ESD Report

230772 LISMORE SOUTH PUBLIC SCHOOL - FLOOD RECOVERY REBUILD

Client:
NSW DoE

Revision:
T5

Date:
04/06/2025

REPORT INFORMATION

Project	Lismore South Public School - Flood Recovery Rebuild
Title	ESD Report
Client	NSW DoE
Revision	T5
Revision Date	04/06/2025
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REVISION SCHEDULE

Revision	Date	Issue Name	Author	Authorised
T1	27/11/2024	Issued for Information	JP	ZD
T2	10/12/2024	Issued for Information	JP	ZD
T3	13/02/2025	Updated Site Plan	ZD	ZD
T4	20/02/2025	Minor Update	ZD	ZD
T5	04/06/2025	Updated Site Plan and Evaluation	ZD	ZD

CONTENTS

1 Introduction

This report has been prepared to support a Review of Environmental Factors (REF) for the rebuild of Lismore South Public School (the activity). The purpose of the REF is to assess the potential environmental impacts of the activity prescribed by State Environmental Planning Policy (Transport and Infrastructure) 2021 (T&I SEPP) as "development permitted without consent" on land carried out by or on behalf of a public authority under Part 5 of the Environmental Planning and Assessment Act 1979 (EP&A Act).

The activity will be carried out at Lismore South Public School (LSPS) located 69-79 Kyogle Street, South Lismore (the site).

The purpose of this report is to demonstrate how the design initiatives for the project respond to the sustainability requirements for the project. The Sustainability drivers for the project are elaborated upon in Section 4 of this report.

2 Site Description

The site, located at 69-79 Kyogle Street, South Lismore, consists of two separate land parcels situated on either side of Wilson Street. The proposed activity will be undertaken on the eastern parcel, where most of the school's existing structures are located. The western parcel contains sports fields and temporary learning facilities. Figure 1 outlines the school's boundary, covering approximately 2.5 hectares. Due to flood damage, the existing buildings on the eastern parcel are currently unused, and students are temporarily using facilities on the sports field and oval, located on the western side of Wilson Street, adjacent to the primary school.

Figure 1: Aerial image of site (Source: Nearmap)

3 Overview of Proposed Activity

The proposed activity comprises the rebuild of the LSPS on the eastern parcel of the existing site, in South Lismore, and will be delivered in a single stage. The western parcel is out of the scope of the activity. Any works required on the western parcel (such as removal of demountable classrooms) will be subject to separate approval (if required).

A detailed description of the proposal is as follows:

1. Retention of the existing play equipment, Building K and covered outdoor learning area (COLA) on the western parcel.
2. Bulk earthworks, comprising fill and excavation and other site preparation works on the eastern parcel.
3. Construction of a new building on the eastern parcel for LSPS including:
    a. A one storey building (with undercroft areas below) fronting Kyogle Street containing a general learning space (GLS) hub, hall, library, support hub, administration, and pre-school.
    b. Undercroft outdoor learning areas as well as amenities and storage located on ground level.
4. Landscaping and public domain works, including tree planting, a games court in the northeast corner and an outdoor playing area adjacent to the preschool.
5. A car park on the eastern side of the site, with access from Kyogle Street.
6. Waste collection area access from Kyogle Street.
7. Multiple entrance points, including:
    a. Primary and secondary entries distributed on site frontages.
    b. Vehicular access point to provide access to waste collection/delivery areas and car parking.
8. Ancillary public domain mitigation measures.

Figures 2 below show the scope of works.

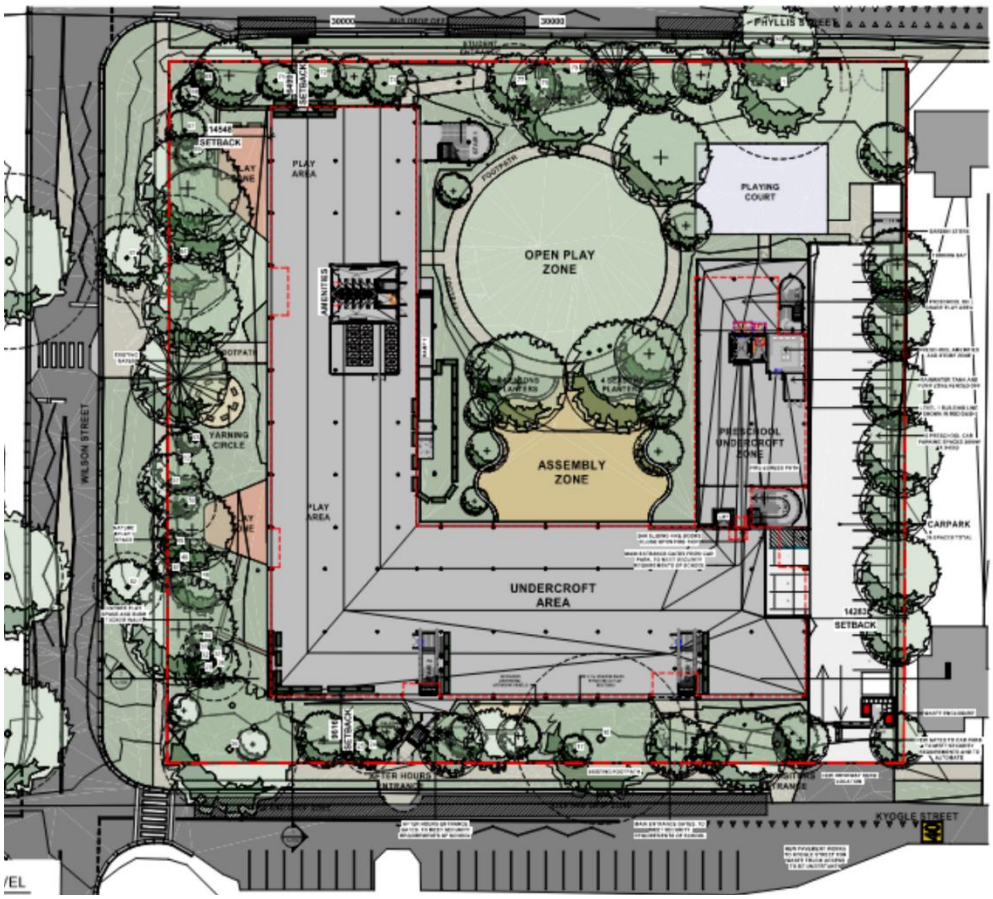


Figure 2: Proposed site plan (Source: EJE Architecture)

4 Sustainability Drivers

To achieve excellence in sustainability, Lismore South Public School activity is committed to meeting key statutory requirements and sustainability objectives. All design and future project work must comply with the following technical specifications and standards to ensure adherence and promote sustainable outcomes, including but not limited to:

- Environmental Planning and Assessment Act 1979
- Environmental Planning and Assessment Regulation 2021
- SINSW Educational Facility Standards and Guidelines (EFSG)
- National Construction Code – Section J
- State Environmental Planning Policy 2022 (Sustainable Buildings)
- NSW Government Resource Efficiency Policy (GREP)
- 4 Star Green Star Buildings rating
- NSW Climate Change Framework

4.1 Principles of Ecologically Sustainable Development

The following section describes the design responses to the ESD principles as defined in Clause 7(4) of Schedule 2 of the Environmental Planning and Assessment Regulation 2021. These design principles have been incorporated into the holistic design with input and coordination of the design team.

The principles of Ecologically Sustainable Development are the following -

- the precautionary principle,
- inter-generational equity,
- conservation of biological diversity and ecological integrity,
- improved valuation, pricing, and incentive mechanisms.

4.1.1 The Precautionary Principle

The precautionary principle is 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—
(a) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and
(b) an assessment of the risk-weighted consequences of various options.

Project response:

The proposed activity will be constructed on previously developed land. During the design and construction phases, the main contractor will implement an independently certified Environmental Management System (EMS), which demonstrates formalised systematic and methodical approach to planning, implementing, and auditing. Throughout the building's operation, adherence to procedures that account for environmental risk and mitigation measures will be met.

4.1.2 Inter-generational Equity

The principle of inter-generational equity is that the present generation should ensure the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.

Project Response:

To uphold inter-generational equity, the proposed activity minimises the consumption of energy and water resources whilst reducing embodied carbon and waste. The ESD principles incorporated into the proposed activity facilitates the conservation of energy and water resources through energy and water efficiency measures.

Energy consumption will be designed to achieve a minimum 10% improvement above National Construction Code requirements (NCC 2022). The building is designed to be fully electric creating a pathway for a future net-zero carbon emissions building when the procured electrical energy comes from a renewable source. Onsite renewable energy from solar PV panels will reduce grid demand.

The reduction in water use will be established through high WELS rated water fixtures and fittings.

At least 80% of waste generated during the construction and operational phases will be diverted from landfill to be recycled. An Environmental Management System (EMS) will be established and adhered to throughout construction. Operational waste streams will be separated to maximise recycled waste once the building is complete and occupied.

4.1.3 Conservation of Biological Diversity and Ecological Integrity

The principle of the conservation of biological diversity and ecological integrity is that the conservation of biological diversity and ecological integrity should be a fundamental consideration.

Project Response:

The project's ESD principles to reduce energy, water and waste consumption have an indirect impact to conserve biodiversity and ecological integrity to the surrounding area. The ecological value of the site post construction will exceed that of preconstruction due to the planting proposed with an emphasis on native trees and plants. This improves habitat for local fauna and increases a connection to nature for occupants.

4.1.4 Improved valuation, pricing, and incentive mechanisms.

The principle of improved valuation, pricing and incentive mechanisms is that environmental factors should be included in the valuation of assets and services.

Project Response:

The valuation of the project's assets and services consider environmental factors through the implementation of various ESD initiatives. An Environmental Management System will be in place throughout the construction to ensure that excessive pollution and waste are minimised, and to establish recycling and avoid landfill waste streams during construction and operational phases. This creates a system where pollution is managed and controlled and creates an incentive to reduce pollution and waste.

The design of the project will meet and exceed the National Construction Code (NCC) and be benchmarked against a Green Star buildings rating which will provide environmental goals for the project. Project requirements stipulate design teams are contractually required to deliver targeted ESD initiatives for the project.

The project is being rebuilt as a disaster response to significant damage due to flooding. The new design has the building elevated on stilt like columns allowing the asset to be resilient against future floods, improving the value of the school for the community.

4.2 EFSG Targets

The Educational Facilities Standards and Guidelines (EFSG) have been developed by SINSW to provide a reference guide for the management, planning, design and construction of new and refurbished/upgraded school buildings.

Ecologically Sustainable Development (ESD) principles must be applied in the design, construction, operation, and end of life, of all state assets and are an important contribution to developing a considered whole of life cost development approach. These principles include:

- Responsible use of energy, water, and resources in the construction, operation, refurbishment, maintenance, management and their ultimate disposal.
- The protection and support biological and ecological diversity.

- Minimising or eliminating the flow of pollutants into our natural environment.

The below table lists the sustainability requirements of the EFSG and outlines the projects design response to each requirement.

Table 1: EFSG requirements and outlines the projects design response

Category	Requirement	Response	Section in Report
0.05 Climate Change adaptation	Initial assessment	This is captured in targeting Green Star Credit 16. *Refer to appendix B for climate risk matrix*	Appendix -B
	Comprehensive climate change risk assessment		
0.06 Energy Conservation	Passive design	The proposed passive design strategies for the building include high performance glazing, thermal insulation and daylight harvesting. The building uses natural ventilation through different window systems like sliding and louvre windows. These windows are protected from direct solar gain through purposefully located horizontal and vertical shading devices.	-
	Lighting and Daylight	LED lighting systems, equipped with occupancy sensors will be used. Daylight will be maximized with the use of different window systems while minimizing glare.	4.6.4
	Views	Minimum 60% of the regularly occupied areas will have high quality internal or external view.	4.6.4
	Glare control and shading	External shading devices are designed to control external glare. This is captured in targeting Green Star credit 11 Light quality.	4.6.4
	Lighting and HVAC control	On/off and dimming lighting controls will be provided for the Regularly Occupied Areas. The mechanical system is designed to have an occupant controlled mixed mode ventilation which provide user access for operation of the systems via a Local Control Point incorporating green, blue, and yellow mode indication lights.	-
	Energy efficient appliances and equipment	The appliances and equipment will comply with the NCC minimum efficiency requirements.	4.6.6
	Renewable energy generation	Solar PV system currently included in the design.	4.6.6
0.07 Water Conservation	Water efficient appliances	WELS rated fixtures and fittings will be implemented in the procurement stage.	4.6.6
	Roof water harvesting and tank storage	The project is designed to maximise rainwater catchment from exposed non-trafficable surfaces. This harvested water will be used for onsite flora irrigation, reducing the need for potable water for this purpose.	4.6.6
	Stormwater Management	Onsite stormwater detention (OSD) is proposed for the project. The Stormwater	-

		quality treatment will comply with the Lismore City Council DCP 2012 requirements.	
0.08 Sustainable Materials	Timber and low formaldehyde-emitting engineered wood products Low VOC materials	This is captured in targeting Green Star Credit 09 Responsible finishes and credit 13 Exposure to toxins.	4.6.4
0.09 Ecological Conservation	Preserve or re-establish native flora.	This is captured in targeting Green Star Credit 36 Biodiversity Enhancement.	4.6.8
0.10 Waste Management	Construction and demolition waste	At least 80% of construction and demolition waste to be diverted from landfill by the head contractor, excluding hazardous materials.	4.6.3
	Operational Waste	This is captured in targeting Green Star Credit 4 Responsible resource management. Project to report on their top three waste streams.	4.6.3

4.3 NCC – Section J – Energy Efficiency

The building is seeking to meet and exceed the National Construction Code (NCC) Volume 1, 2022. Section J of the NCC outlines performance requirements so that the building and its services facilitate the efficient use of energy. During the detailed design stage, the architectural design will be assessed to develop thermal requirements for all the aspects of the building's envelope, such as glazing performance, façade & roof colouring, shading and insulation.

4.4 SEPP (Sustainable Buildings) 2022

Chapter 3 of SEPP (Sustainable Buildings) 2022 applies to the proposed activity, the following statements outline how the proposed activity aims to address the clauses within the policy.

- ***Demonstrate how the development has been designed to address the provisions set out in Chapter 3.2(1).***

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

- A minimum of 80% of construction and demolition waste (excluding hazardous and contaminated materials) to be diverted from landfill by the head contractor.
- Contaminated soils will be managed through an in-situ cap and containment strategy, which avoids the need for excavation, off-site transport, and disposal to landfill, thereby reducing construction-related waste and associated emissions in line with waste minimisation principles.

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

- Solar panels are designed to be installed on the roof of the new building, providing a portion of the school's operational energy demand, with provisions for future expansion if required.
- Provisions have been considered for the future integration of battery systems, which could enable energy storage and increase operational resilience. This would support the potential for grid independence during peak demand periods. There is spare bus connection for further equipment

connections which will be further detailed in the DD stage of the project. No spatial considerations have been made for a battery at this stage.
- Energy-efficient HVAC systems, including demand-driven ventilation and heat recovery, will ensure minimal energy use while maintaining indoor comfort.
- LED lighting systems, equipped with occupancy sensors where necessary, will optimise electricity usage.

