



## 79-81 Queens Road and 2-8 Spencer Street, Five Dock Ecologically Sustainable Development Report for SSDA SSD-78287462

Prepared for: DPG Project 37 Pty Ltd

Attention: Alan Chen

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A	2602160	ESD Report for SSDA [FINAL DRAFT]	TD	RB	27/02/2026
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**Limitations of this report:** The report is prepared using design and systems assumptions at a development application level of resolution (before tender and detailed construction level of design and specification). It should be recognized that final detailed design (for construction certificate) will be refined and adjusted after procurement of the building contractor and after final specification and construction details are resolved. Analysis at this stage relies on comparisons of proposed activities against averages (often at different rated performance levels) as complete bottom up data is not yet available.

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## ESD Vision and Summary of Initiatives

### ESD initiatives will support Net Zero CO2 emissions in operation and exceedance of mandatory energy, water and waste requirements

Smart energy and electrification—69% saving (BASIX) and able to operate as Net Zero

- PV array c.70kW exceeding BASIX requirements
- All electric residential operation supporting Net Zero operational outcome
- Efficient HVAC (COP/EER > 3.5) and appliances

Strong passive design outcomes

- Average NatHERS rating achieved of minimum 7 stars
- Façade designed to minimise heat gain and loss—glazing is optimised based on orientation
- Shading strategies to reduce unwanted solar heat gain while maintaining daylight access and thermal comfort.

Climate change resilient

- High SRI colour/material horizontal surfaces, and greenscape surfaces to mitigate urban heating
- Façade review and mechanical systems review to be undertaken in design development to mitigate downward reflection of solar radiation, expel heat pump heat away from lower levels
- Building drainage design and rooftop mechanical systems to be reviewed for risks from higher intensity rainfall and storm events



Water efficient—more than 50% saving (BASIX)

- Target BASIX 50 Water outcome exceeding compliance
- 30KI rainwater storage providing alternative water for landscape and specific toilets and laundries
- All appliances and fixtures high efficiency and WELS rated

Strategies to reduce embodied carbon emissions

- Optimised structural grid used in design to reduce high CO2 intensity transfer slabs
- Reuse of bricks from existing buildings in new building fabric
- Options for 10-20% reduced embodied emissions concrete and steel & other materials

Reduced waste and responsible material management

- High levels of construction and demolition material recycling (targeting >90% land fill avoidance for key materials); additional waste streams to be set up in operation
- Façade design using simplified structural system able to be supplied from material efficient prefabricated processes

Human health and wellbeing

- Indoor environmental quality and comfort, mixed communal spaces for occupants

79-81 Queens Road and 2-8 Spencer Street, Five Dock  
Ecologically Sustainable Development Report



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# 1. Introduction and project information

## Introduction and purpose of report

This ESD report has been prepared by Efficient Living Pty Ltd to support State Significant Development SSD-78287462 to develop an apartment building complex at Five Dock in the Canada Bay LGA.

The ESD report has been structured considering the requirements of Planning Secretary Environmental Assessment Requirements ('SEARs') issued for the proposal (in this case industry specific SEARs for housing).

In response to SEARs (Clause 1) the report considers relevant ESD related regulations and controls (as noted in Section 3 of the report).

In response to SEARs (Clause 16) the ESD report considers key ESD factors required to address the ESD principles in section 193 of the EP&A Regulation including:

- Reduced carbon emissions, energy efficiency and energy sources—including efforts to reduce embodied carbon emissions in materials
- Water efficiency and alternative water sources to potable water where available
- Environmentally responsible material selection and waste management/recycling
- Climate change resilience
- Human health and wellbeing in the building environment

These factors primarily address the requirements of SEARs (Clause 16) together with other key ESD factors important to industry and the community.

## Structure of this report

The report has been structured into key ESD categories to address SEARs Cl 16. Each category details the ESD measures included in the proposal and an assessment of the performance of this measure against regulatory requirements and industry benchmarks where applicable. The categories include:

- Energy efficiency and low carbon emissions
- Water efficient design
- Climate change resilience
- Responsible materials and waste management
- Human wellbeing and indoor environmental quality

## Methodology to identify ESD measures and outcomes

Efficient Living uses a combination of industry benchmarks, reference projects and comparative project data, together with industry recognised modelling tools, to propose ESD measures.

It should be noted that a wide cross section of ESD factors are considered with both qualitative and quantitative measures.

The committed and proposed ESD measures in this report are considered against the performance and detail required under key planning policy requirements at a State level (primarily responses to SEARs and the Sustainable Building SEPP), and as relevant at a Local level.

Where relevant, comment and reference to published Australian standards and sustainability rating schemes is made. Efficient Living also relies on its experience across multiple NSW proposals to provide opinion on whether the proposed ESD measure meets 'industry benchmarks' which can be subjective.

The ESD report also recommends further detail and specification outcomes as the project moves into detailed design development and building tender processes. Final ESD outcomes can not be fully determined until the detailed level of design and final construction package of works is agreed.

# 1. Introduction and project information

## The site

The Site is situated in the Kings Bay Precinct which is proposed to be a 'thriving village precinct with new and active uses around Spencer Street'. The area has long been planned for urban renewal as part of the Parramatta Road Corridor Urban Transformation Strategy (PRCUTS).

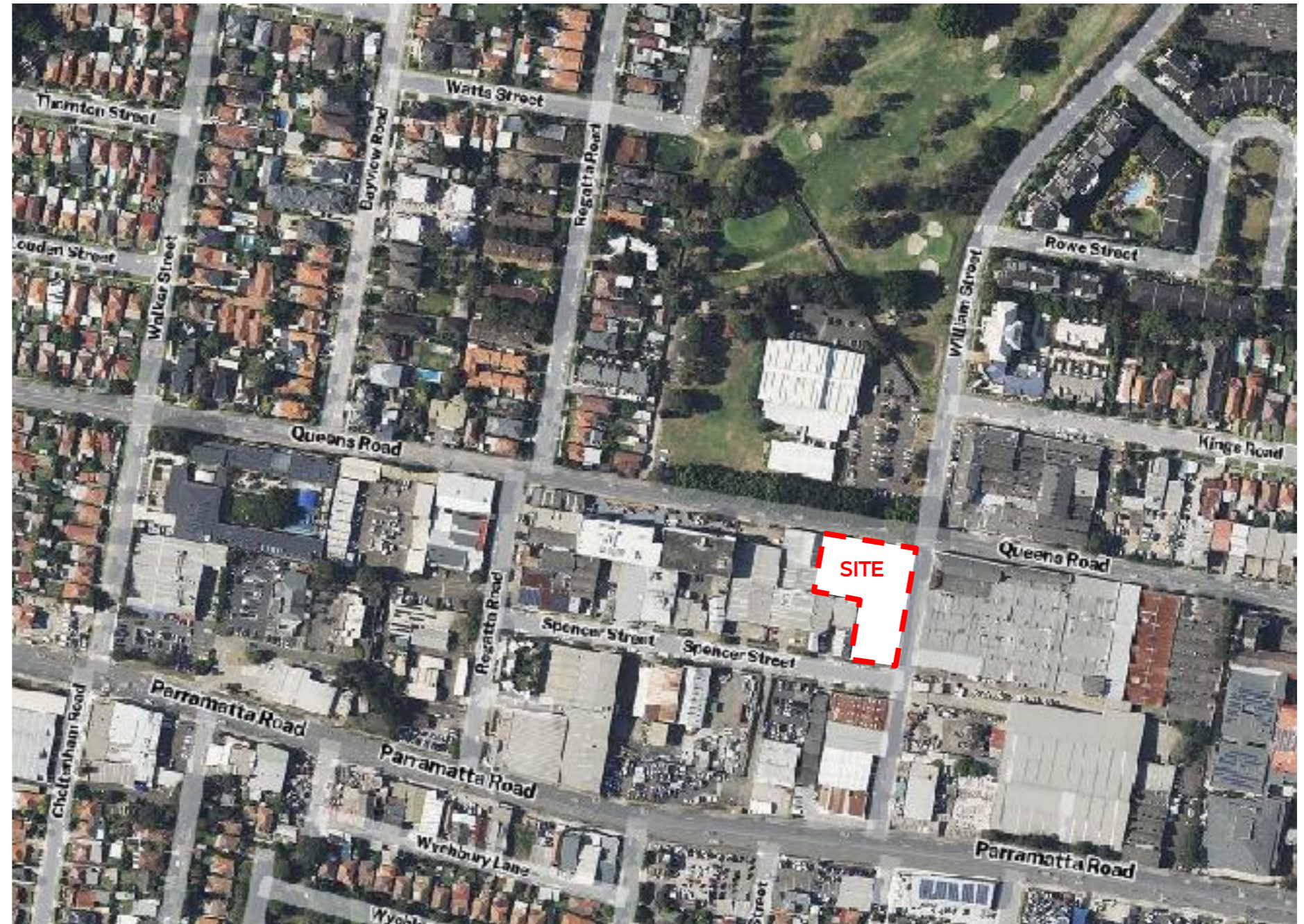
The Site is bounded by Queens Road to the north, Spencer Street to the South and William Street to the east with an adjoining boundary to existing light industrial property to the west.

