NORTHROP

ESD REPORT

Woolworths Austral South

330-350 Eighth Avenue, Austral South NSW 2179

PREPARED FOR
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ESD Report

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1. Introduction

This Ecologically Sustainable Design (ESD) report has been prepared for Woolworths Group to support the development application submitted to the City of Liverpool relating to the development site at 330-350 Eighth Avenue, Austral South NSW 2179. The application seeks approval for the detailed design and operation of a new retail centre with supporting food and beverage tenancies and commercial tenancies.

This report addresses the following items of Liverpool Growth Centre Precincts Development Control Plan (DCP):

- To encourage energy efficient building design and operation that complies with statutory benchmarks in sustainable development.
- To minimise energy and resources consumption during construction and operation.
- To consider local climatic conditions and ensure that the design of centres maximises amenity and activity within the public domain during a wide range of weather conditions.

This report addresses the above and provides an overview of the ESD principles and greenhouse gas and energy efficiency measures that will be implemented.

Specific sustainability initiatives proposed for the building include, but are not limited to:

- Space efficient building layout.
- Water Sensitive urban design principles
- High Efficiency Electrical Systems
- Large scale on-site renewable energy generation
- Installation of a rainwater capture and reuse system for all buildings on-site
- Energy Efficient heating, ventilation and air conditioning including natural ventilation to open spaces.
- Waste Minimisation strategies
- Certified 4 Star Green Star Buildings Rating

Through the implementation of the initiatives noted in this report, the project addresses, and endeavours to mitigate against negative environmental, social and economic impacts associated with the development of the site.

1.1 The Site

The proposed development site is situated to the south of Eighth Avenue and is located within the City of Liverpool Local Government Area. It is located approximately 2.7km northwest of Leppington Station. (refer to **Figure 1** below).

Figure 1 – Site location

Source: Moxham Commercial

1.2 Overview of the Proposed Development

This development application seeks approval for the detailed design and operation of the retail centre that will have a total GFA of **7,364 m²** including **5,581m²** of retail tenancies and **1,782m²** of commercial tenancies.

In summary, the proposal includes:

- the construction and operation of a two storey retail centre with specialty retail and commercial tenancies
- the construction of entry piazza
- ground level car parking in the southern portion of the site with approximately 321 spaces;
- detailed landscape design; and
- external infrastructure upgrades, including the construction of the South Road and New West Road adjacent to the development.

This report is based on the design package prepared by ClarkeHopkinsClarke. The Site Plan illustrating the proposal is provided at **Figure 2** below.

