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East Perth Primary School

Sustainability DA Report

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Title:	East Perth Primary School - Sustainability DA Report
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Description:	<p>This report presents the ESD Strategy for the proposed works to be undertaken for the new proposed East Perth Primary School, located in East Perth, WA – prepared as part of the project DA Submission.</p> <p>The project has completed an internal review against the Department of Housing and Works Technical Guideline 040 and the Green Star Buildings framework – targeting Australian Excellence in sustainable design. There is no intent to complete a peer review or formal certification for the project.</p> <p>Rev A is issued based on a review of the Schematic Design reporting for the project.</p>

Revision	Date	Checked by		Transmitted by	
A	30 th September 2025	X	GEA	X	IA
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C	28 th October 2025	X	GEA	X	IA

Distribution	Revision						
	A	B	C				
Receiver							
EIW Architects	X	X	X				
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Executive Summary

This report outlines the sustainable design inclusions for the East Perth Primary School. The report is based on target design initiatives to meet Department of Education guidance for sustainable design inclusions in education projects and Department of Housing and Works requirements for non-residential government projects.

The project is aiming to meet the intent of at least 35 points under the Green Star Buildings framework. The Department of Education have indicated that the project does not intend to target a formal certification, however, the design team are to demonstrate compliance with design intent as part of reporting through to the end of Contract Documentation.



By FCDS analysis, the project team have identified 46 points which are intended to be included within the final delivered project – exceeding the target by around 11 points ~30%. FCDS are therefore confident that the project will easily achieve its target performance.

Key design features included in the design are as follows:

- Onsite Renewable Energy generation – 100kW Peak output PV array
- Sophisticated water and energy metering systems
- High quality lighting design and fittings
- Building envelope performance improvement, including onsite performance verification with pressure testing
- Acoustic and air quality performance verification on site
- Nature play and interaction for students
- Waste management and diversion plan to avoid landfill
- Climate resilient design

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1. Introduction

FCDS have been commissioned to provide sustainable design advice for the East Perth Primary School. This report is issued as part of the DA submission, summarising the sustainable design strategy for the project.

In compiling this report, FCDS have reviewed the schematic design report from all major design disciplines for the school and cross-referenced Green Star Building’s requirements with briefed outcomes from both the Department of Education Secondary School Guidelines and the Department of Housing and Work’s TG 040 – Environmentally Sustainable Design Guidelines for Non-Residential Government Buildings. Where relevant, FCDS have provided recommended optional features which can contribute to:

- Kep Katjin water saving intent
- Occupant Health and Comfort:
- Promotion of Healthy Living:
- Excellent Performance in Operation:
- Resilience and Durability:
- Responsible Material Use – Construction and Operation:
- Education and Engagement
- Minimisation of operational carbon and achieving carbon neutral operations

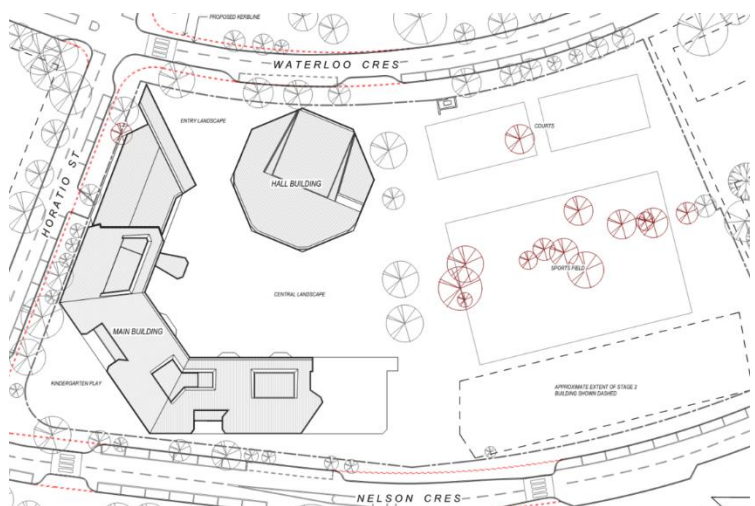
Overall, the design is to achieve ‘Australian Excellence’ sustainable outcomes, by self-comparison to achieve at least 35 points under the Green Star Buildings framework – considered a nationally accepted benchmark.

1.1 Site Description

East Perth Primary school is to be developed on a currently bare site between Waterloo Crescent and Nelson Crescent, along Horatio Street, in East Perth, a short distance from Perth’s CBD.

The proposed project works include two new buildings, with allocated space for future expansion with transportable classrooms or additional teaching blocks.

The design is intended to house 600 students upon opening in 2029, with potential expansion to 800. The site area is just over 16,400m², with a connection planned for community involvement



Block	Occupied Area m ²	Total Area m ²	Occupied Spaces
Hall Building	220	346	13
Main Building	2970	3090	38

Roof colour is expected to be light and the works have been briefed to include at least a 60kW peak output solar array. Works also include dedicated nature play and landscaped areas, with shaded bike parking and covered courts with a sports oval.

Construction cost is estimated at ~\$100.7M, including \$1.13M allowance for sustainable design inclusions.

