

SUSTAINABILITY MANAGEMENT PLAN

SSDA - Logistics Development, Moorebank

Prepared for:

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BASIS OF REPORT

This report has been prepared by SLR Consulting Australia Pty Ltd (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Alexandra Log Aus Assets 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.

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

DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
630.V14671-R01-v1.0	26 March 2024	Dr Neihad Al-Khalidy	Mark Hobday	Dr Neihad Al-Khalidy
630.V14671-R01-v1.0	14 August 2023	Dr Neihad Al-Khalidy	Mark Hobday	Dr Neihad Al-Khalidy

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1 INTRODUCTION

This Sustainability Management Plan (SMP) report has been prepared by SLR Consulting (Aust) Pty Ltd to accompany a State Significant development application (SSDA) for a proposed warehouse and distribution centre development with ancillary office space located at 20 Kelso Crescent, Moorebank (the site)

The proposed development is State Significant development (SSD) under Schedule 1 clause 12 of State Environmental Planning Policy (Planning Systems) 2021.

This study has been prepared in accordance with the following Secretary’s Environmental Assessment Requirements (SEARs) issued for SSD-58978472 on 8th June 2023.

It is proposed to lodge a development application under section 4.38 of the Environmental Planning and Assessment Act 1979 (EP&A Act) to be assessed as SSD. It is therefore requested that the DPE issue SEARs under section 4.12 of the EP&A Act and Clause 3 of Schedule 2 of the Environmental Planning and Assessment Regulation 2021 that will enable the preparation of an Environmental Impact Statement (EIS) for the proposed development.

Table 1 below summaries all key issues relevant to this report and how they have been addressed in this report.

This study has been prepared in accordance with the following Secretary’s Environmental Assessment Requirements (SEARs) issued for SSD-58978472 on 8th June 2023.

Table 1 Regulatory Requirements – Sustainability Management Plan

Item	Item for inclusion	Action and Report Location
8	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 5, Table 4 details how ESD principal as defined in section 193 of the EP&A Regulation are being incorporated in the design, construction, and operation phases of the project.
8	Demonstrate how the development will meet or exceed the relevant industry recognised building sustainability and environmental performance standards	Section 5 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.

Item	Item for inclusion	Action and Report Location
8	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.	<p>By implementing all energy efficiency measures described in Section 5 including the proposed PV solar system, the project will significantly minimise greenhouse gas emission reflecting the goal to achieve net zero emissions.</p> <ul style="list-style-type: none"> The project is predicted to achieve a 44.6% GHG emission reduction with a 300kW when compared with 2022 NCC Reference Building. Refer Section 5 <p>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 at least 5073.3 L /day.</p>

1.1 Site Description

The subject site is located to the north of the Moorebank industrial area, which is bound by the A34 Newbridge Road to the north and the Anzac Creek to the east, with the Heathcote Road wrapping around to the west and south where it joins the M5 South-Western Motorway .

The front of the site is accessible from the A34 via Kelso Crescent, with separate dedicated access provided from Seton Road to the rear. The site is sandwiched between industrial properties to the east and west. Refer **Figure 1** and **Figure 2**

The subject site benefits from a site area of approximately 3.5 hectares, and comprises the following lots :

- Lot 2 in DP 521146 to is the western portion; and
- Lot C in DP 327378 is the eastern portion.

The current main occupier of the subject site appears to be 'Adbri Masonry' which operates the site as a production plant. The site comprises single-storey warehouse buildings at the front (north) of the site, together with landscaping addressing the streetscape at Kelso Crescent. An additional warehouse building is located at the north-west portion of the site, with a large construction aggregate processing structure at the rear (south) of the site. These areas of warehousing are all linked by a network of internal circulation.

The site is otherwise interspersed with significant volumes of external storage, which include building materials, construction aggregates and palettes. Clusters of trees are present at the centre of the site and along the southern boundary addressing Seton Road. The Moorebank Zone Substation occupies what would otherwise constitute the north-west corner of the subject site.

The site benefits from the road connections to the A34 and M5 and the Sydney CBD is 26km to the east.

The Moorebank industrial area is located to the south of the Liverpool CBD. It benefits from direct access to the M5 Motorway and its north-western corner is approximately 800m from Liverpool train station. Refer **Figure 3**

The built form and character of the area is diverse and comprises large floor-plate warehousing and distribution centres alongside strata title multi-unit complexes and older factory style buildings. Lot sizes vary from 325m² through to 83 hectares.

Main land use activities include freight, transport, warehousing and wholesale supplies owing to the accessibility of the nearby M5 and M7 Motorways and now the Intermodal Terminal, a new transport connection facility for freight containers transported from Port Botany via rail.

Moorebank Intermodal Terminal Precinct

The Australian Government is facilitating the delivery of a major intermodal facility in south-west Sydney to provide a rail 'port shuttle' between Port Botany and the Moorebank precinct, a separate terminal for interstate freight and warehousing. Successive Australian Governments and NSW Governments have identified Moorebank as a key strategic location for increased intermodal capacity to serve freight logistics centres in Sydney's south-west. The site is adjacent to the existing dedicated freight railway line, the M5 motorway and close to the M7 motorway, and is approximately 1.5km to the south of the subject site.

The Moorebank intermodal freight precinct will include:

- An Import-Export (IMEX) Rail Terminal with a capacity to handle up to 1.05 million 20ft equivalent units of international containerised freight per year;
- An Interstate Rail Terminal with a capacity to handle up to 500,000 20ft equivalent units of interstate and regional freight per year;
- Up to 850,000m² of high specification warehousing where containers can be unpacked before delivery of their contents to their final destination;
- Auxiliary services including retail and service offerings; and
- A rail connection to the South Sydney Freight Line, which will provide direct access to the facility.

The concept plan for the new precinct is shown in **Figure 4**.

Figure 1 Cadastral Map of the Project Site



Figure 2 Aerial Map of the Project Site including Site Context (Source: Nearmap)



Figure 3 Aerial Image of Subject Site (Source: Architectural Drawing Set)



Figure 4 Moorebank Intermodal Terminal Precinct Plan (Source: Moorebank Intermodal Company, 2022)



1.2 Objectives of the Study

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 solar power in accordance with Council requirements.

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 DPIE'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.

2 SUSTAINABILITY MANAGEMENT GUIDELINES AND LEGISLATION

2.1 Building Code of Australia

The Building Code of Australia (BCA) is produced and maintained by the Australian Building Codes Board (ABCB) on behalf of the Australian Government with the aim of achieving nationally consistent, minimum necessary standards of relevant health and safety, amenity and sustainability objectives efficiently. The BCA contains mandatory technical provisions for the design and construction of BCA class buildings.

Volume 1, Section J of the BCA outlines energy efficiency provisions required for BCA class buildings (including Class 7b Warehouses and Class 5 Offices). There are 8 Deemed-to-Satisfy subsections, J1 to J8, that focus on separate aspects of energy efficiency as follows:

- J1 - Building Fabric (i.e. the ability of the roof, walls and floor to resist heat transfer)
- J2 - External Glazing (i.e. the resistance to heat flow and solar radiation of the glazing)
- J3 - Building Sealing (i.e. how well parts of a building are sealed to ensure comfortable indoor environments are efficiently maintained)
- J4 - Air Movement (i.e. the provision of air movement for free cooling, in terms of opening and breeze paths)
- J5 - Air Conditioning and Ventilation Systems (i.e. the efficiency and energy saving features of heating, ventilation and air-conditioning systems)
- J6 - Artificial Lighting and Power (i.e. power allowances for lighting and electric power saving features)
- J7 - Hot Water Supply (i.e. the efficiency and energy saving features of hot water supply)
- J8 - Access for Maintenance (i.e. access to certain energy efficiency equipment for maintenance purposes)

3 DESCRIPTION OF THE PROJECT

3.1 Proposed Development

The proposal seeks to facilitate the construction of a multi-level warehouse and distribution centre, incorporating onsite car parking and ancillary offices.

Specifically, the proposed development comprises the following works:

- Demolition of all existing structures and buildings on site;
- Construction of a multi-level warehouse comprising 34,690 m² of warehouse GLA with 2,400 m² office space, landscaping at ground and multi-level carparking;
- provision of 214 car parking spaces and end of trip facility;
 - The proposed end of trip facilities includes 29 bike racks.
- Site landscaping;
 - The development concept achieves 10% landscaped area at ground level and has a minimum of 10m and 5m landscape setbacks at the primary and secondary frontages respectively.
- Business identification signage; and
- Operational hours of 24 hours a day, 7 days per week.