(c) a reduction in the reliance on artificial lighting and mechanical heating and cooling through passive design,
- Passive design strategies, such as Pattern Book design shading and natural ventilation, are incorporated.
- Fixed shading systems are optimised for Lismore's climate, protecting windows from high summer sun while allowing low-angle winter sunlight to penetrate.
- Vertical fins reduce glare, enhancing occupant comfort while minimising energy demands for cooling.
- Cross-ventilation pathways allow effective airflow throughout learning spaces.
- Sensor will be installed that monitor outdoor weather conditions. These sensors display a green or red signal, indicating whether the outdoor conditions are suitable or unsuitable for natural ventilation. This helps guide occupants on when to open the windows and insulated doors to allow natural ventilation optimal times.
- High-performance insulation stabilises indoor temperatures, reducing the need for active heating or cooling.
- The mechanical system will be designed that a "Fan Only" mode can be turned on to night purge the building of remanent heat from the day. This allows for a smaller load on the mechanical system the following day.

(d) the generation and storage of renewable energy,
- Solar panels are designed to be installed on the roof of the new building, providing a portion of the school's operational energy demand, with provisions for future expansion if required.
- Provisions have been considered for the future integration of battery systems, which could enable energy storage and increase operational resilience. This would support the potential for grid independence during peak demand periods. There is spare bus connection for further equipment connections which will be further detailed in the DD stage of the project. No spatial considerations have been made for a battery at this stage.

(e) the metering and monitoring of energy consumption,
- A Building Management System (BMS) may be included in the design to monitor real-time energy use, providing the operator with insights to make data-driven decisions aimed at optimising energy performance and reducing energy waste.

(f) the minimisation of the consumption of potable water.
- The water saving measures include high WELS rating sanitary fixtures reducing the potable water demand for showers, taps, WCs and urinals.

- Provide a NABERS Embodied Emissions Material Form to disclose the amount of embodied emissions attributable to the development in accordance with section 35B of the EP&A Regulation.
  - Refer to Appendix C for NABERS Embodied Emissions Material Form

- Provide 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).
  - Refer to Appendix D for Net Zero Statement

4.5 NSW Government Resource Efficiency Policy 2019

The aim of the NSW Government Resource Efficiency Policy (GREP) is to reduce the NSW Government's operating costs and lead by example in increasing the efficiency of its resource use. The policy will continue to drive resource efficiency by NSW Government agencies in four main areas – energy, water, waste and air emissions from government operations.

The below table lists the requirements of the GREP and outlines the projects design response to each standard.

Table 2: GREP requirements and outlines the projects design response

Category	Requirement	Response	Section in Report
Energy	E1: Target to save energy across all government sites	Minimum of 10% reduction in energy against NCC	4.6.6
	E3: Minimum standards for new electrical appliances and equipment	All equipment implemented into the project will meet or surpass the performance requirements in this standard.	4.6.6
	E4: Minimum standards for new buildings and fit-outs	4 Star Green Star Buildings Rating will be achieved. This significantly surpasses the superseded Star Green Star Design & As Built rating outlined in the GREP.	4.6.2
	E5: Whole-of-government solar target	Solar PV system currently included in the design	4.6.6
	E6: Minimum fuel efficiency standards for new light vehicles	Not applicable to this project	-
	E7: Purchase 6% GreenPower	Lismore South Public School is to adhere to this	-
Water	W1: Report on water use	This is captured in targeting Credit 03 – Verification and Handover Verification and Handover – Monitoring Strategy	4.6.3
	W3: Minimum standards for new water-using appliances	These WELS ratings will be implemented in the procurement stage	4.6.6
Waste	P1: Report on top three waste streams	Project to report on their top three waste stream	4.6.3
Clean air	A1: Air emission standards for mobile non-road diesel plant and equipment	Requirement to pass on to head contractor	-
	A2: Low-VOC materials	This has been targeted in Credit 10 – Clean Air	4.6.4

4.6 Green Star Sustainable Design Initiatives

4.6.1 Green Star Buildings Rating Overview

The project has been registered with the Green Building Council of Australia and is set to achieve a minimum of a 4 Star Green Star Buildings rating. Green Star Buildings is a recently updated holistic building sustainability rating tool. A 4 Star Rating is considered to exhibit 'Best Practice' environmental performer. The outcome meets or exceed the relevant industry recognised sustainability and environmental performance standard.

This new tool includes targets that directly address the UN Sustainable Development Goals and encourages ambitious building design to significantly reduce the impact the built environment has on aggravating climate change. This new tool aligns to meet the Paris Agreement on climate change, create clear expectations for new buildings and ensures transparency in supply chains to ensure complete understanding of materials and products used in the project.

The Green Star Buildings rating system assessing buildings through the following categories:

Figure 3: Green Star Buildings Categories (Source: Green Star Buildings v1)

4.6.2 Sustainability Benchmarking

Points are awarded for a building project's ability to secure as many credits as possible from each category. Each credit targets the environmental impact of a specific design feature. The total number of points awarded determines if the level of certification. A 4 Star building requires minimum 15 points. See the below table which breaks up the pathway per category.

Table 3 - Green Star Points per Category

Category	Points Available	4 Star Target (Project Target)
Responsible	17	4
Healthy	14	7
Resilient	8	2
Positive	30	0
Places	8	0
People	9	4
Nature	14	4
Sub-total	100	21
Leadership	10	0
Total	110	21

This table is indicative of level of outcome that the project will pursue but exact selection of credits may change through the design and construction process.

The following sustainable design principles have been proposed for the Lismore South Public School building and can be addressed through the categories outlined within the Green Star Buildings v1 rating system.

4.6.3 Responsible

The Responsible category recognises activities that ensure the building is designed, procured, built, and handed over in a responsible manner.

Materials - This category has a strong focus on the materials that have been used in a building. The building finishes will be selected based on their responsible product value. The vision of the responsible product framework is to drive the supply chain to deliver transparent, healthy, low-impact, and net zero carbon products that are part of a circular economy. Not only does this reduce the resource consumption impact of the project but also ensures clean supply chains, something that the building industry has turned a blind eye to for a long time.

Verification and handover – These criteria make sure the building has been optimised and handed over to deliver a high level of performance in operation. The building is set up for optimum ongoing management due to its appropriate metering and monitoring systems. The building has set environmental performance targets, designed and tested for airtightness, been commissioned, and will be tuned. The project team create and deliver operations and maintenance information to the facilities management team at the time of handover. Information is available to building users on how to best use the building.

Waste - The responsible category also looks at waste, both in the building's construction and operation. The project will divert at least 80% of construction and demolition waste (excluding contaminated and hazardous materials) from landfill with a focus on reusing material. The building will also be designed for a functional waste system with recycling systems, adequate space and appropriate pick-up locations.

Education and Information - Education and information are notions that are carried within the responsible category. The head contractor when the building is in construction phase will educate the workers on site around climate change and the importance of sustainable design, construction and operation is critical in climate change mitigation. Information about the projects build and associated costs towards sustainability will be disclosed to the Green Building Council to further understand the response and viability of their framework.

4.6.4 Healthy

Building occupant health is a primary objective for the activity. This improves the morale and productivity of the staff and students enhancing their health and wellbeing.

Clean Air - The ventilation systems for occupants of the project must provide a 50% improvement of outdoor air required by AS 1668.2:2012 to ensure occupants have plenty of fresh air and do not have a feeling that the environment is stuffy or odorous.

Light Quality - Where appropriate the façade will accommodate for generous natural daylight to improve occupant wellbeing. Artificial lighting will be flicker free with appropriate lux levels and uniformity per space. The use of daylight. Daylight will be maximized with the use of different window systems while minimizing glare.

Acoustic Comfort – The project will implement a design strategy to control of intrusive/ high levels of noise, privacy, noise transfer, speech intelligibility.

Exposure to toxins – Low volatile organic compound products and finishes will be used in the project to ensure toxins are mitigated from the space. All the engineered wood products used in the project will meet specified formaldehyde emission limits as per green star guidelines. A hazardous materials survey must be carried out on existing buildings, in accordance with the relevant Environmental and Work Health and Safety (WHS) legislation. Where the survey identified asbestos, lead, or PCBs in any existing structures, the materials must be stabilised or removed and disposed of in accordance with best practice guidelines.

Connection to Nature – A biophilic connection has proven to reduce stress and improve mental wellbeing. By implementing nature inspired design and integrated landscape into the project, the occupants will fulfil the sense of natural connection.

4.6.5 Resilient

A buildings resilience is a major lens to assess how sustainable it is. Buildings that are not resilient to external pressures are usually first to be rebuilt, shortening the life of the building. By shortening the life of a building, all embodied material within the building may not have reached its service life and the emissions per year for each material increases. Also, future costs to uplift a building to withstand the future pressures is an expensive exercise. To ensure the project is resilient to future pressures a range of assessments will be completed.

Climate Change Assessment - will be made highlighting components of the buildings design where risks lie. A follow up plan for mitigating these risks from the design will then be implemented. This will attempt to future proof the activity from climate pressures such as floods, high temperatures, drought, and storms. The building is designed at 14.95 FFL which is above 2022 Flood Levels (14.45m).

Urban Heat Island - To prevent the urban heat island effect locally onsite, vegetation and roofing materials with a high solar reflective index will be used.

4.6.6 Positive

Upfront Carbon Reduction - The project aims to reduce upfront carbon emissions by 10% compared to a standard reference building by procuring responsible materials.

Energy Use - Onsite solar PV arrays will be maximized on roof surfaces and the building's energy consumption will be reduced by 10% compared to a NCC 2022 compliant reference building. Monitoring and metering will be critical for the building's efficient operation. LED lighting will be used throughout, with efficient monitoring strategies to ensure responsiveness.

Water Conservation - The project acknowledges the importance of preserving water resource and has designed measures to minimise the building's potable water usage. Low flow rate end uses will be implemented throughout the building to reduce unnecessary water wastage, especially for sanitary needs.

In addition to minimising potable water usage, the project is designed to maximise rainwater catchment from exposed non-trafficable surfaces. This harvested water will be used for onsite flora irrigation, reducing the need for potable water for this purpose.

4.6.7 Place

Movement and Place - The building's design and location encourage occupants and visitors to use active, low carbon, and public transport options instead of private vehicles. The building includes showers and changing facilities for students and staffs. The facilities are accessible, inclusive, and located in a safe and protected space.

4.6.8 People

Indigenous Design - By aligning the design method with the principles of the Australian Indigenous Design Charter, a true representation of Aboriginal heritage can be evoked in the design. This reminds the occupants that the land they are on was habited tens of thousands of years before their arrival and educate them on the rich history.

4.6.9 Nature

An obvious sustainable approach to building design is integrating into the local environment as possible. By implementing native and endemic species onsite, the local ecology can enhance from habitat and food. The local ecology extends to flora and fauna.

Impacts to Nature - Reduce the negative impacts associated with buildings to the nature by reducing light pollution, and the building by not built on a significantly impacted site with a high ecological value.

Biodiversity Enhancement - Integrating into the local environment is a key aspect of sustainable building design. One approach to achieving this is by implementing native and endemic species onsite. By doing so, buildings can enhance the local ecology by providing habitat and food sources for local flora and fauna.

Refer to Appendix A for 4 Star Green Star Pathway. The LCI spreadsheet displays information regarding a brief description of each credit, respective compliance requirements and the provide simple and easy to use documents.

4.7 NSW Climate Change Framework

The NSW Climate Change Framework provides a comprehensive approach to addressing climate change by focusing on reducing emissions, preparing for future impacts, and enhancing resilience across the state. By encouraging sustainable development, supporting the transition to a low-carbon economy, and promoting collaboration across sectors, the framework aims to make NSW more climate-resilient and sustainable for future generations.

Refer to Appendix B for the Climate Change Risk Assessment and the Mitigation Strategies identified for the project.

Refer to Appendix D Net Zero Statement for the energy efficiency strategies for the project.

5 Evaluation of Environmental Impacts

After an initial review and assessment of the proposed activity, LCI confirms that the project will not have a significant impact on the environment and is not expected to cause any substantial adverse effects. The report has identified potential impacts related to the activity, and it has been determined that these impacts can be effectively mitigated through sustainability initiatives to be implemented during the detailed design, construction, and operation phases of the project. These measures will reduce the environmental footprint, ensuring that impacts during design, construction, operation, and decommissioning are not considered significant.

Some of the mitigation measures that have already been designed, or will be implemented in the later stages of the project are outlined in the table on the following page.

Mitigation Number/Name	Aspect/Section	Mitigation Measure	Reason for Mitigation Measure
Finished Floor Height 800mm above 2022 Flood Height	Climate Change Resilience	The building design incorporates a Finished Floor Level (FFL) of 15.25m, which is above the 2022 flood levels of 14.45m. Additional climate-related challenges, such as high temperatures, drought, and storms, will be addressed during the detailed design phase.	Climate Change Resilience, Building Longevity
Onsite Solar PV	Renewable Energy	Onsite solar photovoltaic (PV) arrays will be maximized on roof surfaces, with the building's energy consumption reduced by 10% compared to a National Construction Code (NCC) 2022 compliant reference building.	Reducing Greenhouse Gas Emissions
Future Integration of Battery	Renewable Energy/Energy Reduction	Provisions will be made for the future integration of battery systems, enabling energy storage and enhancing operational resilience.	Reducing Greenhouse Gas Emissions
A Minimum of 80% of Construction and Demolition Waste Diverted from Landfill	Waste Reduction	A minimum of 80% of construction and demolition waste (excluding hazardous and contaminated materials) to be diverted from landfill by the head contractor	Waste Reduction
Haz-mat Reduction	Healthy Site	A hazardous materials survey will be conducted on existing buildings at the project site. If asbestos, lead, or PCBs are found, these materials will be stabilized or removed and disposed of according to best practice guidelines.	Occupant Health
Reduction in light pollution	Impact to nature	Measures will be taken to minimise the negative impacts of light pollution on the surrounding natural environment.	To avoid illuminating natural land and neighbouring spaces.
Urban Heat Island Reduction	Outdoor Thermal Comfort	To combat the urban heat island effect, vegetation and roofing materials with a high solar reflective index will be used onsite.	Human health, minimise reliance of spending time indoor in air conditioning, reducing energy and greenhouse gases
Potable water reduction and water reuse	Water Efficiency	Low flow-rate fixtures will be installed throughout the building to minimize unnecessary water wastage, particularly for sanitary purposes. Rainwater tank used for irrigation	Resilience in times of drought, community resilience allowing more fresh water to be available during times of drought.

Mitigation Number/Name	Aspect/Section	Mitigation Measure	Reason for Mitigation Measure
Healthy Indoor Spaces	Human Health	Indoor environmental quality strategies will be implemented to enhance occupant comfort and wellbeing, addressing visual, thermal, and acoustic comfort, as well as indoor air quality.	Ensure the health of the student and staff not harmed from occupying the school. Bolsters learning opportunity with high indoor environment quality.
Lower Embodied Carbon Materials	Embodied Carbon	Materials will be carefully selected with a focus on reuse, recycling, reduced embodied energy, and transparency.	Reducing greenhouse gases.

