LOTS 201 AND 202

GOONOO GOONOO ROAD

TAMWORTH, NSW

ESD REPORT

FOR

DEVELOPMENT APPLICATION (DA)

GNOO GNOO ROAD PTY LTD

Client

EMF GRIFFITHS

Sustainability Consultants

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EXECUTIVE SUMMARY

EMF Griffiths have been engaged as ESD Consultants by **Gnoo Gnoo Road Pty Ltd** to prepare this ESD report in support of the Development Application (DA) for the Lots 201 and 202 Goonoo Goonoo Road, Tamworth project (the project).

This report provides an outline of the Ecologically Sustainable Development (ESD) initiatives included in the project as well as future commitments to ensure best practice design and construction in regard to ecologically Sustainable Development (ESD).

The project is led by **Gnoo Gnoo Road Pty Ltd** and comprises two (2) new lots (four (4) tenancies) on a new subdivision and associated landscaping works.

For DA, the schematic design proposal for the new buildings and associated landscaping works are the subject of this report.

The project is subject to the following sustainability policies and regulations: -

- National Construction Code (NCC 2022) Section J for Energy Efficiency.
- State Environmental Planning Policy (SEPP) (Sustainable Buildings) 2022.
- Tamworth Regional Development Control Plan 2010.
- The objectives of the NSW Department of Planning.

The above documents contain provisions that translate into best practice sustainable design targets and objectives for the project, requiring to develop a series of ESD strategies from early design phase. This DA report captures the ESD strategies in place in a first instance for the DA stage and outlines the ESD strategies that will guide project design as it evolves, demonstrating how the project addresses the requirements of the NSW Department of Planning.

Key ESD initiatives included in the project are: -

- A building design that is responsive to the local climate and includes passive design measures to provide high quality indoor environments that enhance occupant comfort and wellbeing.
- Façade optimisation to ensure the project meets the energy efficiency requirements of NCC 2022 Section J while providing adequate levels of daylight and visual connection to nature but also helping reduce excessive solar heat gains.
- Combination of lightweight constructions and thermal mass for walls to control the amount of heat gain through opaque parts of the building fabric.
- Measures to reduce potable water consumption including water efficient fixtures and fittings and a rainwater tank to enable reuse.
- Measures to reduce energy consumption including energy efficient building systems and controls, including LED lighting and automated controls, and energy efficient mechanical HVAC systems and ventilation fans.
- Landscape will be designed to be drought tolerant as well as assist in reduction of heat island effect.
- No fossil fuels will be used on-site, and the project may include provisions or opportunities for future solar photovoltaic (PV) systems to reduce greenhouse gas (GHG) emissions associated with the building's operational energy consumption and reduce reliance on grid-sourced electricity.
- Low carbon, sustainable and third-party environmentally certified materials to be specified to reduce embodied emissions and to limit the presence of indoor pollutants such as VOCs.
- Reduction and recycling of demolition and construction waste.

SECTION 1

INTRODUCTION

SECTION 1.0 INTRODUCTION

1.1 PURPOSE OF THIS REPORT

This report identifies and responds to relevant government policy, targets, and requirements pertinent to the Lots 201 and 202, Goonoo Goonoo Road, Tamworth project (the project). Its primary purpose is to detail how the project addresses the State Environmental Planning Policy (SEPP) (Sustainable Buildings) 2022 requirements issued by the NSW Department of Planning.

In accordance with State Environmental Planning Policy (Sustainable Buildings) 2022, the proposed non-residential development is required to comply with Clause 3.2 of Chapter 3 as summarised below, namely subsections (1):

(1) In deciding whether to grant development consent to non-residential development, the consent authority must consider whether the development is designed to enable the following—

(a) the minimisation of waste from associated demolition and construction, including by the choice and reuse of building materials,

(b) a reduction in peak demand for electricity, including through the use of energy efficient technology,

(c) a reduction in the reliance on artificial lighting and mechanical heating and cooling through passive design,

(d) the generation and storage of renewable energy,

(e) the metering and monitoring of energy consumption,

(f) the minimisation of the consumption of potable water.