1.2 Project Targets

The project is aiming to achieve the intent of at least 35 points (5 Star / Australian Excellence level) when compared to the Green Star Buildings rating system.

Design features to prioritise energy efficiency and simplification of operations as well as improving occupant comfort are being prioritised and specific design targets for key parameters are to be set.

Category	Target	Design Team Response
General Sustainability	Best Practice Design	The project is targeting demonstrating intent of 35 points under the Green Star Buildings rating tool – representative of 5 stars – Australian Excellence.
	Operational Performance	Monitor and tune building performance in operation – targeting <50kWhrs per m ² . Benchmarking should be carried out to the new NABERS for Schools system, targeting 4 Star performance.
Energy Consumption	10% Improvement over BCA 2022 Minimum Practice - Facade	This will require insulation and glazing performance in excess of minimum standard, FCDS Section J reporting is in alignment with this requirement.
	15% Improvement over BCA 2022 Minimum Practice - Overall	<ul style="list-style-type: none"> Energy efficient services (lighting and mechanical in particular) to be provided. Reverse cycle heat pump (gas boost) for DHW
	Renewable Energy	The project should include a large solar photovoltaic array, up to around 100kW peak for the campus. Consideration should be given to provision of a battery to improve on site utilisation of solar generation.
Water Consumption	Low Flow Tapware	Ensure all taps, showers, WC's, urinal, dishwashers and washing machines provided are within 1 star of the best available WELS rating.
	Waterwise Irrigation	Utilise drought tolerant and native planting where possible. Utilise rain / moisture sensing and sub-soil drip irrigation for all planted areas.
Waste Targets	75%+ Recycling in operation	Design to facilitate capture of recyclable goods and use of comingled recycling. Minimum three waste streams to be collected. Align with Waste Sorted framework for waste management on site.
	>90% Recycling in construction	Use of high efficiency resource recovery facility to sort waste in construction.
Durability	>10 Years for Common Area Finishes	Internal finishes shall target >10 year life spans, with minimal repair and maintenance rather than regular replacement.
IEQ	Mixed Mode Operation	Key spaces to be able to function in air conditioned or naturally ventilated modes.
Transport	Mode Shift	Provide potential for EV charging to 20% of new bays – and install at least one bay initially.

2. Feature Summary

The following elements are part of the Department of Education expectations for a 5-Star level, self-assessed primary school. These are to be incorporated within the design:

	Feature	Comment
Minimum Green Star Compliance	General ESD	Reporting and analysis, based on experience and high level review.
	Building Modelling	Energy and Daylight modelling for credit justification.
	Contractor Environmental Management	Contractor to create an EMP, hold an ISO 14001 Certified EMS and divert 90% of C+D waste from landfill. Costs associated with reporting and audits, if required.
	Service and Maintainability Review	Completed by ESD consultant and BTW review for major design milestones
	Metering Upgrades	Water Metering and monitoring system upgrades
	Building Envelope Pressure Test	Specialist contractor : includes two rounds of testing.
	Building Tuning	Undertake performance monitoring and optimisation during DLP
	Building Logbook + O&Ms	Documentation around building operations and handover.
	Landscape Bin Allocation	Provide fixed bins to facilitate waste segregation within the landscape package. Minimum 3 Streams. Align with waste sorted school's framework.
	Waste Management Plan	School planning is to align with DWER Waste Sorted Schools. Formal certification requires a site-specific plan.
	Exhaust Systems	Exhaust systems are provided to all major internal sources of contamination.
	Lighting Modelling	Electrical design scope to include modelling to all typical occupied spaces.
	Light Fitting Quality	Cost for fitting upgrade TBC - budget at \$2 per m ² .
	Acoustic Strategy	Acoustic consultant to provide acoustic design report outlining key performance outcomes and design intent.
	Climate Change Resilience	Completion of a risk assessment. Design interventions not included in cost.
	Water Savings	Minimum compliance requires a 10% potable water reduction. This should be achievable with efficient irrigation systems and low flow tapware.
	Zero Carbon Action Plan	Required for formal submission. Simple where sites are electrified. FCDS are to complete this work.
Staff change, showers and lockers.	Provide facilities to support active transport.	
Inclusive Construction Practices	Main contractor to provide best practice OH&S support to contractors and sub-contractors.	
Light Spill	Electrical design will avoid light spill from site. No modelling included within proposed approach.	
4 Star / TG 040 Compliance	ESD Peer Review & Registration	Documentation for peer review.
	Responsible Procurement Plan	Provision of procurement plan formalising procedure / approach.
	Climate Change Resilience & Energy Efficiency	Building Envelope Improvement - Upgrade of glazing, roof and wall insulation to exceed BCA minimum compliance requirements - improve natural lighting, thermal comfort and energy outcomes.
	Heat Island Mitigation	Planting, shade structures, light coloured finishes. Ensure all paved areas (other than car parks) have a 3 year reflective index >64.
	Life Cycle Assessment	Formal assessment of building upfront and life cycle footprint. Carbon emissions for demolition to be reviewed.
	Solar Array	Provide 60kW PV Array – increased allowance across the site – included within budget.

