Honeman Close, Warehouse Facility Huntingwood – SSD 79500208

Sustainability Management Plan

Goodman Property Services (Aust) Pty Ltd

1-11 Hayes Road
Rosebery NSW 2018

Prepared by:

SLR Consulting Australia

SLR Project No.: 610.032326.00001

21 March 2025

Revision: 02

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
02	21 March 2025	Dr Neihad Al-Khalidy	Mark Hobday	Dr Neihad Al-Khalidy
01	26 February 2025	Dr Neihad Al-Khalidy	Mark Hobday	Dr Neihad Al-Khalidy
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Basis of Report

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Goodman Property Services (Aust) Pty Ltd (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

Executive Summary

SLR Consulting Australia Pty Ltd (SLR) has been engaged by Goodman Property Services (Aust) Pty Ltd to prepare a Sustainability Management Plan (SMP) to accompany a State Significant Development (SSD) application for the development at Honeman Close, Huntingwood.

The site is zoned IN1 General Industrial under the provisions of the State Environmental Planning Policy. The developable site area is 209,307 m^2.

This report has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) and accompanying cover letter issued for the Project (SSD-79500208) dated 31 January 2025. Specifically, this report has been prepared to respond to the SEARs requirement issued pertaining to Ecologically Sustainability Design (ESD).

This study has been prepared in accordance with the following Secretary's Environmental Assessment Requirements (SEARs):

- 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.
- Demonstrate how the development will meet or exceed the relevant industry recognised building sustainability and environmental performance standards.
- 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.
- If Chapter 3 of SEPP (Sustainable Buildings) 2022 applies:
    - Demonstrate how the development has been designed to address the provisions set out in Chapter 3.2(1).
    - Provide a NABERS Embodied Emissions Material Form to disclose the amount of embodied emissions attributable to the development in accordance with the section 35BA of the EP&A Regulation.

The principal objective of this Sustainability Management Plan is to identify all potential energy savings that may be realised during the operational phase of the project, including a description of likely energy consumption levels and options for alternative energy sources such as PV solar power.

A BCA Sections J Deem-to-Satisfy compliant building is the baseline for energy consumption savings. BCA Section J provides the minimum requirement for energy efficiency, and it is expected that the proposed development will operate energy efficiently via:

- A PV solar system of at least 1,275 kW has been proposed.
    - The proposed 1,275 kW PV solar system will offset approximately 1,768.4 MWh/year of energy usage
    - The estimated greenhouse gas CO_2 emission saving is approximately 1,326,319 $kgCO_2$/annum
- Solar Hot water systems implemented in staff amenities, including toilets, lunchrooms and cleaners rooms;

- Daylight-controlled LED lighting for the warehouse instead of metal halide, resulting in a considerable energy reduction and reduced maintenance;
- Motion sensors to all LED lights within the warehouse and offices;
- Translucent roof sheeting to warehouse areas;
- Roof and external wall insulation as per the NCC requirements; The following recommendations are made to minimise cooling and heating loads for the conditioned areas:
    - All external walls have a total R-value of R2.8
    - All internal walls to unconditioned space have a total R-value of R2.1
    - Concrete/Metal roof with insulation, Total R-value= R3.7 to all airconditioned areas.
    - High-performance glazing system (glass and frame) with U value & Solar Heat Gain Coefficient (SHGC) as follows:
        - Maximum U-Value: 4
        - SHGC: 0.4
- Passive solar design for external outdoor areas;
- Efficient air conditioning system;
- Air-conditioning control zoning is recommended where necessary to cater for varying occupancy rates, orientation to solar loads, etc. Also, a time clock is provided with provision for after-hours override;
- Power sub-metering to enable continued review of power consumption for the offices and warehouse;
- Selection of endemic and low-maintenance landscaping species;
- The project is committed to achieve a 40% reduction in average annual stormwater discharge;
- 150 kL rainwater tanks for rainwater harvesting and re-use for landscape irrigation and toilet flushing;
- Low flow fixtures and fittings, including at least 4-star taps and shower heads;
- Low VOC paints, carpet, and sealant for all offices;
- 16 parking spaces are dedicated to electric cars with charging stations proposed (10 Bays for Warehouse 1 and 6 Bays for Warehouse 2);
- Low carbon construction materials, including 15% replacement of cement with fly ash;
- More than 90% of the predicted construction waste arising from the development will be reused;
- Bicycle parking; and
- Other measures as detailed in this report.

By implementing all lighting energy efficiency measures described in Section 6 of this report, the proposed building will likely achieve a 112.5% GHG emission reduction with the proposed PV solar system when compared with the NCC Reference Building.

By installing 4-star rated toilets, urinals, and taps and the proposed rainwater harvesting facility, the proposed development will reduce its potable water demand by approximately 45%.

A detailed response to SEARS requirements is summarised in the table below.

Item for inclusion	Action and Report Location
• 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.	Section 4.1 details how ESD principial as demined in clause 7 (4) of Schedule 2 of the Environmental Planning and Assessment Regulation 2000 (reproduced in Clause 193 of the 2022 revision of the regulation) and up to date legislation are being incorporated in the design, construction, and operation phases of the project. In terms of Precautionary Principle, the project does not present threat of serious or irreversible environmental damage. The project conducted all required environmental studies and incorporated adaptability and resilience measures in the design. Inter-generational equity, the health, diversity and productivity of the environment are enhanced for the benefit of future generations via a number of initiatives including large PV solar installation, sustainable materials, reduced waste, reduced heat islands, etc. Refer **Section 5.1** for all other initiatives. From a conservation of biological diversity and ecological integrity perspective, the project satisfies all environmental and statutory provisions requirements and will maintain the existing ecological structures (species and ecosystems, etc) for the proposed site and provide additional native vegetation planting and reduced stormwater runoff the site. The project is committed to achieve a 40% reduction in average annual stormwater discharge. Environmental goals have been established and achieved using recognised rating tools. A Quantity Surveyor will be engaged to ensure that the project will remain on budget and all sustainability measures in the current study are implemented. The proposed ESD initiatives will help to achieve significant reductions in the energy, waste and water required by the development both in building and operation and will deliver improved valuation and beneficial outcome.

Item for inclusion	Action and Report Location
• Demonstrate how the development will meet or exceed the relevant industry recognised building sustainability and environmental performance standards.	Section 4 to Section 7 detail how the project exceeds relevant industry recognised building sustainability and environmental performance standards through the implementation of best design principal and a wide range of ESD initiatives including renewable energy to offset the site energy use and reduce peak demand on electricity supply infrastructure.
• 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 Section 5 and Section 6 of the report. By implementing all energy efficiency measures described in Section 5, including the proposed PV solar system, the project will significantly minimise greenhouse gas emissions, reflecting the goal of achieving net zero emissions. • The proposed 1,270 kW PV solar system will offset approximately 1,786.4 MWh/year of energy usage. • The project is predicted to achieve a 112.5% GHG emission reduction with the proposed PV solar system when compared with the NCC Reference Building. Refer Section 5
• If Chapter 3 of SEPP (Sustainable Buildings) 2022 applies: ○ Demonstrate how the development has been designed to address the provisions set out in Chapter 3.2(1). ○ Provide a NABERS Embodied Emissions Material Form to disclose the amount of embodied emissions attributable to the development in accordance with the section 35BA of the EP&A Regulation.	The following design considerations have been implemented to address Chapter 3.2.(1) of SEPP 2022: • More than 90% of the predicted construction waste arising from the development will be reused (on-site or at another development) or recycled offsite. Refer Section 5.1, Page 22 • The reliance on artificial lighting and mechanical ventilation has been reduced via Translucent roof sheeting to warehouse areas, passive design, outdoor seating area and control systems. • The peak demand for electricity is significantly reduce via a proposed 1,275 kW PV solar system. • To enable effective review of energy usage by the project, sub-metering will be implemented for all major energy consuming processes or items of equipment including warehouse lighting, warehouse power, Office lighting, Office power and Office HVAC. The facility manager will ensure all monitoring and audit results are well documented and carried out as specified in the current Sustainability Management Plan (Refer Section 6). • By implementing all water efficiency measures described in Section 6, including 4-star rated toilets, urinals, and taps and the proposed rainwater harvesting facility, the proposed development will

Item for inclusion	Action and Report Location
	reduce its potable water demand by approximately 45%.

It is recommended that ESD initiatives continue to be developed and implemented during the detailed design stage of the project.

In conclusion, the relevant ESD initiatives and Energy Efficiency measures outlined in this report are incorporated into the proposed building and development details. The proposed ESD initiatives will help to achieve significant reductions in the energy required by the development both in building and operation.

Building tuning will be conducted by the builder, and SLR recommends that quarterly reviews of actual building energy and water consumption be carried out once the warehouses are operational to check the actual energy usage and energy savings and verify that all systems are performing at their optimum efficiency. This will provide an opportunity for the systems to be tuned to optimise time schedules to best match occupant needs and system performance while satisfying the sustainability target for the project.

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1.0 Introduction

A state significant development application (SSDA) has been prepared in support of a two-warehouse development at Honeman Close, Huntingwood. The site is in Blacktown City Council area, approximately 5 km south of the Blacktown CBD and 11 km west of the Parramatta CBD.

The site is zoned IN1 General Industrial under the provisions of the State Environmental Planning Policy (Western Sydney Employment Area) 2009 (WSEA SEPP). The developable site area is 98,131 m^2.

This report has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) and accompanying cover letter issued for the Project (SSD-79500208) dated 31 January 2025. Specifically, this report has been prepared to respond to the SEARs requirement issued pertaining to Ecologically Sustainability Design (ESD).

The ESD report has been prepared in a standard form considering the following aspects of the development.

- Identify how ESD principles are incorporated in the design and ongoing operation of the development.
- Demonstrate how the development will meet or exceed the relevant industry recognised building sustainability and environmental performance standards.

The initiatives suggested throughout this report have been included as opportunities for the project team to adopt ESD initiatives that provide both direct and indirect benefits to the proposed development.

