ESD Report for SSDA (SSD-82548708)

Middle Harbour Road, Lindfield

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Contents

Revision History

Revision	Project	Description	Author	Checked By	Date
1.0	P210002	Draft ESD Report (SSDA)	Payal Aggarwal	Luke Williams 	14th May 2025

1 Introduction

Aspire Sustainability Consulting has been engaged to prepare an Ecologically Sustainable Design (ESD) report to accompany the State Significant Development Application (SSD-82548708) regarding the proposed development located at 24, 26 & 28 Middle Harbour Road Sydney NSW 2070. This report outlines the sustainable design initiatives proposed for the development, demonstrating a commitment to achieve Secretary's Environmental Assessment Requirements (SEAR's) and additional regulatory frameworks.

1.1. Sustainable Design Frameworks

The development shall be designed in line with the following sustainable design frameworks, ensuring key ESD design principles are implemented across all aspects of design:

- National Construction Code (NCC) 2022 Section J Provisions;
- State Environmental Planning Policy (SEPP) 2022: Sustainable Buildings;
- Building Sustainability Index – Standards for residential development (BASIX) 2022;
- Planning Secretary's Environmental Assessment Requirements (SEARs) by Department of Planning, Housing and Infrastructure (DPHI);
- State Environmental Planning Policy (Housing) 2021;
- Ku-ring-gai Local Environmental Plan 2015 (KLEP2015); &
- Ku-ring-gai Development Control Plan (DCP) 2024.

1.1.1. National Construction Code (NCC) 2022 Volume 1 Section J (Energy Efficiency)

Provisions within Section J of the NCC relate to energy efficiency and the reduction of Greenhouse Gas Emissions for Class 2 to 9 developments. Aspects of design required to be addressed in Section J include the façade, building envelope, lighting, HVAC, energy metering, building sealing and ventilation. Non-Class 2 spaces will target Section J compliance through the delivery of a J1V3 Performance Solution that will be completed during early design development.

1.1.2. State Environmental Planning Policy (SEPP): Sustainable Buildings 2023

The Sustainable Buildings SEPP is aligned with National Construction Code & NSW Net Zero Policy which will help in delivering buildings that are more energy efficient, produce less GHG emissions and inform future benchmarks. It should be noted that the Sustainable Buildings SEPP is a framework that sets minimum performance requirements for projects in NSW, however local councils may enforce increased sustainability targets.

1.1.3. Building Sustainability Index (BASIX)

BASIX is the primary framework applied to Class 2 portions of developments in addition to their associated common areas. Minimum performance requirements regarding the building fabric, appliances (energy and water efficiency) and central building systems must be achieved.

The following table references sections within the report where compliance is demonstrated with applicable SEPP requirements.

Table 1: State Environmental Planning Policy (SEPP): Sustainable Buildings 2022 Requirements

2.1 Standards for BASIX development and BASIX optional development	
Schedule 1 sets out the standards that apply to BASIX development referred to in paragraphs (a) and (b) of the definition of ***BASIX development*** in the *Environmental Planning and Assessment Regulation 2021*.	
1. Schedule 2 sets out the standards that apply to: a BASIX development referred to in paragraph (c) or (d) of the definition of ***BASIX development*** in the *Environmental Planning and Assessment Regulation 2021*, & BASIX optional development if the development application or the application for a complying development certificate was accompanied by a BASIX certificate.	
2. The standard specified in Schedule 2, section 4 extends to a swimming pool or spa that has a capacity of less than 40,000L if the swimming pool or spa is part of development referred to in paragraph (c) of the definition of BASIX development in the Environmental Planning and Assessment Regulation 2021.	
3. A standard specified in Schedules 1 or 2 does not apply to development involving a heritage item or in a heritage conservation area to the extent that the Planning Secretary is satisfied that the development is not capable of achieving a standard because of other development controls that apply.	
4. Development consent must not be granted to development to which the standards specified in Schedules 1 or 2 apply unless the consent authority is satisfied the embodied emissions attributable to the development have been quantified.	
2.2 Standards not affected by environmental planning instruments or development control plans	**Addressed in:**
1.a. To reduce consumption of mains-supplied potable water or greenhouse gas emissions related to the use of— i. a building, or ii. the land on which a building is located.	Section 4, 10 & 11.
1.b. To improve the thermal performance of development.	Section 4 & 10.
1.c. To quantify and report on the embodied emissions attributable to development.	Section 4 & 7.
Schedule 1 Standards for erection of BASIX buildings and change of use to BASIX buildings	**Addressed in:**
2. Energy use	Section 4.
1. The standard is that the amount of greenhouse gas emissions resulting from the use of energy attributable to an occupant of the development over a year must be less than the baseline, by at least the percentage specified in Table 1 for the development.	
3. Water use	Section 4.
1. The standard is that the average daily amount of main-supplied potable water use attributable to an occupant of the development over a year must be less than the baseline, by at least the percentage shown on the *Water Use Map* for the land on which the development will be carried out.	
4. Application of Part	Section 4.
1. The standard represents the maximum amount of energy that may be used to heat and cool a dwelling to a comfortable temperature, measured in megajoules per square meter of the conditioned floor area of the dwelling over a year.	
Schedule 2 Standards for alterations of BASIX buildings and BASIX swimming pools and spas.	Not applicable to the development.

1.1.4. State Environmental Planning Policy (Housing) 2021

State Environmental Planning Policy (Housing) 2021 does not form part of ESD scope.

1.1.5. SEAR's & Ku-ring-gai DCP 2024 Controls & Objectives

The following table references sections within the report where compliance is demonstrated with applicable SEAR's and DCP requirements.

