



Kyeemagh Public School



ESD Report



Rev	Date	Description of Revision	Prepared By	Reviewed By
P1	08/11/18	Draft	SM	MA
P2	13/11/18	Preliminary Issue	SM	MA
P3	11/01/19	For Review	SM	MA
P4	23/09/19	For Review	TN	MA

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1.introduction

1.1 general

This ESD Report has been prepared for dwp as part of the SSD 9391 application for the proposed Kyeemagh Public School redevelopment at Jacobsen Ave and Beehag St in Kyeemagh, NSW 2216.

This report details how ESD principles as defined in clause 7(4) of Schedule 2 of the Environmental Planning and Assessment Regulation 2000, as well as the Educational Facilities Standards and Guidelines (EFSG), will be incorporated in the design and ongoing operational phases of the development.

This report includes:

- Initiatives that would minimise the consumption of resources, water and energy.
- Demonstration of assessment against a suitable accredited rating scheme to meet industry best practice.

The sustainability initiatives proposed for the development including water and energy efficiency initiatives are in addition to the minimum compliance requirements of the BCA (i.e. Section J).

It is expected that as a result of the implementation of the sustainability initiatives discussed within this report, the Kyeemagh Public School development will achieve a high level of environmental sustainability.

1.2 project description

The proposed development is nestled on the edges of Botany Bay, in the suburb of Kyeemagh in the South Sydney region and forms part of the Kogarah Primary Cluster. The NSW Department of Education has proposed to expand the school from a K-2 to K-6 school.

The redevelopment of Kyeemagh Public School is part of the NSW Government's 2018/19 plan to deliver more than 170 new and upgraded schools. The NSW Department of Education as identified the following upgrades to the proposed development:

- New future-focused classrooms;
- New Staff/Administration area;
- New Library, Hall, Amenities (Games Court, Outdoor Car Park) and Canteen;
- A new covered outdoor learning area (COLA).

The redevelopment will enable the school to continue to upgrade its core facilities to address enrolment growth, as well as to strive to be a preferred education provider in the area.

The proposed works involves the construction of a new two-storey Consolidated Northern Building, a single storey Staff and Administration Building and a Community Hall. The proposed works will also include site landscaping

1.3 sources of information

This report is based upon the following information:

- Architectural plans (where available);
- Concept Plans
- Acoustic Assessment Report, REF: 610.17503-R01, Version 1.0, prepared by SLR Consulting Australia