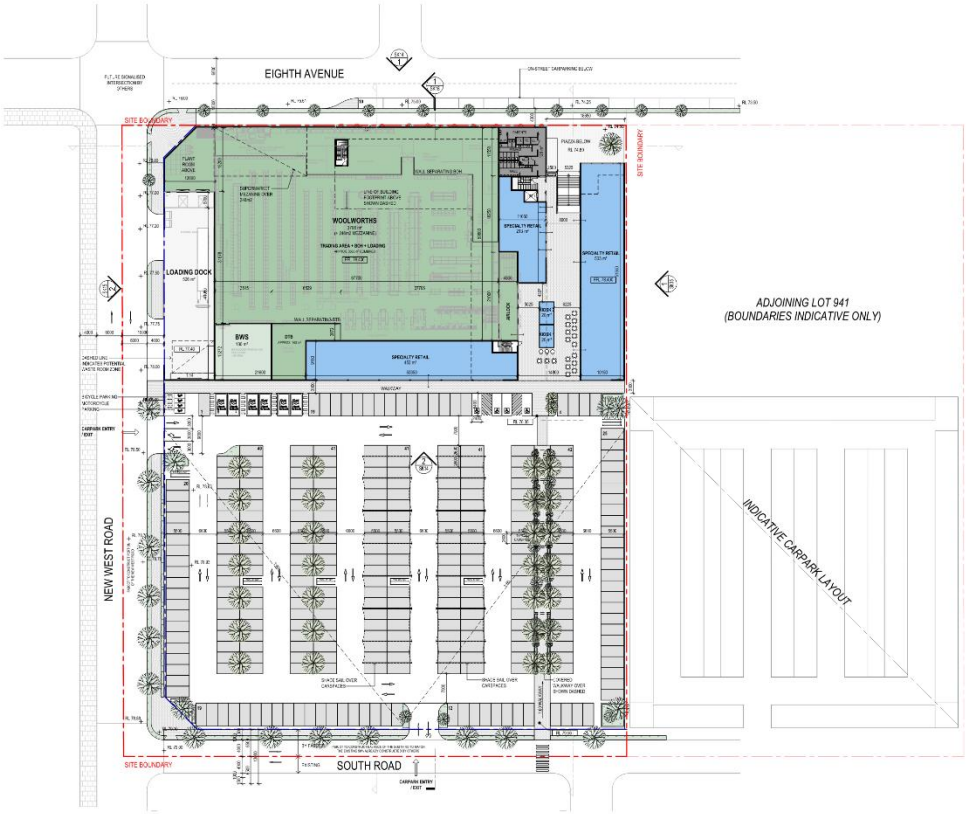

Figure 2 – Proposed Site Plan

Source: ClarkeHopkinsClarke (Not to Scale)

1.3 Response to Liverpool Growth Centre Precincts Development Control Plan (DCP)

This report addresses how the proposed project addresses the DCP. These requirements are outlined below alongside where the response to each can be found within this report.

Key Issue	Item for inclusion	Action to Address Requirement	Report Location
Solar access, weather protection and energy efficiency	To encourage energy efficient building design and operation that complies with statutory benchmarks in sustainable development.	The project is committed to achieving an Australian Excellence 4-star Green Star Buildings rating, and details of the targeted initiatives are addressed in Section 4.	Section 4
	To minimise energy and resource consumption during construction and operation.	This report includes sections that nominate the materials, energy and water efficiency measures proposed during construction and operation.	Section 2
	To consider local climatic conditions and ensure that the design of centres maximises amenity and activity within the public domain during a wide range of weather conditions.	A climate risk assessment has been conducted and with results incorporated in the current design.	Section 3

1.4 Limitations

Due care and skill have been exercised in the preparation of this report.

No responsibility or liability to any third party is accepted for any loss or damage arising out of the use of this report by any third party. Any third party wishing to act upon any material contained in this report should first contact Northrop for detailed advice, which will consider that party's requirements.

All simulations and performances noted within this report are estimations only. They are based on the existing design of the facility and best practice estimation techniques. These figures are indicative only and should not be used for cost or other analysis purposes.

1.5 The Proposal

1.5.1 Project Details

Component	Description
Site Name	Woolworths Austral South
Address	330 – 350 Eighth Avenue, Austral South NSW 2179
Site Area	Total area of 18,133 m2 (Approximate)

The site is in Austral South, 43km southwest of the Sydney CBD and 28km from Parramatta.

2. Ecologically Sustainable Development

The following section describes how ESD principals (as defined in section 193 of the Environmental Planning and Assessment Regulation 2001) are being incorporated in the design, construction, and operation phases of the project. These initiatives illustrate how the project addresses the following;

- The precautionary principle – through the implementation of environmental management and an assessment of the building's operational maintainability, the project attempts to incorporate adaptability and resilience into the project design. The concept behind the precautionary principle is to create spaces that can both; accommodate for changes, which may eventuate in the future, and avoid the risk of serious or irreversible damage to the environment.
- Inter-generational equity to ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations – through the inclusion of zero ozone depleting refrigerants, best practice PVC and low impact paints, sealants and adhesives, alongside a focus on providing greater vegetation and support for the buildings connection with nature, the project demonstrates a strong commitment to the preservation of environmental health, diversity and productivity of the local area.
- Conservation of biological diversity and ecological integrity – through the planting of native vegetation, improvement of stormwater runoff from the site and use of integrated landscaping, the project will act to improve, conserve and support the local biological diversity and integrity.
- Improved valuation, pricing and incentive mechanisms - the design process should involve significant input from the Quantity Surveyor who will be involved ensure that the project both remains on budget and effectively considers environmental factors in the valuation of assets and services. Furthermore, the project will look at maintainability and the operational costs associated with individual design initiatives and the overall design.

