ESD Report

Botany Waste Management Facility

2 – 4 Hale Street, Botany, NSW 2019

Project No.	P00945
Revision	3
Issued	26 February 2024
Client	Coombes Property Group

E-LAB Consulting

Where science and engineering inspire design.

DOCUMENT QA AND REVISIONS

ISSUE	DATE	COMMENTS	ENGINEER	REVIEWER
1	12/01/2024	For Review	NA	AK
2	29/01/2024	For Review	NA	AK
3	26/02/2024	SSDA Issue	NA	AK

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Authorised by:

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Sustainability

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1 INTRODUCTION

1.1 EXECUTIVE SUMMARY

E-LAB Consulting has been engaged by Coombes Property Group to prepare this report in accordance with the technical requirements of the Secretary's Environmental Assessment Requirements (SEARs), and in support of the State Significant Development Application (SSD-62855708) for the proposed Waste Management Facility at 2 – 4 Hale Street, Botany, NSW 2019.

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:

- No gas on site to reduce fossil fuel consumption;
- On-site energy generation through a solar PV array on the roof to reduce operational energy and GHG emissions associated with the site;
- Water Sensitive Urban Design Principals being upheld;
- Targeting a 90% diversion of waste from landfill during demolition and construction;
- Water recycling through rainwater storage and reuse.
- Providing parking capacity for electric vehicles to prepare for a decarbonised future;
- Urban heat island effect mitigation strategies; and
- 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 of project towards sustainability in line with the Bayside Council development guidelines, Sustainable Buildings SEPP 2022 and are to be further developed during subsequent stages of the project.

1.2 PROJECT SITE OVERVIEW

The site is located at 2 – 4 Hale Street, Botany (Lot 1 DP 562374), within the Bayside Local Government Area (LGA). The site is located approximately 12 km south-west of the Sydney Central Business District (CBD). It is immediately adjacent (south-east) to Sydney Airport, and is sited near major roads including General Holmes Drive and Foreshore road. Mill pond and Mill Stream are less than 250m to the north and west of the site. Its immediate context is commercial and industrial development in nature, much of which is associated with operations of the Airport. The site has a large frontage to Hale Street, which provides vehicular access to the local road network.

The site is identified in the figure below.