Table 2: SEARs (DPHI) and DCP ESD Controls & Objectives

Planning Secretary's Environmental Assessment Requirements - Ref 15	Addressed in:
• Identify how ESD principles (as defined in section 193 of the EP&A Regulation) are incorporated in the design and ongoing operation of the Proposal.	Sections 5-13.
• Demonstrate how the Proposal will meet or exceed the relevant industry recognised building sustainability and environmental performance standards.	Section 1.1.
• Demonstrate how the Proposal 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 10.
• Identify compliance with the relevant sustainability requirements of the KLEP2015 and State Environmental Planning Policy (Sustainable Buildings) 2022 (Sustainable Buildings SEPP).	Section 1.1.
23.3 Sustainability of Building Materials, Ku-ring-gai DCP 2024	**Addressed in:**
1. To provide good indoor air quality.	Section 12.
2. To limit pollution and protect public health and comfort.	Section 12.
3. To select materials and products which minimise environmental impact throughout a building's life cycle.	Section 7.
4. To reduce the consumption of natural and non-renewable resources.	Section 10.
5. To ensure material selection has been equally driven by environmental sustainability, safety, commercial competitiveness and quality.	Section 7.
6. To promote use of materials and finishes that contribute to the design of innovative buildings.	Section 7.
7. To reduce urban heat island effects.	Sections 8 & 10.
23.4 Materials, colours and finishes, Ku-ring-gai DCP 2024	**Addressed in:**
1. To ensure buildings are constructed using high quality materials and finishes that are durable and able to retain their aesthetic value over time.	Not part of ESD scope.
2. To ensure built form is of high architectural standard and able to positively contribute to the streetscape.	Not part of ESD scope.
3. To ensure the future character of dense built form continues to contribute to the Ku-ring-gai character.	Not part of ESD scope.
23.5 Roof terraces and podiums, Ku-ring-gai DCP 2024	**Addressed in:**
1. To provide high quality of private and public common open space on roof terraces and podiums.	Not part of ESD scope.
2. To design roof terraces so that they contribute to the streetscape.	Not part of ESD scope.
3. To encourage use of low maintenance planting and low water use on roof terraces and podiums with appropriate support systems.	Section 11.

23.9 Construction, demolition and disposal, Ku-ring-gai DCP 2024		Addressed in:
1.	To preserve the various natural elements and habitats such as soil profile, vegetation, natural rock shelves and watercourses.	Section 6.
2.	To protect existing trees and the natural elements of the site, including soil profile, vegetation, rock outcrops and water courses.	Section 6.
3.	To reduce the volume and cost of construction and demolition waste material.	Section 6.
4.	To protect neighbouring structures and minimise disturbance to neighbouring and downstream properties.	Not part of ESD scope.
5.	To ensure regular rainfall events do not adversely affect water quality.	Section 13.
6.	To protect the sensitive Hawkesbury Sandstone communities in the LGA.	Section 13.
7.	To prevent cumulative impacts from pollutants, (such as excess nutrients, sediment) on downstream ecosystems.	Section 13.
8.	To maintain visual amenity of the locality and the natural environment.	Not part of ESD scope.
25A.1 General requirements, Ku-ring-gai DCP 2024		**Addressed in:**
1.	To enable efficient, effective and sustainable waste management practices.	Section 6.
2.	To ensure waste collection and storage within the site that does not affect the amenity of residents with regard to odour, visual appearance or noise disturbance.	Section 6.
3.	To ensure waste and recycling storage areas are designed and constructed to meet the requirements of the building's use and its occupants.	Section 6.
4.	To ensure design and management of waste and recycling facilities protect public health.	Section 6.
25A.2 Waste storage rooms, Ku-ring-gai DCP 2024		**Addressed in:**
1.	To ensure waste generated from the building is fully accommodated onsite.	Section 6.
25A.3 Access to collection point, Ku-ring-gai DCP 2024		**Addressed in:**
1.	To ensure access to waste storage rooms for both building uses and for collection service operators.	Section 6.
25A.4 Construction of waste and recycling rooms, Ku-ring-gai DCP 2024		**Addressed in:**
1.	To ensure waste and recycling rooms are designed to prevent health and safety hazards.	Section 6.
2.	To ensure provision of facility to aid cleaning of waste areas.	Section 6.
25A.5 Residential buildings, Ku-ring-gai DCP 2024		**Addressed in:**
1.	To ensure storage and collection of waste can be carried out in a safe and orderly manner.	Section 6.
2.	To ensure adequate provision of waste facilities for all residential dwellings.	Section 6.
3.	To prevent unauthorised dumping of waste on the street and associated visual clutter and hazard.	Section 6.

1.1.6. Section 193 Principles of Ecologically Sustainable Development, NSW Environmental Planning and Assessment Regulation 2021

- The principles of ecologically sustainable development are the following:
  - the precautionary principle;
  - inter-generational equity;
  - conservation of biological diversity and ecological integrity; &
  - improved valuation, pricing and incentive mechanisms.
  - 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:
  - Careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment; &
  - An assessment of the risk-weighted consequences of various options.
- 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.
- 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.
- 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—
  - Polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement;
  - 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; &
  - 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.

Principles of Section 193 ecologically sustainable development, NSW environmental planning and assessment regulation 2021 have been addressed by the development through the following initiatives:

1.1.6.1 The precautionary principle:

As per SEAR condition number 16, biodiversity impacts caused due the development will be assessed. A suitably qualified professional will be engaged to assess local biodiversity and ecological value of site in accordance with the Biodiversity Conservation Act 2016 and the Biodiversity Assessment Method 2020. By complying with the sustainable design frameworks in section 1.1, the development should not have significant or lasting impact on the surrounding environment.

