



# Sustainability Report

## State Significant Development Application

270 Pacific Highway, Crows Nest, NSW, 2065.

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**E-LAB Consulting**

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# Document QA and Revisions

## DESIGN FINALISATION

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Sustainability



# Table of Contents

<b>EXECUTIVE SUMMARY</b>	<b>5</b>
<b>1 INTRODUCTION</b>	<b>7</b>
<b>2 PROJECT INFORMATION</b>	<b>8</b>
2.1 PROJECT SITE	8
2.2 GOVERNING ESD FRAMEWORKS & POLICY	8
<b>3 SUSTAINABLE DESIGN INITIATIVES</b>	<b>13</b>
3.1 ENERGY & GREENHOUSE GAS EMISSIONS	13
3.2 WATER CONSUMPTION	15
3.3 PASSIVE DESIGN AND INNOVATIVE SERVICES	16
3.4 MATERIALS	17
3.5 MANAGEMENT AND SOCIETY	18
3.6 ACTIVE TRANSPORT	19
3.7 RENEWABLE ENERGY	19
3.8 CLIMATE RESILIENCE & URBAN HEAT ISLAND	19
3.9 BIOPHILIC DESIGN	20
<b>4 WELL FOR RESIDENTIAL</b>	<b>21</b>
4.1 APARTMENT DESIGN AND LAYOUT	22
4.2 WIDER BUILDING AMENITY PROVISIONS	24
4.3 POLICY, OPERATIONAL AND WIDER SOCIAL VALUE	26
4.4 NEIGHBOURHOOD ATTRIBUTES	27
<b>5 BASIX COMMITMENTS (RESIDENTIAL)</b>	<b>30</b>
5.1 BASIX ENERGY TARGET	30
5.2 BASIX WATER TARGET	32
5.3 MATERIALS INDEX	32
<b>6 NCC SECTION J (2022) PART J4, BUILDING FABRIC - (NON-RESIDENTIAL)</b>	<b>33</b>
<b>7 NABERS ENERGY AND WATER</b>	<b>35</b>
7.1 NABERS EMBODIED EMISSIONS REPORTING	35
<b>8 SUMMARY</b>	<b>37</b>





## EXECUTIVE SUMMARY

This Sustainability Report has been prepared by E-Lab Consulting to support the State Significant Development Application (SSDA-79658964) for the mixed-use development located at 270 Pacific Highway, Crows Nest. The purpose of this report is to outline the environmentally sustainable design (ESD) initiatives and commitments associated with the proposed development.

The project vision centers on enhancing sustainable outcomes across key areas such as energy, water, waste, and materiality. Furthermore, it incorporates a focus on health, wellbeing, placemaking, community engagement, and social sustainability, providing broader benefits to the surrounding area.

This report has been compiled to inform the North Sydney Council of the development's commitment to sustainability, presenting tangible and measurable sustainability goals that will contribute positively to the local community. The aim is to deliver a responsible development aligned with the district's needs, both now and into the future. In line with this commitment, the following sustainability targets are proposed, adhering to governing sustainability frameworks and policies:

- **Exceed minimum compliance with new legislated BASIX benchmarks** in accordance with the Sustainable Buildings SEPP 2022 requirements for mid/high-rise residential buildings.
  - **BASIX Energy Benchmark** – Targeting a 66% reduction (exceeding the 60% requirement)
  - **BASIX Water Benchmark** – Targeting a 50% reduction (exceeding the 40% requirement)
  - **Thermal Comfort Benchmark**
    - Achieving an average of 7.8 NatHERS Stars for the entire development, surpassing the 7-star requirement.
    - Ensuring a minimum of 6 NatHERS Stars for individual apartments.
- **5.5 Star NABERS Energy Rating and 3 Star NABERS Water Rating** for large commercial spaces (office/medical center areas >1000m<sup>2</sup>) to demonstrate high performance in the Class 5 areas.
- **Net Zero Operational Carbon by 2035** in line with the NSW Sustainable Buildings SEPP.
- **Fossil-fuel free design** to achieve carbon neutrality by 2035.
- **WELL for Residential Program commitment** as an innovative initiative for improving health and wellbeing.
- Embedding a range of sustainability initiatives across the development, including:
  - Maximizing on-site renewable energy generation through solar photovoltaics (PV) up to 99kW.
  - Designing a **fossil-fuel free development** to allow for carbon neutrality by 2035.
  - Incorporating high-efficiency, appropriately sized centralised building service systems, such as domestic hot water and mechanical HVAC systems.
  - Employing passive design principles such as shading, high-performance thermal envelopes, and strategies to balance daylight access and solar heat loads.
  - Using materials with low environmental impact to minimize resource overconsumption and waste.
  - Ensuring high-quality indoor environments for occupants, with a focus on natural light access and optimized acoustic comfort by utilising the innovative ventilation design on project.
  - Implementing mitigation strategies to address climate change impacts, including the Urban Heat Island Effect.
  - Incorporating site-wide greening initiatives, with diverse native and resilient planting.
  - Developing and implementing a **Green Travel Plan** to encourage low-emission transport alternatives and optimize the use of nearby public transport networks.



Following the implementation of the above mitigation measures, the remaining impacts are considered acceptable, contributing to the development's overall sustainability goals.



# 1 INTRODUCTION

The application seeks development consent for the development of a 16-storey mixed-use development at 270 Pacific Highway Crows Nest, comprising 168 build to rent units and non-residential uses in the podium. Specifically, the SSDA seeks development consent for:

- Demolition of two existing 5 storey commercial buildings
- Construction of a maximum 16 storey building, including:
  - 2 basement parking levels (with 81 carparks, 8 motorbike spaces and 230 bicycle Spaces)
  - 3 podium levels comprising non-residential uses such as medical centre, retail, and residential uses (build to rent units and residential amenity facilities such as A gym and sauna, steam room, outdoor pool, class space, cinema room, co-working Space)
  - 13 storeys of residential uses in the tower, comprising build-to-rent units
  - Communal open space
  - Landscaping on ground, level 2 – level 15
  - Rooftop solar panels
  - Internal and external residential amenities space on roof top
- Streetscape upgrades
- Office and substation along the northwestern boundary

This report has been prepared in response to the requirements contained within the Secretary’s Environmental Assessment Requirements (SEARs) dated 31 January 2025 and issued for the SSDA (SSD-79658964). Specifically, this report has been prepared to respond to the SEARs requirement issued below.

*Table 1 SEARs Requirements*

REQUIREMENT	RESPONSE
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.	Refer to Section 22.1 for the project’s response to the principles of the EPA regulation.
Demonstrate how the development will meet or exceed the relevant industry recognised building sustainability and environmental performance standards.	Refer to the Section 4 of this report and BASIX report by E-Lab Consulting for details of the developments BASIX performance targets.
Demonstrate how the development minimises greenhouse gas emissions (reflecting the Government’s goal of net zero emissions by 2050) and consumption of energy, water (including water sensitive urban design) and material resources.	Refer to Section 3.1, 3.2, 3.3 and 3.4 for details on energy, water and materials.



## 2 PROJECT INFORMATION

### 2.1 PROJECT SITE

The site is located on the western side of Pacific Highway, approximately 70m to the south of the Five-Ways Intersection and 320m north of the Mater Hospital. The site has a frontage of 75m to Pacific Highway and contains 2 x 5 storey mixed use buildings consisting of a restaurant, office and medical uses above a single level basement.

The site is zoned MU1 mixed-use under the North Sydney Local Environmental Plan 2013.



Figure 1 Aerial Photograph. Source: Fitzpatricks + Partners

### 2.2 GOVERNING ESD FRAMEWORKS & POLICY

The development's guiding principles and overall performance has been designed in line with the following general requirements and documents:

- NSW Environmental Planning and Assessment (EPA) Regulation 2021
- ABCB National Construction Code (NCC) 2022 Volume 1, Section J
- State Environmental Planning Policy (SEPP), Sustainable Buildings, 2022
- NSW Department of Planning, Industry and Environment (DPIE), Net Zero Plan 2020-2030.
- SEARS Conditions for the Development
- WELL for Residential



## 2.2.1 NSW EPA Regulation 2021

The principles of Ecologically Sustainable Development to which the development should generally adhere to are defined within Part 8, Division 5, clause 193 of the NSW EPA Regulation 2021 as.

(2) **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.

