# Attachment A13

## Ecologically Sustainable Development Report

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## 118-130 Epsom Road, Zetland 2017 NSW

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# Document QA and Revisions

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**Authorised by:**

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**Sustainability**

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# 1 EXECUTIVE SUMMARY

E-LAB Consulting have been engaged by Karimbla Constructions Services C/- Meriton to provide Sustainability services inputs for the development at 118-130 Epsom Road, Zetland. The intent of this report is to establish an Ecologically Sustainable Design (ESD) strategy for the assessment of the Stage 1 Development Application and to meet the relevant planning frameworks for the proposed residential mixed-use development.

This report presents a summary of the ESD strategies proposed and commitments made for the development. The developer is aiming to deliver an affordable, sustainable outcome for the project by demonstrating a strong commitment to sustainability in its design, construction, and operation.

The proposed sustainability elements include:

- Complying with the **BASIX** requirements at the time of approval for the building.
- Providing dedicated parking spaces for **Electric Vehicles** with charging infrastructure.
- Satisfying the City of Sydney's Alternative **Natural Ventilation** of Apartments in Noisy Environments criteria. Allow for achieving natural ventilation without compromising acoustic performance.
- Complying with City of Sydney's planning controls in relation to ESD initiatives.
- Following a range of sustainability initiatives across the site spanning **energy efficiency, thermal performance, indoor environment quality, waste management and comfort**.

The strategies and initiatives presented in this report demonstrate a strong commitment to sustainability in line with the City of Sydney's development guidelines and are to be further developed during subsequent stages of the project.

# 2 INTRODUCTION

## 2.1 PROJECT OVERVIEW

The 118-130 Epsom Road development reference is a residential development comprising:

- 8 buildings of up to 22 storeys
- Retail/commercial tenancies on site

Figure 1 below is an image of the site in context of its location.


*Figure 1. Site Location (Source: Nearmap)*

# 3 SUSTAINABILITY FRAMEWORKS

The 118-130 Epsom Road development's sustainability outcomes are influenced by the following key frameworks:

- Sydney Local Environment Plan 2012
- Sydney Development Control Plan 2012
- Building Sustainability Index (BASIX)
- Nationwide House Energy Rating Scheme (NatHERS)
- Natural ventilation of apartments in noisy environments

## 3.1 SYDNEY LOCAL ENVIRONMENT PLAN (LEP) 2012

The Sydney LEP 2012 Part 6.21 aims to deliver the highest standard of architectural, urban and landscape design. In accordance with this clause, the development must consider:

- Environmental impacts such as sustainable design, overshadowing and solar access
- The achievement of principles of ecologically sustainable development

## 3.2 SYDNEY DEVELOPMENT CONTROL PLAN (DCP) 2012

The Sydney DCP 2012 Section 3.6 outlines sustainability objectives that the development must consider, in particular:

- Reduction of greenhouse gas emissions and use of renewable and low carbon energy;
- Minimisation of potable water use;
- Consideration of climate change impacts;
- Waste minimisation and recycling;
- Improvement in indoor environment quality;
- Consideration of sustainable materials; and
- Improvement in biodiversity.

## 3.3 BUILDING SUSTSINABILITY INDEX (BASIX)

The Building Sustainability Index (BASIX) is a legislative requirement for all residential dwelling types within NSW. BASIX is the web-based planning tool designed to assess the potential performance of certain residential buildings against a range of sustainability indices including thermal comfort and energy. It sets water and greenhouse gas reduction targets relative to the NSW average benchmark for per person potable water consumption & greenhouse gas emissions within the residential sector. BASIX also sets the minimum performance levels for thermal comfort of the dwelling.

## 3.4 NATIONWIDE HOUSE ENERGY RATING SCHEME (NatHERS)

Nationwide House Energy Rating Scheme (NatHERS) assessments are the most common way to meet the minimum energy efficiency requirements of the National Construction Code (NCC).

Energy assessors use the NatHERS rating tools to predict the amount of heating and cooling your apartment or house will need to stay comfortable all year round. The findings are converted to a star rating between 0 and 10 stars.