3.2 Access Arrangements

- The development concept has been designed in accordance with the following carparking and access requirements.
 - The layout of driveways to loading docks must enable heavy vehicles to:
 - Enter and exit the site in a forward direction.
 - Park within designated loading areas.
 - When possible, loading docks are to be located in areas that:
 - Are not exposed to public streets.
 - Are generally separate from and do not interfere with car parking areas.

The access ramp for heavy vehicles to the Level 1 loading areas / hardstand is also screened off by the office and carparking structure fronting Kelso Crescent.

3.3 Overview of Proposed Development

Overall building areas are outlined in **Table 2**.

Table 2 20 Kelso Crescent, Moorebank Building Area

Site Area	
Site Total Gross Floor Area	35,190 m ²
Warehouse (ALL Warehouses)	34,690 m ²
Workplace (offices)	2,400 m ²
Lobby (All levels)	700 m ²
End Of Trip (EOT) Facility	29 bike racks
Total Carpark Provided	214 spaces
Landscaping Site Coverage	3,525 m ² (10%)

Further details of the proposed development are shown in **Figures 5 - 11**.

Figure 5 Basement Carpark Plan

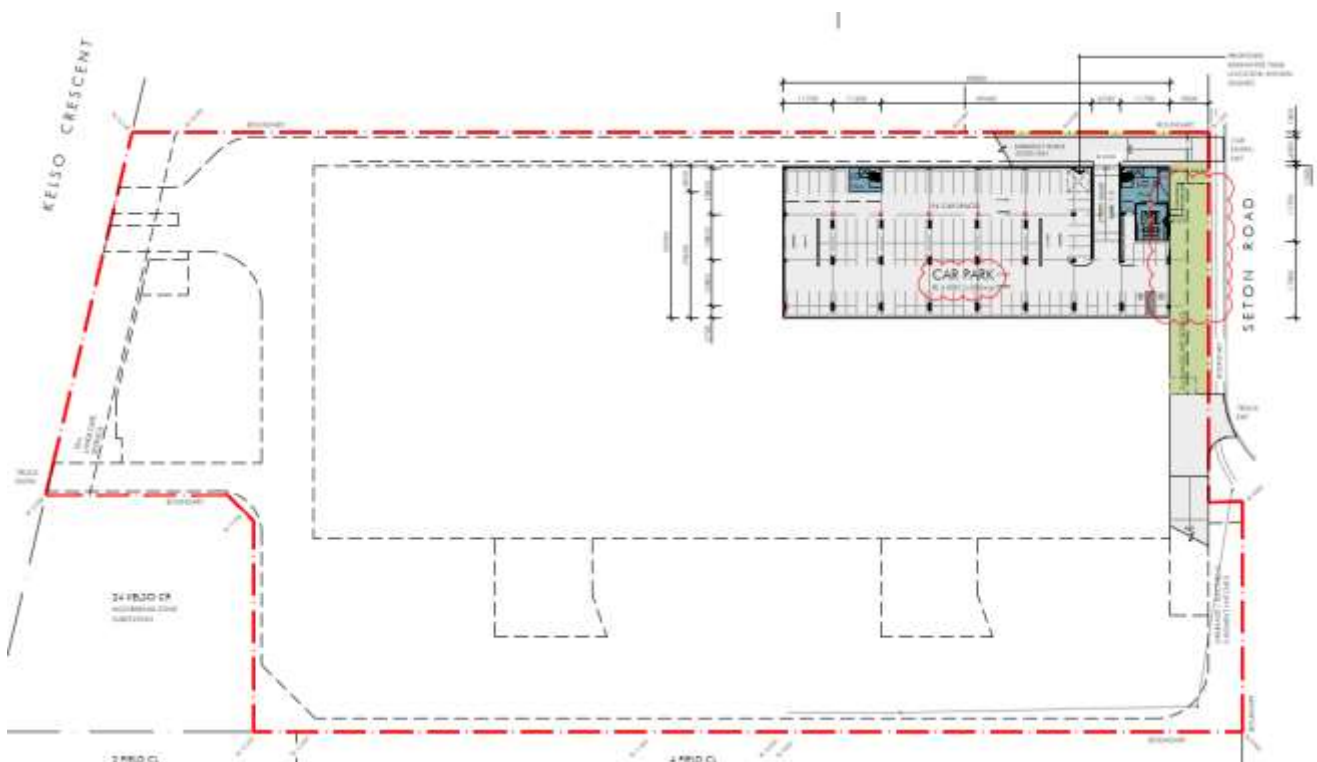


Figure 6 Ground Floor Plan

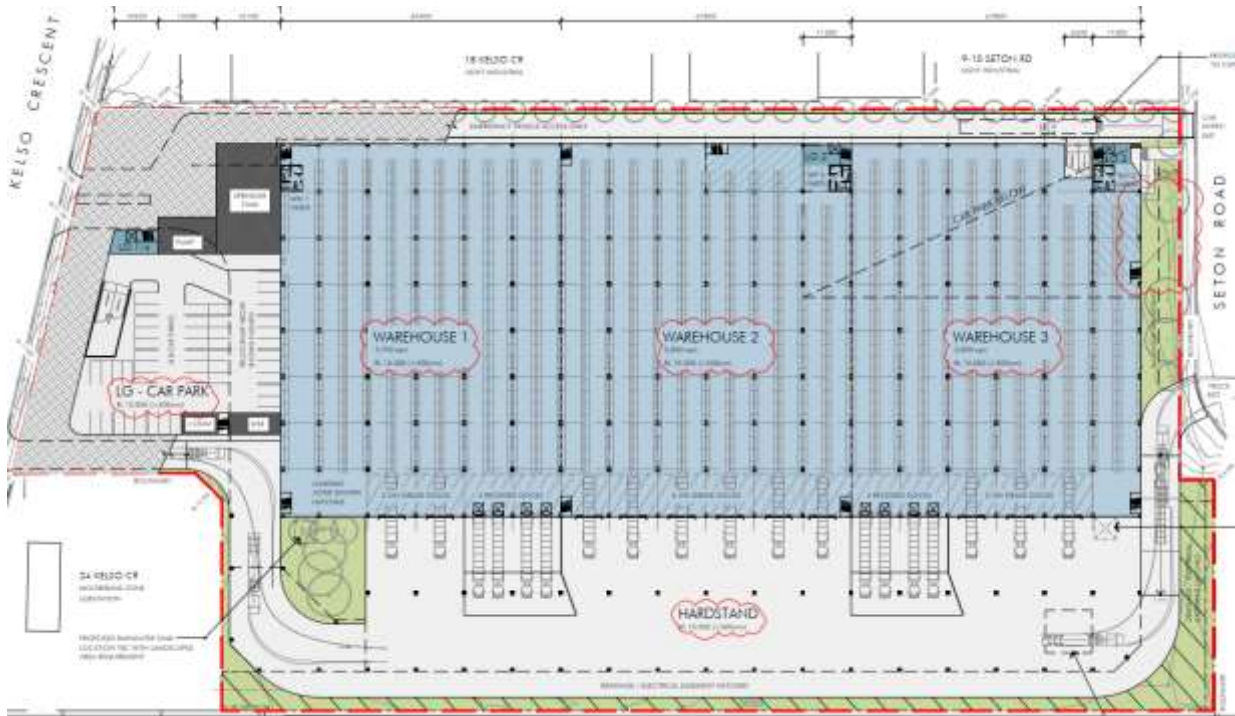


Figure 7 Ground Floor Plan – Mezzanine Level

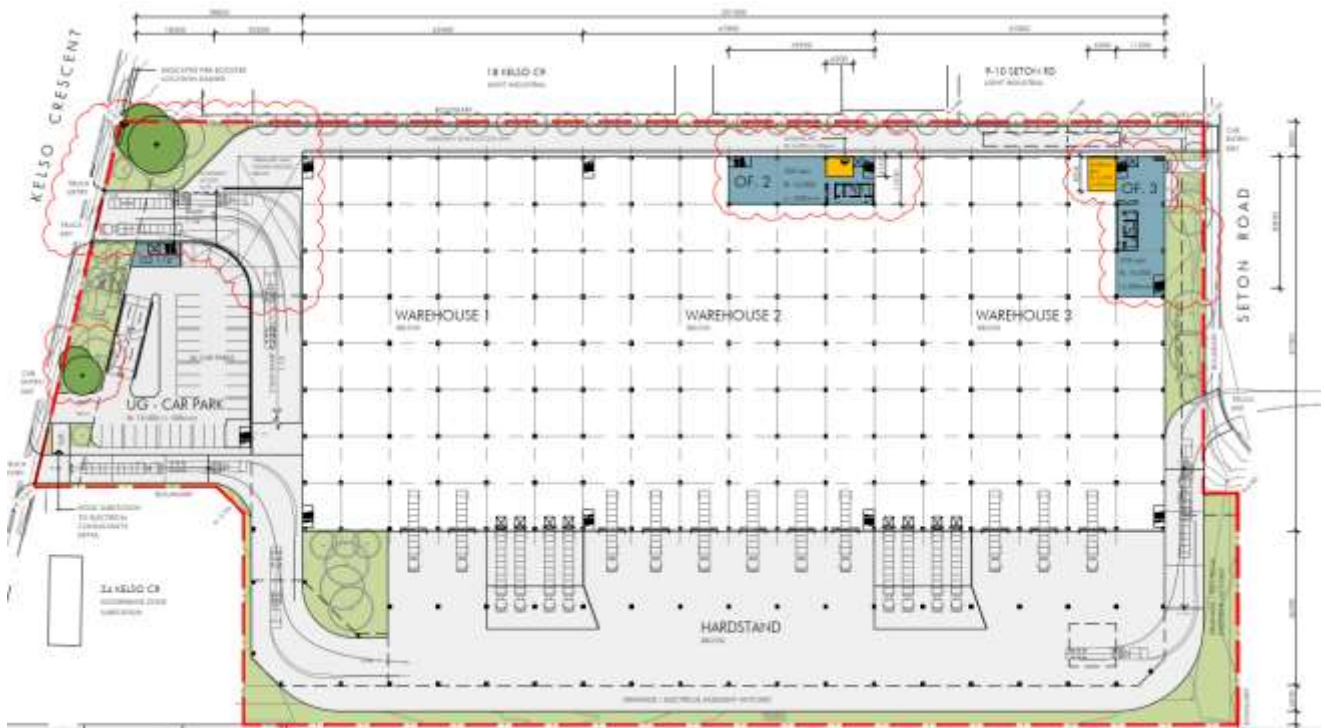


Figure 8 Level 1 Floor Plan

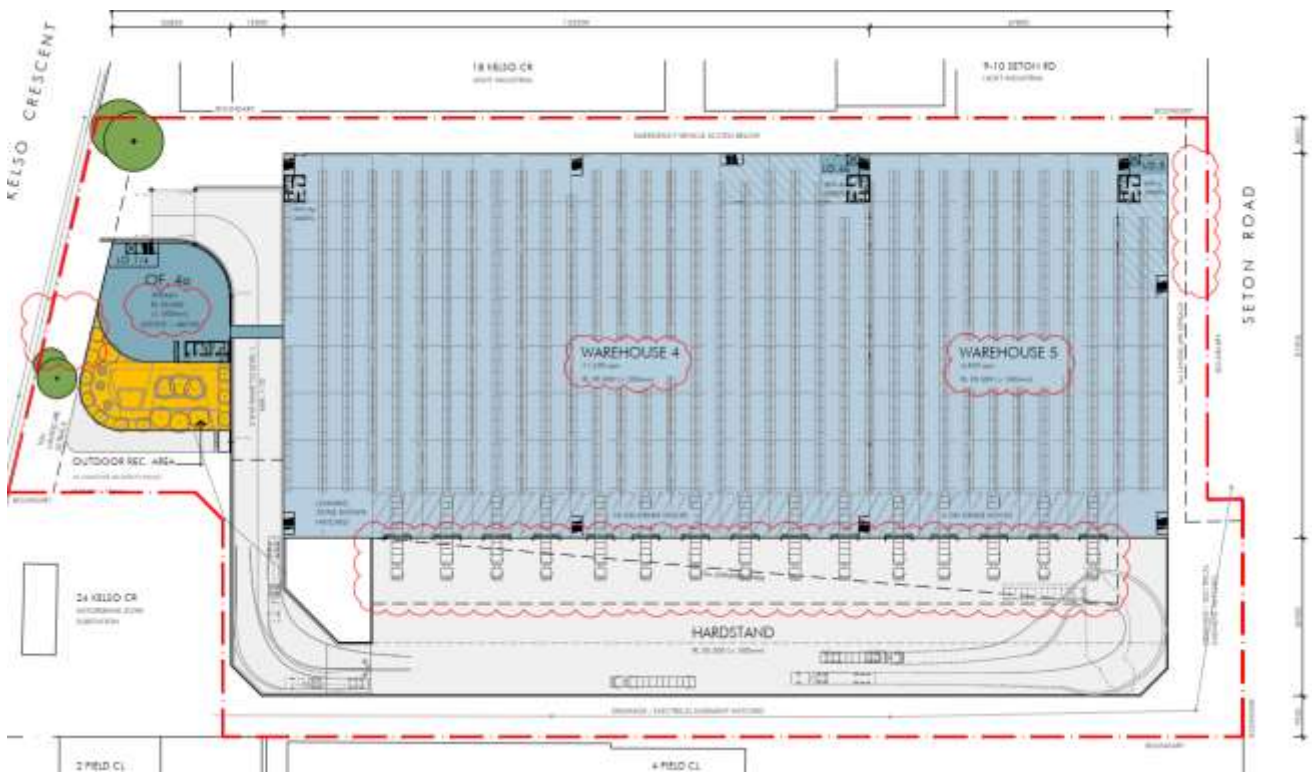


Figure 9 Level 1 – Mezzanine Level

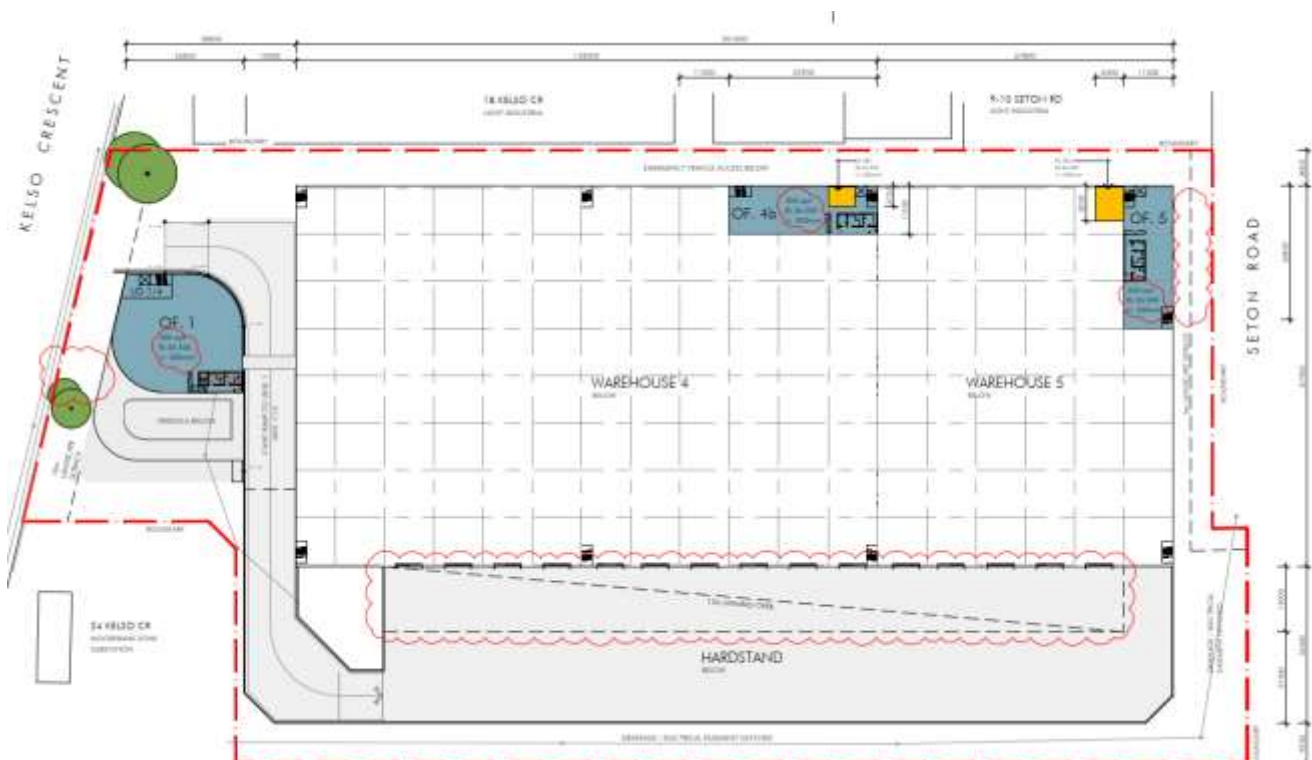


Figure 10 Roof Plan

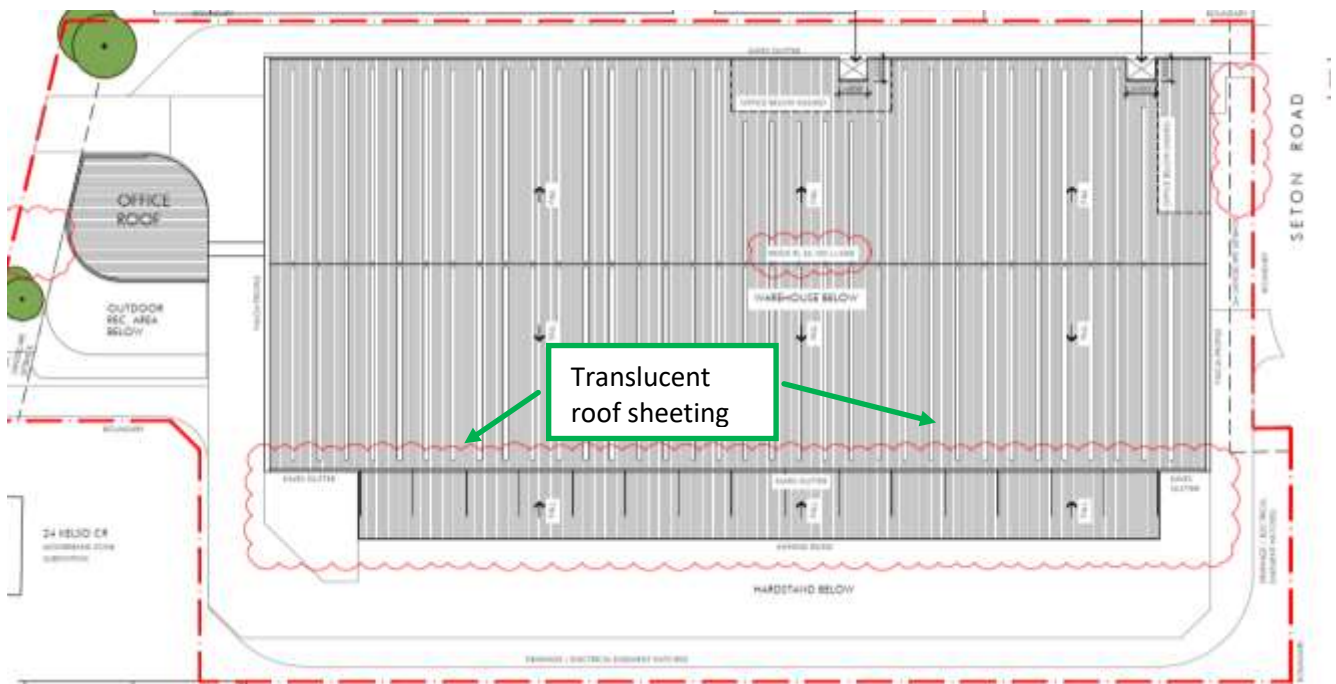


Figure 11 3D image of the Proposed Development



4 OPERATIONAL ENERGY MANAGEMENT

Ineffective energy management for industrial and commercial premises can lead to unnecessary growth in greenhouse gas emissions and consumption of natural resources. 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.

4.1 Identified Major Energy Use Components

The major energy use components of the Project Site have been identified below based on information available within the Project Design Brief.

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

4.2 Energy Sources

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

5 SUSTAINABILITY MEASURES COMMITMENTS

5.1 Documentation

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

Table 3 Project Documentation Sources

Document Type	Document Number	Issue Date
Architectural Drawing	12865: Architectural Drawings Set	27 July 2023
Completed Energy Efficiency Questionnaire	Email	05 July 2023