1.4 site overview

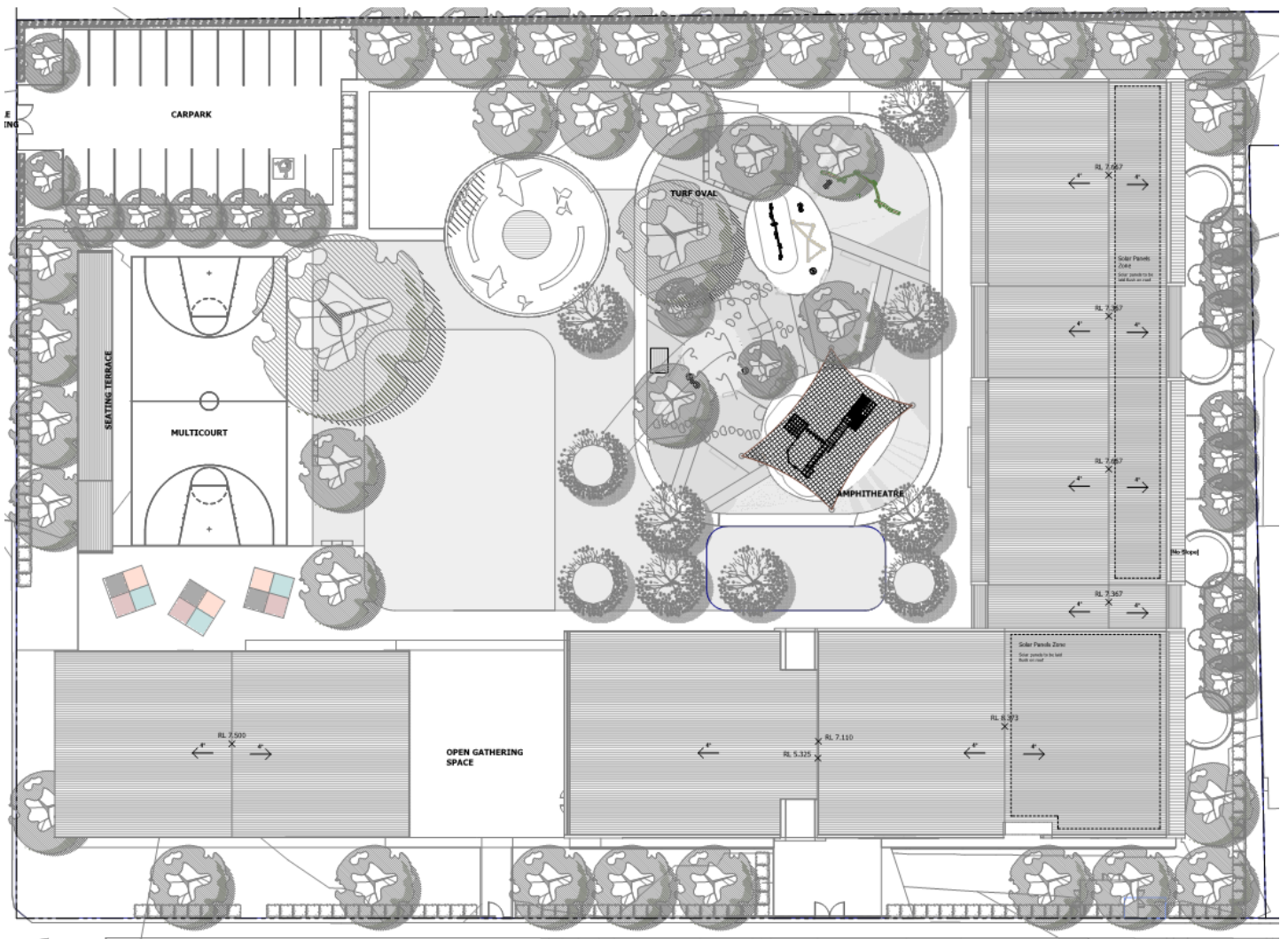


Figure 1 Site Overview

cSource: dwp Architectural Concept Room/Site Plan

Site	Level	Space Description	Area (m2)
Consolidated Northern Building	Ground	<ul style="list-style-type: none"> - Home bases - Withdrawal Rooms - Special Programs Rooms - Practical learning spaces - Shared learning spaces - Library 	(TBC)
Consolidated Northern Building	Level 1	<ul style="list-style-type: none"> - Home bases - Withdrawal Rooms - Special Programs Rooms - Practical learning spaces - Shared learning spaces 	(TBC)
Staff/Admin Building	Ground	<ul style="list-style-type: none"> - Administration - Professional Rooms 	(TBC)
Community Hall	Ground	<ul style="list-style-type: none"> - Hall - COLA 	319.2
Games Court	N/A		
Car Park	N/A		

Table 1 Description of spaces of proposed development

2. SEARS requirements

The Secretary's Environmental Assessment Requirements, Item 8 Ecologically Sustainable Development (ESD) states the following must be achieved for application SSD 9391:

- Detail 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.
- Include preliminary consideration of building performance and mitigation of climate change, including consideration of Green Star Performance.
- Include a description of the measures that would be implemented to minimise consumption of resources, water (including water sensitive urban design) and energy.
- Provide a statement regarding how the design of the future development is responsive to the CSIRO projected impacts of climate change.

Specifically:

- Hotter days and more frequent heatwave events;
- Extended drought periods;
- More extreme rainfall events;
- Gustier wind conditions; and
- How these will inform material selection and social equity aspects (respite/shelter area)

3. environmental planning & assessment regulation 2000

The following section details how ESD principles as defined in clause 7(4) of Schedule 2 of the Environmental Planning and Assessment Regulation 2000 will be incorporated in the design and ongoing phases of the development.

Clause 7(4) of Schedule 2 of the Environmental Planning and Assessment Regulation 2000 states:

a) the **"precautionary principle"**, namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:

(i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and

(ii) an assessment of the risk-weighted consequences of various options.

b) **"inter-generational equity"**, namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.

c) **"conservation of biological diversity and ecological integrity"**, namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration.

d) **"improved valuation, pricing and incentive mechanisms"**, namely, that environmental factors should be included in the valuation of assets and services, such as:

(i) polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,

(ii) the users of goods and services should pay prices based on the full life cycle of costs of

providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,

(iii) environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.

3.1 precautionary principle

There are no significant perceived threats of serious or irreversible environmental damage as a result of the redevelopment and upgrade of Kyeemagh Infants School.

