

Edsgear

38 Pacific Highway

ESD DA Report

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Our Vision is to **think beyond the square.**

Our Mission is to create spaces, places, and communities that are positive for both the environment and for people. We will do this by providing our clients with sustainable and bespoke solutions that are innovative, challenge perceived ideas, and push the boundaries of achievement and excellence.

We confirm that all work has been undertaken in accordance with our ISO 9001 accredited quality management system.

Acknowledgement of country

The dsquared team wish to acknowledge the Traditional Custodians of all country throughout Australia, and their cultural, spiritual, physical, and emotional connection with their land, waters, and community. We pay our respects to all Elders past, present, and emerging.

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1 Introduction

1.1 Purpose

This report describes the proposed Environmentally Sustainable Design (ESD) initiatives for the new development at 38 Pacific Highway, St Leonard, NSW to enhance the occupants' health and wellbeing and reduce the development's impact on the environment in both construction and operation.

It follows the development of the building design by the integrated design team lead by Tonkin Zulaikha Greer Architects, using computer building simulation design techniques to optimise the built form.

Facilitating ecologically sustainable development is an objective of the Environmental Planning and Assessment Act 1979 (EP&A Act 1979). The Act requires the integration of 'relevant economic, environmental, and social considerations in decision-making about environment planning and assessment'. It also fosters social and economic benefits, an improved environment and promotes good design and construction of the built environment (including improved health and safety of building occupants).

The State Environmental Planning Policy (Sustainable Buildings SEPP) 2022 places sustainability at the forefront of developments in NSW. The Sustainable Buildings SEPP sets standards for developments and introduces measuring and reporting on embodied emissions of construction materials and therefore is a key policy in the NSW net zero emissions by 2050 commitment.

This report has been prepared in accordance with the EP&A Act 1979, Sustainable Buildings SEPP 2022 and the Lane Cove Local Environmental Plan (LEP) 2009 and Development Control Plan (DCP) 2010.

1.2 Brief and context

In line with Lane Cove Council's Local Strategic Planning Statement, the design aims to create a sustainable building which incorporates environmentally sustainable design principles to provide a long-term asset and healthy work and living spaces while minimising its impact on the environment.

Most of the GFA will include hotel units and shared communal indoor and outdoor spaces designed to provide high quality and sustainable accommodation for key workers, a user group with highly individual needs. The relevant brief requirements and specific needs of key workers are summarised in Figure 1.

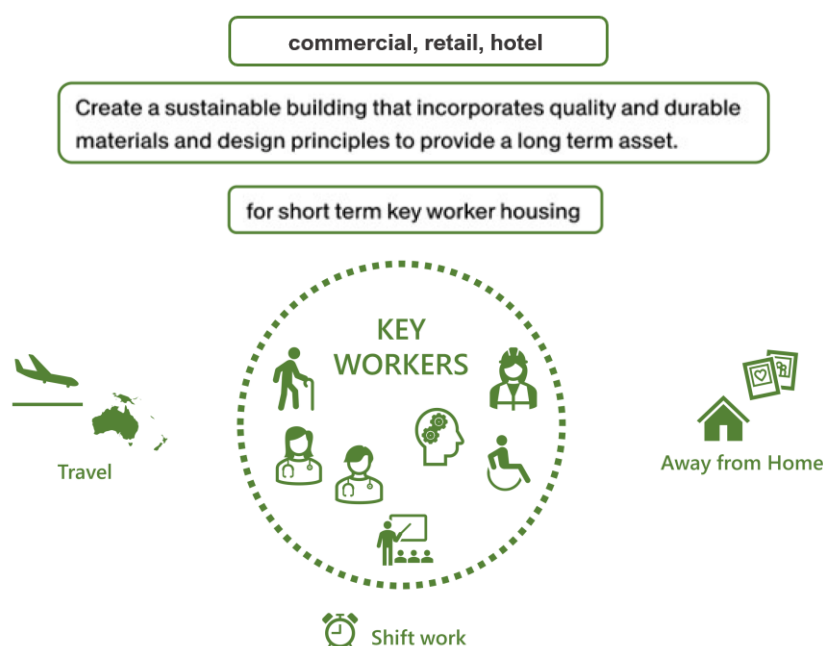


Figure 1: Brief and occupant needs

An analysis of the site and microclimate was undertaken by Tonkin Zulaikha Greer Architects and dsquared Consulting which also involved a review of key environmental aspects and requirements impacting on occupant comfort, health and wellbeing. The key findings are captured in Figure 2.

