



601 Pacific Highway – Mixed Use

23/03/2026

Ecologically Sustainable Development SSDA Report



Prepared for

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1 Introduction

This Ecologically Sustainable Development (ESD) report has been prepared by LCI Consultants and is submitted to the Department of Planning, Housing and Infrastructure (DPHI) in support of a State Significant Development Application (SSDA) (SSD-85848713) and concurrent rezoning proposal for a new mixed-use development at 601 Pacific Highway, St Leonards (the site).

The proposal seeks consent for the following:

- An amendment to the North Sydney Local Environmental Plan 2013 (NLEP 2013) to rezone the site from E2 Commercial Centre to MU1 Mixed Use and to amend the minimum non-residential floor space ratio development standard under Clause 4.4A from 20:1 to 1:1.
- Demolition of the existing 14 storey commercial office building that is currently on the site.
- Site excavation, remediation and other preparatory works.
- Construction and operation of a new 52 storey (RL264.50) mixed use shop top housing development, with a FSR of 20:1 (maximum GFA of 56,880m²), comprising:
 - 538 dwellings including 508 Build-to-Sell apartments and 30 Affordable Housing apartments across a mix of apartment typologies.
 - A contribution of 5% of the residential GFA toward Affordable Housing.
 - Retail and commercial land uses at the ground and podium levels.
 - Internal and external residential amenities provided throughout the building.
 - Six levels of basement carparking, comprising a total of 300 car spaces, bicycle parking, loading bays, waste areas, plant, and back of house.
- Vehicular access to the basement via Atchison Street.
- Landscaping and Public Domain works.
- Reticulation of site services and infrastructure (electricity, telecommunication, water, and sewer connections).

2 Relevant SEARS

This Ecologically Sustainable Development (ESD) Report has been prepared to address the following relevant Secretary's Environmental Assessment Requirements (SEARs) set out in the **Table 1** below.

Table 1: Secretary's Environmental Assessment Requirement relevant to this Report

SEARS	Where addressed in this report
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.	See Section 4.1 for responses to each of these principles of ecologically sustainable development.
Where relevant, provide an assessment of the development against the standards for non-residential development set out in Chapter 3 of State Environmental Planning Policy (Sustainable Buildings) 2022. .	Refer to Section 4.7, which outlines 601 Pacific Highway's compliance with the requirements of Chapter 3 of the SEPP (Sustainable Buildings) 2022, including NABERS and other mandated performance standards.

3 Site Location and Context

The site is located on Cammeraygal country at 601 Pacific Highway, St Leonards within North Sydney (LGA). The site is legally described as Lot 71 in DP749690 and has a total area of 2,844m². The site is 4.5 km north of the Sydney CBD, 3 km from the North Sydney CBD, and within proximity to the centres of St Leonards, Chatswood, and Macquarie Park. The site is located 350 metres (walking distance) from St Leonards train station and approximately 400m (walking distance) from the Crows Nest Metro station.

A site aerial and location plan is provided at **Figure 1** below.



Figure 1: Aerial image of the site (Source: Urbis).

4 SSDA Assessment Requirements

Department of Planning, Housing and Infrastructure (DPHI) has issued Secretary's Environmental Assessment Requirements (SEARs) to the applicant for the preparation of an Environmental Impact Statement (EIS) for the proposed development. This section of the report addresses these requirements.

4.1 Section 193 EP&A Regulation

The ESD principles that are to be incorporated into the proposed development must be aligned with Section 193 – Environmental Planning & Assessment Regulation. The ESD principles are listed below:

- (a) **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 the application of the precautionary principle, public and private decisions should be guided by:
 - (i) careful evaluation to avoid, wherever practicable, serious, or irreversible damage to the environment, and
 - (ii) an assessment of the risk-weighted consequences of various options,
- (b) **inter-generational equity**, namely, that the present generation should ensure that the health, diversity, and productivity of the environment are maintained or enhanced for the benefit of future generations,
- (c) **conservation of biological diversity and ecological integrity**, namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration,
- (d) **improved valuation, pricing and incentive mechanisms**, namely, that environmental factors should be included in the valuation of assets and services, such as:
 - (i) **polluter pays**, that is, those who generate pollution and waste should bear the cost of containment, avoidance, or abatement,
 - (ii) **the users of goods and services should pay** prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,
 - (iii) **environmental goals**, having been established, 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.

