/2026

GA Plan - Basement 1	HDA110	REV 01	20/03/2026
GA Plan - Basement 1 Mezzanine	HDA111	REV 01	20/03/2026
GA Plan - Ground Floor	HDA112	REV 01	27/03/2026
GA Plan - Level 1	HDA113	REV 01	20/03/2026
GA Plan - Level 2	HDA114	REV 01	20/03/2026
GA Plan - Level 3 Typical Affordable Housing	HDA115	REV 01	27/03/2026
GA Plan - Level 7	HDA119	REV 01	27/03/2026
GA Plan - Level 8, 10, 12 Typical Low-Rise	HDA120	REV 01	27/03/2026
GA Plan - Level 9, 11, 13 Typical Low-Rise	HDA121	REV 01	27/03/2026
GA Plan - Level 14, 16, 18, 20, 22, 24 Typical Low-Rise / Mid-Rise	HDA126	REV 01	27/03/2026
GA Plan - Level 15, 17, 19, 21, 23, 25 Typical Low-Rise / Mid-Rise	HDA127	REV 01	27/03/2026
GA Plan - Level 26, 28, 30, 32 Typical Mid-Rise	HDA138	REV 01	27/03/2026
GA Plan - Level 27, 29, 31, 33 Typical Mid-Rise	HDA139	REV 01	27/03/2026
GA Plan - Level 34, 36 (Tower A Mid-Rise) & Level 34 (Tower B Plant)	HDA146	REV 01	27/03/2026
GA Plan - Level 38 (Tower A Plant) & Level 36, 38 (Tower B Mid-Rise)	HDA150	REV 01	27/03/2026
GA Plan - Level 39, 41, 43, 45, 47, 49, 51, 53 Typical High-Rise	HDA151	REV 01	27/03/2026
GA Plan - Level 40, 42, 44, 46, 48, 50, 52, 54 Typical High-Rise	HDA152	REV 01	27/03/2026
GA Plan - Level 55 High-Rise / Sub-Penthouse	HDA167	REV 01	27/03/2026
GA Plan - Level 56 High-Rise / Penthouse	HDA168	REV 01	27/03/2026
GA Plan - Level 57 High-Rise / Roof Terrace	HDA169	REV 01	27/03/2026
GA Plan - Level 58 High-Rise / Roof Plant	HDA170	REV 01	27/03/2026
GA Plan - Level 59 Sub-Penthouse / Roof	HDA171	REV 01	27/03/2026
GA Plan - Level 60 Penthouse	HDA172	REV 01	27/03/2026
GA Plan - Level 61 Roof Terrace	HDA173	REV 01	27/03/2026
GA Plan - Level 62 Roof Plant	HDA174	REV 01	20/03/2026
GA Plan - Level 63 Roof	HDA175	REV 01	20/03/2026
North Elevation	HDA201	REV 01	27/03/2026
East Elevation	HDA202	REV 01	27/03/2026
South Elevation	HDA203	REV 01	27/03/2026
West Elevation	HDA204	REV 01	27/03/2026
Central North Elevation	HDA205	REV 01	27/03/2026
Central South Elevation	HDA206	REV 01	27/03/2026
Section A-A	HDA301	REV 01	20/03/2026
Section B-B	HDA302	REV 01	20/03/2026
Driveway Section	HDA303	REV 01	20/03/2026
Finishes Schedule	HDA400	REV 01	27/03/2026

1.6 METHODOLOGY

The goal of this SSDA ESD Report is to identify and summarise the Ecologically Sustainable Design (ESD) initiatives that have been proposed in the design of the development to demonstrate compliance with the relevant planning requirements and respond to the SEARs requirement.

To achieve this goal, this report first outlines the planning requirements relevant to ESD in Section 2 and 3. The following sub-sections in Section 2 and 3 present how the planning requirements are addressed. Subsequently, Section 4 illustrates the Sustainable Design Framework for the development providing a detailed summary of the ESD commitments. In addition to the assessment of relevant planning requirements, an Environmental Pre-screening Checklist and a BASIX assessment has been undertaken to inform Section 2, 3 and 4. Finally, Section 5 concludes listing the mitigation measures ensuring that remaining impacts of the development are appropriate.

2. PLANNING REQUIREMENTS

2.1 ESD PLANNING REQUIREMENTS

This mixed-use development is required to demonstrate compliance with the following planning requirements:

- Item 15 Ecologically Sustainable Development within Industry Specific SEARs for SSD-93776214, 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]

2.2 ITEM 15 ESD WITHIN INDUSTRY-SPECIFIC SEARS (SSD-93776214)

This ESD SSDA Report has been prepared to address the Planning Secretary's Environmental Assessment Requirements (SEARs) issued by the Department of Planning, Housing and Infrastructure (DPHI) for the subject SSDA, with specific SEAR(s) identified in the table below.

