

An aerial photograph of a lush green forested area. A winding river flows through the center of the image. In the upper right and lower left corners, there are residential areas with houses and roads. The text is overlaid on the image in white.

CONRAD  
GARGETT

NSW  
Department of  
Education  
Green Star & ESD  
Report

Smalls Road Public School  
16321 October 2017  
Revision C

### Documentation Control

Revision	Description	Issue date	Prepared by	Reviewed by
A	Draft Issue	19/07/2017	AF	GR
B	Revised Issue	1/08/2017	AF	NG
C	Revised Issue	6/10/2017	AF	SW

## Introduction:

### **General:**

This ESD Report accompanies an Environmental Impact Statement (EIS) prepared in support of the State Significant Development Application for the development of 'Smalls Road Public School (Ryde)' at Smalls Road, Ryde, NSW.

The purpose of this ESD Report is to outline the measures that are proposed to be implemented to minimise consumption of resources, energy and water, and to demonstrate that the project has been assessed against a suitable accredited rating framework. 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).

As a result of the sustainability initiatives discussed within this report, the Smalls Road Public School (Ryde) development is expected to achieve a high level of environmental sustainability.

**The Green Star rating system has been used as a framework for assessment of the project only. It is not the intention of the client to undertake a formal certification.**

### **Project Description:**

The site is located within the City of Ryde Government Area. The site is the site of the former Ryde High School and includes two large sporting fields that are currently used by the local community. The proposed development consists of a new Public Primary School, including core facilities, landscaped play and learning spaces, such as a new central outdoor learning area. Improvements to traffic and pedestrian access are also proposed.

The School will provide new flexible learning spaces, open play and outdoor learning spaces and associated core facilities including a communal hall, library, canteen and staff/admin facilities.

### **Limitation of this report:**

The purpose of this ESD Report is to outline the measures that are proposed to be implemented to minimise consumption of resources, energy and water, and to demonstrate that the project has been assessed against a suitable accredited rating scheme, as detailed within the EIS. It should be read in conjunction with the current project documentation and specific applications may vary during the design development of the project.

**This report has been developed at the concept design stage. The proposal is subject to change through design development and tender process.**



## Ecologically Sustainable Development Requirements

### 02.01 Definition

The NSW DoE Definitions

Ecologically Sustainable Development (ESD) is defined in Australia as: Using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased.

ESD principles are to be applied in the design, development and operation of all state assets, and are an important contribution to developing a considered whole of life cost

### 02.03 NSW DEPARTMENT OF EDUCATION (DoE) ENVIRONMENTAL DESIGN POLICIES

The following design principles are applicable to all NSW DoE Facilities:

#### 02.03.01 Green Building Design and Green Star

It is expected that the policies set out within the (EFSG) design guide will lead to a Green Star - Education v1 Design & As Built 4 Star rating, which is considered to be best practice within the Australian building industry.

DoE requires that any new school buildings on an existing or new site will be able to achieve a minimum 4 Star Green Star rating. DoE also aims to ensure Ecologically Sustainable Development principles will be included in any new school, to a level that the building could be benchmarked to achieve a 5 Star Green Star rating

**Note: Green Star - Education v1 Design & As Built rating tool has been superseded by Green Star - Design & As Built in December 2015. This rating tool is the most appropriate for assessing new school/ school buildings sustainable design principles.**

4 Star rating is considered Best Practice in the Australian building industry.

#### ACTION:

Refer to the Green Star section of this report

#### 02.03.02 Environmental Management Plan (EMP)

All projects will require the preparation of an appropriate site-specific Environmental Management Plan (EMP) prior to the commencement of the relevant site works.

Contractors will be required to prepare an EMP as a condition of contract.

All projects of \$10m or more, and all projects under \$10m if they are environmentally sensitive, contractors will need to have a corporate Environmental Management System (EMS) accredited by a NSW government construction agency.

#### ACTION:

Nominated in CGAMW Specification for *Contractor* to provide

#### 02.03.03 Timber

No Rainforest timbers to be used unless plantation grown

No timbers from high conservation forests

Use only recycled timber, engineered and glued timber composite products, timber from plantations or from sustainably managed regrowth forests.

#### ACTION:

Captured in CGAMW Specification.

#### 02.03.04 Ecologically Sustainable Development

Ensure the preservation, maintenance and sustainable use of the community's natural and material assets.

Protect and support biological and ecological diversity  
Restrict the flow of pollutants into our natural environment.

**ACTION:**

Captured in CGAMW Specification.

**02.03.05 Environmentally Friendly Materials / Products**

Encourage the use of materials and products which:  
Adequately and economically perform their intended functions, and also have lower adverse environmental impacts throughout their life cycle.  
Contain reduced or no hazardous substances (Low VOC)  
Reduce the demand for rare or non-renewable resources  
Are made from or contain recycled materials or can be recycled at the end of their useful

**ACTION:**

Captured in CGAMW Specification.