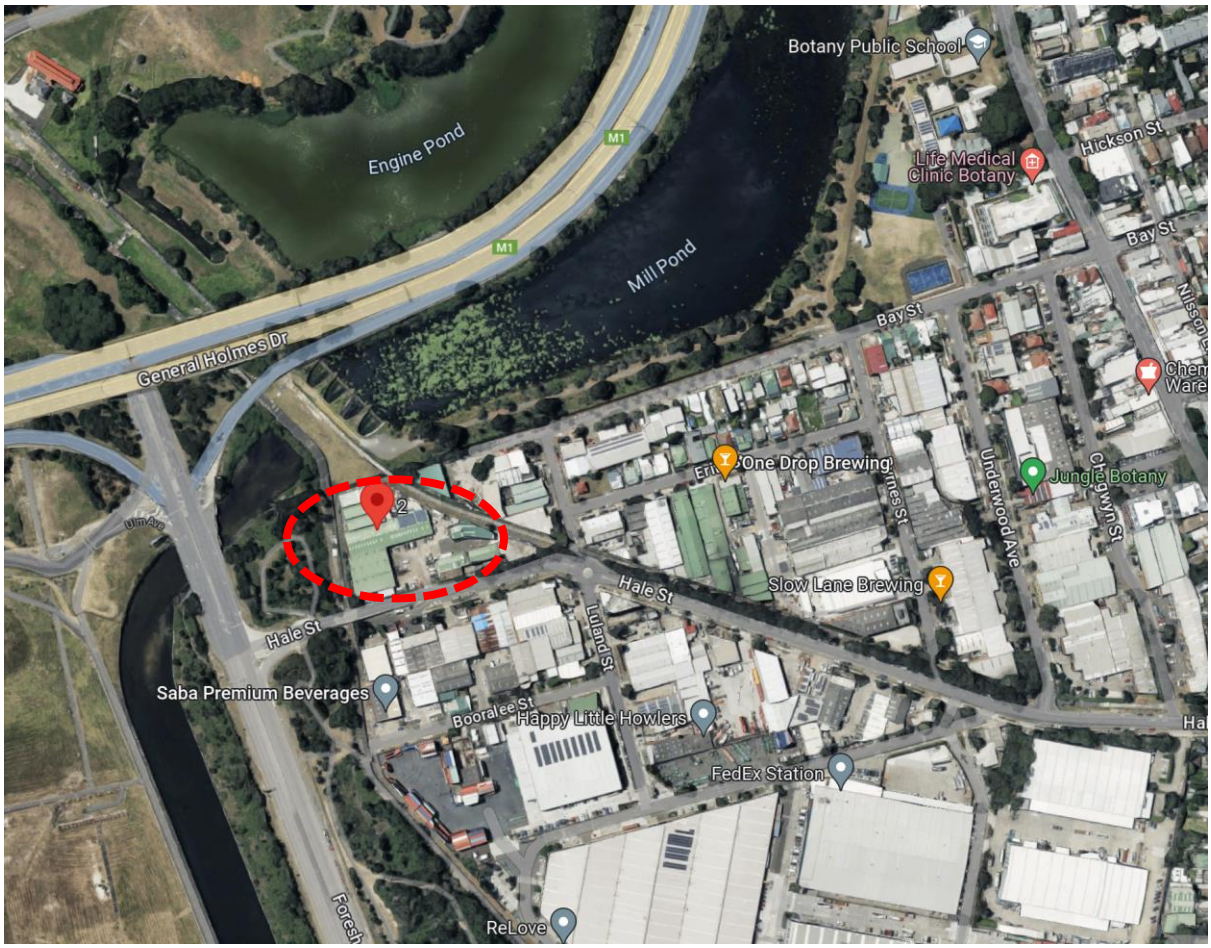


Figure 1: Subject Site (Source: Google Map)

1.3 PROJECT DESCRIPTION

CPG and KLF are proposing to develop a construction and demolition waste management facility at 2-4 Hale Street, Botany. The facility proposes to accept up to 300,000 tonnes per annum (tpa) of C&D waste and would operate as a waste transfer station with aggregation of material. Waste would be transported in bulk to an advanced resource recovery facility within the KLF group where more advanced sorting and recycling would be undertaken.

The project consists of the following:

- Demolition of existing buildings and hardstand area and construction of a waste management facility consisting of new hardstand, purpose-built warehouse, lunchroom, office and amenities which operates 24/7 hours. Key components include:
  - Estimated 300,000 tonnes per year
  - Combined GFA of 3,992.5sqm, consisting of:
    - Warehouse: 3,670sqm
    - Office: 260sqm
    - Gatehouse: 14.5sqm
    - Pump room: 48sqm
  - Vehicle access via Hale Street, including two new crossovers (one for cars and one for trucks)
  - On-grade car park of 13 spaces
  - In-ground weighbridges
  - New Substation

1.4 RESPONSE TO THE SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS (SEARS)

This report outlines how the development will address the SEARs as part of the Environmental Impact Statement. These are:

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.	This report outlines how ESD Principles (as defined in clause 7(4) of Schedule 2 of the EPA) are incorporated in the design and ongoing operations of the development.
Demonstrate how the development will meet or exceed the relevant industry recognised building sustainability and environmental performance standards.	Section 3.3 of this report outlines the substantial energy efficiency measures to minimise the development's greenhouse gas emissions including carbon emissions.
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.	Sections 3.2, 3.3 and 3.4 of this report outline how the development minimises its environmental impact through sustainable design and operation.

1.5 RESPONSE TO THE BAYSIDE DEVELOPMENT CONTROL PLAN (DCP) 2022

This report outlines how the development considered the Bayside DCP controls as described below and in Section 2.1 and Section 2.2. It should be noted that the Development Control Plan (DCP) is not applicable to the SSD project. The significant requirements of Bayside DCP controls lies on residential and commercial development, with the majority of Chapter 3 and relevant schedules not being relevant to industrial development. Following is the list of items:

1.5.1 Section 3.2 Design Excellence – Requirement C5

REQUIREMENT	RESPONSE
Provision of Solar Photovoltaic Cells on the rooftop designed to maximise the coverage of the non-trafficable roof space.	Refer to Section 3.2 Energy which describes the energy principles and the provision of PV systems.
Provision of Electric Vehicle (EV) charging within the parking facility.	Refer to Section 3.8 Sustainable Transport for detail on EV provisions.
Maximisation of non-potable stormwater re-use.	Refer to Section 3.3 Water.
Zoned and sensor-controlled lighting and air conditioning.	Refer to Section 3.2 Energy.
Use of LEDs and other low energy flicker free lighting resources.	Refer to Section 3.2 Energy.
Use of water saving appliances above and beyond BASIX requirements.	Not applicable to industrial development.
Provide ample recycling storage rooms.	Not applicable to industrial development/ Waste facility.