SEAR	SEAR Description	Relevant Section of Report
15. Ecologically Sustainable Development (ESD) SEARs Requirement	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 2.3 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 Buildings SEPP 2022.*

In accordance with the above industry-specific SEARs requirements, the development will implement a holistic and integrated approach to ESD, maximising passive design opportunities while selectively applying modern technology where appropriate.

2.3 PRINCIPLES OF ECOLOGICALLY SUSTAINABLE DEVELOPMENT

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

2.3.1 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.

PROJECT 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.

2.3.2 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/commercial tenancies, the childcare centre 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.

2.3.3 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) waiver was issued by the Department of Planning and Environment. The waiver states that the development will not be likely to have any significant impacts on biodiversity values.

2.3.4 IMPROVED VALUATION, PRICING, AND INCENTIVE MECHANISMS

The principle of improved 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 3 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 BUILDINGS 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 published 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 Buildings 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 Pacific Highway and Wilson Street, Chatswood. 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 the Sustainable Buildings 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 Buildings 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 Buildings SEPP 2022 are not applicable for this project:

- *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

Chapter 3.2 (1) of Sustainable Buildings 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:

General Sustainability Provisions	Project Specific Responses
a) The minimisation of waste from associated demolition and construction, including by the choice and reuse of building materials.	▪ A Construction Waste Management Plan will be prepared by the building contractor prior to the commencement of works on site which includes measures to maximise the diversion of construction and demolition waste from landfill.
b) A reduction in peak demand for electricity, including through the use of energy efficiency technology.	▪ A high-efficiency HVAC system. ▪ Energy-efficient LED lighting.
c) A reduction in the reliance on artificial lighting and mechanical heating and cooling through passive design.	▪ Appropriate insulation and roof colour will be provided. ▪ High thermal performance glazing system. ▪ Appropriate building design elements to maximise natural daylight and winter heat gains while minimising unwanted heat gains in summer.
d) The generation and storage of renewable energy.	▪ Provision of a roof-mounted photovoltaic system (PV).
e) 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. Accessible energy and water metering will be provided for all common uses, major uses and major sources.
f) The minimisation of consumption of potable water.	▪ Installed water-efficient fixtures and fittings meeting the minimum WELS Rating as nominated. ▪ Incorporating indigenous or low water use species.

3.2.2 CHAPTER 3.2 (2) – EMBODIED EMISSIONS

The NABERS embodied emissions materials form must be prepared for this development to disclose the amount of embodied emissions attributed to the non-residential part of the development. Refer to the separately issued NABERS Embodied Emissions Materials Form of the project.

4. SUSTAINABLE DESIGN FRAMEWORK

4.1 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 the design of the project during the detailed design by the design team.

4.2 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.

4.2.1 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 below.

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 are 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.

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.

RESIDENTIAL AREAS

Building Elements		BASIX Requirements
Envelope Roof/Ceiling	Ceiling with balcony or external above	min R4.0 insulation
	Internal Ceiling	no insulation required
Envelope Walls	External Walls	min R2.5 insulation
	Corridor Walls	min R2.5 insulation
Envelope Floors	Exposed to outside air/unconditioned space	min R2.0 insulation

Building Elements		BASIX Requirements
	Apartment/common area/conditioned space below	no insulation required

These requirements 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

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.

NON-RESIDENTIAL AREAS

The building will be designed to comply with NCC 2022 Section J Energy Efficiency. Based on the Part J4 DTS pathway, the minimum glazing performance requirements can be found below.

Building Elements	NCC 2022 Requirements
Vertical Envelope Glazing	Total U-value=3.3, Total SHGC=0.22 (DGU Low-E Tinted or the like)

RESIDENTIAL AREAS (CLASS 2 SOU)

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

Building Elements		BASIX Requirements
Vertical Envelope Glazing	Awnings	Total U=2.7, Total SHGC=0.32 (+/-5% Total SHGC)
	Fixed	Total U=2.3, Total SHGC=0.35 (+/-5% Total SHGC)
	Sliding	Total U=2.8, Total SHGC=0.32 (+/-5% Total SHGC)

4.2.2 SHADING AND DAYLIGHTING

Solar access can enhance indoor environmental quality through access to daylighting and reduce lighting energy consumption. However, excessive solar access and hence, direct solar radiation heat can increase HVAC energy demand and can also cause thermal discomfort. The passive solar heating principle which aims to prevent solar heat gain in the summer and harvest it in the winter for a free source of heating, and the Passive cooling principle which prevents heat from entering the building during the summer months, are strategies that can conveniently take advantage of the site-specific solar access for optimised indoor environmental quality and reduction of HVAC energy demand through the use of tailored shadings.