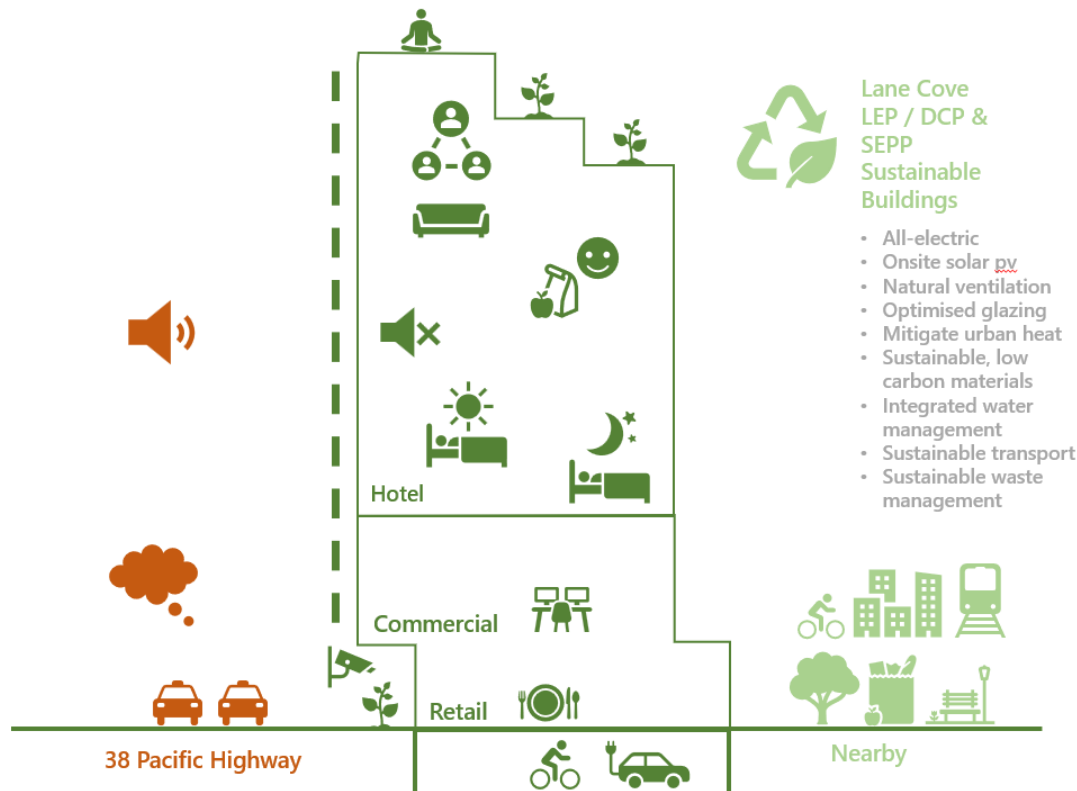


Figure 2: Key environmental aspects and requirements

1.3 Sustainability vision and ESD principles

The sustainability vision (Figure 3) and ESD principles have been developed with a focus on the building occupants' comfort, health and wellbeing and consideration of site constraints, opportunities and planning regulations.

A sanctuary for key workers

offering a restorative 'home away from home' experience. It prioritises occupant well-being, with enhanced acoustic and indoor environmental comfort, thoughtfully designed community amenities, and a commitment to minimising environmental impact through sustainable practices.

Figure 3: ESD vision

1.4 ESD principles

The overarching ESD principles for the building are that it:

- provides excellent Indoor Environmental Quality (IEQ).
- prioritises occupant health and wellbeing.
- is all-electric, and fossil fuel free, and therefore carbon-neutral ready;
- has a low embodied carbon footprint; with procurement promoting circular economy principles.
- is energy-, water- and resource-efficient.
- produces minimal waste and maximises opportunities for reuse and recycling.
- enhances outdoor connectivity and biodiversity by integrating landscaping and biophilic design.
- creates inclusive and flexible spaces that encourage social interaction and future flexibility.
- encourages sustainable transport options
- considers climate change resilience.

