NORTHROP

SUSTAINABILITY REPORT

# 2-8 Highgate Rd, Lindfield NSW

## 2 - 8 Highgate Road  NSW

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**PREPARED FOR**
CPDM
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# Sustainability Report

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# 1. Executive Summary

This Ecologically Sustainable Development (ESD) report has been prepared by Northrop Consulting Engineers to accompany a State Significant Development Application (SSDA) for the proposed new residential development located at 2-8 Highgate Road, Lindfield.

This report has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) issued for the project (SSD-78493518).

Information contained within this report has been prepared in direct response to:

- The Secretary's Environmental Assessment Requirements (SEARs).
- The Environmental Planning and Assessment Regulation 2021.
- Ku-ring-gai Development Control Plan (DCP) 2022.

The project seeks to meet and exceed the sustainable requirements set for residential developments. Specific sustainability initiatives proposed for the building include, but are not limited to:

- Space efficient building layout.
- Complying with the energy efficiency requirements of Section J of the Building Code of Australia.
- Complying with the energy, water and thermal performance requirements of BASIX.
- Designing a highly efficient façade wall-glazing system to minimise heat gains while maximising daylight entry for daytime-occupied areas.
- Reducing potable water use through high WELS-rated sanitary fixtures and fittings.
- Collecting and reusing rainwater to conserve water resources.
- Increasing the use of daylighting to reduce reliance on artificial lighting and lower power consumption.
- Implementing comprehensive waste minimisation strategies.
- Adopting Water Sensitive Urban Design (WSUD) principles to protect water quality.
- Installing Electric Vehicle charging infrastructure and secure bicycle parking amenities.

The integration of these initiatives demonstrates the project's strong social and environmental commitments, effectively addressing and mitigating the negative environmental, social, and economic impacts associated with it. The proposed building initiatives offer a cost-effective solution in design, construction, and operation, and the design team is committed to further pursuing sustainable development goals across the site as the project progresses.

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# 2. Introduction

## 2.1 Background

This Ecologically Sustainable Development (ESD) report has been prepared by Northrop Consulting Engineers to accompany a State Significant Development Application (SSDA) for the proposed new residential development located at 2-8 Highgate Road, Lindfield. The project comprises the demolition of the existing buildings, subdivision, site preparation works, and construction of a residential development comprising a 9 floors of apartment units.

This report has been prepared in response to the requirements contained within the Secretary's Environmental Assessment Requirements (SEARs) dated 20 December 2024 and issued for the SSDA (SSD-78493518). Specifically, this report has been prepared to respond to the SEARs requirement issued below.

*Table 1 Response to Ecologically Sustainable Development (ESD) of the SEARs*

| Item | Description of requirement | Section reference (this report) |
|---|---|---|
| **Ecologically Sustainable Development** | Identification of 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 3.2** |
| | Demonstration of how the development will meet or exceed the relevant industry recognised building sustainability and environmental performance standards. | **Section 4** |
| | Demonstration of how the development minimises greenhouse gas emissions (reflecting the Government's goal of net zero emissions by 2050) and consumption of energy, water (including water sensitive urban design) and material resources. | **Section 4** |

To ensure that the development meets the SEARs and aligns with the client's commitment to sustainability, this report has examined the design documentation and the project's integration with the surrounding area. Northrop has then examined the ESD principles that have been incorporated into the project design and will provide guidance on further initiatives to be considered during the project's detailed design phase. This report lays out the site approach to sustainability and refers to the applicable elements of the planning requirements.

## 2.2 Site Location

The proposed development is situated at 2-8 Highgate Road, Lindfield, NSW, 2070 and is surrounded by residential developments.


*Figure 1 Site Location (Source: Google maps)*

## 2.3 Scope

Northrop Consulting Engineers have been engaged by CPDM to provide a Sustainability Report that will outline how the project meets the relevant planning requirements. The following sections of this report will identify the ESD principles of the construction and its relation to the Planning Secretary's Environmental Assessment Requirements (SEARs), State Environmental Planning Policies, Ku-ring-gai Development Control Plan (DCP) 2022, and any other planning requirements relevant to the area.

# 3. Methodology

Information contained within this report has been prepared in direct response to:

- The Secretary's Environmental Assessment Requirements (SEARs).
- The Environmental Planning and Assessment Regulation 2021.
- Ku-ring-gai Development Control Plan (DCP) 2022.
- State Significant Development Guidelines

The ESD initiatives and targets outlined within this report have been compiled based on the following:

- Best practice design principles.
- National Construction Code (NCC) Section J – Energy Efficiency Targets.
- Building Sustainability Index (BASIX).