Extensive use of deep soil landscaping and planters on interior/exterior of the buildings including provision of green walls, green roofs where possible etc.	Refer to Section 3.3 Water and Section 3.6 Urban Heat Island Effect for detail on provision of landscaping introduced into the projected development.
Provide separate circuiting for temporary power to minimal stair and corridor lighting.	Refer to Section 3.2 Energy.
Consideration for adoption of sustainable building materials such as timber and the use of blast slag, fly ash or other pozzolan admixtures in concrete to minimise cement and reduce embodied carbon.	Refer to Section 3.4 Materials.
Mitigation of any environmental impacts such as urban heat island effect, overshadowing, wind, air quality and reflectivity.	Refer to Section 3.6 Urban Heat Island Effect and Section 3.7 Section J.

1.5.2 Section 3.3 Energy and Environmental Sustainability

REQUIREMENT	RESPONSE
Areas of glazing are located to avoid energy loss and unwanted energy gain.	Refer to Section 3.5 Comfort and Quality and Section 3.7 Section J. Refer to architectural drawings for further detail. Section J J1V3 approach will be conducted to ensure the development will be designed to high standards. It is only applicable to Conditioned area of the Office space in Waste facility. Main warehouse is excluded from Section J – Building Fabric assessment.
Development provides appropriate sun protection during summer for glazed areas facing north, west and east, whilst allowing for penetration of winter sunlight.	Refer to Section 3.5 Comfort and Quality and Section 3.7 Section J. Refer to architectural drawings for further detail.
Extensive areas of glazing that are unprotected from sun during summer are not permitted. Shading devices include eaves, awnings, balconies, pergolas, external louvers, and projecting sunshades. Unprotected tinted windows are not acceptable.	Refer to Section 3.5 Comfort and Quality and Section 3.7 Section J. Refer to architectural drawings for further detail. Section J J1V3 approach will be conducted to ensure the development will be designed to high standards.
Lighting for streets, parks and any other public domain spaces provided as part of a development should use energy efficient lighting such as LED lighting	Not applicable not part of development.
Ensure the location of windows, doors and internal layout of the building promotes air movement for cooling.	Refer to Section 3.5 Comfort and Quality and Section 3.7 Section J. Section J J1V3 approach will be conducted to ensure the development will be designed to high standards. It is only applicable to Conditioned area and refer to Office space in Waste facility. Main warehouse is excluded from Section J – Building Fabric assessment.

For all developments where BASIX is not applicable, the following water efficiency design elements must be included and demonstrated on the plans: **a. new or altered showerheads are to have a flow rate of no greater than 9 litres per minute or a 3 star or greater rating** **b. new or altered toilets are to have a flow rate no greater than 4 litres per average flush or a 3 star or greater rating** **c. new or altered taps must have a flow rate no greater than 9 litres per minute or 3 star or higher water rating**	Refer to Section 3.3 Water. Provision of WELS rated fixtures and fitting to ensure efficient water consumption.
Development is to be designed and constructed to reduce the need for active heating and cooling by incorporating passive design measures including design, location and thermal properties of glazing, natural ventilation, appropriate use of thermal mass and external shading, including vegetation.	Refer to Section 3.5 Comfort and Quality, Section 3.6 Urban Heat Island Effect and Section 3.7 Section J. Section J J1V3 approach will be conducted to ensure the development will be designed to high standards, this will include glazing properties, thermal insulation and other elements. It is only applicable to Conditioned area of the Office space in Waste facility. Main warehouse is excluded from Section J – Building Fabric assessment.
Rainwater tanks are to be installed for all non-residential developments, including major alterations and additions that have access to a roof form from which rainwater can be feasibly collected and plumbed to appropriate end uses.	Refer to Section 3.3 Water.
Industrial development over 20,000sqm GFA; Minimum 5-star Green Star rating or equivalent for Energy **Minimum 5-star Green Star rating or equivalent for Water**	Not applicable to development.
Buildings must comply with the following minimum ceiling heights to facilitate adequate natural lighting and ventilation as per DCP.	Refer to architectural drawings to meet minimum ceiling heights. Refer to Section 3.5 Comfort and Quality to ensure natural lighting is achieved along with ventilation strategies effective for building type.
Buildings must be designed to maximise opportunities for cross flow ventilation by providing clear breeze paths and shallow building depths. The maximum internal plan depth of a residential apartment should be 18m from glass line to glass line. Developments that propose greater than 18m must demonstrate how satisfactory daylight and natural ventilation is achieved.	Not applicable to industrial development/ Waste facility.
Windows that can open and which are designed to provide controlled air flow should be installed.	Naturally ventilated and mechanically assisted for spaces whereas office spaces are not controllable due to energy efficiency.