1.5 Author

This report has been prepared by Juli Wolter, an ESD Consultant at dsquared Consulting. Juli is a specialist ESD/ Sustainable Design Consultant (MSc) and Architect (Dipl.-Ing.) with over 15 years' experience in a broad range of complex project types and scales across Australia and Germany including residential, adaptive reuse, public, retail and education buildings as well as masterplans. She specialises in providing strategic planning advice and crafting sustainable building design solutions by fostering collaboration, integration, and innovation. Juli is a Green Star Accredited Professional for Design & As Built, Buildings and Communities.

2 Environmentally Sustainable Design (ESD) initiatives

2.1 Community and Social Sustainability

The following social sustainability initiatives are included:

1. The building design offers views from and to the units and shared spaces to provide transparency and a visual connection between staff, residents, the community and environment.
2. The building design allows for connection to the local environment through passive design and natural ventilation, where practical, and extensive roof terraces.
3. All roof areas not allocated to plant are maximised for use as open terraces and amenity spaces.
4. Inclusion of design elements that respect connection to Country.
5. Responsible procurement of products and services. Preference will be given to suppliers who disclose the labour and ethical practices of their supply chain.

2.2 Health and Wellbeing

The following Indoor Environment Quality initiatives are included:

1. Using paints, sealants, adhesives, carpets, coverings and furniture which have low off-gassing properties (low VOC, low formaldehyde).
2. All LED lighting (CRI of 85 or higher) has best practice illumination levels and uniformity levels to code.
3. The south-facing units will be fully naturally ventilated. The north-facing units will be mechanically ventilated to mitigate noise and pollution impacts from Pacific Highway.
4. The provision of localised mechanical heat recovery ventilation systems (MHRV) to all hotel units will enhance energy efficiency and indoor air quality by capturing and reusing heat from exhaust air, reducing heating and cooling costs while providing a comfortable, well-ventilated spaces.
5. All rooftop residential common areas will be naturally ventilated.
6. Air conditioning system condensing units will be concealed and located in acoustically sheltered plant areas, such that external noise will not impact on the amenity of the residents.
7. Deployment of biophilic design techniques, such as the use of natural materials, colours, forms, indoor planting/landscaping, and views.
8. The building will be designed to become a pandemic-ready building which prioritises resilience through enhanced indoor air quality (MHRV) with filtration, adaptable spaces, touchless technologies (including automated doors, soap dispensers etc.) and shared outdoor spaces.

2.3 Urban Heat and Shade

The following heat island and shade initiatives are included:

1. Using light-coloured external finishes (paving and roof coverings) to reflect heat and reduce solar gain, reduce the heat island effect and increase the wellbeing of the community.
2. Roof terraces and external amenities include fixed shading structures which are designed to limit visible reflectivity for neighbours.
3. Urban cooling is also provided through large, raised planters with diverse landscaping including shrubs, grasses and small trees.

2.4 Energy

The following energy initiatives are included:

1. The building will be fully electrified and will not utilise fossil fuels (natural gas) for heating, cooling, or hot water.
2. As all roof areas not being used as plant have been maximised for use as outdoor amenity spaces, no space is available for on-site solar PV panels. However, as an all-electric building with an embedded energy network, access to 100% renewable energy is available via an off-site managed contract.
3. The south-facing units have access to natural ventilation through openable doors and windows.
4. Efficient domestic hot water systems using a centralised electric heat pump system; sized appropriately to the demand.
5. Mechanical heat recovery ventilation to all units to provide high levels of indoor air quality while minimising energy consumption.
6. All commercial, retail and common areas will be provided with daylight access. The units have good daylight to all bedroom areas meeting NCC 2019 requirements for daylight access.
7. Selection of energy efficient, flicker-free lighting fittings (LED) with automated lighting control systems.
8. Metering and sub-metering for energy and water management.
9. Selection of energy efficient appliances of at least a 4 Star Energy rating, with 4.5 Star refrigerators and 6 Star clothes dryers.
10. All refrigerants shall have the lowest GWP rating available at the time of procurement.

2.5 Façade

The following façade strategies are adopted:

1. Passive design and a high-performance façade with low-e double glazing and external shading hoods. Shading and glazing system specifications will be optimised using computer simulation techniques.
2. The façade thermal performance specification adopted is as follows:
 - Glazing to be a low-e double glazed units in order to maintain high solar load control whilst still providing high levels of natural light. Total system performance for the glazing will be specified in accordance with NCC 2022 Deemed-to-Satisfy provisions to meet the following:

Table 1: Total glazing system performance values

Location	U-Value (W/m ²)	SHGC (maximum)	% (minimum)
All	3.6	0.32	40

- Thermal Insulation to external walls R2.5.
- Thermal insulation to exposed soffit under a conditioned zone R2.0.
- Thermal Insulation to roofs R3.65
- Building insulation and building sealing to reduce building fabric permeability (confirmed via air leakage pressure testing) to ensure a controlled environment to reduce unwanted heat transfer and therefore demand on mechanical systems.

