If a building becomes architecture, then it is art. Clearly, if a building is not functionally and technically in order, then it isn't architecture either – it's just a building.
Arne Jacobsen

Mechanical Engineering
Lighting Design
Sustainable Design
Electrical Engineering

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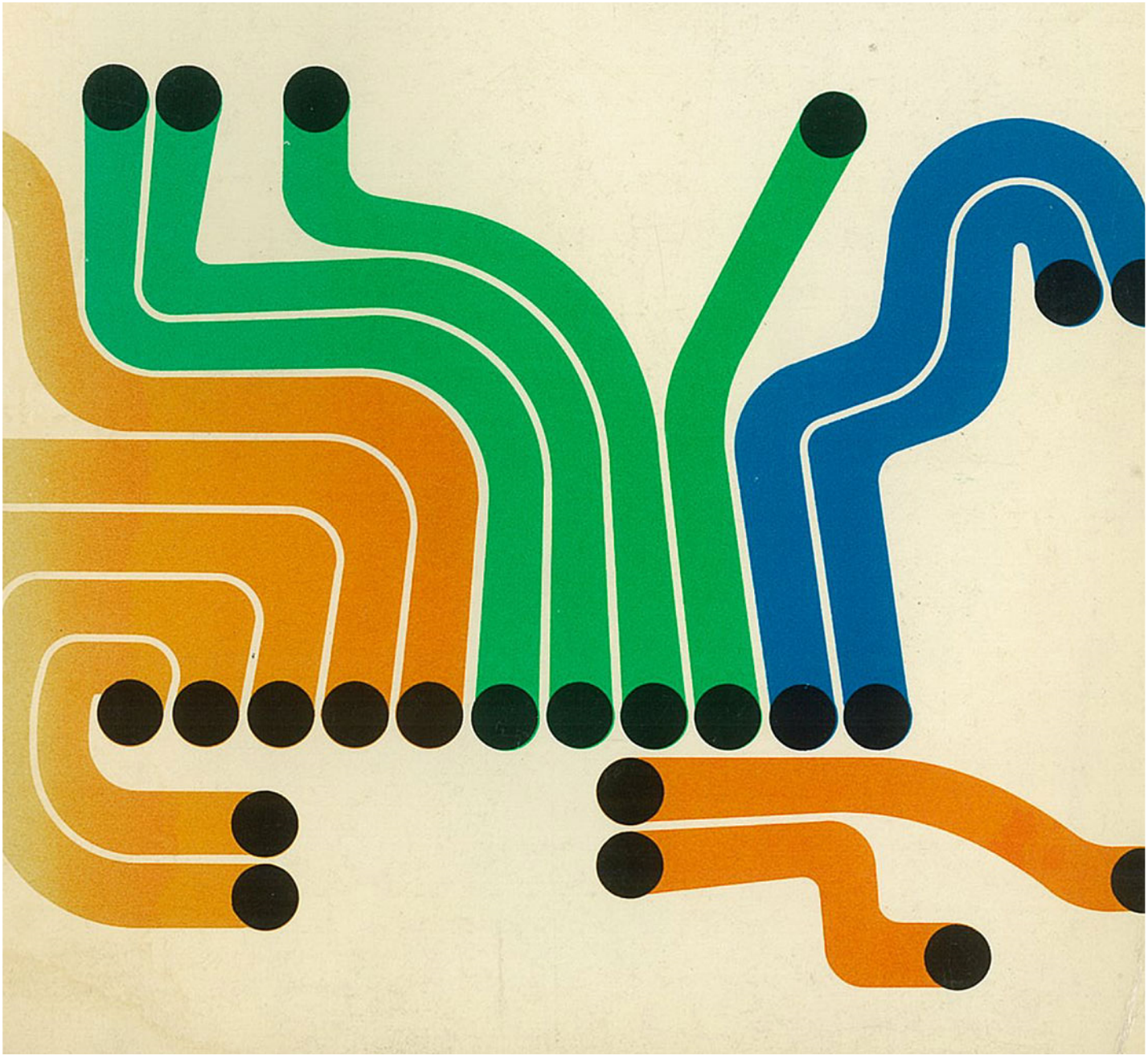
SUSTAINABLE DESIGN

STEENSEN VARMING

New Primary School at Murrumbateman
ESD SSDA Report



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1.0 Introduction

This ESD SSDA Report prepared by Steensen Varming accompanies an Environmental Impact Statement (EIS) pursuant to Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act) in support of an application for a State Significant Development (SSD-11233241).

The development is for a new primary school located at 2 Fairley Street, Murrumbateman.

This report addresses the relevant Secretary's Environmental Assessment Requirements (SEARs), namely:

Ecologically Sustainable Development (ESD) SEARs REQUIREMENTS
A) Identify how ESD principles (as defined in clause 7(4) of Schedule 2 of the Regulation) will be incorporated in the design and ongoing operation phases of the development.
B) Identify proposed measures to minimise consumption of resources, water (including water sensitive urban design) and energy.
C) Identify how the future development would be designed to consider and reflect national best practice sustainable building principles to improve environmental performance and reduce ecological impact. This should be based on a materiality assessment and include waste reduction design measures, future proofing, use of sustainable and low-carbon materials, energy and water efficient design (including water sensitive urban design) and technology and use of renewable energy.
D) Identify how environmental design will be achieved in accordance with the GANSW Environmental Design in Schools Manual (GANSW, 2018).
E) Provide an assessment against an accredited ESD rating system or an equivalent program of ESD performance. This should include a minimum rating scheme target level.
F) Provide a statement regarding how the design of the development is responsive to the NARCliM projected impacts of climate change. Relevant Policies and Guidelines: NSW and ACT Government Regional Climate Modelling (NARCliM) climate change projections
G) Provide an Integrated Water Management Plan detailing any proposed alternative water supplies, proposed end uses of potable and non-potable water, and water sensitive urban design.

1.1 The Proposal

The proposed development is for construction and operation of a new primary school with Core 21 facilities in Murrumbateman that will accommodate up to 368 students.

The proposed development includes:

- A collection of 1-2 storey buildings containing 14 home base units, 2 special education learning units, hall, administration facilities and library.
- On-site parking lot with 40 spaces and kiss-and-ride area.
- Outdoor sports court and play area.
- Integrated landscaping, fencing and signage.

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1.2 Site Description

The site is located at 2 Fairley Street, Murrumbateman, in the local government area of Yass Valley Council. The site is formally described as Lot 302 DP1228766 (refer to Figure 1). The site is irregular in shape and has an area of 15,434.92m².

The site is located at the northern end of the Murrumbateman village, which is characterised by a mix of uses including low density residential and some commercial.

Immediately surrounding development includes a tourist hotel to the north across Fairley Street, Murrumbateman Library (located in the former Murrumbateman schoolhouse, a local heritage item) to the south, a medical centre and childcare centre to the west, and rural land and equestrian facilities to the east across Barton Highway. There is also a cycling and equestrian pathway to the south between the site and library.

The site contains an existing parking lot in its northern end and a driveway along its western boundary. There is also a mound of soil at the southern end of the site. The site is otherwise cleared and vacant.

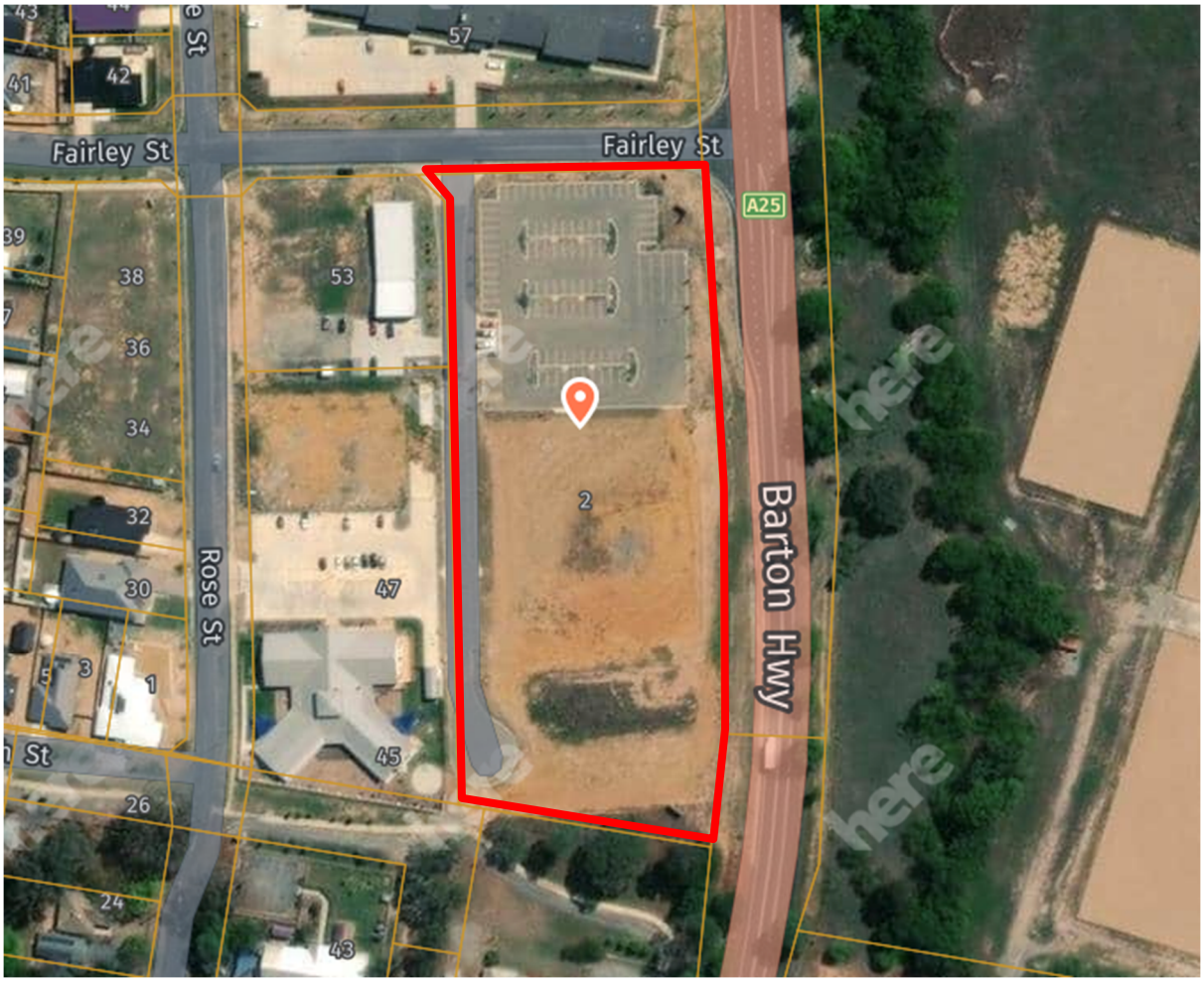

Figure 1: Site aerial photograph
Source: Nearmap

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2.0 Response to SEARs

The ESD SEAR's report is required by the Secretary's Environmental Assessment Requirements (SEARs) for SSD-11233241. This table identifies the SEARs Requirements and relevant reference within this report.