1.1 Objectives

The specific objectives of this plan are as follows:

- To encourage energy use minimisation through the implementation of energy efficiency measures;
- To promote improved environmental outcomes through energy management;
- To ensure the appropriate management of high energy consumption aspects of the Project;
- To identify energy savings procedures for overall cost reduction, greenhouse gas emission reduction and effective energy management;
- To assist in ensuring that any environmental impacts during the operational life of the development comply with DPHI's development consent conditions and other relevant regulatory authorities; and
- To ensure the long-term sustainability of resource use through more efficient and cost-effective energy use practices for the life of the development.

In addition, this report also aims to provide an overview of recommendations on potential ESD initiatives that can be implemented. In particular, the project is required to respond to the SEARs requirement as outlined in the **Table 1** below:

Table 1 ESD Requirements as per SEARs - SSD-79500208

8. Ecologically Sustainable Development (ESD)
• Identify how ESD principles (as defined in section 193 of the EP&A Regulation) are incorporated in the design and ongoing operation of the development.
• Demonstrate how the development will meet or exceed the relevant industry recognised building sustainability and environmental performance standards.
• 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.
• If Chapter 3 of SEPP (Sustainable Buildings) 2022 applies:
  ○ demonstrate how the development has been designed to address the provisions set out in Chapter 3.2(1).
  ○ provide a NABERS Embodied Emissions Material Form to disclose the amount of embodied emissions attributable to the development in accordance with section 35BA of the EP&A Regulation.
	• ESD Report
	• NABERS Embodied Emissions Materials Form

1.2 Site Description

The subject site is a 20ha greenfield development site located at Honeman Close, Huntingwood. The site comprises the following:

- Lot 1 in DP 1098102 – to facilitate the proposed two warehouse and distribution centre buildings with ancillary offices zoned IN1 General Industrial
- Great Western Highway, Lot 16 & 19 in DP1024111, and Lot 19 in DP819317 – to facilitate intersection upgrade works and formal access, zoned both SP2 Classified Road and IN1 General Industrial

The broader site is located to the north of the M4 Motorway, West of Reservoir Road, and South of Great Western Highway.

The site is affected by the following constraints that have all been considered as part of the masterplan and assessment reports for the site;

- State and Local Heritage classification of Honeman Close
- Threatened Ecological Communities / Serious and Irreversible Impact (SAII) entities;
- First and Second Order watercourse's
- TrfNSW Crash lab design consideration for access
- Sydney Water Potable Water Service
- Aboriginal Heritage artefacts
- Contamination (Compromising of Friable & Non-Friable Asbestos and Septic Tank contamination)

This application seeks approval for the construction, operation, use and fit-out approval of two warehouses spanning 52,935 m^2 GLA and associated infrastructure and lead-in works.

Approval is sought for 24/7 operation of the proposed Warehouse and Distribution use.

The development is proposed to be constructed in one stage and will generally consist of the following scope:

- Infrastructure and Lead-in Works
  - Estate wide infrastructure and preparation works including vegetation clearing, bulk earthworks and remediation, watercourse realignment, retaining walls, internal services reticulation;
  - Lead in services including stormwater, sewer, potable water, electrical and communications.
  - New Left in, left out intersection at Great Western Highway / new proposed estate road including services relocation and eventual dedication;
- Warehouse with ancillary office development.
  - Construction, operation, fit-out and use of two warehouses, totalling 52,935 sqm GLA of warehouse, including ancillary office spaces, access and hardstand, guardhouses, loading bays, landscaping, car parking, electric vehicle charging, solar panels and signage;
  - Warehouse proposed height limit of 15m
  - 24/7 operation
  - Warehouse and distribution use with generic racking layout

An aerial image of the site showing its location is shown in **Figure 1** below.

Figure 1 Site Location

A 3D image of the porposed develoment is shown in **Figure 2**

Figure 2 Site Image

1.3 Overall Building Areas

The overall building areas are outlined in **Table 2**.

Table 2 Lot 1 DP 1098102 Honeman Close, Huntingwood

Location	Lot 1, DP 1098102
Warehouse 1	30,455 m^2
Warehouse 2	10,726 m^2
Office and Dock Office	2,205 m^2
Landscaped Area	108,444 m^2
Carparking Warehouse 1	211
Carparking Warehouse 2	118

Further details of the proposed development are shown in **Figure 3** to **Figure 6**

Figure 3 Site Plan

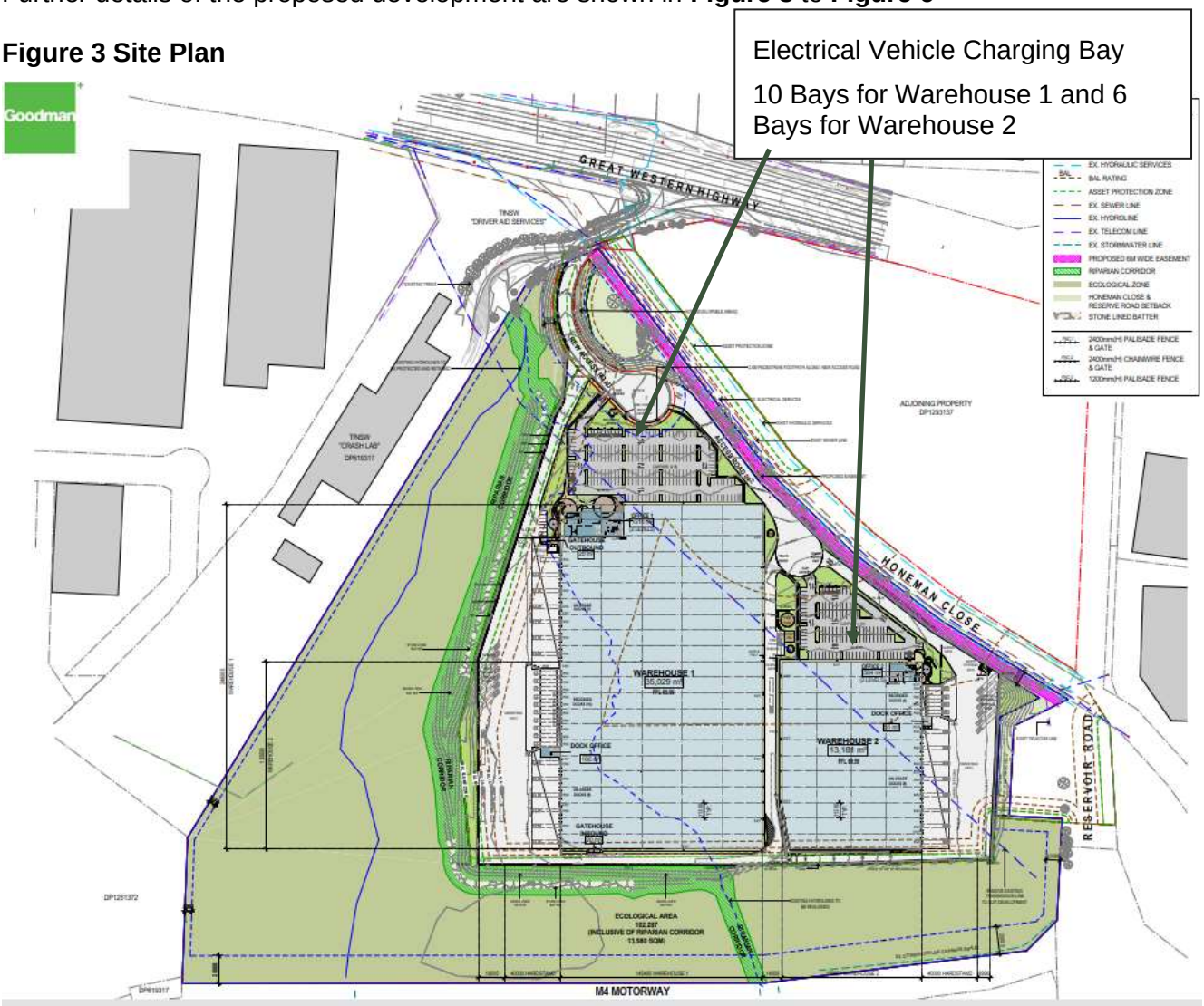
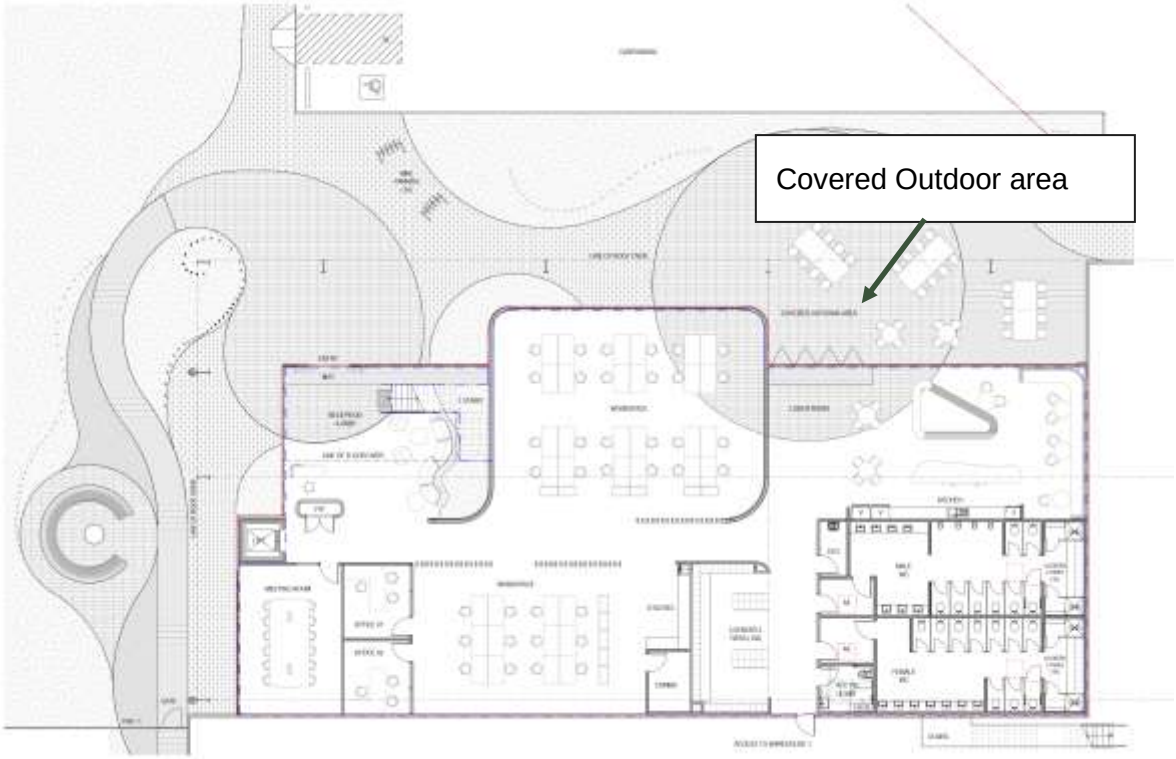