Mapletree Group Development Management Sustainable Design Specification For New Development	Version V1	3 April 2023
Mapletree Group ESD Policy Summary		Policy Implementation Date: October 2022

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	<ul style="list-style-type: none"> Documentation of design intent and expected outcomes. Appropriate commissioning. 	<ul style="list-style-type: none"> Communicate sustainability initiatives and operation to building users. Commissioning and building tuning required by contractors and reviewed for 12 months after completion. 	<ul style="list-style-type: none"> Provision of Building Users Guide. 	✓	<ul style="list-style-type: none"> 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. All building systems must be commissioned per a recognised commissioning standard (CIBSE or ASHRAE commissioning guides).
			<ul style="list-style-type: none"> Investigate costs and viability of commissioning and building tuning requirements and appointing an independent commissioning agent. 	✓	
			<ul style="list-style-type: none"> Independent consultant to perform quarterly tuning of fire, mechanical, electrical, hydraulic services. 	✓	

Category	Objective	Proposed Target	Proposed Strategy	Commitment	Comment
Façade Performance	<ul style="list-style-type: none"> Optimised façade performance. 	<ul style="list-style-type: none"> Achieve minimum performance requirements under NCC Section J1 and J2. Reduce heat gain through the warehouse façade. 	<ul style="list-style-type: none"> Performance glazing in office spaces appropriate to the window size and orientation. 	✓	<ul style="list-style-type: none"> The building target Average glazing U value ≤ 4 and a Solar Heat Gain Coefficient (SHGC) ≤ 0.4 or less for Wall to Windows ratio (WWR) $\leq 40\%$ and U ≤ 2.7 and SHGC ≤ 0.3 if WWR $> 40\%$ 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. Roof assembly for air-conditioned area will have U-value ≤ 0.8 and U-value ≤ 1.1 for non-air-conditioned building. Insulation proposed to roof and external walls of all air-conditioned office areas
			<ul style="list-style-type: none"> Meet or exceed NCC Section J1 and J2 façade performance for conditioned spaces. 	✓	
			<ul style="list-style-type: none"> Light coloured roofing and appropriate insulation to reduce solar heat gain into the warehouse. 	✓	

Category	Objective	Proposed Target	Proposed Strategy	Commitment	Comment