Table 1 – SEARs and References

SEARs REQUIREMENTS	Project Response and Reference to relevant section in Report
H) Identify how ESD principles (as defined in clause 7(4) of Schedule 2 of the Regulation) will be incorporated in the design and ongoing operation phases of the development.	The selection of ESD strategies for the project has been aligned with the ESD principles from clause 7 (4) *Refer to section 3.0 and Appendix A*
I) Identify proposed measures to minimise consumption of resources, water (including water sensitive urban design) and energy.	Measures to minimize the consumption of resources have been discussed with the design team and included into the project. Goals, targets, and strategies are being considered for the project to achieve resource conservation. *Refer to Sections 4.0*
J) Identify how the future development would be designed to consider and reflect national best practice sustainable building principles to improve environmental performance and reduce ecological impact. This should be based on a materiality assessment and include waste reduction design measures, future proofing, use of sustainable and low-carbon materials, energy and water efficient design (including water sensitive urban design) and technology and use of renewable energy.	Best practice sustainable building principles have been considered for the design. A hierarchy approach was undertaken to ensure passive measures were considered first to reduce demand, followed by efficiency of supply and reuse of resources. Waste reduction, low-carbon materials, energy, water efficiency and resilience have all been considered for the design. Their corresponding strategies are presented in detail in the following sections of this report. *Refer to Section 4.0 and Appendix A*
K) Identify how environmental design will be achieved in accordance with the GANSW Environmental Design in Schools Manual (GANSW, 2018).	The GANSW Environmental Design in Schools Manual has been considered as part of the performance requirements for this project. This manual also shares goals and targets with the EFSG and Green Star both of which have been considered for this project. *Refer to Section 3.4 and Appendix A*
L) Provide an assessment against an accredited ESD rating system or an equivalent program of ESD performance. This should include a minimum rating scheme target level.	An assessment against the Green Star Design and As Built v1.3 has been undertaken. The project aims to achieve a 4 Star Rating. Refer to Section 4 and Appendix A
M) Provide a statement regarding how the design of the development is responsive to the NARCliM projected impacts of climate change. Relevant Policies and Guidelines: NSW and ACT Government Regional Climate Modelling (NARCliM) climate change projections	Initial advice to achieve a resilient design has been provided considering the NARCliM climate change projections. *Refer to Sections 5.0.*
N) Provide an Integrated Water Management Plan detailing any proposed alternative water supplies, proposed end uses of potable and non-potable water, and water sensitive urban design.	The development of an Integrated Water Management plan is being considered for the project. *Refer to Section 4.1.2 and 4.2*

This report outlines the key ESD opportunities and initiatives that are being considered for the new primary school at Murrumbateman. The strategies presented in this report are based on the current architectural schematic design developed by Pedavoli Architects and Hansen Yunken.

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To ensure a sustainable outcome, the following are key strategies being considered within the proposed design:

- Incorporate a high-performance building envelope, to ensure energy efficiency as well as occupant comfort (including thermal, visual, and acoustic comfort);
- Incorporate appropriate passive and active design strategies to ensure a low-energy as well as low-maintenance design outcome;
- Adopt water sensitive urban design principles; and
- Adopt practices to minimise demolition, construction and operational waste including recycling of demolition and construction waste.
- Utilise environmentally preferable materials

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3.0 ESD Targets / Benchmarks

Addressing SEARS ESD criteria:

- ***A) Identify how ESD principles (as defined in clause 7(4) of Schedule 2 of the Regulation) will be incorporated in the design and ongoing operation phases of the development.***

In addition to the Secretary's Environmental Assessment Requirements (SEARs), the following environmental targets are aspired by the new primary school at Murrumbateman:

- Exceed the requirements of Section-J of the National Construction Code (NCC) 2019 for energy-efficiency in building fabric and building services / systems.
- Demonstrate good design through early-stage modelling and guidance, in general accordance with the best practice standards such as Green Star;
- Align with new Government Architects NSW school standards such as:
    - Environmental Design in Schools (2018);
    - Better Placed Design Guide (2018);
    - Educational Facilities Standards & Guidelines.

3.1 NCC Section-J

Section-J of the National Construction Code (Previously known as the Building Code of Australia) 2019 relates to "energy efficiency" of buildings". Section J is a minimum performance target for standard buildings and specifies minimum performance targets known as deemed-to-satisfy (DTS) requirements, for building fabric and services.

The proposed school project aims to exceed the DTS requirements of Section-J where practical. A JV3 methodology is being applied for the project to demonstrate the improvement beyond DTS.

3.2 Green Star

The new Primary School at Murrumbateman is targeting a formal 4 Star Green Star rating, utilising the Green Building Council of Australia's (GBCA's) Design and As-built rating tool (DAB) version 1.3.

3.3 Project Response to SEARS clause 7 (4) of Schedule 2 of EP&A Regs

The ESD initiatives proposed for the new primary school at Murrumbateman aim to reduce the environmental impacts typically associated with buildings during the construction and ongoing operation of the building. The project utilises a resource hierarchy approach, with emphasis on avoiding, then reducing the use of energy, water, materials etc.

The outcome of the resource hierarchy approach is to ensure the schools aligns with the ecological sustainable development principles of Clause 7(4) of Schedule 2 of the Environmental Planning and Assessment Regulation 2000 and the four key principles listed below. Where these principles align around the goals of a particular

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strategy being considered for the project, it has been noted in the ESD Scorecard included in Appendix A,

- The precautionary principle
- Inter-Generational Equity
- Conservation of Biological Diversity Ecological Integrity
- Improved Valuation, Pricing and Incentive Mechanisims

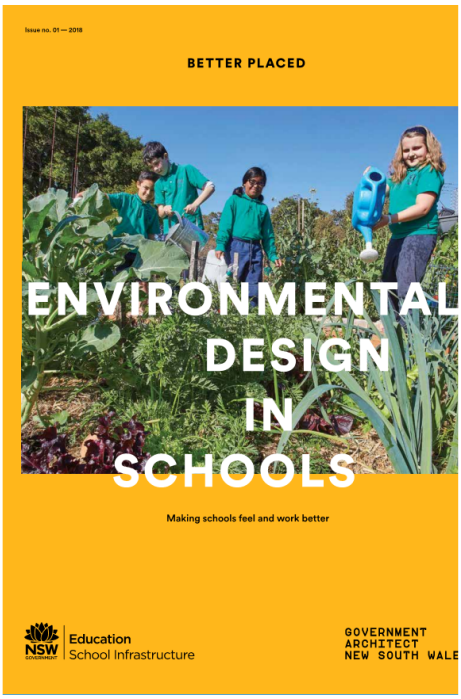
3.4 GANSW Considerations

Addressing SEARS ESD criteria:

- ***D) Identify how environmental design will be achieved in accordance with the GANSW Environmental Design in Schools Manual (GANSW, 2018).***

GANSW has developed a series of Manuals to assist school communities and project teams in planning projects and embed sustainability initiatives in schools. The key manuals considered for this project are:

- Government Architects NSW: Better Placed Design Guide for Schools (2018);
- Government Architects NSW: Environmental Design in Schools (2018).



These practical manuals include a series of design and ESD recommendations which have been included within the key strategies selected for new primary school at Murrumbateman. Most of the strategies have a clear alignment with the EFSG and Green Star requirements, as they all share key priorities around high indoor environmental quality, energy reduction and resource conservation.

Where these three documents align around the goals of a particular strategy, it has been noted in the ESD Scorecard included in Appendix A,
The table below presents those strategies which are being considered for the project but that are not fully captured within the Green Star / EFSG Strategies presented in Appendix A.

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Guide	N	Strategy	Project Response
GANSW Better Placed Environmental Design in Schools (EDiS) Design Guide for Schools (DGfS)	1	Be responsive to local climate including sun, wind and aspect.	Workshops during the Concept Design stage were undertaken to identify site specific opportunities and constraints considering climate, prevailing winds, noise sources, orientation and opportunities for passive strategies.
	2	Select Materials and approaches to detailing that are robust and durable	Aligned with the EFSG requirements, a whole of life approach will be considered for the materials selected for this project.
	3	Seek opportunities for buildings and outdoor spaces to be learning tools in themselves	It was discussed during the ESD workshops to aim to use the building as a teaching tool. This can be achieved by incorporating different learning elements throughout the space embedded in the building which can educate occupants about sustainable principles and building operation.
	4	Allow for future adaptation to accommodate demographic changes, new teaching and learning approaches and the integration of new technologies	Design flexible spaces which can adapt over time was another key consideration. This can be achieved through the use of the DFMA modular pods and good design.
	5	Ventilation Strategy	The following strategies have been considered within the design: ■ Operable windows will promote passive cooling through natural ventilation. ■ External shading will prevent unwated heatgains during summer ■ Optimized building fabric will reduce heat loss
	6	Communicate careful use of resources	Several initiatives are being considered to use the building as a teaching tool such as, exposed services, native landscaping areas to educate about local flora and fauna, signage, and live data display of building performance to create an understanding of the building's resource consumption and encourage resource conservation.
	7	Control Heat Gain	The design of the building envelop considers the following strategies to reduce heat gains: ■ Include shading to prevent direct solar access from 9am to 3pm ■ Provide good levels of daylight & views ■ Provide operable windows for ventilation ■ Meet the NCC requirements to comply with energy performance ■ WWR to balance daylight / thermal / energy performance

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4.0 Sustainability Approach

Addressing SEARS comments:

- ***B) Identify proposed measures to minimise consumption of resources, water (including water sensitive urban design) and energy; and***
- ***C) Identify how the future development would be designed to consider and reflect national best practice sustainable building principles to improve environmental performance and reduce ecological impact. This should be based on a materiality assessment and include waste reduction design measures, future proofing, use of sustainable and low-carbon materials, energy and water efficient design (including water sensitive urban design) and technology and use of renewable energy.***
- ***E) Provide an assessment against an accredited ESD rating system or an equivalent program of ESD performance. This should include a minimum rating scheme target level.***

Sustainable building design involves a holistic and integrated design approach, which builds on an increased awareness of site opportunities, form and function, to encompass and target a broad range of sustainable design initiatives.

For the new primary school at Murrumbateman, the key priorities to support the functional demand i.e. a learning / teaching environment, are as follows:

- The promotion of natural daylight
- High levels of IAQ (Indoor Air Quality)
- Thermal, Visual and Acoustic comfort
- Resource conservation (energy, water, and waste); and
- The creation of an integrated community resource.

The promotion of natural daylight – There is a direct correlation between access to daylight and student performance, attention, productivity, and general wellbeing.

Excellent Indoor Air Quality (IAQ) – In a similar manner to daylight, there is proven correlation between student performance, occupant wellbeing, student attendance and staff retention. Principle strategies considered include:

- Increased levels of outside air through the promotion of mixed mode or natural ventilation strategies, and increased outdoor air allowances
- Mould prevention through the avoidance of thermal bridges, condensation and effective strategies in ventilation, odour and pollution control
- Low pollutant emitting materials selections such as low VOC paints, adhesives, sealants, composite woods etc.

Excellent Thermal, Visual and Acoustic comfort:

- Thermal comfort: To ensure teachers, students and administrators are not subject to unacceptable extremes in temperature as they teach, learn and work
- Visual comfort: To ensure the quality of light is supportive of visual tasks such as reading and presenting. In design for natural daylight, consideration must be given to daylight uniformity, penetration depth, solar heat ingress and glare control
- Acoustic comfort: To ensure effective communication can always be achieved, noise from ventilation systems, external and internal disruptive noise affecting classrooms is minimised.