(3) In applying the **precautionary principle**, public and private decisions should be guided by—

(a) *careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and*

(b) *an assessment of the risk-weighted consequences of various options.*

- **Development Response:** The project will employ relevant environmental protection measures and risk assessments to ensure no irreversible environmental harm is acted because of the construction or operation of the development. Refer to section 3 for further detail.
- (4) **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:** The project will ensure no irreversible environmental harm is acted because of the construction or operation of the development. The design team will address key elements such as energy, potable water and material use to do all which is within the project's control to ensure future generations have equal opportunity and access to the environment. Refer to section 3 for further detail.

- (5) **Conservation of Biological Diversity and Ecological Integrity** is that the conservation of biological diversity and ecological integrity should be a fundamental consideration.

**Project Response:** The pre-developed site can be considered to have low-ecological value and biodiversity significance. In response to this, the project is committed to planting a high proportion of native vegetation to improve site ecology and managing stormwater runoff from the site to minimise onset impacts. The development intends to improve on the existing biological diversity and ecological integrity of the site.

- (6) **Improved Valuation, Pricing and Incentive Mechanisms** is that environmental factors should be included in the valuation of assets and services, such as—
  - (a) polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,
  - (b) 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,
  - (c) 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:** The project is committed to achieving a construction waste diversion target of 90%+, as well as developed specific project waste management strategies. The project shall



ensure the full life cycle impacts of goods and services employed throughout the project have been considered. Further, it will be designed to minimise operational energy and water consumption, which provides benefit for residents through lower utility bills.

## 2.2.2 National Construction Code (NCC), 2022, Volume One, Section J (Energy Efficiency)

The development will ensure the energy use of proposed buildings adheres to the relevant minimum performance requirements as set out within Section J of the NCC, 2022. The development will manage energy use whilst maintaining a high degree of human comfort using high-performance thermal fabric elements and efficient building service equipment. Refer to Section 3.1 for further details.

Provision for Electric Vehicle (EV) charging infrastructure shall be in accordance with S9D4 of the NCC. Ceiling fans for sole-occupancy units within class 2 residential spaces will require ceiling fans as per J3D4 of the NCC, and as necessary to meet the required BASIX and NatHERS targets.

## 2.2.3 State Environmental Planning Policy (SEPP), Sustainable Buildings, 2022

**Residential Development** components of the project must adhere to Schedule 1 and Schedule 2 of the SEPP through demonstrating compliance with energy, thermal comfort, water and embodied emissions (materials index) reporting using the current NSW BASIX tool. The BASIX requirements outlined will be covered in a BASIX report at detailed State Significant Development Application stage.

**Non-Residential Development** components of the project must demonstrate design considerations which enable or integrate the following.

- (a) Minimisation of waste from associated demolition and construction, including by the choice and reuse of building materials,
  - (b) Reduction in peak demand for electricity, including using energy efficient technology,
  - (c) Reduction in the reliance on artificial lighting and mechanical heating and cooling through passive design,
  - (d) Generation and storage of renewable energy,
  - (e) Metering and monitoring of energy consumption,
  - (f) Minimisation of the consumption of potable water.
- (2) Quantification of the embodied emissions attributable to the development using the NABERS tool disclosed at development application and construction certificate stages.

In addition to the above, Large Commercial Office Development (> 1000m<sup>2</sup>) components of the project must demonstrate design considerations which enable or integrate the following;

- (1) Minimises the use of on-site fossil fuels, as part of the goal of achieving net zero emissions in New South Wales by 2050.
- (2) Capable of achieving the standards for energy and water use specified in [Schedule 3](#).
- (3) Capable of achieving a standard specified in [Schedule 3](#) if there is a NABERS commitment agreement in place to achieve the standard.
  - Schedule 3;



- 1) Energy use
- (1) The standard for energy use for development for the purposes of prescribed office premises is a 5.5-star NABERS energy rating.
- 2) Water use
  - The standard for water use for large commercial development is a 3-star NABERS water rating.

#### **2.2.4 NSW Department of Planning, Industry and Environment (DPIE), Net Zero Plan 2020-2030.**

The development will be constructed and operated to contribute towards the net zero priorities as outlined within the DPIE, Net Zero Plan 2020-2030. This will be achieved through the prioritization of energy efficiency and on-site renewable energy generation capacity. The development is actively aiming to adhere to the Government's goal of net zero emissions by 2050 through a range of strategies discussed in following sections of this report.

The approach to minimising greenhouse gas emissions should always follow a reduction first – outcomes-based approach to decarbonisation which in turn will provide an approach to net zero emissions. This approach generally involves:

- Avoid: Identify carbon intensive activities and sources that can be avoided or eliminated from the development.
- Reduce: Reduce the carbon intensity of activities and sources through improved technology or process.
- Transition: Transition to renewable electricity.
- In support of this, and as required by the Sustainable Buildings SEPP, a net zero transition plan will be prepared and agreed upon for the development, outlining the necessary steps to remove fossil-fuel reliance and consumption across the project.

#### **2.2.5 WELL for Residential**

The development also aims to meet and exceed industry best practice health and well-being standards within its design, construction, and ongoing operation. As part of its commitment to delivering healthier living environments, the development is recommended to target certification under the WELL for Residential framework.

The WELL for Residential certification is the first and only holistic, third-party verified certification program to exclusively address health, well-being and amenity in all residence types, regardless of operational model (i.e. build-to-sell, build-to-rent, purpose-built student accommodation, independent living units, etc).

This approach has been taken by the project as an innovative approach by the development to provide additional amenity benefits to residents through design, policy and operational measures and verified through

The standard comprises of over 100+ strategies which are evidence-based and undergo a rigorous governance selection process prior to inclusion into the program.

Every strategy implements results in points earned, and once a minimum number of points are earned following a rigorous 3<sup>rd</sup> party certification process, residential units earn the designation of a WELL Residence.

The WELL for Residential program is a voluntary certification program. Incorporating the requirements within the WELL for Residential certification will provide a significant amount of amenity in addition to the statutory



requirements provisioned for as part of DA requirements and enhances some amenity provisions outlined within the Apartment Design Guide (ADG).

This will be achieved by addressing the ten core concepts of the WELL Standard—Air, Water, Nourishment, Light, Movement, Thermal Comfort, Sound, Materials, Mind, and Community—ensuring the integration of design strategies and performance outcomes that support resident health, comfort, and quality of life. The initiatives and approaches incorporated into this development are extrapolated in Section 4.



## A new standard of living

Informed by the WELL Standard, the certification program includes 100+ strategies for improving resident well-being and fostering a healthier home environment.

Figure 2 Infographic on the WELL for Residential Standard



### 3 SUSTAINABLE DESIGN INITIATIVES

The only path to a low carbon economy and achieving a “2°C world” where the average global temperature is kept to less than 2°C above pre-industrial levels is through comprehensive and complete consideration of how the development consumes resources. The strategy focusses on energy, water, and materiality to ensure resource use is appropriate.

#### 3.1 ENERGY & GREENHOUSE GAS EMISSIONS

The energy efficiency strategy follows the energy efficiency hierarchy strategy outlined in Figure 2 below. The development will prioritize reducing the demand for energy consumption through passive design strategies and optimizing system sizes. This includes enhancing the building's high-performance envelope, improving insulation values, and ensuring the thermal comfort of the space, which can be achieved with minimal impact on cost or space.

Next, energy efficiency will be improved by integrating high-efficiency systems in high-demand areas such as lighting, heating, cooling, hot water, ventilation, and other building services.

Once the demand for energy-consuming elements has been minimized and efficiency measures are in place, renewable energy sources (both on-site and off-site) will be explored to supply the required energy for the development. Given the spatial limitations on the roof, solar photovoltaics will be sized to maximize the on-site renewable energy generation potential.

Finally, after implementing all the above steps, carbon offsets will be considered to close the gap and achieve net zero energy performance.