The proposed building is to be designed to make the best use of the sun by using passive design elements to prevent the high summer sun from entering the building whilst allowing the low winter sun to enter the building for passive heating.

These passive design features allow for enriched daylighting and greater access to external views for occupants. Additional daylighting reduces the reliance on artificial light and benefits alertness, mood, and productivity. External

views provide a connection to nature and the building and help to create an environment encouraging constructive experience.

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 shall be designed to comply with the minimum requirements of NCC 2022 Section J6 requirement.

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).

All bathrooms/toilets, laundries (if any), and general exhaust are mechanically ventilated. The design will have a sufficient amount of exhaust fans to ensure liveability for the building users.

The control of the air conditioning system shall be designed to minimise energy consumption. Further, high-efficiency equipment for the HVAC system will be selected to assist with the energy conservation of the building.

Ductwork systems will be designed to reduce system pressure losses to reduce fan motor power. This includes the selection of equipment for reduced coil and fittings drops and being generous with ductwork sizes to reduce friction losses.

4.3.2 LIGHTING

Lighting is to be designed to comply with NCC 2022 Section J7. Also, the Lighting illumination density is to be according to NCC2022 Section J7D3. Fittings incorporating the latest lamp technologies to be installed to minimise energy use and provide efficient artificial lighting systems. The proposed development shall be illuminated using energy-efficient light fittings.

All the external luminaires proposed will be according to AS 4282:1997. This will make sure that the external luminaires do not emit light pollution to the night sky above a given benchmark.

4.3.3 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.

4.3.4 ELECTRICITY METERING

Electricity metering and sub-metering shall be specified in accordance with Section J 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).

4.3.5 PHOTOVOLTAICS

Collection of solar energy should be implemented, with a goal of reducing the building's energy consumption and greenhouse gas emissions from a renewable source via the provision of a roof-mounted photovoltaic system.

4.4 INDOOR AIR QUALITY (IAQ)

The quality of indoor air has a significant impact on our health and environment. Poor indoor air quality results in adverse health effects such as allergies, asthma, etc. The ventilation system shall be designed to minimise the entry of outdoor pollutants as per ASHRAE Standard 62.1:2013 and should comply with AS1668.2:2012.

4.5 WATER CONSERVATION

The following initiatives are proposed to ensure that significant water saving is achieved.

4.5.1 FITTINGS AND FIXTURES

Water consumption shall be reduced by incorporating water-efficient fixtures and fittings in accordance with the Australian Government's Water Efficiency Labelling Scheme (WELS). The fixtures and fittings to meet the minimum WELS Rating.

Water Fittings/Fixtures	Minimum WELS Rating
Showerhead rating	4 (> 4.5 but <= 6 L/min)
Toilet rating	4
Taps and flow controllers	5
Dishwashers	4

4.5.2 WATER-SENSITIVE URBAN DESIGN

The project is to implement best practices of water-sensitive design by decreasing the total suspended solids in stormwater and by not using water for heat rejection. Please refer to the stormwater management plan including water-sensitive urban design (WSUD).

4.6 SUSTAINABLE MATERIALS

4.6.1 LOW VOC/LOW FORMALDEHYDE MATERIALS

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

4.6.2 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 Construction Waste Management Plan (CWMP) will be prepared to assess and monitor the waste management process during the construction and demolition. An Operational Waste Management Plan (OWMP) will be prepared regarding the waste produced during occupation within the development. The waste management plans 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 reports for details.

5. CONCLUSION

This ESD report has identified and summarised the project's Ecologically Sustainable Design (ESD) initiatives for the Department of Planning, Housing and Infrastructure (DPHI) in support of a State Significant Development Application (SSD-93776214) and in accordance with Item 15 of the SEARs issued by the Department of Planning, Housing and Infrastructure (DPHI) on 29 September 2025.

Through the inclusion of the sustainability initiatives outlined within this report, the project addresses the Industry Specific SEARs for SSD-93776214, 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).

5.1 MITIGATION MEASURES

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

- ESD principles are incorporated in the design and ongoing operation of the development as outlined in this report (refer to Section 2.3 & Appendix A).
- Sustainability Standards for Residential Development (BASIX) are incorporated in the design and ongoing operation of the development as detailed in this report and the BASIX Certificate.
- Sustainability Standards for Non-Residential Development set out in Chapter 3 of State Environmental Planning Policy (Sustainable Buildings) 2022 are incorporated in the design and ongoing operation of the development as detailed in this report.