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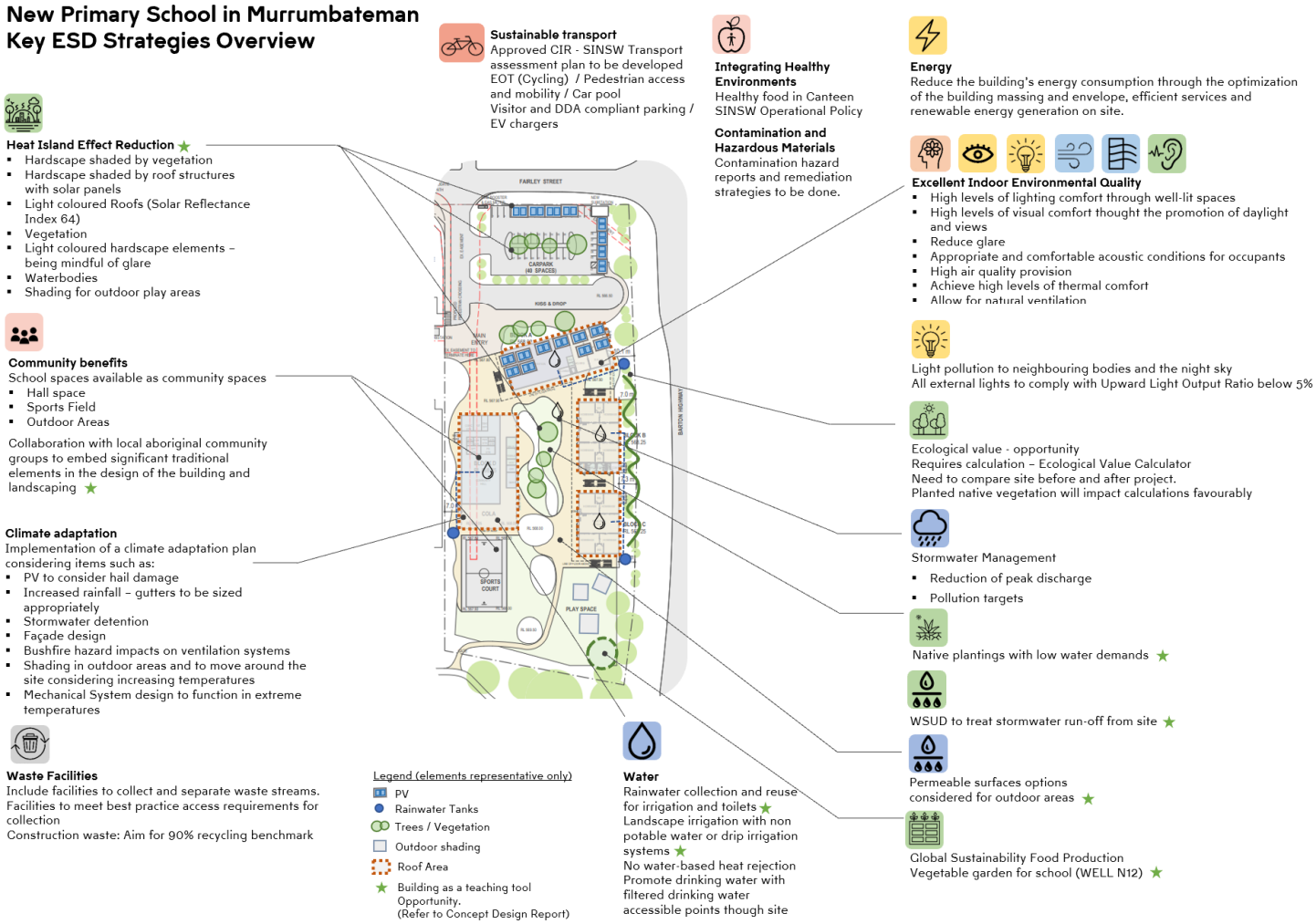
Resource conservation (energy, water and waste) – In delivering on the functional demands of an educational building (high levels of daylight, thermal comfort, visual comfort, and IAQ), incurs resource use through the optimisation of these attributes. These are to be supported with minimal consumption of energy and water resources, or the generation of waste and pollution in demolition, construction, and operation of the building. Our approach to resource conservation is based on applying a "hierarchy" methodology as outlined in the following sections.

The creation of an integrated community resource – The School can play a role within the local community through the use of shared facilities (library's, auditoriums, sport facilities and open spaces), facilitating events such as farmers markets, community gatherings, and integration of community gardens.

The development of the building and surrounds as a teaching tool – Students develop greater knowledge retention, understanding and awareness, when they have the opportunity to interact directly with their environment through the mediums of touch, sight and feel, compared to the traditional textbook learning.

The above approach has been taken to ensure the ESD strategies proposed meet the SEARs and targets/benchmarks discussed in the previous section. An overview of the strategies considered for the project are shown in the diagram below:



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The following sections provide an overview of the strategies considered.

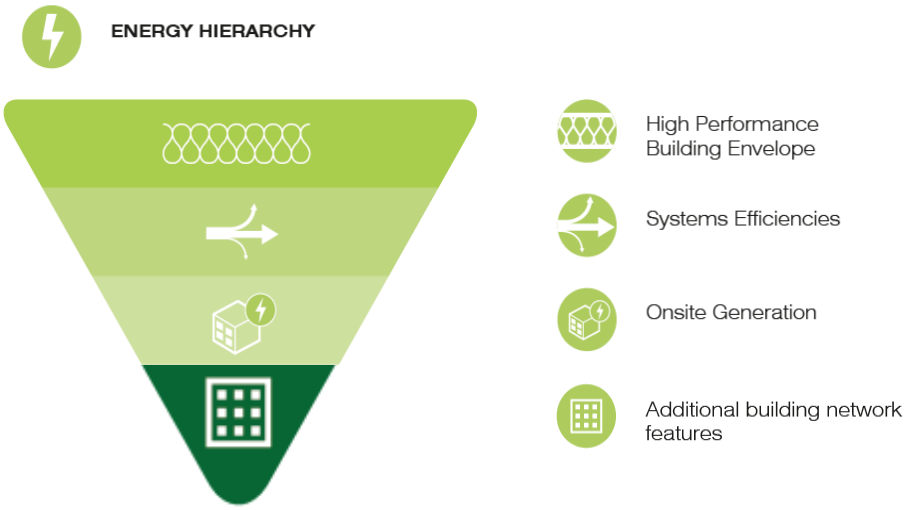
4.1 Resource Conservation

This section provides an overview of the resource conservation measures.

4.1.1 Energy Conservation

The targeted approach to sustainability and energy related systems is based on applying an "energy hierarchy" methodology.

This methodology has the reduction of energy use as its first priority, and then seeks to meet the remaining energy demand by the most efficient means available, before the inclusion of on-site generation and importation of green power.



The following energy initiatives are considered for the new school:

- **Building Form** has been designed with consideration of façade access for greater access to natural daylight and opportunity for natural ventilation, within the constraints of the site.
- **Passive design principles** will be employed to respond to environmental conditions of the building including orientation, solar access, prevailing winds, seasonal and diurnal temperatures changes.
- **Building envelope performance** (airtightness and thermal) will be enhanced by prefabrication.
- **A Mixed Mode Ventilation strategy** will be assessed for improved indoor air quality, whilst also reducing energy consumption associated with air-conditioning. When external and internal conditions are favourable, external windows to each cluster can open to facilitate natural ventilation.
- **Building energy performance improvement -** Energy modelling will be undertaken using the NCC Section J, JV3 energy modelling guidelines. The energy modelling will aim to demonstrate the project achieves a minimum 10% energy reduction against the benchmark standard.
- **Energy efficient LED lighting, zoning, controls, and site co-ordination** for both internal and external lighting systems are to be considered among the lighting strategies.

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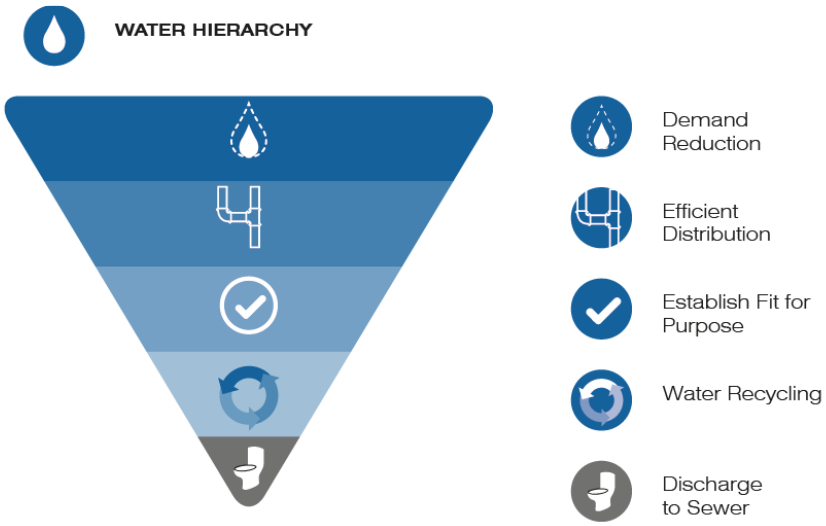
- **Occupancy controls** considered for spaces so that AV, lighting, and mechanical systems can be shut down both manually and automatically when unoccupied.
- **A Solar photovoltaic (PV) array** has been considered and will potentially be located on the roof terrace. Energy generated onsite can be reused onsite.
- **High efficiency HVAC (Heating, Ventilation & Air-conditioning)** systems to be incorporated
- **CO_2 monitoring** in the appropriate control of outdoor air provisions.

4.1.2 Water Conservation

The following hierarchy will be applied, along with the following targeted strategies:



- **Water efficient fixtures / fittings will be specified.** These include fittings such as taps, showerheads, toilets, zip taps, dishwashers etc certified under the WELS rating scheme
- **Rainwater Reuse** - Rainwater collection and reuse systems will be assessed Reuse options include landscape irrigation and toilet flushing.
- **Fire Systems test water capture and storage** for re-use using the rainwater tank will be assessed.

4.1.3 Materials and Construction Waste

Selection of environmentally preferable materials is a key priority for the project because building materials consume energy and natural resources during its manufacture and for their transportation to the construction site. Choices of materials and construction methods can significantly change the amount of energy embodied in the structure of a building.

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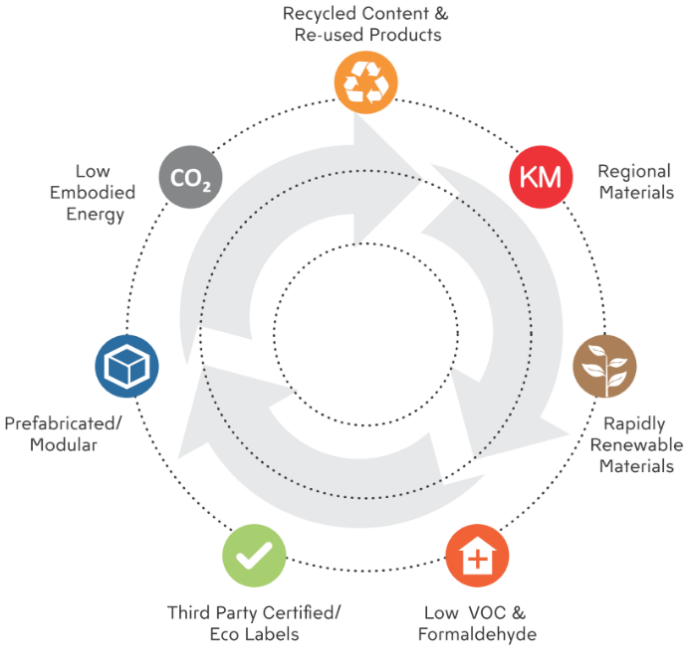

Low-impact construction methods such as offsite prefabrication/preassembly shall be considered for the school where applicable. Prefabricated structures built in purpose-built factories are less labour intensive, more time efficient, and produce less waste compared to traditional onsite construction methods. Raw materials and construction elements are not exposed to the elements, which ensures high quality in the final building, and the construction process is less weather dependant.

Preference will be given to materials that contain high-recycled content and/or are highly recyclable. The following strategies are being considered:

- **Use sustainable timber** - timber products used for concrete formwork, structure, wall linings, flooring and joinery will be sourced where possible from reused, post-consumer recycled or FSC-certified, or PEFC certified timber.
- **Steel –** will be specified where possible to meet specific strength grades, energy-reducing manufacturing technologies, and off-site fabrication. Steel will also be sourced with a proportion of the fabricated structural steelwork via a steel contractor accredited by the Environmental Sustainability Charter of the Australian Steel Institute.
- **Recycled concrete** – The project aims to reduce the use of Portland cement through substitutions. Fine and coarse aggregate inputs from manufactured sand or other alternative materials, and the amount of Portland cement will be reduced within the concrete mix where possible.
- **High recycled content or recyclability** – Furniture items with high recycled or recyclability content to be considered.