## 3.1 Secretaries Environmental Assessment Requirements (SEARs)

This report discusses how the proposed development addresses Ecologically Sustainable Development (ESD) of the SEARs. The requirements are outlined below, along with references to where each response can be found within this report.

*Table 2 Response to Ecologically Sustainable Development (ESD) of the SEARs*

| Item for inclusion | Report Location |
|---|---|
| Identification of 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 3.2** |
| Demonstration of how the development will meet or exceed the relevant industry recognised building sustainability and environmental performance standards. | **Section 4** |
| Demonstration of how the development minimises greenhouse gas emissions (reflecting the Government's goal of net zero emissions by 2050) and consumption of energy, water (including water sensitive urban design) and material resources. | **Section 4** |

## 3.2 Environmental Planning and Assessment Regulation 2021

The following section describes how ESD principles (as defined within clause 193 of the Environmental Planning and Assessment Regulation 2021) are incorporated in the design, construction, and operation phases of the project.

*Table 3 Principles of Ecologically Sustainable Development*

| Principle | Objective | Project Response |
|---|---|---|
| **The precautionary principle** | Namely, 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 | Through the implementation of environmental management and building maintainability, the project will incorporate a focus on adaptability and resilience into the |

| Principle | Objective | Project Response |
|---|---|---|
| | applying the precautionary principle, public and private decisions should be guided by:<br>• careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and<br>• an assessment of the risk-weighted consequences of various options. | project design. The concept behind the precautionary principle is to create features in the project that can both; adapt to changes, which may eventuate in the future, and avoid the risk of serious or irreversible damage to the environment. |
| **Inter-generational equity** | Namely, that the present generation should ensure the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations. | To ensure the maintenance or enhancement of the health, diversity, and productivity of the environment for the benefit of future generations, the design will incorporate initiatives such as best practices PVC and low-impact paints, sealants, adhesives and FSC certified wood. Additionally, there will be a focus on integrating more vegetation and enhancing the connection with nature. Through these measures, the project will demonstrate a strong commitment to preserving the environmental health, diversity, and productivity of the local area. |
| **Conservation of biological diversity and ecological integrity** | Namely, that the conservation of biological diversity and ecological integrity should be a fundamental consideration. | By planting native vegetation and employing integrated landscaping, the project will work to enhance, conserve, and support the local biological diversity and integrity. |
| **Improved valuation, pricing, and incentive mechanisms** | Namely, that environmental factors should be included in the valuation of assets and services, such as:<br>• polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement, and<br>• 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<br>• established environmental goals should be pursued in the most cost-effective way by establishing incentive | The design of this development will employ lifecycle costing to determine the optimal strategy for major plant items. Decisions will be based on whole-of-life costs rather than capital expenditure alone. The project will involve significant input from the Quantity Surveyor, who will ensure that the project remains on budget and effectively considers environmental factors in the valuation of assets and services. |

| Principle | Objective | Project Response |
|---|---|---|
| | 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. | |

Through the inclusion of the above and the sustainability initiative outlined within this report the project clearly addresses the ESD Principles into the design, construction and operation of the development as defined within clause 193 of the Environmental Planning and Assessment Regulation 2021. Further details of the general sustainability initiatives are outlined in Section 4.

### 3.3 State Environmental Planning Policy (Planning Systems) 2021 – Schedule 1 (29)

Schedule 1 (29) of the State Environmental Planning Policy (Planning Systems) 2021 defines the project as SSD in Northern Sydney (Upper North Shore).

### 3.4 State Environment Planning Policies (SEPP) 2022 - Sustainable Buildings Requirements

The SEPP (Sustainable Buildings) 2022 outlines new requirements to allow projects to reduce greenhouse gas emissions. This section specifically addresses the following sustainability objectives for non-residential buildings.