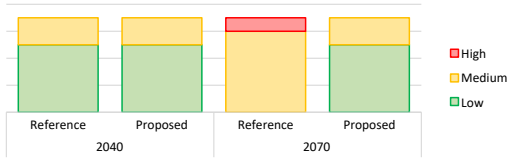
The relevant impacts have been addressed by following the implementation of the above mitigation measures.

6. APPENDIX A: ENVIRONMENTAL PRE-SCREENING CHECKLIST

Pacific Highway and Wilson Street - 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 severity of <u>BUSHFIRE</u> 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 and visitors, impacting health. In addition, **smoke and embers** may **damage** the air conditioning system.	Minor	Unlikely	Low	Minor	Possible	Medium	Mechanical Developer	**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.	Insignificant	Unlikely	Low	Minor	Unlikely	Low	The risk and impact of smoke on occupants will be reduced by good management practice implemented.
Hotter and dryer conditions resulting in higher frequency and/or duration of <u>HEATWAVES/ EXTREME HEAT</u> (over 35 degree Celsius)	On balance, the projected climate scenarios indicate a summer that will be warmer in the near future and becoming hotter and drier later. Under these projected scenarios, the likelihood and severity of heatwaves 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. Increased **urban heat risk** due to warmer to hotter conditions may further increase cooling energy requirement and cause a direct impact on the **health and well-being** of the building occupants.	Minor	Likely	Medium	Moderate	Likely	High	Architect Landscape ESD Mechanical	**Arch**: Incorporate passive thermal design principles in the design and construction of the building such as appropriate levels of shading devices and thermal insulation. Consider targeting light coloured roofs and facade as well as landscaped areas to reduce heat gains to help mitigate urban heat island effect. **Landscape**: Improving the vegetation on site by planting more indigenous species to improve the microclimate of the site. Providing water bodies where possible. **ESD**: Building is targeting a reduction in energy use. Reduction will be achieved through efficiency systems, building fabric optimisation and onsite PV array on roof. The solutions will help to reduce the peak load, and therefore the HVAC system strain.	Minor	Possible	Medium	Minor	Likely	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.
Hotter and dryer conditions resulting in higher frequency and/or duration of <u>HEATWAVES/ EXTREME HEAT</u> (over 35 degree Celsius)	On balance, the projected climate scenarios indicate a summer that will be warmer in the near future and becoming hotter and drier later. Under these projected scenarios, the likelihood and severity of heatwaves will be increased.	DIRECT: Reduction in the ability to **use outdoor spaces** due to effects of **Urban Heat Island,** Heatwaves/Extreme heat**.**	Minor	Likely	Medium	Minor	Almost certain	Medium	Architect Landscape	**Landscape/Arch**: Provide extensive landscaping, shade structures/overhangs for outdoor spaces and light colour finishes to roof and envelope to reduce the effect of urban heat island effect.	Minor	Possible	Medium	Minor	Likely	Medium	Providing landscaping, shade and increasing reflectivity of hardscape and roof will reflect more heat and lower microclimate temperatures.

Pacific Highway and Wilson Street - 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 HEATWAVES/ EXTREME HEAT (over 35 degree Celsius)	On balance, the projected climate scenarios indicate a summer that will be warmer in the near future and becoming hotter and drier later. Under these projected scenarios, the likelihood and severity of heatwaves 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.	Insignificant	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 HEATWAVES/ EXTREME HEAT (over 35 degree Celsius)	On balance, the projected climate scenarios indicate a summer that will be warmer in the near future and becoming hotter and drier later. Under these projected scenarios, the likelihood and severity of heatwaves 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 STORM/ WIND 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.
Increased frequency and intensity of DROUGHT periods.	On balance, the projected climate scenarios indicate more extensive drought periods followed by increased intensity of extreme rainfall events.	DIRECT: **Damage to landscaping** due to lack of rainfall.	Insignificant	Likely	Low	Insignificant	Almost certain	Medium	Landscape	**Landscape**: Selection of planting from landscape architect to be resilient indigenous plants that require less watering than other species. Investigate specifying low water requirement landscaping with a high efficiency irrigation system (e.g. Sub-surface drip irrigation).	Insignificant	Possible	Low	Insignificant	Possible	Low	Decreasing the landscapes dependency on regular rainfall and increasing the tolerance of the plants selected will reduce the need to replace planting.