This report forms part of the **Statement of Environmental Effects (SEE)** documentation required for the development application.

1.2 CONTENTS OF THIS REPORT

This report describes the ESD initiatives that have been investigated and included in the project as well as the ESD initiatives to be considered in future development phases to achieve and demonstrate Australian best practice in sustainable development and the project's response to SEPP Sustainable Buildings requirements.

1.3 PROJECT OVERVIEW

The proposed development includes two (2) new lots on a new subdivision located on Goonoo Goonoo Road, Tamworth. The project site is already identified as E3 Productivity Support Land within Tamworth.

1.4 DESCRIPTION OF WORKS

Development consent is sought for the following works: -

- Construction of two (2) lots on a new subdivision comprising of the following:
  - Lot 201 consisting of Tenancy 1 (2,090m^2 GLA) and Tenancy 2 (2,000m^2 GLA) each with associated BOH areas, loading dock and office/amenities.
  - Lot 202 consisting of Tenancy 3 (1,540m^2 GLA) and Tenancy 4 (2,000m^2 GLA) each with associated BOH areas, loading dock and office/amenities.
- Two hundred and forty-nine (249) car parking spaces for visitors, staff and disabled.
- Associated landscaping works.
- Total site area of 23,096m^2.

A detailed project description is provided within the **Statement of Environmental Effects (SEE)** for the project.

1.5 SITE DESCRIPTION

The proposed development is located on Goonoo Goonoo Road, Tamworth, NSW (Figure 1). A new road will be constructed to facilitate visitor access to the new lots.

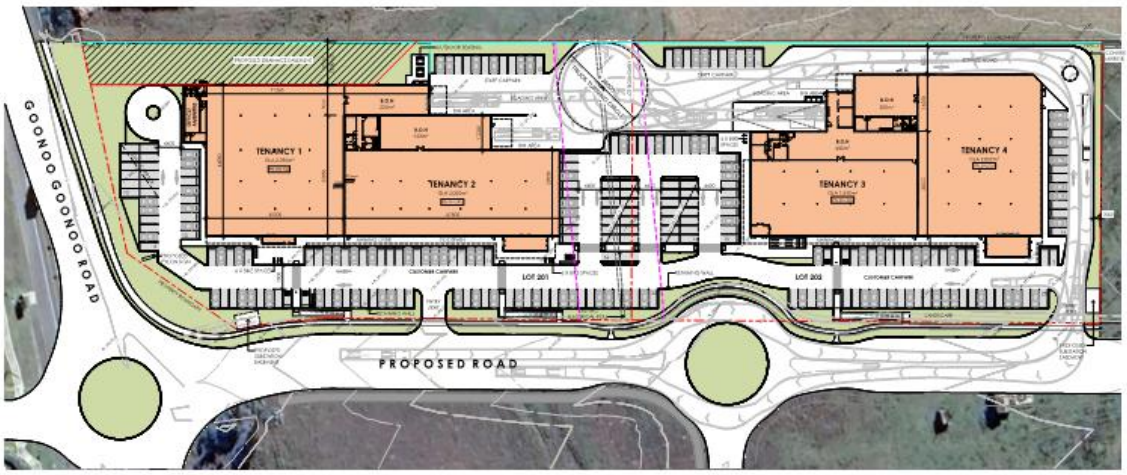

Figure 1: Site Location (Source: Leffler Simes Architects)

Figures 2 and 3 below show the proposed site plans for Lot 201 and 202 respectively.