4.1.1 The Precautionary Principle

The project team for 601 Pacific Highway is adopting a responsible and precautionary approach to minimise potential environmental impacts throughout the design, construction, and operational phases. The development will replace an existing 14-storey commercial building, which will be demolished to enable rezoning for mixed-use purposes and help address the shortage of housing opportunities in the area.

A comprehensive sustainability strategy will guide the project, aligned with Stockland's corporate objectives of decarbonisation, circular economy, and renewable energy integration. Decarbonisation is the primary focus, and the project will aim to reduce upfront carbon emissions compared to a standard reference building. Materials will be procured responsibly, with a focus on products containing recycled content and those manufactured under certified sustainable practices.

Circular economy principles will be embedded in the design and construction phases by reusing existing building elements wherever feasible and incorporating them into the new design. The project will also retain and utilise a portion of the existing carpark structure, significantly reducing the need for new materials and lowering embodied carbon impacts. In addition, at least 90% of construction and demolition waste will be diverted from landfill. To achieve this, the main contractor will implement an Environmental Management System (EMS) in accordance with NSW EMS Guidelines, ensuring best-practice resource efficiency and waste management.

Energy efficiency and renewable energy integration are also central to the project's sustainability strategy. Each apartment will achieve a NatHERS rating of at least 6 stars, with an overall average of 7 stars, while non-residential areas will consume at least 20% less energy than a standard reference building. The building will be fully electric in operation, and the operator will procure 100% renewable electricity for all common areas under their control. On-site renewable energy generation will be maximised through the installation of solar photovoltaic panels wherever feasible. Commercial and residential tenants will be encouraged to procure renewable energy or GreenPower from their retailer of choice. Combined with refrigerant offset purchases, these measures will enable the building to operate as net zero in operations.

4.1.2 Inter-Generational Equity

Following on from the above response, to uphold inter-generational equity, the proposed development minimises the consumption of natural resources, water and energy while reducing waste and emissions. In doing so, reduces the pressures on the environment. The project will also be enhancing its biodiversity on site by increasing the canopy cover when compared with its current state.

This project itself is an investment for future generations, attracting a diverse range of residents by designing for inclusion. The development also provides more housing supply for the area and creates employment opportunities in the retail precinct and building operations.

4.1.3 Conservation of Biological Diversity and Ecological Integrity

The project's ESD principles to reduce energy, water and waste consumption have an indirect impact to conserve biodiversity and ecological integrity to the surrounding area. The ecological value of the site post construction will exceed that of preconstruction due to the planting proposed with an emphasis on native trees and plants. This improves habitat for local fauna and increases a connection to nature and Country for occupants.

4.1.4 Improved Valuation

The valuation of the project's assets and services consider environmental factors through the implementation of various ESD initiatives. An Environmental Management System will be adhered to during construction to ensure that contractors are responsible for costs associated with generating excessive pollution and waste. The project will include the provision of separate recycling and landfill waste streams during construction and operational phases. This creates a system where the polluter pays more for landfill waste and creates an incentive to reduce pollution and waste.

The design of the project will meet the National Construction Code (NCC) and be benchmarked against an industry-recognised sustainability framework to help set and document the project's environmental objectives. Project requirements stipulate design teams are contractually required to deliver targeted ESD initiatives for the project.

4.2 Framework to Reflect Best Practice Sustainable Design Principles

4.2.1 Green Star Buildings v1- 5 Star

This report uses the Green Star Buildings framework to illustrate and benchmark best-practice sustainability initiatives for the project. While formal Green Star certification is not being pursued for this project, the initiatives presented reflect the performance level typically aligned with a 5 Star outcome and provide a clear, industry-standard structure for the project's ESD strategy.

This tool includes targets that directly address the UN Sustainable Development Goals and encourages ambitious building design to significantly reduce the impact the built environment has on aggravating climate change. This new tool aligns to meet the Paris Agreement (2021) on climate change, create clear expectations for new buildings and ensures transparency in supply chains to ensure complete understanding of materials and products used in the project.

The Green Star Buildings rating system assessing buildings through the following categories:



4.3 Resource efficiency



The project will not utilise gas from the grid for building operations, aligning with NSW net zero strategy. Furthermore, the project will procure 100% renewable electricity in operation for all common areas and offset the building's refrigerants. This allows 601 Pacific Highway to operate as net zero in operations from practical completion which will be well before the grid decarbonises.