4.2 Emissions

Proposed design aims to reduce of all forms of emissions, including watercourse pollution, light pollution, and ozone depletion.

- **Water Sensitive Urban Design (WSUD)** integrates water cycle management with urban planning and design. The aim of WSUD is to manage the impacts of storm

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water run-off from the development to protect and improve waterway health by replicating the natural water cycle.

As part of the WSUD, the development will aim to incorporate rainwater reuse and storm water management.

The storm water drainage system can prevent storm water contamination, control sedimentation and erosion during construction and operation of the building.

4.3 Additional Key measures

The following measures are considered for the school. These measures are intended to reduce the environmental impacts associated with the construction of new buildings.

- **Environmental Management Plan (EMP)** – An EMP has been considered for the school. The EMP will be developed and implemented for the construction stage, including demolition and excavation, to address environmental, worker health and safety and community risks. The EMP is a project specific plan and developed using State and Federal Guidelines and standards. The main contractor will implement an Environmental Management System certified to the ISO 14001 standard to ensure the objectives of the EMP are met.
- **Site waste management plan.** During the demolition and construction phase, the development of a project-specific site waste management plan (WMP) will be assessed to reduce recycling of demolition and construction waste.
- **Comprehensive commissioning** – pre-commissioning, commissioning, and quality monitoring for all building services to be considered.
- **Waste storage** will be provided dedicated to the separation and collection of recyclable waste.
- **Cycle parking and end of trip facilities** – Inclusion of bicycle parking racks, and end of trip facilities for staff are being considered.

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5.0 Climate Change Considerations

Addressing SEARS ESD criteria:

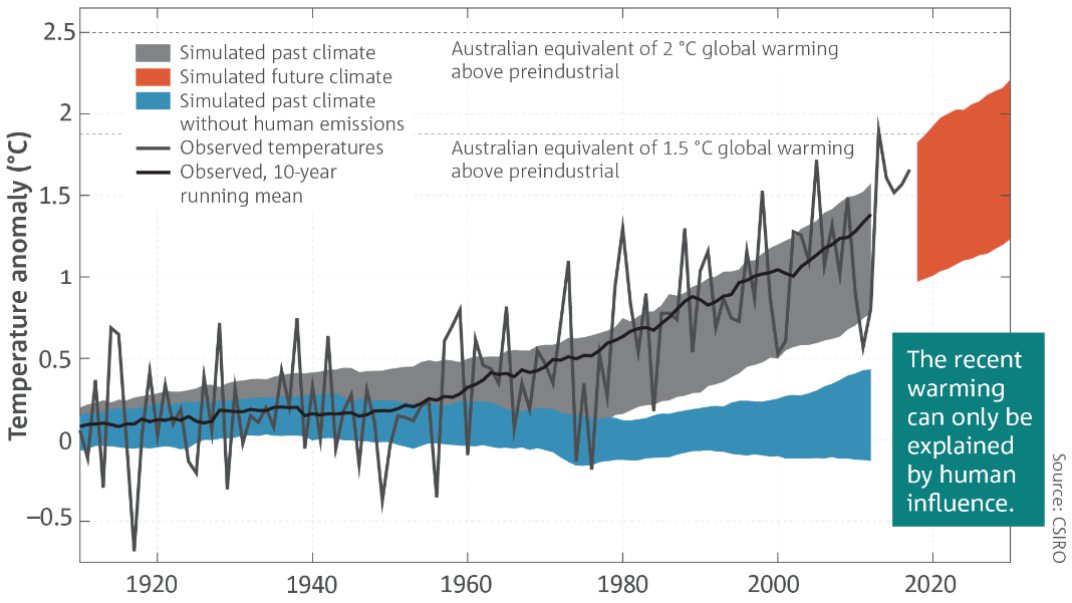
- ***F) Provide a statement regarding how the design of the development is responsive to the NARCliM projected impacts of climate change.***

A high-level assessment of possible Climate Change impacts has been carried out during this stage to assess how the public realm design and services strategy will respond to future expected climate conditions. An overview of predicted future conditions and the project's response is presented below.

Australia's climate has seen gradually increasing average temperatures over the past century, with an increase of just over 1°C since 1910. Most of this increase has occurred since 1950 and 8 of Australia's top ten warmest years on record have occurred since 2005. It has also seen an increase in the number of extreme temperature days (days where temperatures exceed the 99th percentile of each month from 1910-2017).

This trend is predicted to continue, and the extent of the warming will be based on global emissions scenarios. The current projections (source: climatechangeaustralia.gov.au) are as follows:
Near future (2030): Projected warming of 0.5-1.4°C (against 1986-2005 average)
Long term (2090):

- High emission scenario – warming of 2.8-5.0°C
- Intermediate scenario – warming of 1.3 – 2.6°C



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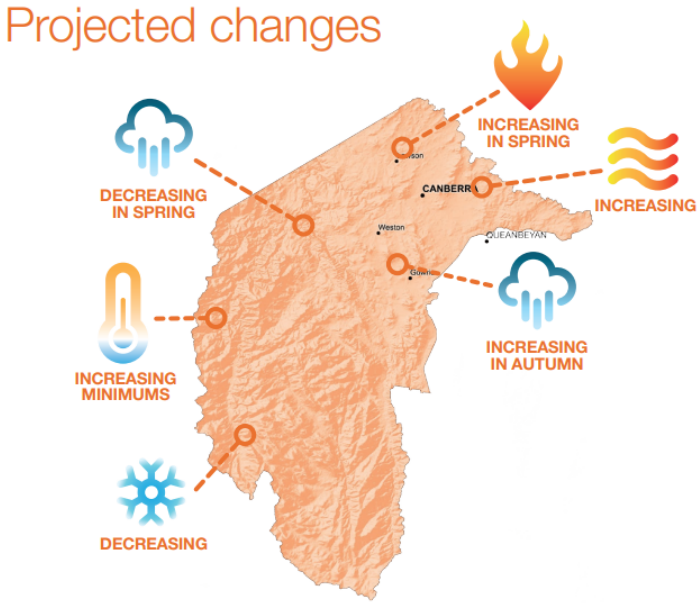
5.1 NARCliM projected impacts of climate change

To assess the climate projections for the region, the NSW and ACT Regional Climate Modelling (NARCliM) project has been considered. Murrumbateman is included within close proximity to the Australian Capital Territory area.

NARCliM Climate change projections are presented for the near future (2030) and far future (2070), compared to the baseline modelled climate (1990–2009). The projections are based on simulations from a combination of twelve climate models run to provide detailed future climate information for NSW and the ACT considering temperature, hot days, cold nights, rainfall, and fire weather.
While all projections will be considered, given the life span of the project, projections for the far future (2070) will be considered in more detail. The diagram below summarizes the main trends regarding climate change projections for the area:



Projected **temperature** changes	
Maximum temperatures are projected to increase in the near future by 0.6 – 0.9°C	Maximum temperatures are projected to increase in the far future by 1.4 – 2.3°C
Minimum temperatures are projected to increase in the near future by 0.4 – 0.7°C	Minimum temperatures are projected to increase in the far future by 1.4 – 2.3°C
The number of hot days will increase	The number of cold nights will decrease
Projected rainfall changes	
Rainfall is projected to decrease in spring	Rainfall is projected to increase in summer and autumn
Projected Forest Fire Danger Index (FFDI) changes	
Average fire weather is projected to increase in spring, summer and winter	The number of severe fire weather days is projected to increase in summer and spring

Source: NARClim Climate Change projection Summary

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The table below shows a high-level review of climate change risks and a review of how the design can address these risks. A more detailed review and workshop will be conducted during this stage of the project to review all likely risks and discuss how their relative impacts can be identified, assessed, and mitigated.

Climate Impact		Risk	Response / Design Considerations
	Increase in **extreme hot days and average temperatures**	■ Stress on electricity network / **blackouts** ■ Increased **internal temperatures** ■ Greater **energy consumption** ■ Higher **peak loads** ■ Accelerated **degradation of materials** ■ **Heat Stress effects on human health**	■ **Back-up power** (Generators / PV) ■ **Redundancy** built into cooling capacity ■ **Thermal Storage** – manages peak loads ■ **Durable materials** selection ■ **Mechanical System** to be able to respond to extreme temperatures
	Increased **drought duration**	■ Restrictions to **water supply** ■ **Damage to landscape** and higher maintenance costs	■ **No water-based heat rejection** to be used ■ **On-site efficiency measures** to reduce potable water demand ■ Drought resistant planting selection
	Increased **fire weather**	■ **Smoke from bushfires** causing health impacts ■ **Damage to powerlines** impact supply	■ **Back-up power** systems & **onsite generation** ■ **Filtration** for air intakes into buildings
	Increased **rainfall variability And flooding**	■ Damage to buildings, landscape, and infrastructure. ■ Flooding impacts	■ **Sustainable urban drainage** features will capture, treat, store stormwater, and reduce outflow. ■ Predictive / forecast management of water storage
	Increased storm intensity	■ Blowing debris causing property damage and safety risks ■ Interruption of waste collection services	■ **Durability** of materials selection ■ **Predictive management** planning in even of large storm events

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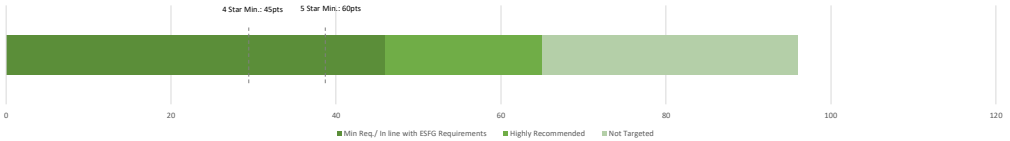
6.0 Appendix A: Green Star Scorecard

207203 Monaro Schools

Category	Not Targeted	Available Pts	Min Req./ In line with ESFG Requirements	Highly Recommended	Total	Not Targeted
CATEGORY / CREDIT	#VALUE!	POINTS AVAILABLE	10	3	13	#VALUE!
Indoor Environment Quality	17	17	10	3	13	4
Energy	22	22	3	0	3	19
Transport	10	10	0	10	10	0
Water	12	12	5	0	5	7
Materials	14	14	6	0	6	8
Land Use & Ecology	6	6	2	1	3	3
Emissions	5	5	4	0	4	1
Innovation	10	10	6	2	8	2
Total	**#VALUE!**	**96**	**46**	**19**	**65**	31
4 Star Target		45-59	45		Yes	
5 Star Target		60-74	60		Yes	
6 Star Target		75+	75		No	



	Points which cover an EFSG upgrade
	Points with approved CIR (SINSW)
	Points Removed (Review 20/04/21)
	Points pending further review

207203 Monaro

Green Star (D&AB v1.3)