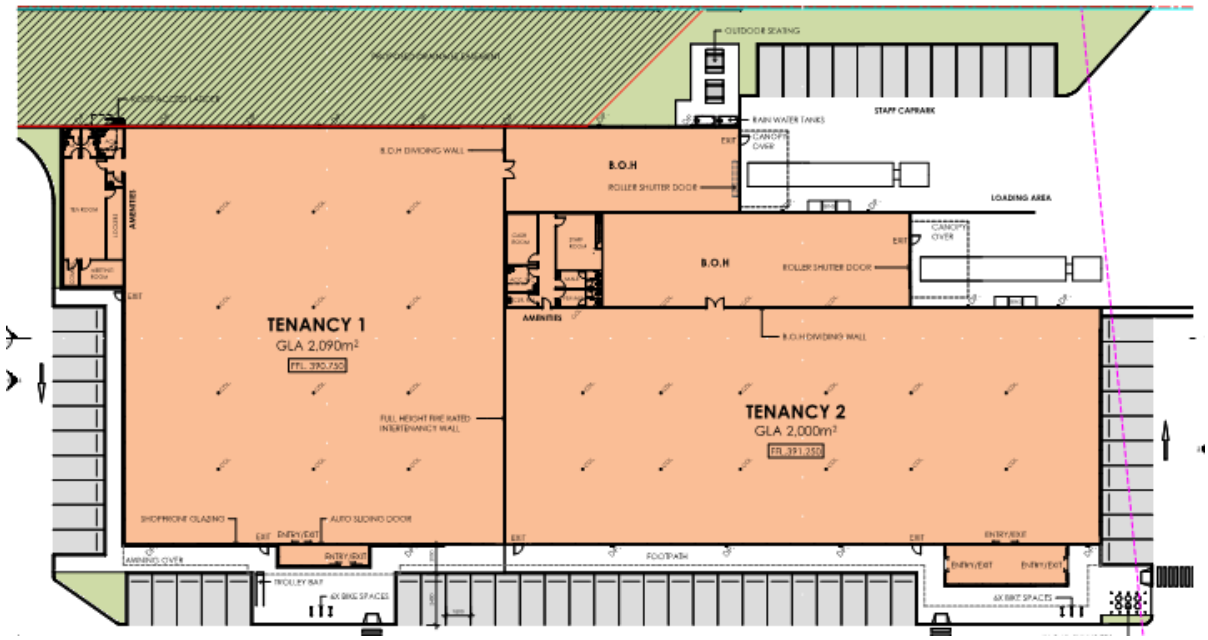

Figure 2: Ground Floor Plan of Lot 201 (Source: Leffler Simes Architects)

