NORTHROP

ECOLOGICALLY SUSTAINABLE DEVELOPMENT REPORT

Fairfield Showground Community and Events Centre

Ref: SY230893-00-SU-RP01
Rev: H
Date: 02 September 2025

PREPARED FOR
NBRS & Partners Pty Ltd
Level 2, 4 Glen Street
Milsons Point NSW 2061

Ecologically Sustainable Development (ESD) Report

Revision Information

Project:	Fairfield Showground Community and Events Centre
Document Title:	Ecologically Sustainable Development (ESD) Report
Client:	NBRS & Partners Pty Ltd
Revision:	H
Status:	Issue for SSDA Submission
Revision Date:	02 September 2025
Author:	Daniel Soetjahjono Sustainability Consultant ***BE(Hons), BArchDes***
Verifier:	Durita Sookharee Sustainability Consultant ***BEng, M.ArcSci***

Northrop Consulting Engineers Pty Ltd

ACN 064 775 088 | ABN 81 094 433 100

Level 10, 400 George Street, Sydney NSW 2000

02 9241 4188 | sydney@northrop.com.au | www.northrop.com.au

Table of Contents

Executive Summary

Northrop Consulting Engineers have been engaged to provide Sustainability Consulting advice to NBRS & Partners Pty Ltd to support the State Significant Development Application (SSDA- 73365208) process for the proposed Fairfield Showground Community and Events Centre located at 430-482 Smithfield Road, Prairiewood, NSW 2176.

This Ecologically Sustainable Design (ESD) report accompanies an Environmental Impact Statement (EIS) pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), in respect of a State Significant Development Application (SSDA) for the construction and operation of Fairfield Showground Community and Events Centre.

This report provides an overview of the proposed Ecologically Sustainable Development (ESD) principles and efficiency measures that form part of the Environmental Impact Statement (EIS), aligning with sustainability objectives set out in the Planning Secretary's Environmental Assessment Requirements (SEARs), Sustainable Buildings State Environmental Planning Policies (SEPP) 2022 and the Fairfield CityWide Development Control Plan (DCP) 2024.

Information contained within this report has been prepared in direct response to:

- The Secretary's Environmental Assessment Requirements (SEARs).
- The Environmental Planning and Assessment Regulation 2021.
- State Environmental Planning Policy (Planning Systems) 2021 – Schedule 1 (29)
- State Environment Planning Policy (Sustainable Buildings) 2022
- Fairfield CityWide Development Control Plan (DCP) 2024.

The ESD initiatives and targets outlined within this document have been compiled based on the following:

- Industry Best practice design principles.
- National Construction Code (NCC) Section J – Energy Efficiency Targets (i.e.: exceeding targets).

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
- Provision for large scale on-site renewable energy generation
- Increased use of daylighting to reduce power usage
- 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.

The integration of these initiatives demonstrates strong social and environmental commitments of the project, aligning the project to an Australian Excellence Sustainability Standard and effectively addressing and mitigating against the negative environmental, social, and economic impacts associated with the project. The proposed building initiatives provide a cost-effective solution in design, construction and operation and the design team is committed to further pursuing the goals of sustainable development across this site as the project progresses.

1. Introduction

This Ecologically Sustainable Design (ESD) report accompanies an Environmental Impact Statement (EIS) pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), in respect of a State Significant Development Application (SSDA) for the construction and operation of Fairfield Showground Community and Events Centre. This report addresses the relevant Secretary's Environmental Assessment Requirements (SEARs) issued for the project, notably:

Table 1 Summary of Relevant SEARs and Response

SEAR	Requirement	Response	Report Section
9.1	Identification of how ESD principles (as defined in section 193 of the EP&A Regulation) are incorporated in the design and ongoing operation of the development.	Details of ESD principles (as defined in section 193) and their incorporation in the design and operation are described in the listed report section.	**1.3**
9.2	Demonstration of how the development will meet or exceed the relevant industry recognised building sustainability and environmental performance standards.	Details of how the development will meet or exceed sustainability performance standards are noted in the listed report sections.	**2, 3**
9.3	Demonstration of 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.	Details of how the development shall minimise its greenhouse gas emissions (in conjunction with reduced energy and water consumption) are provided in the listed report sections.	**2, 3**
9.4	If Chapter 3 of State Environmental Planning Policy (Sustainable Buildings) 2022 applies: • demonstrate how the development has been designed to address the provisions set out in in Chapter 3.2(1) • provide a NABERS Embodied Emissions Material Form to disclose the amount of embodied emissions attributable to the development in accordance with section 35BA of the EP&A Regulation.	Responses to the Sustainability Buildings SEPP 2022 3.2(1) items are provided in the listed report sections. Responses are provided for items (a) to (f), noting whether items are applicable to the project.	**1.4**