CATEGORY / CREDIT	CODE	CREDIT CRITERIA	CREDIT DESCRIPTION	POINTS AVAILABLE	INPUT	Min. EFSG Requirement / Standard Practice / Inherent	Good Practice / highly Rec. / Buffer Points	Total Targeted	Captures EFSG (Yes / No / Partially)	Crossover with EFSG	Strategies	Alignment with GANSW Better Placed Manuals. Design Guide for Schools (DGfS) Environmental Design in Schools (EDiS)	EP&A Reg 2000 Alignment with SEARS clause 7 (4)
Management				**14**									
Accredited Professional	1.0	Accredited Professional	A Green Star Accredited Professional (GSAP) has been contractually engaged to provide advice.	1	ESD	1		1	Yes	MANDATORY ●DG02.09 - Sustainability Benchmarking	MANDATORY		
Commissioning and Tuning	2.0	Environmental Performance Targets	Project Team must set and document environmental performance targets for the project.	Req	HI / ESD	C		C	Yes	MANDATORY ●DG02.09 - Sustainability Benchmarking	MANDATORY DG02.09 - Projects in Planning phases must develop a Sustainable Development Plan including sustainability targets, initiatives and an ESD schedule detailing the relevant Green Star/EFSG pathway adopted for the project. Benchmarking must be undertaken against the Green Star credits using the edition of the Green Star scorecard current at the time of the assessment. The fcompleted scorecard must demonstrate the project can achieve enough points for the required rating.	**Aligns with DGfS** **2 - Sustainable, efficient and durable.** Minimise the consumption of energy, water and natural resources and reduce waste and encourage recycling. **6-Whole of life, flexible and adaptive.** Good design for schools should deliver high environmental performance	**Aligns with *The precautionary Principle*** Detail the projects environmental considerations
	2.1	Services and Maintainability Review	Comprehensive services and maintainability review of the project is performed.	1	CONTR / FM	1		1	Yes	● SINSW Commissioning Team			
	2.2	Building Commissioning	Comprehensive pre-commissioning and commissioning activities are performed for all nominated building systems.	1	CONTR	1		1	Yes	● Commissioning & Handover Procedure			
	2.3	Building Systems Tuning	A tuning process is in place that addresses all nominated building s	1	ICA	1		1	Yes	● Asset Management Units (AMU)			
	2.4	Independent Commissioning Agent	Utilization of an Independent Commissioning Agent (ICA) to advise, monitor and verify the commissioning and tuning of the nominated building systems throughout the design, tender, construction commissioning and tuning phases.	1	ICA		1	1	Yes	● Project Governance Framework ● Technical Stakeholder Group Practice Note ● Commissioning & Handover Procedure			
Adaptation and Resilience	3.1	Implementation of a Climate Adaptation Plan	A project specific Climate Adaptation Plan has been developed in accordance with a recognized standard. Solutions haven been included into the building design and construction that specifically address the risk assessment component of the plan.	2	ENV	1		1	Partially	MANDATORY DG 02.08 - Climate Change Adaptation DG 03.02 - Site Investigations DG 13 - Bushfire Protection DG 8.05 - Weather Protection	MANDATORY DG 02.08 - Climate Change Adaptation -Initial Assessment of natural hazards and project vulnerability must be carried out -Where significant risks are identified a comprehensive climate change risk assessment must be undertaken. (See details) -High or extreme risks identified must be addressed through design measures -Timescales (2050 and 2070)/2C and 4C / IPCC DG 03.02 - Site Investigations - An environmental risk report will be required for developments proposed within sensitive natural environments or sites subject to natural risks (i.e. flood prone sites, bush fire areas).		**Aligns with The precautionary Principle** Make reference to a Risk Management Plan (RMP) and the inclusion of any environmental, social and climate change risks, in the RMP if the project has included these Make reference to work done for EFSG DG02.08 Climate Change Adaptation **Aligns with Inter generational equity**
Building Information	4.1	Building Information	Comprehensive operations and maintenance information is devloped and made available to the facilities management team and relevant and current building user information is developed and made available to all relevant stakeholders.	1	CH / ELEC / ME	1		1	Partially	MANDATORY DG 65.02 - Special Electrical Systems - Energy Conservation DG 64.10 - Communications Manuals and Training ● Commissioning & Handover Procedure	MANDATORY DG 65.02 - Energy Conservation Produce a Building User's Guide to enable the client to understand the building systems and operate systems to maximise efficiency. This must: - Clearly and concisely describe the operation of building and its services - Detail a reasonable maintenance program		
Commitment to Performance	5.1	Environmental Building Performance	There is a commitment to set targets and measure results for the environmental performance of the building.	1	HI	1		1	Yes	MANDATORY 02.02 NSW GREP ● SINSW Environmental Performance Plan	MANDATORY 02.02 NSW GREP The policy includes measures, targets and minimum standards to drive efficiency in energy and water use and waste and also improving air quality. All new building and upgrade projects must comply and demonstrate adherence to the NSW		
	5.2	End of Life Waste Performance	There is a commitment to reduce demolition waste at the end of life of an interior fitout or base building component.	1	WASTE		1	1	Partially	MANDATORY DG02.07 Waste Management 02.01 ESD Scope ● EFSG multiple references to a WOL approach to services and material selection	MANDATORY DG2.7.1 Construction and demolition waste Designers must seek to use of incorporate building materials which are able to be disassembled for re-use, in conjunction with considerations for the addition and removal of accommodation over time. 02.01 ESD Scope		**Aligns with Improved valuation, Pricing and Incentive Mechanisms** Make reference to DG01.03 Whole of life
Metering and Monitoring	6.0	Metering	To qualify for this credit it is a minimum requirement that accessible metering be provided to monitor building energy and water consumption, including all energy and water common uses, major uses and sources. The metering is to be accurate and inform energy consumption practices and reduce wasted energy.	Req	MECH	C		C	Partially	● DG 53.04 - Metering Supplies DG61.04 Electricity Contract and Metering	MANDATORY DG 53.04 - Metering Supplies In addition to the main water meter for the site provide sub meters for the following: - Mixed irrigation systems - Laboratory buildings - Amenities blocks - Canteens		
	6.1	Monitoring Systems	A monitoring strategy is adressed through a monitoring system, capable of capturing and processing the data produced by the installed energy and water meters and accurately and clearly presentind data consumption trends.	1	MECH	1		1	Partially	MANDATORY 02.02 NSW GREP	MANDATORY 02.02 NSW GREP The policy includes measures, targets and minimum standards to drive efficiency in energy and water use and waste and also improving air quality.		
Responsible Building Practices	7.0	Environmental Management Plan	To qualify for this credit it is a minimum requirement that environmental impacts are managed during construction by implementing a best practice environmental management plan.	Req	CONTR	C		C	No			**Aligns with EDGS** Contribute to Local Environment	**Aligns with Improved valuation, Pricing and Incentive Mechanisms** Make reference to DG02.07 Waste Management
	7.1	Formalised Environmental Management System	The reponsible party for the site has a formalized approach to planning, implementing and auditing is in place during construction to ensure conformance with the EMP.	1	CONTR	1		1	No			**Aligns with EDGS** Contribute to Local Environment	**Aligns with Improved valuation, Pricing and Incentive Mechanisms** Make reference to DG02.07 Waste Management
	7.2	High Quality Staff Support	High quality staff support practices are in place that: Promote positive mental and physical health outcomes of site activities and culture of site workers through programs and solutions on site and; Enhance site worker's knowledge on sustainable practices through on-site, off- online education programs.	1	CONTR		1		No	Not Covered in the EFSG			
Operational Waste	8A	Performance Pathway - Specialist Plan	A waste professional prepares and implements an Operational Waste Management Plan (OWMP) for the project in accordance to best practice approaches and this is reflected in the building's design.	1	WASTE				Yes	MANDATORY DG 02.07 - Waste Management	MANDATORY DG 02.07 -Operational waste management plan For new and refurbished schools, an operational waste management plan (OW/MP) must be developed to establish operational waste targets, identify opportunities for reuse and recycling in the		
	8B	Prescriptive Pathway - Facilities	Facilities are in place to collect and separate distict waste streams and where these facilities meet best practice access requirements for collection by the relevant waste contractor.	-	WASTE	1		1	Yes	MANDATORY DG 02.07 - Waste Management	MANDATORY DG 02.07 - Waste Management	**Aligns with EDGS** Contribute to Local Environment	Aligns with Improved valuation, Pricing and Incentive Mechanisms Make reference to DG02.07 Waste Management
Total				**14**		**10**	**3**	**12**					
Indoor Environment Quality				**17**									