Buildings must have an adequate number of openings at each level to allow natural light and ventilation, including lift lobbies and entries.	Not applicable to industrial development/ Waste facility.
Office premises must be designed to receive natural light and ventilation. Office floor plates are to have a depth of no greater than 20m if dual aspect, or 10m if single aspect. Office spaces should be designed, through orientation and the inclusion of environmental control devices, to achieve maximum daylight without compromising the internal amenity through glare or heat gain from direct sunlight.	Refer to Section 3.5 Comfort and Quality. Office spaces have been selected on southern and eastern facades to receive daylight but minimise glare and thermal gain.
Each industrial unit within an industrial complex must have a reasonable size window at each level to allow natural light and ventilation.	Refer to Section 3.5 Comfort and Quality and Section 3.7 Section J. Section J J1V3 approach will be conducted to ensure the development will be designed to high standards, this will include glazing properties, thermal insulation and other elements. It is only applicable to Conditioned area of the Office space in Waste facility. Main warehouse is excluded from Section J – Building Fabric assessment.
On deep sites, courtyards and light wells should be provided on the lower levels of mixed use and commercial buildings to achieve natural lighting of every level and cross ventilation and/or stack effect ventilation.	N/A not part of development.
Section 3.3.3 Reflectivity	N/A
Section 3.3.5 Energy Assessment	N/A

2 SUSTAINABILITY FRAMEWORKS

The proposed development's sustainability outcomes are influenced by the following key frameworks:

- Bayside Council Local Environment Plan (LEP) 2021
- Bayside Council Development Control Plan (DCP) 2022
- Sustainability Buildings SEPP 2023
- Compliance with NCC/BCA Section J 2022

This development aligns with these values:

- Performance Standards for Net Zero Ready Energy Buildings
- Secretary's Environmental Assessment Requirements (SEARs)
- ESD principles outlined in the Environmental Planning and Assessment Regulation 2021

2.1 BAYSIDE COUNCIL LOCAL ENVIRONMENT PLAN (LEP) 2021

The Bayside Council LEP 2021 outlines the requirements for the development in accordance with the principles of sustainable development, which include:

- Conserves energy and reduces carbon dioxide emissions;
- Minimises embodied energy in materials and building processes;
- Optimises building design and orientation;
- Promotes energy efficiency and conservation;
- Conserves and reuses water;
- Minimises waste and promoting recycling; and
- Reduces vehicle dependence;

2.2 BAYSIDE COUNCIL DEVELOPMENT CONTROL PLAN (DCP) 2022

The Bayside Council Development DCP 2022 outlines the sustainable development objectives new developments in the City of Botany Bay must consider. In particular, Part 3.2 and Part 3.3 requires new developments to meet the following requirements:

- Minimises consumption of resources including non-renewable energy, water, waste, and soil;
- Construction of development minimises adverse impacts on the environment;
- Improves the comfort and health of resident, employee, and construction workers;
- Minimises pollution of air, soil, and water;
- Promotes environmentally sensitive design and construction of buildings; and
- Reduces energy bills and the lifecycle cost of energy services

It is important to highlight that the Development Control Plan (DCP) does not apply to the SSD project. Nonetheless, the Hale Street project has chosen to consider relevant provisions, demonstrating a commitment to progressing with a focus on sustainability.

2.3 SUSTAINABLE BUILDINGS SEPP 2022 FOR NON-RESIDENTIAL BUILDINGS

NSW has whole-of-economy targets to reduce greenhouse gas emissions by 50 per cent by 2030 compared to 2005 levels, and net zero emissions by 2050. Achieving these targets will require all new and existing buildings in NSW to be operating at net zero well before 2050. Energy efficiency, conserving potable water and improving thermal performance are also high priorities. State Environmental Planning Policy (Sustainable Buildings) - 2022 covers all types of buildings from residential to key types of non-residential by the policy.