SEAR	Requirement	Response	Report Section
9.5	Provision of a net zero statement (as defined in section 35C of the EP&A Regulation) that includes: • evidence of how the development will either be fossil fuel-free after the occupation of the development commences or transition to be fossil fuel-free by 1 January 2035. • details of any renewable energy generation and storage infrastructure implemented and any passive and technical design features that minimise energy consumption. • estimations of annual energy consumption for the building and amount of emissions relating to energy use in the building (if information is available).	A net zero statement, signed by NBRS Architects with endorsement from a chartered electrical engineer (Northrop Consulting Engineers), has been provided as part of the SSDA submission within this report. Relevant details regarding: • demonstration of being a fossil fuel-free project, • details of renewable energy generation, and • details on the future process to estimate energy consumption, have been provided within the statement.	**Appendix 1 – Net Zero Statement**

1.1.1 Project Site Description

The project site is located within the Fairfield Local Government Area (LGA), at 430-482 Smithfield Road, Prairiewood, legally identified as Lot 1 DP 1251493 and known as Fairfield Showground.

Lot and DP	Lot Area
Lot 1 DP 1251493	30.1 hectare

Fairfield Showground currently comprises several different uses including Fairfield Markets, outdoor sports fields, grandstands incorporating function centres, at-grade parking in multiple locations throughout the site and a range of other community and recreational uses.

The project site is located to the west of the existing market awning as shown in **Figure 1**.

Figure 1 Project Site (Source: DFP/Nearmap)

The regional context of the project site is shown in **Figure 2** and includes the following:

- **Fairfield Hospital:** Located approximately 250m to the north of the Fairfield Showground Precinct are Braeside and Fairfield Hospital.
- **Fairfield City Golf Club:** Also located to the north of the site, the Fairfield City Golf Club is an 18-hole golf course, inclusive of a driving range and associated club house.
- **Wetherill Park Shopping Centre:** Located approximately 600m to the northeast of the site is the Stockland Wetherill Park Shopping Centre
- **Mackillop Catholic College**: To the east of the site is Mackillop Catholic College, being an independent Catholic school for girls.
- **Deerbush Park**: To the south of the site is Deerbush Park. In the broader context of land to the south of the site there are a range of low-medium density residential developments.
- **Transport Corridors:** The key regional transport corridors in proximity to the project site are:
    - Smithfield Road – Smithfield Road adjoins the eastern side of the site. Several bus services travel along Smithfield Road, notably from Parramatta Station (Stand B2).
    - Cumberland Highway – The Cumberland Highway is located approximately 1.5km to the east of the site.

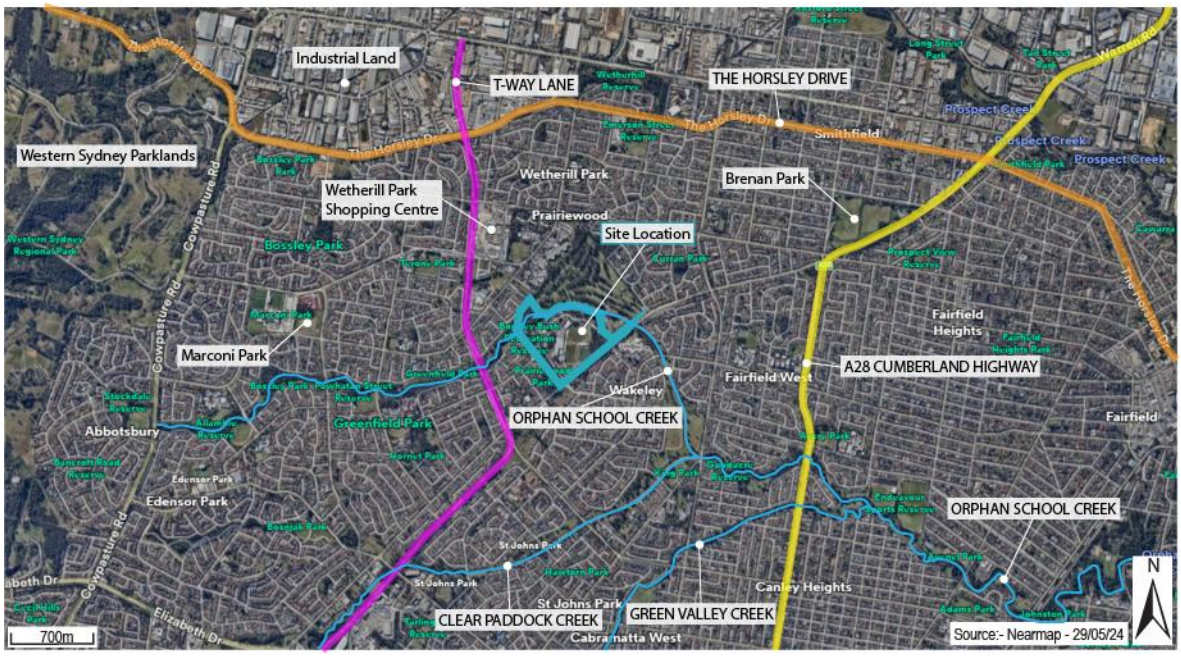


Figure 2 Regional Context (Source: DFP/Nearmap)

1.1.2 Project Description

The project forms part of a masterplan located on the Fairfield Showground site which will comprise works to be carried out under multiple planning pathways.