Figure 4 Office 1

Ground Level



Level 1

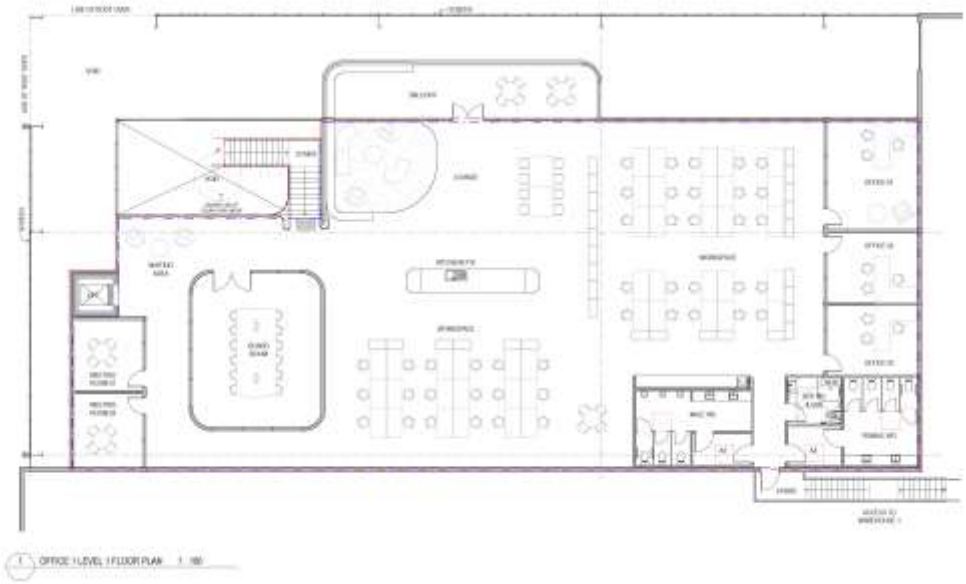


Figure 5 Office 2

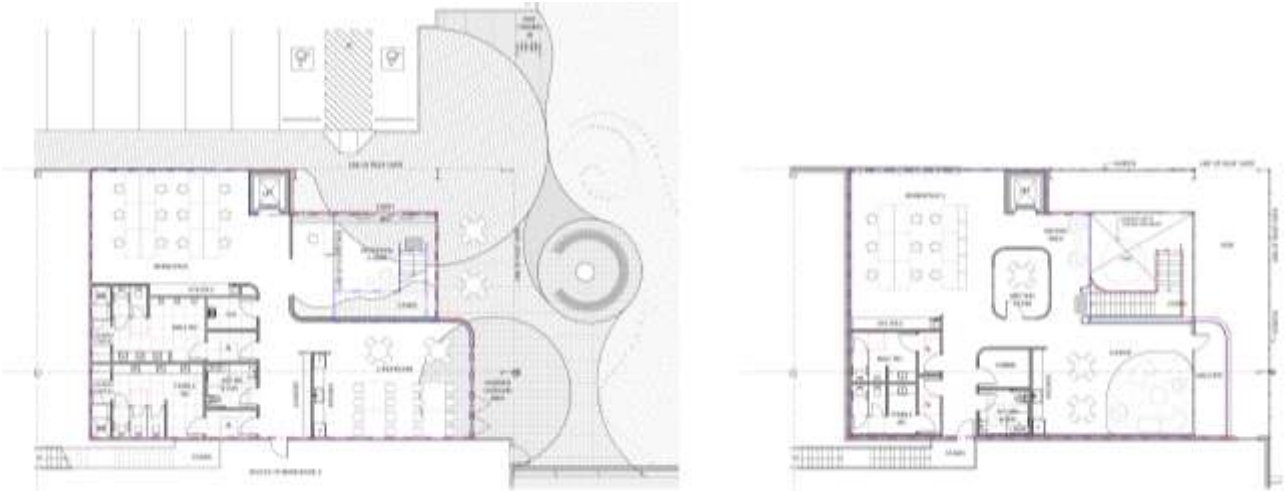


Figure 6 Dock Offices and Gatehouse

2.0 Ecologically Sustainable Design

The concept of Ecologically Sustainable Development (ESD) was outlined in “Our Common Future”, the report of the 1987 United Nations World Commission on the Environment and Development (the Brundtland Commission). It defined Sustainable Development as,

> “Development that meets the needs of the present without compromising the ability of future generation to meet their own needs”.

This concept was adopted within Australia in 1990 when the Council of Australian Governments endorsed a National Strategy for Ecologically Sustainable Development. The Commonwealth Government suggested the following definition for ESD in Australia:

> “Using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased”.

Put simply, ESD is development which aims to meet the needs of Australians today, while conserving our ecosystems for the benefit of future generations. To do this, it is necessary to develop ways of using those environmental resources which form the basis of our economy in a way which maintains and, where possible, improves their range, variety and quality.

The National Strategy for Ecologically Sustainable Development notes that there is no identifiable point where it can be said that ESD has been achieved. The strategy further states that there are two main features which distinguish an ecologically sustainable approach to development:

- We need to consider, in an integrated way, the wider economic, social and environmental implications of our decisions and actions for Australia, the international community and the biosphere; and
- We need to take a long-term rather than short-term view when taking those decisions and actions.

National Strategy for ESD Objectives and Guiding Principles are elaborated below.

The National Strategy for ESD sets its core objectives as:

- To enhance individual and community well-being and welfare by following a path of economic development that safeguards the welfare of future generations.
- To provide for equity within and between generations.
- To protect biological diversity and maintain essential ecological processes and life-support systems.

The Guiding Principles of the National Strategy for ESD are documented as:

- Decision making processes should effectively integrate both long and short-term economic, environmental, social and equity considerations.
- Where 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.
- The global dimension of environmental impacts of actions and policies should be recognised and considered.
- The need to develop a strong, growing and diversified economy which can enhance the capacity for environmental protection should be recognised.
- The need to maintain and enhance international competitiveness in an environmentally sound manner should be recognised.

- Cost effective and flexible policy instruments should be adopted, such as improved valuation, pricing and incentive mechanisms.
- Decisions and actions should provide for broad community involvement on issues which affect them.

These guiding principles and core objectives need to be considered as a package. No objective or principle should predominate over the others. A balanced approach is required that considers all these objectives and principles to pursue the goal of ESD.

2.1 Specific Requirements for Compliance

Specifications for environmental design measures required for the proposed site are detailed below:

2.1.1 Mandatory ESD Measures for Consideration

2.1.1.1 SEARS requirements

As per the Planning Secretary's Environmental Assessment Requirements, the ESD controls of the project are to:

- 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.
- Demonstrate how the development will meet or exceed the relevant industry recognised building sustainability and environmental performance standards.
- 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.
- If Chapter 3 of SEPP (Sustainable Buildings) 2022 applies:
    - Demonstrate how the development has been designed to address the provisions set out in Chapter 3.2(1).
    - Provide a NABERS Embodied Emissions Material Form to disclose the amount of embodied emissions attributable to the development in accordance with the section 35BA of the EP&A Regulation.

2.1.1.2 National Construction Code

The project is also required to comply with the energy efficiency requirements of National Construction Code Section J requirements.

The following sections elaborate on the various ways the project responds to the above controls and requirements. Recommendations have also been made to go over and beyond minimum requirements and this will be evaluated as the design progresses.

3.0 OPERATIONAL ENERGY MANAGEMENT

Ineffective energy management for industrial and commercial premises can lead to unnecessary growth in greenhouse gas emissions and natural resource consumption. Effective energy management reduces costs using energy efficiency measures and improves environmental outcomes locally, regionally, and globally.

Effective energy management is achieved through the implementation of a Sustainability Management Plan (SMP) for the operational life of the Project.

3.1 Identified Major Energy Use Components

The major energy use components of the Project Site are identified below based on information available in the Project Design Brief.

- Lighting (include natural and artificial lighting);
- Air Conditioning; and
- Power.

3.2 Energy Sources

The main source of energy for the proposed site is electricity.

4.0 SUSTAINABILITY MEASURES COMMITMENTS

4.1 Documentation

The documentation used in this report is listed in **Table 3**.

Table 3 Project Documentation Sources

	Filename
Site Drawings and Photos	24267_Site and Warehouse Plan, DA050, Revision G, 21/03/2025 24267_Combined Drawings (DA00, DA011, DA012, DA100, DA200-204, DA300, DA 304 and DA 400), Revision C, 19/02/2025
Specification	Goodman Base Building Specification

Energy Efficiency measures have been recommended and approved for project implementation and have informed the sustainability assessment of this project – they are listed in **Table 4**.

Table 4 ESD Assessment Summary

Category	Objective	Proposed Target	Proposed Strategy	Commitment	Comment
Design & Management	• Documentation of design intent and expected outcomes. • Appropriate commissioning.	• Communicate sustainability initiatives and operation to building users. • Commissioning and building tuning required by contractors and reviewed for 12 months after completion.	• Provision of Building Users Guide. • Investigate costs and viability of commissioning and building tuning requirements and appointing an independent commissioning agent. • Independent consultant to perform quarterly tuning of fire, mechanical, electrical, hydraulic services.	✓ ✓	• SLR recommends the preparation of Building User Guide that enables building users to optimise the building's environmental performance. • A sub-contractor will be engaged to maintain the facility in accordance with the operations and maintenance manuals during the 12-month defects liability period.
Façade Performance	• Optimised façade performance.	• Achieve minimum performance requirements under NCC Section J1 and J2. • Reduce heat gain through the warehouse façade.	• Meet or exceed NCC Section J1 and J2 façade performance for conditioned spaces. • Light coloured roofing and appropriate insulation to reduce solar heat gain into the warehouse. • Performance glazing in office spaces appropriate to the window size and orientation.	✓ ✓ ✓ ✓	• NCC Section J report needs to be prepared by a qualified ESD consultant. • This warehouse will comply with all the requirements specified within the report during construction stage. • Light colour Colourbond – Dover white roof finish proposed. • As per the project NCC Section J report. Insulation proposed to warehouse roof and walls.

