



Edward Street and Rosedale Road, Gordon.

ESD Report

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E-LAB Consulting

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DOCUMENT QA AND REVISIONS

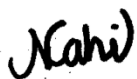
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Authorised by:

Engineering Lab NSW Pty Ltd



Natalie Cahill | Technical Lead

Sustainability



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EXECUTIVE SUMMARY

Engineering Lab NSW Pty Ltd (E-LAB Consulting) has been commissioned by CPDM to prepare this report in accordance with the technical requirements of the Secretary's Environmental Assessment Requirements (SEARs), and in support of the State Significant Development Application (SSDA) SSD-85549710. for the proposed a Residential development with in-fill affordable housing at 1 & 1a Edward Street and 25 & 27 Rosedale Road, Gordon NSW 2072.

As part of its commitment to sustainability, the development has committed to the following:

- Meeting BASIX Energy, Water and Thermal Comfort Targets as minimum of:
 - 60% Energy
 - 40% Water
 - Thermal comfort:
 - Average 6-Star NatHERS for all individual units
 - Heating load = 55.7 MJ/m²
 - Cooling load = 56.2 MJ/m²
- Provision of substantial communal space for occupant amenity

The strategies and initiatives presented in this report demonstrate a commitment to sustainability in line with SEARS requirements and are to be further developed during subsequent stages of the project.

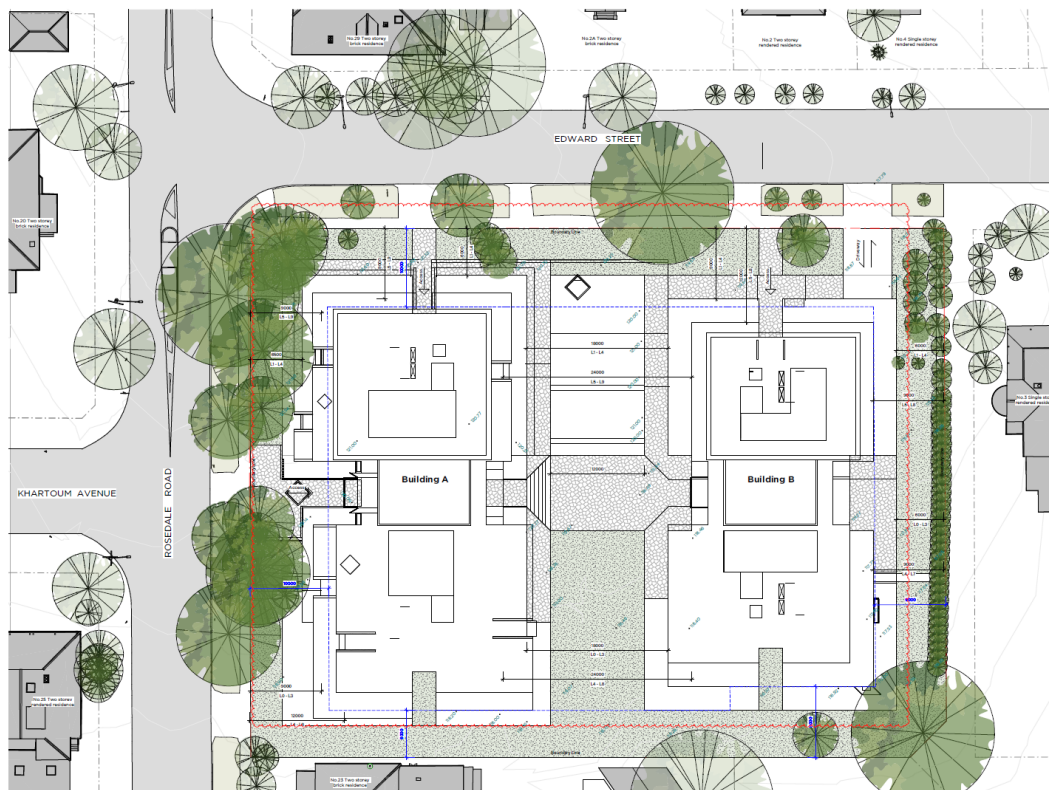


Figure 1: Proposed Development (source: Architecture drawing)

1 INTRODUCTION

This Engineering Lab NSW Pty Ltd (E-LAB Consulting) accompanies an Environmental Impact Statement (EIS) pursuant to Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act), in support of a State Significant Development Application (SSDA) for the construction of the proposed a Residential development with in-fill affordable housing at 1 & 1a Edward Street and 25 & 27 Rosedale Road, Gordon, reference SSD-85549710.