Under *State Environmental Planning Policy (Transport and Infrastructure)* 2021 (SEPP TI), certain works can be undertaken as development permitted without consent (Part 5 approval). Accordingly, these works do not form part of the scope of physical works proposed under this State Significant Development Application (SSDA).

The proposed extent of works to be carried out under the development permitted without consent (Part 5/REF) planning pathway as part of the masterplan includes:

- Demolition of six small ancillary buildings and construction of a new amenities block;
- Road and car parking upgrades and new car parking area;
- New kiosk/substation; and
- Associated civil and landscape works.

The proposed extent of works to be carried out under this SSDA as part of the masterplan includes:

- Construction and use of a one-storey multi-purpose building; and
- Associated civil and landscape works.

Figure 3 details the masterplan and the delineation between the Part 5 and SSDA extent of physical works.

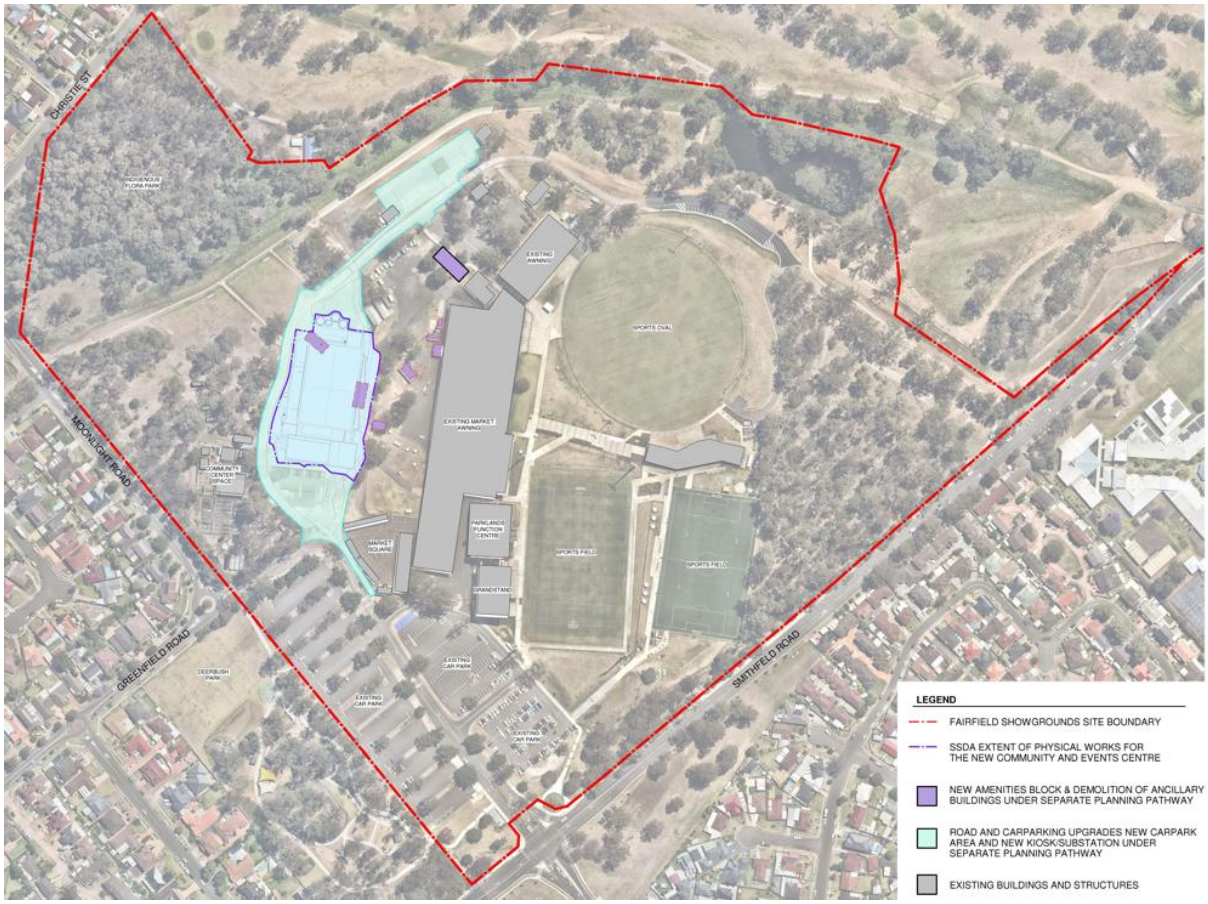


Figure 3 Masterplan (Source: NBRS)

1.2 Overview of Project Sustainability Initiatives

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
- Provision for large scale on-site renewable energy generation
- Increased use of daylighting to reduce power usage
- 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.