Category	Objective	Proposed Target	Proposed Strategy	Commitment	Comment
Social Sustainability	• Consider design with due regard to occupant satisfaction in accessibility, usability, Indoor air quality and public space utility.	• High level of occupant satisfaction. • Provide external as well as internal comfort.	• Flexibility of space for potential future configurations. • Use of Low VOC paints, carpets and sealants. • Consider Landscaping and dense planting. • Consider occupant user control eg A/C systems, lighting etc.	✓ ✓ ✓ ✓	• The design will incorporate open plan workspaces, offices, meeting rooms, lunchroom and outdoor seating area. Refer **Figure 3** to **Figure 6** • Low VOC paints, carpet and sealant will be used for the offices. • Refer proposed landscaping, Architectural Drawings. • Selection of endemic and low maintenance landscaping species. • Both AC and lighting control is provided to offices and warehouses.
Minimising Transport Impact	• Consider location with links to public transport and employee services. • Consider location to reduce operational transport. • Consider the impact of industrial trucks on local traffic.	• Reward drivers of fuel-efficient vehicles by providing spaces for small cars and or motorbikes. • Provide alternatives to single-occupancy vehicles. • Reduce operational fuel consumption through close proximity to major arterial roads.	• Consider providing 5% for electrical cars and 10% of total parking spaces for small cars and motorbikes where possible. • The roads linking the site to the motorways are	✓ ✓ ✓	• 16 parking spaces are dedicated for electrical cars with charging stations proposed. Refer **Figure 3** • 14 Bike parking spaces for Warehouse 1 and 5 Bikes parking spaces for Warehouse 2. Refer **Figure 3.** • Car Park numbers and provision for disabled

Category	Objective	Proposed Target	Proposed Strategy	Commitment	Comment
		• Reduce the impact of operational traffic on local communities.	predominantly used for industrial traffic, as such the traffic is unlikely to impact on local areas.		parking are provided be in accordance with Consent Authority requirements.
Optimising IEQ	• Optimise natural light to work environment. • Optimise fresh air ventilation. • Consider Thermal Comfort of occupants. • Consideration of noise transference in space planning. • Minimise use of materials that emit volatile organic compounds. • Create a pleasant working environment.	• Daylight: Daylight Factor (DF) of at least 2% at finished floor level under a uniform sky for at least 60% of the GLA. • Thermal comfort: 95% of office areas have PMV levels between -1 and +1 for 98% of the year; Warehouse spaces include passive thermal comfort strategies. • Finishes: 95% of all paints, adhesives & sealants and all carpet and flooring to be low-VOC finishes; use low-formaldehyde wood products. • Electric lighting levels: 95% of GLA has a lighting system that is flicker free and has a maintained illuminance of no more than 25% above those	• Daylight: rationalised glazing to offices; high-performance glass. • Thermal comfort: Office envelope and HVAC system designed to meet thermal comfort requirements. • Provide sufficient roof and wall insulation to the air-conditioned spaces; • Finishes: Specify and track correct finishes and wood products. • Provide pleasant indoor and outdoor breakout spaces with sufficient daylight. • Lighting: Good light fixtures and well-designed layout. • Ventilation: Consider increased fan and duct sizing. • Provide sufficient shading and blinds with rationalised glazing for visual and thermal comfort.	✓ ✓ ✓ ✓ ✓ ✓ ✓	• High-performance glazing in all air-conditioned areas to satisfy Section J requirements. • Refer **Section 5.5** of this report for proposed set up temperatures. • Insulation as per the NCC requirements. • Low VOC finishes and low-formaldehyde wood products will be used. • Refer to Architectural Drawings. • LED lighting and lighting controls in warehouses and offices. • Adequate ventilation will be supplied in accordance with AS1668. • Shown on the Architectural Drawings

Category	Objective	Proposed Target	Proposed Strategy	Commitment	Comment
		recommended in AS1680.2.4, 2.1 and 0.1. • Reduce visual glare.			
Minimising Energy Use	• Consider passive design to minimise energy use such as orientation, ventilation, shading and floor plate design. • Appropriate sizing of plant and equipment in heating and cooling, lighting, control systems, • Building management systems and renewable energy sources. • Reduce reliance on connection to grid electricity and gas.	• Target a 20% reduction in Greenhouse gas emissions. • Energy sub-metering for all major uses greater than 100kVa; linked to monitoring system. • High efficiency warehouse lighting and controls. • Reduce energy for water heating. • Integrated building management. • Consider renewable energy generation for a portion of energy consumption and/or consider future-proofing the building for future installation. • Reduce urban heat island effect and heat load through the roof by providing a highly reflective roof.	• Roof Insulation, External Wall Insulations, Reduced Glazing area and associated heat loss in winter. • Consider office air conditioning temperature set-points for an increased comfort band. • Provide energy efficient T5 lighting, with zoning and automatic controls where reasonable. • Consider LED lighting strategies and advanced controls. • Consider a solar hot water system or a heat pump. • Sub-metering: install appropriate metering; develop metering and tracking strategy to allow for self-assessment, problem-solving and ongoing improvements during operations • Use roofing material that has a high Solar Reflective Index	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	• Awning Shown on the Architectural Drawing. Insulation as per the NCC requirements. Refer **Figure 3** to **Figure 6** • Design brief sets the temperature - Refer Section 5.5 of this report. • LED lighting in warehouse and offices. • Lighting controls to warehouse and offices. • Solar hot water or heat pump system. • Sub meters for major energy/water uses.

Category	Objective	Proposed Target	Proposed Strategy	Commitment	Comment
		• Reduce office equipment load from 20W/m² to 15W/m². • Optimise insulation for energy and thermal comfort.	• Investigate the current insulation design and determine proposed options.		• Colourbond metal deck which has a light colour is proposed. • As per the project NCC Section J report.
Choosing Materials	• With consideration to energy inputs in manufacture. • Toxicity. • Consequential impacts – rain forest timbers. • Regional or local manufacturer employment support.	• Reduce steel and cement in the internal slab (10% reduction in embodied energy). • Reduce embodied energy in concrete and plasterboard elements. • Consider 95% of timber to be AFS or FSC certified. • Reduce emissions associated with insulation and refrigerant. • Reduce environmental impact of materials for tiling, awning.	• Jointless fibre-reinforced slab. • Use pre-cast concrete panels with recycled content. • Goodman is offsetting the embodied carbon generated from this development.	✓ ✓	• The project will replace 15% of cement with fly ash. To minimise the environmental impacts of materials used by encouraging the use of materials with a favourable lifecycle assessment based on the following factors: • Fate of material • Recycling / re-use • Embodied energy • Biodiversity • Human health • Environmental toxicity • Environmental responsibility.
Minimising Waste	• By clever design. • Contracted to builder as a requirement on site for construction waste. • During the life of the building.	• Reduce construction waste going to landfill by 90%. • Reduce operational waste going to landfill. • Consider a design that can be disassembled at	• Contractor is to develop and implement a Waste Management Plan and track all waste going offsite to show that 90% of all construction waste is re-used or recycled.	✓ ✓	• SLR recommends more than 90% of the predicted construction waste arising from development can be re-used (on-site or at another development) or recycled off-site. Refer

Category	Objective	Proposed Target	Proposed Strategy	Commitment	Comment
	• And in dealing with building end of life options.	the end of the building's life.	• Waste storage and recycling facilities to be provided for different operational recycling streams such as paper, glass, plastics, metals, food waste etc. Consider operational waste plans and training for staff to provide incentive to reduce waste.		project Waste Management Plan. • The following waste avoidance measures are recommended in the Waste Management Plan for the Project: - Provision of take back services to clients to reduce waste further along the supply chain.
Water Conservation and Reuse	• Monitoring of meters to track use. • Timely maintenance of fixtures and fittings. • Water sensitive landscape design. • Source potable water alternatives such as rain water harvesting, grey and black water treatment.	• Reduce potable water in internal fixtures. • Reduce potable water for irrigation. • Water efficient operation of appliances. • Utilise rainwater and/or recycled water.	• Water efficient sanitary taps and toilets. • Water efficient and drought tolerant landscaping. • Water and energy efficient dishwasher. • Rainwater collection for toilets, irrigation and truck wash down.	✓ ✓ ✓ ✓	• Low flow fixtures and fitting including taps and shower heads. • Selection of endemic and low maintenance landscaping species. • SLR recommends water efficient dishwashers. • 150 kL Rainwater tanks have been proposed for rainwater harvesting and re-use for landscape irrigation and flushing of toilets.
Land Use and Ecology Impact	• Consider local biodiversity impacts of flora and fauna. • Look to specialist advice on land in development.	• Encourage biodiversity. • Reduce light pollution from the site. • Consider reducing impact of stormwater flows off the site into the natural	• Install indigenous planting appropriate to the area and the adjacent biodiversity lots. • Design external lighting to avoid emitting light into the night sky or beyond the site boundary.	□ □	• Selection of endemic and low maintenance landscaping species • LED lights have been proposed for all external lights to avoid emitting light beyond the site boundary.

Category	Objective	Proposed Target	Proposed Strategy	Commitment	Comment
		watercourses including Ropes Creek adjacent to the site.	• Consider integrated stormwater management to minimise the impact on receiving waters of flow volumes and pollution content, eg bioswales, bio retention, OSD tanks and treatment. • Consider permeable concrete/paving for staff parking areas and footpaths, etc.		The warehouse sustainability objectives include: • Reduce the impact of stormwater runoff and improve quality of stormwater runoff • Achieve best practice stormwater quality outcomes • Incorporate water sensitive urban design principles.
Renewables	• Supply renewable electricity to the building.	• Reduce carbon footprint for the project site • Reduce the peak electricity demand for the building	• Provisions of on-site renewable energy systems		• At least 1,275 kW of PV system (925 kW for Warehouse 1 and 350 kW for Warehouse 2) has been proposed the rooftop of the warehouse.