CATEGORY / CREDIT	CODE	CREDIT CRITERIA	CREDIT DESCRIPTION	POINTS AVAILABLE	INPUT	Min. EFSG Requirement / Standard Practice / Inherent	Good Practice / highly Rec. / Buffer Points	Total Targeted	Captures EFSG (Yes / No / Partially)	Crossover with EFSG	Strategies	Alignment with GANSW Better Placed Manuals. Design Guide for Schools (DGfS) Environmental Design in Schools (EDiS)	EP&A Reg 2000 Alignment with SEARS clause 7 (4)
Indoor Air Quality	9.1	Ventilation System Attributes	•Entry of outdoor pollutants is mitigated Building ventilation system designed to comply with ASHRAE Standard 62.1:2013 in regard to min. separation between pollution sources and air intakes. •Design for Ease of maintenance & cleaning Provide adequate access for maintenance to both sides of all moisture and debris-catching components •Cleaning prior to use and occupation All new and existing ductwork that serves the building must have been cleaned in accordance with the recognized Standards	1	MECH	1		1	Yes	MANDATORY DG16.10 Access for maintenance	MANDATORY DG16.10 Access for maintenance All systems and equipment that is installed to be provided with suitable access to ensure that this equipment is safely and efficiently maintainable. In order to ensure that maintenance is available, on the completion of all buildings, drawings are to be provided showing the completed (As Built) building including all equipment and equipment access arrangements. EFSG responds to Thermal Comfort and IAQ Performance Brief		
	9.2	Provision of Outdoor Air	Outdoor air is provided at a rate 50% greater than the minimum required by AS 1668.2:2012 or CO2 concentrations are maintained below 800ppm. Compliance methods depend on which is the primary mode of ventilation (In operation for at least 70% of the occupied hours)	2	MECH	1		1	Partially	MANDATORY DG37.01 Required Air Changes DG57.05 Natural Ventilation ● DG 55.02 - Thermal Comfort and Indoor Air Quality Performance Brief	MANDATORY DG37.01 Required Air Changes Provide a minimum of two roof ventilators to each Secondary General Learning Space or a Primary Home Base unless otherwise directed, or other number recommended by the manufacturer for the size of the space (whichever is the greater). Ventilator throat diameter to be no less than 400mm. See DG 37 for further requirements		
	9.3	Exhaust or Elimination of Pollutants	Pollutants from printing and photocopying equipment, cooking processes and equipment and vehicle exhaust are limited from the nominated area by either: •Removing the source of pollutants (products compliant with minimum emission standards or not present) •Exhausting pollutants directly to the outside in accordance with a recognized Standard and / or physically separated from occupants.	1	MECH	1		1	Partially	MANDATORY DG 57.06 - Ducted Duct Extraction **DG 57.07 - Printing Room Ventilation** DG 57.08 - Fume Cupboard - Single Side or Double Side DG 57.09 - Chemical Store Ventilation DG 57.10 - Ceramic Kiln Ventilation DG 57.11 - Hot Metal Exhaust Ventilation DG 57.12 - Darkroom Ventilation DG 57.13 - Welding Area Ventilation DG 57.14 - Wind Powered Roof Ventilators DG 57.15 - Communication Room DG 57.16 - Toilet and Change Room Ventilation DG 57.17 - Laundry	MANDATORY DG57.07 Printing Room Ventilation Modern dry photocopiers are designed for low emissions, provided they are properly maintained (including replacement of the ozone filter). The ventilation system is to be designed to serve the whole room and is not intended to provide localised exhaust at equipment. - Provide ventilation systems to meet the following performance requirements in new photocopier and printing rooms: - Discharge air from the ventilation unit to the outside of the building via a vermin proofed louvre. - Draw Make-up air from inside the building through wall or door grilles. - Inlet and exhaust grilles require security bars to preserve the physical security of the duplicating room. - Locate the inlet/s and exhaust to achieve good airflow across the room in plan and elevation to pick up all machine emissions.		
Acoustic Comfort	10.1	Internal Noise Levels	Internal ambient noise levels are no more than 5dB (A) above the lower figure recommended in Table 1 of AS/NZS 2107:2016 Mixed Mode buildings can be treated as mechanically ventilated	1	ACOUS	1		1	Yes	MANDATORY DG11.02 Internal Noise Levels DG 55.02 - Thermal Comfort and Indoor Air Quality Performance Brief (Acoustics Section) N/A DG 11.07 - Acoustic post occupancy evaluation	MANDATORY DG11.01 - The design of all building components, including acoustic components should consider the 'Whole of Life 'framework DG11.02 Internal Noise Levels An internal noise level assessment must be carried out for all new buildings to ensure comfortable acoustic conditions for the spaces occupied. The internal noise levels within the space must meet the limits stipulated in Table 11.06.1 of Section 11.6 Acoustic Performance Guidelines or be within the range stipulated in Table 1 of the AS/NZS 2107:2016 standard. The more stringent of the two should be met.	**Aligns with DGfS** **5-Amenity** - Locate buildings away from noisy roads and other noise sources to ensure acoustic levels within teaching and learning spaces are acceptable EDGS Acoustics	
	10.2	Reverberation	Reverberation time in the nominated area is below the maximum stated in the Recommended Reverberation Time provided in Table 1 of AS/NZS 2107:2016 If note 1 of Table 1 applies, acoustic absorption should be installed in the noise sensitive space Dedicated teaching space must have reverberation times in the lower half of the range specified in Table 1	1	ACOUS		1	1	Yes	MANDATORY DG11.03 Room Acoustics DG45.01 Ceiling - General DG45.01 Ceiling - Circulation Area Finishes	MANDATORY DG11.03 Room Acoustics The reverberation time within a room must be within the range stipulated in table Table 11.06.1 of Section 11.6 Acoustic Performance Guidelines or Table 1 of the AS/NZS 2107:2016 standard. The more stringent of the two should be met. In acoustically critical environments (such as teaching spaces for students who are deaf or hard to hearing), it is desirable to define and design for the required reverberation time at all octave band		
	10.3	Acoustic Separation	Sound Reduction - Sound Reduction Index of 45 for partitions: § Fixed without a door § Glazed partitions without a door (Acoustic consultant to determine whether a Rw of 35/45 is more applicable when using glazed partitions) § Sound Reduction Index of 35 for all partitions with doors	1	ACOUS		0	0	Yes	MANDATORY ● DG 11.05 - Room to Room Noise Control	MANDATORY DG 11.05 - Room to Room Noise Control Ascertain a room or space noise level and determine constructions (both walls and ceilings) required to control noise emission to an adjacent space Ascertain a room or space sensitivity as a noise receiver and determine constructions (both walls and ceilings) required to control noise intrusion from adjacent spaces. Consider airborne noise and impact (footfall) noise - Operable walls (between general learning areas, all schools): Rw 45 - Entry doors to occupied teaching, music, drama and sports spaces: Solid core, minimum 35 mm thick	**Aligns with DGfS** **5-Amenity** Where teaching and learning spaces must be located alongside noise sources, arrange built form to ensure dual aspect that will allow for natural ventilation away from noise source.	
Lighting Comfort	11.0	Minimum Lighting Comfort	Lights in the nominated area are flicker free and accurately address the perception of colour in the space. (Minimum CRI of 80)	-	LIGHT	C		C	Yes		MANDATORY 63.03.01 Lighting Considerations Design considerations Attention should be given to the colours and finishes of interior surfaces.		
	11.1	General Illuminance and Glare Reduction	Lighting levels and quality comply with best practice guidelines Glare is eliminated	1	LIGHT	1		1	Yes	MANDATORY DG 63.03 - Lighting Design	MANDATORY 63.03.03 Illuminance Where illuminance levels are specified for indoor applications they are maintained illuminance levels.		
	11.2	Surface Illuminance	A combination of lighting and surfaces improve the uniformity of li	1	ARCH		1	1	Yes		MANDATORY		
	11.3	Localised Lighting Control	Occupants the ability to control the lighting in their immediate env	1	LIGHT		1	1	Partially		MANDATORY		
Visual Comfort	12.0	Glare Reduction	Glare in the nominated area from sinlight through all viewing facades and skylights is reduced through a combination of blinds, screens, fixed devices or other means.	-	ESD	C		C	Partially	MANDATORY DG7.01 - Glare Control DG7.01 - Sunshades DG14.05 Sunshades DG76 Blinds NEGOTIABLE DG7.02 Perforated Sun Shades TBC DG91.07 - Pavements	MANDATORY 7.01 Glare Control ● Exclude direct sunlight from all learning spaces, libraries, administrative offices and staff studies for the period of 9.00am to 3.30pm including Eastern Daylight Saving Time between 21st September to 21st March (equinoxes). ● Exclude direct sunlight from desk level in all learning spaces between 9am and 3:30pm. Sun exclusion and glare control can be achieved by the use of elements such as sun shades, eave extensions, tinted glazing, screens, vertical blades and the like. ● Glare must only be controlled by blinds as a last resort. ● Designers must prepare sun diagrams in the design phase as a minimum requirement. DG14.05 Sunshades		
	12.1	Daylight	160 lux during 80% of the occupied hours for 40% of the spaces (1 point) 160 lux during 80% of the occupied hours for 60% of the spaces (2 points)	2	ESD / ARCH	1		1	Yes	MANDATORY DG 12.0 - Natural Light DG 31.01 Windows DG31.29.03 Operable Louvres TBC DG 14.13 -Openings NEGOTIABLE DG 31.02 GLazing	MANDATORY DG12.0 Natural Light ●Maximise natural daylight in all habitable spaces; ●Discomforting glare and brightness contrasts must be avoided ●Provide brownout function to spaces where is required, skylights must include a method to sufficiently adjust light levels. ● Movement Areas will require natural and/or artificial light to at least BCA minimum ● Green Star requirements (40%) OR ● No overshadowing – external shading should not impinge on the direct 25 degree line from centre of the window ● Minimum 40% Visual Light Transmittance (VLT) for building glazing	**Aligns with DGfS** **4-Health and Safery** Locate buildings and design facades that optimise fresh air intake and access to daylight **Align with EDGS** Daylight and views	
	12.2	Views	60% of the nominated area have a clear line of sight to high quality internal or external views. The space must be within 8m from the view.	1	ARCH	1		1	Yes	MANDATORY DG 02.10 - Views	MANDATORY DG 02.10 - Views Building design must ensure that at least 60% of primary occupied spaces have a clear line of sight to	**Aligns with DGfS** **5-Amenity** Ensure access to sunlight, natural ventilation and visual outlook wherever possible	
Indoor Pollutants	13.1	Paints, Adhesives, Sealants and Carpets	95% of all internally applied paints, adhesives, sealants and carpets meet the stipulated VOC limits	1	ARCH	1		1	Yes	MANDATORY ● DG 2.5.2 - Low VOC	MANDATORY 2.5.2 Low VOC	As above	
	13.2	Engineered Wood Products	95% of all engineered wood products meet stipulated formaldehyde limits or no new engineered wood products are used in the building.	1	STRUC	1		1	Yes	MANDATORY ● DG 2.5.2 - Low VOC	MANDATORY 2.5.2 Low VOC Only low formaldehyde-emitting engineered wood products should be used, such as those that meet		
Thermal Comfort	14.1	Thermal Comfort	A high degree of thermal comfort is provided to occupants in the space, equivalent to 80% of all occupants being satisfied in the space. (For 95% of the nominated area and 98% of the annual hours of operation, a high degree of thermal comfort is provided.) Mech ventilated spaces: PMV levels are between -1 and 1	1	MECH	1		1	Partially	● DG 06.03 - Cooling ● DG 55 - Cooling Policy	MANDATORY 55.03 The attached Cooler Classroom Program (CCP) Design Guideline details the methodology to be adopted to achieve the required thermal comfort and indoor air quality in existing permanent learning spaces and libraries forming part of the School Infrastructure NSW Cooler Classrooms Program. The Guideline is to be read in conjunction with the Educational Facilities Standards and Guidelines (EFSG) suite of information to aid in the planning, design and use of NSW Department of Education	**Aligns with EDGS** Ventilation Strategy	
	14.2	Advanced Thermal Comfort	A high degree of thermal comfort is provided to occupants in the space, equivalent to 90% of all occupants being satisfied in the space. (For 95% of the nominated area and 98% of the year, a high degree of thermal comfort is provided.) Mech ventilated spaces: PMV levels are between -0.5 and +0.5	1	MECH								
Total				17		10	3	13					
Energy				22									