	Feature	Comment
5 Star – Australian Excellence	Acoustic Comfort	Design verification on site. Additional costs, potential for construction upgrades.
	Building Envelope Pressure Test	Complete design phase envelope review
	Onsite air quality testing	Testing on site will validate construction performance for material selections and ventilation
	Operational Energy Offset	Cost estimate to source operational energy as green energy for 5-Years. Requires modelling to confirm. Operational budget of 50kWhrs/m ²
	Refrigerant Offset	Cost to offset carbon footprint associated with refrigerants. Estimated based on standard mechanical design.
	Climate Change Resilience	Mechanical Heat Rejection - Increase design ambient heat rejection to 40°C. Include 10% safety on mechanical loads.
	Energy Use	Upgrade PV array to 100kW
	Non-Potable Water	Cater for non-potable water usage within blocks.
	Enjoyable Places	Cater for public use of buildings with shared spaces, playgrounds etc.
	Contribution to Place	Provide benefits to the local community.
	Design for Inclusion	Ensure the building is designed and constructed to be inclusive of a diverse range of people, with different needs. No reporting included.
	Biodiversity Improvement	Target compliance for landscaped area. Landscaping and biodiversity is to be diverse and resilient to climate change impacts, thereby increasing the longevity of the landscape
	Waterway Protection	Design will retain stormwater on site, with appropriate pollutant management to avoid contamination of ground water. MUSIC modelling not included.
Additional Elements	Independent Commissioning Agent	Appointment of specialist consultant for review of commissioning and handover
	Nature Play and Interaction	Occupants can interact with nature either inside the building, or externally through a green wall or roof garden. At least 5% of the building's floor area/ or site area (whichever is greater) must be allocated to this opportunity. The allocated area must be accessible and have the necessary infrastructure to allow the activity to occur (for example water source/taps for irrigation, storage area for tools and equipment
	Sustainable Transport	Provision of 1 EV chargers (pending final car park numbers) and preparation of a sustainable transport plan.

3. Responsible Design Features

The Responsible category refers to credits which are intended to minimise ecological footprint by control of the design, construction and commissioning process. The features also include elements to optimise operational performance through design of effective spaces and measuring consumption.

The following section outlines FCDS expectation with respect the Responsible design elements intended to be included by the project team:

3.1 Sustainable Design Professional

The project team have included sustainable design considerations from schematic design phase and will continue through to practical completion and beyond.

3.2 Marketing Excellence

The design team documentation will be shared with key project stakeholders. This is considered to meet the intent of the credit only for the purposes of self-assessment.

3.3 Environmentally Responsible Construction

The main contractor will be expected to implement an environmental management system, using ISO 14001 practices to monitor its implementation on site.

The plan will include waste management and minimisation, targeting a minimum of 90% of construction and demolition waste diversion from landfill.

Contractors visiting site for more than 3 days will be required to undertake site familiarisation and sustainable design training covering design features for this development, as well as a wider overview of sustainability issues, FCDS will assist with the preparation of training materials.

3.4 Commissioning, Verification and Handover

The design team have been provided clear design targets for environmental performance – refer to Section 1.3 above.

The designers and contractors will complete a constructability and maintainability review as part of the shop drawing process. FCDS recommend appointing a specialist consultant to oversee and report on this element.

Commissioning will be in accordance with best practice international standards, including CIBSE, ASHRAE and Airah. The building envelope will be tested for air leakage prior to practical completion. FCDS recommend architectural design scope is extended to cover a detailed assessment of this element.

Common area services will be closely monitored over the first 12 months of operation to minimise performance issues and optimise operational efficiency against design targets.



Green Building Council of Australia

certifies that

Imran Ahmed

has obtained the following qualification

Green Star® Accredited Professional

The Green Star® Accredited Professional qualification recognises advanced knowledge and experience in sustainability, and competency in the application of the Green Star® rating tools.

Jul 2023 – Jun 2025
Continual Enrolment



Green Star – Buildings Exam – 21 Feb 2023

Davina Rooney

Davina Rooney
Chief Executive
Green Building Council of Australia

The designers will include meters for major electrical, and water uses, with a new metering system for analysis and reporting.

Detailed handover documentation will be provided to building stakeholders in electronic format, including As Built drawings and functional control descriptions.

3.5 Operational Waste

The school will have input from a specialist waste consultant to minimise operational waste to landfill.

3.6 Responsible Procurement

A sustainable procurement plan will be delivered and will consider sustainable procurement for key elements such as:

- Steel
- Concrete
- Refrigerant
- Floor Coverings
- Paints
- Adhesives and Sealants
- Blinds
- Glass
- Wood Products
- Insulation
- Landscape
- Solar Panels

3.7 Responsible Products

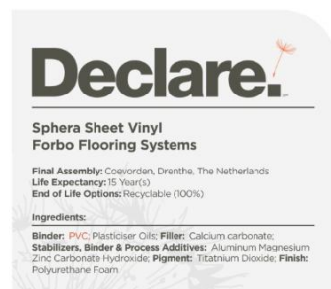
This category review products selected for building structure, envelope, systems and finishes and provides points for projects which can demonstrate performance improvement over standard practice.