## 3.5 NATURAL VENTILATION OF APARTMENTS IN NOISY ENVIRONMENTS

In response to an increase in high-density residential development, the City of Sydney introduced guidelines establishing requirements for alternative means of natural ventilation for façades adjacent to busy roads. This development is committed to providing the highest level of amenity for the apartments, and as such are committed to achieving the Performance requirements outlined in the guide.

This will allow fresh outdoor air to be delivered to the apartments without the impacts of traffic noise which typically drives users to maintain closed windows in high density areas. This is of particular concern along Epsom Road, Link Road, and Southern Cross Drive.

# 4 PROJECT DESIGN RESPONSE

## 4.1 EPA PRINCIPLES

The 118-130 Epsom Road development will follow the golden standard in sustainability principals throughout the development. This includes the design, construction, and operational elements of the project. The key overarching principals are aligned with the definition of Ecologically Sustainable Development as defined in clause 7(4) of Schedule 2 of the Environmental Planning and Assessment Regulation 2000. These include:

**The Precautionary Principle:**

**Philosophy:** Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

**Project Response:** The project is committed to incorporating elements to minimise impacts on the environment. A commitment to improvement on minimum benchmarks demonstrates the development's commitment to sustainability.

**The Principle of Inter-generational Equity:**

**Philosophy:** The present generation should ensure that the health, diversity, and productivity of the environment is maintained or enhanced for the benefit of future generations.

**Project Response:** The project is committed to incorporating careful selections into the project design. The design team will address key elements such as energy, potable water, and material consumption to do what is within the project's control to allow each following generation to have an opportunity for ecological equality.

**The Principle of the conservation of biological diversity and ecological integrity:**

**Philosophy:** Conservation of biological diversity and ecological integrity should be a fundamental consideration

**Project Response:** The project is committed to planting native vegetation and using integrated landscaping to enhance the overall ecological and biodiversity of the site. Rainwater and stormwater will be carefully managed and controlled to minimise impacts on surroundings.

**Principles relating to improved valuation, pricing, and incentive mechanisms:**

**Philosophy:** Environmental factors should be included in the valuation of assets and services. The users of goods and services should pay prices based on the full life cycle costs of providing goods and service.

**Project Response:** The project will target a construction waste diversion target of 90%, as well as developed specific project waste management strategies. These combine to ensure the project pays for the waste and damage it creates. Further, it is designed to be low-energy and low-water consumption, which provides an incentive for residents through lower utility bills.

**The Principle of Waste Minimisation**

**Philosophy:** All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment.

**Project Response:** The project will target a construction waste diversion target of 90%, as well as developed specific project waste management strategies. Construction materials are chosen to be low impact in their manufacture, including best practice PVC and FSC/PeFC timber throughout where possible. This impacts waste both created by the site, as well as upstream and downstream waste categories.

The above principles are addressed by 5 key themes, being *Sea, Land, Water, Air and People*. These 5 key themes are centred around reducing harm as far as practicable across the practice of buildings and infrastructure, both in their construction and operation.

## 4.2 RESOURCES

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 material efficiency to ensure resource use is appropriate.

### 4.2.1 ENERGY

The energy efficiency strategy generally follows the energy efficiency pyramid of design in Figure 2 below. In the first instance demand for Greenhouse Gasses should be reduced. Consideration should be to remove the need for energy to be consumed where possible. Beyond this, energy can be more efficient, through efficient lighting, mechanical systems, and appropriate services.

Once the system has reduced all available energy-consuming elements and made the remaining systems as efficient as possible, renewable energy sources will be considered. If space allows on the roof, PV will be installed. Only after all the above steps have been completed should offsets be used to close the gap and achieve neutrality.