Onsite electrical generation through Solar PV arrays will be maximised while still ensuring the architectural intent remains. The building will be designed to achieve a NatHERS energy rating of at least 6 stars for each apartment and a weighted-area average of at least 7 stars. Other areas of the development will be designed to consume at least 20% less energy than a standard reference building in operation. LED lighting will be used throughout with appropriate monitoring strategies to create an efficient and responsive lighting design.



Although the project will be procuring 100% renewable energy for common areas, this energy is still drawn from the grid which still has carbon intensive energy emissions. By reducing the demand of the building, it allows further uptake of renewable energy occurring in the grid by other buildings.



The project will seek to reduce upfront carbon emissions compared to a standard practice reference building. Materials will be selected responsibly, prioritising recycled content and certified sustainable practices where possible.

Water is considered an integral resource in the project. The sanitary fixtures and fittings will have low flow rates to ensure unnecessary potable water is not wasted for sanitary needs. Rainwater catchment will be maximised from exposed non-trafficable surfaces, filtering it and pumping it around to serve the landscape irrigation system.

4.4 NCC – Section J – Energy Efficiency

The development will meet the Section J requirements of the National Construction Code (NCC) Volume 1, 2022. Section J of the NCC outlines performance requirements to ensure that the building facilitates the efficient use of energy. During the detailed design stage, the architectural design of non-residential portion of the project will be assessed to develop thermal requirements for all the aspects of the building envelopes, such as glazing performance, façade & roof colouring, shading, and insulation.

4.5 Residential ESD Compliance Targets

In addition to the previously mentioned targets under SEARs, the residential tower is required to comply with NSW legislated Building Sustainability Index (BASIX) requirements. As part of that process, all Single Occupancy Units (SOUs) are required to achieve satisfactory thermal comfort targets using NatHERS software. Common areas not covered by the BASIX certificate are assumed to have similar fabric requirements to the SOUs. Common areas may also be subject to other, non-fabric NCC Section J 2022 requirements for equipment such as AC units, pumps, fans, and lights.

Projects must demonstrate a score of at least 40% for Water and 63% for Energy and meet thermal comfort heating and cooling caps that equate to 6 Stars as a minimum for each SOU and 7 Stars on average across all SOUs. The project will achieve these requirements, along with the required BASIX scores for Energy and Water.

4.6 NABERS Energy and Water requirements

The National Australian Built Environment Rating System (NABERS) is a performance-based rating tool that measures the environmental impact of buildings in operation. NABERS ratings are based on actual metered performance over a 12-month period and are benchmarked against similar building types across Australia. Ratings range from 1 to 6 Stars, with 6 Stars representing market-leading performance.



Figure 2: NABERS stars scale

NABERS encourages continual improvement through measurement, monitoring, and management of operational energy and water consumption. This process supports building owners and managers in identifying inefficiencies, optimising systems, and achieving long-term sustainability outcomes.

In accordance with SSD - 85848713, the Pacific highway project is required to demonstrate the incorporation of ESD principles in the design, construction, and ongoing operation phases of the development, including the following minimum NABERS standard targets:

- Minimum 5.5 Star **NABERS Energy** (Base Building) rating, and
- Minimum 3 Star **NABERS Water** rating,

4.7 Sustainable Buildings SEPP (2022)

The Sustainable Buildings SEPP encourages the design and delivery of more sustainable buildings across NSW. It sets sustainability standards for residential and non-residential development and starts the process of measuring and reporting on the embodied emissions of construction materials. The Sustainable Buildings SEPP (2022) establishes mandatory sustainability standards for both residential and non-residential development. The development is subject to the provisions of:

a. Residential development – Chapter 2:

The residential portion of the development is subject to the updated BASIX standards under Section 2.1 of SEPP 2022. The project has been designed to meet the following:

- Thermal Performance: All residential units achieve a minimum 6-star NatHERS rating and a weighted-area average of at least 7 star, ensuring improved thermal comfort and reduced reliance on mechanical heating and cooling.
- Energy Efficiency: The design incorporates energy-efficient lighting, appliances, and HVAC systems, contributing to a reduction in greenhouse gas emissions in line with the updated BASIX energy targets.
- Water Conservation: Fixtures and fittings meet BASIX water targets, and rainwater harvesting systems are included to reduce potable water consumption.
- Embodied Carbon: The development includes reporting on embodied emissions of key building materials, supporting transparency and alignment with NSW's net zero goals.