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

1.3 Environmental Planning and Assessment Regulation 2021

The following section describes how ESD principles (as defined within clause 193 of the Environmental Planning and Assessment Regulation 2021) are incorporated in the design, construction, and operation phases of the project.

Table 2 EP&A clause 193 - Principles of Ecologically Sustainable Development

Principle	Objective	Project Response
The precautionary principle	Namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In applying the precautionary principle, public and private decisions should be guided by: • careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and • an assessment of the risk-weighted consequences of various options.	Through the implementation of environmental management and building maintainability, the project will incorporate a focus on adaptability and resilience into the project design. The concept behind the precautionary principle is to create features in the project that can adapt to changes which may eventuate in the future, as well as avoid the risk of serious or irreversible damage to the environment.
Inter-generational equity	Namely, that the present generation should ensure the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.	To ensure the maintenance or enhancement of the health, diversity, and productivity of the environment for the benefit of future generations, the design will incorporate initiatives such as low-VOC and formaldehyde paints, sealants, adhesives and carpets. Additionally, there will be a focus on integrating more vegetation and making the most of a strong existing site connection to nature.

Principle	Objective	Project Response
		Through these measures, the project will demonstrate a strong commitment to preserving the environmental health, diversity, and productivity of the local area.
Conservation of biological diversity and ecological integrity	Namely, that the conservation of biological diversity and ecological integrity should be a fundamental consideration.	The development retains existing hardscaped carpark areas as well as multiple site trees. Further, the designs propose to install native and/or drought-resistant vegetation within an integrated landscaping and water management plan. The combination of tree retention and conscientious new landscaping demonstrates the project considerations to enhance, conserve, and support local biological diversity and integrity.
Improved valuation, pricing, and incentive mechanisms	Namely, that environmental factors should be included in the valuation of assets and services, such as: • polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement, and • the users of goods and services should pay prices based on the full life cycle of the costs of providing the goods and services, including the use of natural resources and assets and the ultimate disposal of waste, and • established environmental goals should be pursued in the most cost-effective way by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.	The design of this development will employ lifecycle costing to determine the optimal strategy for major plant items. Decisions will be based on whole-of-life costs rather than capital expenditure alone. The project will involve significant input from the Quantity Surveyor, who will ensure that the project remains on budget and effectively considers environmental factors in the valuation of assets and services.

1.4 State Environment Planning Policies (SEPP) 2022 - Sustainable Buildings Requirements

The SEPP (Sustainable Buildings) 2022 outlines new requirements to allow projects to reduce greenhouse gas emissions. This section specifically addresses the following sustainability objectives for non-residential buildings.

Table 3 Response to SEPP (Sustainable Buildings) 2022 Requirements

Reference	Objective	Design Response
3.2(1)(a)	Minimisation of demolition and construction waste	• Where possible, excess cut material from earthworks is to be reused directly on site. • The project is looking to retain existing car park hardscape where possible • The project is also aiming to divert construction and demolition waste from landfill.
3.2(1)(b)	Reduction in electrical peak demand	• The provision for a solar array system will provide a reduction of electrical demand during periods of generation. • High efficiency electrical and mechanical equipment will be chosen to ensure effective performance. • The efficient HVAC system will be supported through an optimised façade.
3.2(1)(c)	Reduction in artificial lighting and HVAC usage through the implementation of passive design principals	• Daylight access will be maintained and promoted through high VLT glazing and light-coloured internal finishes. This is emphasised through the considered design approach for primary areas.
3.2(1)(d)	Generation and storage of renewable energy	• Structural and electrical provisions for solar array system to generate renewable energy and reduce energy usage from the grid. • Provision will be made within the main switchboard to allow for future connection of an electrical battery storage system.
3.2(1)(e)	Metering and monitoring of energy consumption	• Energy metering and monitoring strategy will be implemented to effectively monitor the main energy uses within the building.
3.2(1)(f)	Minimisation of potable water consumption	• Water efficient fixtures and fittings will be selected. • A rainwater harvesting system will be used to ensure a reduction of potable water through the distribution of collected rainwater.

1.5 Fairfield CityWide Development Control Plan (DCP) 2024

Chapter 3A: Environmental Management Constraints of the Fairfield CityWide DCP includes performance objectives relevant to Ecologically Sustainable Development:

Table 4 Response to Ecologically Sustainable Development (ESD) of the Fairfield CityWide DCP 2024

Item for inclusion	Design Solution	Report Location
3.1 Statutory Provisions; C2 – Environmental Conservation Zone: • Uses Permitted in adjoining zone can be considered if potential impacts on the land zoned C2 is minimised.	There will be an Ecologist Report, outlining the projects potential impacts towards zone C2 and how it plans to minimise this.	**Not included in this report**
3.5 Flood Risk Assessment.	There is a Water Sensitive Urban Design study, highlighting any potential flood risks and how this are addressed through different design principles.	**Not included in this report**

1.6 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.