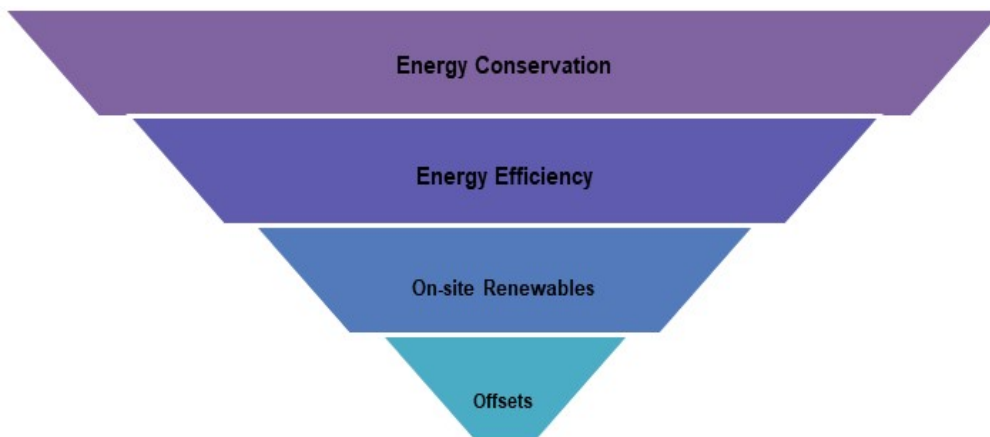


Figure 3 Energy Hierarchy

To achieve the above, the following initiatives are being sought to be implemented:



**Passive Design** – The balance between daylight access, views and solar heat gains will be a priority of the design team to ensure occupant comfort and energy performance is maximized. The architectural approach will incorporate careful consideration of building massing, form, orientation, and shading, alongside the integration of high-performance building fabric elements, to meet or exceed the required energy performance standards. Furthermore, attention will be given to the precise sealing of the building envelope through rigorous construction methodologies and quality control procedures, ensuring the minimization of undesirable bulk air infiltration and maximizing thermal efficiency.



**Innovative Services for Air Ventilation and Acoustic Performance** – Advanced mechanical systems will be integrated to optimize both air quality and acoustic comfort. Energy-efficient ventilation systems, such as Heat Recovery Ventilation (HRV) and Demand-Controlled Ventilation (DCV), will be employed to regulate airflow based on occupancy and air quality needs, ensuring fresh air is supplied while minimizing energy consumption.



**Efficient Lighting Systems** – High efficiency LED lighting throughout, including common areas with efficiency controls to meet the requirements of BASIX and NABERS targets. Controls may include motion sensors, timers and zoned switching which will help reduce unnecessary consumption of energy. Lighting power density should be designed to at least 10% below Section J.



**Controls, Energy Metering and Monitoring** – Energy meters and monitoring systems will be provided to comply with NCC 2022 Section J Part J8 and NABERS sub-metering and validation requirements. The automated control of applicable centralised systems will reduce unnecessary energy consumption and allow energy demands to be better managed across the development.



**Hot Water** – Hot water will be provided by energy efficient heat pump systems. These systems are highly efficient which will allow occupants to reduce their energy consumption. Showers and taps with a high WELS rating should be used to reduce water demand from hot water fixtures across the development.



**Appliances & Equipment** – Residential appliances and centralised equipment will be selected with a high energy efficiency/performance to ensure reduced consumption to achieve the BASIX and NABERS energy targets.



**Renewable Energy** – Exposed roof area across site provides an excellent opportunity for the installation of a solar photovoltaic system(s). An appropriately sized system to maximum of 99kW will allow the development to generate renewable electricity to offset demand and minimise stress on the grid. PV will be installed at a rate that maximises the coverage of the non-trafficable roof area. The detail of the system size will be confirmed during subsequent stages of design and coordinated with the services strategy.

**Battery Storage:** To enhance energy independence and reduce reliance on the grid, energy storage solutions will be an integrated option to provide in this development, allowing excess solar energy to be stored for use during peak demand periods.





**Low emission Transportation** – To encourage low-emission transport alternatives bicycle storage and ancillary EOT facilities shall be developed. Pedestrian access to nearby public transport networks such as the recently completed Crows Nest Sydney Metro station will be maximised.



**Net Zero Transition Plan** – A net zero plan has been developed outlining the scope of emissions and the necessary actions and timeline to transition away from fossil fuel dependence.

## 3.2 WATER CONSUMPTION

To achieve responsible water consumption and water sensitive urban design, best practice water-saving initiatives will need to be implemented throughout the project. The following initiatives will be explored to achieve the potable water targets:

**Sanitary Fixtures** – By implementing low-flow water fixtures, the consumption will be significantly reduced. All sanitary fixtures are to be provided with the minimum WELS ratings identified below:

- Taps – 6 Star WELS
- Toilets – 4 Star WELS
- Showers – 4 Star WELS (> 6.0 but <= 7.5 L/min)
- Dishwashers – 5 Star WELS



**Landscape Irrigation** – Efficient irrigation systems will be implemented, including sub-surface drip systems, moisture sensors, and the prioritization of native plants. Native plants have evolved to thrive in the Australian environment and are typically more resilient than their exotic counterparts, they typically require less water and are more likely to survive the predicted increase in extreme drought conditions due to climate change. Native vegetation also stores a significant amount of carbon, further helping to mitigate the effects of climate change.



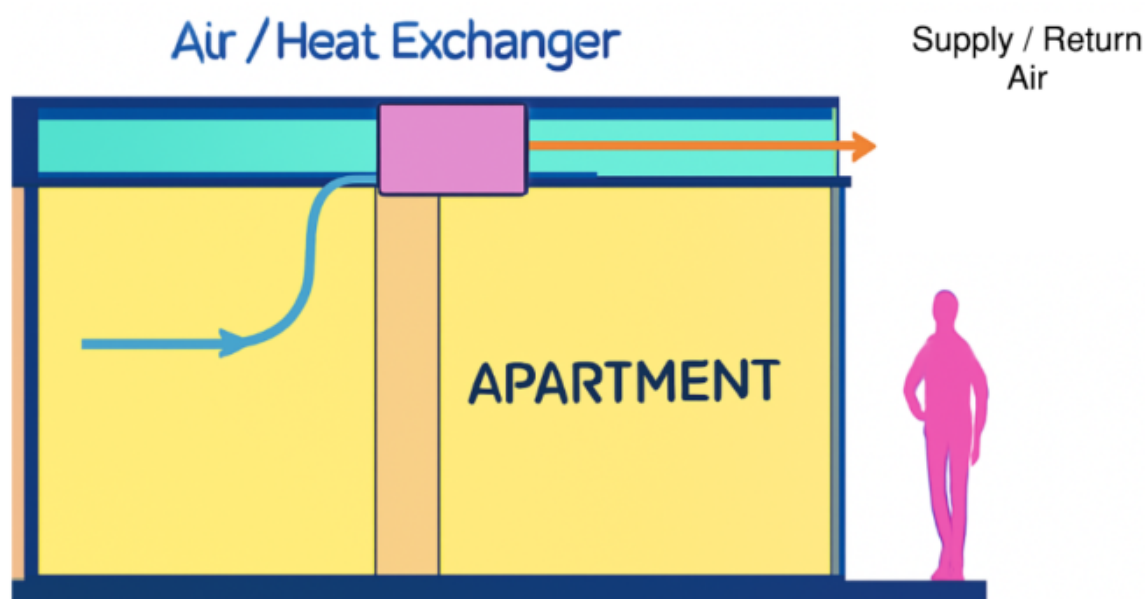
**Rainwater** – the development will supply minimum 10 kL on-site rainwater tank for irrigation demand (and potentially if necessary toilet flushing, car washing and mechanical cooling systems - TBC) (sizing to be refined during detailed design stages). Rainwater will be captured from the roof areas of the building to reduce reliance on main supply water for reasonable non-potable applications.



### 3.3 PASSIVE DESIGN AND INNOVATIVE SERVICES

To create an optimal environment for comfort, well-being, and energy efficiency, the project integrates innovative passive design strategies alongside cutting-edge mechanical services. The following initiatives will be implemented:

**Advanced Indoor Air Quality** – Advanced ventilation systems will be incorporated to ensure clean, pollutant-free air throughout the development. For units located next to highways, Heat Recovery Ventilation (HRV) technologies will be employed as an innovative alternative to traditional fresh air systems. These HRVs not only aid ventilation but also act as a barrier against external noise and pollution, providing a clean air supply to residents. Equipped with advanced filtration systems, the HRVs enhance indoor air quality by delivering fresh air while keeping windows shut, effectively preventing pollution from entering. Additionally, the use of materials that promote optimal air circulation will further enhance the internal environment, ensuring a comfortable and healthy living space for residents while maintaining access to fresh air in a pollution-free manner.



**Visual Comfort** – Maximizing natural daylight penetration into living spaces while offering expansive views of the sky, ocean, and surrounding nature, where possible. The integration of strategically placed windows, shading devices, and architectural elements enhances the visual quality of the environment.

**Acoustic Excellence** – The building layout and material selection are carefully crafted to mitigate noise from external sources. Innovative acoustic treatments, including high-performance insulation and soundproofing solutions, along with optimal building shapes and window placements, contribute to superior acoustic comfort.