The CSIRO projected impacts of climate change relating to this site have been considered, with the highest risks being an increase in maximum temperatures, extended drought periods and the frequency of heatwave events.

The built form shall embrace sustainability principles and will be designed and arranged to maximise the passive performance of the building. This shall be achieved through the harnessing of natural daylight and natural ventilation in an effort to reduce energy consumption of air conditioning systems, in turn reducing carbon emissions.

The roof form has also been designed for the instalment and operation of solar panels. Additionally, rainwater from the new roofs is to be captured and used for irrigation and wash down.

With regard to the predicted rise in temperatures, the current concept design has addressed the issue of high external heat loads by providing substantial roof overhangs and shading. Design development will further explore options for high performance glazing.

The proposed use of the development is associated with low risks of environmental consequences, given that it has predominantly the same use as the current buildings on site. As such, it is anticipated that no serious or irreversible damage is expected from the operation of the proposed development.

3.2 inter-generational equity

To preserve or enhance the health, diversity and productivity of the environment for future generations to benefit from, the Indoor Environmental Quality as well as the proposed landscape design of the development should be focussed on, to ensure the health and well-being of its occupants as well as to encourage them to actively engage with their surroundings.

The proposed development is recommended to adopt the following passive design principles in an effort to maintain optimal occupant comfort and safety which in turn encourages and conserves inter-generational equity:

- Design of facades that respond to the local climate including sun, wind and aspect;
- Use of natural ventilation and mixed-mode air conditioning, providing high levels of fresh air with reduced energy consumption;
- High levels of natural daylight through windows and skylights;
- High levels of thermal insulation;
- Sunshades (both horizontal and vertical);
- Robust and durable external building materials;
- Usage of low VOC paints, sealants, adhesives, floor coverings and composite timbers used internally;
- Acoustic separation between different spaces.

3.3 conservation of biological diversity and ecological integrity

The redevelopment of Kyeemagh Infants School will have limited, if any impact on the current level of biological diversity and ecological integrity due to the inherent developed nature of the current site. The proposed works will have minimal impact on existing vegetation and biological communities on the site.

3.4 Improved valuation, pricing and incentive mechanism

The Head Contractor shall provide a Sustainability Master Plan in which operational requirements are captured and formulated with sustainable outcomes in mind. Contractors shall be required to provide and abide by an Environmental Management Plan and Environmental Management System in accordance with NSW Environmental Management Systems Guidelines or a similar standard.

4.ESD initiatives

Green Star has been determined as the rating system for the proposed development to be assessed against for the purposes of demonstrating best practice on the project. Green Star evaluates the environmental initiatives of design, projects and/or buildings based on a number of criteria, including energy and water efficiency, indoor environmental quality and resource conservations.

The informal self-assessment of the proposed development intends to achieve at least a 5 Star Australian Excellence rating. Whilst prescriptive, it is not formally certified by the Green Building Council of Australia, which is the enacting body of Green Star.

For the purposes of this report, *Green Star – Design & As Built* is used as the rating tool to rate the design and construction of the proposed Kyeemagh Public School ('the School') redevelopment.

4.1 green star categories

Green Star – Design & As Built assesses the sustainability attributes of a building through the following nine categories:

- Management;
- Indoor Environmental Quality;
- Energy;
- Transport;
- Water;
- Materials;
- Land Use and Ecology;
- Emissions; and
- Innovation

Each category groups a number of issues related to certain sustainability impacts, known as Credits. A Credit addresses an initiative that improves or has the potential to improve the project's sustainability performance. Points are awarded in each credit for actions that demonstrate the project has met the overall objectives or Green Star and the specific aims of the rating tool.

4.1.1 management

The management category aims to encourage and reward the adoption of practices and processes that support best practice sustainability outcomes throughout the different phases of a project's design, construction and ongoing operation.