Under the new BASIX Materials Index, the calculation and reporting of embodied emissions will be undertaken and formally documented as part of the project submission. The tool will do this by estimating the volume of different materials used in construction and applying standard emissions factors for the materials. There is no limit on embodied emissions of building materials. A limit (or standard) may be

applied in future after a period of collecting comprehensive data on the embodied emissions of new developments built to the upcoming standards.

b. Non-Residential Development – Chapter 3

The commercial and retail components of the development meet the sustainability obligations under Chapter 3 of SEPP 2022, including:

General Sustainability Measures:

- A reduction in the reliance on artificial lighting and mechanical heating and cooling through passive Design: The building layout incorporates natural daylight access, external shading, and façade articulation to enhance thermal performance and reduce demand for active systems.
- Integration of renewable energy generation infrastructure, with provision for rooftop solar PV arrays (subject to detailed design) to offset base building energy demand and support net zero operational targets.
- Metering and monitoring of energy and water consumption.
- The minimisation of waste from associated demolition and construction, including by the choice and reuse of building materials. A Construction and Demolition Waste Management Plan will be implemented to support resource recovery. The design also prioritises materials with recycled content and durable construction.

Large Commercial Development Requirements:

In addition to design measures, the SEPP requires a few key documents to be submitted.

- Net Zero Readiness: The building is designed to operate without fossil fuels, with infrastructure in place to support full electrification. Please refer to the Appendix A – Net Zero Statement – for further details
- Embodied Carbon Reporting: Disclosure of embodied emissions for key materials during SSDA and CC stages.

These measures ensure that the development contributes meaningfully to NSW's climate targets and deliver long-term environmental, social, and economic benefits.

5 North Sydney Council - Sustainability Planning

The proposed development at 601 Pacific Highway demonstrates a comprehensive response to the environmental objectives outlined in North Sydney DCP 2025 – Part B *Environmental Considerations*, in conjunction with Part E Section 2 – *Development in Employment and Mixed-Use Zones*. The project incorporates a range of passive and active design strategies that support improved environmental performance, resilience, and long-term sustainability.

Key environmental considerations addressed include:

- **Water Management – Part B Section 4: Water:** Incorporates integrated Water Sensitive Urban Design (WSUD) measures, including rainwater harvesting and efficient irrigation systems, to reduce potable water demand and manage stormwater quality. Additional opportunities such as permeable surfaces and rain gardens will be explored during detailed design.
- **Biodiversity & Vegetation – Part B Section 3.1: Tree & Vegetation Management:** While some existing street trees must be removed to accommodate works, the project will deliver a net increase in canopy cover and biodiversity through extensive new native planting within and beyond the site boundary. Species selections favour local endemics to support urban habitat and resilience. The landscape strategy achieves approximately 9% canopy coverage and ~19% green cover across ground and terraces, contributing to urban cooling and alignment with Council's Urban Forest Strategy.
- **Acoustic and Vibration Control - Part B Section 7: Operational Noise:** The building envelope and internal layouts are designed to comply with acoustic performance targets and vibration guidelines, addressing impacts from Pacific Highway and rail corridors.
- **Energy and Carbon Performance - Part B Section 10: Environmental Sustainability:** Targets net-zero operational energy for common areas and incorporates high-performance glazing, insulation, and

efficient HVAC systems. Passive solar design and natural ventilation strategies reduce reliance on mechanical conditioning. The project also enables EV charging infrastructure to support low-carbon mobility. Embodied carbon is reduced through responsible material selection and construction methodology.

- **Waste Management - Part B Section 10: Materials & Resource Efficiency:** Provides dedicated waste and recycling facilities sized for mixed-use operations and implements a Construction & Demolition Waste Management Plan targeting $\geq 90\%$ diversion from landfill. Material selections prioritise durability and recyclability to minimise life-cycle impacts.
- **Other Environmental Considerations (Light Spill & Air Quality) – Part B Sections 8 & 9:** External lighting will be designed to minimise light pollution, reducing glare and sky-glow impacts on the surrounding environment. Air quality will be protected through the specification of low-toxicity materials and the implementation of best-practice construction management measures, including dust suppression and avoidance of on-site burning, consistent with DCP provisions.

While the North Sydney DCP 2025 does not apply to State Significant Development Applications (SSDAs) under the Environmental Planning and Assessment Act 1979 and is therefore not a statutory requirement for this proposal, its provisions have been reviewed and considered as local guidance to inform the environmental performance of the development.

These sustainability outcomes are addressed in detail in Chapter 6 – Sustainable Design Principles of this report.