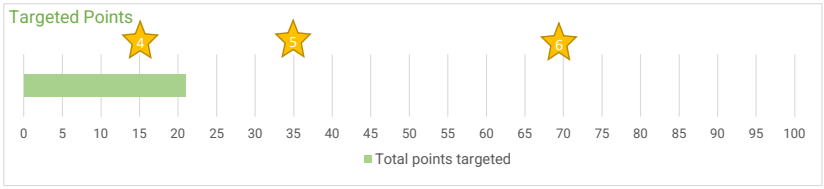
Appendix A – Green Star Buildings Pathway

Project Name	Lismore South Public School
Project Number	230772
Revision	2
Date	28/11/2024

Scorecard

Targeted Green Star rating		**4 Star**
Minimum expectations met	◆	Yes
Net zero in operations targeted	*	No
Credit Achievement points targeted		19
Exceptional Performance points targeted		2

Core points targeted	21
Leadership points targeted	0
Buffer Points	6
Total points targeted	21
Potential Points	22



	Credit Name	Minimum Expectation (ME)	Credit Achievement (CA)	Exceptional Performance (EP)	Targeted Performance	Points Targeted	Stage of Implementation	Risk	Credit Requirements Summary *For full requirements refer to Green Star Buildings Submission Guidelines*
Responsible			**11**	**6**		**4**			
1	Industry Development		**1**		Credit Achievement	1	All	LOW	1. Appoint a GSAP from the time of registration. 2. Complete the Financial Transparency disclosure template. 3. Complete a Case Study, detail how the building will market its sustainability. achievements to stakeholders and Green Star signage to be prominently displayed in a public/ visitor location.
2	Responsible Construction	◆	**1**		Credit Achievement	1	Tender, Construction	MED	1. (ME) The head contractor must have an environmental management system (EMS) in place. 2. (ME) Site must have an environmental management plan (EMP). 3. (ME) The head contractor provides training on the sustainability targets of the building. 4. (ME) Waste contractors and waste facilities to complete a Disclosure Statemen. 5. 90% (ME is 80%) of construction and demolition waste diverted from landfill. 6. Waste contractors and waste facilities must comply with the Green Star Reporting Criteria. Waste must be measured in kilograms.
3	Verification and Handover	◆	**1**		Credit Achievement	1	Design, Tender, Construction, Handover, Use	MED	1. (ME) Metering and monitoring strategy. 2. (ME) Environmental performance targets. 3. (ME) Services and maintainability review. 4. (ME) Commissioned and tuning including airtightness testing. 5. (ME) Operations and maintenance (O&M). 6. (ME) Building logbook. 7. (ME) Building users guide (BUG). 8. Engage an ICA or Soft Landings Approach.
4	Responsible Resource Management	◆			Minimum Expectation	◆	Design, Handover, Use	LOW	Building must provide bins or storage containers to building occupants to enable them to separate their waste. An adequate spaces for storage and collection of waste streams that is easy and safe to access by collection vehicles. A waste specialist and/or contractor must sign-off on the design.
5	Responsible Procurement		**1**				Strategy, Design, Tender, Construction	MED	
6	Responsible Structure		**3**	**2**			Design, Tender, Construction	HIGH	Sepp 2022 (sustianable buildings) - EPA protection of environment policy (sustainable construction)
7	Responsible Envelope		**2**	**2**			Design, Tender, Construction	HIGH	
8	Responsible Systems		**1**	**1**			Design, Tender, Construction	MED	
9	Responsible Finishes		**1**	**1**	Credit Achievement	1	Design, Tender, Construction	HIGH	40% of all internal building finishes (by cost) meet a Responsible Products Value (RPV) of at least 7. (EP - 60% meet a value of at least 7 or 10% meet a value of at least 12)

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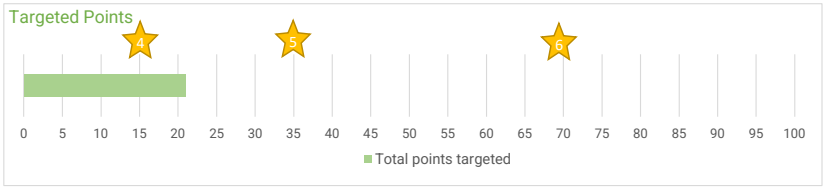
Targeted Green Star rating		**4 Star**
Minimum expectations met	◆	Yes
Net zero in operations targeted	*	No
Credit Achievement points targeted		19
Exceptional Performance points targeted		2

Core points targeted	21
Leadership points targeted	0
Buffer Points	6
Total points targeted	21
Potential Points	22



	Credit Name	Minimum Expectation	Credit Achievement	Exceptional Performance	Targeted Performance	Points Targeted	Stage of Implementation	Risk	Credit Requirements Summary *For full requirements refer to Green Star Buildings Submission Guidelines*
Healthy			11	3		7			
10	Clean Air	◆	**2**		Minimum Expectation	◆	Design, Tender, Construction, Handover, Use	MED	1. Separation distances between pollution sources and outdoor air intakes must comply with ASHRAE 62.1:2013 or AS 1668:2012. 2. All new and existing ductwork must be cleaned prior to occupation. 3. Pollutants from printing and photocopying equipment, cooking processes and equipment are removed or exhausted directly to the outside. 4. Outdoor air to achieve 50% improvement over AS 1668.2:2012 or CO2 levels must be maintained at maximum 800 ppm. (CA - Outdoor air to achieve 100% improvement or CO2 levels of 700 ppm + adequate access for ventilation systems maintenance)
11	Light Quality	◆	**2**	**2**	Credit Achievement	2	Design, Tender	MED	1. (ME) LED lights - have no observable effect as per IEEE 1789-2015, flicker free, Colour Rendering Index (CRI) ≥85, meet AS/NZS 1680.1:2006 & AS/NZS 1680.4 and must have a MacAdam Ellipse or a Standard Deviation Colour Matching (SDCM) ≤ 3. 2. (ME) Provides adequate levels of daylight. 3. (ME) Limit glare from light sources and mitigate external glare. 4. Best practice artificial lighting or best practice access to daylight including external glare control. (EP - must to comply with both)
12	Acoustic Comfort	◆	**2**		Credit Achievement	2	Design, Tender, Construction, Handover	LOW	1. (ME) Qualified consultant to prepare an Acoustic Comfort Strategy to include the following criteria: quiet enjoyment of space, functional use of space, control of intrusive/ high levels of noise, privacy, noise transfer and speech intelligibility. Meet the applicable acoustic comfort criteria specific to project type as per Technical manual. 2. On-site measurements in accordance with AS/NZS 2107:2016.
13	Exposure to Toxins	◆	**2**		Credit Achievement	2	Design, Tender, Construction, Handover	LOW	1. (ME) 95% of internally applied paints/ adhesives/ sealants (by volume)/ carpets (by area) must have Low VOC as per Technical manual.. 2. (ME) 95% engineered wood products meet specified formaldehyde emission limits as per Technical manual. 3. (ME) Lead, Asbestos and PCBs -hazardous material survey carried out on any existing buildings or structures onsite in accordance with OH&S legislation. 4. On-site testing of VOC and formaldehyde levels.
14	Amenity and Comfort		**2**				Strategy, Design, Tender, Handover, Use	MED	
15	Connection to Nature		**1**	**1**	Credit Achievement	1	Strategy, Design, Tender, Handover, Use	HIGH	1. 60% of regularly occupied areas have a high quality internal or external view. 2. Provide indoor plants (at least 500 cm2 per 15m2) and incorporates nature-inspired design (5 interventions) or 5% of the regularly occupied areas or site area (whichever is greater) must be planted area and accessible. (EP - need to comply with both)

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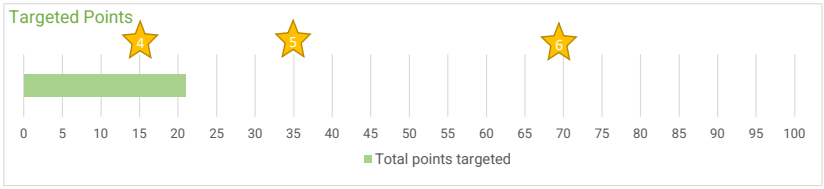
Minimum expectations met	◆	Yes	**Leadership points targeted**	0
Net zero in operations targeted	*	No	**Buffer Points**	6
Credit Achievement points targeted		19	**Total points targeted**	21
Exceptional Performance points targeted		2	**Potential Points**	22



	Credit Name	Minimum Expectation	Credit Achievement	Exceptional Performance	Targeted Performance	Points Targeted	Stage of Implementation	Risk	Credit Requirements Summary *For full requirements refer to Green Star Buildings Submission Guidelines*
Resilient			**8**	**0**		**2**			
16	Climate Change Resilience	◆	**1**		Credit Achievement	1	Strategy, Design	LOW	1. Climate Adaptation Plan developed by qualified professional including medium term and long term time scales. 2. Extreme and high risks are addressed through specific design responses (minimum 2 risks). (ME - Complete Climate Change Pre-screening Checklist + signed off by the client/ building owner)
17	Operations Resilience		**2**				Strategy, Design	MED	
18	Community Resilience		**1**				Strategy, Design	MED	
19	Heat Resilience		**1**		Credit Achievement	1	Design, Tender, Construction	LOW	At least 75% of the whole site comprises of one or a combination of the following strategies that reduce heat island effect: - vegetation - green roofs - roofing material including shading structures - unshaded hard-scaping elements with a 3 year SRI of minimum 34 OR initial SRI of minimum 39 - hardscaping elements shaded by overhanging vegetation - water bodies and/ or water courses
20	Grid Resilience		**3**				Strategy, Design, Handover, Use	MED	

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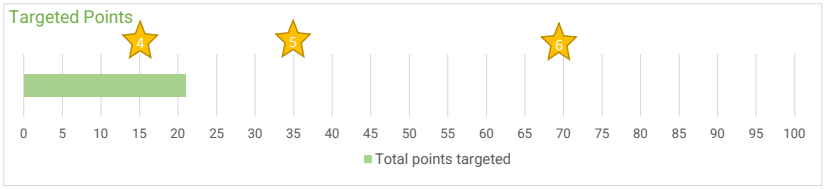

	Credit Name	Minimum Expectation	Credit Achievement	Exceptional Performance	Targeted Performance	Points Targeted	Stage of Implementation	Risk	Credit Requirements Summary *For full requirements refer to Green Star Buildings Submission Guidelines*
Positive			16	14		0			
21	Upfront Carbon Emissions	◆	3*	3	Minimum Expectation	◆	Strategy, Design	MED	10% reduction of upfront carbon emissions through design and material selection when compared to a reference building. (CA - 20% reduction and demolition works are offset - minimum requirement for 6 star) (EP - 40% reduction and demolition works are offset)
22	Energy Use	◆	3*	3	Minimum Expectation	◆	Strategy, Design, Tender	LOW	Section J - Building energy use is 10% less than a reference building, not including PV Systems or NABERS Commitment Agreement (Office) - 5.5 Stars (CA - 20% less or 5.5 Stars NABERS with 25% modelling margin) (EP - 30% less or 6 Stars NABERS)
23	Energy Source	◆	3*	3*	Minimum Expectation	◆	Strategy, Design, Tender	MED	1. Develop a Zero Carbon Action Plan (including refrigerants) with target date by when the building is expected to operate as net zero carbon. 2. It must be signed off by the client/ building owner. (CA - 100% renewable electricity) (EP - 100% renewable electricity end energy - minimum requirement for 6 star).
24	Other Carbon Emissions		2*	2			Design, Tender, Construction	MED	
25	Water Use	◆	3	3	Minimum Expectation	◆	Design, Tender, Construction, Use	MED	Efficient water fixtures: - 5 star WELS = Taps/ Urinals/ Dishwashers - 4 star WELS = Toilets/ Clothes Washing Machine - 3 star WELS = Showers or The building uses 15% less potable water compared to a reference building (CA - 45% less potable water + provide infrastructure for recycled water connection) (EP- 75% less potable water + provide infrastructure for recycled water connection)
26	Life Cycle Impacts		2				Strategy, Design, Tender, Construction	MED	30% reduction in life cycle impacts when compared to standard practice (Life Cycle Assessment) The reduction must be against the following impact categories: climate change, net use of fresh water, stratospheric ozone depletion potential, acidification potential of land and water, eutrophication potential, photochemical ozone creation potential, mineral depletion, fossil fuel depletion. The calculated impact in any category can not exceed the normalised and weighted score by more than 10%.

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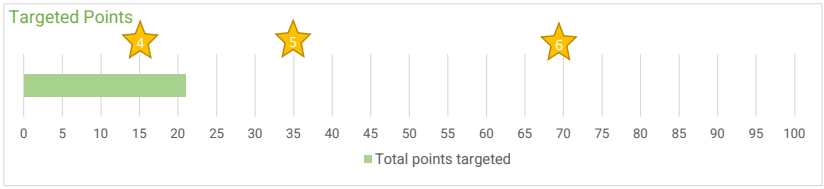

	Credit Name	Minimum Expectation	Credit Achievement	Exceptional Performance	Targeted Performance	Points Targeted	Stage of Implementation	Risk	Credit Requirements Summary *For full requirements refer to Green Star Buildings Submission Guidelines*
Places			8	0		0			
27	Movement and Place	◆	3		Minimum Expectation	◆	Strategy, Design, Tender, Construction	LOW	Changing facilities - provide showers and lockers based on the regular occupancy of the building. - access must be: safe, well lit and easily located. (CA - Bicycle parking facilities, Sustainable Transport Plan, Reducing private fossil fuel powered vehicle use, Encouraging walkability)
28	Enjoyable Places		2				All	LOW	
29	Contribution to Place		2				Strategy, Design, Construction	MED	
30	Culture, Heritage and Identity		1				Strategy, Design, Handover, Use	LOW	

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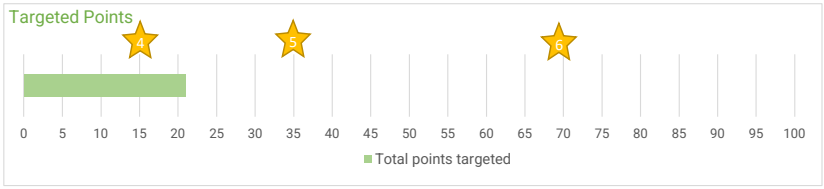