3. Sealing of the building envelope during design and construction will be prioritised to minimise fabric permeability, maintaining a controlled environment, reducing unwanted heat transfer, and lowering reliance on mechanical systems.

2.6 Water

The building aims to use 20% less water. This will be achieved through the following strategies:

1. Installation of water efficient fittings with the following minimum WELS ratings will be installed throughout:

Table 2: Water efficiency requirements

Type	WELS Star Rating Minimum
Toilets (WCs)	4 Star
Urinals	6 Star
Taps – bathrooms and kitchens	6 Star
Showerheads	4 Star

2. Selecting appropriate native landscaping with low irrigation water demand to minimise irrigation water use.
3. A 10kL rainwater storage tank will be provided, harvesting roof rainwater for landscape/planting irrigation.
4. Preference will be given to in-ground drip irrigation systems, with moisture demand and time control.
5. Water Sensitive Urban Design, which include self-watering planters and raingardens.
6. Stormwater systems designed such that historic peak stormwater outflows will not be exceeded before discharge to the Sydney Water system, in accordance with the separate Stormwater Management Plan.
7. Selection of water efficient appliances of at least a 4 Star Water rating.

2.7 Materials

The following embodied energy & construction initiatives are included:

1. A minimum 30% reduction of embodied carbon compared to a standard building. This will through the following strategies:
 - a. Use of CLT/GLT for structural design elements, such as slabs, loadbearing walls, columns and beams on levels L1 to L8,
 - b. Use of post-tensioning slab design in lieu of conventional slab design with reinforcing mesh on the lower levels (basement to mezzanine)

Further emission reduction strategies will be considered at the next stage, including low carbon concrete in floor slabs and building core, recycled content in reinforcement bars and ceiling/wall/floor coverings.

2. A whole-of life-approach has been adopted, and life cycle analysis modelling undertaken during concept stage.
3. The use of sustainable and responsible products will be prioritised as following:

- Timber products must be reused or included on the Forest Stewardship certification scheme.
 - All common uses of PVC must be either PVC products sourced from manufacturers which meet the Best Practice Guidelines for PVC in the Built Environment or are products that do not contain PVC.
 - Products that have been re-used, re-purposed, have recycled content (e.g. thermal insulation, reinforcement bar, fly ash in concrete, recycled and carbon neutral bricks, green steel, recycled content floor coverings, where)
 - Products that have an Environmental Product Declaration (EPD), or a third-party certification (such as GECA, Global Greentag, etc.).
 - Products which are durable and locally sourced wherever viable.
4. Dematerialisation principles, including a preference for Open Plan layouts with minimal partitioning wherever practicable, and the use of exposed ceilings and flooring in appropriate locations.

2.8 Waste

The following construction and operational waste initiatives are included:

1. Construction waste will be minimised through efficient design techniques including modularity, standardisation and wherever practicable off-site pre-fabrication. A minimum 90% diversion from landfill rate will be targeted.
2. Provisions will be made for the location and use of separate bins for general, organic, recyclable waste and bulky waste with two central storage rooms for the commercial/ retail spaces and hotel areas, in accordance with the separate Operational Waste Management Plan.

2.9 Sustainable Transport

The following Transport initiatives are included:

1. Bicycle parking is provided for staff and residents, located in a safe and protected area in the basement. Provisions have been made for external bicycle parking for visitors. Numbers and provisions are summarised in the Traffic & Parking Assessment Report.
2. End of Trip facilities (lockers and change rooms with showers) for staff and residents are included adjacent to the internal bicycle parking area.
3. Electric charging points will be provided to some bike racks as outlined in the Traffic & Parking Assessment Report.
4. 10% of the parking spaces associated with the commercial/ retail tenancies and 20% of the parking spaces allocated for the hotel will be provided with future charging infrastructure (e.g. conduits and supply capacity) in accordance with NCC 2022 requirements.
5. Two dedicated on-site car share parking spaces will be available.
6. Level 2 40A chargers will be provided to several parking spaces in accordance with the Traffic & Parking Assessment Report.