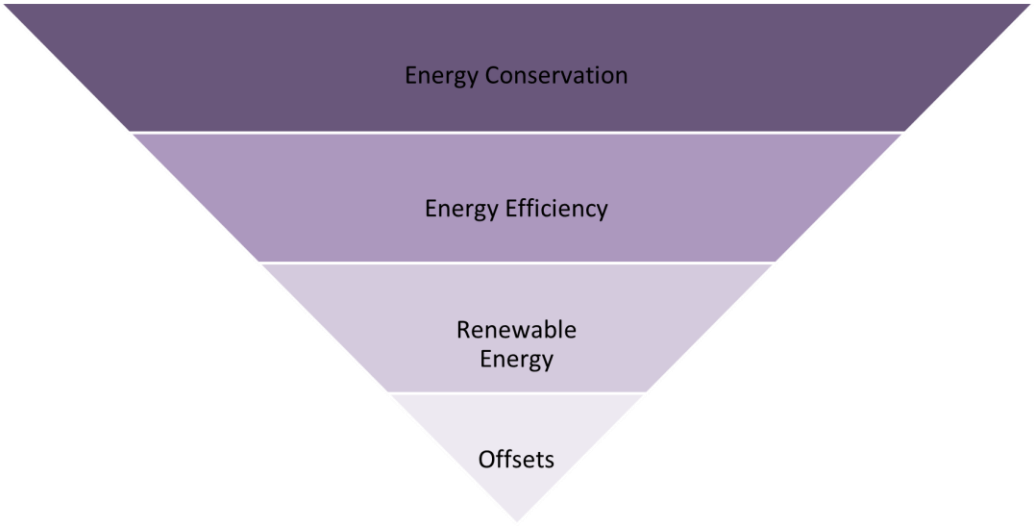



*Figure 2. Energy efficiency pyramid.*

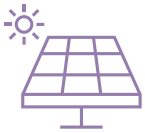
To achieve the above, the following initiatives are proposed:

**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.

**Natural Ventilation –** Apartments are able to be operated via operable windows. Natural ventilation will be available to all units when external weather conditions allow.

Corridors will be naturally ventilated to further reduce energy consumption, without compromising acoustic performance.

**Efficient Lighting Systems** – High efficiency LED lighting throughout, including in common areas with efficiency controls to meet the stringent requirements of NCC 2019 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. The size of the system will be further developed, taking into consideration roof design, spatial allowance and building demand.

This ability will be balanced with plant requirements and exploring opportunities for activation.

**Controls, energy metering and monitoring** – Energy meters and monitoring systems will be provided to comply with NCC 2019 Section J Part J8 requirements. Exhaust fans will be connected to light switches to ensure they do not run when not required.

### 4.2.2 WATER CONSUMPTION

The project will meet the BASIX Water requirements at the time of approval. To achieve responsible water consumption, 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 associated with apartments will be significantly reduced. All sanitary fixtures are to be provided to the WELS ratings required at the time of approval.

**Landscape Irrigation -** 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.

**Recycled water and rainwater** – the development will supply the majority of irrigation needs from onsite rainwater tanks to serve landscape irrigation and washdown. Rainwater will be captured from the roof of the buildings to also reduce potable water demand.

The developments design is deliberately working to reduce potable water consumption by in the first instance reducing water use, then offsetting it through rainwater tanks. The sizing of the rainwater tanks are designed to aim to meet as much of the site irrigation needs as possible.

### 4.2.3 MATERIALS

In line with the principals of sustainability outlined in the EPA, the project will have a significant focus on materiality. The scope of consideration includes the following action items within the project response:

- **Construction Waste** – A minimum 90% diversion from landfill target during demolition and construction. This diverts and ensure reuse or recycling of a high portion of site waste.
- **Low VOC and Low Formaldehyde Materials** – paints, adhesives, sealants, floor coverings, carpets and engineered wood will be selected appropriately to provide a healthier and low-impact environment. Such efforts provide a cleaner and better environment for all.

- **Best-Practice PVC** – cables, pipes, flooring, and blinds will be selected and specified to be Best Practice PVC. This ensures upstream performance will be met and has significant benefit for the overall environment during the construction process.
- **Best Practice Steel** – Where possible, steel will come from a sustainable steel manufacturer, who has an action plan.
- **FSC/PeFC Timber throughout** – where possible, timber, including virgin and engineered timber through construction and fitout elements under the builder's control will be specified as FSC/PeFC. This ensures the timber provided to site is of the highest standard and sourced from sustainable sources.
- **Waste Management Plan** – Development of an ongoing Waste Management Plan so waste can be sorted, separated, and recycled. This will assist ongoing diversion from landfill for the development.