The proposal involves the demolition of the existing dwellings and the construction of two x nine storey residential flat buildings at 1 & 1a Edward Street and 25 & 27 Rosedale Road, Gordon, comprising of:

- 119 residential units, including affordable housing apartments
- Basement levels, and,
- Associated infrastructure

1.1 SITE ANALYSIS

The site is located at 1 & 1a Edward Street and 25 & 27 Rosedale Road, Gordon. The legal description of the site is provided below address Lot Area (on Survey)

- 1 Edward Street Lot A in DP 189351 1,843sqm
- 1a Edward Street Lot C in DP 334965 1,710sqm
- 25 Rosedale Road Lot B in DP 334965 850.7sqm
- 27 Rosedale Road Lot A in DP 334965 1,542sqm

The site is located within the Ku-ring-gai Local Government Area, approximately 18km north of Sydney's Central Business District and around 350m northeast of Gordon Train Station. The site has a total surveyed area of approximately 5,945.7sqm.

The site is located on the corner of Edward Street and Rosedale Road and is surrounded by detached residential dwellings. The site is rectangular in shape and is currently occupied by four dwelling houses and associated development such as swimming pools and gardens.

The site is located within the Roberts Grant Heritage Conservation Area.

An aerial photo of the site is provided below in Figure 3.



Figure 3: Aerial view of the site, outlined in red (source: Nearmap)

1.2 RESPONSE TO THE SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS (SEARS)

This report outlines how the development will address the SEARs as part of the Environmental Impact Statement in support of the SSDA. These are:

REQUIREMENT	RESPONSE
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.	Refer to Section 3.1 for the project's response to the principles of the EPA regulation.
Where relevant, provide an assessment of the development against the standards for non-residential development set out in Chapter 3 of <i>State Environmental Planning Policy (Sustainable Buildings) 2022</i>	Refer to Section 3.2 for the project's response to the requirements for retail and commercial gym components of the development.

2 SUSTAINABILITY FRAMEWORKS

The proposed development's sustainability outcomes are influenced by the following key frameworks:

- State Environmental Planning Policy - Sustainable Buildings (SEPP) 2022
- To have energy efficiency in the design and operation of development proposals. This is done by:
 - Promoting the use of energy efficient principles in the design of a facility; and
 - Ensuring the ongoing operations of the facility incorporates energy minimisation measures.

This development aligns with the values outlined in the following:

- BASIX Energy, Water and Thermal Comfort Targets

2.1 STATE ENVIRONMENTAL PLANNING POLICY (SUSTAINABLE BUILDINGS) 2022

The NSW Government has introduced the State Environmental Planning Policy (Sustainable Buildings) 2022 to ensure new and renovated buildings are sustainable and resilient for future climate and bring NSW towards net zero emissions. As part of the SEPP the following is required to be addressed for this development as minimum:

COMPONENT	REQUIREMENT
Residential	BASIX Energy Target 60% BASIX Water Target 40% BASIX Thermal Comfort • Average 6-Star NatHERS for all individual units The above requirements will be covered in the BASIX report by E-LAB Consulting

Refer to the following table for the project responses to each SEPP requirement.