The design team will target design features which align with the following metrics:

Metric	Score
• Industry specific environmental product declarations (EPD)	2 Points
• Product specific environmental product declarations (EPD)	4 Points
• ISO14001 certification	3 Points
• Reused Product	15 Points
• FSC Certified	10 Points
• Best Practice PVC certification	5 Points

Based on our understanding of the project and recent experience in this space, FCDS expect the project team will deliver sustainable material selections in building envelope and finishes. FCDS note the following, common products with strong sustainable design credentials:

- Vertilux Blind Green Tag – Level A
- Autex Acoustic Finishes Green Tag – Level A
- Forbo Flooring EPD, Green Tag – Level A, Declare Compliant
- Laminex Laminate E0, FSC Certified, Green Tag Level A, E0 Rated
- Shaw Contract Carpet Low VOC, Green Tag Compliant
- Dulux Paints EvirO2 Low VOC, EPD, product stewardship



4. Healthy Design Features

The Healthy credit category is about ensuring the building provides a strong response to occupant health and wellbeing. Features supporting air quality, views, access to light and noise contribute to point scoring within this category:

4.1 Ventilation System Attributes

Outside air and natural ventilation systems are to comply with the prescriptive requirements of AS 1668.2 (mechanical ventilation) and AS 1668.4 (natural ventilation) for air quantity, intake location and exhaust separation.

Outside air rates are to be increased by at least 100% over the minimum requirements of the Australian Standards, which will require the use of ducted air conditioning units and MERV 8 (F5) filters.

Local exhaust systems are to be provided to isolate occupied spaces from contamination such as kitchens.

4.2 Lighting Systems

Lighting systems are to be flicker free and provide a minimum Colour Rendering Index (CRI) average R1 to R8 > 85, and a CRI R9 > 50r, with a maximum of 3 MacAdam Ellipses.

The design will meet best practice illuminance levels for each task within each space type with a maintained illuminance values must achieve a uniformity of no less than that specified in Table 3.2 of AS/NZS 1680.1:2006.

4.3 Glare Control

External shading systems will generally exclude direct solar radiation to workspaces.

Lighting systems are to be provided with diffusers or other design features which maintain direct glare from the luminaries below the UGR (Unified Glare Rating) limit within AS 1680.1

4.4 Access to Daylight

All occupants have excellent access to natural lighting through strong passive design (north facing windows with overhangs) and relatively shallow plans. FCDS will complete building modelling and daylight analysis to quantify performance.

4.5 Noise Levels

The use of high-quality mechanical plant and good architectural detailing will result in comfortable internal noise levels, generally matching AS 2107. The design also includes walls and space layouts to limit noise carryover from loud to quiet spaces. Ceilings and finishes are expected to be detailed to limit reverberation within the space.

The acoustic consultant has provided a variation (recommended to appoint) for onsite verification of performance at completion.

4.6 Low Toxicity Products

The design team are expected to select finishes and composite wood products with low Volatile Organic Compound (VOC) and low formaldehyde content. This includes joinery, carpets, adhesives and sealants. Wall and ceiling paints will target a level <5 g/L for VOC content.

FCDS will specify on site air quality testing in key locations at completion.

4.7 Amenity and Comfort

The intent of the Amenity and Comfort credit is to provide internal and external spaces, allocated to promote either inclusivity, mindfulness, exercise or relaxation.

FCDS believe that the internal activity spaces, covered assembly and play areas meet the intent of this credit and would seek acceptance under a formal ruling if the project was to seek certification.

4.8 Connection to Nature

At least 60% (close to 100% for this project) of spaces are within 8m of a view to outside, including nature. FCDS recommend the project team target the use of natural finishes and motifs to further promote the connection of users to nature.

The landscape design will include nature play to improve interaction opportunities for staff and students.



5. Resilient Design Features

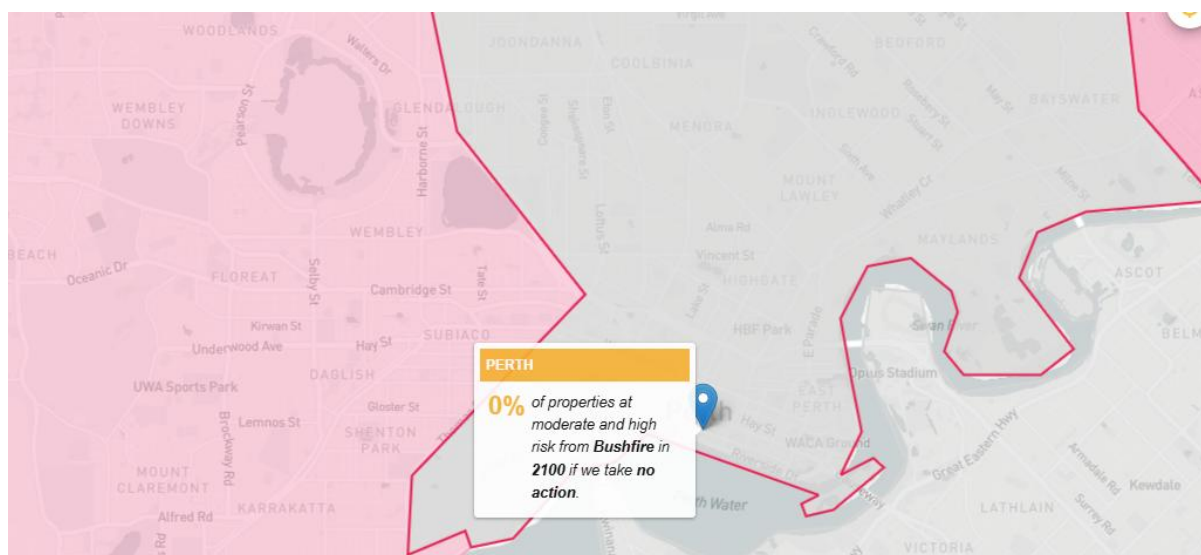
The Resilient category of credits highlights the need for projects to be ready for the imminent impacts of climate change and to provide a level of support to the surrounding community. Shocks to power infrastructure, ongoing weather pattern adjustment and the urban heat island effect are considered within the category.