The Site is rectilinear in shape, on a block corner/end with a total area of 3158m<sup>2</sup>. In its current state, the Site contains light industrial buildings and grade car parking. The Site has several vehicle access points due to the triple road frontage.

## Proposal description

The proposal is for redevelopment and urban renewal. The proposed works consist of:

- Site preparation works, including demolition and excavation.
- Construction of 2 x shop top housing buildings, including a 5-storey building along Queens Road, and a 26-storey building along William Street, comprising a shared single storey non-residential podium, with 134 dwellings above.
- Construction of a shared basement carpark accessed from Spencer Street.
- Public domain and landscaping upgrades, including landscaped street setbacks to all boundaries, and the provision of part of a shared through site link connecting Queens Road to Spencer Street.
- Associated infrastructure upgrades and diversions.



Local context of Site (from NSW Explorer)

## 2. Project responses to SEARs

### SEARs REQUIREMENTS

### Project response (and reference to relevant report section)

#### 1. Statutory Context

- Address all relevant legislation, environmental planning instruments (EPIs) (including drafts), plans, policies, guidelines and planning circulars.
- Identify compliance with applicable development standards and provide a detailed justification for any non-compliances.

The report primarily considers the EP&A Act ESD principles and required ESD measures for CII6 of the in-fill affordable housing SEARs provided for the proposal. In addition the report also considers ESD principles or objectives from the following State strategies and policies:

- Greater Sydney Region Plan 2018 and draft Sydney Plan
- Eastern District Plan 2018
- Sustainable Buildings SEPP and Housing SEPP (ADGs)
- NSW Government Net Zero Plan

The report also includes compliance with National Construction Code (NCC) Section J Energy Efficiency requirements as is mandatory for components of this project type. These considerations are made in Section 4 of the report.

#### 16 Ecologically Sustainable Development (ESD)

- 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.

- The project is not considered to create any threat of serious environmental damage given it's location on an existing developed site in a highly urbanised area. The development process is established with any potential impacts understood with a high level of certainty.
- The project demonstrates a commitment to minimising environmental impact, implementing climate change resilience measures, implementing resource conservation measures and implementing human health and wellbeing measures.
- In combination these initiatives deliver the concept behind a precautionary approach to approving development based on avoidance of potential future or uncertain impacts.
- On balance the project presents very low risk to the environment and supports sustainable outcomes.

#### Principle 1—the precautionary principle (Section 193, EP&A Regulation 1a)

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, and
- an assessment of the risk-weighted consequences of various options.

## 2. Project responses to SEARs

### SEARs REQUIREMENTS

#### Principle 2—Inter generational equity (Section 193, EP&A Regulation 1b)

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.

### Project response (and reference to relevant report section)

Achieving inter generational equity requires that the proposal takes steps to avoid, mitigate and support processes that preserve the environment and sustainability of communities over the long term.

Core responses to deliver these long term sustainability outcomes include:

- Avoiding resource depletion— through resource efficiency, steps towards waste recycling and a circular economy, with a focus on the longer term and full life cycle impacts for the environment and community.
- Helping to mitigate climate risk—through measures to reduce CO2 emissions from the proposal (operational and embodied).
- Helping to adapt to climate change risk—through including measures in the proposal that allow future communities to better manage climate change impacts.
- Creating places that will support ongoing human health over the long term.

The proposal includes environmental performance initiatives and outcomes to deliver inter generational equity. Sections 4-8 of this report set out these categories an) have been determined based on meeting or exceeding industry benchmarks.

The proposed ESD initiatives incorporate measures that greatly reduce GHG/carbon emissions and consumption of energy, incorporate onsite renewable electricity supply, conserve water and minimise resource consumption and embodied energy in materials.

The primary performance benchmarks for these categories include:

Minimising carbon emissions and energy (Section 4) - exceeding regulatory requirements

- Scope 1 and 2 CO2 emissions for the building c.69% savings against a BASIX benchmark; options included to reduce Scope 3 CO2 emissions
- Sustainable Building SEPP 2022 BASIX Energy score of 69% (versus 63% compliance) and average NatHERS thermal performance rating of c. 7.0 stars
- Provision for a 70kW PV array included for onsite renewable electricity; education and contract options to be highlighted to Owners Corporation for 100% renewable electricity to common building electric services
- Target to reduce upfront carbon emissions in key materials by 10-20% with a focus on reduced embodied carbon concrete and steel; optimised structural grid building fabric to reduce need for high strength transfer slabs; reuse of bricks from existing buildings on site
- Provision for future battery inclusion in the building electrical system and provision for 100% EV parking spaces (NCC 2022) allows transition away from ICE vehicles

Water conservation (Section 5) - exceeding regulatory requirements

- Reduce potable water demand to meet the Sustainable Building SEPP BASIX requirements through water efficient appliances and fixtures—achieves BASIX score of >50% exceeding the 40% regulatory requirement
- Alternative water source (30,000L rainwater tank) used for servicing residential toilets and laundries and soft landscape