The Project will include the following initiatives:

- The School will establish environmental performance targets for its consumption of energy and water, production and recycling of waste, and to the ongoing maintenance and improvement of good indoor environmental quality.
- Consistent review of design during Tender documentation and documentation for construction, for ease of maintenance for all building services and building fabric.
- Comprehensive pre-commissioning, commissioning, and quality monitoring in accordance with CIBSE Commissioning Codes and ASHRAE Commissioning Guideline 1-1996 are to be performed for all building services (Building Management and Control Systems, mechanical, electrical and hydraulic).
- A minimum 12-month period tuning process after handover of the building, including no less than monthly monitoring of all building systems, quarterly reviews and reporting of the outcomes of the tuning to the building owner. A full tuning service is to be carried out 12 months after practical completion in accordance with design intent documentation from the design team and the results of which are to be provided to the building owner in a generated report format. The roles and responsibilities of various parties involved during this period is also to be provided within the generated report.
- An Independent Commissioning Agent (IAC) shall be engaged and be involved in each major stage of the project (namely throughout the tender, construction and commissioning phases) to advise, monitor and verify the commissioning of the nominated building systems. The IAC must be independent of any services design, contractor or sub-contractor organisation that has been involved in the design or installation of the nominated systems.
- A Sustainability Master Plan shall be produced to capture all operational requirements and ensure sustainable outcomes are met and maximised.
- A Building Users' Guide (BUG) will be produced to enable building users to optimise the building's environmental performance in its day to day operation. The BUG shall include information relevant to the building users such as the building's energy and environmental strategy, energy, water and waste targets and benchmarks, descriptions of basic functions of the building services (HVAC, Electrical, Lighting, Domestic Hot Water), transport facilities (provision of cyclist facilities, conditions of access, local public transport information), and other relevant guidance on all sustainability attributes of the site. The BUG is to be produced in addition to the building Operations and Maintenance manuals.
- The Contractor will produce and implement a comprehensive, project specific Environmental Management Plan (EMP) for the works in accordance with Section 3 of the NSW Environmental Management System Guidelines (2009).
- Building systems shall include effective metering and monitoring of water and electricity consumption. Water meters and electricity meters shall have the capacity to collect, record and monitor major water uses or electricity uses greater than 100kVA respectively to provide the facility manager with information on system performances. Separate electricity meters shall be provided for lighting and power for each primary functional space.

4.1.2 indoor environmental quality

The Indoor Environment Quality category aims to encourage and reward initiatives that enhance the comfort and well-being of occupants. The credits within this category address issues such as air quality, thermal comfort and acoustic comfort.

The Project will include the following initiatives:

- All habitable rooms including teaching and learning spaces will be provided with fresh air provisions at a rate 50% greater than the minimum required stated in AS 1668.2-2012;
- High level of acoustic comfort will be attained through achieving internal ambient noise levels no higher than 5dB(A) above the 'satisfactory' sound levels in Table 1 of AS/NZ 2107:2000;
- Provision of finishes with acoustically absorptive properties to the internal spaces to reduce the effects of noise breaking into teaching spaces and to assist in controlling reverberation. Dedicated teaching spaces must be reverberation times in the lower half of the range specified in Table 1 of AS/NZ 2107:2000 (i.e. < 0.45);
- Internal partitions should be constructed to achieve a weighted sound reduction index R_w of at least 45 to control noise emission to an adjacent space (i.e. homebase to homebase, group room to homebase);
- Lighting levels shall comply with best practice guidelines and light fixtures shall be selected, where possible, such that glare is controlled or reduced. Light fittings shall be selected such that occupants have the ability to manually control the lighting in their immediate environment.
- Teaching and learning spaces shall be extensively daylight through the inclusion of windows and glazed sliding doors;
- Occupants have high quality internal or external views to the surrounding landscape, which is a key factor in a building's connection to occupants' health and well-being;
- Paints and glues with low volatile organic compounds (VOC) shall be specified to provide improved air quality within the working and learning environment;
- CO₂ sensors shall be installed in all air conditioning ducts and habitable areas to monitor levels to ensure that rooms are well ventilated.
- Energy Recovery Ventilators (ERV) will be incorporated in the Mechanical design which can supply up to 100% pre-conditioned outdoor air, improving the indoor air quality.