5.1 Climate Change Resilience

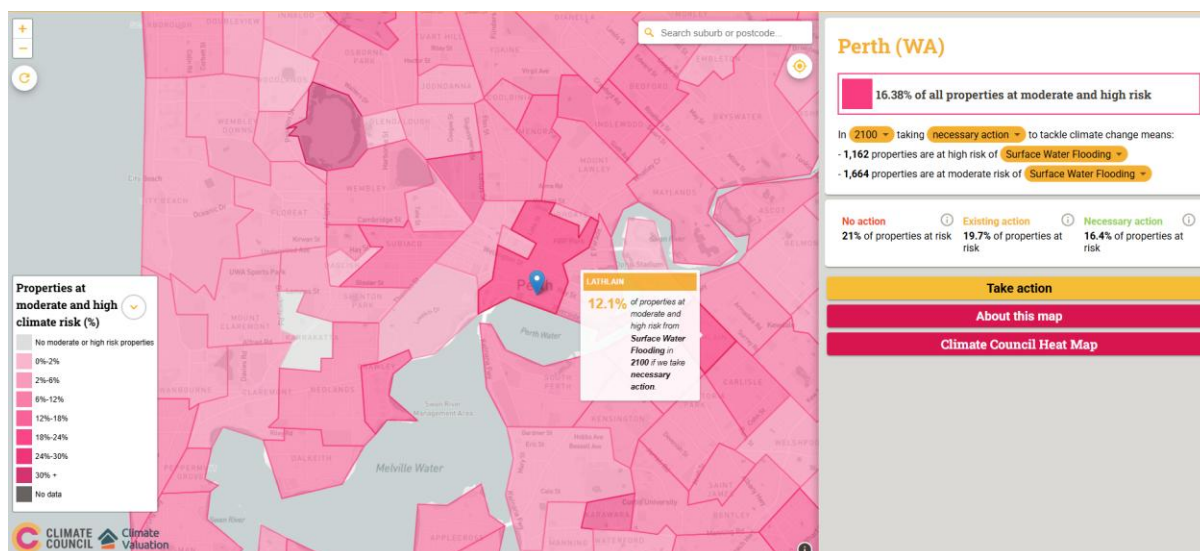
FCDS have undertaken a base review of the project and the potential likely impacts of climate change on the site, based on the following likely impacts of climate change in South West WA:

Variable	Current	Predicted	Expected Change	Possible Range
Annual Average Temperature (°C)	25.8°C	29.3°C	+3.5°C	28.4 – 30°C
Number of days over 35°C	28	63	+35	50-72
Annual Average Rainfall (mm)	851.7mm	698mm	-18%	536 – 809mm
Summer	40.5mm	38.5mm	-5%	27.9 – 55.1mm
Autumn	144.1mm	135.4mm	-6%	98 – 162.8mm
Winter	398.2mm	282.7mm	-29%	223 – 338.5mm
Spring	147.5mm	94.4mm	-36%	60.5 – 126.8mm
Annual Average Potential Evaporation	1800mm	1836mm	+2%	1818-1872mm
Annual Relative Humidity	55%	54.4%	-0.6%	53.7 – 55%

The site is considered a moderate risk to flooding under climate change scenarios, but has no risk of bushfire, with the actual school site itself away from bushfire prone areas:



<https://www.climatecouncil.org.au/resources/climate-risk-map/>



<https://www.climatecouncil.org.au/resources/climate-risk-map/>

Checklist	Criteria Response	Has Data Regarding Future Climate Exposure Been Reviewed	Has a risk to the project been identified?	Has a risk treatment been identified?
	(Yes / No)	(Yes / No)	(Yes / No)	(Yes / No)
Has the project area been previously impacted by extreme climate events? (e.g. storms/tropical cyclones, extreme rainfall and flooding, damaging winds, damaging hail, bushfires, heatwaves, drought, coastal inundation) Please indicate which events.	No*	Yes	No	NA
Is the project located in a cyclone zone?	No	Yes	No	NA
Is the project located in or adjacent to a bushfire prone area?	No	Yes	No	No
Is the project located in or adjacent to a flood prone area?	Yes – The project is not located in a flood prone area, but has potential risk for surface water flooding in 2100.	Yes	Yes	NA
Is the project located at or adjacent to the coastline or tidally influenced waterway?	No	Yes	No	NA
Will the project accommodate occupants vulnerable to the impacts of climate extremes? (e.g. children, elderly, low mobility, seeking medical treatment)	Yes	Yes	Yes	NA

* FCDS have reviewed Bureau of Meteorology storm data base for the site, with no significant events in the past 6 years, and relatively few in the past 15.