1.1.6.2 Inter-generational equity:

The development proposes to address inter-generational equity by incorporating measures of sustainable development to reduce environmental impact and promote health and wellbeing of occupants.

By adopting energy and water efficiency measures, sustainable materials, enhanced indoor environment quality and reduced ecological impact, the proposed development is participating in preserving the availability of natural resources for future generations.

1.1.6.3 Conservation of biological diversity and ecological integrity:

The development is being constructed on a previously developed land. Hence, there will not be a major negative impact on existing ecological value of the site. A biodiversity impact assessment per SEAR's condition No. 16 will help understand the impact of project on the local biodiversity. Green roofs and landscaping will establish a connection with nature and increase ecological value of the site.

1.1.6.4 Improved valuation, pricing, and incentive mechanisms:

The proposed development will consider various sustainability initiatives to be integrated into the valuation of assets and services.

- Head Contractor engaged throughout the entire project completion will implement and comply with an Environmental Management Plan and Environmental Management System aligned with the NSW Environmental Management Systems Guidelines or equivalent standards. This ensures that the team is responsible for environmental impacts caused due to project construction and introduce measures to promote sustainable strategies.
- The project team will consider using recycled and responsibly sourced materials where possible. A minimum of 90% construction and demolition waste will be diverted from landfills. Additionally, the developer/occupants will bear costs associated with operational energy, waste management, water consumption, refurbishment etc. This approach reflects that the developer/occupants pay for the entire life cycle of the project which includes construction, use, refurbishment and end of life.
- The project will consider ESD initiatives highlighted in this report as sustainability goals. This includes the below initiatives but not limited to:
    - Investing in efficient water systems to reduce potable water use and associated costs; &
    - Incorporating energy-efficient design features that lower long-term carbon emissions and operational cost.

Through these integrated mechanisms, the project aligns with the objectives of improved valuation, pricing, and incentive frameworks, supporting both environmental protection and economically efficient outcomes.

1.2. Aim of Report

The following sections outline design initiatives being considered that reduce the environmental impact of the design, construction, and operation of the development, highlighting alignment with applicable targets and planning controls.

2 Project Description

The Proposal comprises a Residential Flat Building including in-fill affordable housing and Build-to-Rent housing at 24, 26 and 28 Middle Harbour Road, Lindfield. The Proposal is for the purposes of residential development which seeks to provide a range of diverse housing types to meet the needs of the wider community.

Specifically, the Proposal seeks consent for the following works:

- Demolition of the existing structures;
- Associated tree removal;
- Associated bulk earthworks involving cut and fill works;
- Construction of a nine (9) storey RFB comprising 94 residential units (of which 20 are affordable units and 32 are Build-to-Rent units) with basement car parking (190 spaces);
- Associated services and infrastructure installation/augmentation; and
- Associated landscaping works.

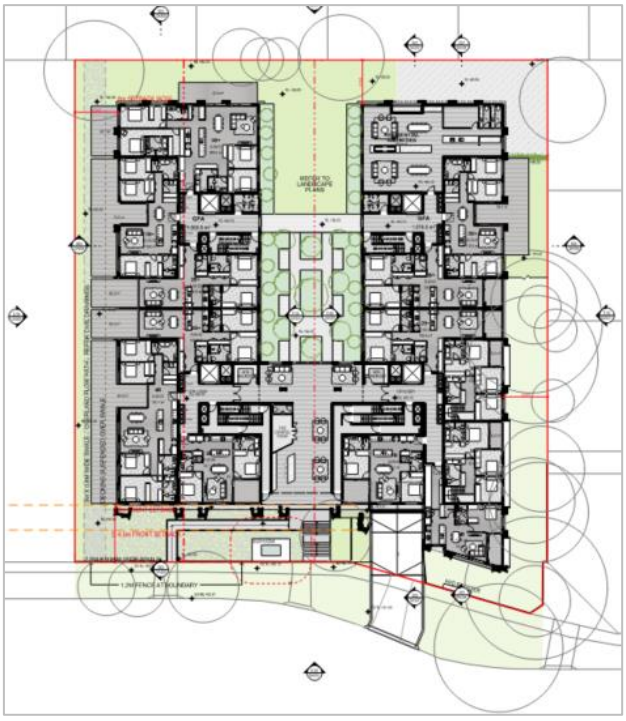


Figure 1: Site Layout

2.1. Information Sources

- National Construction Code (NCC) 2022 Section J Compliance (via J1V3 Performance Solution);
- State Environmental Planning Policy (SEPP) 2022: Sustainable Buildings;
- Building Sustainability Index – Standards for residential development (BASIX) 2022;
- Planning Secretary's Environmental Assessment Requirements;
- State Environmental Planning Policy (Housing) 2021;
- Ku-ring-gai Local Environmental Plan 2015 (KLEP2015);
- Ku-ring-gai Development Control Plan (DCP) 2024; &
- Architectural drawings: SSDA Submission 06/05/25.

3 National Construction Code (NCC) 2022 Section J Provisions

High-level recommendations are provided below relating to glazing, insulation and NCC Section J J9D4 & J9D5 Provisions for residential amenity spaces located on Lower Ground & Ground Floors.