## 4.3 COMFORT AND QUALITY

To ensure the best quality for users and visitors inside the space, the following key initiatives will be committed to:

- **Visual Comfort** – Maximising high-quality light into the living spaces, with views to the sky and nature where possible. The development has sweeping uninterrupted views to the harbour.
- **Acoustic Excellence** – Designing the layouts of the apartments to be protected from noise from external sources. Delicate material selection, acoustic attenuation, and designing the shape of the building and openings accordingly achieves the performance. Further, separation of spaces ensures acoustic privacy between dwellings.
- **Thermal Comfort** – Appropriate mix of vernacular design, overhangs, high-performance windows, and mechanical systems to deliver the users optimised thermal**.**
- **Lighting Comfort** – Use of high colour rendering index (CRI > 80) LED lighting throughout the entire development. Low-glare lighting with baffles or louvres to limit UGR.
- **Generous natural planting –** Greenery through natural planting throughout the development assists in a connection to nature for users and passers-by. It also has a cooling effect, reducing the Urban Heat Island burden on the project.

The above combine to ensure the development is responsible, efficient, beautiful, and in the best interest of not just the developers, but the residents, community, and society as a whole.

## 4.4 URBAN HEAT ISLAND MITIGATION

The site is location in a position which experiences a high level of urban heat island effect. Figure 3 below shows the variation of temperature compared to a non-urban vegetated surface, such as a heavily wooded area. The **site experiences temperatures of 8.1˚C above baseline.**

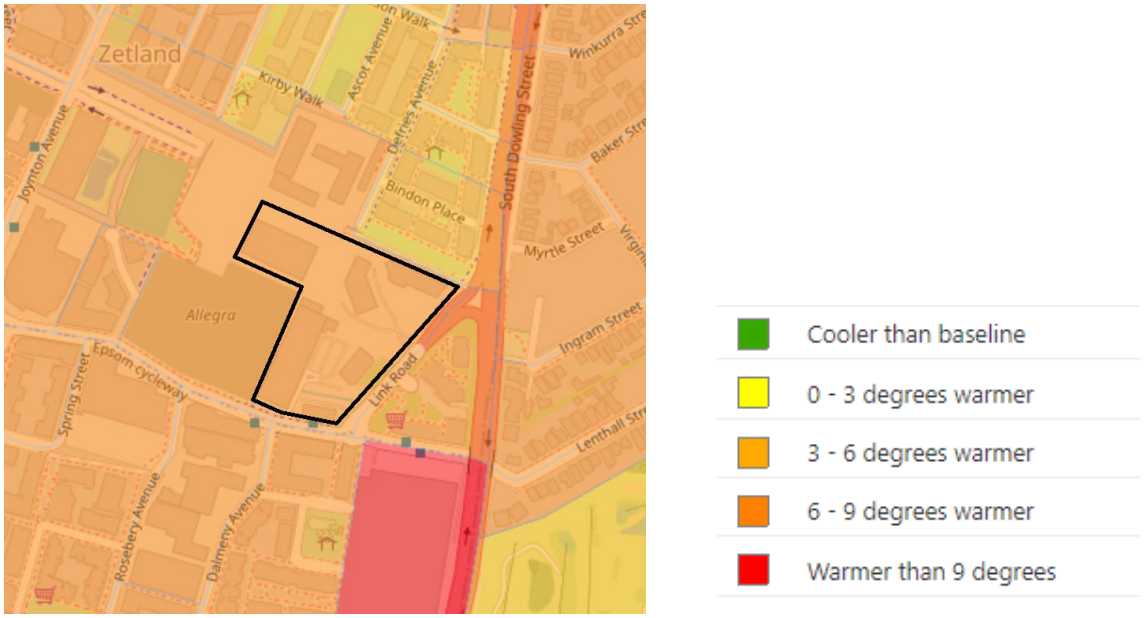



*Figure 3. Urban Heat Island Effect (Source: SEED Database).*

To minimise the urban heat island effect and provide a more comfortable environment for occupants, the development can implement the following initiatives:

- Gardens with drought tolerant planting
- Light coloured external materials and roof
- Plant trees with wide tree canopies


The landscaping design proposed by Urbis increases the ecology of the site, improving biodiversity, user experience, quality and tackling urban heat island effect issues in the heart of the city.

## 4.5 SECTION J

The non-residential components of the 118-130 Epsom Road development will be subject to compliance with Section J under the NCC 2019 Amendment 1 code. This code places strict environmental performance requirements on the building envelope and services within the building.