CATEGORY / CREDIT	CODE	CREDIT CRITERIA	CREDIT DESCRIPTION	POINTS AVAILABLE	INPUT	Min. EFSG Requirement / Standard Practice / Inherent	Good Practice / highly Rec. / Buffer Points	Total Targeted	Captures EFSG (Yes / No / Partially)	Crossover with EFSG	Strategies	Alignment with GANSW Better Placed Manuals. Design Guide for Schools (DGfS) Environmental Design in Schools (EDiS)	EP&A Reg 2000 Alignment with SEARS clause 7 (4)
Greenhouse Gas Emissions	15E.0	Conditional Requirement: Reference Building Pathway	Operational GHG from the proposed building are less than those of the equivalent Benchmark Building. The BB represents a 10% improvement on a building which achieves minimal compliance with the NCC Section J DTS sions using a defined HVAC type (Reference Building)	0	MECH	C		C	Yes	MANDATORY DG 02.03 - Energy Conservation	MANDATORY DG02.03 Energy Conservation In accordance with the NSW Government Resource Efficiency Policy all new facilities must be designed and built so that energy consumption is predicted to be at least 10% lower than if build to minimum compliance with National Construction Code requirements		
	15E.1	Comparison to a Reference Building Pathway	Relates to building fabric performance	4					-				
	15E.2	Comparison to a Reference Building Pathway	Reducing the proposed building's modelled emissions against the Benchmark Building energy model	16		2		2	Yes	MANDATORY DG 02.02 NSW GREP (10% energy reduction NCC) DG 02.03 Energy Conservation DG 04 - Heat loss / gain DG 16.09 - Energy Efficiency DG 53.09 - Hot Water Heaters for Schools DG 55 - Cooling Policy (energy efficient AC) DG 65.02 - Energy Conservation (special electrical systems) DG 65.03 - Automatic Lighting Control DG 66 - Photovoltaic Solar Power Generator DG 66.7 RENEWABLE ENERGY SCHEME BENEFITS DG 66.8 BATTERY ENERGY STORAGE SYSTEM IN CONJUNCTION WITH PV SOLAR SYSTEM RECOMMENDED DG06.02 Principles of Energy Efficient Design	MANDATORY DG02.02 GREP - All new building and upgrade projects must comply and demonstrate adherence to the NSW Government Resource Efficiency Policy issued 21 February 2019.The policy includes measures, targets and minimum standards to drive efficiency in energy and water use and waste and also improving air quality. - Each building's system and façade must comply with the corresponding Section J requirements in the National Construction Code. The total building's energy consumption reduction must be achieved without including renewable energy generation in the calculation. DG 2.3.1 Lighting - Maximise natural daylight in all learning and administrations paces to reduce energy usage - Discomforting glare and brightness contrasts must be avoided. - Provide brownout function to spaces where is required, skylights must include a method to sufficiently adjust light levels. - Including daylight sensors to rooms to reduce light output or turn off lights when sufficient daylight	**Aligns with DGfS** **2-Sustainable, Efficient and durable.** - Minimise reliance on mechanical systems **Aligns with DGfS** **2-Sustainable, Efficient and durable.** - Include initiatives to reduce emissions **Aligns with EDGS** - Passive cooling and heating - Shading - Building Envelope and glazing - Building Sealing - Energy efficiency	
Peak Electricity Demand Reduction	16A	Prescriptive Pathway - On-site Energy Generation	Where it is demonstrated that the use of on-site electricity generation systems reduces the total peak electricity demand by at least 15%	1	ELEC								
	16B	Performance Pathway - Reference Building	It is demonstrated that the project's predicted peak electicity demand has been reduced below that of a Reference Building 20% : 1 point 30%: 2 points	2	ELEC	1		1				**Aligns with DGfS** **Sustainable, Efficient and durable.** - Include the use of advanced energy production systems where possible **EDGS** Renewable Energy	
Total				**23**		**3**	**0**	**3**					
Transport				**10**									
Sustainable Transport	17A.1	Performance Pathway	Up to 10 points are available where projects provide access to sustainable transport infrastructure ihch decreases GHG emissions from transport, decreases mental and social impacts of commuting and enco uptake of healther active transport options.	10	TRANS		10	10		● SEARs		**Aligns with DGfS** **1-Context, built for and landscape.** Take advantage of its context by optimising access to nearby transport, public facilities and local centres	
	17B.1	Access by Public Transport	Points available based on the accessibility of the site by public tran	3								**Aligns with DGfS** **2- Sustainable, Efficient and durable.** - Maximise opportunities for safe walking, cycling and public transport access to and from the school.	
	17B.2	Reduced Car Parking Provision	Reduction in the number of car parking spaces when compared to a standard practice building.	1									
	17B.3	Low Emission Vehicle Infrastructure	Parking spaces and/or dedicated infrastructure is provided to support the uptake of low-emission vehicles.	1									
	17B.4	Active Transport Facilities	Bicycle parking and associated facilities are provided to regular building occupants and visitors.	1									
	17B.5	Walkable Neighbourhoods	The project is located conveniently to amenities or the project achieves a specified Walk Score.	1								**Aligns with DGfS** **4-Health and Safety** - Support safe walking and cycling to and from school through connections to local bike and foot paths and the provision of bike parking and end of journey facilities	
Total				**10**		**0**	**10**	**10**					
Water				**12**									
Potable Water	18A.1	Potable Water - Performance Pathway	Up to 12 points available based on the magnitude of the predicted reduction in potable water consumption, when the project is compared against a Reference Building. Potable Water calculator must be used.	12	HYDR					MANDATORY DG 53 - Water DG 51.01 - Hydraulics	MANDATORY DG53.01 General Water services and the selection of fittings, must be undertaken based on a "Whole of Life" (WOL) perspective		
	18B.1	Sanitary Fixture Efficiency	All fixtures are within one Star of the WELS rating specified by GS Taps / Urinals / Diswashers=6 Stars Toilets / Clothes washing machines=5 Stars Showers=3 Star (>4.5 but <=6.0)	1	HYDR	1		1	Yes	MANDATORY DG 53 - Water	MANDATORY DG53.01 Water - General Water Conservation Strategies must be implemented on school sites , including: - Manual Flush Urinal Systems: New and replacement urinals must use manual in lieu of automatic flushing mechanisms. A microwave-activated urinal flushing system may be used as an alternative.	**Aligs with EDGS** Water Efficiency	
	18B.2	Rainwater Reuse	Rainwater tank is installed to collect and reuse rainwater. The rainwater tank volume must meet the following criteria as a minimum: GFA 2.500 (m2) ------ 25 (kL) GFA 5.000 (m2) ------ 50 (kL) GFA 10.000 (m2) ------ 100 (kL) GFA 20.000 (m2) ------ 200 (kL) Note that this table is an over-simplified sizing indication. Tanks should be sized based on the collection area, rainfall and the demands for rainwater use on the project	1	HYDR	1		1	Partially	MANDATORY DG 53 - Water DG2.4.2 Roof Water Harvesting and Tank Storage NA DG53.2	MANDATORY DG53.01 General A rainwater tank must be provided to enable rainwater harvesting from roofs. The tank must be connected to irrigation systems and where practical, to toilets for toilet flushing. DG2.4.2 Roof Water Harvesting and Tank Storage The rainwater tank water must be connected to irrigation systems for adjacent landscape/gardens. The rainwater tanks must be connected to toilets for toilet flushing. If this is not feasible, approval must be granted by SINSW. NA	**Aligns with EDGS** Contribute to Local Environment	
	18B.3	Heat Rejection	No water is used for heat rejection	2	MECH	2		2	No				
	18B.4	Landscape Irrigation	Either subsoil drip irrigation with moisture sensor override is installed or no potable water is used for irrigation. For Xeriscape gardens (Dry gardens) if any, the provision of irrigation systems must be able to be removed within 3 months of installation and the landscape must not require watering after this time	1	LAND / CIVIL / HYDR	1		1	Yes	MANDATORY DG 2.4.2 - Roof Water harvesting and tank storage TBC DG90.7 A sustainable Landscape - Water Management DG93.06 Water Tanks and drip irrigation	MANDATORY 2.4.2 Roof water harvesting and tank storage Include roof water harvesting in projects and tank storage must be included in new schools and encouraged where practical in existing schools, to reduce the demand on drinking water supplies. The rainwater tank water must be connected to irrigation systems for adjacent landscape/gardens with the major preference being for gravity fed supply to minimise ongoing maintenance. The rainwater tanks must be connected to toilets for toilet flushing. If this is not feasible, approval	**Aligns with EDGS** Contribute to Local Environment	
	18B.5	Fire System Test Water	One of the following conditions is met: - Fire protection system does not expel water for testing -The fire protection system includes temporaty storage for 80% of the routine fire protection system test water and maintenance drain-downs for reuse on-site calculated on the basis that any single zone is drained down annually or; -If sprinkles are installed, each floor must be fitted with isolation valves or shut down points for system-by-system testing.	1	FIRE				Yes	MANDATORY (IF APPLICABLE) ● DG 2.4.2 - Roof Water harvesting and tank storage	MANDATORY DG 2.4.2 - Roof Water harvesting and tank storage Where schools are required to install a sprinkler system for fire safety, a closed loop system must be installed to capture and reuse testing and maintenance water, or an alternative non-potable water source		
Total				**6**		**5**	**0**	**5**					
Materials				**14**									
Life Cycle Impacts	19A.1	Comparative Life Cycle Assessment	Up to 7 points are available where a whole-of-building, whole of life (cradle to grave) life cycle assessment (LCA) is conducted for the project and a reference building.	0					Yes	RECOMMENDED ● DG 01.03 - Whole of life - General Design Considerations	RECOMMENDED 01.03 WHOLE OF LIFE - GENERAL DESIGN CONSIDERATIONS		
	19B.1	Concrete	Portland Cement content in all concrete used in the project has been reduced by replacing it with supplementary cementitious materials. -30% reduction of Portland Cement (measured by mass) compared to a reference case. (1 point) -40% reduction (2 points) -Mix water for all concrete contains at least 50% captured or reclaimed water (0.5 points) Aggregates Reduction (0.5 points) -40% of coarse aggregate in the concrete is crushed slag aggregate or another alternative material -Or, 25% of fine aggregate (sand) inputs in the concrete are manufactured sand or other alternative material. *Cost of concrete must me more than 1% of the Project Contract Value for this credit.	3	ARCH / STRUC	1		1	Partially	MANDATORY DG 02.05 Sustainable Materials DG 21.02 - Concrete	MANDATORY DG 02.05 Sustainable Materials Construction materials must be selected based on the following: - Adequately and economically perform their intended functions, and also have lower adverse environmental impacts throughout their life cycle (refer to DG 3) - Contain reduced or no hazardous substances (e.g. low VOC) to ensure effective indoor environmental quality. - Reduce the demand for rare or non-renewable resources. - Have low embodied energy and water. - Are made from or contain recycled materials or can be reused or recycled at the end of their useful life. 21.02.3 Materials Requirements - Use materials complying with AS based on the Whole of Life approach to materials selection; - Do not use breccia or dolerite in concrete mixes;	**Aligns with DGfS** **7- Aesthetics** Achieve a purposeful composition of materials and elements through a rigorous design process **Aligns with DGfS** **2 - Sustainable, Efficient and durable.** - Include initiatives to reduce embodied Energy	