4.2 Baseline and Proposed Energy Consumption

A NCC Sections J Deem-to-Satisfy compliant building is used as the baseline building for energy consumption savings. NCC Section J provides the minimum requirement for energy efficiency and based on data for similar warehouses, it is expected that the proposed development will have 112.5%reduction when compared with 2022 NCC Reference Building.

The following initiatives have been proposed for the warehouses and offices:

- Daylight-controlled LED lighting for the warehouse instead of metal halide, resulting in a considerable energy reduction and reduced maintenance. Motion sensors to all LED lights within the warehouses, masonry plant, and offices.
- High efficiency glazing and shading for the offices.
- Highly efficient air conditioning system for the offices. Refer **Table 6**
- Good daylighting levels (including warehouse windows along all sides and doors) will reduce the amount of artificial lighting required during the day.
- Heat-reflective semi-translucent roller blinds on all windows will reduce solar heat load to the building.
- Lighting zoning will offer flexibility for light switching in zones.
- All lighting systems in the offices and amenities are to be programmable and incorporate time clocks and motion sensors.
- Energy-efficient floodlights will be utilized to light the external perimeter of the building.
- Awnings over windows will reduce the solar heat load on the building, therefore decreasing the cooling load requirements from the air conditioning system.
- Air-conditioning control zoning is recommended where necessary to cater for varying occupancy rates, orientation to solar loads, etc. Also, a time clock is provided with provision for after-hours override.
- Achieving high insulating values of external development fabrics (in compliance with NCC requirements) will allow for lower energy demand on the air-conditioning system.
- Door seals for recessed loading docks and doors and airlock for reception areas will help to maintain a comfortable indoor air environment and lower energy demand on the air-conditioning system.
- Hot water systems implemented in staff amenities, including toilets, lunchrooms and cleaners room to be connected to a solar hot water system.
- A Building Users’ Guide will be prepared and implemented. These measures will help monitor the building's energy consumption.
- Electrical sub-metering to all metered loads will facilitate ongoing management of energy consumption.

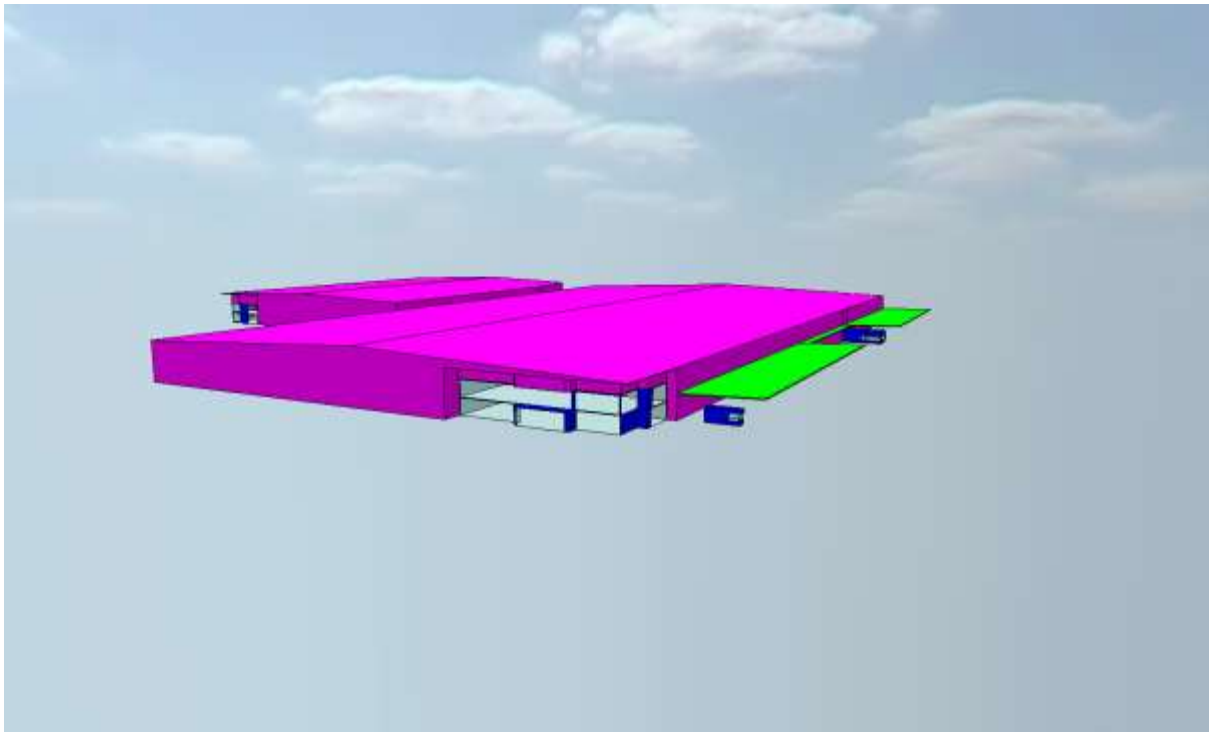
4.3 Energy Calculation of the Proposed and Reference Buildings

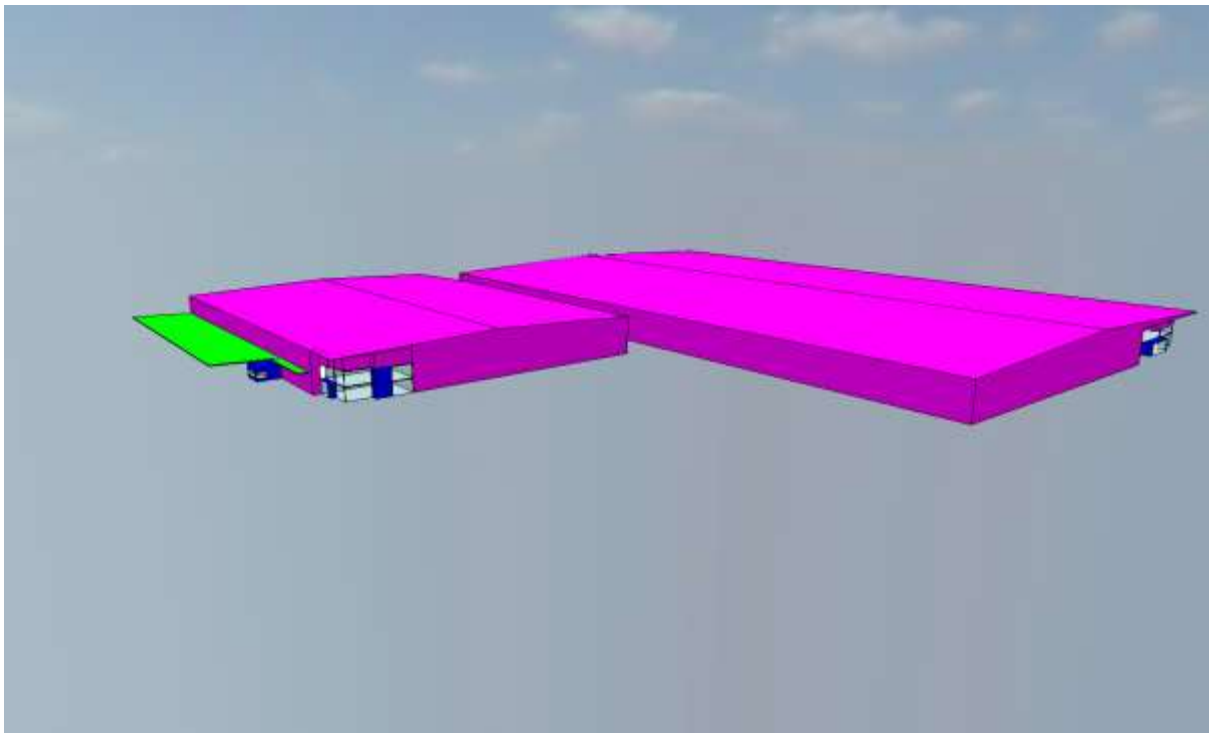
The Energy Simulation Program used in this study is the IES computer program Virtual Environment 2022 (VE). The program is based on the ASHRAE response factor and the modifications included utilising Australian weather data and including building materials more appropriate to those used in Australia and enabling the input of metric data.

- SLR supports a perpetual license of the Energy Simulation Software package IES <VE>;
- IES <VE> has passed the BESTEST (ASHRAE Standard 140) external validation process;
- The weather data from ACADS-BSG NSW_Richmond_88 Test Reference Year (TRY) is used for the modelling;
- IES<VE> assesses U-Value, SHGC, and shade coefficient when evaluating the effect of glazing;
- Detailed warehouse operating schedules are not available at this stage. Therefore, NCC standard building operating profiles such as occupancy, lighting, air conditioning and equipment were adopted for the office areas; and
- At least 1,275kW of PV system has been proposed on the rooftop of the warehouse.

The developed 3D model for energy modelling is shown in **Figure 7.**

Figure 7 Proposed Warehouses in IES Model





4.4 Artificial Lighting

In Section J6 of the NCC, the requirement for the total lighting power load within the proposed spaces of a building is to be no greater than a maximum illumination power load, measured in Watts (W). The maximum allowable building illumination power load is based on the total illumination power load calculated for each space.

For artificial lighting, the aggregate design illumination power load must not exceed the sum of the allowances. This may be obtained by multiplying the area of each space by the maximum illumination power density (as found in Table J6.2a of the NCC Volume One). The maximum illumination density for a storage warehouse is 4 W/m² as per Table J6.2a of the NCC Volume One.

The proposed warehouses will adopt the following energy efficiency measures to reduce the lighting energy consumptions:

Office lighting

- LED fitting for offices.
- Occupancy sensors to low occupancy areas, e.g., offices, toilets, and lunch rooms.

Warehouse lighting

- LED fitting for warehouse.
- Occupancy sensors to low occupancy areas.

Outside lighting

- LED external lighting for all outside areas.
- External lighting will be controlled via daylight sensor (photocell).

Electrical lighting is the major energy reduction component for warehouses with a large footprint.