Through the inclusion of the above and the sustainability initiative outlined within this report the project clearly addresses the ESD Principles into the design, construction and operation of the building as defined in section 193 of the Environmental Planning and Assessment Regulation 2001. Further detail of the general sustainability initiatives is outlined below.

2.1 Energy Efficiency:

Energy efficiency will be considered throughout the design development process with the following improvements to be considered by the design team. It is expected that the measures outlined in the following section, alongside a large solar array, will significantly reduce the site's grid electricity demands when compared to a standard practice building.

2.1.1 Improved building fabric and glazing performance

The building envelope comprises several different façade types, with the proposed scheme using a combination of light-coloured metal roof finishes and low-e glazing to lower heat gains throughout summer while maintaining good daylighting throughout of the building.

The use of well-designed glazing and building materials will also assist the projects targets for energy efficiency, acoustic performance, and thermal comfort.

2.1.2 Integration of Cool roofs

To address heat islanding across the site and wider area, the site should incorporate cool roofing with a high Solar Reflectivity Index (SRI 82) which will minimise the build-up of heat within the material and reduce load on the HVAC system.

2.1.3 HVAC System Control

The proposed HVAC system will provide thermal comfort and acceptable indoor air quality to individual areas of the site. The project will look to select a HVAC system with a higher seasonal energy efficiency ratio (SEER) rating. Given the scale of the conditioned spaces this will likely be a variable refrigerant flow (VRF) energy efficiency system which will provide individual comfort control and simultaneous heating and cooling within different zones ensuring the system does not consume more energy than required at any given time.

2.1.4 Energy Metering and Monitoring

An energy metering and monitoring strategy is to be considered to effectively monitor the main energy uses within the building, alongside the lighting and small power use. This aims to provide fault detection and monitoring of the different areas of the building.

2.1.5 Improved Outdoor Air Provision

The project will aim to improve the outdoor air provided to regularly occupied spaces. This will be achieved through the use of CO_2 sensors and monitoring to minimise CO_2 build up within the internal areas and improve comfort for the building occupants.

2.1.6 Highly efficient lighting system

The installation of LED lighting throughout the building will assist in the minimisation of lighting energy use. Improved lighting energy also reduces the heat loads within conditioned spaces and therefore lowers the energy used to condition the building. The use of efficient controlled lighting within the retail areas will provide a significant improvement in energy use.

2.1.7 Low Impact

Embodied energy will be reduced by avoiding unnecessary use of materials and procuring materials with a low carbon footprint where appropriate options are available.

2.2 Energy Generation

With the above energy efficiency measures, the energy load of the facility will be reduced, allowing a large portion of the site's electrical energy demand to be met through the suggested inclusion of a PV Solar Array. This will assist to both offset the sites energy use and minimise the sites daytime peak demand from the grid.

2.3 Indoor Environment Quality

Indoor environment quality is always an important consideration in spaces that are regularly occupied such as the commercial tenancies and shopping centre. The following considerations have been considered as part of the building design:

2.3.1 Daylight Access

The design of the facility has aimed to allow good daylight penetration into both internal and external spaces. Daylighting is provided through shopfront glazing with awnings above to avoid addition of significant thermal gains. This access to daylight throughout the building will both minimise energy used for lighting and will improve occupant connection to their external environment.

2.3.2 Interior noise level control

Internal noise levels will be actively considered with the building layout and systems design considering how noise will reverberate through the building. The use of acoustic insulation and sound isolation will ensure that interior noise levels to be maintained below acceptable limits.

2.3.3 Material selection

Materials selection for the project aims to improve the internal environment of the site with materials with low volatile organic compound (VOC) and formaldehyde content preferred to help minimise respiratory issues for building occupants.

2.4 Sustainable Transport

2.4.1 Bicycle parking

Bicycle parking spaces will be provided near the west side of the carpark entry and accessible to both staff and patrons to encourage the uptake of sustainable transport option.

2.4.2 Electric vehicle charging

Dedicated car parking spaces with charging infrastructure provided for electric vehicles to support the uptake of electric vehicles to minimise greenhouse gas emissions.