The checklist above identifies two main risks to meet Green Star requirements; flood risks and the presence of children – a potentially at risk group for climate change.

5.2 Climate Change Risk Management

Following the base risk review above, FCDS recommend the design team to consider the inclusion of the following features to mitigate risks and provide an improved outcome for occupants and the local community:

Climate Change Impact	Risk	Proposed Response
Increased temperatures lead to increased bushfire risk and intensity.	Low due to current classification of site.	Consider provision of air filtration on air conditioning systems. Compliance with bushfire codes.
Rising sea levels and increased flood risk.	Moderate risk.	Avoid construction below ground level. Ensure structure can adapt to changing water levels.
Reduced rainfall	Increasing requirement for irrigation, increased cost of scheme water.	Utilise smart irrigation, including moisture detection and prioritise drought tolerant planting. Limit turf as far as practical
Increased temperatures lead to increased reliance on air conditioning.	Building is unable to provide comfortable environment for extended periods.	Provide high efficiency air conditioning systems with automatic controls. Upgrade building envelope in excess of BCA minimum requirements.
Increased temperatures lead to increased power demand.	Operating cost increases as electrical prices increase. Power security becomes questionable.	Good control systems and energy efficient design. Installation of solar photovoltaics for renewable generation.
Increased temperatures place increased risk on occupants – children	Moderate. Project is a primary school, without special needs facilities.	Efficient air conditioning, envelope performance in excess of BCA minimum requirement, external shaded area, heat resilience.

5.3 Operations Resilience

Whilst the project team have identified no significant risks in terms of operation under the loss of power, the design includes features which improve operational resilience under major shocks to electrical infrastructure including:

- Strong solar passive design
- Building envelope upgrade above minimum compliance
- Onsite renewable generation

Under black out, the school's ability to function will be compromised, however, access to natural light and ventilation in teaching spaces will allow these areas to be functional and provide shelter for occupants.

FCDS are recommending provision of batteries as part of the proposed design to cater for operation in island mode and improve school and local grid resilience.

5.4 Grid Resilience:

The building will be designed to reduce its electricity peak demand by 10% of the annual peak electricity demand for at least a one-hour period through a variety of features, some of which may include:







- Improved building envelope
- Outside air management and control
- High efficiency systems
- On site renewable generation.

Building modelling is to be undertaken to verify this outcome.

FCDS are recommending provision of batteries as part of the proposed design to cater for operation in island mode and improve school and local grid resilience.

5.5 Heat Resilience

The project should include the selection of light colours to external finishes as well as shaded area (from fixed building shading and planting) and landscape integrated into the site to minimise the impacts of urban heat island on the site. The following table shows the recommended colour palettes with respect colours and solar absorbance:

Usage	Initial SRI	3 Year SRI	Sample Product
Metal Roof > 15° Pitch	>34	>39	 <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Shale Grey™ SA = 0.43 SRI = 66</p> </div> <div style="text-align: center;"> <p>Dunes+ SA = 0.47 SRI = 67</p> </div> <div style="text-align: center;"> <p>Windsprays+ SA = 0.58 SRI = 46</p> </div> <div style="text-align: center;"> <p>Pale Eucalypte SA = 0.60 SRI = 43</p> </div> </div>
Hardscape			<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Bamboo (35-48)</p>  </div> <div style="text-align: center;"> <p>Grey Limestone (54)</p>  </div> </div>
Metal Roof < 15° Pitch	>82	>64	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Surfmist+ SA = 0.32 SRI = 82</p> </div> <div style="text-align: center;">  <p>Classic Cream+ SA = 0.32 SRI = 82</p> </div> <div style="text-align: center;"> <p>White Concrete (86)</p>  </div> </div>

Based on FCDS initial site review, the project should be able to achieve compliance without shading car parks, provided light paving and shaded structures are used throughout.

6. Positive Design Features

The Positive category refers to design elements which contribute positively to the environment. Buildings must actively reduce their harm, but also act as a restorative force for good in order to achieve credits. The category assesses energy use, energy source, water consumption and refrigerant emissions, aligning with the National Standard for carbon neutral assessment and certification (Climate Active).

6.1 Upfront Carbon Emissions

The design team will target material selections which reduce the embodied energy by a minimum of 10%. Features to support this include reduction of cement and steel quantity and using masonry in lieu of curtain walls.

FCDS will progress modelling as the built form progresses, however, will be seeking to include at least some of the following inclusions:

- Use of PT slab
- Replacement of cement – target 30% against standard practice
- Use of low-energy steel reinforcement
- Avoidance of finishes in some areas
- Specification of high recycled content or natural materials such as timber.
- Potential for low carbon aluminium frames

6.2 Energy Use

The design team will ensure low energy use by improving performance against BCA Section J minimum, across building envelope, air conditioning and ventilation systems and lighting.