2. Ecologically Sustainable Design Strategies

The Fairfield Showground Community and Events Centre will incorporate a set of ESD strategies which minimise the impact and, where feasible, enhance the ecological, social and economic outcomes for construction workers, future tenants, the wider community and ecosystem ecologies both local, regional and global.

2.1 Energy Efficiency

Energy efficiency will be prioritised throughout the design development process, with the design team considering the following improvements. It is anticipated that the measures outlined below, the structural and electrical provisions for a future solar array will allow for significant reductions to site grid electricity demands when compared to a standard practice building. The following initiatives will provide significant savings in energy use.

2.1.1 Fabric Optimisation

Intelligent design and material selection will ensure thermal comfort is achieved without relying solely on mechanical means. Passive design strategies such as performance glazing, shading and use of insulation will reduce demand on the mechanical air conditioning systems leading to lower energy consumption and greenhouse gas emissions.

Implementing effective shading design ensures consistent access to daylighting throughout the building, consequently helping to minimise the use of artificial lighting.

The building fabric will be designed to meet or exceed the NCC 2022 requirements for building envelope. Thermal breaks will be incorporated into walls and roofs where appropriate.

2.1.2 Energy Efficient Equipment

Only energy-efficient appliances and equipment will be used in the project, with a focus on selecting systems with higher Seasonal Energy Efficiency Ratio (SEER) rating when compared to Section J/ Minimum Energy Performance Standards (MEPS) requirements.

2.1.3 HVAC System

The air-conditioning and ventilation systems will be designed to comply or exceed the minimum requirements of NCC 2022 Section J Part J6.

Ductwork and pipework systems will be designed to reduce system pressure losses to reduce fan and pump motor power. This includes the selection of equipment for reduced coil and vessel pressure drops and being generous with ductwork and pipework sizes to reduce friction losses.

2.1.4 Highly Efficient Lighting System

Installing efficient lighting systems, such as LED lighting, throughout the building will significantly decrease its overall energy consumption. LED lights are more efficient than traditional fluorescent lights and are characterized by an extended lifespan contributing to a reduction in carbon emissions. They are also efficient in dissipating heat and therefore reduce the heat load experienced within conditioned spaces.

Lighting will be designed to comply or exceed the minimum requirements of NCC 2022 Section J Part J7 and will be controlled via automatic control system.

2.1.5 Energy Metering and Monitoring

An energy metering and monitoring strategy will be implemented to effectively monitor the main energy uses within the building as per the requirements of Section J9D3 in the NCC 2022.

2.2 Energy Generation and Storage

Renewable energy generation is essential for optimising building's efficiency, reducing reliance on fossil fuels and decreasing greenhouse gas emissions. The measures are expected to achieve significant energy savings and enhance overall efficiency.

2.2.1 Photovoltaic (PV) Panels

The project will include an 88kW PV array which is inclusive of relevant structural and electrical provisions to support the array. The installation of PV will reduce reliance on external power sources and lower utility bills. Solar arrays will help offset on-site energy consumption and reduce peak daytime demand from the grid, resulting in cost savings and enhanced energy efficiency.

2.2.2 Battery Storage Systems

Provision will be made within the main switchboard to establish connection to a battery storage system in line with the requirement of J9D5 of NCC 2022. These provisions will enable seamless integration of an electrical battery storage system (if desired in the future) which would contribute to grid stability by providing a reliable source of power during peak demand or outages, thereby mitigating the risk of blackouts. It also ensures that excess energy generated during off-peak periods is not wasted but stored for later use.

2.3 Indoor Environment Quality

Indoor environment quality is always an important consideration in spaces that are regularly occupied. The following have been considered as part of the building design.

2.3.1 Daylight Access

Material strategies consistent with improved daylighting will be integrated throughout the project to support the admission of natural light and direct sunlight throughout the design. This will be achieved using high Visible Light Transmission (VLT) windows and light colour finishes within the main areas. Adopting an integrated daylight approach will improve the wellbeing of the building occupants by creating a visually stimulating environment.

In addition to promoting occupant comfort, providing daylight will reduce the overall energy consumption of the building. Natural light will alleviate the need for artificial lighting whilst the direct sunlight will enhance thermal comfort during cooler months.

2.3.2 Indoor Air Quality (IAQ)

The quality of indoor air has a significant impact on both our health and the environment, potentially leading to adverse health effects such as allergies and asthma.

To address this concern, the project will improve the outdoor air provided to regularly occupied spaces, which will reduce CO_2 build up within the office areas and improve comfort for the building occupants.