## 2. Project responses to SEARs

SEARs REQUIREMENTS	Project response (and reference to relevant report section)
<p>Principle 2—Inter generational equity (Section 193, EP&amp;A Regulation 1b)</p> <p>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.</p>	<p>Climate change resilience (Section 6)</p> <ul style="list-style-type: none"> <li>Final building systems and site drainage detailed design to be reviewed in detailed design development to consider increased extreme rainfall events, storm events and heat wave events for operational performance in extremes</li> <li>Heat island mitigation steps including high reflection horizontal hard surfaces, planned canopy and green cover and attention to preventing building reflection to the ground level</li> </ul> <p>Responsible materials and waste management (Section 7)</p> <ul style="list-style-type: none"> <li>Target to recycle or reuse at least 90% of key demolition and construction waste; implement waste streaming to support operational phase recycling outcomes</li> <li>Procurement strategy to prefer key materials with Environmental Product Disclosures confirming low environmental impact</li> </ul> <p>Human health and wellbeing (Section 8)</p> <ul style="list-style-type: none"> <li>Procurement strategy to target low VOC and low/no formaldehyde products to improve air quality</li> <li>Acoustic and lighting (and daylighting) outcomes and products tailored for healthy and comfortable living environments</li> <li>High levels of daylight access to residential dwellings,</li> </ul>
<p>Principle 3- conservation of biological diversity and ecological integrity (Section 193, EP&amp;A Regulation 1c)</p> <p>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.</p>	<ul style="list-style-type: none"> <li>The renewal strategy for the site seeks to maximise the use of local native species in landscape and minimise environmental impacts (such as carbon emissions, stormwater volume and quality controls) such that the post development outcome retains biodiversity values consistent with local flora and fauna.</li> <li>A stormwater management plan will be developed for the site seeking to minimise any impacts of stormwater (quantity and quality) leaving the site and entering the local water system (consistent with City of Canada Bay stormwater management controls).</li> </ul>

## 2. Project responses to SEARs

### SEARs REQUIREMENTS

Principle 4—improved valuation, pricing and incentive mechanisms.

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, and
- the users of goods and services should pay prices based on the full life cycle of the costs of providing the goods and services, including the use of natural resources and assets and the ultimate disposal of waste, and
- 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.

### Project response (and reference to relevant report section)

- The sustainability and environmental measures for the project are being incorporated in the early design and cost plan for the project to ensure the most economic pathways are identified through design and construction.
- Further, the specification of materials and equipment will strongly consider the most cost efficient operations and maintenance outcomes which are anticipated to also match the most efficient environmental outcomes for the apartment complex operation (for example use of PV arrays to minimise the long term financial and environmental cost of electricity, choice of robust building materials with a long useful life).
- Future occupants will be able to choose their preferred pathway and retailer to access renewable electricity for private apartment uses and for electric vehicle charging—communal area access to renewable energy will be factored into the building cost through provision of the solar/PV array system and then will be determinable by the Owners Corporation for base building/common area electricity purchase.

## 3. State and Local strategies and policies

### Key State ESD related strategies and policies

#### Sustainable Buildings SEPP 2022

For residential development the proposal will need to at least meet the requirements of the BASIX conditions for thermal performance, energy/carbon reductions and potable water reductions.

- BASIX thermal performance average NatHERS 7 star
- BASIX Energy outcome of at least 63%
- BASIX Water outcome of at least 40%

#### Housing SEPP—NSW Apartment Design Guide

The objectives, design criteria and design guidance will need to be considered especially in relation to design criteria including:

- Sunlight to habitable rooms (70% of apartments to receive 2 hours, <15% receive no sunlight)
- Natural cross ventilation to at least 60% of apartments
- Apartment and room sizes, window requirements, room depths for habitable rooms, balcony provision and size

#### Greater Sydney Region Plan 2018

Various objectives of this plan require targeted ESD outcomes including Objective 27 Biodiversity is protected, urban bushland and remnant vegetation in enhanced; 30 Increased tree canopy; 33 Low carbon city; 34 Energy and water flows are captured, used and reused; 35 More waste is recycled; 36 People and places adapt to climate change; 37 Exposure to natural and urban hazards is reduced; 38 Heatwaves are managed.

#### Eastern District Plan 2018

Various objectives of this plan require targeted ESD outcomes including Planning priority N21 with Reducing carbon emissions and managing energy, water and waste efficiently, Planning Priority N20; Delivering high quality open space, Planning Priority N19; Increasing urban tree canopy cover and delivering Green Grid connections, Planning Priority N17; Protecting and enhancing scenic and cultural landscapes, Planning Priority N16; Protecting and enhancing bushland and biodiversity, Planning Priority N15; Protecting and improving the



health and enjoyment of Sydney Harbour and the District's waterways, Planning Priority N5; Providing housing supply, choice and affordability, with access to jobs, services and public transport.

#### Draft Sydney Plan 2026

The Resilient Priority of this plan requires that proposals consider future climate change risks and develop responses to these risks.

Response 9 of this plan requires that development proposals consider opportunities for enhancing urban greening with a particular focus on enhanced urban tree canopy.

#### NSW Government Net Zero Plan

The NSW Government targets (NSW Climate Change Policy Framework—Net Zero Plan) for 70% reduced emissions by 2035 and net zero by 2050 should also shape the ESD initiatives for the proposal.

#### National Construction Code (NCC) Section J Energy Efficiency

Section-J of the National Construction Code 2019 focuses on "energy efficiency of buildings". Section J is a minimum performance target for standard buildings and specifies minimum performance targets known as deemed-to-satisfy (DTS) requirements, for building fabric and services.

Section J performance requirements are relevant for the common areas proposed in a residential, Class 2 apartment development and for Class 6 retail floor space proposed.

NCC 2022 Section J also requires provision of space and electrical infrastructure planning to allow future uptake of electric vehicle chargers, battery systems and PV arrays (if not already provided).

#### City of Canada Bay LEP and DCP

Clause 4.4 of the LEP allows for a floor space bonus is certain ESD outperformance outcomes are achieved for BASIX Energy and BASIX Water. Efficient Living has prepared a separate Technical Memo on the potential meeting of these requirements.

We note that the DCP objectives and controls are technically superseded by the ESD requirements in the SEARS given the SSDA pathway for the proposal. We note however that the Kings Bay precinct (Five Dock) DCP includes specific sustainability and design excellence objectives guiding development to exceed current sustainability requirements and mitigate climate change impacts.



## 4. Energy efficiency and low carbon emissions

### Passive design Initiatives to reduce energy use

With thoughtful planning, a well-designed building can be passively heated, cooled, and ventilated for most of the year in temperate NSW climates. This approach minimizes reliance on mechanical heating, ventilation, and air-conditioning (HVAC) systems, which are only needed when outside temperatures are too extreme to be controlled passively.

### Proposed outcome meeting compliance and meeting or exceeding industry standards

- NatHERS average ratings of minimum 7 stars for apartments (minimum c.6 stars for individual apartments) meeting BASIX thermal performance requirements
- Approximately 86% of apartments achieve solar access requirements exceeding the ADG benchmark of 70%
- Approximately 70% of apartments achieve cross ventilation exceeding the ADG benchmark of 60%

### Strong NatHERS ratings for apartments

Strong passive design will translate into strong measured thermal performance outcomes in NatHERS modelling. The project has achieved a weighted average of NatHERS 7 stars for apartments (minimum 6 stars per apartment) meeting the upgraded requirements of the Sustainable Buildings SEPP 2022..

### Compliance with NCC 2022

The project will comply with the latest NCC 2022 Section J inclusions for building fabric and energy requirements. These requirements are relevant for common residential spaces that may be conditioned and proposed retail floor spaces.