The design team are confident that the proposed energy efficient design features and onsite renewable generation will represent an annual energy consumption reduction of at least 30% against BCA minimum requirements. Modelling will be undertaken to verify this performance as the design progresses.

6.3 Energy Source

The design will omit all fossil fuels for heating, hot water and cooking.

6.4 Other Carbon Emissions

The project team will minimise carbon footprint associated with refrigerants as far as practical with plant location and system configuration. Where possible, low GWP refrigerants will be used.

Contractors will be required to quantify and offset the carbon footprint associated with their refrigerants as part of the tender process.

Material	PER embodied energy MJ/kg
Air dried sawn hardwood	0.5
Stabilised earth	0.7
Concrete blocks	1.5
In situ concrete	1.9
Precast tilt-up concrete	1.9
Kiln dried sawn hardwood	2
Precast steam-cured concrete	2
Clay bricks	2.5
Gypsum plaster	2.9
Kiln dried sawn softwood	3.4
Autoclaved aerated concrete (AAC)	3.6
Plasterboard	4.4
Fibre cement	4.8
Cement	5.6
Local dimensioned granite	5.9
Particleboard	8
Plywood	10.4
Glue-laminated timber	11
Laminated veneer lumber	11
MDF (medium density fibreboard)	11.3
Glass	12.7
Imported Dimensioned Granite	13.9
Hardboard	24.2
Galvanised steel	38
Acrylic paint	61.5
PVC (polyvinyl chloride)	80
Plastics — general	90
Copper	100
Synthetic rubber	110
Aluminium	170

6.5 Water Use

The development is targeting a minimum 15% reduction in water consumption against benchmarks, including the provision of low flow fixtures are being provided for sanitary uses in accordance with the table below:

Fixture Type	Minimum WELS rating	Maximum Flow Allowable
Taps	5 stars	4.5-6 L/min
Urinals	5 stars	1.0 L / Flush + Smart demand flush device
Toilets	4 stars	<3.5 L average flush <4.7L full flush, <3.2 half flush
Showers	3 stars	6.0 – 7.5 L/min

6.5.1 Rainwater Reuse

Rainfall reuse generally does not provide good economic returns in Perth. The highly seasonal nature of our rainfall along with potential health risks associated with long-term storage of untreated water makes rainfall reuse outside of domestic applications highly problematic and, generally, uneconomic.

In lieu of non-potable water systems being installed now, the project team are aiming to cater for non-potable water use within the blocks, through plumbing water supplies for toilet flushing separately to potable water use.

6.5.2 Landscape water use:

The landscape design provided should include a combination of native plant mixes and turfed areas. The recommended planting palette should be native to Western Australia. Overall plant selections should contribute to a drought-tolerant variety and have a low crop coefficient, contributing to reduced irrigation demand.

Drip irrigation has not been briefed for the site.



7. Places Design Features

The places category reflects outcomes that are linked to the location and nature of the development. Design features which reduce the impacts of transport – on the environment and occupant health – are rewarded with credits. In addition, proximity of the development to local amenity and public transport which can promote walking and reduce reliance on vehicles is also recognised.

Within the site, the category considers the provision of communal spaces and their potential beneficial impacts on the occupants. Externally, project teams are encouraged to engage with, consult and justify their design to the local community as well as their shareholders.

7.1 Active Transport

The design includes for under cover bike parks for students. Staff facilities will also be provided to support active commuting.

7.2 Sustainable Transport

In addition to active transport facilities, the intent is to facilitate EV charging.

8. People Design Features

The People category of credits provides an increased emphasis on social sustainability outcomes within the Green Star system. Projects are required to consider gender inclusivity and provide staff support around issues such as mental and physical health as part of their impact on the people building the project as well as the people who will use it long term.

The category also rewards projects that deliver strong outcomes for Indigenous or disadvantaged and under-represented social groups.

8.1 Minimum Requirements

The main contractor will be required to provide gender specific bathrooms and PPE on site and provide policies and training on discrimination, racism, bullying, drug and alcohol awareness and mental health.

FCDS will specify a requirement for the contractor to introduce programs and solutions to address at least five current health issues such as suicide prevention, healthy eating and depression.

8.2 Needs Analysis

The contractor will be required to complete a needs analysis of site workers and contractors to inform the programs and policies implemented.

8.3 Design for Inclusion

The GBCA have recently lowered the benchmark for achieving this credit and the Department of Education have briefed for project teams to achieve this credit. Design requirements include:

Feature	Outcome
Equal Access to the Building	Design includes stairs, with ramps and lifts where students are required to change levels.
Diverse Wayfinding	Design is expected to include features like tactiles. Potential to include hearing augmentation. Potential to include different colours for blocks, or similar to improve student outcomes.
Inclusive Spaces	Design should include inclusive play areas, quiet rooms and the like.
Other	Where schools are provided with Education Support facilities, these can also contribute to credit achievement.

9. Nature Design Features

The Nature category is based on providing design solutions which prioritise and restore the natural environment around prospective developments. Features consider biodiversity, previous site usage, site emissions and waterway protection. Projects are required to demonstrate best practice performance across the range of local impact areas considered.