	Credit Name	Minimum Expectation	Credit Achievement	Exceptional Performance	Targeted Performance	Points Targeted	Stage of Implementation	Risk	Credit Requirements Summary *For full requirements refer to Green Star Buildings Submission Guidelines*
People			**7**	**2**		**4**			
31	Inclusive Construction Practices	◆	**1**		Minimum Expectation	◆	Strategy, Tender, Construction	LOW	Head contractor - provides gender inclusive facilities and gender specific fit for purpose personal protective equipment (PPE) for diverse body sizes and types. - implement policies to address issues of discrimination, racism and bullying onsite. - introduce on-site redress procedures for any breaches. - empower a diverse lead team to manage policies onsite. - provide training to all contractors and sub-contractors on these policies. (CA - carry out a needs analysis of potential site workers, physical and mental health programs by the head contractor and provide an evaluation report of the effectiveness of the training)
32	Indigenous Inclusion		**2**		Credit Achievement	2	Strategy, Design, Tender, Construction	LOW	Reconciliation Action Plan (RAP) - key member of the Project Team is a part of organising RAP Working Group - at least 90% of the RAP targets have been met - all implemented actions related to the RAP are publicly reported or Inclusion of Indigenous Design - demonstrate that the Australian Indigenous Design Charter guiding principles are incorporated in the design of the building.
33	Procurement and Workforce Inclusion		**2**	**1**	Credit Achievement	2	Tender, Construction	MED	1. Develop and implement a Social Procurement Strategy or Plan and includes targets and annual reporting requirements. 2. At least 2% (EP is 4%) of the buildings total contract value has been directed to generate employment opportunities for disadvantaged and under-represented groups.
34	Design for Inclusion		**2**	**1**			Design, Tender, Construction, Handover, Use	MED	

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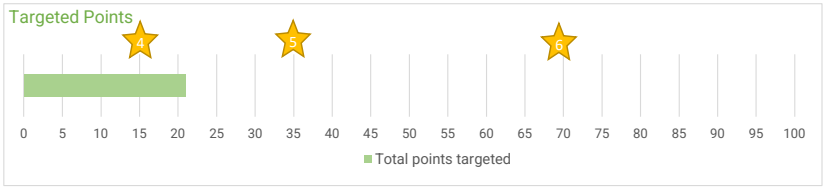

	Credit Name	Minimum Expectation	Credit Achievement	Exceptional Performance	Targeted Performance	Points Targeted	Stage of Implementation	Risk	Credit Requirements Summary *For full requirements refer to Green Star Buildings Submission Guidelines*
Nature			10	4		4			
35	Impacts to Nature	◆	2		Minimum Expectation	◆	Strategy, Design	LOW	1. Site Ecological Value - at the date of site purchase or option contract, land clearing does not occur on the following site: - old-growth forest - prime agricultural land - any wetland listed as being of 'High National Importance, - aspects considered 'Matters of National Environmental Significance' If the project site is adjacent, within 100 meters, or contains the above and these are being protected, the construction and future operations of the site takes measures to reduce their impact. 2. The building's light pollution to neighbouring bodies and to night sky has been minimised. 3. Wetland Management Plan prepared by a qualified Ecologist or other qualified professional. (CA - Ecological assessment report prepared by an ecologist + design response how ecological values will be protected.)
36	Biodiversity Enhancement		2	2	Exceptional Performance	4	Design, Use	HIGH	1. External landscape - horizontal or vertical provided at ration of either 30% (ME is 15%) of the site area or 1:300 (ME is 1:500) of the GFA (whichever is large). 2. Diversity of species - <80% (EP is <60%) of plants must be indigenous and include at least 1 significant (nesting) tree or equivalent habitat provision per 250m2 (ME is 500m2) of landscape area. An ecologist must review, assess, and verify how the choice of landscaping and biodiversity is diverse and resilient to climate change impacts. 3. (ME) Biodiversity Management Plan prepared by suitably qualified professional.
37	Nature Connectivity		2				Strategy, Design	HIGH	
38	Nature Stewardship		2				Strategy, Design	LOW	
39	Waterway Protection		2	2			Design, Construction, Handover	LOW	1. 40% (EP is 80%) reduction in average annual stormwater discharge (ML/yr) 2. Achieve water pollution targets listed below: - TSS = 85% (EP is 90%) - Gros Pollutants = 90% (EP is 95%) - TN = 45% (EP is 60%) - TP = 65% (EP is 70%) Minimise the risk of chemical pollutants and other toxicants entering the stormwater system.

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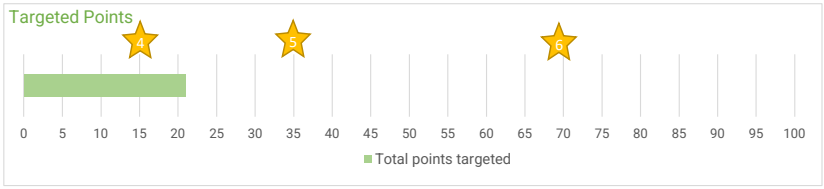
Net zero in operations targeted	*	No	**Buffer Points**	6
Credit Achievement points targeted		19	**Total points targeted**	21
Exceptional Performance points targeted		2	**Potential Points**	22



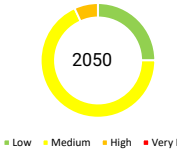
	Credit Name	Minimum Expectation	Credit Achievement	Exceptional Performance	Targeted Performance	Points Targeted	Stage of Implementation	Risk	Credit Requirements Summary *For full requirements refer to Green Star Buildings Submission Guidelines*
Leadership			**7**	**2**		**0**			
40	Market Transformation		**5**				All	HIGH	Project must demonstrate for each credit: - how a building solution or process is considered leading in their targeted sector, nationally or globally, OR - that the technology or process is not commonly used within Australia's building industry; or globally depending on the context.
41	Leadership Challenges		**Unlimited**				All	HIGH	The project meets a Leadership Challenge developed by the GBCA
41.1	Climate Positive Pathway		**1**						- 1 leadership challenge point achieved as part of the Climate Positive Pathway
41.2	Fossil Fuel Free Construction		**1**	**2**					- 20% of high emitting construction equip is fossil fuel free - site office is powered by 100% renewable energy - all electricity used by the construction site is 100% renewable.
Sector Specific			**3**	**4**					
42.1	Tenant Energy Source		**2**	**3**					The building owner actively assist tenants to procure renewable electricity. At least 40% of tenant space (by NLA) uses 100% renewable electricity (EP is 80%)
42.2	Collaborative Leasing		**1**	**1**					There is a commitment between landlord and tenant regarding collaboration, resource management and performance reporting. At least 10% of tenants have signed high quality lease agreements.
Points									
	Core points		**71**	**29**		**21**			
	Leadership points		**7**			**0**			
	Buffer Points					**6**			
	Actual					**21**			

* Climate Positive

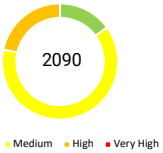
Appendix B – Climate Change Adaptation and Mitigation Matrix

Category	Risks Registered	2020-2039	2040-2050	2070-2090
Temperature	18	0.78	1.7	4.11
Precipitation	4	-53.09	-44.05	-22.14
Sea-level Rise	0	+ 0.3 m	+ 0.3 m	+ 0.8 m
Relative Humidity	3	-1.02	-1.59	-3.1
Drought	4	Max. no. of consecutive dry days: 6.39	Max. no. of consecutive dry days: 7.86	Max. no. of consecutive dry days: 10.99
Flood	7	Max. no. of consecutive wet days: -1.13	Max. no. of consecutive wet days: -1.3	Max. no. of consecutive wet days: -1.53
Wind+Storm	6	Wind Speed: + 4%	Wind Speed: + 4%	Wind Speed: +5%
Bushfire	12	SPEI Index: -0.16	SPEI Index: -0.17	SPEI Index: - 0.76
Cyclones	6	Data not available. Medium Level of Confidence for Increase		
Total Risks	**60**			

	2050
Low	15
Medium	41
High	4
Very High	0



	2090
Low	9
Medium	38
High	13
Very High	0



	Residual
Low	17
Medium	37
High	0
Very High	0

					2050			2090				Residual		
Ref	Category	Impact	Risk	Risk Owner	Likelihood	Consequence	Risk 2030	Likelihood,	Consequence8	Risk 2090	Mitigation/ Management Strategy	Likelihood.	Consequence14	Risk Final
W	Wind+Storm	More frequent and intense extreme storms, increase in wind speed	Damage to ventilation system due to particulate matter carried by increased wind	Mechanical	Unlikely	Moderate	Medium	Likely	Moderate	Medium	O/A intake located in shielded locations. Space provision for Carbon Filters to be allowed for events with potential to cause damage i.e bush fire or dust. Heat recovery ventilators to have filters.	Unlikely	Moderate	Medium
W	Wind+Storm	More frequent and intense extreme storms, increase in wind speed	Façade elements to cope with increased wind loads (roof, long cantilevers etc) at risk of uplift.	Architectural/Façade/Structural	Unlikely	Major	Medium	Unlikely	Major	Medium	Facade to be detailed designed with consideration of more severe storms and consider the increased liklihood of a cyclone to pass the site in the future.	Unlikely	Major	Medium
W	Wind+Storm	More frequent and intense extreme storms, increase in wind speed	Inceased storm/wind to impact landscaped areas	Landscape	Unlikely	Minor	Low	Likely	Minor	Medium	Landscape plant selection to be native to the areas. During the establishment of the landscape in the first few years extra irrigation provided to ensure plant does not dry out due to wind.	Unlikely	Minor	Low
W	Wind+Storm	More frequent and intense extreme storms, increase in wind speed	Damage to exterior equipment during a period of high wind	Electrical/ Mechanical	Unlikely	Moderate	Medium	Unlikely	Moderate	Medium	Similar mitigation strategy to above - Outdoor equipment to be in shielded locations that are designed to withstand wind loading that considers increased intensity of storms	Unlikely	Moderate	Medium
W	Wind+Storm	More frequent and intense extreme storms, increase in wind speed	Increased wind, dust and hail damage to (Services Plant and Solar PV)	Electrical/Mechanical	Likely	Moderate	Medium	Likely	Moderate	Medium	Since the pitch of the roof on LSPS is quite slight, there would need to scheduled observation of the PV panels to determine whether they require cleaning. There are no strategies for protecting solar PV panels from hail damage without compromising their efficiency. Solar panels within Australia are rated to withstand hail stones of 35mm diameter. Outdoor/External lighting luminaires to have suitable IP/IK ratings to withstand rain and hail.	Likely	Moderate	Medium
W	Wind+Storm	More frequent and intense extreme storms, increase in wind speed	Concerns for the outdoor furniture	Architectural	Likely	Moderate	Medium	Likely	Moderate	Medium	Outdoor furniture to be permant fixtures that are mounted to the ground sruface beneath them to prevent uplift from wind.	Very Unlikely	Moderate	Low
T	Temperature	Increase in daily temperature (min, max and mean), solar radiation and heatwaves. Decrease in cold nights	The heat rejection to the street, may cause an increase in localised heat island effect	Mechanical	Unlikely	Minor	Low	Likely	Minor	Medium	All outdoor units on LSPS are on the roof which is approx 10m above the surrounding ground floor area. This is unlikely to be noticed by people within the area since there is significant planting surrounding the buildings too.	Unlikely	Minor	Low

T	Temperature	Increase in daily temperature (min, max and mean), solar radiation and heatwaves. Decrease in cold nights	Blackout or brownout of the building during heatwaves or periods of prolonged high temperatures	Electrical/ Mechanical/ Facilities Manager	Likely	Major	High	Very Likely	Major	High	Substation to be uprated to ensure significant buffer between the forecasted projects peak demand and the power available.	Unlikely	Major	Medium
T	Temperature	Increase in daily temperature (min, max and mean), solar radiation and heatwaves. Decrease in cold nights	Annual temperature range outside of mechanical operating range	Mechanical	Likely	Moderate	Medium	Very Likely	Moderate	High	System to be designed such future upgrading in capacity is possible through upgrading indoor and outdoor units and not requiring to upgrade ductwork, HRVs and pipework. Therfore futureproofing the design for later increased temperatures.	Unlikely	Moderate	Medium
T	Temperature	Increase in daily temperature (min, max and mean), solar radiation and heatwaves. Decrease in cold nights	Building Systems Failure due from blackouts/ brownouts	Electrical/ Mechanical/ Facilities Manager	Likely	Major	High	Very Likely	Moderate	High	Substation to be uprated to ensure significant buffer between the forecasted projects peak demand and the power available. Provisions for temporary generators to be connected when required.	Likely	Moderate	Medium
T	Temperature	Increase in daily temperature (min, max and mean), solar radiation and heatwaves. Decrease in cold nights	Buckling of materials (eg pavement, roads ect)	Civil	Unlikely	Moderate	Medium	Unlikely	Moderate	Medium	This is unlikely due to most hardstands being shaded by the building itself or canopy cover. Areas that are exposed to sunlight will be constructed with appropriate expansion joints to prevent cracking	Unlikely	Moderate	Medium
T	Temperature	Increase in daily temperature (min, max and mean), solar radiation and heatwaves. Decrease in cold nights	A reduction in the use of outdoor spaces and amenities.	Landscape	Very Likely	Minor	Medium	Almost Certain	Moderate	High	Project is targeting a 30% canopy cover, this combined with a large undercroft should provide the site with plenty shaded and cool space.	Very Likely	Minor	Medium
T	Temperature	Increase in daily temperature (min, max and mean), solar radiation and heatwaves. Decrease in cold nights	Conduction risk in the glass reducing the thermal comfort for the occupants	Mechanical	Likely	Minor	Medium	Likely	Minor	Medium	Currently the Section J analysis proposes double glazed systems for the fixed outer perimeter windows which are the ones that will experince direct solar radiation. Double glazing will prevent this risk. Also these external windows have appropriate horizontal and vertical shading around them to prevent direct solar radiation. Operable windows are mostly shaded by the walkway and would not experiece long durations of direct solar radiation - therefore this issue low risk.	Unlikely	Minor	Low
T	Temperature	Increase in daily temperature (min, max and mean), solar radiation and heatwaves. Decrease in cold nights	Degradation and damage to building envelope (e.g. façade, roof) due to exposure to high temperatures (superficial peeling, cracking, corrosion, etc.)	Architect / Façade	Unlikely	Minor	Low	Unlikely	Minor	Low	Most façade elements will be relatively light in colour, reflecting a large portion of solar radiation, extending their life. Façade element procured to consider lifetime of the coating compared to the building design life.	Unlikely	Minor	Low
T	Temperature	Increase in daily temperature (min, max and mean), solar radiation and heatwaves. Decrease in cold nights	Degradation and damage to Building Systems due to exposure to high temperatures higher frequency system replacement requirements	Electrical	Likely	Moderate	Medium	Very Likely	Moderate	High	Plant area to be covered to reduce the effects of direct solar radiation.	Likely	Moderate	Medium
T	Temperature	Increase in daily temperature (min, max and mean), solar radiation and heatwaves. Decrease in cold nights	Electrical equipment failure during heatwaves or projected increased temperatures.	Electrical	Unlikely	Major	Medium	Likely	Major	High	Substation to be uprated to ensure significant buffer between the forecasted projects peak demand and the power available.	Unlikely	Major	Medium