Social Sustainability	<ul style="list-style-type: none"> Consider design with due regard to occupant satisfaction in accessibility, usability, Indoor air quality and public space utility. 	<ul style="list-style-type: none"> High level of occupant satisfaction. Provide external as well as internal comfort. 	<ul style="list-style-type: none"> Flexibility of space for potential future configurations. 	✓	<ul style="list-style-type: none"> The design will incorporate open plan workspaces, flexible indoor/outdoor space for casual work offices, client rooms, meeting rooms, lunch room and outdoor seating area. Refer Figures 5-9 Low VOC paints, carpet and sealant will be used for the offices. Refer proposed landscaping, Figure 5 to Figure 7. The development concept achieves 10% landscaped area at ground level. Selection of endemic drought tolerance and low maintenance landscaping species Both AC and lighting control is provided to offices and warehouses. The project is committed to connect all lighting to the monitoring system and utilise daylight harvesting to the offices to minimize usage.
			<ul style="list-style-type: none"> Use of Low VOC paints, carpets and sealants. 	✓	
			<ul style="list-style-type: none"> Consider Landscaping and dense planting. 	✓	
			<ul style="list-style-type: none"> Consider occupant user control eg A/C systems, lighting etc. 	✓	

Category	Objective	Proposed Target	Proposed Strategy	Commitment	Comment
Minimising Transport Impact	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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 proximity to major arterial roads. Reduce the impact of operational traffic on local communities. 	<ul style="list-style-type: none"> Consider providing 5% for electrical cars. Consider 10% of total parking spaces for small cars and motorbikes where possible. Provide Bicycle parking and End of Trip facility. The roads linking the site to the M4 motorway, as such the traffic is unlikely to impact on local areas. 	✓	<ul style="list-style-type: none"> 5% (11 spaces) of total parking spaces will be equipped with electrical cars charging stations. The building will have features that facilitate the future installation of electrical vehicle charging equipment. 29 Bicycle parking spaces are proposed based on a Travel Management Plan for the project. One locker will be provided for every eight regular building occupants. The design will include 5 shower facilities. Car Park numbers (214 car parking and provision for disabled parking are provided be in accordance with Consent Authority requirements.
				✓	
				✓	