3.1 Insulation & Glazing

Compliance with NCC Section J 2022 J4 will likely involve the following:

- R2.0-R2.5 insulation batts (approximately 90mm) to external and internal walls between conditioned/non conditioned spaces;
    - Where lightweight walls are present in the thermal envelope, R0.2 thermal breaks are required to be installed between the outer construction layer (FC/Aluminium Cladding) and stud frame housing insulation;
- R1.00 insulation (approximately 25mm if rigid PIR insulation) between floors of conditioned spaces and unconditioned spaces below;
- R3.30 insulation (approximately 60-70mm if rigid PIR insulation) to ceilings/roofs, with reflective backing facing airspace/ceiling void; &
- Amenity spaces are well shaded and not excessively glazed.

Insulation & glazing requirements will be finalised following completion of Section J report in early Design Development.

3.2 EV Infrastructure (J9D4)

The following requirements for EV infrastructure should be specified:

Table 3: J9D4 Requirements (EV Infrastructure)

Building Class	Infrastructure Requirements	% of Car Parking Spaces	Future Charging Requirements
Class 2 (Residential)	Sized to support future installation of 7kW (32A) Type 2 chargers.	100%	Capable of delivering a minimum 12kWh from 11pm to 7am daily.

3.3 Solar PV (J9D5)

J9D5 not applicable due to >50% of roof area comprising terrace/roof garden.

4 BASIX (Class 2 Units & Common Areas)

BASIX certificate (1794763M) has been generated that contains water, energy, thermal performance and material requirements for all the buildings to consider and implement in detailed design.

Refer to Appendix B for BASIX Thermal Requirements Summary Table. Scores achieved are outlined below.

Table 4: BASIX Scores

	Target	Score
Water	40	48
Energy	60	62
Thermal Performance	Pass	Pass
Materials	N/A	N/A

The following Sections provide an overview of the sustainable design features considered for implementation across the site.

5 Ecologically Sustainable Design

The following sections contain sustainable design initiatives proposed and currently being explored by the design team in line with the ecologically sustainable design categories outlined below:

- Construction & Waste Management
- Enhanced Indoor Environment Quality
- Climate Change Adaptation
- Transport
- Passive Design
- Energy Efficiency
- Water
- Sustainable Materials
- Land Use & Ecology

6 Construction and Waste Management

To ensure sustainable construction practices throughout construction and building operation, the following initiatives will be considered:

Table 5: Design Initiatives to be Considered for Construction and Waste Management

Initiative	Design Response	Comments
Divert waste from landfill.	Waste Contractor to divert >90% of construction waste by weight from landfill.	Head Contractor to include waste diversion requirements in Waste Contractor scope.
Responsible management systems.	Implementing an Environmental Management System in line with ISO 14001.	Head Contractor to ensure effective implementation of EMS throughout construction.
Reduce impacts caused due to construction activities.	Construction Environmental Management Plan (CEMP) to set environmental performance targets.	Head Contractor to ensure effective implementation of CEMP throughout construction as required in SEAR's condition No.17.
Operational waste management and segregation.	OWMP to be created including provisions of waste segregation for glass, plastic, cardboard and organic waste.	Project team to create a project specific OWMP as required in SEAR's condition No.17.

Figure 2: Various waste streams to be considered as part of waste segregation strategy.

7 Sustainable Materials

The environmental footprint of the development can be reduced through the procurement of sustainable products. This can include products produced with lower than typical energy consumption during manufacture, made with reused content, or not transported large distances to its point of use.

During the detailed design phase, the sustainable materials strategy for the development will explore the following items:

Table 6: Design Initiatives to be Considered for Sustainable Materials

Initiative	Design Response	Comments
Using responsibly sourced materials.	Selection of timber with FSC certification.	Architect to consider FSC timber where possible.
	Selection of steel from ISO 14001 certified manufacturer.	Project team to ensure requirements for ISO 14001 certified steel manufacturers are included in design.
	Selection of PVC products in line with Best Practice Certificate.	Project team to ensure Best Practice PVC products are selected.
Reduced embodied emissions due to building materials.	Use of recycled content in products where appropriate. For example, using concrete with fly ash.	Project team to ensure requirements for recycled products are included in design where practical.
	Selection of major building elements that have Environmental Performance Declarations (EPD's) or third-party certificates.	Architect to consider specifying products with EPDs/third party certificates.
Use of Low GWP refrigerants.	Use of air conditioning systems with refrigerants that have a low Global Warming Potential will be explored.	Mechanical Consultant to consider specifying low GWP refrigerants in HVAC systems.

Figure 3: Examples of third-party environmental product declarations that can be explored during design development.

8 Climate Change Adaptation

To ensure the long-term durability of the site and its ability to adapt to a changing climate, the following measures will be considered:

Table 7: Design Initiatives to be Considered for Climate Change Adaptation

Initiative	Design Response	Comments
Reduce potable water use.	5kL rainwater tank to reduce potable water consumption of the development and reduce strain on central water infrastructure.	Refer to Lower Ground plan from Architectural Drawings Set (SSDA Submission 06/05/25) for RWT location.
Reduce heat island effect	Light colour schemes keep the external surfaces of the building cool, reduce impacts of the urban heat island effect & keep naturally ventilated spaces cool.	Architect has considered light colour external surfaces where possible.
	Green roofs to reduce cooling loads, reduce heat island effect, improve air quality and enhance local biodiversity.	Refer to Level 8 plan from Architectural Drawings Set (SSDA Submission 06/05/25 and Figure 4 for green roofs.
Increased MSSB capacity for effective HVAC systems in case of increased temperatures.	Increasing capacity of mechanical and electrical distribution boards to accommodate an increase in building electrical loads associated with a warming climate.	Mechanical Consultant to consider specifying increased MSSB capacity.
Offering areas of respite during extreme weather events	Providing large green spaces with dense tree canopy trees to provide natural shading.	Refer to Ground plan from Architectural Drawings Set (SSDA Submission 06/05/25) and Figure 4 for landscape design.