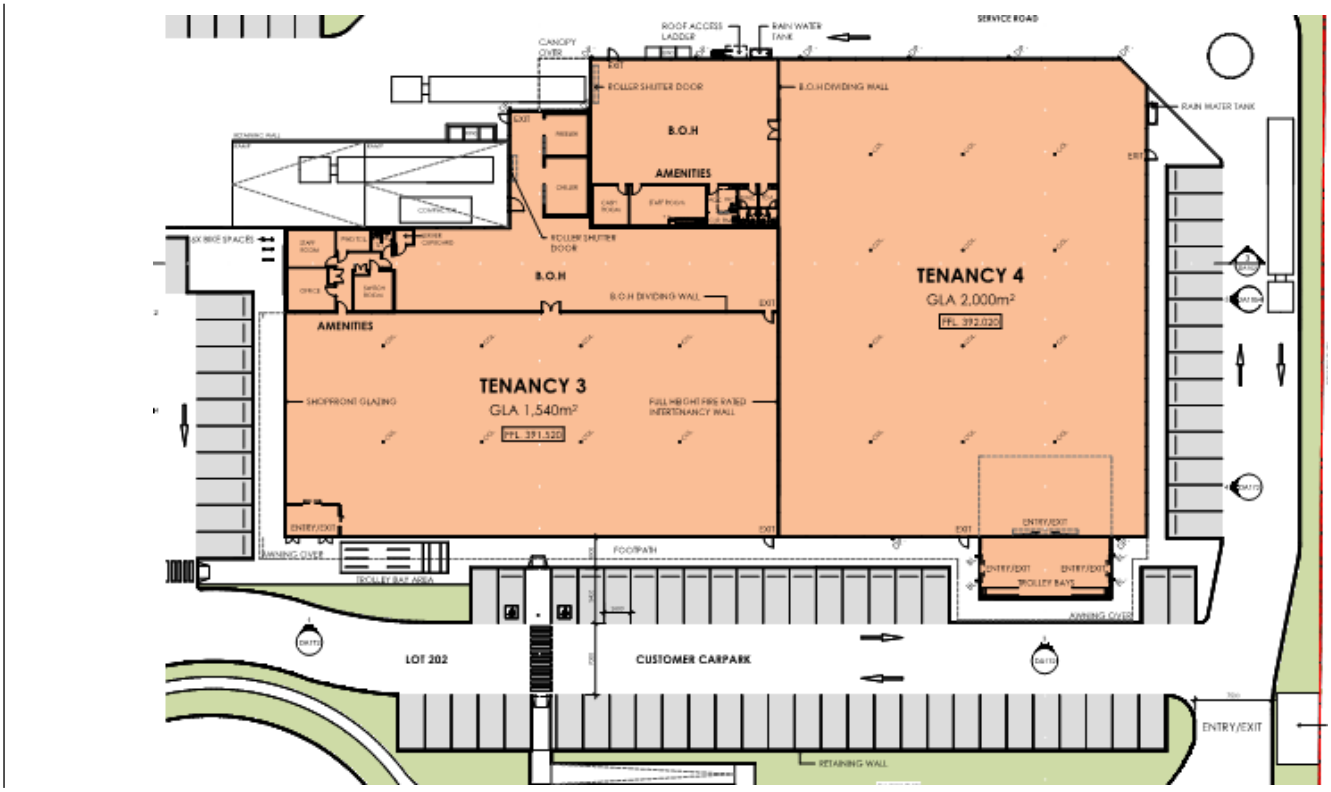

Figure 3: Ground Floor Plan of Lot 202 (Source: Leffler Simes Architects)

1.6 SITE CLIMATE

The Site experiences distinct seasonal variations in temperature. Mean minimum annual temperatures range from 2.9˚C in winter to 15.5˚C in summer; and mean maximum annual temperature range from 17.4˚C in winter to 30.8˚C in summer. Figure 4 below shows average temperature data based on 1992-2024 data from the closest weather station from the Bureau of Meteorology (Tamworth Airport).