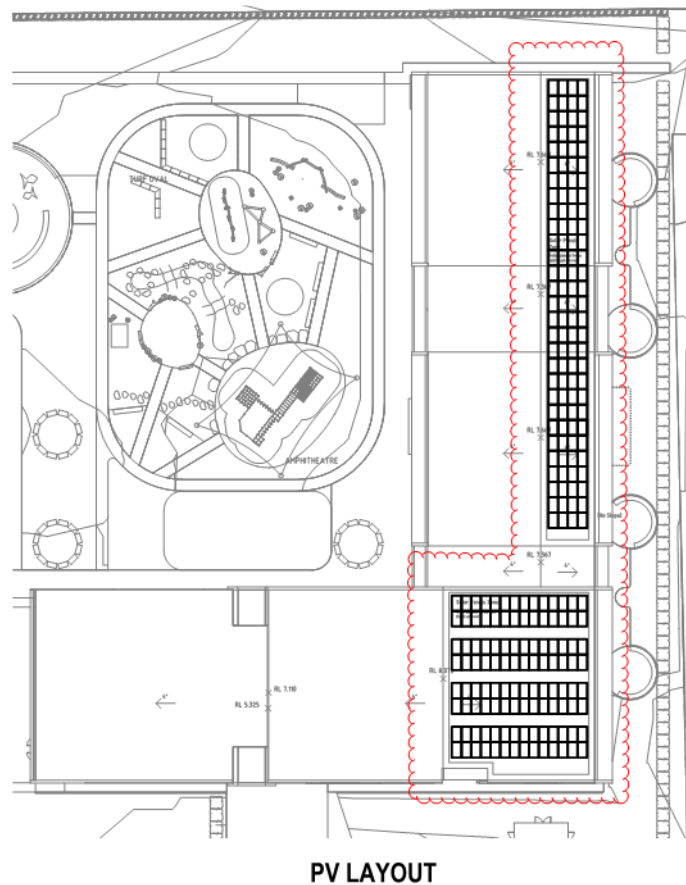
4.1.3 energy

The Energy category aims to reward projects that are designed and constructed to reduce overall greenhouse emissions from operations by addressing energy demand reduction, use efficiency and generation from alternative sources.

The Project will include the following initiatives:

- The building envelope will exceed NCC BCA Section J Parts J1 Building Fabric and J2 Glazing by at least 15% as demonstrated through the DTS or JV3 pathway;
- Provision of motion sensors throughout the buildings to switch off the lights after a period of no occupancy detection;

- HVAC systems shall be designed such that the installed fan motor power and pump power, is at least 15% less than the maximum fan motor powers and pump powers defined in NCC BCA Section J Part J5. Where Section J does not apply to the equipment capacity, the minimum energy efficiency ratio for packaged air conditioning equipment shall be increased by at least 15%;
- Provision of sunset switches to switch off external lighting during the day.
- Lighting shall generally be LED luminaires.
- Habitable spaces will be naturally ventilated and naturally lit where possible.
- CO₂ monitoring in air conditioning systems to be utilized to match outside air to occupant density.
- Exhaust fans to be electronically interlocked to air conditioners and/or lighting and/or BMS to prevent energy wastage after hours.
- Energy Recovery Ventilators (ERV) shall be incorporated to pre-treat or pre-condition incoming fresh outside air by recovering energy from the outgoing exhaust air. This energy recovery via air to air counterflow plate heat exchangers can reduce the outside air load by up to 75%.
- Provision of photovoltaic systems where possible on the roof form for the generation of renewable energy.



4.1.4 transport

The Transport category aims to reward projects that facilitate a reduction of the dependency on private car use as an important means of reducing overall greenhouse gas emissions, as well as to encourage the provision of alternative forms of transportation.

The Project will include the following initiatives:

- Bicycle facilities including staff showers and lockers should be incorporated to encourage bike use and minimise car use, reducing carbon pollution;
- Secure bicycle parking is provided for 40% of students over grade 4.

4.1.5 water

The Water category aims to encourage and reward initiatives that reduce the consumption of potable water through measures such as the incorporation of water efficient fixtures and building systems and water re-use.

The Project will include the following initiatives:

- All sanitary fixtures (toilet pans, urinals, hand basin taps and showers) will be within one star of the WELS ratings stated below.

Fixture / Equipment Type	WELS Rating
Taps	6 Star
Urinals	6 Star
Toilet	5 Star
Showers	3 Star (> 4.5 but <= 6.0)
Clothes Washing Machines	5 Star
Dishwashers	6 Star

- Low flush and automatic urinals will be adopted to reduce water use;
- A Rainwater tank will be installed to collect and reuse rainwater within the project's site boundary;
- Water will not be used for heat rejection on the project (i.e. HVAC systems must not use water for heat rejection. The proposed air conditioning systems will utilise air-cooled outdoor condensing units.);
- Landscaping and associated systems must be designed such that no potable water is used for irrigation, instead utilising subsoil drip irrigation with moisture sensor override and controls.

4.2 4.1.6 materials

The Materials category aims to address the consumption of resources for the project, by encouraging the selection of lower-impact materials. The category also encourages absolute reductions in the amount of waste generated or the recycling of as much of the waste generated as possible.