### Solar Access

The floor plate of the building has been designed to maximise solar access. Solar access provides daylight which means electric lights can be left off during the day but also provide passive heating during the winter months, meaning that the heating system has less work to do, and less energy is consumed heating the spaces.

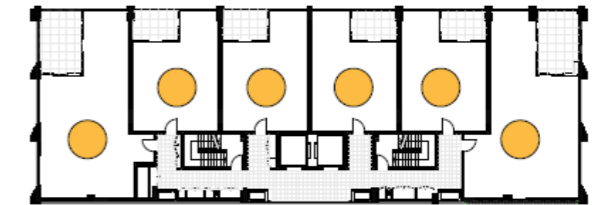
86% of apartments will receive more than 2hrs of solar access between 9am-3pm exceeding the guidelines (minimum requirement of 70% apartments) in accordance with the Apartment Design Guide.

### Cross Ventilation

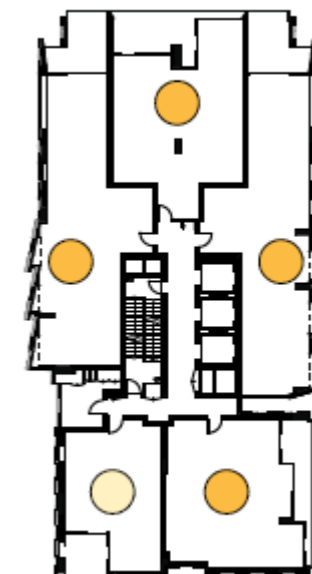
The floor plate of the building has been designed to maximise the number of dwellings achieving natural cross ventilation.

70% of apartments will comply with natural cross ventilation requirements in accordance with SEPP 65 Apartment Design Guide.

Opportunities to naturally ventilate the common areas will be further investigated as the design progresses.



Levels 3-4 - 100% solar access outcomes—ADGs (Plus)



Levels 6-13—80% solar access outcomes—ADGs (Plus)

## 4. Energy efficiency and low carbon emissions

### Service and appliance initiatives to reduce energy use and carbon emissions

#### Proposed outcome meeting or exceeding industry standards

- BASIX Energy saving outcome of 69% versus compliance 63%
- A/C high efficiency targets of > 3.5 EER cooling and >4 COP heating
- Appliance efficiency in upper quartile of ratings
- All electric services to major residential components of buildings

### An all electric building supporting net zero carbon emissions in operation

The major residential components of buildings will be serviced with all electric services making net zero carbon emission operational immediately achievable.

To operate as net zero three core sources of renewable electricity will be required, including:

- An onsite solar/PV array supplying energy primarily to common area and service demands
- A renewable electricity purchase agreement by the building operator/embedded network operator—an option for this outcome will be investigated to test commercial viability

The small exception to 'all electric' services may be limited gas supply to commercial cooktops in future food and beverage retail areas.

### Hot Water Systems

Domestic hot water systems can be responsible for 10-15% of total apartment building CO2 emissions.

A centralised electric heat pump system will be utilised for hot water with a high level of insulation for the hot water ring main throughout the building.

The coefficient of performance (COP) for this system should be greater than 3.5 compared to a traditional gas boiler system with coefficient of performance less than 1.

Any pool or spa heating services will also be through electric heat pumps.

### Air conditioning services

With strong passive design, reflected in a minimum 7 star average NatHERS rating, space conditioning is responsible for about 5-8% of total apartment building CO2 emissions.

Air conditioning systems will target a higher efficiency cooling mode EER of >3.5 and heating COP of >4.

### Appliances

Appliances and related other electrical demand average approximately 35% of total CO2 emissions in a modern apartment building.

The following star ratings are targeted for key domestic appliances subject to final clarification of BASIX requirements.

- Dishwashers - minimum 4.5 star
- Clothes Dryers - minimum 9 star condenser/heat pump dryers (supporting avoidance of separate ducting requirements under NCC 2022 required for non-condensing dryers)

### Lighting

Lighting can use up to 10% of an apartment building's electricity consumption, therefore efficient luminaires and lighting control systems are critical in order to optimise the building's energy efficiency. The following measures will be implemented:

- LED lighting to be specified throughout with a target of 10% reduction in energy demand compared to NCC minimum compliance.
- Common area lighting to have motion and daylight sensors with further zoned lighting controls for car park areas.

### Lifts

Lift use can be responsible for over 10% of total apartment building CO2 emissions.

The lifts will incorporate PMS motor and regenerative drive technology for the east tower building.

### Car park ventilation

Common area ventilation can be responsible for over 10% of apartment building CO2 emissions.

Car park mechanical ventilation will be CO monitored/controlled and utilise energy efficient variable speed fans.

Other ventilation, such as to switch rooms, plant rooms and communal bathrooms, will be either interlocked to light switching or controlled through a building management system.

### Common area services

Opportunities for natural ventilation of common areas will be further targeted in future design development.

## 4. Energy efficiency and low carbon emissions

### Electric transport services

#### Electric transport

Electric vehicles are anticipated to experience high adoption over the coming decades (Electric Vehicle Council target 50-60% of new vehicle sales by 2030). When serviced with renewable electricity this mode of transport provides an effective net zero in operation outcome for travel.

Provision for electric cars is the major item to consider followed by power access and storage for the fast growing use of e-bikes and e-scooters.

#### Electric car provisions

Final detailed electrical system design will cater for a high uptake of electric cars and bikes.

Consistent with NCC 2022, dedicated distribution boards to support EV charging on each basement level will be provisioned together with an active load management system that allows future connection of all parking spots within an achievable total electrical demand level for the project.

Consideration of a charger provision and tariff system/model, so that individual apartments are provided with an accurate electricity bill for their usage, is also recommended. This service is most often provided by specialist EV charging entities.

Any shared car service parking spots and service provider procurement should also plan for shared EVs to further provide zero net carbon outcomes for car based transport.

#### E-bike and e-scooter provisions

Provision of standard GPOs with access from bike storage racks and other storage areas (potentially for e-scooters) will be provided to facilitate charging of these mobility devices.

### The future of Electric Vehicle batteries integrated with building electricity demand

Batteries in EVs theoretically store enough energy to run a typical apartment for 5-7 days. Technology is under development to allow the energy in EV batteries to be accessed by homes, and potentially apartment buildings, to help reduce peak demand and otherwise supplement demand throughout the day as required.

The software controlling the management of the car battery, through a 'two way' charging connection, would allow for a proportion of the battery power (say 50%) to be utilised for building energy management. The owner of the EV would be compensated for this service.

When fully developed this energy management system may be able to greatly reduce the buildings peak demand and therefore help reduce the required substation size requirements for 'all electric' buildings.

The final detailed electrical system design and fitout will consider incorporation of sourcing power from EV chargers through to the main switchboard for the apartment building.