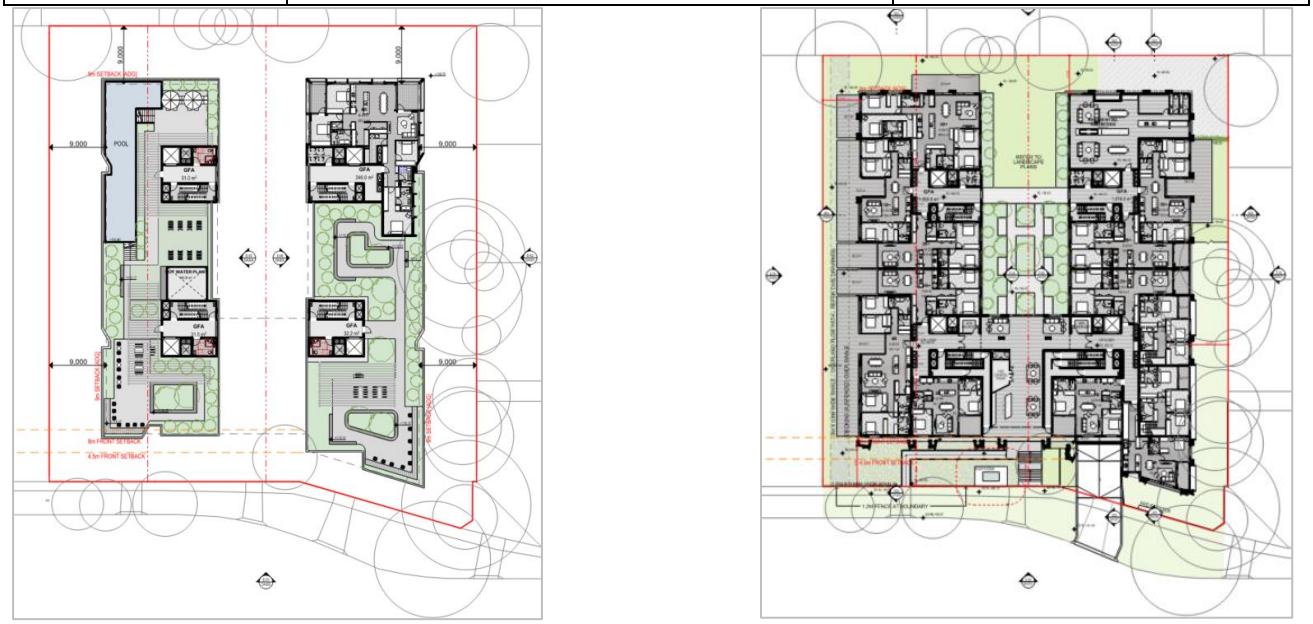


Figure 4: Green Roof and Landscaping

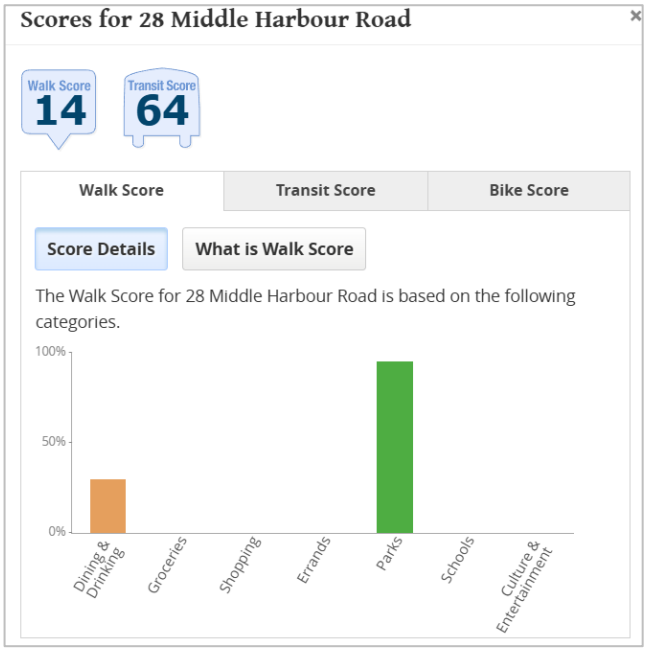
9 Transport

The development is located within Lindfield and has a walk score of 14 and transit score of 64 meaning it is well connected with public transports. Refer to Figure 4 for detailed breakdown of walk score and amenities surrounding the project.

During the detailed design phase, the following initiatives will be explored:

Table 8: Design Initiatives to be Considered for Sustainable Transport Facilities

Initiative	Design Response	Comments
Provision of EOT facilities.	Provision of showers & locker facilities for staff.	Architect to consider specifying EOT facility.
Promoting sustainable transport initiatives.	Provision of EV vehicles parking.	Electrical Consultant to specify provisions for EV vehicle charging as per NCC 2022.
	Provisions of bicycle parking facilities for staff and regular occupants.	Architect to consider providing bicycle parking facility.