Category	Objective	Proposed Target	Proposed Strategy	Commitment	Comment
Optimising IEQ	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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 recommended in AS1680.2.4, 2.1 and 0.1. Reduce visual glare. 	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> ✓ ✓ ✓ ✓ ✓ ✓ ✓ 	<ul style="list-style-type: none"> High performance glazing to all air-conditioned office areas to satisfy Section J requirements. Refer Section 5.5 of this report for proposed set up temperatures. Sun shading for main offices. Refer Architectural Drawings R3.7 total roof insulation for the offices as per the NCC requirements Low VOC finishes and low-formaldehyde wood products will be used. Refer Figures 3-7 LED lighting , daylight harvesting for the offices and lighting controls to warehouse and offices. Adequate ventilation will be supplied in accordance with AS1668 and green star requirements. Holland blinds are proposed to reduce glare

Minimising Energy Use

- | | | | | |
|---|---|--|---|--|
| <ul style="list-style-type: none"> • 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. | <ul style="list-style-type: none"> • 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. • Reduce office equipment load from 20W/m² to 15W/m². • Optimise insulation for energy and thermal comfort. | <ul style="list-style-type: none"> • 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 • Investigate current insulation design and determine proposed options. | <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> | <ul style="list-style-type: none"> • Awning shown on the Architectural Drawing. Refer Figure 11 • Insulation as per the NCC requirements • Design brief sets the temperature - Refer Section 5.5 of this report. • LED lighting and lighting controls to warehouse and offices. • Lighting controls to warehouse and offices. • Solar hot water or heat pump system. • Sub meters for major energy/water uses. • Colourbond metal deck is proposed. • As per project NCC Section J report. |
|---|---|--|---|--|

Category	Objective	Proposed Target	Proposed Strategy	Commitment	Comment
Choosing Materials	<ul style="list-style-type: none"> • With consideration to energy inputs in manufacture. • Toxicity. • Consequential impacts – rain forest timbers. • Regional or local manufacturer employment support. • Lower embodied carbon content to typical material 	<ul style="list-style-type: none"> • Reduce steel and cement in 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. 	<ul style="list-style-type: none"> • The project is committed to measuring, reducing and offsetting upfront embodied carbon on all new developments. • Jointless fibre reinforced slab. • Use pre-cast concrete panels with recycled content. • Maximise the use of recycled steel. • Reclaimed / Recycled or Certified timber and Brick Pavement. 	<p>✓</p> <p>✓</p>	<p>To minimise the environmental impacts of materials used by encouraging the use of materials with a favourable lifecycle assessment based on the following factors:</p> <ul style="list-style-type: none"> • Fate of material • Recycling / re-use • Embodied energy • Biodiversity • Human health • Environmental toxicity • Environmental responsibility. <p>The development will adopt sustainable green building systems and products in the construction process to minimize the associated embodied carbon footprint. This includes lightweight concrete panel, certified timber in accordance with Green Building Council of Australia (GBCA) requirements, recycled, green cement and recycled concrete aggregate.</p>

Category	Objective	Proposed Target	Proposed Strategy	Commitment	Comment
Minimising Waste	<ul style="list-style-type: none"> • By clever design. • Contracted to builder as a requirement on site for construction waste. • During the life of the building. • And in dealing with building end of life options. 	<ul style="list-style-type: none"> • Reduce construction waste going to landfill by 90%. • Reduce operational waste going to landfill. • Consider a design that can be disassembled at the end of the building's life. 	<ul style="list-style-type: none"> • Contractor is to develop and implement a Waste Management Plan and track all waste going offsite to show that at least 90% of all construction waste is re-used or recycled. • 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. 	✓	<ul style="list-style-type: none"> • At least 90% of the predicted construction waste arising from development will be re-used (on-site or at another development) or recycled off-site. • The following waste avoidance measures are recommended in the Waste Management Plan for the Project: <ul style="list-style-type: none"> - Provision of take back services to clients to reduce waste further along the supply chain.
				✓	
Water Conservation and Reuse	<ul style="list-style-type: none"> • Monitoring of meters to track use. • Timely maintenance of fixtures and fittings. • Water sensitive landscape design. • Source potable water alternatives such as rainwater harvesting, grey and black water treatment. 	<ul style="list-style-type: none"> • Reduce potable water in internal fixtures. • Reduce potable water for irrigation. • Water efficient operation of appliances. • Utilise rainwater and/or recycled water. 	<ul style="list-style-type: none"> • 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. 	✓	<ul style="list-style-type: none"> • Low flow fixtures and fitting including taps and shower heads. • Selection of endemic and low maintenance landscaping species • SLR recommends at least 4-star water efficient dishwashers. • 110 kL Rainwater tanks have been proposed for rainwater harvesting and re-use for landscape irrigation and flushing of toilets
				✓	
				✓	
				✓	

Category	Objective	Proposed Target	Proposed Strategy	Commitment	Comment
Land Use and Ecology Impact	<ul style="list-style-type: none"> Consider local biodiversity impacts of flora and fauna. Look to specialist advice on land in development. 	<ul style="list-style-type: none"> Encourage biodiversity. Reduce light pollution from the site. Consider reducing impact of stormwater flows off the site into the natural watercourses including Ropes Creek adjacent to the site. 	<ul style="list-style-type: none"> Install indigenous planting appropriate to the area and the adjacent biodiversity lots. 	✓	<ul style="list-style-type: none"> Selection of endemic and low maintenance landscaping species LED lights have been proposed for all external lights to avoid emitting light. All outdoor lighting will comply with AS4282:2019 Control of the Obtrusive Effect of Outdoor Lighting. Box gutter and similar contained roof configurations will be designed to operate with reduction in average annual stormwater discharge (ML/Year) of 40% across the whole site. Detention tanks are proposed to collect water during a storm event, then release it at controlled rates to the downstream drainage system to reduce peak discharge rates.
			<ul style="list-style-type: none"> Design external lighting to avoid emitting light into the night sky or beyond the site boundary. 	✓	
			<ul style="list-style-type: none"> 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. 	✓	
			<ul style="list-style-type: none"> Consider permeable concrete/paving for staff parking areas and footpaths, etc. 	✓	
Renewables	<ul style="list-style-type: none"> Supply renewable electricity to the building. 	<ul style="list-style-type: none"> Reduce carbon footprint for the project site. Reduce the peak electricity demand for the building 	<ul style="list-style-type: none"> Provisions of on-site renewable energy systems 	✓	<ul style="list-style-type: none"> 300 kW PV solar system is proposed to significantly reduce the carbon footprint for the project.

5.2 Baseline and Proposed Energy Consumption

An 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 it is predicted that the proposed development will have more than 44.6% energy reduction - refer **Section 5.6** for the energy saving calculations. The reduction has been enabled via:

- On site PV solar system;
- All luminaire shall be low energy LED type;
- Warehouse lighting is generally to be zonally controlled via light switches;
- Daylight harvesting function to office with external windows; and
- Efficient air conditioning system.

All building information and associated parameters are listed in the following sections of this report.

The Energy Simulation Program used in this study is the IES computer program Virtual Environment 2021 (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_Sydney_RO_81 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, however it is understood a 24-hour operation is proposed. 24-hour operating profiles for occupancy, lighting, air conditioning and equipment were therefore adopted for the office areas; and
- At least 300 kW of PV system has been proposed the rooftop of the warehouse.