Example of EV charging provision image from <https://evse.com.au/blog/apartmentevcharger/>



Modern buildings are providing charging options for e-bikes and e-scooters

## 4. Energy efficiency and low carbon emissions

### Renewable energy sources and energy management

#### Proposed outcome meeting compliance and meeting or exceeding industry standards

- A solar/PV array of minimum 70kW capacity will be provided (BASIX commitment) optimising available roof space
- Future options available for a renewable electricity contract for base building and EV charging power
- Provision for future battery system integration

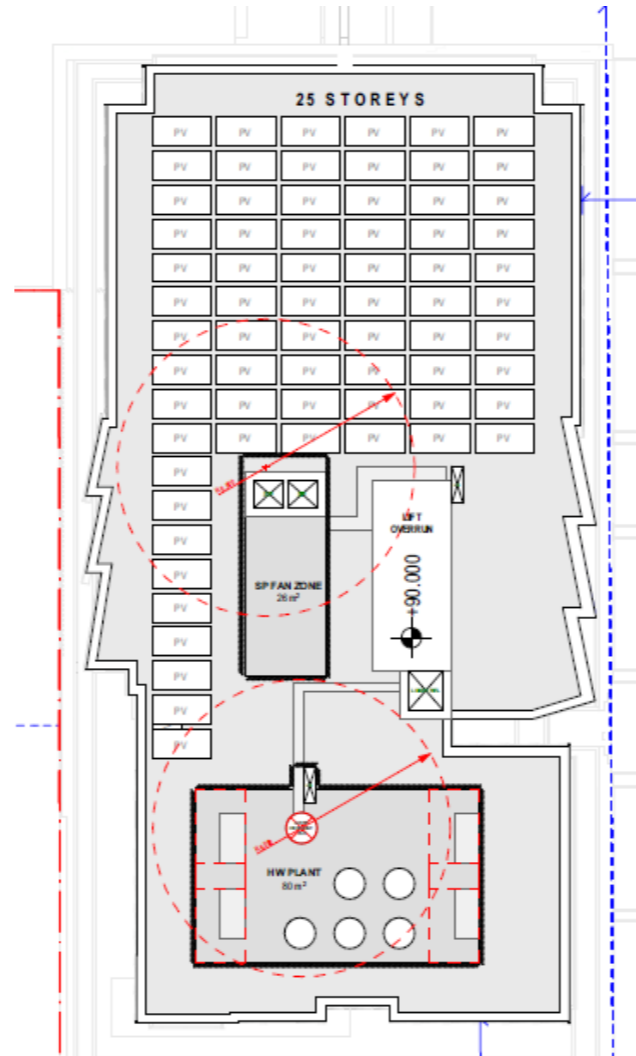
#### Incorporation of solar/PV arrays

A 70kW PV array will be provided in line with the BASIX commitment for the proposal. The areas on the northern and eastern buildings indicate space availability for c. 150-160 PV panels equivalent to approximately 78kW (using modern 500w panels).

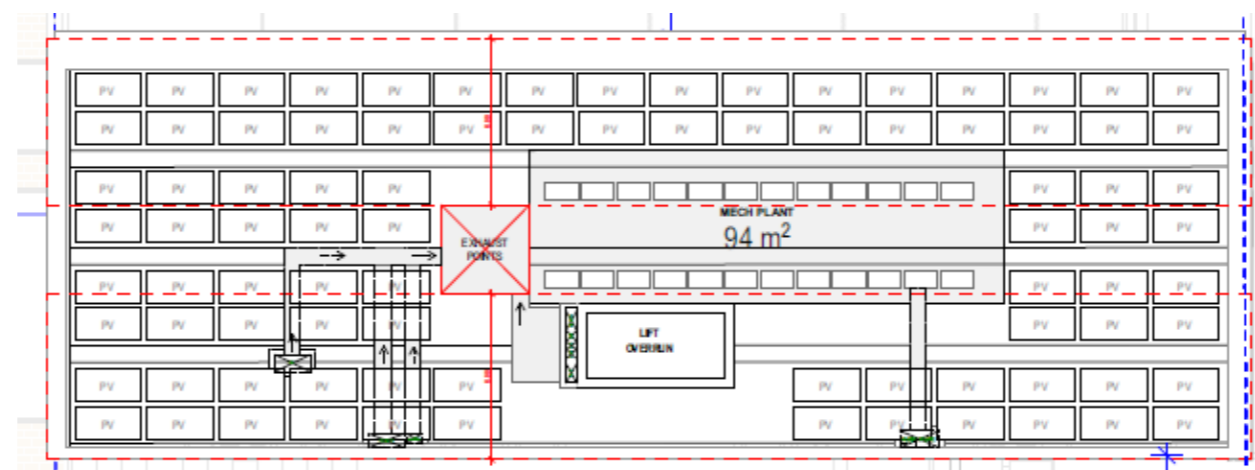
#### Potential future purchase of renewable electricity to help achieve Net Zero

The developer of the proposal will provide education/information (in handover documents at the first Owners Corporation AGM) on potential purchase options for renewable electricity to service the base building.

These handover documents will provide details on at least two providers of Green Electricity and also options to join any available longer term Renewable Electricity Power Purchase Agreement.



Eastern tower roof—indicative PV panel area subject to final design



Northern building roof—indicative PV panel area subject to final design

### Building energy management

Building systems will be set up with sufficient sub meters to allow detailed monitoring of consumption patterns and equipment performance.

### Investigation of a centralised battery system

In the next stage of detailed design development, an area will be identified in the basement in close proximity to the main switchboard to allow potential installation of multiple batteries in the future—as now required in NCC 2022.

The building operator/embedded network operator will ultimately determine if a shared community battery is worthwhile given the specific demand profile, and PV production profile,

Ultimately the potential to utilise 'two way' EV batteries linked to the building system (discussed on the preceding page) will determine if a stationary battery system is also warranted.

## 4. Energy efficiency and reduced carbon emissions

### Summary of carbon emission reduction measures

#### Boundary and Scope of carbon emissions considered

- The most relevant boundary for considering CO2 reduction measures are the activities carried out in building operations—predominantly residential activities
- Scope 1 CO2 emissions for the proposal include those from onsite gas used for the centralised hot water plant and apartment cooktops
- Scope 2 CO2 emissions, the major source of emissions, come from electricity sourced to power building systems and appliances
- Significant Scope 3 CO2 emissions, embodied carbon in key buildings materials and carbon emissions related to cars stored in the building for transport are also considered.

#### Operational carbon emissions—energy use

##### Passive design

- NatHERS average rating of c 7.stars
- Future compliance with NCC 2022 Section J for communal and retail areas

##### Energy efficient systems and appliances

- Electric heat pump for domestic HW
- Air conditioning with min COP 4 and EER 3.5
- Energy efficient appliances—ratings as indicated

##### Provisions for electric transport—EVs and other options

- NCC 2022—100% of car spaces will be provisioned for Type 2 EV charging capability with additional provisions for e bike charging

#### Operational carbon emissions—energy source

##### On-site renewable electricity

- PV array system of minimum 70kW capacity (BASIX requirement)

##### Offsite renewable electricity

- Developer will provide education and options for the Owners Corporation to secure a renewable electricity contract

#### Operational carbon emissions—energy management

- Energy metering in place to allow monitoring and optimisation of core systems
- Provision for future battery storage if feasible to manage peak and also consideration of how future EV battery integration may occur

#### Reduced upfront embodied carbon emissions

The project will target savings of 10-20% in upfront carbon emissions in the key materials responsible for Scope 3 emissions in apartment buildings. This will include reuse of approximately 1,120 sqm of existing brick onsite avoiding new embodied CO2 emissions in manufacture and transport related embodied emissions.