6 Sustainable Design Principles

The following sustainable design principles have been proposed for the 601 Pacific Highway and can be addressed through the categories outlined within the Green Star Buildings rating system. While formal Green Star certification is not being pursued for this project, the initiatives presented reflect the performance level typically aligned with a 5 Star outcome and provide a clear, industry-standard structure for the project's ESD strategy. It is the most stringent sustainable buildings tool recognised by the NSW government. The rating system is broken into the following categories.

6.1 Responsible

The Responsible category recognises activities that ensure the building is designed, procured, built and handed over in a responsible manner.

Materials - This category has a strong focus on the materials that have been used in a building. The building's finishes will be selected based on their responsible product value. The vision of the responsible product framework is to drive the supply chain to deliver transparent, healthy, low-impact, and net zero carbon products that are part of a circular economy. Not only does this reduce the resource consumption impact of the project but also ensures clean and sustainable supply chains, something that the building industry has turned a blind eye to for a long time.

Waste - The responsible category also looks at waste, both in the building's construction and operation. The project will divert at least 80% of construction and demolition waste from landfill. The building will also be designed for a functional waste system with recycling systems, adequate space and appropriate pick-up locations.

Education and Information - Education and information are notions that are carried within the responsible category. The head contractor when the building is in construction phase will educate the workers on site around climate change and the importance of sustainable design, construction and operation is critical in climate change mitigation.

6.2 Healthy

Building occupant health is a primary objective for 601 Pacific Highway. The desire is for residents to feel comfortable in the space. Healthy conditions and comfortable conditions exist in parallel.

Clean Air - The project will provide a 50% improvement of outdoor air to all non-residential portions of the building to ensure occupants have plenty of fresh air and do not have a feeling that the environment is stuffy or odorous. Residential portions of the building will be provided with outdoor air as per the NCC and also have adequate distance separation between discharge and intakes of outdoor air.

Light Quality - Where appropriate the façade will accommodate for generous natural daylight to improve occupant wellbeing. Artificial lighting will be flicker free with appropriate lux levels and uniformity per space.

Acoustic Comfort - Due to the residential nature of the building, 601 Pacific Highway will implement a design strategy to minimise transfer of noise between SOU's and to common areas. This will be achieved through wall and ceiling insulation, party wall systems, lagging of services pipework and sealing of penetrations.

Exposure to toxins - Low-VOC products and finishes will be specified throughout the project to minimise the release of indoor pollutants and ensure a healthy indoor environment. It is anticipated that at least 95% of all internally applied materials will comply with low-VOC and formaldehyde emission limits.

Amenity - Residents will benefit from a high level of amenity through a wide range of shared facilities, including an on-site gym, swimming pool, dining areas, and a wellness centre. In addition, accessible green spaces will be provided at the ground level, podium, and mid-level terraces, allowing residents to enjoy outdoor areas and enhance their connection with nature.

Connection to Nature - A biophilic connection has proven to reduce stress and improve mental wellbeing. By implementing nature inspired design and integrated landscape into the project, the occupants will feel a sense of connection to place.

Accessible green spaces will be provided at the ground level, podium, and mid-level terraces, allowing residents to enjoy outdoor areas and enhance their connection with nature.

6.3 Resilient

A building's resilience is a major lens to assess how sustainable the development will be over time. Buildings that are not resilient to external pressures are usually first to be rebuilt, shortening the life of the building. As a result, all embodied material within the building may not have reached its service life and the emissions per year for each material increases. Also, future costs to uplift a building to withstand external changes is an expensive exercise. To ensure the project is resilient to future pressures a range of assessments and modelling will be completed, with design elements to be incorporated to address these changes.

Climate Change Assessment - will be made highlighting components of the buildings design where risks lie. A follow up plan for mitigating these risks from the design will then be implemented. This will attempt to future proof the development from climate pressures such as floods, high temperatures, drought and storms.

Operational resilience - refers to large scale external factors that could influence how the building operates, this includes failure of critical infrastructure, health pandemic, natural disasters and increased energy costs.

Community resilience - needs to be assessed to ensure the needs and desires of the surrounding community. The building should foster social cohesion and provide opportunity for local employment as well as educating the neighbourhood. By considering the needs and wants of the community the building is likely to increase its visitors and extend its service life.

Urban Heat Island - To prevent the urban heat island effect locally onsite, vegetation and materials with a low solar reflective index will be investigated.