REQUIREMENT	RESPONSE
General Sustainability – reporting on general performance, including water conservation, waste minimization and use of renewable energy.	The report outlines the general sustainability principles and design responses that are included. Refer to Section 3.1 to confirm the overall sustainability practices. Refer to Section 3.3 for water conservation, refer to Section 3.4 for waste minimization, refer to Section 3.2 for energy. Refer to Section 3.10 for additional information.
Embodied Emissions Reporting – disclose at development application and construction certificate the quantities of materials and associated emissions. Describe how embodied emissions are minimised (by re-used or recycled content and low emissions construction technologies).	The development will declare materials for embodied emissions reporting through the BASIX tool. Refer to Section 3.4 for preliminary strategies in place to reduce emissions.
The minimisation of waste from associated demolition and construction, including by the choice and reuse of building materials.	Refer to Section 3.4 which outlines minimisation of waste.
A reduction in peak demand for electricity, including through the use of energy efficient technology.	Refer to Section 3.2 which discusses reduction in electricity and energy through efficient strategies, systems and monitoring. Refer to Section 3.10 for additional information.



A reduction in the reliance on artificial lighting and mechanical heating and cooling through passive design.	Refer to Section 3.2, 3.5 and 3.6 which outlines the design responses to reduce reliance on artificial lighting and mechanical systems to achieve visual and thermal comfort and reduce requirement of heating and cooling. Refer to Section 3.10 for additional information.
The generation and storage of renewable energy.	Refer to Section 3.2 which discusses the provision of a PV system and its associated generation and storage. Refer to Section 3.10 for additional information.
The metering and monitoring of energy consumption.	Refer to Section 3.2 which discusses energy metering and monitoring.
The minimisation of consumption of potable water.	Refer to Section 3.3 which discusses the efficient systems in place to minimise water use and the strategies in place to recycle and re-use water throughout the development.

3 PROJECT DESIGN RESPONSE

3.1 EPA PRINCIPLES

The proposed development will follow the golden standard in sustainability principles throughout the development. This includes the design, construction, and operational elements of the project. The key overarching principles are aligned with the definition of Ecologically Sustainable Development as defined in Section 193 of the Environmental Planning and Assessment Regulation 2021. These include:

The Precautionary Principle:

Philosophy: Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

Project Response: The project is committed to incorporating elements to minimise impacts on the environment, as outlined below in this section of this report. A commitment to improvement on minimum benchmarks demonstrates the development's commitment to sustainability with additional commitments to third party certification schemes to capture strategies that will prevent environmental degradation and serious or irreversible damage.

The Principle of Inter-generational Equity:

Philosophy: The present generation should ensure that the health, diversity, and productivity of the environment is maintained or enhanced for the benefit of future generations.

Project Response: The project is committed to incorporating careful selections into the project design. The design team will address key elements such as energy, potable water, and material consumption to do what is within the project's control to allow each following generation to have an opportunity for ecological equality.

The Principle of the conservation of biological diversity and ecological integrity:

Philosophy: Conservation of biological diversity and ecological integrity should be a fundamental consideration

Project Response: The project is committed to planting native vegetation and using integrated landscaping to enhance the overall ecological and biodiversity of the site. Rainwater and stormwater will be carefully managed and controlled to minimise impacts on surroundings. Additionally, through third party certifications the project will be able to utilise the strategies to improve biological and ecological standards.

Principles relating to improved valuation, pricing, and incentive mechanisms:

Philosophy: Environmental factors should be included in the valuation of assets and services. The users of goods and services should pay prices based on the full life cycle costs of providing goods and service.

Project Response: The project will target a construction waste diversion target of 90%, as well as develop specific project waste management strategies. These combine to ensure the project pays for the waste and damage it creates. Further, it is designed to be low-energy and low-water consumption, which provides an incentive for residents through lower utility bills.

The Principle of Waste Minimisation:

Philosophy: All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment.

Project Response: The project will target a construction waste diversion target of 90%, as well as develop specific project waste management strategies. Construction materials are chosen to be low impact in their manufacture, including best practice PVC and FSC/PeFC timber throughout where possible. This impacts waste both created by the site, as well as upstream and downstream waste categories

3.2 ENERGY

The only path to a low carbon economy and achieving a “2°C world”, where the average global temperature is kept to less than 2°C above pre-industrial levels, is through comprehensive and complete consideration of how the development consumes resources, including energy, water, and material efficiency.