*Table 4 Response to SEPP (Sustainable Buildings) 2022 Requirements – Residential development*

| Reference | Objective | Design Response |
|---|---|---|
| BASIX | Reduce water and energy consumption and greenhouse gas emissions from new houses and apartments. | • All developments that meet the criteria for BASIX development under the Environmental Planning and Assessment Regulation 2021 will obtain a BASIX certificate issued by the Planning Secretary (not part of this report).<br>• The development will meet the Energy, Water and Thermal Performance targets as per BASIX requirements. |

### 3.5 Ku-ring-gai Development Control Plan (DCP) 2022

Part 7B and 7C of the Ku-ring-gai Development Control Plan (DCP) 2022 includes performance objectives relevant to Ecologically Sustainable Development:

*Table 5 Response to Ecologically Sustainable Development (ESD) of the Ku-ring-gai DCP 2022*

| Item for inclusion | Design Solution | Report Location |
|---|---|---|
| Site layout of development and public domain mitigates urban heat island effect. | The project will use low Solar Absorptance roof colors to reflect solar radiation.<br>Green roofs and landscaping will be incorporated to provide natural insulation, | **Section 4** |

| Item for inclusion | Design Solution | Report Location |
|---|---|---|
| | reduce temperatures, and lower air conditioning needs.<br><br>Permeable or porous pavements, including light-colored options, will be used to minimise heat absorption and improve the overall comfort and environmental quality of the urban space. | |
| Buildings minimise cooling demand indoors and heat absorbance through orientation, the design of roofs and facades and materials. | Passive design strategies such as performance glazing, shading, orientation and use of insulation will be utilised to reduce demand on the mechanical air conditioning systems.<br><br>Roofs with a low Solar Absorptance (SA) will be chosen to reflect solar radiation.<br><br>Green roofs and landscaping will also be implemented to mitigate the urban heat island effect. | **Section 4** |
| Use of low environmental impact materials and finishes. | Low impact materials will be preferred for use in the development, where appropriate. | **Section 4** |
| Waste management. | The project will ensure Operational waste is managed, with separation of waste streams to encourage recycling, and lower the waste sent to landfill. | **Section 4** |
| Landscaping to contribute to the biodiversity of the area, with incorporation of deep soil landscaping. | The landscaped areas will incorporate native plant species to enhance biodiversity.<br><br>Deep soil landscaping will be provided which can sustain large and medium sized trees. | **Section 4** |
| Buildings maximise opportunities for sun and wind drying of clothes and reduce use of electric dryers. | All dwellings in the project will have access to an external air clothes drying area, such as a screened balcony, a terrace or clothes lines. | **Section 4** |
| Incorporate communal open spaces providing safe, accessible, and high quality amenity that facilitates social interaction for residents. | The project will provide communal roof gardens and open spaces as part of the amenities provided to the residents.<br><br>The spaces will have adequate access to daylight, and will be integrated with soft landscaping.<br><br>The open space will be well lit with energy efficient lighting and incorporate automatic controls, such as timers or daylight sensors. | **Section 4** |

| Item for inclusion | Design Solution | Report Location |
|---|---|---|
| | The artificial lighting design will ensure no light spills on to neighbours or to the sky. | |
| Incorporate green transport provisions and amenities within the design. | EV-ready infrastructure will be provided to all parking bays to enable installation of EV charging points linked to each dwelling's electricity meter.<br><br>At least 1 secure bicycle parking space with a locker per dwelling will be provided for residents.<br><br>At least 1 secure bicycle parking space per 10 dwellings will be provided for visitors. | **Section 4** |

## 3.6 Limitations

Due care and skill have been exercised in the preparation of this report. No responsibility or liability to any third party is accepted for any loss or damage arising out of the use of this report by any third party. Any third party wishing to act upon any material contained in this report should first contact Northrop for detailed advice, which will consider that party's requirements.

# 4. Ecologically Sustainable Design Strategies

The project will incorporate a set of ESD strategies which minimise the impact and, where feasible, enhance the ecological, social and economic outcomes for construction workers, future tenants, the wider community and ecosystem ecologies both local, regional and global.

## 4.1 Energy Efficiency

Energy efficiency in buildings is crucial for optimising resource use, reducing operational costs, and minimising environmental impact. Energy-efficient technologies and practices will be prioritised throughout the design development process. It is anticipated that the measures outlined below will provide significant savings in energy use.

### 4.1.1 Fabric Optimisation

Intelligent design and material selection will ensure thermal comfort is achieved without relying solely on mechanical means. Passive design strategies such as performance glazing, shading and use of insulation will reduce demand on the mechanical air conditioning systems leading to lower energy consumption and greenhouse gas emissions.

Implementing effective shading design ensures consistent access to daylighting throughout the building, consequently helping to minimise the use of artificial lighting.

The building fabric will be designed to meet or exceed the NCC 2022 and BASIX requirements for building envelope. Thermal breaks will be incorporated into walls and roofs where appropriate.

### 4.1.2 Energy Efficient Equipment

Only energy-efficient appliances and equipment will be used in the project, with a focus on selecting systems with higher Seasonal Energy Efficiency Ratio (SEER) rating when compared to Section J/ Minimum Energy Performance Standards (MEPS) requirements.