**Thermal Comfort** – A combination of passive design strategies such as overhangs, thermal mass, and high-performance insulation in roofs and facades will be used to achieve optimal indoor temperatures. This is complemented by adaptive comfort techniques, ensuring that spaces remain comfortable throughout the year while minimizing energy consumption.

**Lighting Comfort** – High Colour Rendering Index (CRI > 80) LED lighting will be used throughout the development, ensuring that spaces are illuminated with high-quality, energy-efficient light. Low-glare solutions with integrated baffles or louvres will be incorporated to minimize discomfort from excessive brightness and improve lighting uniformity.



**Biophilic Design** – Natural greenery and planting throughout the development will not only provide aesthetic value but also create a deeper connection to nature for both residents and visitors. These elements will help reduce the Urban Heat Island effect and support environmental sustainability. The biophilic design will be particularly prominent in communal areas.

**Accessibility** – The building design will prioritize accessibility for people of all abilities, incorporating features like ramps, wide doorways, and elevators to ensure easy navigation throughout the space.

**Safety and Security** – Advanced safety systems and strategic security measures will be implemented to create a secure environment. Smart systems, including surveillance and access control, will enhance protection while ensuring a sense of safety for residents.

**Natural Materials** – The use of natural, non-toxic, and sustainable building materials will promote a healthy indoor environment, enhancing both aesthetics and air quality. Materials will be carefully selected for their ecological credentials and contribution to overall building health.

**User-Friendly Technology** – The integration of smart building technologies will enhance occupant comfort and convenience. Features such as smart lighting, temperature control, and automation systems will ensure that residents can effortlessly manage their environment for optimal comfort and energy efficiency.

By combining these passive design principles with state-of-the-art mechanical services, the project ensures that the development is not only aesthetically pleasing but also highly functional, energy-efficient, and sustainable—meeting the needs of both the residents and the environment.

### 3.4 MATERIALS

In line with the principals of sustainability outlined in the EPA, the project will have a significant focus on the life cycle impacts of material use and responsible procurement. At a high level and subject to further design stages, the use of materials for the development should consider at minimum:

**Waste Management** – 90% of construction and demolition waste is to be diverted from landfill. This diverts and ensures reuse or recycling of a high portion of site waste.

Development of an Operational Waste Management Plan so waste can be appropriately sorted, separated, and recycled. This will assist ongoing diversion from landfill for the development. Inclusion of sufficient bins and appropriate separation systems to ensure waste is minimised and effective recycling is enabled.



**Circularity** – Circularity refers to ‘closing the loop’ of systems and challenging linear approaches to recognise the impacts and opportunities present to increase usability and minimise losses and waste. Considering the full life cycle of materials and products procured for construction should be an underlying principle for how materials are sourced, used, managed and ultimately retired at end of life. A robust decommissioning strategy should be considered for the development, highlighting opportunities for localised reuse and recycling.



**Sustainable Products & Materials** – As feasible, products and materials selected for the project should hold third-party verified environmental declarations (or equivalent certification) to allow for life cycle reporting and quantification of embodied impacts. Products with high recycled content, opportunities for re-use and low embodied emissions will support the sustainable delivery of the development.



Materials such as steel and concrete which inherently have higher embodied carbon and environmental impact should be the main priority for the development to considerably reduce total impact. Substitutions such as fly-ash and blast-furnace slag should be considered to reduce the embodied carbon of concrete.

**Low VOC and Low Formaldehyde Materials** – Ensuring paints, adhesives, sealants, floor coverings, carpets and engineered wood are selected appropriately to provide a healthier indoor environment.



**FSC/PeFC Timber** – All timber, including virgin and engineered timber used through construction and as part of finished elements shall endeavour to be sourced from certified sustainable forestry. This ensures the timber provided to site is of the highest standard and sourced from renewable suppliers.



### 3.5 MANAGEMENT AND SOCIETY

To provide a socially responsible outcome that provides the maximum benefit to both the users and the local area, the following response has been completed:

- **Head Contractor to follow strict sustainability protocols** – As a minimum contract requirement, the head contractor will be required to meet ISO14001 and have a project-specific EMP and EMS in place. This will be maintained throughout the job to ensure the lowest impact to the Environment is achieved and highest quality for the community and workers.
- **High Quality Stormwater Runoff** – The design will be such to ensure the peak stormwater runoff is equivalent to or below the pre-development peak. This water will be treated to ensure low levels of Nitrogen, Phosphorus, Gross Pollutants and Total Dissolved Solids enter the wastewater system
- **Zero ODP Refrigerants** – Ensuring emissions around the building are reduced and the environment is responsibly cared for.
- **Low Levels of Light Pollution** – All external lights are pointed downwards, or designed to strike a hard surface (i.e., awning or wall). This limits light spill into the night sky, assisting with bird migratory patterns and wasted energy

The above combine to ensure the proposal is responsible, efficient, beautiful and in the best interest of not just the owners, but the residents and the community.



### 3.6 ACTIVE TRANSPORT

The adoption of sustainable transport methods is encouraged by building designs which provide appropriate facilities for occupants and visitors. Site proximity to major transport infrastructure also lends itself to building occupants adopting and utilising sustainable methods of transport. The development provides easy access to the bus network with bus stops located close by to have access to the city easily.

**Bicycle Parking** - Secure bicycle spaces to be provided inside the development for use by residents.

**Electric Vehicle Infrastructure** - Project is supportive of the transition to electrification in transport. The carpark can accommodate EV charging infrastructure powered by renewable energy from photovoltaic installation on the building's roof and additional electrical infrastructure to aim for the provision of EV charging points for future uptake wherever possible.

### 3.7 RENEWABLE ENERGY

The project has been designed with a strong commitment to maximizing the potential of the Photovoltaic (PV) system, ensuring the generation of emissions-free electricity on-site. By incorporating renewable energy, the development effectively reduces both energy consumption and environmental impacts. The proposed system size for the entire development is a 99 kW PV system, which has been strategically allocated across the roof, with a balanced distribution between the residential and non-residential portions. This approach aligns with the project's sustainability goals and significantly contributes to the reduction of emissions.

### 3.8 CLIMATE RESILIENCE & URBAN HEAT ISLAND

Resiliency planning with respect to science-based climate projections is a crucial tool in decision making for the proposed development to ensure the investment in social and community infrastructure is secure and assets can benefit the community for years to come. The proposed development should therefore undertake a risk assessment of the potential impacts of climate change (such as flooding, extended periods of high temperature, rising utility infrastructure costs etc.) and include adaptive design responses which specifically address identified risks deemed to be of high or extreme significance. Doing so will improve the development's ability to respond to the threats of climate change and improve operational resiliency.

General provisions such as greening of site through landscaping, high solar reflectance hardscaping, surrounding reflectivity studies, passive shading and solar photovoltaic systems shall all be prioritized and implemented across the development to reduce the urban heat island effect and localised increases in air temperature. Currently, the site is identified as experiencing a high level of urban heat island impact compared to its surroundings. The figure below shows that the site experiences temperatures more than **7.26°C** above the local baseline surface air temperatures due to the urban heat island effect. It is therefore critical that mitigation strategies such as greening and high solar reflectance external finishes be incorporated across the development to minimise the worsening of



urban

heating.

