Ecologically Sustainable Development Report

222 Waldron Road & 138 Campbell Hill Road, Chester Hill

Project No.	P00238
Revision	2
Issued	5 March 2024
Client	ATV C/- Centurion Project Management

E-LAB Consulting

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Document QA and Revisions

ISSUE	DATE	COMMENTS	ENGINEER	REVIEWER
1	10/03/2023	Preliminary Issue	MR	AK
2	05/03/2024	Final Issue	MR	GB
3				
4				

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Sustainability

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1 EXECUTIVE SUMMARY

This report has been prepared to outline the sustainability, health and wellbeing initiatives proposed for the 222 Waldron Road & 138 Campbell Hill Road, Chester Hill development. Abel Tasman Village is aiming to deliver a premium quality, sustainability-focussed outcome for the project, with a strong emphasis on holistic performance, user-experience, quality, health and wellbeing.

The intent of this report is to outline the various sustainability opportunities the development will include, including both general sustainability principles and certified ratings. The sustainability, health and wellbeing elements explored include:

- Achieving the below minimum BASIX benchmarks:
  - **BASIX Energy 61%**
  - **BASIX Water 40%**
  - **7 Star NatHERS average across the whole development**
- Achieving Section J compliance for the designated RCF building
- Following a range of sustainability initiatives across the site including:
  - Use of **low-impact materials** and **minimisation of resources**
  - **Energy efficiency** design features
  - **Water efficiency** measures
  - Provision of high **indoor environment quality** (light, views, acoustics)
- Incorporation of a renewable energy system (on-site PV) and rainwater reuse systems;
- Implementing mitigation strategies for the Urban Heat Island Effect;
- Implementation of a Green Travel Pan and capacity of electric vehicles to reduce emissions from transport.

The strategies and initiatives presented in this report demonstrate a strong commitment to and are to be further developed during subsequent stages of the project.

2 INTRODUCTION

2.1 PROJECT OVERVIEW

The 222 Waldron Road & 138 Campbell Hill Road, Chester Hill development is a multi-building residential development with a, four, five and seven storey developments and a shared basement. The development will comprise of two building for aged care and one building dedicated for assisted living. The following spaces will compose the whole development:

- 101 residential apartments, comprising a mixture of 1, 2 and 3 bed apartments.
- Four retail tenancies in the basement.
- Residential communal areas including communal rooms, a gym, a cinema/multi-purpose room and rooftop gardens.
- A basement car park dedicated to residents and commercial tenants and motorcycle parking spaces.

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

Figure 1: Site Location (Source: Google Maps)

The site is surrounded by Waldron Road on the southern side and Campbell Hill Road on the western side. The trainline follows Waldron Road, with Chester Hill station being directly southwest of the site.

3 OVERALL ESD STRATEGY

3.1 EPA PRINCIPALS

The 222 Waldron Road & 138 Campbell Hill Road development will follow the golden standard in sustainability principles throughout the development. This includes the design, construction, and operational elements of the project. The key overarching principles 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 careful selection 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 Inter-generational Equity:

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

Project Response: The project is committed to incorporating careful selection 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, improving stormwater runoff from the site, and using integrated landscaping. Rainwater will be collected and used for irrigation, and low-impact refrigerants and insulants with zero ODP will be used throughout.

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 services.

Project Response: The project has committed to achieving 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 has committed to achieving 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. This impacts waste both created by the site, as well as upstream and downstream waste categories.

The above is 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.

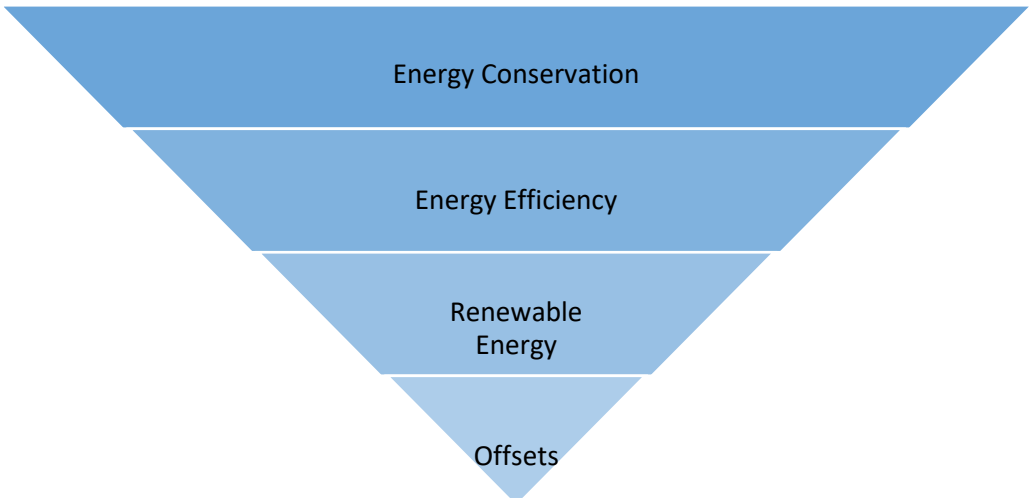
3.2 RESOURCES

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. As part of this, the project has elected to measure the consumption, so it can track and improve upon the performance. The strategy focuses on energy, water, and materiality to ensure resource use is appropriate.