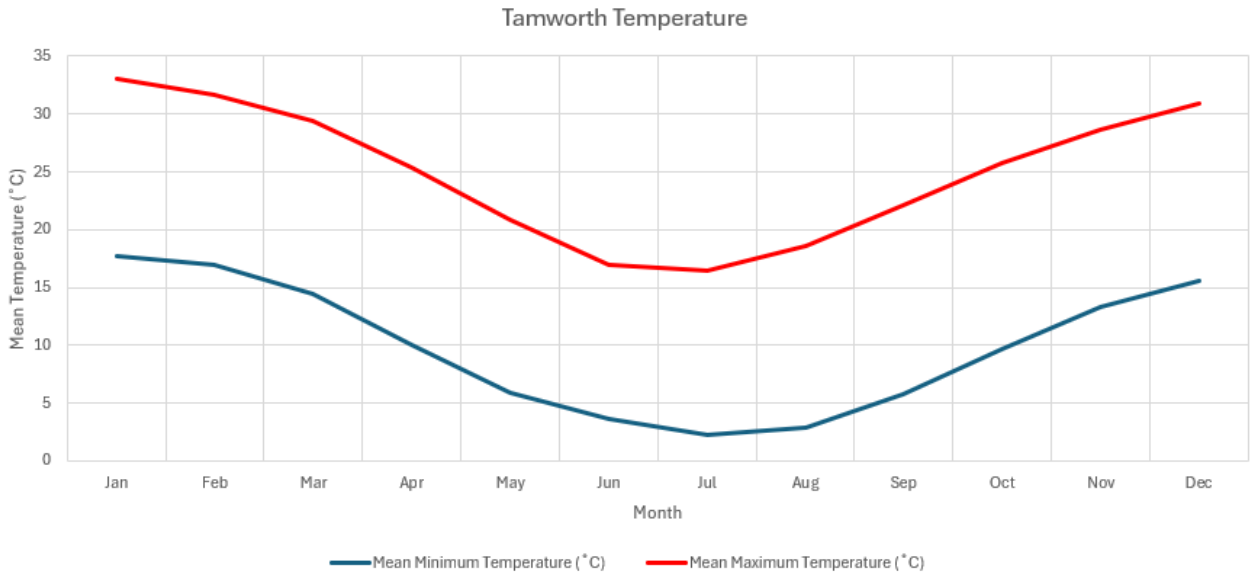

Figure 4: Temperature Data for Years 1992-2024 (BoM: Tamworth Airport)

As shown in Figure 5 below, rainfall varies across the year. Tamworth's annual average rainfall is 653mm with most rainfall occurring in Autumn.

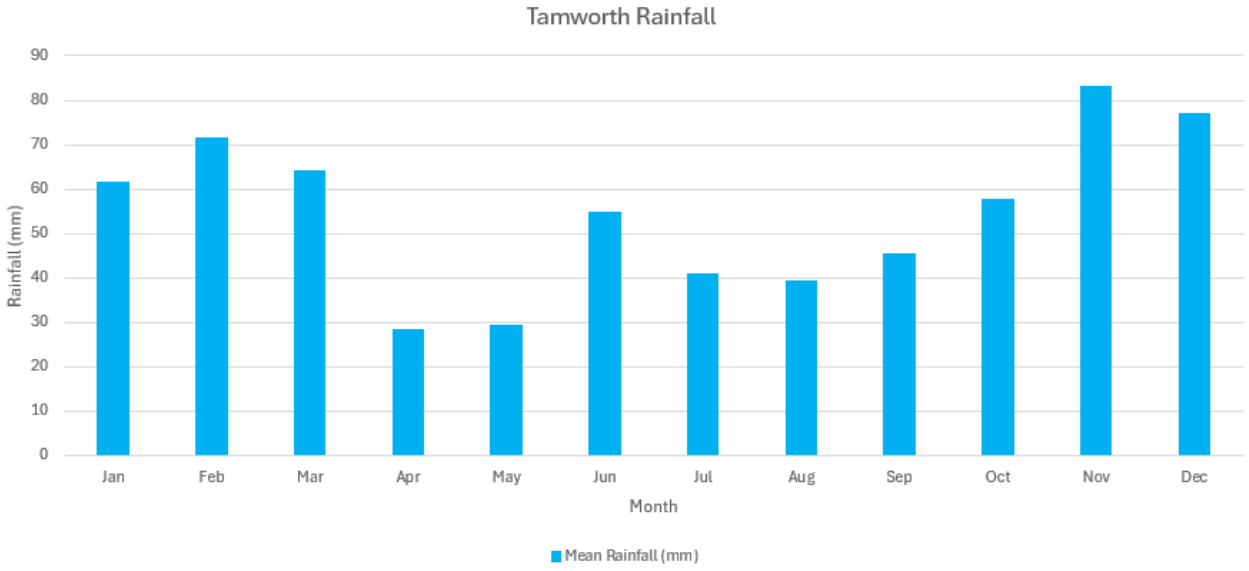

Figure 5: Mean Rainfall Data for Years 1992-2024 (BoM: Tamworth Airport)

SECTION 2

PRELIMINARY CONSIDERATION OF BUILDING PERFORMANCE

SECTION 2.0 PRELIMINARY CONSIDERATION OF BUILDING PERFORMANCE

Preliminary consideration of building performance for the proposed development is reflected by applying passive design principles and achieving the minimum performance requirements stipulated under NCC 2022 Section J.

The building's sustainable design and management practices are further supplemented by consideration of the best practice ESD initiatives.

Section J of the NCC requires that the building fabric and services of the proposed development reduce the generation of greenhouse gas emissions associated with the operation of the building.