The energy efficiency strategy generally follows the energy efficiency pyramid of design in Figure 5. In the first instance demand for greenhouse gases should be reduced. Consideration should be to remove the need for energy to be consumed where possible. Beyond this, energy can be more efficient, through efficient lighting, mechanical systems, and appropriate services.

Once the system has reduced all available energy-consuming elements and made the remaining systems as efficient as possible, renewable energy sources will be considered. Only after all the above steps have been completed should offsets be used to close the gap and achieve neutrality.

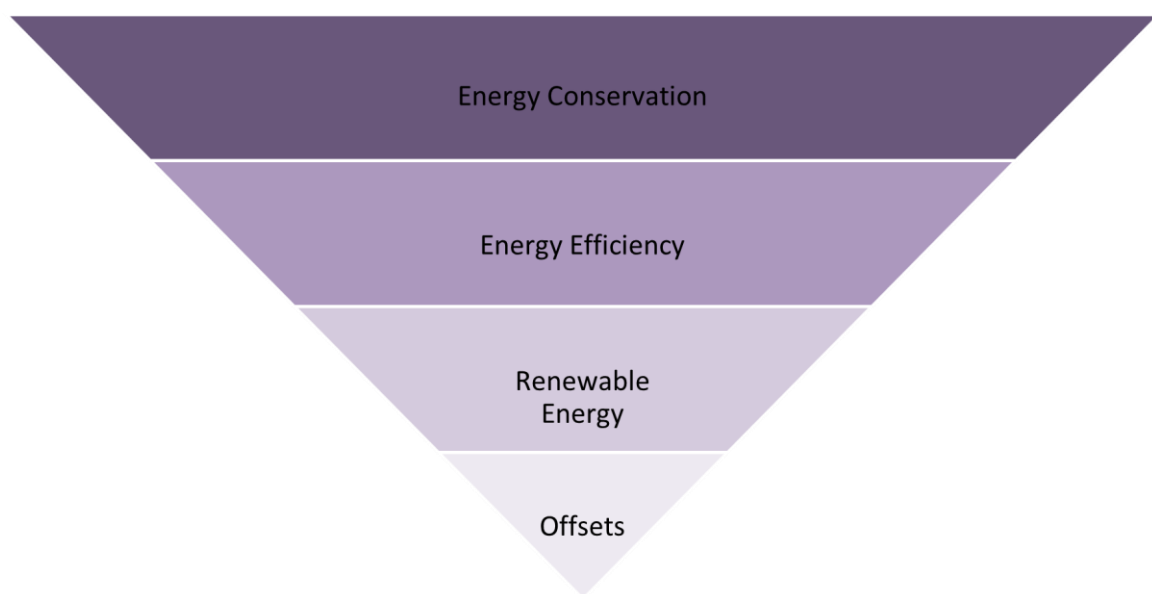


Figure 5: Energy efficiency pyramid: pathway to carbon neutrality.

To achieve the above, the following initiatives are proposed:



Efficient Lighting Systems – High efficiency LED lighting throughout, including in common areas with efficiency controls to meet the requirements of BASIX and Green Star. Controls will include motion sensors, time clocks and zoned switching which will help reduce consumption of energy. Lighting power density to be at least 10% below Section J.



Controls, Energy Metering and Monitoring – Energy meters and monitoring systems will be provided to comply with NCC 2022 Section J Part J8 and Green Star requirements. Preference for natural ventilation and comfort through adaptive cooling and shading.



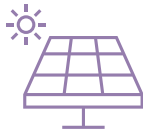
Facade – Façade systems and shading systems will reduce load on the HVAC system with selection of insulation and glazing through new BASIX requirements. Aiming for 6 Star NatHERS average with consideration of window to wall ratio.



Hot Water – Hot water is likely to be provided by energy efficient heat pump systems. These systems are highly efficient which will allow occupants utilise systems often with reduced energy consumption.