New standards and reporting requirements apply for all non-residential developments. These measures are aligned with other NSW policies including the Net Zero Plan, Waste and Sustainable Materials Strategy 2041 and Climate Change Policy Framework.

While the projects is permitted with consent under the SEPP (Transport and Infrastructure) 2021 Chapter 5, it aims to explore incorporating relevant sustainability requirements in line with the Sustainable Buildings SEPP 2022 at the time of delivery. This approach ensures that a development works more towards sustainability and anticipates achieving Net Zero.

2.3.1 Performance Standards for Net Zero Ready Energy Buildings

In alignment with best practice, the development's commitment to sustainability, the project proposes to be ready for net zero carbon emissions. This includes the following strategies:

- Reducing energy loads and usage;
- On-site renewable energy through a large photovoltaic array; and
- Eliminating gas to remove fossil fuel consumption and prepare for a decarbonised grid.

2.4 COMPLIANCE WITH NCC/BCA SECTION J 2022

The proposed development will be subject to compliance with Section J under the NCC 2022 code. This code places strict environmental performance requirements on the building envelope and services within the building. Project requires to demonstrate compliance via Section J Part J4 (for both Building Fabric and Glazing) for Office space. The design of the building fabric will need to demonstrate compliance with Deemed-to-Satisfy (DTS) method, and demonstrating the installed products exceed these values.

3 PROJECT DESIGN RESPONSE

3.1 EPA PRINCIPLES

The proposed development is working towards a range of sustainability principles to enhance sustainability values through 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 2021. 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: a full environmental impact assessment has been conducted to identify any potential impacts of the project on the environment. The results of the assessment indicate that there is no threat of serious or irreversible damage to the environment arising from this project. The project is committed to incorporating elements to minimise impacts on the environment, as outlined below in this section of this report.

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 will plant the native vegetation to enhance the overall ecological and biodiversity of the site. However, it's important to note that the planting of bird-attracting vegetation is discouraged, as it poses an increased risk of wildlife strikes for aircraft. 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 is set to achieve a construction waste diversion rate of 90% and has crafted specific waste management strategies tailored to the nature of the project, which is a waste facility. These strategies align with the project's purpose to enhance sustainability for the environment. Furthermore, the project is engineered for energy efficiency and minimal water consumption, offering operators the added benefit of reduced utility bills as an incentive.

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 waste management strategies tailored to the waste facility. Construction materials will be chosen to be low impact in their manufacture, including best practice PVC and FSC/PeFC timber throughout where possible.

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.

GENERAL SUSTAINABILITY ACTIONS & 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 will measure the consumption, so it can track and improve upon the performance. The strategy focusses on energy, water and materiality to ensure resource use is appropriate towards sustainability.

3.2 ENERGY CONSUMPTION

The energy efficiency strategy generally follows the energy efficiency pyramid of design in Figure 2. In the first instance demand for greenhouse gases 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. PV will be installed at a rate that maximises the coverage of the non-trafficable roof area provided this does not interfere with the reflectivity in relation to the Sydney Airport. Only after all the above steps have been completed should offsets be used to close the gap and achieve neutrality.