T	Temperature	Increase in daily temperature (min, max and mean), solar radiation and heatwaves. Decrease in cold nights	Increase in hot days and heatwaves may impact the ability to maintain thermal comfort	Mechanical	Likely	Moderate	Medium	Very Likely	Moderate	High	System to be designed such future upgrading in capacity is possible through upgrading indoor and outdoor units and not requiring to upgrade ductwork, HRVs and pipework. Therfore futureproofing the design for later increased temperatures. 30% canopy cover will help local heat temperatures. Irrigation from rainwater to occur on peak days to reduce the temperature of the site.	Likely	Moderate	Medium
T	Temperature	Increase in daily temperature (min, max and mean), solar radiation and heatwaves. Decrease	Increase in water demand from both occupants and landscape	Hydraulic/ Landscape	Likely	Minor	Medium	Very Likely	Minor	Medium	Rainwater tank to supply irrigation	Likely	Minor	Medium
T	Temperature	Increase in daily temperature (min, max and mean), solar radiation and heatwaves. Decrease in cold nights	Increased heat island effect	Mechanical/Architectural	Likely	Moderate	Medium	Very Likely	Moderate	High	30% Canopy cover for entire LSPS site and low solar absortance roof provided.	Likely	Moderate	Medium
T	Temperature	Increase in daily temperature (min, max and mean), solar radiation and heatwaves. Decrease in cold nights	Increased temperatures impact on HVAC peak loads and and Mechanical Plant capacity.	Mechanical	Likely	Moderate	Medium	Very Likely	Moderate	High	System to be designed such future upgrading in capacity is possible through upgrading indoor and outdoor units and not requiring to upgrade ductwork, HRVs and pipework. Therfore futureproofing the design for later increased temperatures.	Unlikely	Moderate	Medium
T	Temperature	Increase in daily temperature (min, max and mean), solar radiation and heatwaves. Decrease in cold nights	Increased temperature in pipework may increase legionella risk	Hydraulic	Likely	Major	High	Likely	Major	High	Hot water storage and reticulation loop to be kept at temperature > 60 deg C such that Legionella cannot survive. Cold water pipes to have deadlegs flushed after long periods of no use - ie school holidays	Unlikely	Major	Medium
T	Temperature	Increase in daily temperature (min, max and mean), solar radiation and heatwaves. Decrease in cold nights	Mechanical equipment may fail under higher temperatures	Mechanical	Unlikely	Major	Medium	Likely	Major	High	Mechancial design to consider short term effects of climate change that match the design life of the VRF system. System to be designed such future upgrading in capacity is possible through upgrading indoor and outdoor units and not requiring to upgrade ductwork, HRVs and pipework. Therfore futureproofing the design for later increased temperatures.	Unlikely	Major	Medium
T	Temperature	Increase in daily temperature (min, max and mean), solar radiation and heatwaves. Decrease in cold nights	The natural ventilation system may not be able to be used for as much of the year as predicted	Architectural/Mechanical	Likely	Minor	Medium	Very Likely	Minor	Medium	30% tree canopy cover and low solar absorptance roof will assist this.	Very Likely	Minor	Medium
T	Temperature	Increase in daily temperature (min, max and mean), solar radiation and heatwaves. Decrease in cold nights	Thermal comfort of occupants in naturally ventilated spaces.	Mechanical	Likely	Minor	Medium	Very Likely	Minor	Medium	30% tree canopy cover and low solar absorptance roof will assist this.	Very Likely	Minor	Medium
RH	Relative Humidity	Slight decrease in RH	Condensation and moisture in the façade	Architectural/Façade	Unlikely	Moderate	Medium	Unlikely	Moderate	Medium	Air tightness consultant to be procured, condensation unlikely to occur due to sufficient air changes.	Unlikely	Moderate	Medium
RH	Relative Humidity	Consecutive days of intense rainfall, high RH, high temperature	HVAC system undersized for dehumidifaction. HVAC cannot simulataneously heat and cool	Mechanical	Likely	Minor	Medium	Likely	Minor	Medium	Schools operate on VRF systems that are not capable of dehumidification	Likely	Minor	Medium

RH	Relative Humidity	Fluctuating RH during different ENSO cycles	Increased humidity during La Nina, Decreased humidity during El Nino, impacting thermal comfort, health risk and moisture indoors	Mechanical	Likely	Moderate	Medium	Likely	Moderate	Medium	Schools operate on VRF systems that are not capable of dehumidification	Likely	Moderate	Medium
P	Precipitation	Increased rainfall variability, less frequent but more severe storms events	Drainage from public system to not cope with intense flows	Civil	Very Unlikely	Moderate	Low	Unlikely	Moderate	Medium	Generally this should be ok for short duration rainfalls. For times during extended rainfall the river will rise to a point that will make any drainage from the area redundant. This risk is superceded by flooding risk	Unlikely	Moderate	Medium
P	Precipitation	Increased rainfall variability, less frequent but more severe storms events	Increased rainfall variability may impact the annual capcity of rainwater used for irrigation	Hydraulic	Unlikely	Minor	Low	Likely	Minor	Medium	The planting selection is mostly native to the area plants which will not require significant irrigation after being established. When considering the effects of prolonged drout, the Rainwater tank will supply irrigation only. The roof provides a large catchement area relative to the spaces being irrigated. Approximately twice the size. Tank is currently 10kL.	Likely	Minor	Medium
P	Precipitation	Increased rainfall variability, less frequent but more severe storms events	Operation of natural ventilation louvers during rain events	Mechanical/Architectural	Likely	Moderate	Medium	Likely	Moderate	Medium	The natural ventilation openings have mechanical louvres on them which will act as a barrier to rain to a certain extent. The eave of the roof will also protect these openings from rain. If the rain and wind is too much that it is flying into the spaces it is likely that they will simply be shut and the mech system will be operating	Unlikely	Minor	Low
P	Precipitation	Increased rainfall variability, less frequent but more severe storms events	Penetrations through roofing.	Architectural	Unlikely	Moderate	Medium	Unlikely	Moderate	Medium	Penetrations through the roof will be from roofing screws which are to have a rubber/neopreme washer or the like to prevent water ingress. Similarly PV system must be fastened to ensure waterproofing on the penetrations	Unlikely	Moderate	Medium
F	Flood	More severe and prolonged flood events	Access to the building restricted by flood	Civil	Unlikely	Major	Medium	Unlikely	Major	Medium	Lismore has experienced floods throughout its existence. This projects site does not allow for access during a serious flood. If the site is flooded it is likely that a lot of the town is also flooded and the community has larger. A 10% AEP flood will likely cause flooding across the site where kids would have to get wet feet to enter the class room.	Unlikely	Major	Medium
F	Flood	More severe and prolonged flood events	Death of flora due to flooding	Landscape	Likely	Minor	Medium	Likely	Minor	Medium	This is dependent on when the flood occurs. If the flood occurs after the plants are well established, this would be considered a lower risk. If flooding occurs shortly after planting, this is high risk for plant survival.	Likely	Minor	Medium

F	Flood	More severe and prolonged flood events	Flood damage to building structure	Structural	Unlikely	Severe	High	Unlikely	Severe	High	This project is on stilts where the FFL is at 500mm above the 2022 flood leve but still below the PMF. The structural design has considered the effects of loading from overland flow at the PMF level and designed accordingly. TTW's Flood Concept Design Report for LSPS (7 June 2024) suggest that the Lismore City Council Local Environment Plan suggests that the project is in a flood fringe area and that would require a FPL of 1% AEP + 500mm (=13.15m). The project has an FFL of the 2022 Flood + 500m (=14.95m). This is 1.8m higher than what is expected from council. Due to this height increase from the council requirements, it is has reduce the risk of building damage.	Very Unlikely	Severe	Medium
F	Flood	More severe and prolonged flood events	Flooded underground utilities (e.g. stormwater outflow points, basement facilities or storage)	Civil	Unlikely	Major	Medium	Unlikely	Major	Medium	The site has flooding impacts even at the 10% AEP Flood Level. Therefore the stormwater system will be inevitabaly be inundated during flooding events. The project does not have basement facilities or storage on the site level, these are all lifted above the FFL.	Unlikely	Major	Medium
F	Flood	More severe and prolonged flood events	Flooding causes power outage	Electrical/Mechanical/Civil/Landscape/Facilities Manager	Very Unlikely	Severe	Medium	Very Unlikely	Severe	Medium	Flooding itself would not cause a power outage persay, unless it were above the project finished floor level. The energy operator would turn of the power to the site and surrounding area in the case of a flood. The electrical infrastructure is to be designed such that it remains intact and undamaged if a flood occurs at the project specified flood height (2022 FL + 500mm).	Very Unlikely	Severe	Medium
F	Flood	More severe and prolonged flood events	Overland flow during flood events	Civil	Unlikely	Major	Medium	Unlikely	Major	Medium	The school would be closed during a flood making this risk redundant.	Unlikely	Major	Medium
F	Flood	More severe and prolonged flood events	Undersized systems for drainage, gutters, osd (if needed)	Hydraulic/Civil	Likely	Moderate	Medium	Likely	Moderate	Medium	Gutters are sized to 5 min duration at 5%AEP. The gutters are not critical if they are overflowing as the water would be falling to the site ground rather which is well below the buildings floor level.	Likely	Minor	Medium
D	Drought	More severe and prolonged drought events	Damage to landscaping due to drought.	Architectural	Likely	Minor	Medium	Likely	Minor	Medium	The planting selection is mostly native to the area plants which will not require significant irrigation after being established. When considering the effects of prolonged drout, the Rainwater tank will supply irrigation only. The roof provides a large catchement area relative to the spaces being irrigated. Approximately twice the size. Tank is currently 10kL.	Unlikely	Minor	Low
D	Drought	More severe and prolonged drought events	Decreased availability of potable water. Local laws in place for preventing the use of potable water for non-potable uses.	Landscape	Likely	Moderate	Medium	Very Likely	Moderate	High	Irrigation and toilet flushing are the two non-potable water uses on this site. Irrigation is connected to the rainwater tank. Toilet flushing is kept to town mains but will not become illegal.	Unlikely	Moderate	Medium

D	Drought	More severe and prolonged drought events	Reduction in water availability for rainwater reuse in the building due to droughts	Hydraulic	Likely	Moderate	Medium	Likely	Moderate	Medium	Non-potable water demand not extremely high. Irrigation would want to use rainwater during times of extreme drought. Locally in a basin, regionally in a large basin. Overall humidity crashing to dry desert conditions is very unlikely.	Unlikely	Moderate	Medium
D	Drought	More severe and prolonged drought events	Water scarcity during drought periods affecting towns water supply	Hydraulic	Unlikely	Major	Medium	Unlikely	Major	Medium	This would be challening and likely something that would need to be tackled on a town wide level. Due to the large catchment for Wilsons river, it is very unlikely it would dry up and could be used for non-potable uses while importing drinking water.	Unlikely	Major	Medium
C	Cyclones	Less frequent but more severe tropical Cycles reaching further South	Blockage of drainage systems during large storm events	Hydraulic/Civil	Likely	Moderate	Medium	Likely	Moderate	Medium	Gutters to have debris blocking devices on them. Stormwater to have appropriate access points for maintenance unblockages	Likely	Moderate	Medium
C	Cyclones	Less frequent but more severe tropical Cycles reaching further South	Damage to landscaping and trees	Landscape	Likely	Moderate	Medium	Likely	Moderate	Medium	Long term vision of landscape to be assessed such that large shallow rooted trees such as gumtrees and fig trees are kept at a distance further than their mature height to ensure that the trees will not fall on the buildings in the event of a cyclone	Likely	Moderate	Medium
C	Cyclones	Less frequent but more severe tropical Cycles reaching further South	Hail damage to façade	Architect / Façade	Very Unlikely	Moderate	Low	Unlikely	Moderate	Medium	Glazing is the weak point of the façade. Street facing glazing will be double glazed adding resistance of danger to occupants if hail does hit glass. Glazing to be thick enough to handle a certain level of impact resistance. Single glazed façade in the courtyard facing facades have large overhangs which would prevent hail from hitting the facade. Street facing facade also has shading devices and roof overhangs that would further prevent hail from reaching the glass.	Very Unlikely	Moderate	Low
C	Cyclones	Less frequent but more severe tropical Cycles reaching further South	Hail damaging the roof tiles/ strucutres	chitectural/Facilities Manager/Faca	Unlikely	Moderate	Medium	Unlikely	Moderate	Medium	Roof will be made from Colourbond steel or the like. Hail storms are very unlikely to cause any structural/performance issues of the roof. There is a mild risk of dents being formed from the hail stones. Since the roof cannot be seen in detail from the street or on the building, this is considered a low risk issue.	Unlikely	Minor	Low
C	Cyclones	Less frequent but more severe tropical Cycles reaching further South	Hail damaging the solar panles	Electrical	Unlikely	Moderate	Medium	Unlikely	Moderate	Medium	Australian Code that Solar panels tested and certified to withstand hail up to 25mm falling at 23 m/s	Unlikely	Moderate	Medium
C	Cyclones	Less frequent but more severe tropical Cycles reaching further South	Lighting Strikes to the building	All	Unlikely	Major	Medium	Unlikely	Major	Medium	Height of the building in the regional surrounding geographical area lowers the risk.	Unlikely	Major	Medium
B	Bushfire	Increased frequency and intensity of bushfires	Access to site blocked, preventing, or restricting access and egress to the site caused by bushfire	Landscape / Civil / Architectural	Very Unlikely	Moderate	Low	Very Unlikely	Moderate	Low	Project is not in bushfire prone land	Very Unlikely	Moderate	Low
B	Bushfire	Increased frequency and intensity of bushfires	Damage to buildings/ landscape/ occupants	Landscape	Almost Unprecedented	Major	Low	Very Unlikely	Major	Medium	Project is not in bushfire prone land	Very Unlikely	Major	Medium
B	Bushfire	Increased frequency and intensity of bushfires	False alarms from smoke ingress during bushfire periods	Architect / Façade	Unlikely	Moderate	Medium	Unlikely	Moderate	Medium	Project is not in bushfire prone land	Unlikely	Moderate	Medium
B	Bushfire	Increased frequency and intensity of bushfires	Increase of particulate matter/ ash from bushfires in recycled water system	Hydraulic	Very Unlikely	Minor	Low	Very Unlikely	Minor	Low	Project is not in bushfire prone land . Recycled water system for irrigation purposes only, therefore water quality is not critical	Very Unlikely	Minor	Low

B	Bushfire	Increased frequency and intensity of bushfires	Ingress of smoke through natural ventilation louvers causing building system damage and increase health risks to the building occupants	Architectural/Mechanical	Very Unlikely	Moderate	Low	Very Unlikely	Moderate	Low	Project is not in bushfire prone land. Natural ventilation will not be occuring during bushfire event. Outdoor air to be filtered through mechanical system.	Very Unlikely	Moderate	Low
B	Bushfire	Increased frequency and intensity of bushfires	Internal smoke damage as a result of unsealed areas	Architectural/Mechanical	Very Unlikely	Moderate	Low	Very Unlikely	Moderate	Low	Project is not in bushfire prone land	Very Unlikely	Moderate	Low
B	Bushfire	Increased frequency and intensity of bushfires	Particulate matter compromising the filtration of the mechanical system	Mechanical	Unlikely	Moderate	Medium	Unlikely	Moderate	Medium	Project is not in bushfire prone land. As an operational response, filters are to be inspected with consideration of replacement after bushfire events or during bushfire events if they are of long duration.	Unlikely	Moderate	Medium
B	Bushfire	Increased frequency and intensity of bushfires	Particulate matter effect occupants during times of increased activity	Mechanical	Very Unlikely	Moderate	Low	Very Unlikely	Moderate	Low	Project is not in bushfire prone land. Operationally, activity such as sport and dance should be kept at a minimum during bushfire effects events.	Very Unlikely	Moderate	Low
B	Bushfire	Increased frequency and intensity of bushfires	Particulate matter from bushfires increasing the soiling of PV panels	Electrical	Unlikely	Minor	Low	Unlikely	Minor	Low	Project is not in bushfire prone land. Operationally, roof to be inspected after bushfire event with consideration of cleaning PV panels.	Unlikely	Minor	Low
B	Bushfire	Increased frequency and intensity of bushfires	Reduced air quality within internal areas - IAQ (PM)	Mechanical	Very Unlikely	Moderate	Low	Very Unlikely	Moderate	Low	Project is not in bushfire prone land	Very Unlikely	Moderate	Low
B	Bushfire	Increased frequency and intensity of bushfires	Reduced air quality within open space areas and increase health impacts - Outdoor AQ	Architectural	Unlikely	Moderate	Medium	Unlikely	Moderate	Medium	Project is not in bushfire prone land	Unlikely	Moderate	Medium
B	Bushfire	Increased frequency and intensity of bushfires	Smoke and embers impacting ventilation and air-conditioning systems	Mechanical	Very Unlikely	Moderate	Low	Very Unlikely	Moderate	Low	Project is not in bushfire prone land	Very Unlikely	Moderate	Low

Appendix C – NABERS Embodied Emissions Material Form

NSW Government
4 Parramatta Square
Parramatta NSW 2150
nabers.gov.au

NABERS Embodied emissions materials form

New non-residential developments must complete this form

From 1 October 2023, all new non-residential developments must report on embodied emissions using this form in NSW, where the NSW government's State Environmental Planning Policy (Sustainable Buildings SEPP) 2022 applies. You must disclose the amounts of key materials at the development application and construction certificate stages.