2.5 Water Efficiency

A strong focus has been put on the effective management of water within the building with the following initiatives being included in the design in all areas throughout the project. It is expected that these initiatives will reduce the sites potable water demand by more than 50% compared to a standard practice building.

2.5.1 Water efficient fixtures and fittings

Water Efficient fixtures and fitting will reduce the water consumption of the site. As an indication, the following should be targeted:

- Wash hand basin taps 6-star WELS
- General taps 6-star WELS
- Toilets dual flush 4-star WELS
- Urinals 0.8 L per flush 6-star WELS
- Shower heads 7-9 L per minutes 3WELS

2.5.2 Water Sensitive Urban Design

The project will look to incorporate a water sensitive urban design to reduce the demand on potable water, treat urban stormwater and redirect stormwater into the urban landscape to improve facilities. Rainwater gardens are a low maintenance and cost-effective way to achieve water sensitive urban design as they are designed to capture stormwater runoff within the urban environment. Benefits associated with rainwater gardens include the reduction in water pollution entering downstream receiving water, flood mitigation in surrounding areas, nutrient supply to plans, groundwater reserve replenishments and the promotion of biodiversity through habitat provisioning.

2.5.3 Rainwater capture and reuse

A large rainwater capture and reuse system could be designed for installation to offset the sites water usage for washdown, toilet flushing and other facets of production. This system would have the ability to offset most of the sites potable water usage.

2.6 Improved Ecology

A well-designed landscape featuring a selection of native grasses, shrubs and trees will promote the biodiversity of insects and native birds through the creation of wildlife corridors and habitat provisioning. Consequently, the design will actively contribute to conservational efforts within the

urban environment, encourage positive interactions between people and nature whilst also minimizing the ongoing environmental impact of the project.

2.7 Waste Management

Effective waste management throughout demolition, construction and operation of the site will help to promote resource efficiency and minimise the adverse environmental impacts of the project. The following are being considered as part of the design process.

2.7.1 Waste Management Plan

A Waste Management Plan will be prepared with the following key objectives:

1. To minimise the environmental impacts of the operations of the development
2. To minimise the impact of the management of waste within the development
3. To ensure waste is managed to reduce the amount landfilled and to minimise the overall quantity generated

These objectives will be achieved through strategies such as the integration of recycling bins and back-of-house separation areas, which will encourage recycling and separation of cardboard/paper waste, glass, food waste and comingled recycling and general waste.

2.7.2 Separated Waste and Recycling Streams

The provision of separated waste and recycling streams could allow for more effective recycling of the project's operation waste. Providing separate bins for cardboard/paper waste, glass, food wastes, comingled recycling and general waste will improve the buildings operational efficiency and result in significant environmental benefits.

2.7.3 Construction and Demolition Waste Minimisation

The project should look to minimise the demolition and construction waste associated with the project and can aim to divert over 90% of waste from landfill to recycling or reuse facilities.

3. Climate Change Projections

As part of the design review the project has completed a risk assessment for the sites climate adaption risks based on the CSIRO climate change projections for Southwestern Sydney. This risk assessment reviewed the following three elements:

- Consequence: what will be the effect of the development should the impact occur?
- Likelihood: how likely is it that the impact will occur?
- Risk Rating: what is the associated risk of the development when the likelihood of it happening is measured against the possible consequence of the impact?

Key risks posed to the site which will be addressed as part of this process and high-level issues are outlined below with comment on how these are addressed within the current design; further detail will be developed within the projects detailed design development stages.

- Changing Surface Temperatures should be addressed through the following.
    - Use of high reflectivity roofing to minimise heat gain and heat island effects.
    - Integration of solar panels to provide shading to areas of the roof and provide increased power to the site when peak energy use for cooling is required.
    - Incorporation of heating, ventilation, air conditioning (HVAC) systems designed to modulate in the event of changing outside air temperatures. Equipment will be rated to continue operating during higher temperatures.
- An increase in rainfall intensity should be managed through the following.
    - Inclusion of rainwater and stormwater storage systems to modulate flows exiting the site.
    - Ability to provide increased finished floor level (FFL) designed to be 0.50 m above freeboard requirement to account for increased flooding potential at the site.
    - Inclusion of awnings to the entry access points to promote allow continued operation during adverse conditions.
- An increase in wind speed intensity should be addressed through the following.
    - The metal roof design incorporating roof bracing to fasten the roof onto the building structure to account for increasingly strong winds on site and prevent damage to the roof due to prevailing winds.
    - Improved structural integrity to ensure that the building is not significantly impacted in the event of high intensity wind loads. This includes wind loading on loading dock awnings and doors.
- Decrease in humidity and increased drought conditions will be addressed through the following.
    - Increased capacity within the fire safety systems to assist in the management of bushfire risk associated with dryer conditions.
    - Additional non potable water supply for irrigation needs and the integration of native and drought tolerant vegetation.