The developed 3D model for energy modelling is shown in **Figure 12** and **Figure 13**:

Figure 12 Proposed Warehouses in IES Model (Northwest)

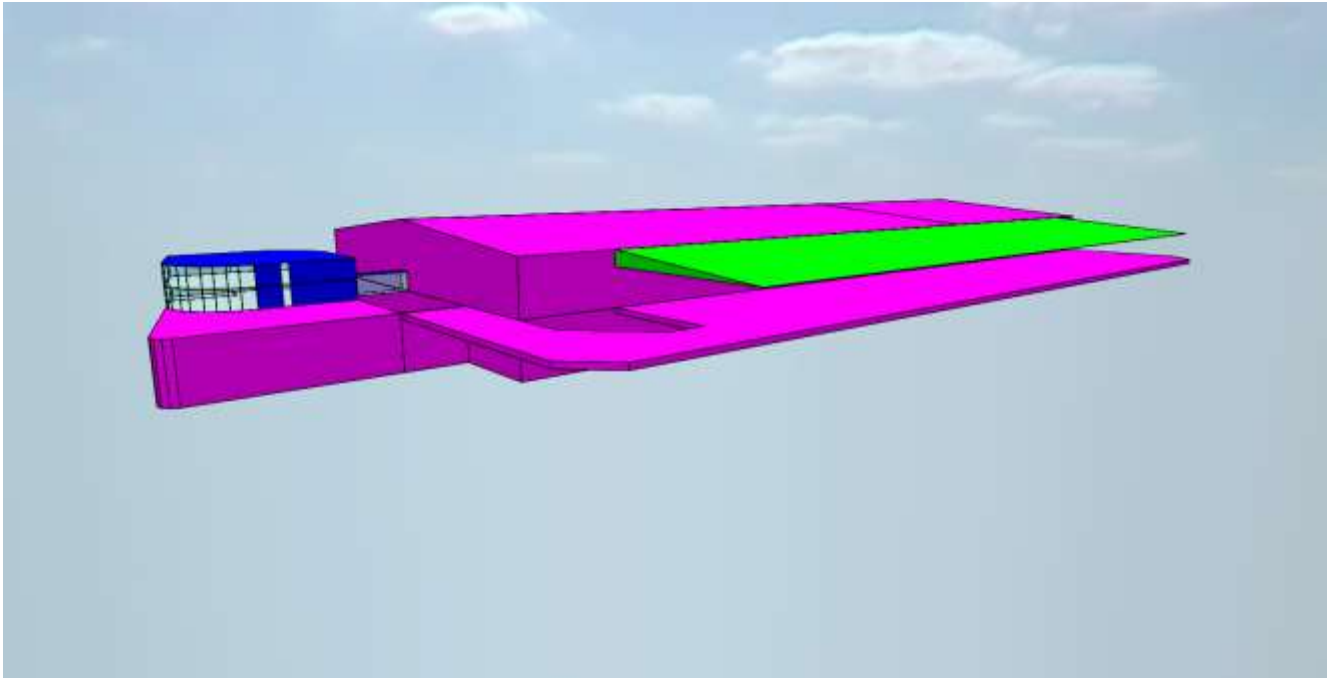
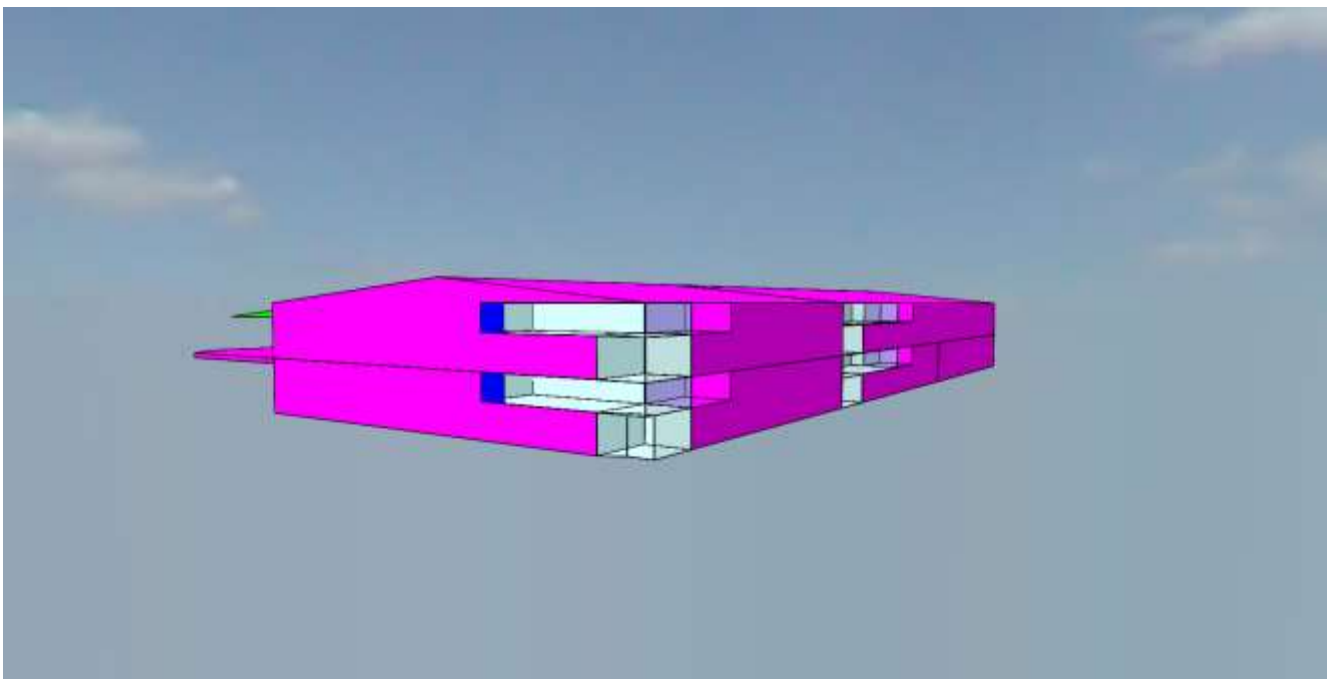


Figure 13 Proposed Warehouses in IES Model (Southeast)



5.3 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 2022 Volume One). The maximum illumination density for a storage warehouse is 4 W/m² as per Table J6.2a of the NCC 2022 Volume One.

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

Office lighting

- LED fitting a minimum Colour Rendering Index (CRI) 85 or higher for offices.
- Lighting is controlled through individual switching in each room.
- Photosensors to maximize use of daylight through windows and skylights.
- Motion sensors at common areas

Warehouse lighting

- LED fitting with a minimum Colour Rendering Index (CRI) 60-80 or higher for warehouse.
- Lighting is controlled through individual switching. The light switch must not operate lighting within an area of more than 250 m² as per the NCC requirements.
- Motion sensors at common 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 warehouse 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 = 4 W/m²
- Offices = 4.5 W/m²

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

- Warehouse 2 W/m²
- Offices 4 W/m²

Therefore, the proposed building is likely to achieve a 43.8% lighting energy reduction when compared with reference building. Detailed calculation is shown in **Appendix A**.

5.4 Mechanical Air-Conditioning

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

Air conditioning will be designed to the BCA/NCC section J and other statutory authorities and applicable Australian standards. Air conditioning systems will be equipped with manual switches, timers or automatic controls for shutting off part of the air-conditioning system during periods of non-use, or reduced heat load in accordance with the Mapletree Group Development Management Sustainable Specification for new development.

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

Table 5 AC Unit Temperature Control Range

Space Type	Temperature Control Range (°C)
Offices	Summer: 22.5±1.5°CBD Winter: 21±1.5°CBD
Space Type	Relative Humidity
Offices	50%

Air-conditioning energy efficiency requirements

2022 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 air flow 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.

SLR recommends the following for the air-conditioned areas:

- All external walls shall have a total R-value of R2.8
- All internal walls to unconditioned space shall have a total R-value of R2.1
- Total roof R-value shall exceed R3.7

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

5.5 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 shall comply with NCC Section J. A Project Section J report will need to 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 for the Conditioned Office Areas

Item	Description								
Climate Data	Weather data from NSW_Sydney_RO_81_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:								
	<table border="1"> <thead> <tr> <th rowspan="2">Description</th> <th colspan="2">Glazing Properties</th> </tr> <tr> <th>U-Value</th> <th>SHGC</th> </tr> </thead> <tbody> <tr> <td>Main office</td> <td>3.2</td> <td>0.18</td> </tr> </tbody> </table>	Description	Glazing Properties		U-Value	SHGC	Main office	3.2	0.18
	Description		Glazing Properties						
U-Value		SHGC							
Main office	3.2	0.18							
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 m3/hr.m ² at 50 Pa reference pressure								
Lighting Density	As per NCC 2022 Table J6.2a for different classification of building								
Lighting hours	24hrs								
Equipment density	Equipment load in the model is 11W / m ² as per 2022 NCC Table 2h								
Equipment schedule	24hrs								