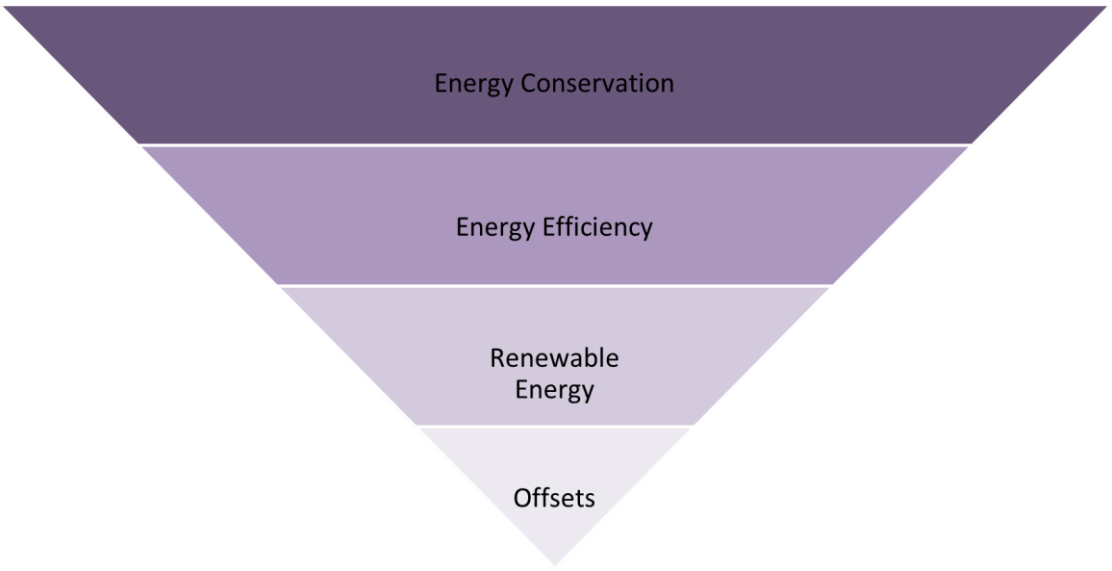
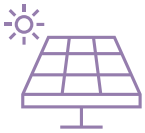


Figure 2. Energy efficiency pyramid: pathway to carbon neutrality.

To achieve the above, the following initiatives are proposed:

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. This is in keeping with the Bayside Council vision for the area.

The development committed to the only implement the energy-efficient equipment that running with occupancy and task control systems. These systems ensure that equipment and devices operate only when necessary, helping to optimise energy consumption.



Renewable Energy – The roof area provides an excellent opportunity for installation of a solar photovoltaic system. The sizeable system will generate renewable electricity to offset grid use and minimise stress on the grid at peak times. Photovoltaic (PV) panels will be installed to maximize coverage on the non-trafficable roof area. Additionally, a power factor correction system will be implemented to maintain the power factor of the site within the range of 0.99 to 1. This approach aims to optimise the utilsation of solar energy and ensure efficient power factor performance on the site.

Efficient Lighting Systems – Energy efficient LED lighting systems with occupancy/task-based lighting control system will be implemented. Project lighting complies with the recommendations of AS/NZS 1680 for internal lighting and AS/NZS 1158 for External lighting, respectively.

Controls, Energy Metering and Monitoring – Energy meters and monitoring systems will be provided to comply with NCC 2022 Section J requirements including lighting, power, air conditioning and hot water. Preference for natural ventilation and comfort through adaptive cooling and shading. Mechanical ventilation including heating and cooling and fan system in office area and also main waste facility space to be controlled effectively with bespoke controls and systems reducing energy consumption.

Hot Water – Hot water is likely to be provided by energy efficient heat pump systems. These systems are highly efficient and has the potential to be run off the solar PV system to reduce the operational carbon of the development.

Integration of Cool Roofing – Roofing with a high albedo (light color roof) will reduce Urban Heat Island effect and reduce load on the HVAC system.

3.3 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 – 5 Star WELS
- Urinals – 6 Star WELS
- Showers – 3 Star WELS

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. 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, helping to mitigate climate change.

Recycled water and rainwater – the development will provide a 60kL RWT system to maximize rainwater reuse through irrigation, trucks wheel washdown and warehouse dust suppression. Rainwater will be captured from the roof of the buildings to reduce potable water demand. Additionally, stormwater re-use to be considered where possible to maximize usage which can be incorporated into landscape irrigation as well.

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

3.4 MATERIALITY

The production of building materials can have serious impacts on the environment and occupants. Energy is used to extract, produce, and transport materials; natural resources are exploited, and pollution is created in their production. The production of building materials can have serious impacts on the environment. Further, dangerous materials can present health risks to occupants. The material impact is reduced by limiting the quantities of virgin building materials and choosing the least harmful when using materials. This report encourages strategies to minimise resource intensive 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:

- **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 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.
- **Sustainable Concrete** – where possible deemed practical, concrete to implement sustainable mixtures of cement such as fly ash or blast slag to reduce embodied carbon.

3.5 COMFORT AND QUALITY

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

- **Visual Comfort** – Maximising high-quality light into spaces, with views to the sky and nature where possible.
- **Acoustic Comfort** – Designing the waste facility layout to reduce noise emission to outside. In addition, the project has undertaken a Noise and Vibration Impact Assessment to examine the potential impacts associated with noise emissions during construction and operation. Any mitigation measures required as part of the NVIA will be incorporated into the project.