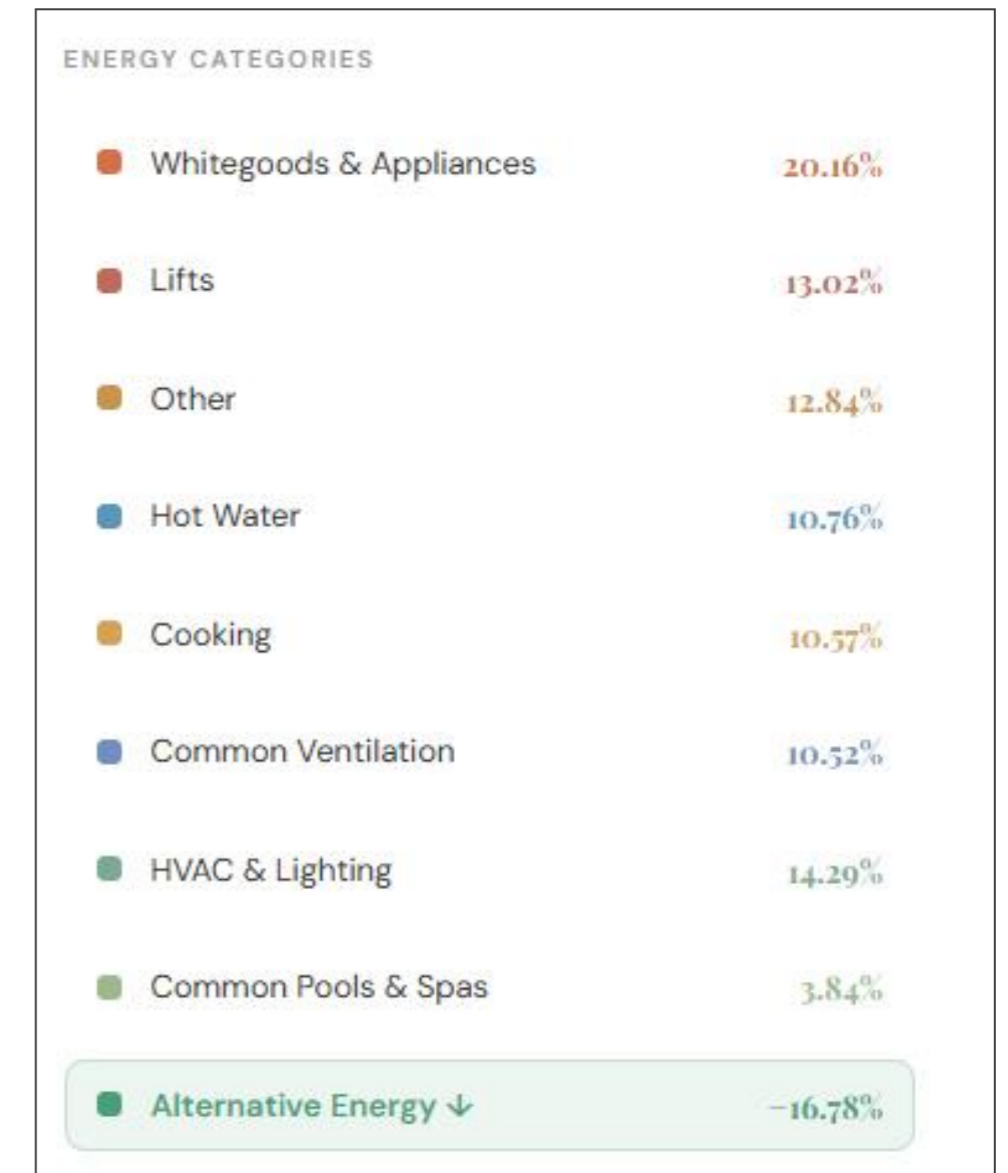
Work by the GBCA (GBCA Think Step ANZ Embodied Carbon and Embodied Energy in Australia's Buildings 2021) identifies steel (46%) and concrete (44%) as the major sources of embodied emissions.

Concrete embodied emissions will be avoided initially through application of a structural support grid in the buildings reducing the intensity of high strength concrete transfer slabs. Secondly, embodied emissions will be reduced by requiring material options targeting certified low carbon concrete mixes. For example from suppliers Holcim, Boral and Hymix. A combination of recycled materials, reduced concrete and other additives allow concrete across strength grades with reduced carbon emissions of generally 20-60%.

It is also recommended that steel is selected from suppliers with evidenced carbon emissions reduction targets in production (including use of recycled steel) and with Net Zero 2050 corporate

targets (in alignment with the NSW Government goal).

It is proposed that the tender phase for building contractors include a requirement for submissions to provide material options that would achieve this outcome and clarify differences in relation to increased cost and/or increased uncertainty of supply. Based on this analysis the project proponent will be able to make an informed decision on the feasibility to implement a reduced embodied emission strategy.



Summary of operational Scope 1 and 2 CO2 emission contributors sourced from NSW BASIX analysis for proposal

### Integrated Water Management plan

Water resources will be managed to deliver three clear objectives for the redeveloped site as an integrated water management plan.

- Reduce the demand for potable water through water efficient fixtures and an alternative water supply
- Reduce negative stormwater volume impacts within and leaving the site (please refer to the project Stormwater Management Plan (SMP))
- Reduce negative stormwater quality impacts within and adjacent to the site (please refer to the SMP)

### Proposed outcome meeting compliance and meeting or exceeding industry standards

- A BASIX outcome of 54 has been achieved exceeding BASIX 40 compliance
- High efficiency fixtures and appliances
- Large rainwater tank supply

### Water Efficient Fixtures and Fittings

Water efficiency in the project will be underpinned by efficient fixtures and fittings in apartments and common areas.

The following WELS water ratings will be achieved in the top quartile of efficiency:

- Shower roses—flow rates of 6-7.5L/min 4 star
- Toilets 4 star
- Kitchen and bathroom taps 6 star
- Dishwashers 5.5 star
- Washing machines 4.5 star

### Rainwater Tank

The project will incorporate rainwater storage. Total storage capacity of 30,000L will be targeted with a roof catchment of c. 1000sqm. The rainwater tank will provide supplementary supply to toilets and laundries in the residential apartments and to community area landscape of c.700 sqm.

### Water Sensitive Urban Design

#### Water efficient plant selection

Over 70% of all proposed landscaped areas will utilise predominantly native and/or low water demand plant species.

#### Water efficient irrigation methods

Irrigation of softscape areas will be driven by passive irrigation for deep soil areas. Any soft landscape areas in need of regular irrigation will be equipped with under surface drip irrigation to avoid evaporation losses and ensure moisture is directed to root areas.

Please refer to the Landscape Plan by Land+Form.

## 5. Water efficient design



*WELS shower label certifying 6.5 L flow rate—consistent with this proposal*

## 6. Climate change resilience

### Future proofing

#### Proposed outcome meeting compliance and meeting or exceeding industry standards

- Future detailed design of building drainage and systems to be reviewed for performance in extreme weather events (rainfall, storm, heat)
- Over 75% of horizontal surfaces to minimise urban heating effects
- Heat reflection from building to street level mitigated through façade design elements/overhangs and lower level canopy and soft landscape.

### Climate Change Resilience

An initial review of climate change impacts over the next 50 years for this location indicate greater extreme events particularly in relation to rainfall, storms and heat wave. Impacts can be direct, for example rainfall ingress to the building, or indirect, for example expected higher maximum temperatures, longer and hotter heat events, increased rainfall intensity leading to increased flooding (East Coast Cluster Report, Climate Change in Australia).