The Project will include the following initiatives:

- 90% of PVC products used in the project including those in all formwork, pipes, flooring, blinds and cables shall meet the *Best Practice Guidelines for PVC in the Built Environment*, published by the Green Building Council of Australia, or no PVC products will be used;

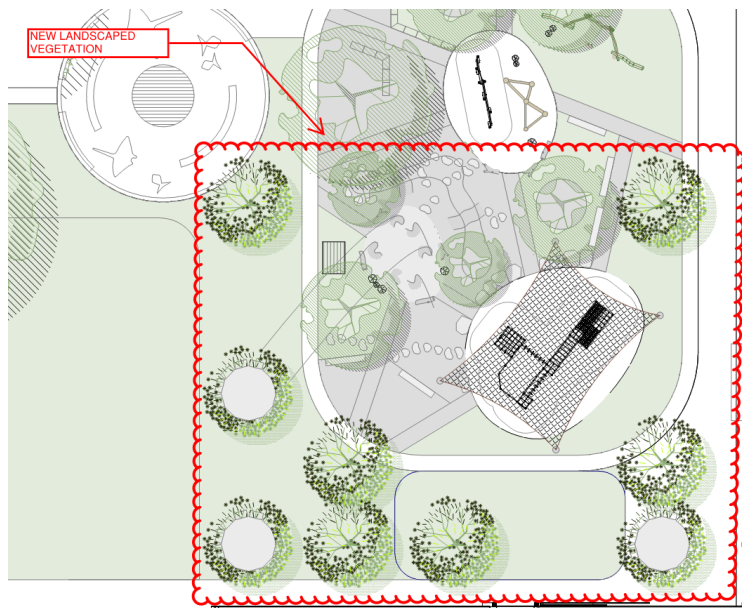
- 95% of the building's steel (by mass) is sourced from a Responsible Steel Maker and at least 60% of the fabricated structural steelwork is supplied by a steel fabricator/contractor accredited to the Environmental Sustainability Charter of the Australian Steel Institute;
- 95% of timber (by cost) used in building and construction will be from a reused source or certified by a forest certification scheme;
- A significant amount of construction waste going to landfill will be diverted;
- A whole building life cycle assessment (LCA) shall be conducted for the project buildings and reference buildings in which the project team shall describe how the LCA was used as a decision making tool for the resulting material selection, project design or other project features. This can include for example, an original material selection option, its alternative option and the decision making criteria.

4.1.7 land use and ecology

The Land Use & Ecology category aims to reduce the negative impacts on sites' ecological value as a result of urban development and reward projects that minimise harm and enhance the quality of local ecology.

The Project addresses this category through the following:

- There will be minimal negative impacts on the site's current ecological value due to retaining and reusing some of the existing buildings on site, and developing over previously developed land;
- Rooftops will contribute to a cooler microclimate through the use of light coloured materials;
- Current landscape will be improved upon through the addition of new landscaped vegetation.



4.1.8 emissions

The Emissions category aims to assess the environmental impacts of 'point source' pollution generated by projects and reduce their effects on the atmosphere, watercourse and native animals.

The Project will include the following initiatives:

- Exterior and landscape lighting shall be carefully selected to ensure there has been a reduction in light pollution through either the control of upward light output ratio (ULOR) or control of direct illuminance;

- A gross pollutant trap (or similar) and swale landscapes will assist in the treatment of stormwater prior to discharge from the site.

4.1.9 innovation

The Innovation category aims to recognise the implementation of innovative practices, processes and strategies that promote sustainability in the built environment.

It acknowledges efforts which demonstrate that sustainable development principles have been incorporated not only for the community for which the Green Star criteria apply, but also in a broader sense. This may include collaboration between developers and other parties, and is recognised separately from any outcomes rewarded in other categories.

The Project may implement the following initiatives to obtain additional points towards the Green Star rating tool:

- **Exceeding Green Star Benchmarks – Ultra Low VOC Paints:** At least 50% (by cost) of the paints specified in the buildings shall have a maximum TVOC content of 5g/L, and shall be verified by one of the approved paint test methods;
- **Innovation Challenge:** Indoor plants shall be evenly distributed across the nominated area and are regularly maintained. One or more plants with a soil area of at least 500cm² are required per 10m² of nominated area.
- **Improving Green Star Benchmarks – No new car parks on site:** 1 point can be claimed if no new car parking is provided on-site.

self-assessed green star pathway

The following self-assessed Green Star Design and As Built v1.2 scorecard demonstrates the ESD Initiatives that are required to be implemented to achieve the project's targeted rating of 5 Stars – Australian Excellence. The respective parties responsible for each credit criteria are also indicated for appropriate measures to be undertaken during the ongoing phases of the development.