2.3.3 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 measures will ensure that interior noise levels are maintained below acceptable limits.

2.3.4 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 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.

2.4.1 Rainwater Capture and Reuse

The site's extensive building roofs offer significant potential for rainwater harvesting, presenting a particularly advantageous opportunity. The project design will incorporate rainwater harvesting systems to collect, store (160kL tank), and distribute rainwater to offset the site potable water usage. Further feasibility studies will be conducted to determine the optimal end-use for any non-potable water applications on site.

2.4.2 Water Efficient Equipment

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

Table 5 Sanitary Fixtures Efficiency

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

2.4.3 Landscaping

The planting design features native and drought-resistant species, including trees, shrubs, groundcovers, and grasses. These plants are chosen from local vegetation to ensure they are well-adapted to the local climate. Once established, they require less water, reducing the need for frequent irrigation and minimising water waste. This diverse selection of plants results in a visually appealing and resilient landscape that requires minimal maintenance.

2.4.4 Irrigation Systems

Drip irrigation will be employed to deliver water directly to the plant roots, reducing evaporation, water waste and runoff.

2.5 Water Sensitive Urban Design

Water Sensitive Urban Design (WSUD) stands at the forefront of modern urban planning, offering innovative solutions to the complex challenges of water management in urban environments.

2.5.1 Stormwater Management & Targets

Stormwater will be effectively managed through soft landscape features, working in conjunction with stormwater detention tanks, pits and pipes, to help reduce site stormwater discharge and reduce pollutants in stormwater.

2.5.2 Vegetation

Drought-tolerant plants will further reduce runoff and enhance groundwater recharge. These practices will support sustainable urban water management and contribute to long-term environmental resilience.

2.6 Circular Economy and Waste Management

Effective waste management throughout construction and operation of the site will help to promote resource efficiency and minimise the adverse environmental impacts of the project. By integrating circular economy principles, a system can be created where materials are reused, recycled and repurposed, reducing waste and conserving natural resources. The following are being considered as part of the design process.

2.6.1 Waste Management Plan

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

- To minimise the environmental impacts of the operations of the development.
- To minimise the impact of the management of waste within the development.
- To ensure waste is managed to reduce the amount landfilled and to minimise the overall quantity generated.
- To ensure appropriate storage and collection of waste.

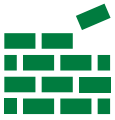
2.6.2 Separated Waste and Recycling Streams

The provision of separated waste and recycling streams is proposed for effective recycling of the project's operation waste. Segregation of waste by general, recycling and paper/cardboard waste will be incorporated into the project which will improve the building operational efficiency and result in significant environmental benefits. Both interim and final waste storage, transfer and collection methods will be detailed in the Waste Management Plan.

2.6.3 Construction Waste Minimisation

The project will limit the amount of construction waste sent to landfill, aiming to divert waste produced towards recycling facilities or onsite re-use.

2.7 Low Impact Materials Selections



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

2.7.1 Sustainable Sourcing

Steel and concrete suppliers with environmental product disclosures (EPDs) will be preferred to support the improvement of industry standards and transparency of information on material impacts.

2.7.2 Local Materials

Materials that are locally sourced will be preferred to reduce transportation impacts and support local economies. Local materials typically have a lower carbon footprint due to reduced shipping distances.

2.7.3 Retention of Existing Site Infrastructure

The project design retains existing carparking hardscape, which reduces the number of new materials procured and construction impacts and therefore reduces the embodied carbon impacts associated with the project.

2.8 Sustainable Transport

The following site attributes and sustainable transport initiatives will be implemented to reduce carbon emissions associated with transport, and access to amenities by building users.

2.8.1 End of Trip Facilities

End of trip facilities will be incorporated into the design to promote walking and cycling among staff members, encouraging sustainable transportation practices and enhancing employee well-being.

2.8.2 Sustainable Transport

On a precinct level the project will incorporate sustainable transport options to encourage alternatives to single-occupancy vehicle travel, such as walking, cycling, carpooling, and public transportation.

2.8.3 Electric Vehicles (EV) Infrastructure

Electrical distribution boards are provided within the development infrastructure in line with NCC 2022 requirements. The aim is to encourage the adoption of electric vehicles to promote green transport, thereby minimising greenhouse gas emissions and promoting sustainable transportation practices.

2.9 Mitigating Urban Heat Island Effect

The urban heat island effect is significant due to its role in elevating temperatures in urban areas, which can increase energy usage, health risks, and environmental strain. To address this issue, the project should prioritise strategies like green infrastructure, light-coloured materials and sustainable urban planning to create cooler and healthier built environments.

2.9.1 Light-coloured Roofing

To mitigate potential urban heat island effects on the site and its surroundings, a roof colour with a low Solar Absorptance (SA) will be chosen to reflect solar radiation.