The following design measures will be implemented in the next stage of detailed design development to improve climate change resilience:

- Equipment and building drainage design assessed to ensure effective operation and protection in increased storm, hail and extreme short term rainfall events
- Landscape design and plant selection to survive an increased number of heat wave days, and dryer winter periods
- HVAC design thresholds to function properly with higher average temperatures and a higher number of heat wave days

### Heat Resilience

Over 75% of total site horizontal surfaces (excluding the area of proposed PV arrays) have been targeted for low urban heating outcomes (consistent with Green Building Council recommendations) including:

- Green softscape outcomes at ground level and Level 1 and 5 podium areas.
- Greatly improved tree canopy, and building form providing shade to hard surfaces helping to mitigate absorption of solar radiation/ urban heating effect
- Total tree canopy outcomes are indicated to be c. 527 sqm (16% of site) and total deep soil c. 483 sqm (15% of site)
- Final colours for the roof, podium hard surfaces and ground level hardscape surfaces will be specified to achieve low solar absorptance/high solar reflectivity.
  - Roof initial SRI target of minimum 81
  - Unshaded hardscapes initial SRI of target minimum 39

Highly reflective glazed facades can have a large influence on the ground level microclimate by pushing solar radiation down to this level.

- Balcony overhangs and shade structures in the proposal contribute to reduce this effect (especially compared to a more flush office building façade)
- The landscape plan incorporates street level softscape/canopy to the easterly, northerly and westerly aspects will help mitigate downward reflection of solar radiation from the façade to the street



*A comparison of the existing canopy situation, with virtually no tree canopy, compared to the proposed landscape concept (Land+Form) demonstrates the positive canopy outcome for the immediate urban area*

## 7. Responsible materials, construction and waste management

### Lower impact materials and 'circular' waste management

The project will investigate the inclusion of responsible materials and include space for splitting and recycling of waste 'resources' during project construction and ongoing operation.

### Proposed outcome meeting compliance and meeting or exceeding industry standards

- Greater than 80% of construction and demolition waste (mass) to be recycled with a target of 90%
- Environmental Product Disclosures (EPDs) preferred for key materials
- EMS preferred, and EMP required for head building contractor (ISO 14001)

### Supporting responsible materials in the building structure and envelope

The detailed design and tender phases for the project will target procurement of products that follow good practice in respect to measuring environmental impacts and reducing these impacts. Products with a certified EPD will be sought where available.

Building contractor tender responses will be required to provide material options aligned to recognised responsible materials ratings schemes such as GECA, FSC and Global GreenTag. If commercially competitive (by cost and supply risk) then these improved materials should be specified.

Key building processes to be considered in detailed design would include:

- Design allowing sub structure and super structure to investigate options for EPD certified concrete, steel and other major components
- Façade design also considered to investigate use of responsible aluminium, glazing, panel/spandrel and shade structures etc

### Responsible building finishes

The tender requirements for internal finish fitouts will also require options for key materials that have achieved certification for environmental responsibility (paints, carpet flooring etc).

Examples of certification schemes also include GECA and Global GreenTag for a wide cross section of finishing materials and the FSC for timber.

### Responsible construction

The tender requirements for building contractors will prefer that the head contractor has an environmental management system consistent with AS/NZS ISO 14001 and will develop and Environmental Management Plan for the project to be advised to all sub contractors.

### Construction and demolition waste recycling

Please refer to the proposal Waste Management Plan. It is recommended that construction waste management targets a combined recycling outcome of 90% by mass (minimum 80%) consistent with better practice for current major Sydney located projects. This would need to be accomplished through additional recycling potential for timber and plasterboard waste.

It is also proposed that approximately 1,120 sqm of brick in existing buildings is reused as part of new building fabric avoiding waste to landfill and transport related carbon emissions.

### Designing in Waste Sorting and Storage Facilities

The project will provide adequately sized waste storage areas in the basement with separation of major waste streams aligned to City of Canada Bay services.

A separate waste streaming area for e-waste should also be considered for occasional removal as required.

A Waste Management Plan will be developed for the project guiding the final sizing and location of facilities and providing a guide to future building operators.



*GECA and FSC are two examples of independently certified improved environmental impacts for materials*

## 8. Human wellbeing and indoor environmental quality

### Human wellbeing initiatives

#### Proposed outcomes meeting or exceeding industry standards

- All NCC and Australian Standards for air quality, light and acoustic comfort will be met
- Cross ventilation outcomes for c.70% of apartments exceeding the ADG target
- Internal materials and fixings will be selected based on certification of low toxicity as measured by VOC off gassing and formaldehyde content
- Multi activity communal spaces

#### Thermal comfort

Passive design has achieved a NatHERS 7 star rating meaning that the apartments will be achieve comfortable temperatures throughout the seasons with minimal need for mechanical heating and cooling

#### Air quality

Natural cross ventilation outcomes have been met at c.70% of apartments. This outcome exceeds the 60% target in the Housing SEPP ADGs and adds to the overall air quality of the majority of apartments. Inclusion of electric cooktops will also help to remove indoor air pollution from typical gas cooktops.

#### Acoustic Comfort

An acoustic study will be carried out to establish requirements for satisfactory acoustic outcomes for building occupants according to the activity they are undertaking.

For residential apartments the strategy and design and inclusions will ensure that:

- Maximum acceptable internal noise levels are achieved in bedroom and living room areas through protection from external and internal (mechanical services) noise sources
- Acoustic separation insulation levels between apartments will be targeted to meet or exceed NCC minimum requirements

#### Lighting Comfort

To further enhance the health and wellbeing of residents the project has considered daylighting outcomes through design and will consider future lighting fixture selection that exceeds basic compliance.

- Daylighting outcomes are enhanced by the ADG guidelines for window sizing and room depths.
- LED lighting colour outputs should be accurate, and reflect natural colour outcomes, as measured by a CRI greater than 85 (luminaires should quantify the CRI level)
- LED temperature should target lower levels (2700k-3000k) in bedrooms with brighter (4500K-6500K) in living and kitchen areas with dimming function

#### Low exposure to toxins

Procurement of paints, adhesives, sealants, carpets and other large surface area materials for internal finishes will target products with a recognised certification of Total Volatile Organic Compounds. Low TVOC emission products will be preferred using wither GBCA Green Star limits or APAS limits (for paint).