The project will demonstrate compliance via verification method JV3 – 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.

The scope of the Section J compliance is limited to areas that meet both of the following criteria:

- Non-Residential areas
- Conditioned Spaces

As such, this includes all retail areas within the development.

## 4.6 SUSTAINABLE TRANSPORT

The development benefits from its key location in being able to offer leading connectivity to Sydney (Figure 4). Located within the City of Sydney's Cycle network, the site easily connects to many trails and dedicated lanes. The car park has incorporated the infrastructure to ensure residents can secure their personal bicycles in a safe and efficient manner privately.

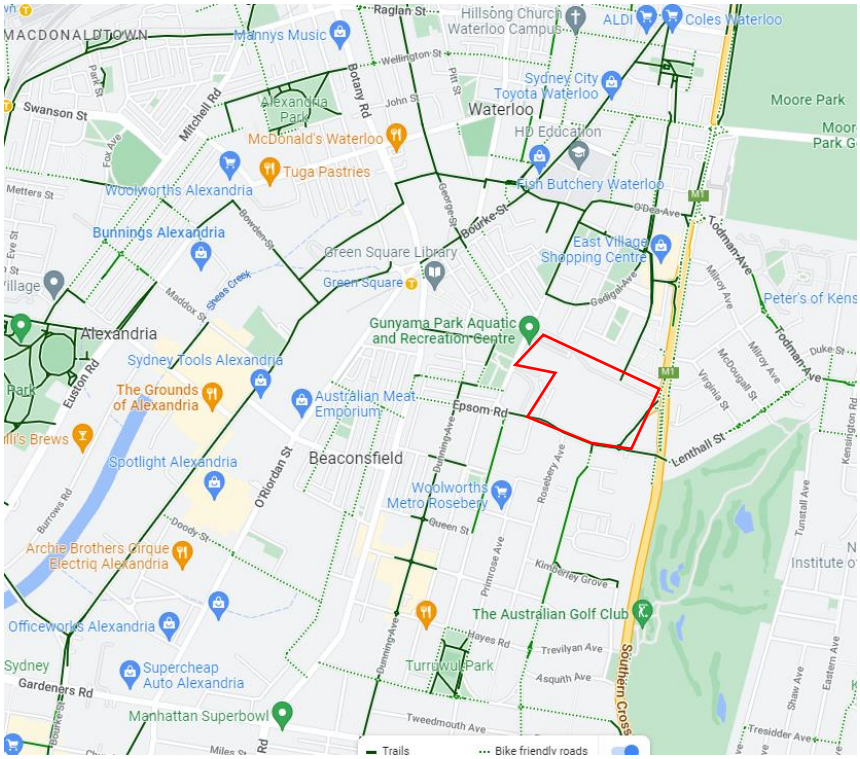



*Figure 4. Development site in context (Source: Google Maps).*

The development also proposes to support the shift away from fossil fuel transport by providing the infrastructure for EV Charging to the carpark. While the anticipated current demand is not anticipated to be high across the development, it is expected the future demand will continue to rise, so the infrastructure required to install and support this transition will be installed in day 1.

This supports the development's commitment to transitioning to a carbon neutral economy.

# 5 CONCLUSION

This report provides an outline of the 118-130 Epsom Road's Ecologically Sustainable Design (ESD) initiatives to be considered for the development to demonstrate Design Excellence.

The ESD strategies proposed will assist the development to achieve high levels of sustainability and environmental performance. These targets include:

- Complying with the **BASIX** requirements at the time of approval for the building.
- Providing dedicated parking spaces for **Electric Vehicles** with charging infrastructure.
- Satisfying the City of Sydney's Alternative **Natural Ventilation** of Apartments in Noisy Environments criteria. Allow for achieving natural ventilation without compromising acoustic performance.
- Complying with City of Sydney's planning controls in relation to ESD initiatives.
- Following a range of sustainability initiatives across the site spanning **energy efficiency, thermal performance, indoor environment quality, waste management and comfort**.

The strategies and initiatives presented in this report demonstrate a strong commitment to sustainability which meet and exceed expectations for the development. Further opportunities for optimisation of the building's performance will be developed during subsequent stages of the project.

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