Green Star - Design & As Built Scorecard

Last update 8/11/2018

Project:	Kyeemagh Public School
Targeted Rating:	5 Star - Australian Excellence

Total Points Available	Total Points Targeted
100	60

						Responsible Party											
CATEGORY / CREDIT	AIM OF THE CREDIT / SELECTION	CODE	CREDIT CRITERIA	POINTS AVAILABLE	POINTS TARGETED	Client	Builder	Architect	Electrical	Hydraulic	Mechanical	QS	Landscape Architect	ESD / GSAP	ICA	Acoustic	Civil
Management				14													
Green Star Accredited Professional	To recognise the appointment and active involvement of a Green Star Accredited Professional in order to ensure that the rating tool is applied effectively and as intended.	1.1	Accredited Professional	1	1	✓								✓			
Commissioning and Tuning	To encourage and recognise commissioning, handover and tuning initiatives that ensure all building services operate to their full potential.	2.0	Environmental Performance Targets	-	Complies		✓		✓	✓	✓	✓		✓	✓		
		2.1	Services and Maintainability Review	1	1		✓	✓	✓	✓	✓	✓		✓	✓		
		2.2	Building Commissioning	1	1		✓		✓	✓	✓	✓		✓	✓		
		2.3	Building Systems Tuning	1	1		✓		✓	✓	✓	✓		✓	✓		
		2.4	Independent Commissioning Agent	1	1	✓	✓								✓		
Adaptation and Resilience	To encourage and recognise projects that are resilient to the impacts of a changing climate and natural disasters.	3.1	Implementation of a Climate Adaptation Plan	2			✓							✓			
Building Information	To recognise the development and provision of building information that facilitates understanding of a	4.1	Building Information	1	1		✓	✓	✓	✓	✓			✓			

	building's systems, operation and maintenance requirements, and environmental targets to enable the optimised performance.																		
Commitment to Performance	To recognise practices that encourage building owners, building occupants and facilities management teams to set targets and monitor environmental performance in a collaborative way.	5.1	Environmental Building Performance	1	1	✓	✓									✓			
		5.2	End of Life Waste Performance	1	1		✓	✓								✓			
Metering and Monitoring	To recognise the implementation of effective energy and water metering and monitoring systems.	6.0	Metering	-	Complies		✓		✓	✓	✓	✓				✓			
		6.1	Monitoring Systems	1	1		✓		✓	✓	✓	✓				✓			
Responsible Building Practices	To reward projects that use best practice formal environmental management procedures during construction.	7.0	Environmental Management Plan	-	Complies		✓												
		7.1	Formalised Environmental Management System	1	1		✓												
		7.2	High Quality Staff Support	1	1		✓												
Operational Waste	To recognise projects that implement waste management plans that facilitate the re-use, upcycling, or conversion of waste into energy and stewardship of items to reduce the quantity of outgoing waste	8.1	Waste in Operations	1	1		✓						✓						
Total				14	12		✓						✓						

Indoor Environment Quality						17													
Indoor Air Quality	To recognise projects that provide high air quality to occupants.	9.1	Ventilation System Attributes	1	1						✓								
		9.2	Provision of Outdoor Air	2	1						✓								
		9.3	Exhaust or Elimination of Pollutants	1	1						✓								
Acoustic Comfort	To reward projects that provide appropriate and comfortable acoustic conditions for occupants.	10.1	Internal Noise Levels	1	1													✓	
		10.2	Reverberation	1	1													✓	
		10.3	Acoustic Separation	1	1				✓										✓
Lighting Comfort	To encourage and recognise well-lit spaces that provide a high degree of comfort to users.	11.0	Minimum Lighting Comfort	-	Complies					✓									
		11.1	General Illuminance and Glare Reduction	1	1					✓									
		11.2	Surface Illuminance	1	1					✓									
		11.3	Localised Lighting Control	1	1				✓	✓									
Visual Comfort	To recognise the delivery of well-lit spaces that provide high levels of visual comfort to building occupants.	12.0	Glare Reduction	-	Complies				✓										
		12.1	Daylight	2	1				✓										
		12.2	Views	1	1				✓										
Reduced Exposure to Pollutants	To recognise projects that safeguard occupant health through the reduction in internal air pollutant levels.	13.1	Paints, Adhesives, Sealants and Carpets	1	1			✓	✓										
		13.2	Engineered Wood Products	1	1			✓	✓										
Thermal Comfort	To encourage and recognise projects that achieve high levels of thermal comfort.	14.1	Thermal Comfort	1	1						✓								
		14.2	Advanced Thermal Comfort	1							✓								
Total				17	14							✓							