The lighting calculation for NCC reference building is based on the maximum illumination power density specified within NCC Table J6.2A as below:

- Warehouse and Wholesale Buildings= 4 W/m^2
- Offices = 4.5 W/m^2

The electrical lighting layout of the proposed building was not provided during the preparation of this report. It is assumed the maximum design lighting power density will be achieved as below:

- Warehouse 2 W/m^2
- Offices 4 W/m^2

Therefore, the proposed building will likely achieve a 48% reduction in lighting energy compared with the reference building. A detailed calculation is shown in **Appendix A.**

4.5 Mechanical Air-Conditioning

The mechanical service design is not available at this stage. Performance reverse cycle units will be used to offices with individual controls.

The air conditioning will be designed according to BCA/NCC section J, other statutory authorities, and applicable Australian standards.

As per the mechanical specification of the Goodman's Tenant Base Building Specification, air conditioning to be designed to the BCA/NCC section J and other statutory authorities and applicable Australian standards.

Air-conditioning temperature control and set point – refer Table 5

Table 5 AC Unit Temperature Control Range

Space Type	Temperature Control Range (°C)
Offices	22.5±1.5°CBD

Air-conditioning energy efficiency requirements

NCC Section J5.11 has specified the minimum energy efficiency ratios requirements for package air conditioning equipment.

Table 6 BCA Unitary Plant Requirement

Office Equipment	Minimum Energy Efficiency Ratio	
	NCC Requirement	Proposed System [1]
Cooling	2.9	4
Heating	2.9	4

Note 1: Detailed Mechanical design is not available at this stage. It is assumed that the proposed package system will achieve the performance requirements above.

When the airflow rate of a mechanical ventilation system is more than 1000L/s, the system must have a variable speed fan when its supply air quantity is capable of being varied.

Details of NCC Section J5 certification demonstrating compliance will need to be submitted with the application for a Construction Certificate.

4.6 Building Fabric Requirements

Parts J1 to J3 of the BCA Section J contain the requirements of the Deemed-to-Satisfy compliance of the building fabric. The purpose of this subsection is to ensure that the building fabric will provide sufficient thermal insulation to minimise heating and cooling loads placed on the building and the commensurate energy consumption HVAC systems servicing internal building spaces.

All fabrics of the proposed building must comply with NCC Section J. A Project Section J report must be submitted with the application for a Construction Certificate.

Parts J1 to J3 of the BCA Section J contain the requirements of the Deemed-to-Satisfy compliance of the building fabric. The purpose of this subsection is to ensure that the building fabric will provide sufficient thermal insulation to minimise heating and cooling loads placed on the building and the commensurate energy consumption HVAC systems servicing internal building spaces.

All fabrics of the proposed building shall comply with NCC Section J. A Project Section J report will need to be submitted with the application for a Construction Certificate.

The reference and proposed building fabric data and other modelling assumptions are shown below:

Table 7 Reference Dynamic Modelling Inputs

Item	Description
Climate Data	Weather data from ACADS-BSG, NSW_Richmond_88 Test Reference Year (TRY)
External wall	All external walls have a total R-value of R2.8
Internal wall	All internal walls to unconditioned space have a total R-value of R2.1
Glazing	Glazing system (glass and frame) with U value & Solar Heat Gain Coefficient as per reference wall glazing system building code calculations: U-Value: 3.0; SHGC: 0.16
Roof	Concrete/Metal roof with insulation, Total R-value= R3.7
Floor	Concrete Floors with carpet overlay / tiles with R2.0 floor
Permeability	No more than 5 $m^3/hr.m^2$ at 50 Pa reference pressure
Lighting Density	As per NCC 2022 for different classification of building
Lighting hours	24hrs
Equipment density	Equipment load in the model is 5W / m^2 as per 2022 NCC
Occupant density	As per Occupant density of the 2022 NCC
Occupancy Schedule	Schedules used in study are as per 2022 NCC JV Specification. See Appendix A
HVAC System type	HVAC efficiencies in the reference building are modelled in accordance with NCC Section J and Minimum Energy Performance Standards (MEPS)
HVAC Hours	24hrs

Item	Description
HVAC Control	Space temperature indoor conditions 22.0±2.0°CBD
Document References	The reference buildings were modelled in IES <VE> as per the architectural drawings, dated February and March 2025

Table 8 Proposed Dynamic Modelling Input

Item	Description
Climate Data	Weather data from ACADS-BSG, NSW_Richmond_88 Test Reference Year (TRY)
External wall	All external walls have a total R-value of R2.8
Internal wall	All internal walls to unconditioned space have a total R-value of R2.1
Glazing	Glazing system (glass and frame) with U value & Solar Heat Gain Coefficient (SHGC) as follows: U-Value: 4.2; SHGC: 0.42
Roof	Concrete/Metal roof with insulation, Total R-value= R3.7
Floor	Concrete Floors with carpet overlay / tiles with R2.0 floor insulation above unconditioned space.
Permeability	No more than 5 $m^3/hr.m^2$ at 50 Pa reference pressure
Lighting Density	4.0W/m^2
Lighting hours	24hrs
Equipment density	Equipment load in the model is 5W / m² as per 2022 NCC.
Occupant density	As per Occupant density of the 2022 NCC
Occupancy Schedule	Schedules used in study are as per the 2022 NCC JV Specification. See Appendix A.
HVAC System type	HVAC efficiencies for heating and cooling as follows: **EER:** 4.0; **CoP:** 4.0
HVAC Hours	24hrs
HVAC Control	Space temperature indoor conditions 22.0±2.0°CBD
PV Solar system	1,275 kW PV system
Document References	The Proposed buildings were modelled in IES <VE> as per the architectural drawings, dated February and March 2025

4.7 Domestic Hot Water (DHW)

The BCA specifies that hot water systems must be at least 80% thermal efficient. The solar hot water reticulation system shall be provided to all faucet fittings, equipment, and apparatus within the development. Hot water will be generated from the roof-mounted solar water packaged plant.

With the installation of water-efficient fixtures, the hot water consumption will be decreased, and thus, the domestic hot water usage will also decrease. If the domestic hot water usage is less than the energy required to heat to the water also decreases.

The energy simulation in this analysis assumes that both the reference and proposed buildings use the same hot water system for DHW. The actual energy consumption will be reduced once solar hot water is adopted for the proposed building.

4.8 Minimization of Greenhouse Gas Emission

4.8.1 PV Solar Green Initiatives

The annual energy consumption of the proposed building may be reduced by the amount of energy obtained from:

- an on-site renewable energy source; or
- another process as reclaimed energy.

SLR has assessed the potential for the installation of a Photo Voltaic (PV) Solar Power System for the Site. It is recommended that at least 2.000 kW PV solar system to be installed on the roof of the warehouses to significantly reduce the carbon footprint for the proposed development.

- The proposed 1,275 kW PV solar system will offset approximately 1,768.4 MWh/year of energy usage
- The estimated greenhouse gas CO_2 emission saving is approximately 1,326,319 $kgCO_2$/annum

4.8.2 Green Power Initiative

It is recommended that a certain percentage (at least 10%) of “Greenpower” should be made available to the project, providing the opportunity to contribute to a reduction in total greenhouse gas emissions produced by the proposed development. Greenpower is produced from environmentally friendly renewable energy sources such as solar, wind, water and biomass.

When a Greenpower product is selected by the owner, the energy supplier commits to buying a certain amount of electricity from approved new renewable energy sources. The financial accounts of Greenpower suppliers are audited independently. This makes a clear distinction between the services provided by standard energy suppliers and the more sustainable service offered through Greenpower options.

The National Greenpower website[1] states that “Australian households generate almost one-fifth of Australia's greenhouse pollution through everyday activities such as transport and household energy use”. The average household in Australia emits over seven to eight tonnes of greenhouse pollution each year through energy use alone. This is because most households source their electricity from burning coal and other fossil fuels. By choosing accredited Greenpower, up to 100% of a household's energy usage can be generated from renewable sources.

4.8.3 Energy Consumption of Proposed and Reference Building

The predicted Total Annual Energy Consumption of the NCC Reference Building and the Proposed Building is summarised in **SLR** has assessed the potential for the installation of a Photo Voltaic (PV) Solar Power System for the Site. It is recommended that at least 2.000 kW PV solar system to be installed on the roof of the warehouses to significantly reduce the carbon footprint for the proposed development.

- The proposed 1,275 kW PV solar system will offset approximately 1,768.4 MWh/year of energy usage
- The estimated greenhouse gas CO2 emission saving is approximately 1,326,319 kgCO2/annum

Table 9. For both buildings, temperatures lie within the range 16°CDB to 27°CDB for 100% of the plant operation time.

The annual energy consumption of the proposed building may be reduced by the amount of energy obtained from:

- an on-site renewable energy source; or
- another process as reclaimed energy.

The reference building uses:

a. The Deemed-to-Satisfy (DtS) Provision such as J1 Building Fabrics, J2 External glazing;

b. A solar absorptance of 0.6 for the external walls and 0.7 for roofs;

c. The maximum lamp power density without any increase for control device illumination power density adjustment factor;

d. Air-conditioning with the conditioned space temperature within the range 18°CDB to 26°CDB for 98% of the plant operation time;

e. The profiles for occupancy air-conditioning, lighting and internal heat gains for people, hot meals, equipment and hot water supply systems of Specifications JV; and

f. Infiltration values:

    a. for the perimeter zone depth equal to the floor-to-ceiling height when pressuring plant is operating, 1.0 air change per hour and

    b. for the whole building, when the pressuring plant is not operating, 1.5 air change per hour.

[1] http://www.greenpower.gov.au

g. Both the proposed and the reference building will use the same annual energy consumption calculation method and building features such as:
    a. location, adjacent structures, building form
    b. internal heat gains including people, lighting, appliances, meals and other electric power loads
    c. and other features as specified in NCC JV3

Table 8 summarises the predicted Total Energy Consumed annually by the reference building and the proposed building with the reference services.

SLR has assessed the potential for the installation of a Photo Voltaic (PV) Solar Power System for the Site. It is recommended that at least 2.000 kW PV solar system to be installed on the roof of the warehouses to significantly reduce the carbon footprint for the proposed development.