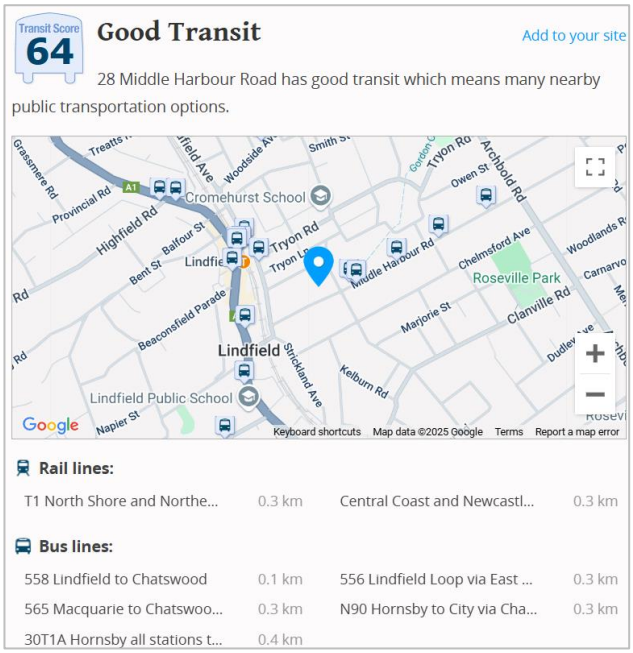


Figure 5: Walk and Transit Score of the development

10 Passive Design & Energy Efficiency

The proposed residential development will consider the following initiatives throughout design development:

Table 9: Design Initiatives to be Considered for Passive Design

Initiative	Design Response	Comments
Incorporating passive design techniques to reduce heating, ventilation and cooling requirements.	A light colour roof and façade lowers internal temperatures by minimising the heat being transferred through the building fabric.	Architect has considered light colour external surfaces where possible.
	Green roofs and landscaping to reduce cooling loads and impacts of heat island effect.	Refer to Ground & Level 8 plan from Architectural Drawings Set (SSDA Submission 06/05/25) and Figure 4 for green roofs and landscape design.
	Horizontal shading on the northern facades and vertical shading (due to protruding columns) to the eastern and western façade helps in reducing heat loads.	Refer to Figure 6 showing horizontal and vertical shading allowing clear glazing to be specified throughout.
	Thermal mass utilised where possible, helping to smooth out daily temperature peaks and troughs.	Thermal mass utilised throughout, reducing both heating and cooling loads in air-conditioned spaces across site.
	Common corridors to be naturally ventilated.	All common corridors in Buildings A & B naturally ventilated. Refer to Section 3/Appendix B for ventilation requirements.
	Cross Ventilation within Apartments	Large number of apartments have openings on more than one façade, allowing cross ventilation to assist in reducing cooling loads, also improving occupant comfort. Awning windows with sill heights above 1,700FFL eliminates the need to install a safety restrictor, further improving ventilation.
	Suitably performing glazing to facades, protecting from hot ambient air during summer whilst allowing heat to be kept inside during winter.	Clear double glazing with adequate shading helps lower peak cooling loads, also allowing solar access during cooler months, reducing reliance on artificial heating and cooling.

Table 10: Design Initiatives to be Considered for Energy Efficiency

Initiative	Design Response	Comments
Reduce energy consumption.	Metering in line with minimum performance standards to track and monitor energy consumption.	Project Team to ensure requirements for metering & monitoring are aligned with Ku-ring-gai DCP 2024.
	Heat pumps for domestic hot water system.	Centralised heat pumps specified for DHW, decreasing on site fossil fuel usage.
	Provision of energy efficient LED lighting throughout with appropriate motion & daylight controls.	Project team to ensure efficient lighting & controls is included in design.
On-site renewable energy to reduce the load on central grid.	Consideration of Solar PV to provide a portion of the sites power, whilst reducing peak power demands.	PV size and location to be determined in Design Development.
Net Zero Provisions.	Provision of infrastructure for future electrification.	Electrical Consultant shall provide infrastructure to accommodate provisions for future electrification.

11 Water

The development will reduce water consumption by incorporating the following water saving measures into design:

Table 11: Design Initiatives to be Considered to Reduce Water Consumption

Initiative	Design Response	Comments
Reduce potable water use.	Installing fixtures and fittings in line with best practice guidelines recommended by Green Star Buildings rating tool.	Architect to select sanitary fixture in line with best practice WELS ratings.
	A total of 5 kL rainwater tank has been proposed for landscape irrigation and car wash bay.	Refer to Lower Ground plan from Architectural Drawings Set (SSDA Submission 06/05/25) for RWT.
	Water dispersed from the sprinkler system to be enclosed in a closed loop system, or provision of isolation valves on each floor to allow floor by floor testing.	Fire Consultant to consider efficiency measures relating to fire system test water.
Reduced water consumption.	Inclusion of low water use plant species and use of drip irrigation for landscape irrigation.	Landscape Architect to consider requirements for plant species and efficient irrigation measures in design.

Table 12: Recommended Water Efficiency of Fixtures & Appliances

Fixture/Equipment Type	WELS Rating
Taps	4 stars
Toilet	4 stars
Showers	4 stars (>6 but <=7.5L/min)
Clothes Washing Machines	4 stars
Dishwashers	4 stars

Figure 6: WELS Water Rating Label

12 Enhanced Indoor Environment Quality

The development will explore the following initiatives to improve occupant health and well-being withing the built environment:

Table 13: Design Initiatives to be Considered to Enhance Indoor Environment Quality

Initiative	Design Response	Comments
Reduced exposure to toxins	Adopt low VOC carpets, paints, adhesives and sealants.	Architect to select products with low VOC content.
	Select engineered wood with low formaldehyde content.	Architect to select engineered wood with low formaldehyde content in design.
Elimination of indoor pollutants.	Printing/Photocopying equipment to be in line with minimum emissions standards.	Building owner to consider all printing/photocopying equipment to meet Green Star emissions standards.
Elimination of indoor pollutants.	All pollutants from kitchen and enclosed carparks should be directed to outside.	Mechanical Consultant to ensure requirements for dedicated kitchen and car park exhaust are as per AS1668 standard.