9.1 Minimum Requirements

- The site is not an old growth forest, prime agricultural land or within 100m of a nationally significant wetland.
- The external lighting will comply with AS 4282 – Control of the obtrusive effects of Outdoor Lighting
- No external light fitting will have an Upward Light Output Ratio (ULOR) of more than 5%.

9.2 Ecological Value

The current and future ecological value of the site will be retained through the use of primarily native planting, with green spaces across the site.

As the existing site is an existing car park, there is very limited requirement to achieve this outcome.



Landscape design will be reviewed as it progresses.

9.3 Stormwater

The design is to infiltrate a proportion of stormwater into local ground water, aiming to minimum outflow and achieve pollution reduction matching the performance below:

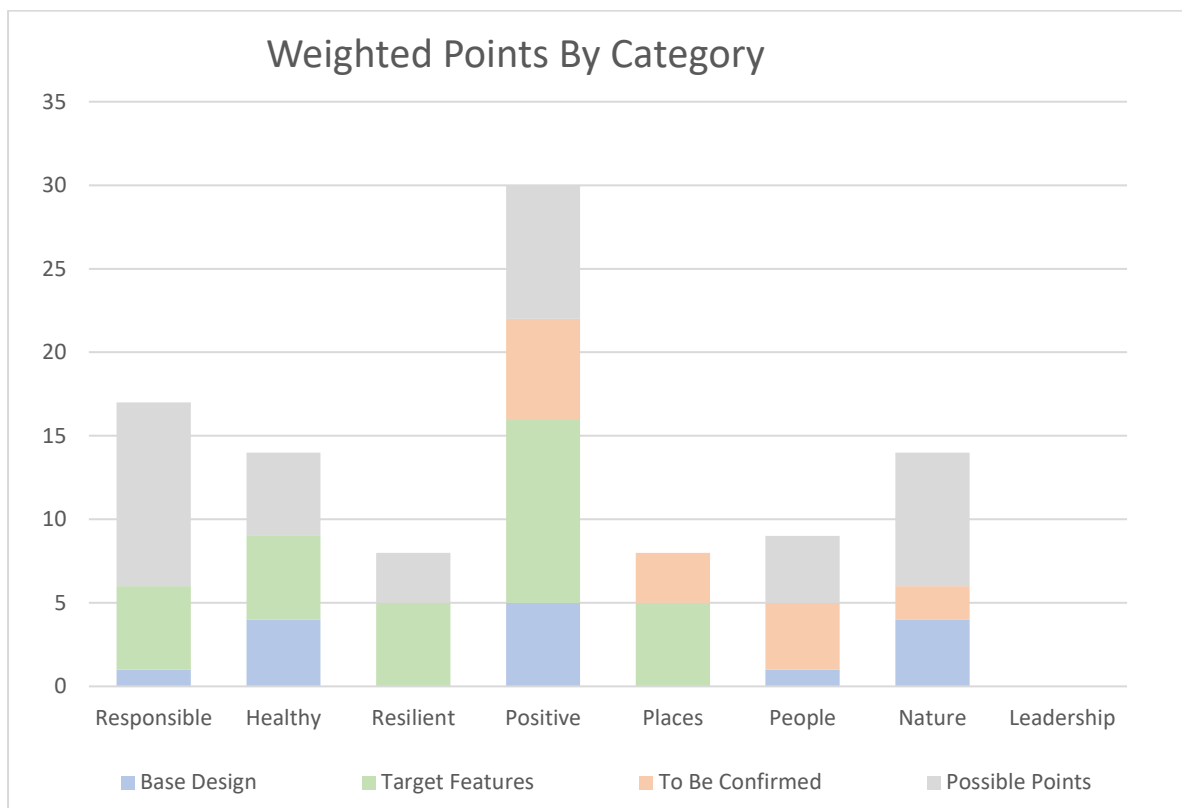
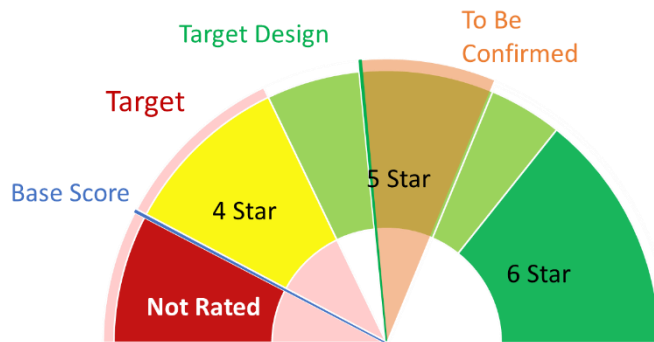
Pollutant	Contaminant Reduction
Total Suspended Solids (TSS)	90%
Gross Pollutants	95%
Total Nitrogen	60%
Total Phosphorus	70%

10. Green Star Review

The design intent currently targets more than 40 points, well over the 35 point target for 'Australian Excellence'.

The project is not undertaking a formal assessment by the GBCA.

As shown from the chart below, briefed performance requirements score well in healthy and low carbon (positive) buildings.



Remaining 'to be confirmed' credits are expected to be determined in the near future as material selections and energy modelling is completed.



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