### 4.1.3 HVAC System

The air-conditioning and ventilation systems will be designed to comply or exceed the minimum requirements of NCC 2022 Section J Part J6.

### 4.1.4 Highly Efficient Lighting System

Installing efficient lighting systems, such as LED lighting, throughout the building will significantly decrease its overall energy consumption. LED lights are more efficient than traditional fluorescent lights and are characterized by an extended lifespan contributing to a reduction in carbon emissions. They are also efficient in dissipating heat and therefore reduce the heat load experienced within conditioned spaces.

Lighting will be designed to comply or exceed the minimum requirements of NCC 2022 Section J Part J7 and will be controlled via automatic control system.

### 4.1.5 Reduced Energy Usage

Measures to reduce energy consumption will be implemented in the design, such as providing outdoor clothes drying area, for example, as a screened balcony, a terrace or clothes lines, to reduce the use of dryers for laundry.

## 4.2 Indoor Environment Quality

Indoor environment quality is always an important consideration in spaces that are regularly occupied. The following have been considered as part of the building design.

### 4.2.1 Daylight Access

Daylighting systems will be integrated throughout the internal and external areas of this project to support the admission of natural light and direct sunlight throughout the design. This will be achieved using high Visible Light Transmission (VLT) windows. Adopting an integrated daylight approach will improve the wellbeing of the building occupants by creating a visually stimulating environment.

In addition to promoting occupant comfort, providing daylight will reduce the overall energy consumption of the building. Natural light will alleviate the need for artificial lighting whilst the direct sunlight will enhance thermal comfort during cooler months.

### 4.2.2 Indoor Air Quality (IAQ)

The quality of indoor air has a significant impact on both our health and the environment, potentially leading to adverse health effects such as allergies and asthma.

To address this concern, the project will provide access to outdoor air to regularly occupied spaces, which will reduce $CO_2$ build up and improve occupant's comfort.

### 4.2.3 Interior Noise Level Control

Internal noise levels will be actively considered with the building layout and systems design, taking into account how noise will be mitigated through the building. The use of acoustic insulation and sound isolation measures will ensure that interior noise levels to be maintained below acceptable limits.

## 4.3 Water Efficiency

A strong focus has been put on the effective management of water within the building with the following initiatives being included in the design in all areas throughout the project.

### 4.3.1 Rainwater Capture and Reuse

The building roof offers potential for rainwater harvesting, presenting a particularly advantageous opportunity. The project design will aim to incorporate rainwater harvesting systems to collect, store, and distribute rainwater to offset the site potable water usage. Further feasibility studies will be conducted to determine the optimal end-use for any non-potable water applications on site.

### 4.3.2 Water Efficient Equipment

Water efficient fixtures and fittings will reduce the water consumption of the site. As an indication, the following should be targeted:

*Table 6 Sanitary Fixtures Efficiency*

| Fixture / Equipment Type | WELS Rating | WELS Label |
|---|---|---|
| Taps | 5 Star |   |
| Toilet | 4 Star | |
| Showers | 3 Star (< 6L/min) | |
| Dishwashers (TBC if provided) | 5 Star | |

### 4.3.3 Landscaping

The planting design will feature native and drought-resistant species, including trees, shrubs, groundcovers, and grasses. These plants will be chosen from local vegetation to ensure they are well-adapted to the local climate. Once established, they require less water, reducing the need for frequent irrigation and minimising water waste. This diverse selection of plants results in a visually appealing and resilient landscape that requires minimal maintenance.

## 4.4 Water Sensitive Urban Design

Water Sensitive Urban Design (WSUD) stands at the forefront in modern urban planning, offering innovative solutions to the complex challenges of water management in urban environments.

### 4.4.1 Vegetation

Installing vegetation on roofs and selecting drought-tolerant plants are key strategies for managing stormwater. Incorporation of green roofs will capture and absorb rainwater, reducing runoff and filtering pollutants to improve water quality. Drought-tolerant plants will further reduce runoff and enhance groundwater recharge. These practices will support sustainable urban water management and contribute to long-term environmental resilience.

### 4.4.2 Permeable Pavements

Permeable unit pavers are proposed, where appropriate, for pedestrian paths and hardstands within the landscape to facilitate water infiltration into the soil and reduce pressure on stormwater systems.