Overall, the current design incorporates significant measures to address key projections for climate change in the near term. The project will incorporate further initiatives to address all high and extreme risks posed to the site.

4. Best Practice Sustainability – Green Star

4.1 Overview

The Green Building Council of Australia's provides an internationally recognised system to assess sustainable outcomes throughout the life cycle of the built environment. It was developed by the Australian Building Industry through the Green Building Council of Australia (GBCA), the nation's leading authority on sustainable buildings and communities.

This section provides a summary of elements drawn from the Green Star tool 'Green Star Buildings' that may be applied at the proposal stage in order to benchmark this project to industry best practice sustainability, noting that this project is targeting a certified Green Star Buildings rating.

The Green Star system incorporates ESD principals across eight major categories:

- Responsible
- Healthy
- Resilient
- Positive
- Places
- People
- Nature
- Leadership

It is noted that a Certified 4 Star Green Star Buildings rating is being targeted at this stage.

4.2 Responsible

The Responsible category aims to assist owners, builders, and the supply chain on the sustainability journey to ensure the building is designed, built, and handed over in a responsible manner. This proposed project design is incorporating the following areas of focus:

- Industry Development
- Responsible Construction
- Verification and Handover
- Operational Waste

4.2.1 Industry Development

Northrop is a member of the Green Building Council of Australia (GBCA) and has been appointed as a sustainability advisor to provide advice, support and information related to sustainability principles and processes, for the development of the project. Additionally, efforts will be made to promote the achievements of this building to relevant stakeholders including the occupants and visitors to the site.

4.2.2 Responsible Construction

To ensure responsible construction is achieved within this project, a formalized systematic approach to the planning, implementing, and auditing phase of construction will be introduced to promote opportunities for improved environmental and social outcomes. From the onset of construction an Environmental Management System certified to the recognized standard AS/NZS ISO 14001 and environmental management plan covering the scope of construction activities will be introduced. Additionally, the project design will look to divert at least 90% of the demolition and construction waste from landfill and sustainability training will be provided to all contractors and subcontractors present onsite for more than three days regarding the sustainable attributes of the building and their role in delivering a sustainable building.

4.2.3 Verification and Handover

As discussed above the project design will look to incorporate an array of monitoring and metering systems regarding the energy and water usage of the building. These systems should be independently verified through a series of commission and tuning assessments conducted prior to, during and 12 months following the completion of the building. Relevant building information regarding the operation and maintenance of the building to deliver best practice will be provided to the building facilities management team to enhance the environmental performance of the building.

4.2.4 Operational Waste

The building design will provide bins and storage areas to ensure the efficient collection and separation of waste into appropriate waste streams by the building occupants and waste collection contractors. The waste storage area design considers safe accessibility for collection vehicles including driveway access and appropriate height clearances which are to be assessed and signed off by a waste specialist or contractor.

4.3 Healthy

The Healthy category strongly emphasizes the importance of improving the indoor environment quality of rated buildings to enhance the health and wellbeing of occupants. The proposed project design is incorporating the following areas of focus:

- Clean Air
- Light Quality
- Acoustic Comfort
- Exposure to Toxins

4.3.1 Clean Air

Outdoor air pollutant infiltration should be mitigated through compliance with ASHRAE Standard 62.1:2013 regarding the minimum separation distances between pollution sources and outdoor air intakes.

To ensure CO_2 levels do not exceed 800ppm within each occupied space an integrated indoor air quality monitoring system and CO_2 sensors should be implemented. This ventilation systems will serve to ensure the source of pollutants meet minimum emission standards and function to exhaust pollutants directly to the outside in accordance with recognized standards.