Item	Description
Occupant density	As per Table D1.13 of the 2022 NCC
Occupancy Schedule	Schedule used within this study assume a 24hr occupancy, 7 days per week with a continuous occupancy rate of 70%.
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
HVAC Control	Space temperature summer indoor conditions 22.0±1.5°CBD Space temperature summer indoor conditions 21.0±1.5°CBD
Document References	The reference buildings were modelled in IES <VE> as per the architectural drawings, dated 21 st July 2023

Table 8 Proposed Dynamic Modelling Input for the Conditioned Office Areas

Item	Description								
Climate Data	Weather data from NSW_Sydney_RO_81_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: <table border="1" data-bbox="539 1167 1259 1294"> <thead> <tr> <th rowspan="2">Description</th> <th colspan="2">Glazing Properties</th> </tr> <tr> <th>U-Value</th> <th>SHGC</th> </tr> </thead> <tbody> <tr> <td>Main office</td> <td>4.2</td> <td>0.47</td> </tr> </tbody> </table>	Description	Glazing Properties		U-Value	SHGC	Main office	4.2	0.47
Description	Glazing Properties								
	U-Value	SHGC							
Main office	4.2	0.47							
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 m3/hr.m ² at 50 Pa reference pressure								
Lighting Density	As per NCC 2022 Table J6.2a for different classification of building								
Lighting hours	24hrs								
Equipment density	Equipment load in the model is 11W / m ² as per 2022 NCC Table 2h								
Equipment schedule	24hrs								
Occupant density	As per Table D1.13 of the 2022 NCC								
Occupancy Schedule	Schedule used within this study assume a 24hr occupancy, 7 days per week with a continuous occupancy rate of 70%								
HVAC System type	HVAC efficiencies for heating and cooling as follows: EER: 4.0; CoP: 4.0								
HVAC Hours	24hrs								

Item	Description
HVAC Control	Space temperature summer indoor conditions 22.0±1.5°CBD Space temperature summer indoor conditions 21.0±1.5°CBD
Document References	The reference buildings were modelled in IES <VE> as per the architectural drawings, dated 21 st July 2023

5.1 Domestic Hot Water (DHW)

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

A solar hot water or electric heat-pump system will be provided for the office domestic hot water use.

With the installation of water efficient fixture, 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. Moreover, the supplement natural gas consumption will be reduced by using the proposed solar hot water system.

The energy simulation in this analysis is assumed both reference and proposed building are using same hot water system for DHW. The actual energy consumption will be reduced once solar hot water or electrical heat pump is adopted for the proposed building.

5.2 Minimization of Greenhouse Gas Emission

The predicted Total Annual Energy Consumption of the NCC Reference Building and the Proposed Building is summarised in **Table 8**. For both buildings, temperatures lie within the specified range 16°CDB to 27°C 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 specified range B 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.
- 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; and
 - c. other features as specified in NCC JV3.

The predicted Total Energy Consumed annually by the reference building and the proposed building with the reference services is summarised in **Table 8**.

- The proposed building is likely to achieve a 43.8% lighting energy reduction when compared with reference building. Refer **Section 5.3**
- At least 300 kW of PV solar system has been proposed.
 - The proposed 300 kW PV solar system will offset approximately 416 MWh/year of energy usage.

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

Electricity Usage	Reference Building (MWh)	Proposed Building (MWh)
Heating	31.9	28.9
Cooling	78.2	84.1
Auxiliary	36	42.4
Lighting	1,544	868
Equipment ¹	assumed identical	assumed identical
DHW ²	3.4	2
Ventilation Fans	43.2	43.2
Pumps	14.4	14.4
PV System	-	-416
Total	1993.7	888.37

Note 1: This item is a specific to a tenant's Fitout -hence assumed to be the same for the Reference and Proposed Buildings

Note 2: Heat pump hot water system is considered for the proposed development.

By implementing all energy efficiency measures described in **Section 6**, the project is predicted to achieve a 44.6% GHG emission reduction when compared with 2022 NCC Reference Building.

5.3 Net-zero Statement

The project has strong alignment to net-zero requirements. Some of the initiatives being proposed are:

- All-electric including the use of Green Power.
- Use of on-site renewables
- Energy efficient air conditioning systems

Once the design of the building services is progressed during the detailed design stage, SLR recommends carrying out detailed energy modelling to assess the energy use and optimise design as required.

In addition, a Net-zero Statement outlining the below will be prepared prior to issuing a Construction Certificate for the project.

- Cover Letter and Certification – by a qualified Mechanical or Electrical Engineer.
- On-site Fossil Fuel Usage (Nil in this case)
- Renewable Energy Generation and Storage
- Energy Efficient Design

Refer Appendix A for the net zero statement.

6 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 reuse 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.

110 kL rainwater tank is proposed for irrigation, toilet flushing and car washing. The proposed development will reduce its potable water demand by 5073.7 L per day.

The rainwater tank is sized based on a total irrigation requirement of 500 m² and anticipated population of 240 people as per the hydraulic service calculations.

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 rainwater harvesting facility the proposed development will reduce its potable water demand by at least 5073.7 L /day.

7 MONITORING AND REPORTING

All committed sustainability-related measures need to be commissioned and tuned once the project is completed, 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.

7.1 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.

7.2 Energy Metering and Monitoring

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:

- Whole tenancy parent meter (covering all end uses below)
- Warehouse lighting
- Warehouse power
- Office lighting
- Office power
- Office HVAC
- Lifts

- Domestic hot water
- Solar photovoltaic system
- EV charge points
- For loads over 100kVA, the energy meters are designed to connect to the building EMS/BMS system for ease of monitoring and collection of data

All electricity and water meters will be connected to a monitoring system to allow data analysis. The monitoring system will be designed to have the capability to generate reports on a monthly and/or as required basis for energy and water meters. The following information will be able to be obtained from the Building Management Control System (BMCS):

- Tenant / Use
- Metering Schedule – identifying the location and types of meters
- Meter No, Billing Address and Contact
- Monthly use
- Graph of previous 12 months usage (rolling time scale)
- Average daily use
- Actual versus target; and
- Cost.

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.

A Building Users' Guide will be prepared for the Project in accordance with the Green Building Council of Australia (GBCA) requirements. 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.

7.3 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.

Senior management should also be involved in energy management planning as an indication of the organisation's commitment to the Energy Management Plan.

8 GREEN STAR ASSESSMENT AND CERTIFICATION

Green Star is a comprehensive environment quality and resource system for buildings. Green Star evaluates separately the environmental initiatives of design, projects and/or buildings based on a number of criteria, including energy and water efficiency, indoor environment quality and resource conservation.

Green Star was created to:

- Establish a common language and standard of measurement for green buildings;
- Promote integrated, whole-building design;
- Identify building life-cycle impacts;
- Raise awareness of green building benefits;
- Recognise environmental leadership; and
- Transform the built environment to reduce the environmental impact of development.

8.1 Rating Tool

Green Star – Design & As Built assesses the sustainability outcomes from the design and construction of new buildings or major refurbishments, across nine holistic impact categories. It encourages industry to create buildings that are not just green but healthy, livable, productive, resilient and sustainable.

There are two versions of the rating tools:

- Current version: Green Star Buildings v1.0
- Expired: Green Star - Design & As Built v1.3

The registrations for Green Star - Design & As Built v1.3 closed in December 2021.

The current project will be assessed in accordance with the latest Green Star – Building V1.0.

8.2 Project Eligibility for Green Star

To be eligible for Green Star assessment, projects must meet all provisions of the Green Star Eligibility Criteria detailed below:

- Spatial Differentiation
 - To meet the Spatial Differentiation criterion, the project must be clearly distinct. Only distinct projects are eligible for assessment; project components are not eligible. Shared building services (such as HVAC plant or water treatment) or amenities (such as waste rooms or bicycle facilities) do not affect the building's eligibility for Green Star assessment. Subtenancies are considered part of the fitout and cannot be excluded from the rating.
- Timing of Certification
 - All projects registered for Green Star – Design & As Built must achieve an As Built certified rating.
 - Registered projects may seek to achieve a Design Review certified rating as an interim step towards As Built certification.
- Design Review Certified Rating

- Submissions for a Design Review certified rating can be lodged as soon as the required evidence is available, but prior to practical completion.
- As Built Certified Rating
 - Submissions for an As Built certified rating can be lodged after practical completion.
- Timing Requirements: The following timing requirements are applicable to all registered projects.