CATEGORY / CREDIT	CODE	CREDIT CRITERIA	CREDIT DESCRIPTION	POINTS AVAILABLE	INPUT	Min. EFSG Requirement / Standard Practice / Inherent	Good Practice / highly Rec. / Buffer Points	Total Targeted	Captures EFSG (Yes / No / Partially)	Crossover with EFSG	Strategies	Alignment with GANSW Better Placed Manuals. Design Guide for Schools (DGfS) Environmental Design in Schools (EDiS)	EP&A Reg 2000 Alignment with SEARS clause 7 (4)
	19B.2	Steel	Steel framed building: 5% reduction of steel framing mass is reduced when compared to standard practice. Reduction can be achieved through: High strength steel (GS specifies strength grades) or mass reduction Concrete framed building: 5% reduction of steel reinforcement mass when compared to standard practice.	1	ARCH / STRUC	1		1	No				
	19B.3	Building Reuse	Façade Reuse: 1 point available where at least 50% (by area) of the building façade is retained or 2 points are available where the proportion retained is 80% Structure Reuse: 30% by mass of the existing major structure is retained or 2 points available the proportion retained is 60%	4					No				
	19B.4	Structural Timber	Minimum requirement: All structural timber used in the building is responsibly sourced.	4	STRUC				No				
Responsible Building Materials	20.1	Structural and Reinforcing Steel	95% of the building steel (by mass) is sourced from a Responsible Steel Maker and, -For steel frame buildings 60% of the fabricated structural steelwork is supplied by a steel fabricator/contractor accredited to the Environmental Sustainability Charter of the Australian Steel Institute. -For concrete framed buildings, at least 60% (by mass) of all reinforcing bar and mesh is produced using energy-reducing processed in its manufacture (measured by average mass by steel maker annually)	1	STRUC	1		1	No			**Aligns with DGfS** **2-Sustainable, Efficient and durable.** - Include initiatives to reduce embodied Energy	
	20.2	Timber Products	95% (by cost) of all timber used in the building and construction works is either: -Certified by a Forest Certification scheme that meets GBCA Criteria (FSC and PEFC) -Is from a reused source Applies to all timber applications within the building and construction works	1	ARCH	1		1	Yes	MANDATORY DG 2.5.1 - Sustainable Materials (timber)	MANDATORY 2.5.1 Timber No rainforest timbers, or timbers from high conservation forests, are to be used unless plantation grown. Use only recycled timber, engineered and glued timber composite products, or timber from plantations or from sustainably managed regrowth forests that is FSC, AFS or PEFC certified. EFSG includes AFS Certification for timber which is not accepted by GS. FSC and PEFC are accepted by		
	20.3	Permanent Formwork, Pipes, Flooring, Blinds and Cables	90% (by cost) of all the above either: - Does not contain PVC and have a recognised product declaration (SDS or EPD) Meet the GBCA Best Practice Guidelines for PVC	1	HYDR MECH ELEC ARCH STRUC	1		1	No				
Sustainable Products	21.1	Product Transparency and Sustainability	A proportion of all materials used in the project meet transparency and sustainability requirements specified.	3	CONTR								
Construction and Demolition Waste	22A	Fixed Benchmark	Construction waste going to landfill is reduced by minimizing the total amount of waste sent to landfill when compared against a typical building.		CONTR							**Aligns with DGfS** **2-Sustainable, Efficient and durable.** - Include initiatives to reduce waste	
	22B	Percentage Benchmark	Construction waste going to landfill is reduced by diverting a significant proportion of waste from going to landfill. (90%)	1	CONTR	1		1	Yes	MANDATORY DG2.7.1 Construction and demolition waste	MANDATORY DG2. 7.1 Construction and demolition waste Targets must be established to increase diversion of waste sent to landfill, with a minimum diversion rate target of 90%. Opportunities for re-use and recycling of materials in the construction phase must	**Aligns with DGfS** **2-Sustainable, Efficient and durable.** - Include initiatives to reduce waste	Aligns with Improved valuation, Pricing and Incentive Mechanisms Make reference to DG02.07 Waste Management
Total				**12**		**6**	**0**	**6**					
Land Use & Ecology				**6**									
Ecological Value	23.0	Endangered, Threatened or Vulnerable Species	Project can demonstrate that at the date of the purchase no critically endangered. Endangered or vulnerable species or ecological communities were present on the site.	Req	ECO / LAND	C			Partially	MANDATORY DG 02.06 - Ecological Conservation	MANDATORY DG 02.06 - Ecological Conservation Adequate due diligence must be conducted where an area of biodiversity or high ecological value is identified on the site, where at least 50% of this area must be retained	**Aligns with DGfS** **6- Whole of Life flexible and adaptive** Respond to the findings of a site appraisal including in-ground conditions, contamination, flora and fauna, flooding, drainage and erosion, noise and traffic generation	Aligs with Conservation of Biological Diversity Ecological Integrity EFSG DG02.06 Ecological Conservation
	23.1	Ecological Value	The ecological value of the site is improved by the project	3	LAND		1	1	Partially	MANDATORY DG 02.06 - Ecological Conservation	MANDATORY DG 02.06 - Ecological Conservation New and refurbished schools must: - Preserve or re-establish native flora (unless it poses a safety risk or cannot be designed around) and create new landscapes through liaising with local government authorities, Landcare and environmental groups, and the use of native low water use plants. - Consider opportunities for development of community garden within the site and relationships with community groups for this to occur. An Ecological Assessment Report must be developed for the site to document the following: - ecological values (current, future, and past) identified for the site and their protection measures - ecological impacts from light and noise pollution and water quality and their mitigation requirements - existing vegetated areas and biodiversity values being retained - how biodiversity has been considered within the project's material supply chain - list of management strategies to protect the integrity of ecological values throughout project planning, construction, and occupancy	**Aligs with DGfS** **Design Considerations** **1- Context, built for and landscape.** - Designed to recognise and protect the special visual qualities and natural environment and designed to minimise the development's impact on the environment. - Respond to its natural environment including scenic value, local landscape setting and orientation	Aligs with Conservation of Biological Diversity Ecological Integrity EFSG DG02.06 Ecological Conservation
Sustainable Sites	24.0	Conditional Requirement	At the day of the site purchase or option contract, the project site did not: Include old growth forest Include prime agricultural land Include a wetland of High National Importance Impact on Matters of National Significance	Req	LAND	C		C	Partially	MANDATORY DG03 - Site Selection	MANDATORY DG03 - Site Selection Prior to design and development, the following is required for each site. - Obtain surveys of pre-development conditions, including existing site, existing buildings and surrounding conditions, surrounding noise sources and local context. - Review local council development information, including future development plans for the local		
	24.1	Reuse of Land	75% of the site was previously Developed land at the date of the site purchase or for previously owned land at the projects GS registration	1	ESD				No	MANDATORY DG03 - Site Selection	As above		
	24.2	Contamination and Hazardous Materials	**Site Contamination:** The site has been previously contaminated to the exent that the intended uses were initially precluded. The developer has adopted and implemented a best practice site remediation strategy. The remediation strategy has been signed off by an auditor prior to issue of the occupation certificate. **Hazardous Materials:** A comprehensive hazardous materials survey has been carried out on any exisitng buildings or structures. Where the survey has identified asbestos, lead or PBC, the materials have been stabilized or removed in accordance to best practice guidelines.	1	CONTR	1			Yes	MANDATORY DG 03.02 - Site investigations DG 48 Hazardous materials	MANDATORY DG 03.02 - Site investigations An environmental risk report will be required for developments proposed within sensitive natural environments or sites subject to natural risks. Testing for toxic residues must be undertaken in all areas identified as being a possible risk - i.e. filled or dumped ground. DG48 - Hazardous Matrial- General Existing School Sites. Where works are proposed on an existing school site, a Hazardous Materials inspection and report should be conducted. In most cases such reports have been undertaken. New School Sites. Where a new school is to be developed a Hazardous materials study is to be conducted. Hazardous Materials inspection reports should be produced in accordance with the requirements of	**Aligns with DGfS** **6 -Whole of life, flexible and adaptive** - Respond to the findings of a site appraisal including in-ground conditions, contamination, flora and fauna, flooding, drainage and erosion, noise and traffic generation	
Heat Island Effect	25.0	Heat Island Effect Reduction	75% of the total project site area comprises building or landscaping that reduce the impact of the heat island effect.	1	ARCH	1		1	Partially	MANDATORY DG 20.03 Design Detailing DG 27.12 - Coloured Roof Sheeting TBC DG 90.05.03 - Landscaping - Shade	MANDATORY DG20.03 Design Detailing Use materials with a high Solar Reflectance Index (SRI) to reduce heat loss/gain and to reduce the heat island effect (unless local glare issues dictate otherwise). DG 27.12 - Coloured Roof Sheeting Unless prevented by glare issues to surrounding development, light colours must be selected to	**Aligns wirh EDGS** Contribute to Local Environment	
Total				**6**		**2**	**1**	**2**					
Emissions	**FALSE**			**5**									

CATEGORY / CREDIT	CODE	CREDIT CRITERIA	CREDIT DESCRIPTION	POINTS AVAILABLE	INPUT	Min. EFSG Requirement / Standard Practice / Inherent	Good Practice / highly Rec. / Buffer Points	Total Targeted	Captures EFSG (Yes / No / Partially)	Crossover with EFSG	Strategies	Alignment with GANSW Better Placed Manuals. Design Guide for Schools (DGfS) Environmental Design in Schools (EDiS)	EP&A Reg 2000 Alignment with SEARS clause 7 (4)
Stormwater	26.1	Stormwater Peak Discharge	Post-development peak event stormwater discharge from the site does not exceed the pre-development peak event stormwater discharge, using the Average Recurrence Interval (ARI) Management of stormwater peak flows may include one or more of the following techniques: •Stormwater reuse (Roof collection and reuse) •Water detention •Infiltration to native soils / plant stormwater treatment systems •Stormwater evapotranspiration	1	CIVIL / LANDSCAPE / HYDRAULICS	1		1	Partially	MANDATORY DG 2.4.3 - Stormwater Management DG95- Stormwater	MANDATORY DG2.4.3 Stormwater Management Stormwater management must aim to minimise the transportation of toxicants to waterways and other offsite environments, and maintain the existing hydrological regimes. Due diligence for flooding must be done early to inform building and landscaping design: - Water sensitive urban design - Reduction in area and connection of impervious surfaces. - Use of road gutters, overflow pipes, verges, swales, living streams. - Retention or detention of stormwater runoff from constructed impervious surfaces, including roof	**Aligns with DGfS** **2-Sustainable, Efficient and durable.** - Integrate landscape, planting and Water Sensitive Urban Design (WSUD) principles to enhance amenity and building performance	
	26.2	Stormwater Pollution Targets	All stormwater discharged from the site meets the required pollution reduction targets when compared to untreated runoff. Include detention tanks, Water Quality Treatment Devices & WSUD features	1	CIVIL	1		1	Partially	MANDATORY DG 95.11.01 Water Cycle Management Study DG 2.4.3 - Stormwater Management DG95- Stormwater	MANDATORY 95.11.01 Water Cycle Management Study The Water Cycle Management Study is to include the following considerations: - Rainwater reuse - On Site Retention and Detention		
Light Pollution	27.0	Light Pollution to Neighbouring Bodies	The project complies with AS 4248:1997 Control of the obtrusive effects of outdoor lighting	-	ELEC	CON		C	No	MANDATORY DG 63.08.01 - External Access Lighting	MANDATORY DG 63.08.01 - External Access Lighting		
	27.1	Light Pollution to Night Sky	A specified reduction in light pollution has been achieved by the project. Two options available to demonstrate.	1	ELEC	1		1	No				
Microbial Control	28.0	Legionella Impacts from Cooling Systems	This credit can be claimed where the building is either: Is naturally Ventilated Has waterless heat rejection Has water based heat rejection systems that include measures for Legionella Control and Risk Management	1	MECH	1		1	No	MANDATORY DG 51.09 - Microbial Control	MANDATORY DG 51.09 - Microbial Control Under the Public Health Act 1991, heated water to hand basins, showers etc. shall be stored at temperature above 65 C Thermostatic Mixing Valves are to be used for tempered water generation at each point of use.		
Refrigerant Impacts	29.0	Refrigerants Impacts	Point can be claimed if one of the following is achieved: The calculated Total System Direct Environmental Impact (TSDEI) of the refrigerant systems in the building is less than 15 The calculated TSDEI is between 15 and 35 and a leak detection system with automated refrigerant recovery is in place All refrigerants in the project have an ozone depletion potential of zero and a global warming potential of 10 or less No refrigerants are employed within the building systems.	1	MECH		0	0					
Total				**5**		**4**	**0**	**4**					
Innovation				**10**									
Innovative Technology or Process	30A	Innovative Technology or Process	The project meets the aims of an existing credit using a technology or process that is considered innovative in Australia or	10			1	1	Yes				
Innovative Technology or Process - Onsite Renewable Energy	30A	Onsite Renewable Energy	The project meets the aims of an existing credit using a technology or process that is considered innovative in Australia or the world.	2	ARCH / ELEC								
Innovative Technology or Process - Building Integrated Photovoltaics	30A	Building Integrated Photovoltaics	The project meets the aims of an existing credit using a technology or process that is considered innovative in Australia or the world.	1	ARCH / ELEC								
Market Transformation	30B	Market Transformation	The project has undertaken a sustability initiative that sustainably contributes to the broader market transformation towards sustainable development in Australia or the world.										
Improving on Benchmarks	30C	Improving on Benchmarks	The project has achieved full points in a Green Star credit and demonstrated a substantial improvement on the benchmark required to achieve full points.		CIVIL / LAND								
Innovation Challenge	30D	Innovation Challenge	The project can target any of the current innovation challenges published on the GBCA website or may propose a new Innovation Challenge.		ELEC								
	30D	Community Benefits			ARCH	1		1	Yes	TBC DC16.08 Community Use Facilities	TBC DC16.08 Community Use Facilities Some school facilities are used out of hours for activities such as weekend church groups, sport events and public meetings. The classification of spaces under the NCC may change due to the community use of facilities. Liaise with the Project Director to gain an understanding of any shared use, or community use arrangements that are being considered for the site. New schools should be designed so that direct access to the open play space, fields , hall and gym can be achieved without the public gaining access to the buildings.	**Aligns with DGfS** **3-Accesible and Inclusive** Schools should actively seek opportunities for their facilities to be shared with the community and cater for activities outside of school hours. **Aligns wirh EDGS** **4-Community Assets**	
	30D	Integrating Healthy Environments				1		1	Yes	Healthy Canteen Strategy	Healthy Canteen Policy research report in lieu of a community analysis report. Additionally, rather than providing a monitoring plan, Schools Infrastructure may focus on		
	30D	RAP				1		1	Yes	Reconciliation Action Plan	The Green Star project being rated can use an organisation Reconciliation Action Plan (RAP) to		
	30D	Universal Design				1		1	Yes	MANDATORY DG19 Access for People With Disabilities DG 65.14 - Hearing Augmentation System	MANDATORY DG19 Access for People With Disabilities DG19.01 All new facilities must meet current Deemed to Satisfy Provisions of the National Construction Code (NCC) and the associated standards (AS1428.1, AS1428.2 & AS1428.4).	**Aligns with DGfS** **3-Accesible and Inclusive** Ensure accessibility for all users of the site	
	30D	Amenity Space				1		1	Yes	PS602.01 Staff Room			
	30E	Digital Infrastructure				1		1	Partially	MANDATORY DG 64 Communications	MANDATORY DG 64 Communications 64.12.02 Networking Wireless New buildings and refurbishments are required to provide a common wireless solution compatible	**Aligns with DGfS** **5-Amenity** - Facilitate flexible learning by providing access to technology	
	30D	DFMA					1	1	Yes				
Global Sustainability	30E	Green Cleaning	Project Teams may adopt an approved credit from a Global Green Building Rating Tool that addresses a sustainability issue that is currently outside the scope of this GS rating tool.				1	1	No	● General Cleaning Specifications (Part F2) ● WEBClean School User Guide			
Total				**10**		**6**	**2**	**9**					
TOTAL						**46**	**19**	**64**					
				96									