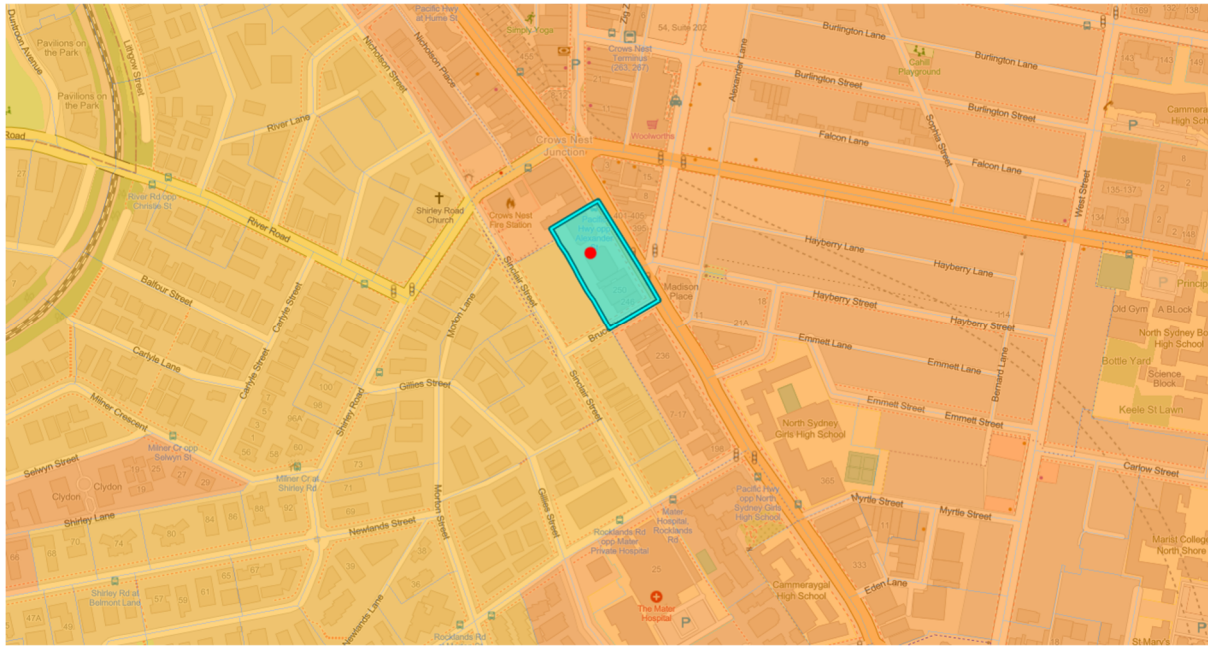


Figure 4 Urban Heat Island Effect (Source: SEED Database)

### 3.9 BIOPHILIC DESIGN

Until relatively recently in human history, people had constant interaction with living things and their natural surroundings. Biophilia, or the idea that humans have an affinity towards the natural world, is an emerging field that aims to address our psychological need to be around life and life-like processes. Exposure to views and images of nature can help to speed up healing and recovery time, boost positive feelings and reduce negative ones. Interior environments that are cold, sterile and devoid of life, on the other hand, can diminish our experience, mood and happiness.



## 4 WELL FOR RESIDENTIAL

This section elaborates further the health & wellbeing initiatives pursued under the WELL for Residential certification program. The intent is that the list of interventions and the benefits presented are not definitive but give a broad representation of the health & wellbeing benefits outcomes to the residents and wider stakeholder base.



Figure 5 Some benefits of a certified WELL Residence

The interventions are grouped into four broad impact categories as follows:

1. **Apartment Design and Layouts**
2. **Wider Building Amenity Provisions**
3. **Neighbourhood Attributes**
4. **Policy, Operational and Wider Social Value**

For each specific intervention highlighted, a narrative is also provided to link the intervention with the evidence-base (including references) on how it improves health, wellbeing and broader social value outcomes. These research publications also provide the objective metrics used to carry out the WELL for Residential certification assessments. Each intervention falls within the 10-Concept Framework of WELL to achieve holistic impact, with the relevant concepts tagged. The 10-Concepts of WELL are shown below.



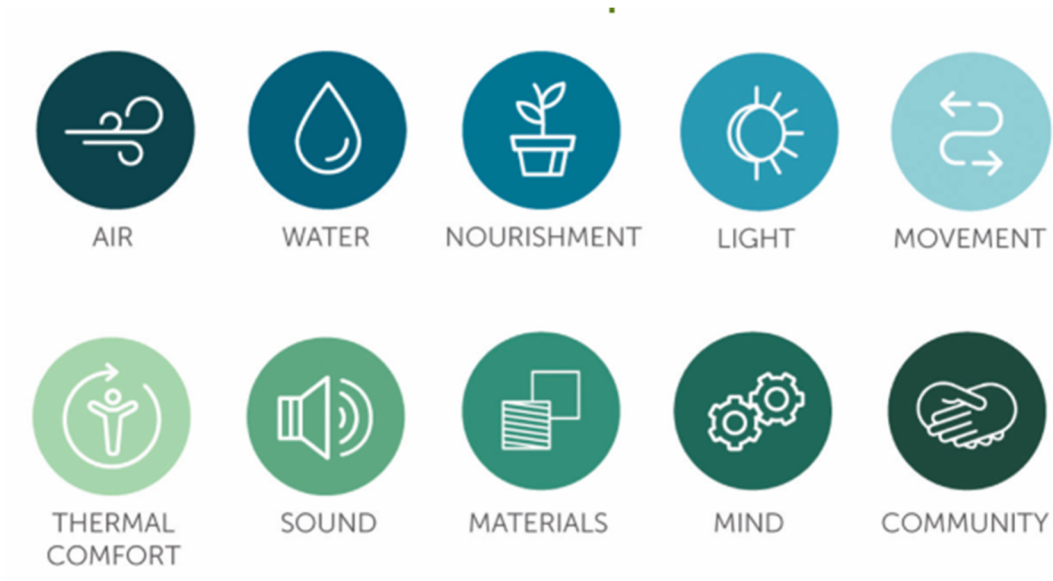


Figure 6 - The 10 Concept Categories addressed within the WELL for Residential certification

## 4.1 Apartment Design and Layout

This section relates to interventions that apply directly to the design and layout of the individual apartment units. These provide typically the highest level of impact, as it is commensurate with the proportion of time spent in apartment units. The average person spends 90% of their time indoors, with most of that time typically spent in their homes.

### 4.1.1 Ventilation Design and Hydraulics Design Supportive of Health

The residential development features mechanical systems i.e. exhaust systems to kitchens, bathrooms which are externally vented as per minimum prescribed rates. They are resident-controlled and externally vented to expel moisture.

Hydraulic systems are designed to prevent backflow and sized in accordance with appropriate water demand calculated for potable water. All systems used to circulate potable water are approved and safe for drinking water to prevent leeching of contaminants.

#### **EVIDENCE-BASE FOR HEALTH**

- Effective exhaust and ventilation strategies, including cooktop exhausts reduce indoor air pollution, overall air quality and may lead to improved residents' overall health, especially with reduced exposure to pollutants such as oxidised fat-based metabolites and particulate matter<sup>1</sup>

<sup>1</sup> National Center for Healthy Housing. Studying the optimal ventilation for environmental indoor air quality. Columbia, MD; 2022. [https://nchh.org/resource-library/report\\_studying-the-optimal-ventilation-for-environmental-indoor-air-quality.pdf](https://nchh.org/resource-library/report_studying-the-optimal-ventilation-for-environmental-indoor-air-quality.pdf)



- Designing water delivery systems adequately and preventing water stagnation (including backflow prevention) prevents contamination of potable water networks and preserves water quality for residents<sup>2</sup>



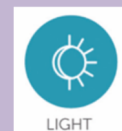
#### 4.1.2 Daylight and Shading provisions

Daylight provision to the apartment units complies with a minimum Tier 2 level under WELL For Residential with total glazing area analysed to be a minimum of 10% of regularly occupied areas of dwelling units, with regularly occupied rooms containing at least one window.

Blackout shading provision (max. 1% visible light transmittance) is also provisioned for the development to provide residents with the ability to control the amount of daylight within spaces.

#### **EVIDENCE-BASE FOR HEALTH**

- Appropriate window sizing helps to increase access to light, improve circadian rhythm regulation and leads to positive health effects. There is scientific evidence also of decreased falling incidents, infectious diseases and depression<sup>3,4</sup>



#### 4.1.3 Sound and Acoustic Comfort

Sound transmission design for both walls and floor-ceiling assemblies are completed to meet minimum Weighted Sound Reduction ( $R_w$ ) values. Acoustic specifications which cover elements including wall construction, door specifications, floor construction, insulation are provided to reduce the cross-transfer of noise within apartments and between apartment units.

<sup>2</sup> U.S. Centers for Disease Control and Prevention, U.S. Department of Housing and Urban Development. Healthy housing reference manual. Atlanta, GA: U.S. Department of Health and Human Services; 2006.

[https://www.cdc.gov/nceh/publications/books/housing/housing\\_ref\\_manual\\_2012.pdf](https://www.cdc.gov/nceh/publications/books/housing/housing_ref_manual_2012.pdf)

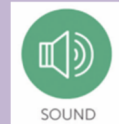
<sup>3</sup> Osibona O, Solomon BD, Fecht D. Lighting in the home and health: A systematic review. Int J Environ Res Public Health. 2021;18(2):609. doi:10.3390/ijerph18020609

<sup>4</sup> Campano MA, Aguilar T, Fernández-Agüera, J, Domínguez S. Optimization of the window design in offices for a proper circadian stimulus: Case study in Madrid. Int J Eng Technol. 2019;11(2):127-131. doi:10.7763/IJET.2019.V11.1134



### **EVIDENCE-BASE FOR HEALTH**

- Noise issues frequently top the list of residential complaints and neighbour problems. Appropriate specifications can help to reduce noise transfer between rooms and providing additional acoustical comfort to residents overall.<sup>5,6</sup>
- Noise disturbances are linked to negative health effects such as tiredness, difficulty concentrating, anxiety and depression<sup>7</sup>



## 4.2 Wider Building Amenity Provisions

This section addresses the broader design provision across the development, which includes the landscaping, common areas within the building and broader amenity provisions. The wider building context provides has a meaningful impact on the overall user experience of residents, with some design features providing “signature experiences” which can sometimes have a higher weighting of impact to the overall wellbeing than apartment specific features.