More on the Sustainable Buildings SEPP

Embodied carbon emissions are generated across the full life cycle of a building from "cradle to grave". Embodied carbon made up 16% of the whole-of-life carbon footprint of Australia's buildings in 2019 [1]. The purpose of this form is to report on material quantities only, to support project team discussions about potential reduction in emissions from key materials. The form does not include embodied emissions factors. This reporting form will be updated to reflect the NABERS Embodied Carbon tool when it's available in 2024.

Step 1: About the building

In the 'About the building' tab, you will add the location, function, and type of building you are planning to construct. You will also need to add information that describes the building, including gross floor area, number of floors, area of carpark, and more. Collecting this information will allow the NSW Government to compare similar buildings.

Step 2: Quantity of materials

In the 'Quantity of materials' tab, you will add the amounts of materials that you will use to construct your building. You only need to complete those fields relevant to your building. Leave fields that aren't relevant to your building blank. We recognise that there will be uncertainty, particularly at DA stage, so please use your best estimates where information is unknown (e.g., based on past projects).

How much do I need to include?

You must include all parts of the building delivered by the main contractor, covering at least 80% of the total materials bill. For example, if you spent $100,000 on materials, you need to include the material amounts of at least $80,000 of those materials in this form.

Wherever possible, consider materials costs only, not labour, plant or equipment. However, where you cannot split out the materials costs, please simply be consistent in the way the costs are reported throughout the spreadsheet.

Enter the **quantity of materials** (excluding labour, plant, equipment, margins and taxes) for:

(1) Structure (substructure and superstructure) within the envelope of the building. Also include any ancillary buildings that are necessary for the main building to function (for example, plant that is in a separate building).

(2) Envelope (cladding, curtain walls, roofing, windows, doors etc.)

(3) Permanent internal walls and doors. At minimum, this should include all structural walls.

(4) External works (hard landscaping, carparks, etc.) outside of the building envelope.

Enter the **cost of materials** (excluding labour, plant, equipment, margins and taxes) for:

(5) Building services (mechanical, electrical, plumbing, vertical transport, etc.) required to run the core of the building. Exclude special equipment required by a particular tenant.

You must enter the amounts of materials in SI units (commonly known as the metric system). These are generally consistent across the various products on the market. However, you might need to convert the units of some materials (for example, convert volume to kg).

Step 3: Certifier details

In the 'Certifier' tab you will add the details of the person who has entered data, and the person who has certified the accuracy of the data. The certifier must be a quantity surveyor, designer, engineer or NABERS assessor.

Step 4: Attach to approval

Attach this Excel spreadsheet to your development application or construction certificate application.

The data collected in this form will be used by the NSW Government to inform future policy development.

Help!

If you have general questions about reporting on the embodied emissions of your building, you should contact your local council or consent authority.

If you have technical questions about this spreadsheet, please contact NABERS:
nabers@environment.nsw.gov.au

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[1] Green Building Council of Australia, 2021, https://new.gbca.org.au/news/gbca-news/gbca-and-thinkstep-release-embodied-carbon-report/

Step 1: About the building

Fill out blue cells

Building location and site data	Value	Unit	Note	Comment
Building address	Phyllis & Wilson Street			
Postcode	2480		Required	Postcode of building
Town/city	BACK CREEK + 75 other localities		Town/city/suburb/region automated from postcode (may not give exact town name)	Town/city/suburb/region of the building site.
Distance to nearest major city/town	150	km	Enter for rural/regional locations only	Declare the shortest route by road to your site from the centre of your nearest major city (>100,000 people). The route must be traversable by a semitrailer truck.
Project stage	Development Application		Required	Stage of development
New build or major renovation?	New build		Required	
Brownfield or greenfield site?	Brownfield		Required	

Floor area by NCC building classification	Gross (GFA)	Net (NLA/NSA/UFA)	Unit	Note	
Please enter all floor areas relevant to your building. Leave areas blank if not applicable. Please enter Gross Floor Area (GFA) for all building classifications. Please also enter the corresponding net area (Net Lettable Area, Net Sellable Area or Usable Floor Area) where it is commonly used for that building classification.					
Class 1a: Detached residential buildings			m²	Required for Class 1a: Detached residential houses, townhouses	Gross Floor Area (GFA), as defined by the AIQS Australian Cost Management Manual
Class 1b: Boarding houses and hostels			m²	Required for Class 1b: Boarding house, guest house, hostel	Net area (Net Lettable Area, Net Sellable Area, Usable Floor Area), as defined by the PCA's Method of Measurement
Class 2: Multi-unit residential buildings			m²	Required for Class 2: Multi-unit residential, including apartment buildings	
Class 3: Other residential buildings			m²	Required for Class 3: Other residential buildings	
Class 4: Residential inside non-residential			m²	Required for Class 4: Residential building inside a non-residential building, e.g., caretaker residence	
Class 5: Office buildings			m²	Required for Class 5: Office building	
Class 6: Retail buildings			m²	Required for Class 6: Retail building, e.g., shop, restaurant, café	
Class 7a: Carparks			m²	Required for Class 7a: Carparks	
Class 7b: Warehouse-type buildings			m²	Required for Class 7b: Warehouses, wholesalers and storage facilities	
Class 8: Industrial buildings			m²	Required for Class 8: Industrial buildings, e.g., factories and workshops	
Class 9a: Healthcare buildings			m²	Required for Class 9a: Healthcare, e.g., hospitals, clinics, day surgeries	
Class 9b: Civic buildings	3,950		m²	Required for Class 9b: Civic buildings, e.g., theatres, civic centres, train stations	
Class 9c: Aged care and personal care buildings			m²	Required for Class 9c: Aged care and personal care	
Class 10a: Non-habitable buildings			m²	Required for Class 10a: Non-habitable buildings including sheds, carports and private garages	
Class 10b: Miscellaneous structures			m²	Required for Class 10b: Miscellaneous structures, including fences, masts, antennas, retaining walls and swimming pools	
Class 10c: Bushfire shelters			m²	Required for Class 10c: Bushfire shelters not attached to a Class 1a building	
Total	3,950	0	m²	Required: Sum of m² inputs must be more than 0.	

Project information	Value	Unit	Note	
Total cost of project		AUD excl. GST	Required	Include labour, materials, transport, plant, equipment and professional fees. Exclude GST, land, finance, escalation and other costs.
Building design life	60	years	Required	If uncertain, enter 50 years
Estimated envelope life		years	Optional	
Estimated replacement cycle for mechanical services		years	Optional	
Estimated replacement cycle for vertical transportation		years	Optional	

Dimensions of the building and the site	Value	Unit	Note	
Site area	10,685	m²	Required	Total area of site to external boundary.
Shared services or infrastructure	No		Required	Indicate if there are shared services that the building utilises, or shared foundations, basement or podium
Building footprint area	3,950	m²	Required	Total floor area of the ground floor measured to the outside edge of the floorplate.
Typical floor area (if different to building footprint area)	2,635	m²	Only needed if different to row above	
Typical floor perimeter	535	m	Required	
Area of external carpark (not included in GFA)	845	m^2	Required. Enter 0 if not applicable.	
Area of external hardstand (not included in GFA)	3,100	m^2	Required. Enter 0 if not applicable.	
Area of other hard landscaping (not included in GFA)	6,740	m^2	Required. Enter 0 if not applicable.	Include all other impervious areas. For example, patios, paths and driveways (not already included in carparks and hardstands above).
Number of floors/storeys above ground, including ground floor	1	no.	Required	
Number of floors/storeys below ground	0	no.	Required. Enter 0 if not applicable.	
Number of floors/storeys of car parking	1	no.	Required. Enter 0 if not applicable.	
Total height above ground	10	m	Required	Measured from the average finished grade to the highest point of the building, excluding protrusions (lighting rods, masts, chimneys, etc.)

Structural material choices	Value	Unit	Note	
Foundation type	Piles		Required	
Frame type (dominant)	Reinforced concrete		Required	
Suspended floor type (typical)	Post-tensioned concrete		Only needed for multi-storey buildings	
Describe low carbon materials specified in your building (e.g. green concrete, low carbon bricks)	High supplementary cementitious material		Required	
Describe recycled content specified in your building (e.g. recycled steel)	High supplementary cementitious material		Required	

Step 2: Quantity of materials

Complete all blue cells that are applicable to the building. Leave items that aren't applicable blank.

Fill out blue cells

Material category	Sub-category 1	Sub-category 2	Sub-category 3	Value	Unit of measure	Comment	AIQS ACMM Code	ICMS3 (Level 3 Codes Construction)
Structure								
The structural parts of the building that are below ground (substructure) and above ground (superstructure). This includes fill below the substructure, foundations, basement levels, suspended floors, wall structure, roof structure, stairs, lift shafts and balconies. It excludes external areas such as hardstands, carparks, patios, etc.								
Coverage of structural material spend	-	-	-	100	%	Required. Coverage of spend for structural elements entered below. Minimum requirement = 80%. Exclude head contractor preliminaries and margins.		
Concrete in-situ	≤10 MPa	-	-		m³	Please enter reinforcing steel as part of "Reinforcing steel" below	01_SB or 02-11	02 or 03
Concrete in-situ	>10 MPa to ≤20 MPa	-	-		m³	Please enter reinforcing steel as part of "Reinforcing steel" below	01_SB or 02-11	02 or 03
Concrete in-situ	>20 MPa to ≤32 MPa	-	-		m³	Please enter reinforcing steel as part of "Reinforcing steel" below	01_SB or 02-11	02 or 03
Concrete in-situ	>32 MPa to ≤40 MPa	-	-		m³	Please enter reinforcing steel as part of "Reinforcing steel" below	01_SB or 02-11	02 or 03
Concrete in-situ	>40 MPa to ≤50 MPa	-	-	1,924.0	m³	Please enter reinforcing steel as part of "Reinforcing steel" below	01_SB or 02-11	02 or 03
Concrete in-situ	>50 MPa to ≤60 MPa	-	-		m³	Please enter reinforcing steel as part of "Reinforcing steel" below	01_SB or 02-11	02 or 03
Concrete in-situ	>60 MPa to ≤80 MPa	-	-		m³	Please enter reinforcing steel as part of "Reinforcing steel" below	01_SB or 02-11	02 or 03
Concrete in-situ	>80 MPa to ≤100 MPa	-	-		m³	Please enter reinforcing steel as part of "Reinforcing steel" below	01_SB or 02-11	02 or 03
Concrete in-situ	>100 MPa	-	-		m³	Please enter reinforcing steel as part of "Reinforcing steel" below	01_SB or 02-11	02 or 03
Concrete pre-cast panel	-	-	-		m³	Please enter reinforcing steel in relevant line items below. If not known at DA stage, please make your best estimate. If not known at CC stage, please ask your supplier.	01_SB or 02-11	02 or 03
Concrete block	Hollow core	-	-		m³	Enter as cubic metres, calculated as (area in m²) * (thickness in mm / 1000). Please include all block fill concrete and all reinforcing steel in relevant line items above/below.	01_SB	02 or 03
Concrete block/brick	Solid	-	-	51.0	m³	Enter as cubic metres, calculated as (area in m²) * (thickness in mm / 1000)	01_SB	02 or 03
Concrete block/brick	Solid AAC	-	-		m³	Solid Aerated Autoclaved Concrete (AAC) block. Enter as cubic metres, calculated as (area in m²) * (thickness in mm / 1000).	01_SB	02 or 03
Mortar	-	-	-		kg		01_SB	02 or 03
Reinforcing steel	Bar & mesh	-	-	272,000	kg	**Include all reinforcing steel bar/mesh in the building's structure in this row.** Usually this is calculated as kg/m³ per concrete element and then summed. Example: 10 m³ of 40 MPa concrete @ 100 kg/m³ + 5 m³ of 50 MPa concrete @ 150 kg/m³ = 1,750 kg reinforcing steel.	01_SB or 02-11	02 or 03
Reinforcing steel	Fibre & strand	-	-		kg	**Include all steel fibre reinforcing and steel strand in the building's structure in this row.**	01_SB or 02-11	02 or 03
Structural steel	Hot rolled structural	-	-	149,000	t	Examples include universal beams, universal columns and welded beams	01_SB	02 or 03
Structural steel	Cold formed structural	-	-		t	Examples include C purlins, Z purlins and all light gauge steel framing	01_SB	02 or 03
Structural steel	Other welded structural	-	-		t		01_SB	02 or 03
Structural steel	Plate	-	-		t	Include any allowance for connections here	01_SB	02 or 03
Structural steel	Sheet	-	-		t		01_SB	02 or 03
Stainless steel	-	-	-		t	Primarily for engineered timber structure connections	02_11	02 or 03
Reinforced concrete piles	Concrete	-	-	2,976,000	m³	Please enter reinforcing steel in the line below. If not known at DA stage, please make your best estimate. If not known at CC stage, please ask your supplier.	01_SB	02 or 03
Reinforced concrete piles	Steel reinforcing			248,000	kg	If not known at DA stage, please make your best estimate. If not known at CC stage, please ask your supplier.	01_SB	02 or 03
Steel piles	-	-	-		t	Where concrete and reinforcing steel are also used, enter these in the rows above.	01_SB	02 or 03
Timber poles/piles	-	-	-		m³	Where concrete and reinforcing steel are also used, enter these in the rows above.	01_SB	02 or 03
Timber (solid)	Sawn softwood	-	-		m³		02_11	02 or 03
Timber (solid)	Sawn hardwood	-	-		m³		02_11	02 or 03
Timber (engineered)	CLT	-	-		m³		02_11	02 or 03
Timber (engineered)	Glulam	-	-		m³		02_11	02 or 03
Timber (engineered)	LVL	-	-		m³		02_11	02 or 03
Timber (engineered)	OSB	-	-		m³	Enter as cubic metres, calculated as (area of wall in m²) * (thickness in mm / 1000)	02_11	02 or 03
Brick	Heat cured	-	-		m³	Enter as cubic metres, calculated as (area of wall in m²) * (thickness in mm / 1000)	02_11	02 or 03
Structural Insulated Panel (SIP)	Steel outer	-	-		m²		01_SB	02 or 03
Structural Insulated Panel (SIP)	Aluminium outer	-	-		m²		01_SB	02 or 03
Structural Insulated Panel (SIP)	Engineered timber outer	-	-		m²		01_SB	02 or 03
Fill	-	-	-		t	Include purchased material only. Exclude site-won material.	01_SB	01
Sand & gravel	-	-	-		t	Include purchased material only. Exclude site-won material and sand/gravel in concrete.	01_SB	01
Waterproofing membrane	Bituminous	-	-		m²		01_SB	01 or 02 or 03
Waterproofing membrane	Polyethylene	-	-		m²		01_SB	01 or 02 or 03
Other structural (Describe and add unit >>)		-	-			Please enter a description for any structural material that does not fit a predefined classification		
Other structural (Describe and add unit >>)		-	-			Please enter a description for any structural material that does not fit a predefined classification		
Other structural (Describe and add unit >>)		-	-			Please enter a description for any structural material that does not fit a predefined classification		
Envelope								
The skin of the building that separates the internal building from the external environment. This includes the roof cladding, wall cladding, windows, doors and internal/external shading. It also includes insulation and the internal wall lining of envelope walls.								
Coverage of envelope material spend	-	-	-	85	%	Required. Coverage of spend for the envelope items you have entered below. Minimum requirement = 80%. Exclude head contractor preliminaries and margins.		