Appliances & Equipment – Apartment appliances and equipment will be selected with high energy rating to ensure reduced consumption which will be in line with BASIX energy targets. Additionally, site will have electric ovens



Renewable Energy – The upper roof area provides an excellent opportunity for installation of a solar photovoltaic system. The sizeable system will generate renewable electricity to offset grid use and minimise stress on the grid at peak times. PV will be installed at a rate that maximises the coverage of the non-trafficable roof area.

3.3 WATER CONSUMPTION

To achieve responsible water consumption and water sensitive urban design, best practice water-saving initiatives will need to be implemented throughout the project. The following initiatives will be explored to achieve the potable water targets:

Sanitary Fixtures – By implementing low-flow water fixtures, the consumption will be significantly reduced. All sanitary fixtures are to be provided with the minimum WELS ratings identified below:

Kitchen Taps – 5 Star WELS

Bathroom Taps – 5 Star WELS

Toilets – 4 Star WELS

Showers – 4 Star WELS (<7.5 L/min)

Dishwashers - 4 Star WELS

Refer to the BASIX report by E-LAB Consulting for further details on residential water consumption measures.



Landscape Irrigation – Efficient irrigation systems and the use of native plants or low water use species of vegetation in the landscaping plan will be considered. Native plants have evolved to thrive in the Australian environment and are typically more resilient than their exotic counterparts. They typically require less water and are more likely to survive the predicted increase in extreme drought conditions due to climate change. Native vegetation also stores a significant amount of carbon, helping to mitigate climate change. The project will aim to use these strategies in communal spaces with gardens and landscaping.



3.4 MATERIALS

In line with the principals of sustainability outlined in the EPA, the project will have a significant focus on materiality. The scope of consideration includes the following action items within the project response:

- **Construction Waste** – Majority construction and demolition waste is to be diverted from landfill. This diverts and ensures reuse or recycling of a high portion of site waste.
- **Low VOC and Low Formaldehyde Materials** – paints, adhesives, sealants, floor coverings, carpets and engineered wood will be selected appropriately to provide a healthier and low-impact environment. Such efforts provide a cleaner and better environment for all.
- **Best-Practice PVC** – cables, pipes, flooring, and blinds will be selected and specified to be Best Practice PVC. This ensures upstream performance will be met and has significant benefit for the overall environment during the construction process.
- **Best Practice Steel** – Where possible, steel will come from a sustainable steel manufacturer, who has an action plan. Steel supplied will aim to have energy reducing processes in manufacturing and recycled content.
- **Sustainable Products** – Where possible, products selected for the project will be sustainable which are verified through recycled content, re-use, environmental product declarations, certifications and more. This will ensure reduced toxicity and improve environmental quality while reducing waste.
- **Waste Management Plan** – Development of an ongoing Waste Management Plan so waste can be sorted, separated, and recycled. This will assist ongoing diversion from landfill for the development. Inclusion of sufficient bins and appropriate separation systems to ensure waste is minimised and effective recycling.

3.5 COMFORT AND QUALITY

To ensure the best quality for users and visitors inside the space, the development will commit to the following key initiatives:

- **Visual Comfort** – Maximising high-quality light into the living spaces, with views to the sky and nature where possible.
- **Indoor Air Quality** – Ventilation to be easily cleaned and elimination of pollutants to improve air quality within internal spaces.
- **Acoustic Excellence** – Designing the building layout to be protected from noise from external sources. Delicate material selection, acoustic attenuation, and designing the shape of the building and openings accordingly achieves the performance.
- **Thermal Comfort** – Appropriate mix of vernacular design, overhangs, adaptive comfort and high levels of insulation in the roof and facades.
- **Lighting Comfort** – Use of high colour rendering index LED lighting throughout the entire development. Low-glare lighting with baffles or louvres to limit UGR.
- **Generous Natural Planting** – Greenery through natural planting throughout the development assists in a connection to nature for users and passers-by. It also has a cooling effect, reducing the Urban Heat Island burden on the project. This will be applied in the communal spaces.