### 4.2.1 Provision of Indoor Activity Space (including accessibility provisions)

The apartment complex has included extensive amenity provisions across both towers including a common recreation area on the rooftops, a common swimming pool along with additional provisions such as steam and sauna rooms. These have measurable long-term health benefits with continual use for cardiovascular and heart health.

There is also an indoor activity space, which will facilitate not only standard machine-based gym provisions but sufficient space to conduct group-based workouts. Consideration is also made to ensure that the gym equipment is also potentially assessed for accessibility provisions to provide benefit to residents who may have physical challenges.

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<sup>5</sup> Lee PJ, Jeong JH. Attitudes towards outdoor and neighbour noise during the COVID-19 lockdown: A case study in London. *Sustain Cities Soc.* 2021;67:102768. doi:10.1016/j.scs.2021.102768

<sup>6</sup> New York City Administrative Code. Article 9: Noise control in multiple dwellings. § 27-768 Requirements. <https://codelibrary.amlegal.com/codes/newyorkcity/latest/NYAdmin/0-0-0-51913>. Accessed April 12, 2023.

<sup>7</sup> Wang J, Norbäck D. Home environment and noise disturbance in a national sample of multi-family buildings in Sweden-associations with medical symptoms. *BMC Public Health.* 2021;21(1):1989. doi:10.1186/s12889-021-12069-w



#### **EVIDENCE-BASE FOR HEALTH**

- Places for physical activity, such as those located near residents and those that have robust amenities and programming, are effective at increasing physical activity and exercise. These have been shown to support resident overall health and well-being<sup>8,9</sup>.



#### 4.2.2 Designing Layouts for Reassurance

The orientation of the apartments is positioned so that main dwelling unit entrances are in a direct line of sight to another main dwelling unit entrance or a hallway which connects other dwelling units. Furthermore, vehicular access into the project boundary will be designated slow zones with the appropriate signage included.

#### **EVIDENCE-BASE FOR HEALTH**

- Building orientation that supports social interconnectedness and mutual trust can increase informal surveillance and act as a crime deterrent.<sup>10</sup>



#### 4.2.3 Active Transport Provisions (in-building)

The building end-of-trip provisions support and promote active cycling use by provided sufficient short-term and long-term bike parking (at least 15% of bedrooms as a minimum provision).

#### **EVIDENCE-BASE FOR HEALTH**

- Cycling, whether for leisure or commuting, is associated with increased physical activity levels and lower mortality rates.<sup>11,12</sup>



<sup>8</sup> Roubal AM, Jovaag A, Hyojun P, Gennuso KP. Development of a nationally representative built environment measure of access to exercise opportunities. *Prev Chronic Dis*. 2015;12:140378. doi:10.5888/pcd12.140378

<sup>9</sup> Sharon-David H, Siekanska M, Tenenbaum G. Are gyms fit for all? A scoping review of the barriers and facilitators to gym-based exercise participation experienced by people with physical disabilities. *Perform Enhanc Health*. 2021;9(1):100170. doi:10.1016/j.peh.2020.100170

<sup>10</sup> Kamalipour H, Faizi M, Memarian G. Safe place by design: Urban crime in relation to spatiality and sociality. *Curr Urban Stud*. 2014;2:152-162. doi:10.4236/cus.2014.22015

<sup>11</sup> Reynolds R, McKenzie S, Allender S, Brown K, Foulkes C. Systematic review of incidental physical activity community interventions. *Prev Med*. 2014;67:46-64. doi:10.1016/j.ypmed.2014.06.023

<sup>12</sup> Handy S, van Wee B, Kroesen M. Promoting cycling for transport: Research needs and challenges. *Transp Rev*. 2014;34(1):4-24.

doi:10.1080/01441647.2013.860204



### 4.3 Policy, Operational and Wider Social Value

An often neglected and missed aspect of providing health & wellbeing benefits are the policies and operational procedures in-place. These are analogous to the “software” that complement the “hardware” (building fabric and design) of a building. These are often “invisible” but are as important in ensuring that health and wellbeing benefits are sustained for residents and wider stakeholders.

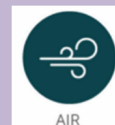
#### 4.3.1 Construction Pollution and Well-being Policies

The building is committed to a construction pollution management plan that ensures internal building systems like ducts, registers, grills and diffusers are protected and sealed during construction. Moisture and dust management procedures will also be in place to ensure storage of absorptive/porous material are protected from moisture damage during construction. Dust guards and walk-off mats at entryways during construction will also be employed.

Furthermore, health and well-being construction policies on the worksite including thermal comfort control, paid break, drinking water, sunscreen and appropriate education is provided.

#### **EVIDENCE-BASE FOR HEALTH**

- Construction sites can generate air pollutants that have been linked to negative health effects. Effective construction management techniques reduce exposure to harmful particles.<sup>13,14</sup>
- Preventative design practices can eliminate work-related injuries, hazards, illnesses and deaths – providing social value to key stakeholders in a development which are the on-site workers<sup>15</sup>



#### 4.3.2 Low-Toxic Cleaning Operations

Building cleaning procedures and policies for common areas that ensure thorough cleaning and selection of low-toxicity cleaning materials are implemented. These include protocols such as:

- List of cleaning supplies used
- Extent and frequency of cleaning
- Protocol for storage and coding of cleaning products
- Training provisions, including PPE and safety guidelines during cleaning.

<sup>13</sup> Singh R, Ahmad K, Jakhwal DC, Kumar MS. Impact of air quality on human health in the vicinity of construction sites in Delhi-NCR. Int J Eng Res Appl. 2014;4(8v4):18-26. doi:ISSN 22489622

<sup>14</sup> Kim S-S, Kang D-H, Choi D-H, Yeo, M-Y, Kim K-W. Comparison of strategies to improve indoor air quality at the pre-occupancy stage in new apartment buildings. Build Environ. 2008;43(3):320-328.doi:10.1016/j.buildenv.2006.03.026

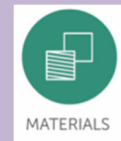
<sup>15</sup> National Institute for Occupational Safety and Health. Prevention through Design: Designing out hazards and risk in the workplace. [https://www.cdc.gov/niosh/newsroom/feature/ptd\\_designing.html](https://www.cdc.gov/niosh/newsroom/feature/ptd_designing.html). Reviewed February 8, 2022.

Accessed April 10, 2023



#### **EVIDENCE-BASE FOR HEALTH**

- Cleaning products that are made without certain chemical can decrease an individual's risk of exposure to toxic substances. These are shown to reduce negative impacts to individuals' skin and toxic substances<sup>16</sup>



### 4.3.3 Emergency Response Support

Operationally, emergency routes and areas of refuge are clearly marked, with common spaces that function as a designated disaster shelter is identified. Availability of first aid kits and AED devices will also be marked and provided for.

#### **EVIDENCE-BASE FOR HEALTH**

- A comprehensive emergency response plan improves how individuals respond to emergency situations and potentially limits the number of casualties and negative impacts of a disaster. Some interventions like AEDs also improve response time and rates of survival for cardiac arrest events, one of the most common causes of sudden death in Australia.<sup>17,18</sup>



## 4.4 Neighbourhood Attributes

Neighbourhood Attributes relate to benefits to residents derived from the local neighbourhood context. Site selection of this location has taken into consideration some of these evidence-based wider benefits. A key part of the health & wellbeing strategy of this development is to provide education and awareness of these features to supplement the provisions made available within the building.

### 4.4.1 Support Fresh Food Access

The building has been analysed to be within the 800m walking distance of a supermarket or grocery store with a fruit and vegetable section (Crows Nest Woolworths). This maximum separation distance has been shown to significantly improve the access to fresh fruit and vegetables.