- The proposed 1,275 kW PV solar system will offset approximately 1,768.4 MWh/year of energy usage
- The estimated greenhouse gas CO_2 emission saving is approximately 1,326,319 $kgCO_2$/annum

Table 9 Comparison of Annual Energy Consumption Between the Reference and Proposed Building

Electricity Usage	Reference Building (MWh)	Proposed Building (MWh)
Heating	15.5	12.8
Cooling	43.9	43.9
Auxiliary	29.7	34.6
Lighting	958.8	498
Equipment	assumed identical	assumed identical
DHW	assumed identical	assumed identical
PV System	-	-1,768.4
Total	**1047.9**	**-1.125.5**

Note 1 these items are specific to a tenant's Fitout -hence assumed to be the same for the Reference and Proposed Buildings

By implementing all energy efficiency measures described in **Section 6**, the project is predicted to achieve a 112.5% GHG emission reduction when compared with 2022 NCC Reference Building.

5.0 POTABLE WATER CONSUMPTION

It is proposed that the Project will have a number of sustainable water-saving measures, including:

- Rainwater reuse and reticulation system – Rainwater will be harvested from the roof and reused for irrigation and toilet flushing. The reticulation will be a separate system to the domestic cold water with domestic water top-up in the event of insufficient rainfall;
- Use of water-saving plumbing devices; and
- Water-sensitive landscape design.

Further to above sustainable water measures, the following items will be considered during the detailed design stage:

- Water efficient sanitary taps and toilets – install higher WELS Rating sanitary fixtures such as 4 stars for water taps, urinals and toilet.
- Water and energy-efficient dishwashers with minimum 4-star WELS water rating.

By installing 4 star-rated toilets, urinals, and taps and the proposed 150 kL rainwater harvesting facility, the proposed development will reduce its potable water demand by approximately 45%.

The quantities of each water fittings are assumed from the drawing and listed in **Appendix B**.

6.0 MONITORING AND REPORTING

Once the project is completed, all committed sustainability-related measures need to be commissioned and tuned to ensure all services operate to their full potential and as designed.

As specified within the Tenant Base Building Specification, the building tuning will be provided by service contractors and overseen by an independent assessor, at least once a month within the Defects Liability Period (DLP) period to ensure that services are operating effectively and efficiently. Monthly reports to be provided to the tenant for DLP.

6.1 Energy Review and Audit

An energy usage review should be undertaken within the first few months of operation to ensure the Energy Management Plan is sufficient for the development's needs. A breakdown of energy usage per month at the Project Site will help to measure the development's baseline energy use and assess what appliances, equipment, and processes are consuming energy.

An energy review is also necessary for the assessment of energy utilisation to further identify opportunities for improvement. Energy usage data obtained during the review process may be used to establish key performance indicators and annual energy targets for the Project.

Energy usage to be included in the review should include all purchased electricity and energy which is consumed by stationary equipment on site. Energy consumed by mobile equipment (e.g. forklifts) should also be examined as this will identify variations in warehouse operation efficiency. (Refer to 'Guidelines for Energy Savings Action Plans' (2005) (as developed by the former Department of Energy, Utilities and Sustainability) for reporting templates and further information.)

An energy audit and management review should also be undertaken on a half-yearly basis to ensure employees are following energy savings procedures correctly. Where audits show that energy savings procedures are not carried out effectively, additional employee training should be undertaken, and signage and procedures re-examined.

The Energy Management Plan should be progressively improved and updated on an annual basis, or as required, to reflect changes to the Energy Management System and to promote continual improvement of energy management at the Project Site.

6.2 Energy Metering and Monitoring

To enable effective review of energy usage by the project, sub-metering should be implemented for all major energy consuming processes or items of equipment including sub-metering for all loads greater than 100 kVA.

Electrical equipment should be maintained to Australian Standards to ensure unnecessary energy wastage is minimised. Roof access system is proposed for third party access to roof for carry out necessary maintenance as required.

6.3 Roles and Responsibilities

It is the responsibility of the facility manager to routinely check energy savings procedures are undertaken correctly (i.e. lighting turned off while areas of the development are not in use). The facility manager should also ensure all monitoring and audit results are well documented and carried out as specified in the Energy Management Plan.

In accordance with the Goodman's Industrial Building Specification, a Building Users' Guide is to be prepared for the Project. The Building Users' Guide provides details regarding the everyday operation of a building and should include energy minimisation initiatives such as natural ventilation strategies, user comfort control, maintenance of air conditioning units and other electrical devices to ensure maximum operating efficiency, and lighting zoning strategies.

An effective Building Users' Guide will ensure that:

- Facility managers understand in detail their responsibilities for the efficient operation of the facility and any additional building tuning necessary to continuously improve energy management.
- Maintenance contractors understand how to service the particular systems to maintain reliable operations and maximum energy efficiency.
- Employees understand energy minimisation procedures and working limitations required to maintain design performance for energy efficiency.
- Future fit-out / refurbishment designers understand the design basis for the building and the systems so that these are not compromised in any changes.

7.0 Conclusion

SLR Consulting Australia Pty Ltd (SLR) has been engaged by Goodman Property Services (Aust) Pty Ltd to prepare a Sustainability Management Plan (SMP) to accompany a Development Application (DA) for the development at Honeman Close, Huntingwood.

The site is zoned E4 General Industrial under the provisions of the State Environmental Planning Policy (Western Sydney Employment Area) 2009 (WSEA SEPP). The developable site area is 98,131 m^2.

This report has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) and accompanying cover letter issued for the Project (SSD-79500208) dated 31 January 2025. Specifically, this report has been prepared to respond to the SEARs requirement issued pertaining to Ecologically Sustainability Design (ESD).

This study has been prepared in accordance with the following Secretary's Environmental Assessment Requirements (SEARs):

- 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.
- Demonstrate how the development will meet or exceed the relevant industry recognised building sustainability and environmental performance standards.
- 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.
- If Chapter 3 of SEPP (Sustainable Buildings) 2022 applies:
    - Demonstrate how the development has been designed to address the provisions set out in Chapter 3.2(1).
    - Provide a NABERS Embodied Emissions Material Form to disclose the amount of embodied emissions attributable to the development in accordance with the section 35BA of the EP&A Regulation.

The principal objective of this Sustainability Management Plan is to identify all potential energy savings that may be realised during the operational phase of the project, including a description of likely energy consumption levels and options for alternative energy sources such as PV solar power.

A BCA Sections J Deem-to-Satisfy compliant building is the baseline for energy consumption savings. BCA Section J provides the minimum requirement for energy efficiency, and it is expected that the proposed development will operate energy efficiently via:

- A PV solar system of at least 1,275 kW has been proposed.
    - The proposed 1,275 kW PV solar system will offset approximately 1,768.4 MWh/year of energy usage
    - The estimated greenhouse gas CO_2 emission saving is approximately 1,326,319 $kgCO_2$/annum
- Solar Hot water systems implemented in staff amenities, including toilets, lunchrooms and cleaners rooms;

- Daylight-controlled LED lighting for the warehouse instead of metal halide, resulting in a considerable energy reduction and reduced maintenance;
- Motion sensors to all LED lights within the warehouse and offices;
- Translucent roof sheeting to warehouse areas;
- Roof and external wall insulation as per the NCC requirements; The following recommendations are made to minimise cooling and heating loads for the conditioned areas:
    - All external walls have a total R-value of R2.8
    - All internal walls to unconditioned space have a total R-value of R2.1
    - Concrete/Metal roof with insulation, Total R-value= R3.7 to all airconditioned areas.
    - High-performance glazing system (glass and frame) with U value & Solar Heat Gain Coefficient (SHGC) as follows:
        - Maximum U-Value: 4
        - SHGC: 0.4
- Passive solar design for external outdoor areas;
- Efficient air conditioning system;
- Air-conditioning control zoning is recommended where necessary to cater for varying occupancy rates, orientation to solar loads, etc. Also, a time clock is provided with provision for after-hours override;
- Power sub-metering to enable continued review of power consumption for the offices and warehouse;
- Selection of endemic and low-maintenance landscaping species;
- The project is committed to achieve a 40% reduction in average annual stormwater discharge;
- 150 kL rainwater tanks for rainwater harvesting and re-use for landscape irrigation and toilet flushing;
- Low flow fixtures and fittings, including at least 4-star taps and shower heads;
- Low VOC paints, carpet, and sealant for all offices;
- 16 parking spaces are dedicated to electric cars with charging stations proposed (10 Bays for Warehouse 1 and 6 Bays for Warehouse 2);
- Low carbon construction materials, including 15% replacement of cement with fly ash;
- More than 90% of the predicted construction waste arising from the development will be reused;
- Bicycle parking; and
- Other measures as detailed in this report.

By implementing all lighting energy efficiency measures described in Section 6 of this report, the proposed building will likely achieve a 112.5% GHG emission reduction with the proposed PV solar system when compared with the NCC Reference Building.

By installing 4-star rated toilets, urinals, and taps and the proposed rainwater harvesting facility, the proposed development will reduce its potable water demand by approximately 45%.

A detailed response to SEARS requirements is summarised in the table below.

Item for inclusion	Action and Report Location
• 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.	Section 4.1 details how ESD principial as demined in clause 7 (4) of Schedule 2 of the Environmental Planning and Assessment Regulation 2000 (reproduced in Clause 193 of the 2022 revision of the regulation) and up to date legislation are being incorporated in the design, construction, and operation phases of the project. In terms of Precautionary Principle, the project does not present threat of serious or irreversible environmental damage. The project conducted all required environmental studies and incorporated adaptability and resilience measures in the design. Inter-generational equity, the health, diversity and productivity of the environment are enhanced for the benefit of future generations via a number of initiatives including large PV solar installation, sustainable materials, reduced waste, reduced heat islands, etc. Refer Section 5.1 for all other initiatives. From a conservation of biological diversity and ecological integrity perspective, the project satisfies all environmental and statutory provisions requirements and will maintain the existing ecological structures (species and ecosystems, etc) for the proposed site and provide additional native vegetation planting and reduced stormwater runoff the site. The project is committed to achieve a 40% reduction in average annual stormwater discharge. Environmental goals have been established and achieved using recognised rating tools. A Quantity Surveyor will be engaged to ensure that the project will remain on budget and all sustainability measures in the current study are implemented. The proposed ESD initiatives will help to achieve significant reductions in the energy, waste and water required by the development both in building and operation and will deliver improved valuation and beneficial outcome.