Energy						22															
Greenhouse Gas Emissions	A. Prescriptive Pathway	15A.0	Conditional Requirement: Prescriptive Pathway	-	Complies												✓				
		15A.1	Building Envelope	1	1		✓	✓									✓				
		15A.2	Glazing	1	1		✓	✓									✓				
		15A.3	Lighting	1	1		✓	✓	✓								✓				
		15A.4	Ventilation and Air-conditioning	1	1						✓						✓				
		15A.5	Domestic Hot Water Systems	1	1					✓							✓				
		15A.6	Accredited GreenPower	5													✓				
		15B.0	Conditional Requirement: NatHERS Pathway	-																	
		15B.1	NatHERS Pathway	-																	
		15C.0	Conditional Requirement: BASIX Pathway	-																	
		15C.1	BASIX Pathway	-																	
		15D.0	Conditional Requirement: NABERS Pathway	-																	
		15D.1	NABERS Energy Commitment Agreement Pathway	-																	
		15E.0	Conditional Requirement: Reference Building Pathway	-																	
		15E.1	Comparison to a Reference Building Pathway	-																	
Peak Electricity Demand Reduction	Prescriptive Pathway	16A	Prescriptive Pathway - On-site Energy Generation	1	1			✓	✓		✓										
		16B	Performance Pathway - Reference Building																		
Total	-	11				6															

Transport					10												✓			
Sustainable Transport	Prescriptive Pathway	17A.1	Performance Pathway	0	0												✓			
		17B.1	Access by Public Transport	3	3												✓			
		17B.2	Reduced Car Parking Provision	1	0				✓								✓			
		17B.3	Low Emission Vehicle Infrastructure	1	1				✓								✓			
		17B.4	Active Transport Facilities	1	1				✓								✓			
		17B.5	Walkable Neighbourhoods	1	1												✓			
		Total				7	6													

Land Use & Ecology						6														
Ecological Value	To reward projects that improve the ecological value of their site.	23.0	Endangered, Threatened or Vulnerable Species	-	Complies													✓		
		23.1	Ecological Value	3	2													✓		
Sustainable Sites	To reward projects that choose to develop sites that have limited ecological value, re-use previously developed land and remediate contaminate land.	24.0	Conditional Requirement	-	Complies													✓		
		24.1	Reuse of Land	1	1													✓		
		24.2	Contamination and Hazardous Material	1	1		✓											✓		
Heat Island Effect	To encourage and recognise projects that reduce the contribution of the project site to the heat island effect.	25.0	Heat Island Effect Reduction	1														✓		
Total						6	4													
Emissions						5														
Stormwater	To reward projects that minimise peak stormwater flows and reduce pollutants entering public sewer infrastructure.	26.1	Stormwater Peak Discharge	1	1					✓										✓
		26.2	Stormwater Pollution Targets	1	1					✓										✓
Light Pollution	To reward projects that minimise light pollution.	27.0	Light Pollution to Neighbouring Bodies	-	Complies					✓										
		27.1	Light Pollution to Night Sky	1	1					✓										
Microbial Control	To recognise projects that implement systems to minimise the impacts associated with harmful microbes in building systems.	28.0	Legionella Impacts from Cooling Systems	1	1							✓								
Refrigerant Impacts	To encourage operational practices that minimise the environmental impacts of refrigeration equipment.	29.0	Refrigerants Impacts	1	1							✓								
Total						5	5													

Innovation					10														
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 the world.	30A	Innovative Technology or Process	10															
Market Transformation	The project has undertaken a sustainability initiative that substantially contributes to the broader market transformation towards sustainable development in Australia or in the world.	30B	Market Transformation																
Improving on Green Star Benchmarks	The project has achieved full points in a Green Star credit and demonstrates a substantial improvement on the benchmark required to achieve full points.	30C	Improving on Green Star Benchmarks																
Innovation Challenge	Where the project addresses a sustainability issue not included within any of the Credits in the existing Green Star rating tools.	30D	Innovation Challenge																
Global Sustainability	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 Green Star rating tool.	30E	Global Sustainability																
Total				10	0														

			POINTS AVAILABLE	POINTS TARGETED
TOTAL			100	60