<sup>16</sup> Calderon L, Maddalena R, Russell M, et al. Air concentrations of volatile organic compounds associated with conventional and "green" cleaning products in real-world and laboratory settings. *Indoor Air*. 2022 32(11):e13162. doi:10.1111/ina.13162

<sup>17</sup> Ready Campaign. Make a plan. U.S. Department of Homeland Security. <https://www.ready.gov/plan>. Accessed April 10, 2023

<sup>18</sup> Marengo JP, Wang PJ, Link MS, Homoud MK. Improving survival from sudden cardiac arrest: The role of the automated external defibrillator. *J Am Med Assoc*. 2001;285(9):1193-1200. doi:10.1001/jama.285.9.1193



### **EVIDENCE-BASE FOR HEALTH**

- Proximity to supermarkets, grocery stores and farmers markets can help individuals improve their dietary and lifestyle behaviours by supporting better food choices. Residents who have better access tend to have healthier diets and are less likely to be overweight or obese.<sup>19,20</sup>



#### 4.4.2 Walkable Neighbourhoods

The primary building entrance connects onto footpaths with local connectivity to other streets within a 540m walking distance. The walking footpath connects residents to three unique use types within an 800m radius such as grocery stores, retail, services such as a bank, laundry, restaurant and other civic and community facilities.

### **EVIDENCE-BASE FOR HEALTH**

- Communities that focus on pedestrian-friendly design, including proximity, connectivity, density and aesthetics, are associated with increased walking for people of all ages and genders. Regular activity contributes to numerous health benefits such as lowering the risk of high blood pressure, heart disease, depression, some cancers, diabetes and obesity.<sup>21,22</sup>



<sup>19</sup> Larson NI, Story MT, Nelson MC. Neighborhood environments: Disparities in access to healthy foods in the U.S.. Am J Prev Med. 2009;36(1):74-81.e10. doi:10.1016/j.amepre.2008.09.025

<sup>20</sup> Saelens BE, Sallis JF, Frank LD, et al. Obesogenic neighborhood environments, child and parent obesity. Am J Prev Med. 2012;42(5):e57-e64. doi:10.1016/j.amepre.2012.02.008

<sup>21</sup> World Health Organization. Global Status Report of Physical Activity. Geneva, Switzerland; 2022. doi:ISBN 978 92 4 005916 0

<sup>22</sup> Cerin E, Sallis JF, Salvo D, et al. Determining thresholds for spatial urban design and transport features that support walking to create healthy and sustainable cities: Findings from the IPEN

Adult study. Lancet Glob Health. 2022;10(6):e895-e906. doi:10.1016/S2214-109X(22)00068-7



#### 4.4.3 Availability of Public Transport and Active Transport Paths

The building entrance is within a 400m walking distance of a bus service which has at least 72 weekday trips and 30 weekend trips to provide local connectivity.

##### **EVIDENCE-BASE FOR HEALTH**

- Reliable public transportation systems not only help improve physical and mental health but also support health equity through improved access to healthy food options and economic opportunities.<sup>23</sup>
- Individuals are more likely to cycle when streets have dedicated cycling infrastructure, such as bike lanes, and when destinations have secure bike parking<sup>24</sup>



#### 4.4.4 Public Outdoor Activity Space Accessibility

The development is within 800m of St. Leonards Park which meets the minimum size requirements (1 acre) and has provisions such as a walking path, outdoor exercise equipment and recreational courts.

##### **EVIDENCE-BASE FOR HEALTH**

- Park use and physical activity increase when parks offer a variety of amenities and are near homes. Parks close to residential communities can contribute to numerous benefits beyond physical activity, including improved mental health, air quality and noise mitigation.<sup>25,26</sup>



<sup>23</sup> Heaps W, Abramsohn E, Skillen E. Public transportation in the US: A driver of health and equity. Health Affairs Health Policy Brief. 2021. doi:10.1377/hpb20210630.810356

<sup>24</sup> Handy S, van Wee B, Kroesen M. Promoting cycling for transport: Research needs and challenges. Transp Rev. 2014;34(1):4-24. doi:10.1080/01441647.2013.860204

<sup>25</sup> Pontin FL, Jennesson VL, Morris MA, Clarke GP, Lomax NM. Objectively measuring the association between the built environment and physical activity: a systematic review and reporting framework. Int J Behav Nutr Phys Act. 2022;19(119). doi:10.1186/s12966-022-01352-7

<sup>26</sup> Sallis JF, Spoon C, Cavill N, et al. Co-benefits of designing communities for active living: An exploration of literature. Int J Behav Nutr Phys Act. 2015;12(30): doi:10.1186/s12966-015-0188-2342



## 5 BASIX COMMITMENTS (RESIDENTIAL)

The Building Sustainability Index (BASIX) is a legislative requirement for all residential dwellings in NSW, assessing the performance of buildings across a range of sustainability indices, including thermal comfort, water, embodied emissions, and energy. BASIX establishes targets for water consumption and greenhouse gas reduction based on the NSW average benchmark for potable water and greenhouse gas emissions within the residential sector. It also sets minimum performance levels for the thermal comfort of dwellings and the embodied emissions of construction materials.

As of October 2023, new targets have been implemented under the SEPP 2022, raising the standards for sustainability.

This project is committed to meeting the requirements set out by the Sustainable Buildings SEPP 2022, as follows:


- **Thermal Performance Standards:** The project exceeds the minimum BASIX requirement of a 7-star average NatHERS rating for the entire development, with individual apartments meeting a minimum of 6 stars.

The building design incorporates cutting-edge technology and a high-performance façade, resulting in an average rating of **7.8 stars**, a **11%** improvement beyond the baseline.

- **Energy Standards:** The project surpasses the minimum BASIX requirement by **additional 10%** and achieving a **66%** reduction in energy consumption across the development, exceeding the targeted 60% reduction. This is achieved through energy-efficient design and the implementation of sustainable strategies.
- **Materials Index:** The project has estimated the volume of various materials used in construction and applied the appropriate emissions factors to ensure sustainability throughout the build.
- **Water Standards:** The project exceeds the required BASIX reduction in water consumption, by **extra 25%** and achieving a **50%** improvement against the benchmark, which surpasses the required 40% reduction. This is made possible through water-efficient design features.

### 5.1 BASIX ENERGY TARGET

The project exceeded the minimum BASIX Energy target of 60% by an **additional 10%**, fulfilling and surpassing the legislative requirements. To ensure efficient energy consumption, the project will incorporate top-tier energy-saving practices. The following strategies will be implemented to achieve these ambitious energy targets:

	<b>BASIX Energy Target of 60%</b> - In line with council targets and the new Sustainable Buildings SEPP 2022, the development is set to achieve an energy target of a 66% reduction compared to a similar equivalent development.
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**Thermally-Efficient Construction** – Insulation through the roof, walls and floor, with proper sealing to reduce bulk airflow. Light-coloured materials will be used to reflect solar heat gains. Delicate consideration will be given to the height of the windows, shading and overall window-to-wall ratio.

Provide air movement through ceiling fans in bedrooms.



**Electrification** – no gas will be used on site, enabling the development to be ‘net zero ready’ and allow the benefits of decarbonisation of the grid to be realised.



**Energy Efficient Appliances** – energy efficient appliances such as electric cooktops and dryers will be provided to reduce operational energy consumption.



**Efficient Lighting Systems** – high efficiency LED and fluorescent lighting in common areas with efficiency controls to meet the stringent requirements of NCC 2022 Section J. Controls will include motion sensors, time clocks and zoned switching.



**Renewable Energy** – The roof area provides a good opportunity for installation of a solar photovoltaic system. This will generate renewable electricity to offset grid use and minimise stress on the grid at peak times. Minimum 50kW PV system has been committed for residential energy target.




**Lift** – Lifts to be provided with regenerative braking.






**Controls, energy metering and monitoring** – energy meters and monitoring systems will be provided to comply with NCC 2022 Section J Part J9 requirements. Exhaust fans will be connected to light switches to ensure they do not run when not required.