Item for inclusion	Action and Report Location
• Demonstrate how the development will meet or exceed the relevant industry recognised building sustainability and environmental performance standards.	Section 4 to Section 7 detail how the project exceeds relevant industry recognised building sustainability and environmental performance standards through the implementation of best design principal and a wide range of ESD initiatives including renewable energy to offset the site energy use and reduce peak demand on electricity supply infrastructure.
• 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 Section 5 and Section 6 of the report. By implementing all energy efficiency measures described in Section 5, including the proposed PV solar system, the project will significantly minimise greenhouse gas emissions, reflecting the goal of achieving net zero emissions. • The proposed 1,275 kW PV solar system will offset approximately 1,768.4 MWh/year of energy usage. • The project is predicted to achieve a 112.5% GHG emission reduction with the proposed PV solar system when compared with the NCC Reference Building. Refer **Section 5**
• If Chapter 3 of SEPP (Sustainable Buildings) 2022 applies: o Demonstrate how the development has been designed to address the provisions set out in Chapter 3.2(1). o Provide a NABERS Embodied Emissions Material Form to disclose the amount of embodied emissions attributable to the development in accordance with the section 35BA of the EP&A Regulation.	The following design considerations have been implemented to address Chapter 3.2.(1) of SEPP 2022: • More than 90% of the predicted construction waste arising from the development will be reused (on-site or at another development) or recycled offsite. Refer Section 5.1, Page 22 • The reliance on artificial lighting and mechanical ventilation has been reduced via Translucent roof sheeting to warehouse areas, passive design, outdoor seating area and control systems. • The peak demand for electricity is significantly reduce via a proposed 1,275 kW PV solar system. • To enable effective review of energy usage by the project, sub-metering will be implemented for all major energy consuming processes or items of equipment including warehouse lighting, warehouse power, Office lighting, Office power and Office HVAC The facility manager will ensure all monitoring and audit results are well documented and carried out as specified in the current Sustainability Management Plan (Refer Section 6) • By implementing all water efficiency measures described in Section 6, including 4-star rated toilets, urinals, and taps and the proposed rainwater harvesting facility, the proposed development will

Item for inclusion	Action and Report Location
	reduce its potable water demand by approximately 45%.

It is recommended that ESD initiatives continue to be developed and implemented during the detailed design stage of the project.

In conclusion, the relevant ESD initiatives and Energy Efficiency measures outlined in this report are incorporated into the proposed building and development details. The proposed ESD initiatives will help to achieve significant reductions in the energy required by the development both in building and operation.

Building tuning will be conducted by the builder, and SLR recommends that quarterly reviews of actual building energy and water consumption be carried out once the warehouses are operational to check the actual energy usage and energy savings and verify that all systems are performing at their optimum efficiency. This will provide an opportunity for the systems to be tuned to optimise time schedules to best match occupant needs and system performance while satisfying the sustainability target for the project.

8.0 Feedback

At SLR, we are committed to delivering professional quality service to our clients. We are constantly looking for ways to improve the quality of our deliverables and our service to our clients. Client feedback is a valuable tool in helping us prioritise services and resources according to our client needs.

To achieve this, your feedback on the team's performance, deliverables and service are valuable and SLR welcome all feedback via https://www.slrconsulting.com/en/feedback. We recognise the value of your time and we will make a $10 donation to our Charity Partner - Lifeline, for every completed form.

Appendix A

Energy Saving Lighting Design Recommendations

BCA Lighting Requirements Honeman Close Huntingwood								
BCA Comply Building	BCA Requirements		Area	Operating Hrs	Lighting Control			Total Annual Energy Consumption (kWh)
	Warehouse W/m2	4	48,210	Monday to Sunday 24 hours	Detector, Daylight	0.9	0.6	912,210
	Office and Dock Office Spaces W/m	4.5	2,205	Monday to Sunday 24 hours	Detector, Daylight	0.9	0.6	46,937
								0
			50,415				Total	959,148
							kWh/m2	19.03

BCA Lighting Requirements Honeman Close Huntingwood								
BCA Comply Building	BCA Requirements		Area	Operating Hrs	Lighting Control			Total Annual Energy Consumption (kWh)
	Warehouse W/m2	2	48,210	Monday to Sunday 24 hours	Detector, Daylight	0.9	0.6	456,105
	Office and Dock Office Spaces W/m	4	2,205	Monday to Sunday 24 hours	Motion Detector, Ds	0.9	0.6	41,722
	0	0	0	0	0-Jan	0	0	0
							1	
			50,415				Total	497,827
							kWh/m2	9.87

Appendix B
Water Saving Lighting Design Recommendations

WATER SAVINGS CALCULATION Honeman Close Huntingwood

Table B1 - Number of fixtures

	Toilets	Urinal	Basins	Showers
Amenities	39	10	37	4
Total	39	10	37	4

Assume 100% of toilet water usage is supplied by rainwater

Fraction not supplied by RWH	0

Table B2 - Results

No water saving measures		**Max water usage rate [1]**	
Toilet	Adopt 3* Average Flush Usage in Table C3	156	L/s
Tap	Adopt 3* Tap Usage in Table C3	333	L/s
Urinal	Adopt 3* Urinal Usage in Table C3	20	L/s
Water reuse measures (4*) with RWH		**Max water usage rate [1]**	
Toilet	Adopt 4* Average Flush Usage in Table C3	136.5	L/s
Tap	Adopt 4* Tap Usage in Table C3	277.5	L/s
Urinal	Adopt 4* Urinal Usage in Table C3	15	L/s
Water reuse measures (5*) with RWH		**Max water usage rate [1]**	
Toilet	Adopt 5* Average Flush Usage in Table C3	117	L/s
Tap	Adopt 5* Tap Usage in Table C3	222	L/s
Urinal	Adopt 5* Urinal Usage in Table C3	10	L/s

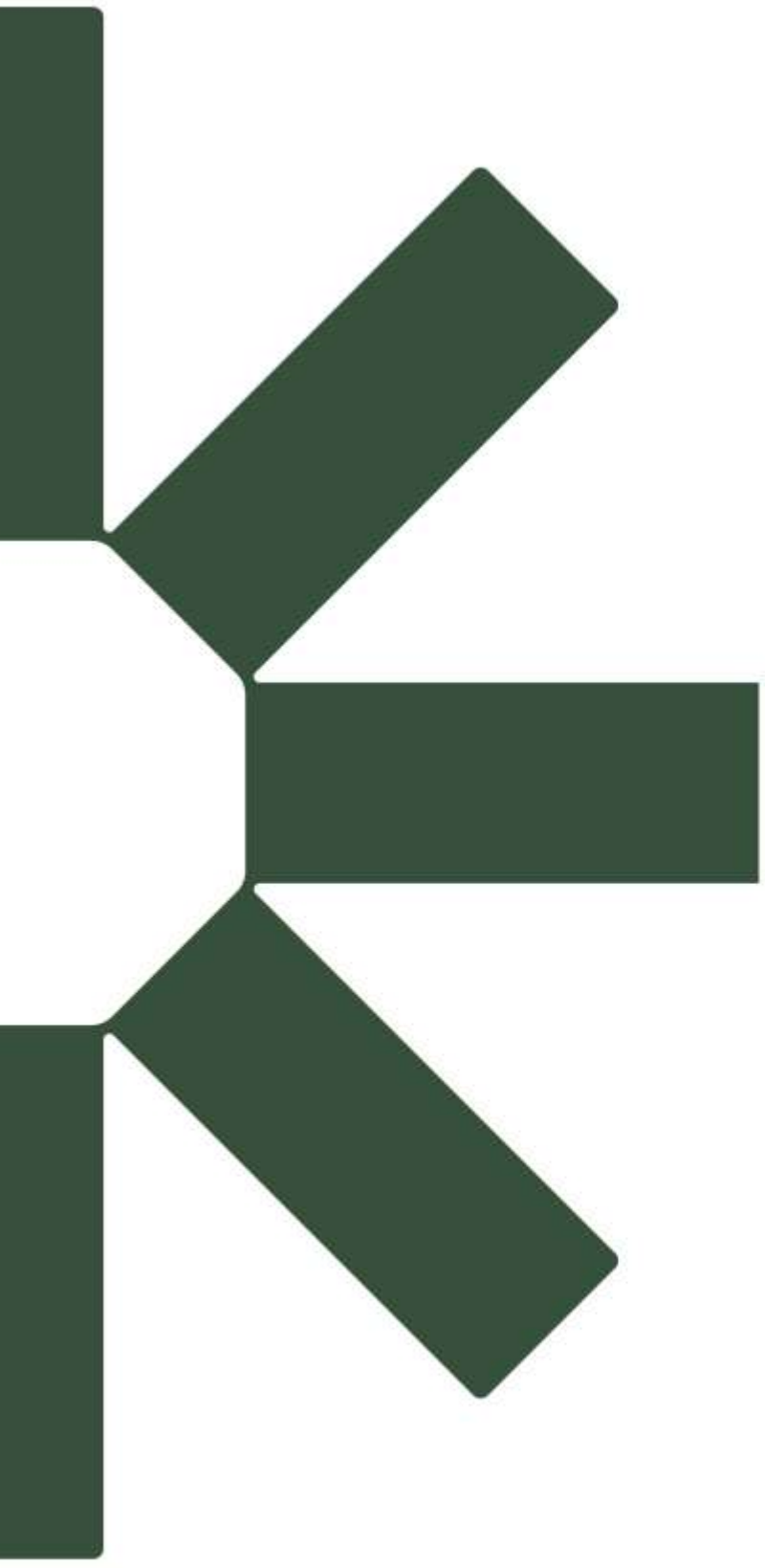
	3* with RWH	4* with RWH	5* with RWH
Improvement Percentage (%) [3]	35	45	56

Calculation Notes

[1] *Water usage rate per use = Number of items in Table C1 x Usage rate in Table C3*

[2] *Assume total water usage is proportional to max water usage rate*

[3] *Improvement percentage = % difference between 3* rated fixtures max water usage rate with no rainwater harvesting and design fixture max water usage rate with 100% of toilet and urinal flushing supplied by rainwater harvesting*



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