Roof cladding	Profiled steel	-	-	4,994	m²	Enter as m² of roof area. Exclude allowances for overlap in the roofing sheets. This row includes all metal-coated and pre-painted steel sheets where steel is the base metal. Examples include: galvanised steel, zinc-aluminium (zincalume) coated steel and zinc-aluminium-magnesium (ZAM) coated steel, whether painted or unpainted.	05_RF	03 or 04
Roof cladding	Profiled aluminium	-	-		m²	Enter as m² of roof area. Exclude allowances for overlap in the roofing sheets. This row also includes pre-painted aluminium sheets.	05_RF	03 or 04
Roof cladding	Profiled zinc	-	-		m²	Enter as m² of roof area. Exclude allowances for overlap in the roofing sheets. This row also includes pre-painted zinc sheets.	05_RF	03 or 04
Roof cladding	Membrane	-	-		m²	Enter as m² of roof area. Exclude allowances for overlap in the membrane sheets.	05_RF	03 or 04
Roof cladding	Tiles (traditional clay)	-	-		m²	Enter as m² of roof area. Exclude allowances for overlap between the tiles.	05_RF	03 or 04
Roof cladding	Tiles (concrete)	-	-		m²	Enter as m² of roof area. Exclude allowances for overlap between the tiles.	05_RF	03 or 04
Roof cladding	Other (Please describe >>)		-		m²	Please enter a description for any roofing that does not fit a predefined classification	05_RF	03 or 04
Wall cladding	Bricks (heat cured)	-	-		m²	Enter as m² of wall area. Heat-cured bricks use a kiln or furnace to raise the brick temperature above ambient temperature during curing process.	06_EW	03 or 04
Wall cladding	Bricks (air dried)	-	-		m²	Enter as m² of wall area. Air-dried bricks are cured using ambient temperature.	06_EW	03 or 04
Wall cladding	Bricks (under fired)	-	-		m²	Enter as m² of wall area.	06_EW	03 or 04
Wall cladding	Bricks (concrete)	-	-		m²	Enter as m² of wall area	06_EW	03 or 04
Wall cladding	Mortar and render	-	-		kg		06_EW	03 or 04
Wall cladding	Profiled steel	-	-		m²	Enter as m² of wall area. Exclude allowances for overlap in the cladding sheets, offcuts, etc. This row includes all metal-coated and pre-painted steel sheets where steel is the base metal. Examples include: galvanised steel, zinc-aluminium (zincalume) coated steel and zinc-aluminium-magnesium (ZAM) coated steel, whether painted or unpainted.	06_EW	03 or 04
Wall cladding	Profiled aluminium	-	-		m²	Enter as m² of wall area. Exclude allowances for overlap in the cladding sheets, offcuts, etc. This row also includes pre-painted aluminium sheets.	06_EW	03 or 04
Wall cladding	Profiled zinc	-	-		m²	Enter as m² of wall area. Exclude allowances for overlap in the cladding sheets, offcuts, etc. This row also includes pre-painted zinc sheets.	06_EW	03 or 04
Wall cladding	GRC cladding	-	-		m²	Enter as m² of wall area. GRC = Glass Reinforced Concrete.	06_EW	03 or 04
Wall cladding	Timber weatherboards	-	-		m²	Enter as m² of wall area. Exclude allowances for overlap between weatherboards, offcuts, etc.	06_EW	03 or 04
Wall cladding	Fibre cement board	-	-	1,169	m²	Enter as m² of wall area. Exclude allowances for offcuts, etc.	06_EW	03 or 04
Wall cladding	Terracotta	-	-		m²	Enter as m² of wall area. Exclude allowances for offcuts, etc.	06_EW	03 or 04
Wall cladding	Brick tiles / veneers	-	-		m²	Enter as m² of wall area. Exclude allowances for offcuts, etc.	06_EW	03 or 04
Wall cladding	Plasterboard	-	-		m²	Enter as m² of wall area. Exclude allowances for offcuts, etc. Include both external wall linings and internal wall linings for envelope walls.	12_WF or 06_EW	03 or 04
Wall cladding	Plywood	-	-		m²	Enter as m² of wall area. Exclude allowances for offcuts, etc. Include both external wall linings and internal wall linings for envelope walls.	12_WF or 06_EW	03 or 04
Wall cladding	Other (Please describe >>)		-		m²	Please enter a description for any wall cladding that does not fit a predefined classification	06_EW or 12_WF	03 or 04
Windows & doors	Aluminium frame	Single glazed	-		m²	Include all single glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	Aluminium frame	Double glazed	-	416	m²	Include all double glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	Aluminium frame	Triple glazed	-		m²	Include all triple glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	Timber frame	Single glazed	-		m²	Include all single glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	Timber frame	Double glazed	-		m²	Include all double glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	Timber frame	Triple glazed	-		m²	Include all triple glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	uPVC frame	Single glazed	-		m²	Include all single glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	uPVC frame	Double glazed	-		m²	Include all double glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	uPVC frame	Triple glazed	-		m²	Include all triple glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	Frameless	Single glazed			m²	Include all single glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	Frameless	Double glazed			m²	Include all double glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	Frameless	Triple glazed			m²	Include all triple glazing, including standard, toughened, laminated and low-E	07_WW or 08_ED	03 or 04
Windows & doors	Other (Please describe >>)		-		m²	Please enter a description for any windows or doors that do not fit a predefined classification	07_WW or 08_ED	03 or 04
Curtain wall	Single skin façade	Glazed panel	Single glazed		m²	Please declare all single-skin façade area in this section. All double-skin façade area should be entered in the next section. Include all single glazing, including standard, toughened, laminated and low-E	06_EW	03 or 04
Curtain wall	Single skin façade	Glazed panel	Double glazed		m²	Include all double glazing, including standard, toughened, laminated and low-E	06_EW	03 or 04
Curtain wall	Single skin façade	Glazed panel	Triple glazed		m²	Include all triple glazing, including standard, toughened, laminated and low-E	06_EW	03 or 04
Curtain wall	Single skin façade	Opaque panel	Aluminium cladding		m²		06_EW	03 or 04
Curtain wall	Single skin façade	Opaque panel	GRC cladding		m²	GRC = Glass-fibre Reinforced Concrete	06_EW	03 or 04
Curtain wall	Single skin façade	Opaque panel	Insulated shadow box		m²		06_EW	03 or 04
Curtain wall	Single skin façade	Opaque panel	Brick cladding		m²		06_EW	03 or 04
Curtain wall	Single skin façade	Opaque panel	Stone cladding		m²		06_EW	03 or 04
Curtain wall	Double skin façade	Glazed panel	Single glazed		m²	Please declare all double-skin façade area in this section. Please declare as the area of the curtain wall and do not enter the inner and outer skins twice. Include all single glazing, including standard, toughened, laminated and low-E.	06_EW	03 or 04
Curtain wall	Double skin façade	Glazed panel	Double glazed		m²	The type of glazing refers to the building's envelope wall, not including the outer skin	06_EW	03 or 04
Curtain wall	Double skin façade	Glazed panel	Triple glazed		m²	The type of glazing refers to the building's envelope wall, not including the outer skin	06_EW	03 or 04
Curtain wall	Double skin façade	Opaque panel	Aluminium cladding		m²		06_EW	03 or 04
Curtain wall	Double skin façade	Opaque panel	GRC cladding		m²	GRC = Glass-fibre Reinforced Concrete	06_EW	03 or 04
Curtain wall	Double skin façade	Opaque panel	Insulated shadow box		m²		06_EW	03 or 04
Curtain wall	Double skin façade	Opaque panel	Brick cladding		m²		06_EW	03 or 04
Curtain wall	Double skin façade	Opaque panel	Stone cladding		m²		06_EW	03 or 04
Curtain wall	Other (Please describe >>)		-		m²	Please enter a description for any curtain wall that does not fit a predefined classification	06_EW	03 or 04

Stick-framed wall system	Aluminium frame	Glazed section	Single glazed		m²	Include all single glazing, including standard, toughened, laminated and low-E	06_EW	03 or 04
Stick-framed wall system	Aluminium frame	Glazed section	Double glazed		m²	Include all double glazing, including standard, toughened, laminated and low-E	06_EW	03 or 04
Stick-framed wall system	Aluminium frame	Glazed section	Triple glazed		m²	Include all triple glazing, including standard, toughened, laminated and low-E	06_EW	03 or 04
Stick-framed wall system	Aluminium frame	Opaque section	Aluminium cladding		m²		06_EW	03 or 04
Stick-framed wall system	Aluminium frame	Opaque section	GRC cladding		m²	GRC = Glass-fibre Reinforced Concrete	06_EW	03 or 04
Stick-framed wall system	Aluminium frame	Opaque section	Insulated shadow box		m²		06_EW	03 or 04
Stick-framed wall system	Aluminium frame	Opaque section	Brick cladding		m²		06_EW	03 or 04
Stick-framed wall system	Aluminium frame	Opaque section	Stone cladding		m²		06_EW	03 or 04
Stick-framed wall system	Steel frame	Glazed section	Single glazed		m²	Include all single glazing, including standard, toughened, laminated and low-E	06_EW	03 or 04
Stick-framed wall system	Steel frame	Glazed section	Double glazed		m²	Include all double glazing, including standard, toughened, laminated and low-E	06_EW	03 or 04
Stick-framed wall system	Steel frame	Glazed section	Triple glazed		m²	Include all triple glazing, including standard, toughened, laminated and low-E	06_EW	03 or 04
Stick-framed wall system	Steel frame	Opaque section	Aluminium cladding		m²		06_EW	03 or 04
Stick-framed wall system	Steel frame	Opaque section	GRC cladding		m²	GRC = Glass-fibre Reinforced Concrete	06_EW	03 or 04
Stick-framed wall system	Steel frame	Opaque section	Insulated shadow box		m²		06_EW	03 or 04
Stick-framed wall system	Steel frame	Opaque section	Brick cladding		m²		06_EW	03 or 04
Stick-framed wall system	Steel frame	Opaque section	Stone cladding		m²		06_EW	03 or 04
Stick-framed wall system	Other (Please describe >>)		-		m²	Please enter a description for any wall system that does not fit a predefined classification	06_EW	03 or 04
Wall louvre system	Aluminium	-	-	1,240	m²		06_EW	03 or 04
External shading system	Aluminium frame	Aluminium cladding	-		m²	Please enter as m² of shaded area = linear metres * (width in mm / 1000)	06_EW	03 or 04
External shading system	Aluminium frame	GRC cladding	-		m²	Please enter as m² of shaded area = linear metres * (width in mm / 1000). GRC = Glass-fibre Reinforced Concrete.	06_EW	03 or 04
External shading system	Aluminium frame	Terracotta cladding	-		m²	Please enter as m² of shaded area = linear metres * (width in mm / 1000)	06_EW	03 or 04
External shading system	Aluminium frame	Stone cladding	-		m²	Please enter as m² of shaded area = linear metres * (width in mm / 1000)	06_EW	03 or 04
External shading system	Aluminium frame	Pre-cast concrete	-		m²	Please enter as m² of shaded area = linear metres * (width in mm / 1000)	06_EW	03 or 04
External shading system	Aluminium frame	Timber	-		m²	Please enter as m² of shaded area = linear metres * (width in mm / 1000)	06_EW	03 or 04
External shading system	Aluminium frame	Glass (opague)	-		m²	Please enter as m² of shaded area = linear metres * (width in mm / 1000)	06_EW	03 or 04
External shading system	Aluminium frame	Steel	-	118	m²	Please enter as m² of shaded area = linear metres * (width in mm / 1000)	06_EW	03 or 04
External shading system	Other (Please describe >>)		-		m²	Please enter as m² of shaded area = linear metres * (width in mm / 1000)	06_EW	03 or 04
Roller doors	Steel profile	-	-	43	m²	Please note unit is square metres, not quantity	08_ED	03 or 04
Roller doors	Hardwood over steel	-	-		m²	Please note unit is square metres, not quantity	08_ED	03 or 04
Roller doors	Softwood over steel	-	-		m²	Please note unit is square metres, not quantity	08_ED	03 or 04
Revolving doors	Glass/aluminium/steel	-	-		no.		08_ED	03 or 04
Fire-rated doors	Engineered timber	-	-	22	no.	Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2.	08_ED	03 or 04
Fire-rated doors	Steel	-	-	1	no.	Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2.	08_ED	03 or 04
Fire-rated doors	Aluminium/glass	-	-		no.	Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2.	08_ED	03 or 04
Insulation	Glass wool / fibreglass	-	-	1,169.0	m²	Please include both wall and ceiling insulation	05_RF or 06_EW	03 or 04
Insulation	Stone wool	-	-		m²	Please include both wall and ceiling insulation	05_RF or 06_EW	03 or 04
Insulation	Polyester	-	-		m²	Please include both wall and ceiling insulation	05_RF or 06_EW	03 or 04
Insulation	Expanded polystyrene	-	-		m²	Please include both wall and ceiling insulation	05_RF or 06_EW	03 or 04
Insulation	Other (Please describe >>)		-		m²	Please include both wall and ceiling insulation	05_RF or 06_EW	03 or 04
Other (Please describe and add unit >>)		-	-			Please enter a description for any envelope material that does not fit a predefined classification		
Other (Please describe and add unit >>)		-	-			Please enter a description for any envelope material that does not fit a predefined classification		
Other (Please describe and add unit >>)		-	-			Please enter a description for any envelope material that does not fit a predefined classification		

Permanent internal walls and doors

Walls and doors within the building that are either structural or designed to be permanent.