	<p><b>Hot water</b> is to be provided by energy efficient heat pump systems. These systems provide an output three times their input energy and can be run off the solar PV system to reduce the operational carbon of the development.</p>
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## 5.2 BASIX WATER TARGET

The project is designed to exceed the minimum BASIX Water target of a 40% reduction by 25%, achieving a 50% reduction, thus surpassing the minimum legislative requirements. To ensure responsible water consumption, best practice water-saving initiatives will be implemented throughout the development. The following initiatives will be explored to meet the potable water targets:

	<p><b>Sanitary Fixtures</b> - By implementing low-flow water fixtures, the consumption associated with apartments will be significantly reduced. All sanitary fixtures are to be provided with the WELS ratings identified below:</p> <ul style="list-style-type: none"> <li>▪ Taps – 6 Star WELS</li> <li>▪ Toilets – 4 Star WELS</li> <li>▪ Showers – 4 Star WELS (&lt;=6 L/min)</li> </ul>
	<p><b>Landscape Irrigation</b> - Efficient irrigation systems will be considered, including underground surface drip systems, moisture sensors, and the use of native plants in the landscaping plan. Natives have evolved to thrive in the Australian environment and are typically more resilient than their exotic counterparts. Native vegetation also stores a significant amount of carbon, mitigating the impacts of climate change.</p>
	<p><b>Water Efficient Appliances</b> – water efficient appliances with low-flow and High WELS ratings will be provided to reduce potable water consumption.</p>

## 5.3 MATERIALS INDEX

Material Index commitment involves sourcing and utilizing construction materials that have a lower environmental impact, thereby reducing the carbon footprint associated with the project's construction and operation. This approach aligns seamlessly with the principles of SEPP 2022, demonstrating the development's dedication to sustainable construction practices. In line with the principals of SEPP 2022 for BASIX, the project will have a significant focus on materiality to reduce the embodied emission.



## 6 NCC SECTION J (2022) PART J4, BUILDING FABRIC - (NON-RESIDENTIAL)

The proposed retail non-residential area of the development will be subject to compliance with Section J under the NCC 2022 code (or 2025 as relevant at time of NCC). This code places strict environmental performance requirements on the building envelope and services within the building.

The project will demonstrate compliance via verification method J1V3 – verification using a reference building (energy modelling). The design of the building fabric will need to demonstrate compliance with this clause through dynamic modelling of the building against a reference case.

A preliminary Section J, Part J4 review has been undertaken for the development to indicate the Deemed-to-Satisfy (DtS) performance requirements of the thermal envelope including glazing units, external and internal walls and spandrel panels which make up the defined thermal envelope.

Element	DtS Performance*
Exposed Roofs/Ceiling Construction (Exposed to Outside Air or Unconditioned Spaces - Heat Flow Downward)	R3.7
Concrete Slab on Ground or suspended above unconditioned space (With No In-slab Heating or Cooling System - Heat Flow Downward)	R2.0
Internal Wall Construction (Separating Internal Conditioned Spaces from the Unconditioned Internal Spaces)	R1.4
External Wall Construction (Separating Internal Conditioned Spaces from the Outside Air)	R1.0
Spandrel Construction (GLCB) (Separating Internal Conditioned Spaces from the Outside Air)	R1.0

Glazing Specifications**	
BCA Class 2 – SOU, Residential	Total System U-Value = 3.6 Total System SHGC = 0.30
BCA Class 5 – Commercial Office	Total System U-Value = 3.6 Total System SHGC = 0.30
BCA Class 6 – Retail	Total System U-Value = 3.6 Total System SHGC = 0.45



\*R-value represents total system performance, inclusive of the effect of thermal bridging, air gaps, bulk insulation and metal-on-metal contact.

\*\*Glazing performance values are total system values, inclusive of the impact of framing.

To demonstrate compliance with Section J, a J1V3 performance verification approach or detailed DtS assessment is required to be undertaken prior to construction to demonstrate that the proposed building exceeds the energy and therefore greenhouse gas performance of a DtS reference building. Ongoing coordination with the Architect and relevant engineering disciplines will be undertaken to ensure the building envelope and facade system contributes to reducing energy demand without compromising visual amenity and daylight access.



## 7 NABERS ENERGY AND WATER

For compliance with the Sustainable Buildings SEPP, large commercial developments that must obtain a NABERS Energy and Water rating include offices over 1000 m2.

Thus, the office component of this development is required to achieve the following NABERS Energy and Water ratings:

- 5.5-star NABERS energy rating and
- 3-star NABERS water rating.

The proposed strategy to achieve these ratings are as follows:

Energy and water initiatives are detailed in the following sections of the report: Section 3.2 Energy and 3.3 Water Consumption.

To meet the energy and water standard application requirements, the development must identify preferred Section J energy reporting pathway, effective water-saving measures and submit **NABERS Energy and NABERS Agreement to Rate** with development application.

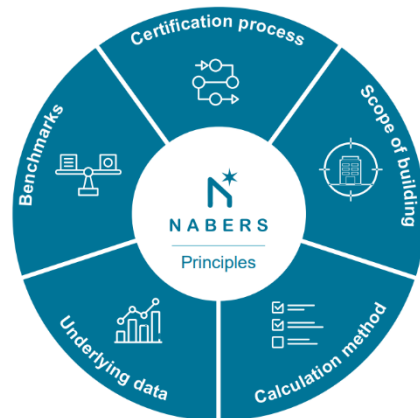


### 7.1 NABERS EMBODIED EMISSIONS REPORTING

For compliance with the Sustainable Buildings SEPP, reporting of the embodied emissions of non-residential buildings are required. Disclosure of embodied emissions will be via the NABERS embodied emissions material form. This interim form will be in use until the NABERS embodied emissions framework and related emissions factors comes into effect in 2024.

In alignment with best practice, we have identified the key initiatives to help reduce the embodied emissions of the development:

- Use salvaged and/or recycled materials.
- Optimise systems for material efficiency.
- Specify low carbon concrete.
- Specify materials that naturally sequester carbon.
- Specify materials manufactured with renewable energy.
- Design for durability.





## 8 SUMMARY

This report summarises the sustainability targets and commitments for the proposed development at 270 Pacific Highway, Crows Nest, NSW, 2065. The requirements for sustainability shall be coordinated with the design team to allow the development to achieve a high level of sustainable practice across the entire development.

This Sustainability Report has been prepared by E-Lab Consulting to support the State Significant Development Application (SSDA-79658964) for the mixed-use development located at 270 Pacific Highway, Crows Nest. The purpose of this report is to outline the environmentally sustainable design (ESD) initiatives and commitments associated with the proposed development.

The project vision centers on enhancing sustainable outcomes across key areas such as energy, water, waste, and materiality. Furthermore, it incorporates a focus on health, wellbeing, placemaking, community engagement, and social sustainability, providing broader benefits to the surrounding area.

This report has been compiled to inform the North Sydney Council of the development's commitment to sustainability, presenting tangible and measurable sustainability goals that will contribute positively to the local community. The aim is to deliver a responsible development aligned with the district's needs, both now and into the future. In line with this commitment, the following sustainability targets are proposed, adhering to governing sustainability frameworks and policies:

- **Exceed minimum compliance with new legislated BASIX benchmarks** in accordance with the Sustainable Buildings SEPP 2022 requirements for mid/high-rise residential buildings.
  - **BASIX Energy Benchmark** – Targeting a 66% reduction (exceeding the 60% requirement)
  - **BASIX Water Benchmark** – Targeting a 50% reduction (exceeding the 40% requirement)
  - Thermal Comfort Benchmark
    - Achieving an average of 7.8 NatHERS Stars for the entire development, surpassing the 7-star requirement.
    - Ensuring a minimum of 6 NatHERS Stars for individual apartments.
- **5.5 Star NABERS Energy Rating** and **3 Star NABERS Water Rating** for large commercial spaces (office/medical center areas >1000m<sup>2</sup>) to demonstrate high performance in Class 5 areas.
- **Net Zero Operational Carbon by 2035** in line with the NSW Sustainable Buildings SEPP.
- **Fossil-fuel free design** to achieve carbon neutrality by 2035.
- **WELL for Residential Program commitment** as an innovative initiative for improving health and wellbeing.
- Embedding a range of sustainability initiatives across the development, including:
  - Maximizing on-site renewable energy generation through solar photovoltaics (PV).
  - Designing a **fossil-fuel free development** to allow for carbon neutrality by 2035.
  - Incorporating high-efficiency, appropriately sized centralised building service systems, such as domestic hot water and mechanical HVAC systems.
  - Employing passive design principles such as shading, high-performance thermal envelopes, and strategies to balance daylight access and solar heat loads.
  - Using materials with low environmental impact to minimize resource overconsumption and waste.



- Ensuring high-quality indoor environments for occupants, with a focus on natural light access and optimized acoustic comfort by utilising the innovative ventilation design on project.
- Implementing mitigation strategies to address climate change impacts, including the Urban Heat Island Effect.
- Incorporating site-wide greening initiatives, with diverse native and resilient planting.
- Developing and implementing a **Green Travel Plan** to encourage low-emission transport alternatives and optimize the use of nearby public transport networks.

We trust this report provides a detailed overview of the project's commitment to sustainability for the 270 Pacific Highway development.

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