6.4 Positive

Net Zero Operational Energy – 601 Pacific highway project is committed to achieving net-zero carbon emissions in its operations for all common areas by avoiding the use of grid supplied natural gas and instead procuring 100% renewable electricity and offsetting the building's refrigerants. This goal will be achieved from the project's practical completion, well ahead of the grid's decarbonisation.

Onsite solar PV arrays will be maximized. The building will be designed to achieve a NatHERS energy rating of at least 6 stars for each apartment and a weighted-area average of at least 7 stars. Other areas of the development will be designed to consume at least 20% less energy than a standard reference building in operation. LED lighting will be used throughout, with efficient monitoring strategies to ensure responsiveness.

Upfront Carbon Reduction - The project will adopt strategies to minimise upfront carbon emissions through responsible material selection and sustainable procurement practices, aiming to improve performance compared to conventional construction approaches.

Water Conservation - Water conservation is a crucial aspect of the Pacific highway. The project acknowledges the importance of preserving this vital resource and has designed measures to minimise the building's potable water usage. Low flow rate end uses will be implemented throughout the building to reduce unnecessary water wastage, especially for sanitary needs.

In addition to minimising potable water usage, the project has also made efforts to maximise rainwater catchment from exposed non-trafficable surfaces. This harvested water will be used for onsite flora irrigation, reducing the need for potable water for this purpose and assisting with lowering the urban heat island effect.

Life Cycle Impacts - The project will investigate opportunities to minimise its overall environmental footprint by considering performance across all life cycle stages. Opportunities for assessment, such as LCA, will be explored during later design phases to inform strategies for material selection, construction methods, and design optimisation, in alignment with best-practice sustainability standards.

6.5 People and Place

Movement and Places - The project promotes sustainable transport and reduces reliance on private vehicles through a comprehensive end-of-trip strategy that supports active travel for residents, workers, and visitors. Key initiatives include:

- Secure bicycle storage for retail, office, residential occupants, and visitors, located in convenient and accessible areas.
- Showers, change rooms, and lockers for commercial tenants and retail staff to encourage cycling and walking commutes.
- Integration with local cycle networks and pedestrian pathways to enhance connectivity and make walking and cycling primary modes of transport.

Its location above the new Chatswood–Sydenham Metro tunnel provides excellent public transport access, further supporting low-carbon mobility and reduced car use.

Enjoyable Places and Contribution to Places - The project enhances both user experience and the surrounding urban environment by providing welcoming, well-designed spaces that promote comfort, social interaction, and connection with nature. Through active frontages, quality landscaping, and accessible communal areas, the development contributes positively to the local character and creates an inclusive, vibrant, and enjoyable place for all users.

History & Culture - A sense of place is integral for a building to have a prosperous long life. A building designed with a sense of place can enhance the social sustainability of a community by providing a space that reflects the local culture and history. This approach can help to strengthen the community's identity and promote a sense of pride in the local area. By creating a building that is responsive to its context, the project can contribute to the social, economic, and environmental well-being of the surrounding area.

Indigenous Design - By aligning the design method with the principles of the Australian Indigenous Design Charter, a true representation of Aboriginal heritage can be evoked in the design. This reminds visitors that the land they are on was habited tens of thousands of years before their arrival. By integrating this with aspects of developed Sydney (relatively new), Indigenous cultural can be spread to a greater audience and educate immigrated Australians on the rich history of this country.

6.6 Nature

Impacts to Nature - The project is located on a previously developed urban site, ensuring no disturbance to areas of high ecological value. All external lighting will comply with AS/NZS 4282:2019 to minimise light pollution to the night sky and surrounding areas. Native landscaping will be incorporated to enhance biodiversity and create a resilient urban environment. These measures demonstrate the project's commitment to protecting nature.

Biodiversity Enhancement - The landscape strategy integrates biodiversity at multiple scales, from the ground plane to upper terraces. Planting is guided by Country and features endemic species from Sydney Sandstone and Eastern Suburbs Banksia Scrub communities, supporting local habitat and ecological resilience. Approximately 9% canopy coverage and 19% green cover are achieved through tree planting, understorey vegetation, and vertical greening. Species with fragrance and bush tucker value enrich sensory experience and foster cultural connection, while layered planting across terraces creates microhabitats that promote urban biodiversity and contribute to cooling and amenity.

7 Conclusion

This Ecological Sustainable Design (ESD) Report has been prepared to by LCI in support of a State Significant Development Application for a new mixed use development at 601 Pacific Highway, St Leonards. The proposed development has undertaken an extensive amount of work to establish and integrate sustainable design and principles into the building design.