13 Land Use & Ecology

The development aims to reduce potential negative impacts resulting from urban development and enhance local ecology by implementing the following:

Table 14: Design Initiatives to be Considered to Improve Land Use and Ecology

Initiative	Design Response	Comments
Enhancing local levels of biodiversity.	Indigenous plant beds & trees at multiple locations which allow for deep planting and significant canopy cover, providing shade and improving air quality.	Landscape to ensure indigenous plant beds & trees are incorporated in design.
	Assess biodiversity impacts caused due to the development.	Ecologist to assess biodiversity impacts in accordance with Biodiversity Conservation Act 2016 and Biodiversity Assessment Method 2020 as required in SEAR condition No 16.
	Green roofs and landscaping to enhance local biodiversity.	Refer to Ground & Level 8 plan from Architectural Drawings Set (SSDA Submission 06/05/25) and Figure 4 for green roofs and landscaping.
Reduce the urban heat island effect.	Light colour schemes to external surfaces and areas of deep soil vegetation.	Architect has considered light colour external surfaces where possible.
Elimination of stormwater pollutants.	Utilising stormwater and Water Sensitive Urban Design (WSUD) features in line with Ku-ring-gai DCP 2024.	Project team to ensure requirements to reduce peak stormwater discharge post development are aligned with Ku-ring-gai DCP 2024.
Reduced peak stormwater discharge post development.	Utilising stormwater and Water Sensitive Urban Design (WSUD) features in line with Ku-ring-gai DCP 2024.	Project team to ensure measures to reduce stormwater pollutants are aligned with Ku-ring-gai DCP 2024.
Minimising external light pollution	All outdoor lighting to be in accordance with AS/NZS 4282:2019.	Project team to fulfill requirements for external lighting as per Ku-ring-gai DCP 2024.

14 Conclusion

This report demonstrates the development is on track to achieving sustainability requirements contained within SEAR's and Ku-ring-gai DCP 2024 requirements in addition to the Sustainable Buildings SEPP.

Throughout design development, detailed investigations will be carried out to further refine the ESD strategy for the development, providing an exceptional example of sustainable design to the Lindfield community and beyond.

Appendix A: Useful Resources for Detailed Design Investigation

1. **Australian Carbon Credit Unit Scheme:** Incentivizes individuals and businesses to undertake projects that lower emissions or capture and store carbon by purchasing offsets.
   Australian Carbon Credit Unit Scheme | Clean Energy Regulator
2. **Best Practice PVC**: Guidelines developed to minimize the environmental and health impacts associated with the manufacture and end-of-life management of PVC products used in buildings.
   Responsible Products Framework | Green Building Council of Australia
3. **Environmental Product Declarations (EPD)**: Standardized documents providing transparent and comparable information about the life-cycle environmental impact of products.
   EPD Search | EPD Australasia
4. **Forest Stewardship Council (FSC)**: A global non-profit organization that sets standards for responsible forest management, ensuring that products come from responsibly managed forests.
   Home | Forest Stewardship Council
5. **Global GreenTag**: A third-party, green product rating and certification system underpinned by scientific and life cycle assessment processes.
   Global GreenTag. The world's best eco products. Certified.
6. **Good Environmental Choice Australia (GECA)**: An independent, not-for-profit ecolabel certification for products and services that meet rigorous environmental, human health, and ethical impact criteria.
   Sustainability & Environmental Certification Program - GECA
7. **Green Star:** Developed by the Green Building Council of Australia (GBCA), Green Star is an environmental rating system that evaluates the sustainability performance of buildings and communities.
   Home - Green Building Council of Australia
8. **Large-scale Generation Certificates:** LGCs are tradable certificates issued to eligible large-scale renewable energy power stations, reflecting the amount of renewable energy generated or offset by the facility.
   Large-scale generation certificates | Clean Energy Regulator
9. **National Australian Built Environment Rating System (NABERS)**: A national initiative that measures and compares the environmental performance of Australian buildings, covering energy efficiency, water usage, waste management, and indoor air quality.
   Home | NABERS
10. **Small-scale Technology Certificates (STCs)**: Part of Australia's Small-scale Renewable Energy Scheme, STCs are tradable certificates that represent the environmental benefits of renewable energy systems, such as solar panels and solar water heaters.
    Small-scale Renewable Energy Scheme | Clean Energy Regulator
11. **Your Home:** It is an independent resource for designing, constructing, or renovating homes with a focus on energy efficiency, comfort, affordability, and future adaptability.
    | YourHome
12. **Water Efficiency Labelling and Standards (WELS) Scheme**: An Australian government initiative that labels products for water efficiency, helping consumers make informed choices and encouraging manufacturers to produce water-efficient products.
    Water Rating | Australian Government
13. **World Steel Association:** An international trade body representing steel producers, national and regional steel industry associations, and steel research institutes.
    Home - worldsteel.org