To ensure easy maintenance efforts of the air distribution system adequate access to both sides of the moisture and debris-catching components of the mechanical ventilation systems will be provided.

4.3.2 Light Quality

Lighting within the building will be flicker free with a Colour Rendering Index (CRI) of 85 to meet minimum comfort requirements and ensure occupant comfort. The project design will also look to incorporate adequate lighting levels through artificial lighting and daylight suitable for typical tasks within each space in accordance with current best practice standards and guidelines.

4.3.3 Acoustic Comfort

An Acoustic Comfort Strategy should be prepared to ensure the building design delivers acoustic comfort to the occupants. This strategy should be prepared by a qualified acoustic consultant during the design stage to ensure the proposed performance metrics for each Acoustic Comfort criteria applicable to this project type will exceed the minimum legislative and best practice guidelines.

4.3.4 Exposure to Toxins

At least 95% of all internally applied paints, adhesives, sealants and carpets will meet the below stipulated 'Total VOC Limits' (TVOC).

Table 1: Maximum TVOC Limits for Paints, Adhesives and Sealants

Product Category	Max TVOC content in grams per litre (g/L) of ready to use product
General purpose adhesives and sealants	50
Interior wall and ceiling paint, all sheen levels	16
Trim, varnishes, and wood stains	75
Primers, sealers, and prep coats	65
One and two pack performance coatings for floors	140
Acoustic sealants, architectural sealant, waterproofing membranes and sealant, fire retardant sealants and adhesives	250
Structural glazing adhesive, wood flooring and laminate adhesives and sealants	100

To demonstrate compliance for the use of carpets all products will be certified under a recognised Product Certification Scheme or other recognised standards.

4.4 Resilient

The Resilient category provides building owners the opportunity to demonstrate their careful consideration towards the short-term and long-term performance and resilience of the building regarding several disruptions including climate change and other externalities ranging from pandemics to infrastructure failure. The proposed project design is incorporating the following areas of focus:

- Climate Change Resilience
- Operation Resilience

4.4.1 Climate Change Resilience

The project team have conducted a high-level assessment of the climate risk for the project (detailed in section 3), however, additional to this the project will conduct a climate change pre-screening to consider potential impacts and exposure risks to climate change for the building which will be effectively communicated to the building owner and future tenants.

4.4.2 Operation Resilience

The building design will respond to acute shocks and chronic stresses that can affect its operations over time. This will be done via a comprehensive risk assessment carried by a suitably qualified professional. The project team will ensure that the risks have been addressed through specific design responses. Additionally, the project team will perform an assessment of the building's survivability in

the case of a blackout and will be designed to account for its design purpose and provide a measure of survivability for the likely occupants.

4.5 Positive

This category drives project designs to address critical aspects of the built environment such as the need to reduce the energy consumption of a building and a transition to renewable energy to pursue the 1.5 °C climate trajectory. This category encourages the built environment to address its emissions alongside water consumption. The proposed project design is incorporating the following areas of focus:

- Upfront Carbon Emissions
- Energy Use – Reference Building Pathway
- Energy Source
- Water Use

4.5.1 Upfront Carbon Emissions

The proposed project design will incorporate good design and responsible material selection to ensure the upfront carbon emissions are at least 10% less than those of a reference building. This is proposed to be achieved through both reductions in the impact of concrete and steel and a strong focus on a lean design for the building to prevent unnecessary resource consumption.

4.5.2 Energy Use – Reference Building Pathway

The project design will aim to reduce energy use by at least 10% in comparison to a 2019 National Construction Code Section J compliant building. This will be assessed as part of the project detailed design with a strong focus on the measures detailed in Section 2.1 of this report.

4.5.3 Energy Source

The project will aim to source 100% of its building electricity from renewables in line with Woolworths' Sustainability Plan 2025.

4.5.4 Water Use

The proposed project design will look to incorporate efficient water fixtures, rainwater capture and reuse systems and infrastructure for potential future recycled water connection to reduce the potable water usage of the building by 45% in comparison with a 2019 National Construction Code Section J compliant building.