The NCC requires buildings to use energy efficiently. This requirement is defined in Volume 1 of the NCC under Section J "Energy Efficiency". There are nine (9) subsections, J1 to J9, which focus on separate aspects of energy efficiency. J1 to J5 relate to the building's fabric and envelope, and J6 to J9 relate to the building services.

Compliance can be demonstrated by meeting the Deemed-To-Satisfy (DTS) provisions or by applying one of the Verification Methods outlined in the NCC. The Verification Methods are generally applied to buildings to which the DTS provisions are not immediately applicable.

The J1V3 Verification Method demonstrates compliance with Clause J1P1 and is the approach that will be adopted for Lots 201 and 202, Goonoo Goonoo Road project. In order to establish compliance with Section J J1P1 using the J1V3 Verification Method, the energy consumption of the proposed development must be less than the energy consumption of a 'reference building' and that the proposed building complies with the J1V3 thermal comfort requirements. Section J compliance then ensures that the proposed building has good energy performance.

While Section J compliance is a policy requirement, meeting the stringent requirements of NCC 2022 Section J will also contribute to the project aspirations to reduce operational energy consumption.

SECTION 3

STRATEGIES AND DESIGN RESPONSE

COMPLIANCE WITH CHAPTER 3 SUSTAINABLE BUILDINGS SEPP

SECTION 3.0 STRATEGIES AND DESIGN RESPONSE: COMPLIANCE WITH CHAPTER 3 SUSTAINABLE BUILDINGS SEPP

In response to subsections (1) of Clause 3.2, a wide range of best practice ESD initiatives and measures will be implemented in the project that will minimise demolition and construction waste, reduction of peak electricity demand, reduce use of fossil fuels, greenhouse gas emissions, energy and water consumption, as well as material resources.

3.1 CONSTRUCTION AND DEMOLITION WASTE MINIMISATION

To limit the amount of waste produced on site, it is critical to manage the process of demolition and ongoing construction. Large amount of waste can be produced on site due to material wastage/ surplus, damages, packaging and general procedures involved in material assembly. Hence, the project's initiatives to reduce waste include: -

- Choosing building fabric materials for the development such that could be prefabricated off site. When delivered on site, these would just have to be erected and assembled. This helps to reduce material wastage, i.e. construction waste and helps to minimise the amount of energy used when compared to other conventional in-situ materials. All these factors together help to reduce the overall embodied emissions of the building. Moreover, use of such materials would also help to reduce the end-of-life waste as they could potentially be reused in other areas upon deconstruction.
- The project will establish targets for the reduction of construction waste. The intention of these targets is to divert the waste from landfill and encourage recycling and reuse of materials. The use of locally sourced materials/ procuring salvaged and/or recycled materials is also prioritised.
- Since the site had no previously existing buildings, there would be minimal demolition waste generated thus resulting in minimal energy required for removal of building related debris. Waste generated from excavation would be managed responsibly, and relevant contractors will be appointed for their safe disposal.

3.2 REDUCTION IN ENERGY CONSUMPTION THROUGH THE USE OF TECHONOLOGY

The energy consumption of a building amounts to its largest environmental impact. Sustainable design techniques focus on reduction of energy consumption through passive design, energy efficient practices, and cleaner energy production/renewable energy to reduce CO_2 emissions to the atmosphere.

The benefits of an energy efficient building are reduced operating costs, a healthier indoor environment, reduced liability, and recognition of being environmentally responsible. The project will incorporate multiple design and operational initiatives to address reduction in energy consumption: -

3.2.1 Mechanical Services

All building services will be designed to comply with NCC 2022 Section J. The following mechanical strategies will be considered, subject to detailed design of the project: -

- All mechanical equipment (indoor and outdoor AC units, ventilation and exhaust fans) is to be energy efficient, subject to life cycle costing analysis outcomes.
- Automated controls to be present to reduce energy consumption with variable speed motors to be provided for ventilation fans, where suited.
- Ductwork/pipework systems to be designed to reduce system pressure losses and reduce fan motor power.