Sustainable design initiatives include:



Development to be all-Electric in operation



Renewable energy procurement for common areas to be “net zero energy” equivalent in operation



90% of construction waste diverted from landfill



Sole occupancy units (SOUs) will meet thermal comfort heating and cooling caps that equate to 6 Star as a minimum and 7 stars on average across all SOUs under NSW BASIX



Target NABERS 5.5 stars for Office



Inclusion of solar photovoltaic panels



Develop an EV Strategy



Biodiversity and Connection to Nature through external landscaping



Indigenous Engagement and cultural diversity strategies

Sustainable principles, covering environmental, social, and economic well-being outcomes, will continually be investigated and integrated, where possible, into the project design and operation of the building to create a market leading build-to-Sell housing development.

8 Appendix A - Net Zero Statement

NET ZERO STATEMENT – 601 PACIFIC HIGHWAY, ST LEONARDS

Subject	Net Zero Statement
Project	230867 – 601 Pacific Highway, St Leonards
Author	Micha Middlebrook
Date	17/03/2026

Site Description

The application seeks development consent for a State Significant Development (SSD) to deliver a new mixed-use development at 601 Pacific Highway, St Leonards.

The proposal seeks consent for the following:

- An amendment to the North Sydney Local Environmental Plan 2013 (NLEP 2013) to rezone the site from E2 Commercial Centre to MU1 Mixed Use and to amend the minimum non-residential floor space ratio development standard under Clause 4.4A from 20:1 to 1:1.
- Demolition of the existing 14 storey commercial office building that is currently on the site.
- Site excavation, remediation and other preparatory works.
- Construction and operation of a new 52 storey (RL264.50) mixed use shop top housing development, with a FSR of 20:1 (maximum GFA of 56,880m²), comprising:
 - 538 dwellings including 508 Build-to-Sell apartments and 30 Affordable Housing apartments across a mix of apartment typologies.
 - A contribution of 5% of the residential GFA toward Affordable Housing.
 - Retail and commercial land uses at the ground and podium levels.
 - Internal and external residential amenities provided throughout the building.
 - Six levels of basement carparking, comprising a total of 300 car spaces, bicycle parking, loading bays, waste areas, plant, and back of house.
- Vehicular access to the basement via Atchison Street.
- Landscaping and Public Domain works.
- Reticulation of site services and infrastructure (electricity, telecommunication, water, and sewer connections).

Scope of this Statement (Non-Residential Only)

In accordance with the Sustainable Buildings SEPP (2022), Chapter 3, a Net Zero Statement is required for non-residential development. This statement therefore applies only to the office and retail areas. Residential sustainability measures are addressed separately via BASIX and NatHERS and lie outside this statement.

Net Zero Statement

This statement outlines strategies to achieve Net Zero operational emissions for the proposed development at 601 Pacific Highway, St Leonards, in accordance with Section 35C of the EP&A Regulation. The development demonstrates a clear pathway to becoming fossil fuel-free and achieving operational Net Zero emissions.

Fossil Fuel-Free Development:

The building will be fully electric, eliminating reliance on gas and aligning with the decarbonisation trajectory of the NSW electricity grid. Infrastructure will be provided to enable the building to operate as Net Zero in

operational energy, subject to the discretion of the building operator post-construction. To achieve Net Zero, the operator would need to procure 100% renewable electricity to offset all building energy use.

Key strategies include:

Electrification of Building Services:

- Instantaneous electric hot water systems will be provided for on-floor toilets and End-of-Trip (EOT) facilities.
- The office component will utilise an air-cooled chilled water system.
- Retail components will be served by individual VRF condensers.
- Tenancy kitchens will feature induction cooktops, eliminating the need for gas.

Passive Design Integration:

The design incorporates passive measures to reduce energy consumption, including:

- High-performance glazing and insulation to minimise heating and cooling loads.
- Maximised natural daylight and ventilation to reduce reliance on artificial lighting.
- Airtightness strategies across façades and penetrations to limit unwanted infiltration.

Renewable Energy and Technical Features:

1. Solar PV Installation

- Rooftop solar panels are proposed to offset grid electricity usage, primarily serving residential common areas.

2. Battery Storage Readiness

- Electrical infrastructure will allow for future integration of battery storage systems to enhance resilience and support peak demand management.