Appendix B: BASIX Thermal Requirements Summary Table

Appendix B: BASIX Summary of Requirements

Aspire Sustainability Consulting BASIX Specifications		**Certificate No:**	*1794763M*
P210002 | 24-26 & 28 Middle Harbour Road	**Target**	**Project Score**	**Compliancy**
Water	40	48	Pass
Energy	60	62	Pass
Thermal Comfort	Pass		Pass
Material	N/A		N/A
Minimum Glazing Performance Requirements: Typical Glazing for All Levels			
Performance (Total System)	**Description**	**Comment**	**Location**
≤U4.20 | SHGC0.45±5%	Double Glazed, Light Tint / Clear	Awning Glazing & Hinged Doors Glazing	All Dwellings unless specified otherwise
≤U3.80 | SHGC0.49±5%	Double Glazed, Light Tint / Clear	Sliding Doors & Fixed Glazing	All Dwellings unless specified otherwise
Minimum Glazing Performance Requirements: Glazing Performance Uplift 1			
Performance (Total System)	**Description**	**Comment**	**Location**
≤U3.30 | SHGC0.45±5%	Thermally Broken, Double Glazed, Light Tint / Clear	Awning Glazing & Hinged Doors Glazing	Units - A-07-03, B-04-05, B-05-05, B-06-05
≤U3.10 | SHGC0.50±5%	Thermally Broken, Double Glazed, Light Tint / Clear	Sliding Doors & Fixed Glazing	Units - A-07-03, B-04-05, B-05-05, B-06-05
Minimum Glazing Performance Requirements: Glazing Performance Uplift 2			
Performance (Total System)	**Description**	**Comment**	**Location**
≤U2.30 | SHGC0.45±5%	Thermally Broken, Double Glazed, Light Tint / Clear	Awning Glazing & Hinged Doors Glazing	Units - A-04-04, A-05-04, A-06-04
≤U3.10 | SHGC0.50±5%	Thermally Broken, Double Glazed, Light Tint / Clear	Sliding Doors & Fixed Glazing	Units - A-04-04, A-05-04, A-06-04

Minimum Insulation Performance Requirements:	
Construction Element	**Additional Insulation**
Concrete Roof *Medium Colour Roof*	Waterproof membrane & ≥R4.00 reflective insulation above ceiling, reflective side down - Unit - A-07-02 & ≥R2.50 reflective insulation above ceiling, reflective side down - All Other Exposed Roofs
External Walls Brick Veneer *Face Brick - Medium Colour*	≥R2.00 bulk insulation with air gap.
External Walls Lightweight FC Cladding *Medium Colour*	≥R2.00 bulk insulation with air gap.
External Walls Lightweight FC Cladding *Medium Colour*	≥R2.50 bulk insulation with air gap. Units - A-04-04, A-05-04, A-06-04, B-07-02
Floor Slab *Suspended Slab over Basement Carpark*	≥R2.00 in direct contact with Slab Soffit - Units - A-00-02, A-00-05, A-00-06, B-0-1-01
	≥R1.00 in direct contact with Slab Soffit All Other Floor Areas Over Basement Carpark
Floor Slab *Suspended Slab over Exposed Air*	≥R2.00 in direct contact with Slab Soffit - Units - A-04-04
Internal Walls	No Insulation
Inter-Tenancy Walls	≥R1.30 insulation between Unit and Unit (installed to one side of wall)
Shared Walls to Risers and Core	≥R1.30 insulation between Unit and Common Corridor No insulation to Stair Core
Floor Coverings	Tile to Wet Rooms | Carpet and Underlay to Bedrooms | Timber to All Other Areas
Ceilings	Plasterboard Ceilings
Ceiling Penetrations	No RCPS provided with current assessment. Following assumptions have been made: - 1 x LED Downlight allocated per 5m2 - 1 x Exhaust Fan per wet area and kitchen
Ceiling Fans	No Ceiling Fans allocated for Project
Other Modelling Assumptions	
All modelled downlights are assumed to be Sealed LEDs, with insulation clearance of 150mm to either side of fixture | All glazing where there is fall risk to have window restrictors installed.	

Summary of Requirements: Common Areas		
Category	**Item**	**Comment**
Water	Fixtures	4 Star toilets | 4 Star taps | 4 Star Common shower (> 6.0 but ≤ 7.5L/min)
	Appliances	No common laundry
	Hot Water	Electric Heat Pump | R0.6 Piping insulation internal and external to building | 3.5 < COP ≤ 4.0
	Landscape - Common	247.0 m^2 Common area lawn| 1,834.0 m^2 Common area garden| 689.0m^2 Area of indigenous or low water use species
	RW Tank	5,000L RWT Capacity fed from 616.3m² Roof Area, serving 1,403.0m² of Landscape
	Fire Sprinkler System	No Fire Sprinkler System Nominated
	Pool	152.0kL Common Pool
Energy	Lighting Type	LED required throughout
	Lighting Control	*Please refer to BASIX Report for detailed requirements*
	Ventilation	
	Lifts	1 No. Gearless traction with VVVF motors required | ≥1,001 kg but ≤1,500 kg
	Pool	Electric Infrared Sauna - manual on / timer off
	Pool	No Pool Heating Pool Pump controlled by timer
	Solar PV	No Solar PV required for this project
	Other	No BMS | No indoor or outdoor drying line | No common laundry | No common clothes dryer

Summary of Requirements: Residential Dwellings		
Category	**Item**	**Comment**
Water	Fixtures	4 Star showers (> 6.0 but ≤ 7.5L/min) | 4 Star toilets | 4 Star kitchen taps | 4 Star bathroom taps | No HW recirculation on demand
	Appliances	4 Star dishwasher | 4 Star washing machine
Energy	Exhaust Fans	Kitchen, Laundry & bathroom fans individually ducted to façade or roof | Operation Control - Interlocked light with timer off for Bathrooms, Manual switch on/off for Kitchens and Laundry
	HVAC	3+ Bedroom Units: 3-phase air conditioning to Living and Bedroom areas | EER 3.5-4.0 All other units: 1-phase air conditioning to Living and Bedroom areas | EER 3.5-4.0
	Lighting	Sealed LED lighting throughout
	Hot Water	Central hot water system: Heat pump
	Appliances	Gas cooktop & electric oven | 4 Star dishwasher | 3 Star clothes dryer
	Other	No Indoor clothes drying line provided | No Outdoor Private clothes drying line provided