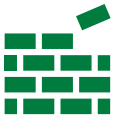
## 4.5 Circular Economy and Waste Management

Effective waste management throughout construction and operation of the site will help to promote resource efficiency and minimise the adverse environmental impacts of the project. By integrating circular economy principles, a system can be created where materials are reused, recycled and repurposed, reducing waste and conserving natural resources. The following are being considered as part of the design process.

### 4.5.1 Separated Waste and Recycling Streams

The provision of separated waste and recycling streams is proposed for effective recycling of the project's operation waste. Waste segregation into categories such as general, recycling, paper/cardboard, organics, clinical, and sharps has been incorporated, which will enhance the building's operational efficiency and deliver significant environmental benefits. Both interim and final waste storage, transfer, and collection methods are outlined in the Waste Management Plan.

## 4.6 Low Impact Materials Selections



Embodied energy will be reduced by avoiding unnecessary use of materials and procuring local materials with a low carbon footprint where appropriate.

## 4.7 Sustainable Transport

The following site attributes and sustainable transport initiatives will be implemented to reduce carbon emissions associated with transport, and access to amenities by building users.

### 4.7.1 Electric Vehicles (EV) Infrastructure

Provisions for dedicated car parking spaces equipped with charging infrastructure will be strategically implemented for electric vehicles. The aim is to encourage the adoption of electric vehicles to promote green transport, thereby minimising greenhouse gas emissions and promoting sustainable transportation practices.

### 4.7.2 Bicycle parking

Provisions for dedicated bicycle parking will be provided for the residents and visitors. At least 1 secure bicycle parking with a locker will be provided for each dwelling. In addition, at least 1 secure bicycle parking will be provided per 10 dwellings for the use of visitors. The aim is to encourage the use of active transport to promote green transport, thereby minimising greenhouse gas emissions and promoting sustainable transportation practices.

## 4.8 Mitigating Urban Heat Island Effect

The urban heat island effect is significant due to its role in elevating temperatures in urban areas, which can increase energy usage, health risks, and environmental strain. To address this issue, the project will aim to incorporate strategies like green infrastructure, light-coloured materials, permeable pavements and sustainable urban planning to create cooler and healthier built environments.

### 4.8.1 Light-coloured Roofing

To mitigate potential urban heat island effects on the site and its surroundings, a roof colour with a low Solar Absorptance (SA) will be chosen to reflect solar radiation.

### 4.8.2 Permeable or Porous Pavement

Permeable pavers will be provided where appropriate, to reduce heat absorption. This approach not only promotes sustainable landscape practices but also improves the overall comfort and environmental quality of the urban space.

### 4.8.3 Increasing Vegetation

Vegetation plays a crucial role in mitigating the urban heat island effect by providing shade, reducing temperatures, and enhancing overall environmental quality. Large and medium sized trees will be planned to expand the tree canopy across the site. Tree planting will be concentrated along streetscapes and near hardstand areas to effectively reduce temperatures in these areas.

Additionally, landscaped garden beds will be provided throughout the development to further reduce heat.

## 4.9 Improved Ecology

Through planting native vegetation and promoting improved interaction with the natural environment, the project will look to improve the site's ecology and minimise its ongoing environmental impact.

### 4.9.1 Light Pollution to Neighbouring Bodies

The design team will implement strategies to reduce light pollution and protect migratory animals and insects in nearby areas. The outdoor lighting controls will be designed to comply with AS/NZS 4282:2019 standard.

# 5. Conclusion

This report has addressed the ESD initiatives to support the proposed new residential development at 2-8 Highgate Road, Lindfield., NSW, 2070.

Specific sustainability initiatives proposed for the building include, but are not limited to:

- Space efficient building layout.
- Complying with the energy efficiency requirements of Section J of the Building Code of Australia.
- Complying with the energy, water and thermal performance requirements of BASIX.
- Designing a highly efficient façade wall-glazing system to minimise heat gains while maximising daylight entry for daytime-occupied areas.
- Reducing potable water use through high WELS-rated sanitary fixtures and fittings.
- Collecting and reusing rainwater to conserve water resources.
- Increasing the use of daylighting to reduce reliance on artificial lighting and lower power consumption.
- Implementing comprehensive waste minimisation strategies.
- Adopting Water Sensitive Urban Design (WSUD) principles to protect water quality.
- Installing Electric Vehicle charging infrastructure and secure bicycle parking amenities.

Overall, through the implementation of the initiatives noted within this report the project clearly demonstrates the site's commitment to ESD principles throughout the design, construction, and operation. Additionally, the project design team has worked to optimise the sites' energy performance, address key climate related risks posed to the site.

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