3.2.1 ENERGY

The energy efficiency strategy generally follows the energy efficiency pyramid of design below. In the first instance, demand for Greenhouse gases (GHG) 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.

In addition to reducing GHG emissions, a large rooftop PV array will be installed to provide on-site renewable energy generation. This system will reduce the site's operational energy and GHG emissions. Only after all the above major steps have been completed should offsets be used to close the gap and achieve neutrality.



To achieve the above, the following initiatives are being implemented:

- **Detailed Modelling.** Complete detailed energy modelling of the site to understand the opportunities and threats to energy performance. This will allow the team to focus their works on the key energy-consuming elements in the design and improve the performance.
- **Thermally-Efficient Construction** – Insulation through the roof, walls, and floor, with proper sealing to reduce bulk airflow. Light-coloured roofing to reflect solar heat gains. Consideration of the height of the windows and overall window-to-wall ratio.
- **Metering and Monitoring –** separating commercial areas from retail and tenancy areas, including café, corridor spaces, external spaces, and car park areas.
- **Efficient Mechanical systems** with a full set of controls, designed to run through operational hours and not after hours. Control of airflow and restriction of simultaneous heating/cooling.
- **Water Efficient Fixtures and Fittings** - Low-flow showers and taps, which will reduce the hot water demand across the development associated with showering, sinks and hand basins.
- **Efficient Lighting Systems** – High-efficiency LED and fluorescent lighting in Base Building areas with an average power density well below the NCC requirements. Low-energy lighting system for all spaces.
- **Lifts** – High-performance class A Lifts to be provided with low energy consumption.

- **On-site Renewable Energy Generation** – A large rooftop PV array will be installed to reduce operational energy demand.
- **Electric Vehicle Parking Capacity** – The basement car park will provide the necessary infrastructure to accommodate the rise in electric vehicles and promote them within the community. This shift towards electric vehicles will prepare the site for a decarbonised future.

3.2.2 WATER CONSUMPTION

To achieve responsible water consumption, best practice water-saving initiatives will need to be implemented throughout the project.

- **Rainwater Collection and Reuse -** A rainwater tank using harvested rainwater for irrigation purposes reduces the site's water consumption. The size of the rainwater tank is subject to design development.
- **Sanitary Fixtures** - By implementing low-flow water fixtures, the water consumption associated with bathrooms, kitchens and laundries will be significantly reduced. All sanitary fixtures are to be provided to the WELS ratings identified below:
  - Kitchen Taps – 5 Star WELS
  - Bathroom Taps – 6 Star WELS
  - Toilet – 4 Star WELS
  - Showers – 4 Star WELS (<7.5 L/min)
  - Dishwashers – 5 Star WELS
- **Landscape Irrigation-** Landscape irrigation supply to be sourced from the on-site rainwater system resulting in low potable water demand. 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.

3.2.3 MATERIALS

In line with the principles 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** – The project is committed to achieving a minimum 90% diversion from the landfill target during demolition and construction. This diverts and ensures the reuse or recycling of a high portion of site waste.
- **Low VOC and Low Formaldehyde Materials** – Ensuring paints, adhesives, sealants, floor coverings, carpets and engineered wood are selected appropriately to provide a healthier and low-impact environment. Such efforts provide a cleaner and better environment for all.
- **Best-Practice PVC** – all 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 benefits 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** – all timber, including virgin and engineered timber through construction and fitout elements under the builder's control will endeavour to be specified as FSC/PeFC. This ensures the timber provided to the 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 in ongoing diversion from landfills for development.

3.3 COMFORT AND QUALITY

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

- **Visual Comfort** – Maximising high-quality light into the living spaces, with views to the sky and nature where possible. The north and east elevation has sweeping uninterrupted views as there is no high-rise in close vicinity.
- **Acoustic Excellence** – Designing the layouts of the apartments to be protected from noise from both the Pacific Highway and the train line. Delicate material selection, acoustic attenuation and designing the shape of the building and openings accordingly achieve the performance. Further, the 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 Burdon on the project.