3.2.2 Electrical Services

The Project Team will work to implement electrical services that assist in creating an energy efficient design, as detailed below, subject to detailed design of the project: -

- Robust, long-life LED lighting with automatic lighting control system to reduce energy wastage – lighting control strategies may include implementation of daylight or motion sensors, area dimming, time clocks, or PIDs.
- Energy efficient electrical equipment will be specified to reduce building electricity consumption.
- The electrical design will also allow for spare spatial provisions and switch board capacity for the future installation of solar batteries, electric vehicle (EV) charging infrastructure and solar PV systems.
- External lighting will be compliant with relevant Australian Standards to reduce light pollution to neighbouring bodies and the night sky.

3.3 PASSIVE COOLING AND HEATING DESIGN STRATEGIES

The design has adopted and will continue to adopt passive cooling and heating design principles to reduce the building's reliance on mechanical HVAC system and artificial lighting. This includes rationalising the extent of the glazing (i.e., window to wall ratio %), implementing external shading as necessary to limit solar penetration in summer to reduce the heat load from the façade, and use of highlight reflective roof materials. In addition, the use of high-performance glazing along with external shade structures will help to reduce excessive heat gains and loss of heat from the inside to the outside.

The aim of passive building performance is to reduce reliance on energy of any source, this means preventing excessive heat entering the building during summer or being lost during winter and/or the need for artificial lighting. To this end, the project has considered general building form, orientation, and shading, as well as roof space for renewable energy as required: -

- Building orientation and shading have been considered to ensure solar gain is managed appropriately for heating and cooling.
- Strategic positioning of glazing to limit the amount of harsh heat entering the building, i.e. limited glazing on the east and west façade.
- Façade design will consider maximising daylight and views for improved occupant comfort, health and wellbeing while at the same time limit exposure to excessive solar heat gains.
- The building is being designed to meet the stringent energy efficiency requirements of NCC 2022 Section J. This applies to both building fabric and services, including insulation, glazing, and shading which will be designed to ensure spaces require minimal additional heating and cooling.
- The building design utilising a combination of lightweight constructions and thermal mass for walls to control the amount of heat gain through opaque parts of the building fabric.

3.4 USE OF RENEWABLE ENERGY

To reflect with the Government's net zero emissions goals of 2050, the project is designed to be all-electric; no fossil fuels will be used for heating or cooling, domestic hot water or cooking.

- Where practical, solar hot water systems will be implemented. Spatial provisions for future solar PV system will be implemented to reduce operational greenhouse emissions.
- The electrical design will also allow for spare spatial provisions and switch board capacity for the future installation of solar batteries, electric vehicle (EV) charging infrastructure and solar PV systems.

3.5 METERING AND MONITORING OF ENERGY CONSUMPTION

To ensure that all building systems operate as per their design criteria, it is essential their energy consumption is continually monitored. This can help in identifying the source of any anomalies/ faults and can be rectified immediately. To ensure this:-

- Major energy uses are to be sub-metered by end use, and/or function area.
- Energy and water meter monitoring systems to be installed to provide real-time energy and water consumption readings.
- Potable water sub-metering to be implemented to reduce wastage through identifying leaks or poor operational performance via an automated monitoring system.

3.6 POTABLE WATER

The Project Team will implement the below strategies that assist in achieving a water efficient design as detailed below, subject to detailed design of the project: -

- Highly water efficient WELS rated fixtures and fittings to be implement. Specification of fittings to be confirmed in the detailed design.
- Provision of rainwater tanks for reuse. Water efficient drip irrigation systems will be incorporated along with drought tolerant plant species to further reduce the need for landscape irrigation.

3.7 OTHER INITIATIVES (INDIRECT IMPACTS)

3.7.1 Site Impacts

There are no existing buildings currently on the site. In increasing the built form on the site, the project has considered how this will affect the following: -

- Heat island effect.
- Ecological impact, in particular landscaping for increased ecological value.
- Site emissions (stormwater and light pollution).