8.3 Green Star Rating Scale

The Green Star rating is determined by comparing the percentage of available points achieved out of the total available points. The rating scale shown below details the percentage thresholds for the Star ratings awarded.

Figure 14 Green Star Rating Scale



In keeping with its position that Green Star recognises and rewards market leaders, the GBCA only certifies projects that achieve a Green Star rating of 4, 5 or 6 Stars.

8.4 Green Star Credits and Weightings

Green Star rating tools include nine separate environmental impact categories, which have different weighting attached to each category as seen in figure below:

Figure 15 Green Star Categories and Weightings



The categories are divided into credits, each of which addresses an initiative that improves or has the potential to improve a design, project or building's environmental performance. Each credit category has an environmental weighting. The number of points allocated to each issue is effectively a weighting between

issues within a credit category.

- As Built certified ratings must be achieved within 24 months of practical completion.
- As Built certified ratings do not expire.
- Design Review certified ratings must be achieved prior to practical completion. Design Review certified ratings will expire when either of the following occurs:
 - The project achieves an As Built certified rating, or;
 - The project reaches 24 months post practical completion.
- Design Review certified rating will be cancelled at any time if there is no intent to achieve an As Built certified rating.

The project meets all provisions of the Green Star “Building V1.0”

8.5 Indicative Green Star rating

The project is committed to achieve a 4-Star Green Star Design and As Built Rating using the Green Building Council of Australia (GBCA) Building V1.0 Rating Tool.

Through initial assessments of the proposed development, the project team has targeted Green Star points outlined in **Table 10**. Targeting and meeting requirements for these points would result in an Australian Best Practice 4-Star rating. Refer **Appendix B** for targeted points.

A detailed assessment will be carried out during the detailed design stage once the building services design is progressed.

The project team will develop a zero Action Plan for the building prior to the tenderer phase in accordance with the green star requirements.

Table 10 Targeted Green Star Credits for the Proposed Development

4 Star Green Star – Building v1.0		
	Available Point	Target Point
Responsible	17	3
Healthy	14	6
Resilient	8	1
Positive	30	6
Places	8	3
People	9	2
Nature	14	0
Total Excluding Innovation Points	100	21
Leadership	10	0
	Total	21

9 NABERS ASSESSMENT AND CERTIFICATION

NABERS is a national rating system that measures the environmental performance of Australian buildings and tenancies.

NABERS provides a rating from one to six stars for buildings efficiency across:

- Energy
- Water
- Waste
- Indoor environment

The developer is committed to design, build and commission the office component of the proposed development to achieve 4 Star NABERS energy rating and 4 Star NABERS water rating

10 CONCLUSIONS

SLR Consulting Australia Pty Ltd (SLR) has been engaged by Alexandra Log Aus Assets Pty Ltd to prepare a Sustainability Management Plan (SMP) to accompany a State Significant development application (SSDA) for a proposed warehouse and distribution centre development with ancillary office space located at 20 Kelso Crescent, Moorebank (the site).

This study has been prepared in accordance with the following Secretary's Environmental Assessment Requirements (SEARs) issued for SSD-58978472 on 8th June 2023.

- 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.

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 used as the baseline building 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:

- At least 300 kW;
 - The proposed 300 kW PV solar system will offset approximately 416.1 MWh/year of energy usage
 - The estimated greenhouse gas CO₂ emission saving is approximately 341,202 kgCO₂/annum
- 2 W/m² maximum illumination density for the warehouses instead of 4 W/m² as per Table J6.2a of the NCC 2022 Volume One resulting in a considerable energy reduction;
- Daylight controlled LED lighting for the entire project instead of metal halide, resulting in a considerable energy reduction and reduced maintenance;
- Translucent roof sheeting to warehouse areas;
- Motion sensors at common areas;
- Daylight sensors for the office areas;
- R3.7 total roof insulation for the air-conditioned office areas;
- R2.8 total external wall insulation for the air-conditioned office areas;
- High performance glazing to all air-conditioned areas or minimum NCC requirements;
- Passive solar design for external outdoor areas;
- Efficient air conditioning system;
- A solar hot water or electric heat-pump system for domestic hot water use;

- Power sub-metering to enable continued review of power consumption for the offices, and warehouse;
- Selection of endemic and low maintenance landscaping species;
- 110 kL rainwater tanks for rainwater harvesting and re-use for landscape irrigation and toilet flushing;
- Low flow fixtures and fittings including taps and shower heads;
- The project is committed to achieve a 40% reduction in average annual stormwater discharge;
- Low VOC paints, carpet and sealant for all offices;
- 5% of total parking spaces are dedicated for electrical cars with charging stations;
- Low carbon construction materials including recycled steel, green cement and recycled concrete aggregate;
- At least 90% of all construction waste is re-used or recycled; and
- Other measures as detailed in this report.

By implementing all energy efficiency measures described in Section 6 of this report, the project is predicted to achieve a 44.6% GHG emission reduction when compared with 2022 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 at least 5073.3 L /day.

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

Item for inclusion	Action and Report Location
<ul style="list-style-type: none"> • 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 5, Table 4 details how ESD principal as defined in section 193 of the EP&A Regulation are being incorporated in the design, construction, and operation phases of the project.
<ul style="list-style-type: none"> • Demonstrate how the development will meet or exceed the relevant industry recognised building sustainability and environmental performance standards 	Section 5 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.

Item for inclusion	Action and Report Location
<ul style="list-style-type: none"> 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. 	<p>By implementing all energy efficiency measures described in Section 5 including the proposed PV solar system the project will significantly minimise greenhouse gas emission reflecting the goal to achieve net zero emissions.</p> <ul style="list-style-type: none"> The project is predicted to achieve a 44.6% GHG emission reduction with a 300kW when compared with 2022 NCC Reference Building. Refer Section 5 <p>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 at least 5073.3 L /day.</p>

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 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.

APPENDIX B

Targeted Green Star Points

Appendix C – Net Zero Statement

Net-zero Statement for the Proposed warehouse and distribution centre development at 20 Kelso Crescent, Moorebank

NSW has whole-of-economy targets to reduce greenhouse gas emissions by 70 per cent by 2035 compared to 2005 levels and reach net zero emissions by 2050.

The proposed development at 20 Kelso Crescent, Moorebank is fossil fuel free and is on track to achieve net-zero status.

Since the project is in early design stages, the annual energy consumption for the building cannot be estimated. Estimated amount of greenhouse gas emissions related to energy use of the proposed development will be provided once the design of the building systems is progressed during the detailed design stage of the project.

Based on a preliminary, energy simulation study it is predicted that the proposed development will achieve a 44.6% GHG emission reduction when compared with 2022 NCC Reference Building.

The project has strong alignment to net-zero requirements. Some of the initiatives being proposed are:

- Key consideration for the building Envelop include
 - High performance glazing to all air-conditioned areas or minimum NCC requirements;
 - R3.7 total roof insulation for the air-conditioned office areas;
 - R2.8 total external wall insulation for the air-conditioned office areas;
 - Passive solar design for external outdoor areas;
- Key consideration for the Building System include
 - 2 W/m² maximum illumination density for the warehouses instead of 4 W/m² as per Table J6.2a of the NCC 2022 Volume One resulting in a considerable energy reduction;
 - Daylight controlled LED lighting for the entire project instead of metal halide, resulting in a considerable energy reduction and reduced maintenance;
 - Translucent roof sheeting to warehouse areas;
 - Motion sensors at common areas;
 - Daylight sensors for the office areas;
 - Energy efficient air conditioning systems
 - When the air flow rate of a mechanical ventilation system with a variable speed fan when the supply is more than 1000L/s, the system must have a variable speed fan when its supply air quantity is capable of being varied.
 - PV solar cells operated hot water system or heat pumps.
 - Low flow fixtures and fittings including taps and shower heads
- Key considerations for renewable energy generation include
 - The design incorporates a 300 kW PV solar system on the roof of the carpark structure and the BIMC facility. The proposed PV solar system will offset approximately 416,100 kWh/year of energy usage. The estimated greenhouse gas CO₂ emission saving is approximately 341,202 kgCO₂/annum

- Other considerations to achieve a net zero Development include
 - Electrification of all appliances and equipment
 - A green power will be used 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 or biomass.

Once the design of the building services is progressed during the detailed design stage, SLR will carry out detailed energy modelling to assess the energy use and optimise design as required.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Neihad', with a long horizontal flourish extending to the right.

DR NEIHAD AL-KHALIDY
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