The above combine to ensure the development is responsible, efficient, beautiful, and in the best interest of not just the developers, but the residents, community, and society as a whole.



3.6 URBAN HEAT ISLAND MITIGATION

The site experiences moderate heat levels which located between the Gordon town centre exhibits elevated Urban Heat Island (UHI) intensity, particularly around the railway station and Pacific Highway, due to dense built form and paved surfaces. While the Ku-ring-gai Flying Fox Reserve provides significant cooling benefits, demonstrating the critical role of vegetation in mitigating local UHI impacts.



Figure 6: Urban heat island effect at the site. (Source: SEED Database)

To minimise the urban heat island effect and provide a more comfortable environment for occupants, the development has incorporated the following initiatives:

- Outdoor communal spaces with landscaping, gardens and lawns to provide additional vegetation.
- Install high-albedo pavements or permeable pavers in walkways and communal open space areas.
- Integrate vertical greenery, where façades face each other.
- Add pergolas over communal open spaces combined with climbing plants for natural shading.
- Light coloured materials selected for roofs and facades where possible.
- Introduction of architectural elements and shading where possible.

3.7 BASIX

The proposed apartments and residential communal spaces will be subject to compliance with the Building Sustainability Index (BASIX) which applies to all residential dwelling types within NSW. This planning measure applies stringent requirements on building envelope, water consumption and energy consumption.

The project will demonstrate compliance through a variety of strategies as listed within this report. The BASIX assessment along with thermal comfort modelling will be undertaken and reported within the BASIX Report by Gradwell Consulting. We understand the development is achieving the following BASIX outcomes:

- 60% Energy (Target 60%)
- 40% Water (Target 40%)
- Pass Thermal comfort
- Average 6 Star NatHERS across the development

3.8 SECTION J

The proposed common areas of the development will be subject to compliance with Section J under the NCC 2022 code. This code places strict environmental performance requirements on the building envelope and services within the building.

The project may demonstrate compliance via verification method J1V3 – verification using a reference building (energy modelling). This has not been undertaken to date. The design of the building fabric will need to demonstrate compliance with this clause through dynamic modelling of the building against a reference case. This report will be developed when necessary and indicate the building fabric requirements.

3.9 SUSTAINABLE TRANSPORT

The development provides easy access to the bus network with bus stops located close by, additionally, the Tallawong Station is a short walk away providing rail and bus route options connecting to Sydney's extensive public transport network. Schofields road and Windsor Road, the two main roads are bike friendly.

The development is located within close proximity to amenities such as:

- Grocery stores including Woolworths and Coles
- Dining and café options
- Banks
- Newsagents and post office
- Medical centres, chemists and hospitals
- Local parks and green spaces

4 CONCLUSION

This report developed by E-LAB Consulting to provide an outline of the proposed development's Ecologically Sustainable Design initiatives and commitments which responds to the technical requirements of the Secretary's Environmental Assessment Requirements (SEARs), and in support of the State Significant Development Application for a Residential development with in-fill affordable housing at 1 & 1a Edward Street and 25 & 27 Rosedale Road, Gordon NSW 2072.

The ESD strategies proposed will assist the development in achieving high levels of sustainability and environmental performance. These strategies include:

- Compliance with BASIX Energy, Water and Thermal Comfort Targets as minimum of:
 - 60% Energy
 - 40% Water
 - Pass Thermal comfort
- Provision of substantial communal space for occupant amenity
- Commitment to meeting the new requirements of SEPP 2022
- Compliance with requirements for NCC/BCA Section J 2022
- Following a range of sustainability initiatives across the site spanning energy efficiency, thermal performance, indoor environment quality, waste management, and comfort

E-LAB Consulting confirm this ESD Report addresses the requirements of SEAR No SSD-85549710 and relevant State and local legislation, policies, and guidelines including (NSW SEPP 2022 guideline).

I further confirm that none of the information contained in the ESD report is false or misleading.