- **Thermal Comfort** – Appropriate mix of vernacular design, overhangs, adaptive comfort and high levels of insulation in the roof and facades to office area. Adaptive cooling will be integrated into the design based on project needs and high-occupancy spaces.
- **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. However, planting will be considered where required in respect of Airport Safeguarding to avoid bird attracting plant selections.

3.6 URBAN HEAT ISLAND MITIGATION

Integrating climate resilience strategies into building design and operations to ensure preparedness for extreme weather events and changing climate conditions. Project site is located in a position that experiences a high level of urban heat island impact compared to its surroundings. Figure below shows the variation of temperature to non-urban vegetated surface, such as a heavily wooded area. The site experiences temperatures of 6-9°C above a non-urban vegetated surface baseline.

In response to the fact Sydney is getting hotter, especially in the Bayside Council, being ranked the lowest for urban forest cover in Sydney in 2022. The site's baseline heatwave temperature experiences peaks approx. 7.2°C above the baseline, as defined by the NSW government for Urban Heat Island Effect (https://geo.seed.nsw.gov.au/Public_Viewer).

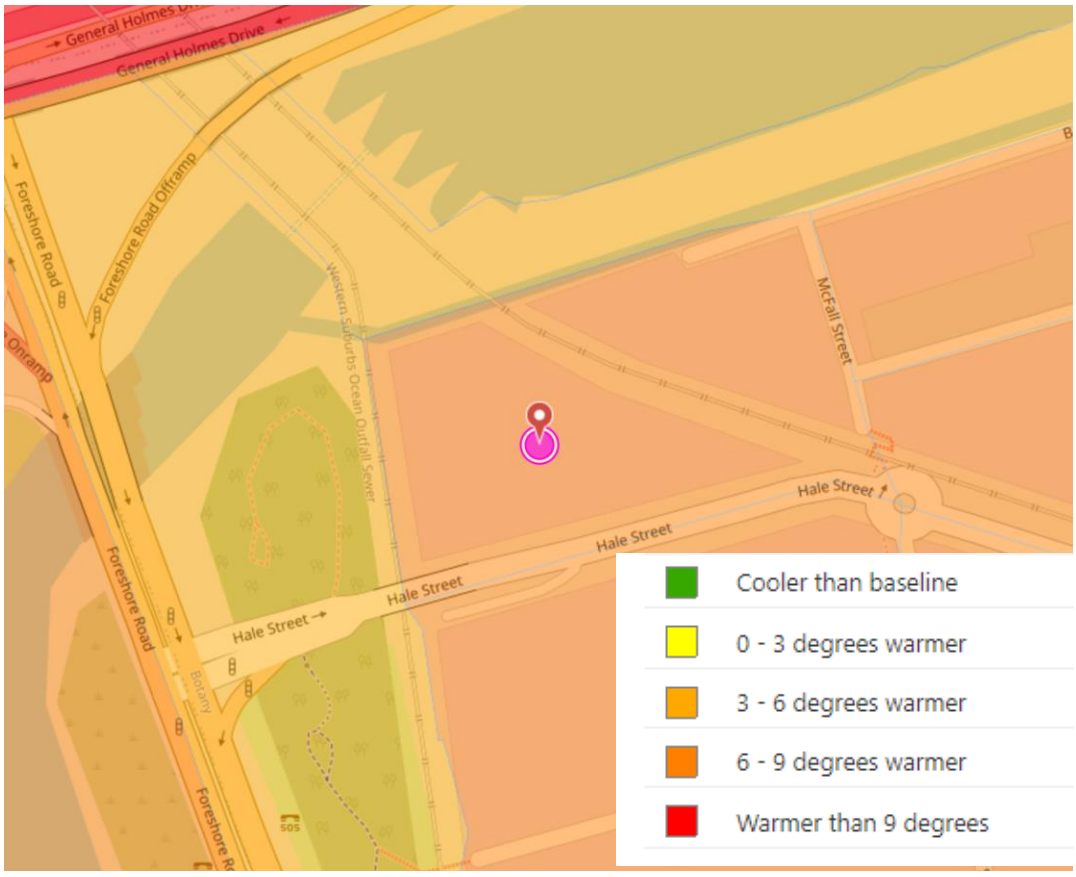


Figure 3. Urban heat island effect at the site. (Source: SEED Database)

To minimise the urban heat island effect and provide a more comfortable environment for employers/occupants, the development has incorporated the following initiatives:

- Keep the existing vegetation on site where possible

- Light coloured external materials and roof; and
- Design to have the minimum façade opening

3.7 SECTION J COMPLIANCE

All new developments in Australia are required to comply with the minimum energy performance requirements set out in the National Construction Code. The relevant component is known as “Section J” which addresses energy efficiency.