Coverage of material spend on permanent internal walls and doors				100	%	Enter the % coverage of spend for the items you have entered below. There is no minimum requirement: enter what you know. This should include all structural walls. Exclude head contractor preliminaries and margins.		
Interior wall (permanent)	Steel (light framing)	-	-		t		09_NW	03 or 04
Interior wall (permanent)	Timber framing	-	-		m³		09_NW	03 or 04
Interior wall (permanent)	AAC panel (reinforced)	-	-		m²	Panels of autoclaved aerated concrete (AAC) with reinforcing steel. E.g., Hebel.	09_NW or 12_WF	03 or 04
Interior wall (permanent)	Concrete-filled steel panel	-	-		m²	Panels made from a steel sheet outer with an aerated concrete core. E.g., Speedpanel.	09_NW or 12_WF	03 or 04
Interior wall (permanent)	Plasterboard	-	-	4,179	m²	Enter as single-layer equivalent. If using 2 layers, multiply the area by 2.	09_NW or 12_WF	03 or 04
Interior wall (permanent)	Plywood	-	-		m²	Enter as single-layer equivalent. If using 2 layers, multiply the area by 2.	09_NW or 12_WF	03 or 04
Interior wall (permanent)	Fibre cement sheet	-	-		m²	Enter as single-layer equivalent. If using 2 layers, multiply the area by 2.	09_NW or 12_WF	03 or 04
Interior wall (permanent)	Insulation	-	-	2,028.0	m²		09_NW or 12_WF	03 or 04
Interior wall (permanent)	Glass	-	-	144.0	m²		09_NW or 12_WF	03 or 04
Interior wall (permanent)	Other (Please describe >>)	Block	-	265	m²	Please enter a description for any internal wall that does not fit a predefined classification	09_NW or 12_WF	03 or 04
Internal door (permanent)	Aluminium/glass	-	-		no.	Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2.	11_ND	03 or 04
Internal door (permanent)	Timber/glass	-	-		no.	Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2.	11_ND	03 or 04
Internal door (permanent)	Timber solid lightweight	-	-	59	no.	Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2.	11_ND	03 or 04
Internal door (permanent)	Fire resistant	-	-	6	no.	Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2.	11_ND	03 or 04
Internal door (permanent)	Steel	-	-		no.	Please enter as single-leaf equivalent. For double-leaf doors, multiply the quantity by 2.	11_ND	03 or 04
Internal door (permanent)	Other (Please describe >>)		-		no.	Please enter a description for any internal door that does not fit a predefined classification	11_ND	03 or 04
Other (Please describe and add unit >>)		-	-			Please enter a description for any material that does not fit a predefined classification		

Other (Please describe and add unit >>)		-	-			Please enter a description for any material that does not fit a predefined classification			
Other (Please describe and add unit >>)		-	-			Please enter a description for any material that does not fit a predefined classification			

Services				Unit of measure					
Building services included within the main building contract. If the building components that are the subject of the development application or the construction certificate are base building only, then only enter these items. If you cannot split services by type, please enter them all in the "Other services" category at the bottom. Enter all values as material costs in dollars.									
Mechanical services	-	-	-	1,234,000	AUD excl. GST	Where possible, enter material costs excluding labour, plant, equipment, margins and taxes	28_SS	05	
Vertical transportation	-	-	-	144,000	AUD excl. GST	Where possible, enter material costs excluding labour, plant, equipment, margins and taxes	28_SS	05	
Electrical services	-	-	-	2,109,000	AUD excl. GST	Electrical services including the main power supply, backup generators, security and communications. Excluding solar installations. Where possible, enter material costs excluding labour, plant, equipment, margins and taxes.	26_LP	05	
Solar photovoltaic installations	-	-	-	25,000	AUD excl. GST	Where possible, enter material costs excluding labour, plant, equipment, margins and taxes	26_LP_LPGP	05	
Plumbing/hydraulic services	-	-	-	1,220,000	AUD excl. GST	Where possible, enter material costs excluding labour, plant, equipment, margins and taxes	18_PD and 19_WS	05 or 06	
Fire services				721,000	AUD excl. GST	Where possible, enter material costs excluding labour, plant, equipment, margins and taxes	25_FPSS04 or 39 XWAW_03 or 41_XF	05	
Other services (Please describe)	ESD Initiatives	-	-	100,000	AUD excl. GST	Please group all other services here, meaning that coverage will always be 100% for services. Enter only the material costs (excluding labour, plant, equipment, margins and taxes).	29_SS or multiple		

External works								
The materials associated with hard landscaping and outbuildings on the site but outside the building envelope. This includes hardstands, carparks, driveways, covered walkways, decks, patios, awnings, fences, gates, etc. Soft landscaping should be excluded.								
Coverage of spend on external works	-	-	-	100	%	Required. Coverage of spend for external works (excluding soft landscaping) entered below. Minimum requirement = 80%. Exclude head contractor preliminaries and margins.		
Asphalt	-	-	-		t		33_XR	07
Concrete in-situ	≤10 MPa	-	-		m³	Please enter reinforcing steel as part of "Reinforcing steel" below	33_XR or 34_XN or 35_XB or 36_XL	07
Concrete in-situ	>10 MPa to ≤20 MPa	-	-		m³	Please enter reinforcing steel as part of "Reinforcing steel" below	33_XR or 34_XN or 35_XB or 36_XL	07
Concrete in-situ	>20 MPa to ≤32 MPa	-	-		m³	Please enter reinforcing steel as part of "Reinforcing steel" below	33_XR or 34_XN or 35_XB or 36_XL	07
Concrete in-situ	>32 MPa to ≤40 MPa	-	-	1,213.0	m³	Please enter reinforcing steel as part of "Reinforcing steel" below	33_XR or 34_XN or 35_XB or 36_XL	07
Concrete in-situ	>40 MPa to ≤50 MPa	-	-		m³	Please enter reinforcing steel as part of "Reinforcing steel" below	33_XR or 34_XN or 35_XB or 36_XL	07
Concrete in-situ	>50 MPa	-	-		m³	Please enter reinforcing steel as part of "Reinforcing steel" below	33_XR or 34_XN or 35_XB or 36_XL	07
Pavers, bricks and blocks	Concrete	-	-		m²		33_XR	07
Pavers, bricks and blocks	Clay	-	-		m²		33_XR	07
Reinforcing steel	Bar & mesh	-	-	6,000	kg	**Include all reinforcing steel bar/mesh in the external works in this row.** Usually this is calculated as kg/m³ per concrete element and then summed. Example: 10 m³ of 40 MPa concrete @ 100 kg/m³ + 5 m³ of 50 MPa concrete @ 150 kg/m³ = 1,750 kg reinforcing steel.	33_XR or 34_XN or 35_XB or 36_XL	07
Reinforcing steel	Fibre & strand	-	-		kg	**Include all steel fibre reinforcing and steel strand in the external works in this row.**	33_XR or 34_XN or 35_XB or 36_XL	07
Structural steel	-	-	-		t		02_11	07
Structural aluminium	-	-	-		t	Includes structures, louvre systems, etc.	35_XB	07
External roof/wall cladding	Polycarbonate	-	-		m²	Enter as profiled polycarbonate sheet that would ordered, including allowance for overlap	35_XB	07
External roof/wall cladding	PVC	-	-		m²	Enter as profiled PVC sheet that would ordered, including allowance for overlap	35_XB	07
External roof/wall cladding	Bitumen sheet	-	-		m²	Enter as bituminous sheet that would ordered, including allowance for overlap	35_XB	07
External roof/wall cladding	Steel profile	-	-	96	m²	Enter as profiled steel sheet that would ordered, including allowance for overlap	35_XB	07
Fill	-	-	-		t	Include purchased material only. Exclude site-won material.	33_XR or 34_XN or 35_XB or 36_XL	07
Sand & gravel	-	-	-		t	Include purchased material only. Exclude site-won material and sand/gravel in concrete.	33_XR or 34_XN or 35_XB or 36_XL	07
Timber (solid)	Sawn softwood	-	-		m³		33_XR or 34_XN or 35_XB or 36_XL	07
Timber (solid)	Sawn hardwood	-	-		m³		33_XR or 34_XN or 35_XB or 36_XL	07
Timber (engineered)	CLT	-	-		m³		33_XR or 34_XN or 35_XB or 36_XL	07
Timber (engineered)	Glulam	-	-		m³		33_XR or 34_XN or 35_XB or 36_XL	07
Timber (engineered)	LVL	-	-		m³		33_XR or 34_XN or 35_XB or 36_XL	07
Timber (engineered)	OSB	-	-		m³		33_XR or 34_XN or 35_XB or 36_XL	07
Fabric (awning/sunshade)					m²		35_XB or 36_XL	07
Other (Please describe and add unit >>)		-	-			Please enter a description for any external works that does not fit a predefined classification		
Other (Please describe and add unit >>)		-	-			Please enter a description for any external works that does not fit a predefined classification		
Other (Please describe and add unit >>)		-	-			Please enter a description for any external works that does not fit a predefined classification		

Step 3: Certifier details

Fill out blue cells

The material quantities must be determined through an itemised list of building materials (such as a bill of quantities) and certified by a quantity surveyor, designer, engineer or NABERS Assessor.

Person that completed this form	Value	Note
Name	Jafin Paulson	Required
Company	LCI Consultants	Required
ABN	92124107973	
Profession	ESD Consultant	Required
Qualification or registration	M.Arch.Sc. Sustainable design	Required

Person that certified the details in this form	Value	Note
Name	Ben Wilde	Required
Company	Wilde & Woolard Quantity Surveyors	Required
ABN		
Profession	Quantity Surveyors	Required
Qualification or registration		Required

Confirmation of certification	Value	Note
Are 80% of material costs captured for the building's structure, envelope and external works?	Yes	Required
If no - why not?		

Additional comments from data provider

Additional comments of certifier

Attach this Excel spreadsheet to your development application or construction certificate application.

Appendix D – Net Zero Statement

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Subject	Net Zero Statement
Project	230772 – Lismore South Public School
Author	Austin So
Date	10/12/2024

Site Description

Lismore South Public School is located at 69-79 Kyogle Street, Lismore South, NSW. The school is situated within a predominantly residential area of the Northern Rivers region, surrounded by tree-lined streets and modest family homes. Its central location provides convenient access to nearby community facilities, public transport routes, and local businesses.

The school consists of a single story building elevated on columns with a well-considered layout designed to support diverse educational needs. Key facilities such as general learning spaces (GLSs), a hall with a basketball court and stage, library, staff lounge, playrooms, and end-of-trip (EOT) facilities are all located on the upper level (Level 1). The building's orientation maximises natural light penetration into key learning spaces while providing strategic opportunities for passive cooling and shading.

Net Zero Statement

This statement outlines the strategies to achieve Net Zero operations at Lismore South Public School in compliance with section 35C of the Environmental Planning and Assessment (EP&A) Regulation. The development demonstrates a clear pathway to becoming fossil fuel-free and achieving operational Net Zero emissions.

Fossil Fuel-Free Development:

The development is designed to be capable of operating as net zero in operations building at the discretion of the building operator after it is built. It will have the necessary infrastructure in place to support this transition. The strategies include:

- **Electrification of Building Services:**
  - The development will feature electric-powered systems for domestic hot water provisions, utilizing either instantaneous heating or element-based storage systems, depending on operational requirements.
  - High-efficiency chillers will be utilised for space cooling
  - Kitchens will operate with induction cooking systems, eliminating the use of gas.
- **Passive Design Integration:**
  - To further reduce energy consumption, passive design strategies, such as Pattern Book design shading and natural ventilation, are incorporated. These features are detailed in the ‘Passive Design Features’ section at the end of this memo.

Renewable Energy and Technical Features:

1. **Solar PV Installation**:
   - Solar panels are designed to be installed on the roof of the new building, providing a portion of the school’s operational energy demand, with provisions for future expansion if required.

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2. **Battery Storage Readiness**:
    - Provisions have been considered for the future integration of battery systems, which could enable energy storage and increase operational resilience. This would support the potential for grid independence during peak demand periods. There is spare bus connection for further equipment connections which will be further detailed in the DD stage of the project. No spatial considerations have been made for a battery at this stage.
3. **Energy Efficiency Measures**:
    - High-performance building envelopes will reduce heating and cooling demands.
    - Energy-efficient HVAC systems, including demand-driven ventilation and heat recovery, will ensure minimal energy use while maintaining indoor comfort.
    - LED lighting systems, equipped with occupancy sensors where necessary, will optimise electricity usage.
4. **Operational Strategies**:
    - A Building Management System (BMS) may be included in the design to monitor real-time energy use, providing the operator with insights to make data-driven decisions aimed at optimising energy performance and reducing energy waste.
    - Educational programs will engage staff and students, fostering behavioural changes to further minimise energy consumption.
5. **Backup Power Transition**:
    - Diesel generators are currently considered as the backup power source for potential use during outages. The design includes infrastructure to accommodate temporary diesel-powered generators, which can be brought to the site and connected when necessary. Furthermore, provisions have been made to allow for a future transition to battery-based backup systems by 2035, aligning with Net Zero goals and reducing reliance on diesel.
6. **Offsets for Residual Emissions**:
    - Any emissions that cannot be eliminated through operational measures are intended to be offset through verified carbon offset programs, helping to achieve and maintain Net Zero operations in the future. These residual emissions would include refrigerant leakage, diesel consumed for backup power during outages, and any fossil fuel-based electricity procurement.

Annual Energy Consumption & Emissions

Whole-building energy consumption calculations are not yet available as the project has not reached the level of design to complete comprehensive modelling. Energy figures will be developed during the detailed design phase, with ongoing efforts to minimise energy use and emissions wherever possible.

Passive Design Features

Passive design plays a critical role in minimising energy consumption at Lismore South Public School.

1. **Pattern Book Design Shading:**
    - Fixed shading systems are optimised for Lismore's climate, protecting windows from high summer sun while allowing low-angle winter sunlight to penetrate.
    - Vertical fins reduce glare, enhancing occupant comfort while minimising energy demands for cooling.
2. **Natural Ventilation:**
    - Cross-ventilation pathways allow effective airflow throughout learning spaces.
    - Sensors will be installed that monitor outdoor weather conditions. These sensors display a green or red signal, indicating whether the outdoor conditions are suitable or unsuitable for

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natural ventilation. This helps guide occupants on when to open the windows and insulated doors to allow natural ventilation optimal times.

3. **Insulation:**
    - High-performance insulation stabilises indoor temperatures, reducing the need for active heating or cooling.
    - The mechanical system will be designed that a “Fan Only” mode can be turned on to night purge the building of remanent heat from the day. This allows for a smaller load on the mechanical system the following day.

Signed: 

Name: Zac Duryea

Title: Senior ESD Engineer

Company: LCI Consultants

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