3.4 MANAGEMENT AND SOCIETY

To provide a socially responsible development 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 on the Environment is achieved and the highest quality for the community and workers.
- **High-Quality Stormwater Runoff –** The design will be to ensure the peak stormwater runoff is 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 and Low GWP 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 spilling into the night sky, assisting with bird migratory patterns, and waste energy.
- **Natural Planting** – Use of a significant amount of natural planting around the site. This includes generous green areas on level 3 and the roof terraces. This assists with aesthetics, reduces urban heat island and improves the ecology of the site.
- **Green Cleaning** – Development of cleaning protocols for inside and outside the building that limit the damage to the environment. This includes pesticides, liquids and cleaners.
- **Green Travel Plan** – The development is located within walking distance of Chester Hill train station providing residents and staff with access to transport more environmentally friendly than personal motor transport. Additionally, the development will also provide electric vehicle parking spaces to promote the use of electric vehicles in place of petrol cars.

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

3.5 HEAT ISLAND MITIGATION

The Waldron Road & Campbell Hill Road site is located in a position that experiences a high level of urban heat island impact compared to its surroundings. The figure below shows the variation of temperature to a non-urban vegetated surface, such as a heavily wooded area. It can be seen that the site experiences temperatures over 7.0°C above a non-urban vegetated surface.

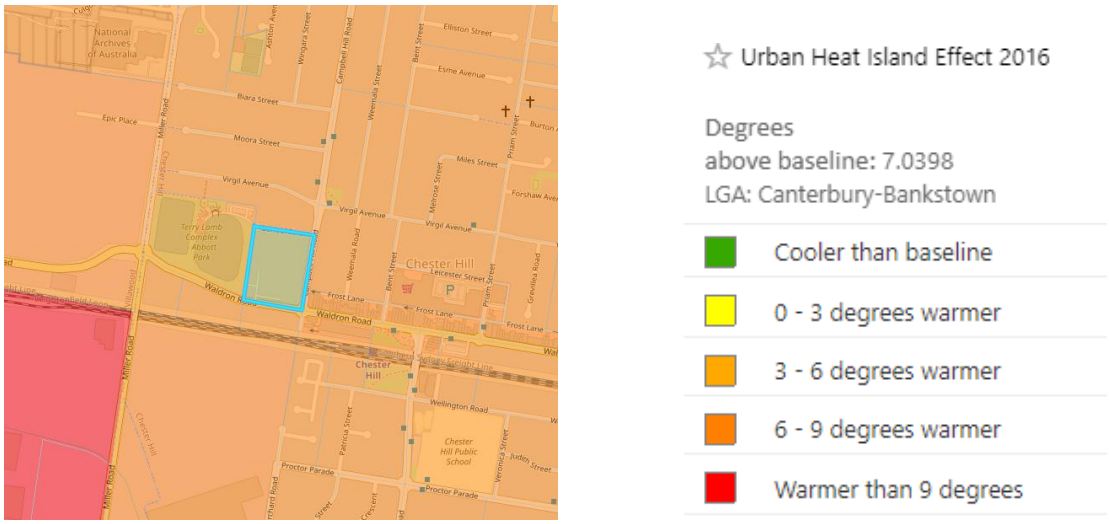


Figure 2:Urban Heat Island Effect (Source: SEED Database)

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

- Green roofs & gardens with drought-tolerant planting.
- Light-coloured external materials and roof.
- Planted Greenery around the development.

3.6 BASIX COMMITMENTS

BASIX is a legislative requirement for all residential dwelling types within NSW. 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 the thermal comfort of the dwelling.

This development will achieve the following BASIX targets:

- Water – 40%
- Energy – 61%
- 7 Star NatHERS Average across the whole development

4 CONCLUSION

This report provides an outline of the 222 Waldron Road & 138 Campbell Hill Road, Chester Hill Ecologically Sustainable Design (ESD) initiatives to be considered for the development.

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

- Achieving the BASIX benchmarks:
  - **BASIX Energy 61%**
  - **BASIX Water 40%**
  - **7 Star NatHERS average across the whole development**
- Achieving Section J compliance for the designated assisted living building
- Following a range of sustainability initiatives across the site including:
  - Use of **low-impact materials** and **minimisation of resources**
  - **Energy efficiency** design features
  - **Water efficiency** measures
  - Provision of high **indoor environment quality** (light, views, acoustics)
- Incorporation of renewable energy systems (on-site PV) and rainwater reuse systems;
- Implementing mitigation strategies for the Urban Heat Island Effect;
- Implementation of a Green Travel Pan and capacity for electric vehicles to reduce emissions from transport.

The strategies and initiatives presented in this report demonstrate a strong commitment to sustainability which meets and exceeds 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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