2.9.2 Increasing Vegetation

The landscaping design will include deep soil across with expansive green spaces. Vegetation plays a crucial role in mitigating the urban heat island effect by providing shade, reducing temperatures, and enhancing overall environmental quality.

2.10 Improved Ecology

Through planting native vegetation and promoting improved interaction with the natural environment, the project will look to improve the site's ecology and minimise its ongoing environmental impact.

2.10.1 Light Pollution to Neighbouring Bodies

The design team is investigating strategies to reduce light pollution that could affect migratory animals and insects in nearby areas. These decisions will be finalised as the design progresses further.

3. Industry Best Practice

The project also aims to meet and exceed industry best practice sustainability requirements within its design as part of the sustainability commitments associated with construction and operation. This section provides a summary of how the project is incorporating best practice in line with elements drawn from the Green Building Council of Australia (GBCA). These elements provide a benchmark for the project to industry best practice.

3.1 Management

Management promotes the adoption of environmental principles throughout the project's inception, design, construction, commissioning and operation of the building. The following initiatives are currently proposed.

- Engagement of an ESD professional to advise the Project team throughout the project design and construction.
- Review of the project design to ensure maintenance and access provisions are incorporated at the early stages of design.
- Commitment to commissioning the building.
- Integration of measures to accommodate risks posed to the site due to expected alterations in climate.
- Provision of detailed Operations and Maintenance information and hand over to support ongoing operations.
- Metering of the main building elements to support reporting and optimisation of the project systems in operation.
- Consideration of the operational waste requirements for the site and integration of support for this within the space layouts.

3.2 Indoor Environment Quality

Indoor Environment Quality aims to enhance the comfort and wellbeing of building occupants. The following proposed initiatives relate to building's HVAC system, lighting, indoor air pollutant monitoring systems as well as other building attributes:

- Building services noise levels to be managed to achieve acoustically comfortable spaces.
- Low irritant materials and coatings to be used.
- LED lighting is proposed throughout the development to meet illuminance, uniformity and glare requirements in applicable areas.
- Increase in outside air provision above minimum standards.
- A mechanical system that promotes good thermal comfort in the conditioned spaces.

3.3 Energy

The energy criteria focus on reducing energy consumption and greenhouse gas emissions through more efficient building fabrics and systems as well as on site energy generation. The following initiatives are proposed:

- Inclusion of a solar array as part of the building design.
- Incorporation of an efficient heating and cooling system.
- Building fabrics that exceed the requirements of the construction code.
- Use of energy efficient appliances.

3.4 Transport

The transport category promotes projects which make provisions for reduced greenhouse gas emissions arising from occupant travel to and from a building. The following initiatives are proposed for implementation:

- Provision of end-of-trip facilities to promote the use of alternative modes of transportation.
- Provision of electric vehicle charging that will reduce emissions of pollutants, lower greenhouse gas emissions, promote resource efficiency, decrease noise pollution, and enhances energy independence. 20% of the total parking spaces will be assigned to electric vehicles
- Implementation of a Green Transport Plan to promote healthier lifestyles by encouraging walking, cycling, and the use of public transportation.

3.5 Water

This category recognises projects which reduce the amount of potable water consumed on-site through the design of efficient systems. The following initiatives are proposed for the project.

- Inclusion of highly efficient fixtures and fittings.
- Rainwater collection and reuse.

3.6 Materials

The materials criteria focus on reducing the consumption of resources through selection and reuse of products, and efficient management practices. The following initiatives are proposed within the building:

- The use of paints, adhesives, sealants, and carpets are low in TVOC or non-toxic.
- The use of low TVOC or non-toxic engineered wood products.
- Minimising occupant exposure to banned or highly toxic materials.
- The use of locally supplied materials.

3.7 Emissions

These criterion targets building emissions relating to watercourse pollution, light pollution, ozone depletion and global warming. The follow initiatives are currently proposed:

- All thermal insulants in the project will aim to avoid the use of ozone depleting substances in both their manufacture and composition.
- Investigation of design opportunities to reduce light pollution, such that no direct light generated inside or outside the building will face directly upward into the sky.
- Protection of local waterways, and the impacts of flooding and drought.

4. Conclusion

This report has addressed the ESD requirements to support the proposed SSDA for Fairfield Showground Community and Events Centre.

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

- Exceeding the energy efficiency requirements of Section J of the Building Code of Australia.
- Space efficient building layout.
- Water Sensitive Urban Design principles
- High Efficiency Electrical Systems
- Provision for large scale on-site renewable energy generation
- Increased use of daylighting to reduce power usage
- 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.

Overall, through the implementation of the initiatives noted within this report, the project clearly demonstrates the site's commitment to ESD principles throughout design, construction, and operation. Additionally, the project design team has worked to optimise the project energy performance, address key climate related risks posed to the site, align the project to the NSW Government's commitment to carbon neutrality by 2050, and has benchmarked the project against industry best practice.