The Project Team has reviewed how roofing materials and landscaping is incorporated into the ESD strategy to ensure the site's contribution to heat island effect is mitigated. This influences the microclimate around the building and the external heat that the building is subjected to.

Additionally, the proposed development intends to include rainwater tanks on site to collect and reuse rainwater for landscape irrigation.

3.7.2 Use of Sustainable Materials

The project encourages the use of sustainable and low carbon construction materials to reduce embodied emissions through initiatives, such as the use of low Portland cement concrete, locally and sustainably made reinforcing and structural steel, as well as measures to minimise the mass or volume of materials. Materials with 'cradle-to-gate' or 'cradle-to-cradle' credentials or with third-party environmental certifications, such as GECA, GreenTag, FSC or PEFC certified timber will be specified. Specification of materials will be confirmed in the detailed design: -

- Specifying low VOC emitting materials to improve indoor air quality.
- Specifying engineered wood products with low or no formaldehyde limits.
- Applying principles to reduce embodied emissions through use of low carbon materials, such as: -
  - Specifying low carbon concrete such as Portland cement replacement through use of fly ash or other supplementary cementitious materials, captured/reclaimed water for mix water, and recycled aggregates.
  - Specifying sustainable and low carbon steel, e.g. reinforcing steel manufactured from energy-reducing processes, substituting the use of conventional reinforcing bar and mesh with steel fibres or post-tensioning strands where applicable.
  - Implementing sound and sustainable procurement practices to reduce embodied emissions from material transport and construction.
- Pipe material selection based on current best practice such that: -
  - Non-PVC pipes to be specified wherever possible.
  - PVC-u to be specified based on the Best Practice PVC guidelines.
  - Polyethylene material to be specified for pressure water and gas services, as polyethylene is recyclable and has significantly lower environmental impact than the alternative ductile iron material.
  - Pipe bedding materials to be specified to be locally sourced, where practical.

SECTION 4

IMPROVING ENVIRONMENTAL PERFORMANCE AND BEST PRACTICE APPROACHES

SECTION 4.0 IMPROVING ENVIRONMENTAL PERFORMANCE AND BEST PRACTICE APPROACHES

The project has been designed in line with best practice sustainable building principles to improve environmental performance and to reduce ecological impact.

An integrated approach to ESD, whereby all Design Team members are aware of the incremental effect of their actions on the overall project, is by far the most effective path to achieving a strong ESD outcome. Passive design and active systems can be implemented to enhance a building's performance, but unless the fundamentals have been addressed, the optimum outcome cannot be assured. In addition, occupant wellbeing is of utmost consideration especially considering the function of the project as an industrial warehouse.

At the DA stage, the following key ESD measures have been implemented to ensure the mentioned policies and targets are achieved: -

- The development will integrate energy efficient building services and façade design such that compliance with NCC 2022 Section J will be achieved. Façade design will also incorporate external shading from overhanging projections and awnings to reduce heat loads on the mechanical HVAC system.
- Building design will implement measures to mitigate future climate risk and encourage climate adaptation and resilience. These include use of highly reflective roof materials and landscaping throughout the site to reduce heat island effect.
- Inclusion of ESD initiatives to reduce energy consumption, such as energy efficient LED lighting with the use of motion sensors.
- Highly water efficient fixtures and fittings will be installed along with rainwater tanks to capture and reuse rainwater for landscape irrigation. The HVAC design will feature waterless heat rejection.
- The project will encourage the use of sustainable and low carbon materials throughout the construction, as well as the use of products with third-party environmental certifications. Interior finishes such as paints, adhesives and sealants, carpets and engineered wood will be low VOC and low formaldehyde respectively.
- External lighting will be compliant with relevant Australian Standards to reduce light pollution to neighbouring bodies and the night sky.
- Where applicable, refrigerants with low ozone depletion potential and low global warming potential to be specified.
- The proposed design will include spatial allowance for a future solar photovoltaic (PV) system to be installed on the roof of each building (where practicable). The use of on-site solar PV will reduce greenhouse gas emissions and reliance on the use of grid electricity.