The non-residential components of development will be subject to compliance with Section J under the NCC 2022. This code places strict environmental performance requirements on the building envelope and services within the building.

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

- Non-Residential areas
- Conditioned Spaces

Section J – J4 is only applicable to Conditioned area and refer to Office space in Waste facility. Main warehouse is excluded from Section J – Building Fabric assessment.

The project will demonstrate compliance via Section J Part J4 (for both Building Fabric and Glazing). The design of the building fabric will need to demonstrate compliance with Deemed-to-Satisfy (DTS) method, and demonstrating the installed products exceed these values.

The following specification is expected to be required in project to comply with Section J4 & J5 in the façade. This below is based on the proposed system detailed in the design brief and is subject to change:

ELEMENT	PERFORMANCE
Façade Glazing	U-Value = 3.5, SHGC = 0.30

ELEMENT	PERFORMANCE (TOTAL R-VALUE)
External Solid Wall Elements	R-Value = 1.4
Internal Walls between Conditioned and Unconditioned	R-Value = 1.4
Exposed Roof	R-Value = 3.7
Internal Floor Between Conditioned and Unconditioned	R-Value = 2.0
Exposed Suspended Floor	R-Value = 2.0

The above performance will likely achieve the overall performance values for Section J.

3.8 SUSTAINABLE TRANSPORT

The development will provide easy access to bus stops and the Mascot train station**.** From here, there is easy access to Sydney’s extensive public transport network.

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.

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

Electric Vehicle Infrastructure - Project is supportive of the transition to electrification in transport. Carspace with EV charging infrastructure is provided in project.

3.9 RENEWABLE ENERGY

Photovoltaic (PV) renewable energy enables the waste facility development to produce emissions-free electricity directly at the location of usage, thereby reducing the energy and environmental impacts of the project. The development is maximizing the potential of the PV system to achieve the maximum system size.

3.10 WASTE MANAGEMENT

3.10.1 Construction Waste

Construction and demolition waste are becoming much easier to recycle as the traditional landfill evolves into waste recovery centres, which are able to recycle the majority of all construction and demolition waste. The development will achieve a minimum of 90% recycling for the construction and demolition waste produced. Construction waste will be managed through contractual requirements outlining the target recycling rate.

3.10.2 Operational Waste

Operational waste, generated in day-to-day operations, can be effectively minimized through efficient sorting methods. This development, being a waste facility by nature, aligns with this goal. The facility concentrates on sorting construction and demolition waste to enhance material recycling and reduce landfill usage. In the office area, the two bins expected to receive the most use are designated for general waste and paper recycling.

3.11 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 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 consistent with the relevant authority requirements - including flood storage or onsite detention as determined by the relevant authority. This water will be treated to ensure low levels of Nitrogen, Phosphorus, Gross Pollutants and Total Dissolved Solids enter the stormwater system. Project stormwater treatment assessment is undertaken to best practise & Bayside Council Requirements.
- **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 spill into the night sky, assisting with bird migratory patterns and wasted energy.
- **Natural Planting** – Use of natural planting around the site where appropriate. This assists with aesthetic, reduces urban heat island and improves the ecology of the site.

4 CONCLUSION

This report provides an outline of the proposed development's Ecologically Sustainable Design initiatives and commitments. The ESD strategies proposed will assist the development in achieving high levels of sustainability and environmental performance. These strategies include:

- No gas on site to reduce fossil fuel consumption;
- Provide on-site energy generation through a solar PV array on the roof to reduce operational energy and GHG emissions associated with the site;
- Water Sensitive Urban Design Principals being upheld;
- Targeting a 90% diversion of waste from landfill during demolition and construction;
- Water recycling through rainwater storage and reuse.
- Providing parking capacity for electric vehicles to prepare for a decarbonised future;
- Urban heat island effect mitigation strategies; and
- 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 of project towards sustainability in line with the Bayside Council development guidelines, Sustainable Buildings SEPP 2022 and are to be further developed during subsequent stages of the project.