3. Energy Efficiency Measures

- LED lighting with occupancy/daylight controls in common and retail areas.
- Zoned HVAC controls and sub-metering of major end uses (HVAC, lighting, lifts, central plant).
- Remote monitoring/analytics capability to support continuous commissioning and optimisation.

4. Ventilation Efficiency

- Economy cycles will also be applied where conditions are favourable, further reducing the need for mechanical cooling.

5. Operational Performance Targets

- Achieve ≥ 5.5 Star NABERS Office Energy rating
- NCC 2022 J1P1 Energy Use has been applied, calculating the maximum allowable energy consumption and emissions limits for the retail component.

6. Offsets for Residual Emissions

- The building's refrigerant-related emissions will be offset.
- Future mechanical equipment replacements will prioritise low global warming potential (GWP) refrigerants to reduce emissions from refrigerant charges and leakage.

Annual Energy Consumption & Emissions

Office Spaces

Whole-building energy consumption calculations are not yet available, as the project has not reached the level of design required for comprehensive modelling. The office component (approximately 2,746 m²) will demonstrate compliance with the Sustainable Buildings SEPP by adhering to maximum allowable energy use intensity and emissions benchmarks, as confirmed by the NABERS reverse calculator. Please refer to the maximum allowable energy use and intensity emissions benchmarks below.

Results

Benchmarking factor at 5.5 stars NABERS Energy:	NaN
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Maximum Benchmarking Emissions at 5.5 Stars NABERS Energy:	121,917.5 kgCO ₂ -e/year
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Benchmarking Emissions Intensity at 5.5 Stars NABERS Energy:	44.398 kgCO ₂ -e/m ² .year
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Energy Intensity at 5.5 Stars NABERS Energy:	228 MJ/m ² .year
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Reporting Emissions for this office – Scope 1, 2 and 3:	121,916 kgCO ₂ -e/year
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Reporting Emissions for this office – Scope 1 and 2:	114,950 kgCO ₂ -e/year
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Maximum Allowable Energy Consumption:

Target Max Electricity:	174,167 kWh per annum
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Target Max Gas and LPG:	0 MJ per annum
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Target Max Diesel:	0 L per annum
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Figure 1: NABERS reverse calculator results

Retail Spaces

All figures presented below are assumptions only, based on the maximum allowable hourly regulated energy consumption under NCC J1P1 Energy Use. Whole-building energy consumption calculations are not yet available, as the project has not reached the level of design required for comprehensive modelling.

Based on the maximum regulated hourly energy intensity of 80 kJ/m²·hr and a total GFA of 666 m², the estimated annual energy consumption for the ground-floor retail component is approximately 65,537 kWh/year. This results in approximately 62.3 tCO₂-e/year across Scope 2, and 3 emissions. This assumes ~55.7 tCO₂-e from electricity use (Scope 2), and ~6.6 tCO₂-e from transmission and distribution losses (Scope 3). The emissions intensity is approximately 93.5 kgCO₂-e/m²·year, with an energy intensity of 354.3 MJ/m²·year.

Combined Results – Retail and Office

To achieve Net Zero operational emissions, the project will implement a two-step strategy:

- All electricity can be procured as 100% renewable (GreenPower), eliminating Scope 2 and Scope 3 emissions.
- Verified carbon offsets can cover residual Scope 1 emissions (e.g., refrigerant leakage), which are excluded from energy-based calculations.

Item	Value
Estimated Annual Energy Consumption	239,704 kWh/year
Energy Intensity	252.9 MJ/m ² ·year
Emissions Intensity (Scope 2 and 3)	54.0 kgCO ₂ -e/m ² ·year
Estimated Emissions – Scope 2 and 3 (before offsets)	184.2 tCO ₂ -e/year

Table 1: Summary Metrics

Stage	Scope 2 (tCO ₂ -e)	Scope 3 (tCO ₂ -e)	Total (tCO ₂ -e)
Before Offsets	170.7	13.5	184.2
After 100% Renewable Electricity	0	0	0

Table 2: Emissions Breakdown and Offset Pathway

These measures ensure that both retail and office components operate as Net Zero from practical completion, aligning with the NSW Net Zero Strategy, Sustainable Buildings SEPP requirements, and best-practice sustainability principles.

As the design progresses, detailed energy modelling and optimisation will be undertaken to refine system selections, minimise operational demand, and ensure the building can achieve and maintain Net Zero emissions in operation.

Signed: 

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Title: Senior ESD Consultant

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