All sanitary fixtures and water-using appliances installed within the project's scope must, at minimum, meet the following WELS ratings:

Table 2: Sanitary Fixture Efficiency

Fixture / Equipment Type	WELS Rating
Taps	5 Star
Urinals	5 Star
Toilet	4 Star
Showers	3 Star
Dishwashers	5 Star

4.6 Places

The Places category places people at the forefront of design. Buildings inevitably impact on their wider surroundings and this category emphasizes the importance of promoting positive impacts and limiting negative ones. This is achieved through celebrating culture, promoting a sense of belonging and welcomeness to occupants and visitors. The proposed project design is incorporating the following area of focus:

- Movement and Place
- Enjoyable Place

4.6.1 Movement and Place

The project design will incorporate changing facilities including shower installations based on the regular occupancy of the building as well as lockers to encourage occupants and visitors to use active, low carbon and public transport options rather than private vehicles. The project design emphasizes the importance of providing safe facility accessibility to all building occupants.

The parking areas provided for staff and patrons will incorporate electric charging, to encourage the transition to electric vehicles.

4.6.2 Enjoyable Place

The building design will provide publicly accessible spaces that are enjoyable and support community activity and interaction. The provided space will be 2.5% of the GFA or 0.25m^3/ occupant whichever is greater, to accommodate community-based activities that designed for enjoyment for local people. An activation strategy will be developed to demonstrate the strategy and implementation of the space.

4.7 People

The People category targets issues such as diversity and gender equity, inclusion, and mental health. This category encourages solutions that address social health of the community whilst bringing a new dimension to the design and construction process of buildings. The proposed project design is incorporating the following areas of focus:

- Inclusive Construction Practices

4.7.1 Inclusive Construction Practices

During the construction phase the head contractor will provide adequate onsite facilities, policies, and training to promote workplace diversity and enhance the overall wellbeing of site occupants. This will be achieved through the provision of gender inclusive bathroom facilities, gender-specific fit-for-purpose personal protective equipment as well as the enforcement of policies which address discrimination, racism and bullying onsite.

Training will be provided to all contractors and subcontractors present onsite for more than three days regarding drugs and alcohol awareness and discrimination policies present onsite. The head contractor should also look to evaluate the effectiveness of physical and mental health programs provided to the needs of the onsite workers.

4.8 Nature

The Nature category addresses the pressures placed upon ecosystems and biodiversity as a result of rapid urbanisation. This category encourages building designs to minimise their impacts on the natural environment by actively bringing nature and biodiversity back into the cities. It also celebrates the positive impacts of green spaces and biodiversity on people and the urban environment. The proposed project design is incorporating the following area of focus:

- Impacts on Nature

4.8.1 Impacts on Nature

The proposed project will avoid the development of highly ecological valued sites whilst minimizing the light pollution to neighbouring bodies. Outdoor lighting will be designed to achieve control of upward light output ratio (ULOR) by demonstrating that no external luminaire on the project has a ULOR that exceeds 5%, relative to its actual mounted orientation.

4.9 Leadership

The Leadership category provides recognition for the implementation of innovative practices, processes, and strategies that promote achievements within the built environment that surpass the scope of the rating tool as released.

To address leadership the project will consider how it can positively influence the industry or the operation of the building throughout its design, construction, and operation.

5. Conclusion

This report has addressed the ESD requirements to support the development application for the Development located on 330 – 350 Eighth Avenue, Austral South NSW 2179.

Specific sustainability initiatives proposed for the building include, but are not limited to:

- Space efficient building layout.
- Water Sensitive urban design principles
- High Efficiency Electrical Systems
- Large scale on-site renewable energy generation
- Installation of a rainwater capture and reuse system for all buildings on-site
- Energy Efficient heating, ventilation and air conditioning including natural ventilation to open spaces.
- Waste Minimisation strategies
- Certified 4 Star Green Star Buildings Rating

Overall, through the implementation of the initiatives noted within this report the project clearly demonstrates the site's commitment to ESD principles throughout the design, construction, and operation. Additionally, the project design team has worked to optimise the sites energy performance, address key climate related risks posed to the site, align the project to the Liverpool Growth Centre Precincts Development Control Plan, and benchmarked the project to industry best practice sustainability.