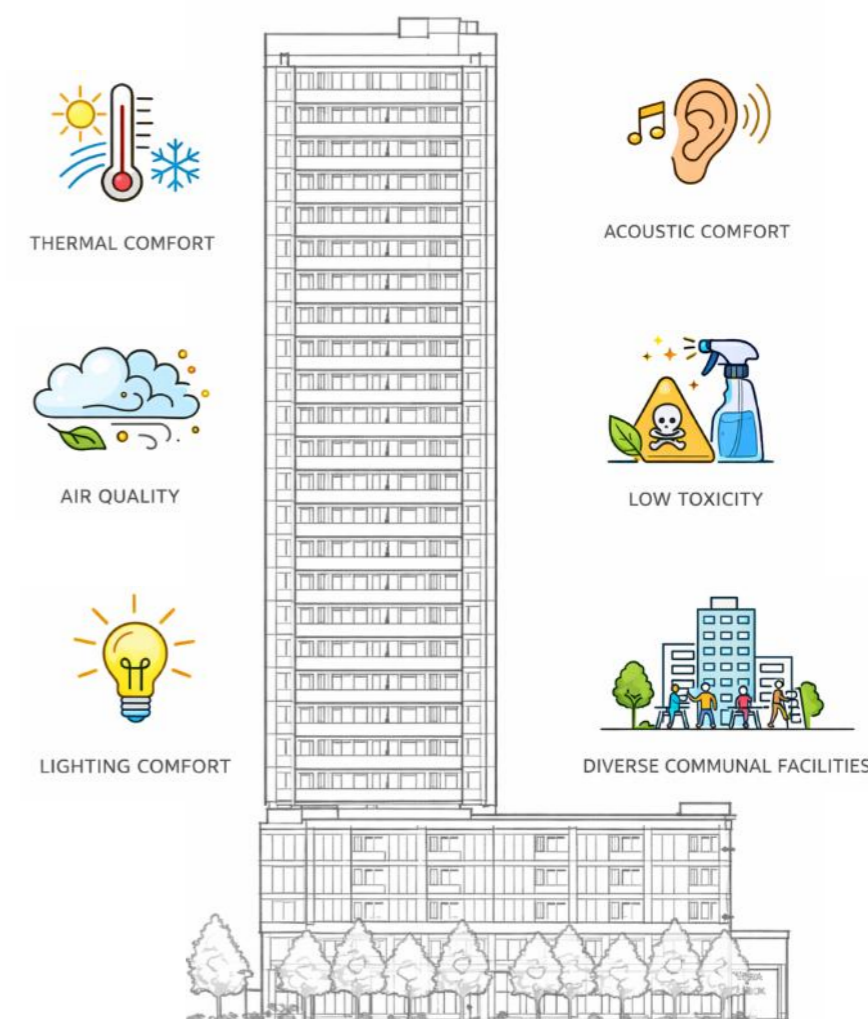
Any engineered wood products selected for the building will also have to be confirmed as having low or no formaldehyde content generally recognised as below 1mg/L.

#### Communal Facilities and Spaces

The design provides communal outdoor spaces of c.532 sqm on Level 1 and c.543 sqm on Level 5. An additional communal recreation area of c.100 sqm is provided on Level 5.


These spaces will support multiple indoor and outdoor 'wellness' experiences for wide interests.

We also note that the proposal is directly adjacent to the Kings Bay parkland and recreation areas including the Five Dock Leisure Centre.



*The occupants of the building will benefit from a focus on inclusions to support comfortable, healthy and active living*

## 9. Appendix A—Consultant Declaration

PROJECT DETAILS	
PROJECT NAME	
Application number	SSD-78287462
Address of subject land	79-81 Queens Road and 2-8 Spencer Street, Five Dock
APPLICANT DETAILS	
Applicant name	DPG Project 37 Pty Ltd
Applicant address	Level 10/97-99 Bathurst St, Sydney NSW 2000
REPORT DETAILS	
Name of report this declaration relates	Ecologically Sustainable Development (ESD) Report for SSD- 78287462
Report reference no.	2602160
Report date	2 March 2026
Company name (inc. ABN / ACN)	Efficient Living Pty Ltd
Author name	Troy Daly
Author qualifications	Green Star Accredited Professional, Master of Urban and Regional Planning, Bachelor of Economics
Author address	Shop 6, 1/5 Collaroy St, Collaroy NSW 2097
DECLARATION BY CONSULTANT	
Name	Troy Daly
Registration no.	GBCA Contact ID 113992 as GSAP
Organization registered with	Green Building Council of Australia
Declaration	<p>The undersigned declares that the Ecologically Sustainable Development Report for SSD- 78287462 :</p> <ul style="list-style-type: none"> <li>• has been prepared in accordance with the following policy, guidelines, or legislative requirements; <ul style="list-style-type: none"> <li>• To address SEARS issued for SSD 78287462 and relevant in force NSW State planning legislation including the Sustainable Buildings SEPP;</li> </ul> </li> <li>• contains all available information relevant to the environmental assessment of the development, activity or infrastructure to which the ESD Report relates;</li> <li>• does not contain information that is false or misleading subject to the limitation of final project information noted on page 1 of the report and any assumption notes throughout the report;</li> <li>• identifies and addresses the relevant Planning Secretary's environmental assessment requirements (SEARs) for the project;</li> <li>• identifies and addresses the relevant statutory requirements for the project, including any relevant matters for consideration in environmental planning instruments to which the ESD Report relates;</li> <li>• contains a consolidated summary of the proposed or necessary mitigation measures</li> <li>• should be read in conjunction with the Efficient Living Pty Ltd provided NatHERS and BASIX certification for the project.</li> </ul>
Signature	
Date	2/3/2026



## Key abbreviations/glossary

**ESD:** Ecologically Sustainable Development or often Environmentally Sustainable Development

**COP:** 'Co-efficient of performance' used to measure conversion of electrical energy into heating or cooling energy

**GFA:** Gross floor area

**ACOP:** 'Annualized co-efficient of performance' also used to measure conversion of electrical energy into heating or cooling energy but typically adjusted for local climate conditions

**NatHERS:** National Home Energy Rating Scheme—note only refers to thermal performance of the home

**BASIX:** Building Sustainability Index measuring thermal, total energy and water efficiency in the home—part of the Sustainable Buildings SEPP 2022

**EV:** Electric vehicle

**PV/solar array:** Solar panels using photo voltaic technology to convert solar radiation into electricity

**IEQ:** Indoor environmental quality usually referring to air, noise and light quality in the building

**DA/SSDA:** Development Application/ State Significant Development Application'

**SEPP:** State Environmental Planning Policy

**LEP:** Local Environmental Planning Policy

**DGP:** Development Control Plan

**CC:** Construction certificate

**SEAR:** Secretary's Environmental Assessment Requirement issued to support a SSDA

**ADG:** NSW Apartment Design Guide setting apartment design standards in the NSW Housing SEPP

**VOC:** 'Volatile organic compound' that is a chemical gas release from typically internal building surfaces and materials

**HVAC:** Heating, ventilation and air conditioning—also includes cooling processes

**Section J:** The energy efficiency section requirements of the National Construction Code

**GBCA:** Green Building Council of Australia—the owner of Green Star ratings for buildings and communities

**NABERS:** National Australian Built Environment Rating Scheme—providing ratings from actual water and energy consumption in buildings

**WELS:** Water efficiency labelling and standards scheme

**GEMS:** Greenhouse and Energy Minimum Standards

**MEPS:** Minimum Energy Performance Standards (under GEMS)

**EPD:** Environmental Product Disclosure providing transparent information on environmental impacts

**Emission scopes** – A mechanism for classifying different sources of carbon/GHG emissions used in carbon accounting. There are three 'scopes'

**Scope 1** covers direct emissions from on-site fuel combustion (e.g. diesel, natural gas and LPG).

**Scope 2** covers indirect emissions from the consumption of purchased electricity, steam, heating and cooling.

**Scope 3** covers indirect emissions from activities not owned or controlled by the reporting organisation, including production of fuels, electricity transmission losses, embodied carbon in construction and maintenance (including materials and products) tenant energy consumption, waste treatment, water treatment and travel to/from the building.

(adopted from Net Zero Technical Note—DPE 2023)



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