Appendix 1 – Net Zero Statement

See over page.

Contact Us

BRISBANE
07 3365 0400
brisbane@northrop.com.au
Level 25, 12 Creek Street
Brisbane QLD 4000

CANBERRA
02 6285 1822
canberra@northrop.com.au
Level 6, 224 Bunda Street
Canberra ACT 2608

CENTRAL COAST
02 4365 1668
centralcoast@northrop.com.au
Level 1, Suite 4 257-259 Central Coast Highway
Erina NSW 2250

COFFS HARBOUR
02 5603 3053
coffsharbour@northrop.com.au
Suite 6, 27 Orlando Street
Coffs Harbour NSW 2450

MELBOURNE
03 9600 2645
melbourne@northrop.com.au
Level 3, 520 Collins Street
Melbourne VIC 3000

NEWCASTLE
02 4943 1777
newcastle@northrop.com.au
Level 1, 215 Pacific Highway
Charlestown NSW 2290

PARRAMATTA
02 9241 4188
sydney@northrop.com.au
Level 15, 6 Hassall Street
Parramatta NSW 2150

SYDNEY
02 9241 4188
sydney@northrop.com.au
Level 10, 400 George Street
Sydney NSW 2000

WOLLONGONG
02 4226 3333
southcoast@northrop.com.au
Level 1, 57 Kembla Street
Wollongong NSW 2500

NORTHROP

NBRS

02.09.2025
NSW Department of Planning
4 Parramatta Square, 12 Darcy Street
Parramatta NSW 2150

To whom it may concern,

At NBRS, we are dedicated to achieving a sustainable, net zero future. We understand the importance of transparency and accountability in addressing climate change, which is why we provide the following information regarding our emissions, transition plans, and sustainable infrastructure initiatives:

Estimated Scope 1 and 2 Emissions up to 2050:

Estimated energy consumption and GHG emissions data is not yet available for the project.

In the next stage of design, detailed predictive energy modelling will be undertaken to inform the design and estimate the quantity of emissions (both direct and indirect) to be offset through the use of solar photovoltaic (PV) systems. Following this assessment, clear targets and strategies will be established to reduce these emissions in alignment with our commitment to achieving net-zero greenhouse gas emissions.

Confirmation of Adequate Infrastructure for Fossil-Fuel Independence by 2035:

This project has been explicitly designed to operate without reliance on fossil fuels, demonstrating our commitment to sustainability and minimising environmental impact. As such, the development will not use fossil fuels from the time of first occupation and will continue to not use fossil fuels as occupation of the development continues.

Onsite Renewables and Sustainable Infrastructure:

We recognise the importance of onsite renewables, passive design, and other sustainable infrastructure in improving energy performance and reducing emissions. As part of our sustainability efforts, we have implemented the following initiatives:

- **Onsite Renewable Energy:** We have invested in provisions for onsite renewable energy systems, such as solar panels to generate clean, renewable electricity to power our operations. We will install an 88kW PV array as part of the design, which will contribute to reduce utility grid supplied electricity consumption and decrease our carbon footprint.
- **Passive Design:** Our building is designed with passive design principles and material selection to ensure thermal comfort is achieved without relying solely on mechanical means. Passive design strategies such as high-performance glazing, shading, and use of insulation will reduce demand on the mechanical air conditioning systems leading to lower energy consumption and greenhouse gas emissions. Implementing effective shading design will ensure consistent access to daylighting throughout the building, consequently helping to minimise the use of artificial lighting.
- **Infrastructure Improvements**: We have implemented infrastructure improvements, such as energy-efficient equipment and lighting systems, to enhance energy performance and reduce overall energy consumption.

Ductwork and pipework systems will be designed to reduce system pressure losses to reduce fan and pump motor power. This includes the selection of equipment for reduced coil and vessel pressure drops and being generous with ductwork and pipework sizes to reduce friction losses.

These improvements contribute to our efforts to achieve net zero emissions and create a more sustainable built environment.

Conclusion:

At NBRS, we are committed to transparency, accountability, and action in our journey towards achieving net zero emissions. By addressing our scope 1 and 2 emissions, transitioning away from fossil fuels, and investing in onsite renewables and sustainable infrastructure, we are working towards a more sustainable future for generations to come.

Kind Regards,

Ranga Fonseka
Senior Architect | Registered Architect NSW No. 11062
M:(02) 9095 5644
E: ranga.fonseka@nbrs.com.au

This document is endorsed by Shaun Burgess, Principal & Senior Electrical Engineer at Northrop. Shaun is a chartered electrical engineer.

Shaun Burgess
Principal | Group Manager | Senior Electrical & VT Engineer
B Eng (Elec) CPEng NER MIEAust
E: sburgess@northrop.com.au
M: 0431 710 576