**02.03.06 Conservation of Biological Diversity**

Conserve for future generations, the biological diversity of genetic materials, species and ecosystems.  
Assess project and purchasing impacts on the natural environment during all project phases and adopt a precautionary approach where risk is high.

**ACTION:**

Captured in CGAMW Specification.

**02.03.07 Pesticide**

New Buildings: no chemical pesticides and termiticide to be used. Preventive treatments to be by physical means and careful design to minimise risk.  
**Existing Buildings: Chemicals to be used only as a last resort for the eradication of infestations, using chemicals approved by the National Registration Authority and applied by a Pest Control Operator licensed by Workcover.**

**ACTION:**

Captured in CGAMW Specification.

**02.03.08 Waste**

Eliminate unnecessary waste by better planning and more efficient use of natural and manufactured resources. This approach is often referred to as a Whole of Life approach to building.

**ACTION:**

Nominated in CGAMW Specification for Contractor to provide

**02.04 ENVIRONMENTAL DESIGN FEATURES OF EDUCATIONAL FACILITIES**

A major objective in the design of Education Facilities is to achieve good indoor environmental quality and comfort conditions with minimum energy consumption.  
Passive Design principles should be employed wherever possible to achieve this.  
The following design solutions are to be incorporated into schools:

**ACTION:**

Captured in CGAMW Drawings, refer to solar and cross ventilation diagrams

**02.04.01 Natural Light**

Natural daylight improves the indoor environmental quality of spaces and encourages beneficial learning.  
Natural daylight is to be provided to all teaching spaces unless identified otherwise.

Natural daylight can be provided via windows, skylights, rooflights and the like. Where a room is required to have a brownout function, rooflights and skylights will need to include a method to sufficiently adjust light levels.

Include daylight sensors to rooms to reduce light output or turn off lights when sufficient daylight is provided within the space.

When the space is large, it is recommended that perimeter lighting is adjacent to windows be on a separate zone to make maximum use of daylight.

Benefit: Saving in energy consumption and ongoing running costs. Lights will seldom need to be turned on during the day.

**ACTION:**

Captured in CGAMW Drawings, refer to solar and external view diagrams

**02.04.02 Sun Shading**

On exposed facades subject to direct sunlight, external window shading should be considered as part of the building design to ensure energy efficiency and thermal

Benefit: Reduces heat gain due to the easterly rising sun and westerly setting sun. Shading will reduce need for cooling energy required for classroom.

**ACTION:**

Captured in CGAMW Drawings, refer to solar and external view diagrams

**02.04.03 Period Bells**

Period Bell Light switching systems are to be in all new schools, major conversions and additions.

All luminaires in rooms are to automatically turn off five minutes after the period bell has rung and all students have left the room. Alternatively include systems to turn off lights when the room is not in use.

A conscious decision is required to turn the lights on again.

Benefit: Significant savings on luminaire energy consumption and ongoing running costs in Schools.

**ACTION:**

Service engineers to attend too

**02.04.04 Appliances and Equipment**

The NSW Government Resource Efficiency Policy sets out the minimum standards for new appliances and equipment.

All new electrical equipment purchased by DoE where relevant, available and fit for purpose, must have minimum Greenhouse and Energy Minimum Standards (GEMS) star ratings stipulated under target E3 of the Policy.

**ACTION:**

Captured in CGAMW Specification.

**02.04.05 Air Cooling and Heating Systems**

Timed or sensor operation functionality for all Air Cooling systems

Centralised control of HVAC plant with programmable schedules for the school year

Consider one single infrastructure for heating and cooling where it demonstrates whole life cycle cost savings.

Benefit:

Ensure electric HVAC systems are turned off when a space is not occupied

Ensure whole of life costs and operation and maintenance costs are optimised through consideration of both heating and cooling infrastructure

**ACTION:**

Service engineers to attend too

#### **02.04.06 Electricity meters**

Suitably sized meter to be installed with capability for monitoring. Contact Advisory Services ([sustainability.enquiries@det.nsw.edu.au](mailto:sustainability.enquiries@det.nsw.edu.au)) to ascertain site specific metering requirements.

Benefit:

Lower electricity meter maintenance costs through selecting a fit for purpose meter.  
Better access to energy consumption data at the school

#### **ACTION:**

Service engineers to attend too

#### **02.04.07 Renewable Energy Generation**

Assess viability of Solar PV systems for new school proposals.

Different financing options such as: purchased outright, financial leasing; or solar leasing should be considered.

Benefit: Onsite generation of electricity to supplement base load demand at the school

#### **ACTION:**

Service engineers to attend too

#### **02.05 INSULATION**

The Building Code of Australia (BCA) sets out the insulation requirements for buildings based on the local conditions and is to be applied to all school spaces

The Key Purpose of insulation is to:

In summer keep heat out to provide cooler, more comfortable classrooms.

In winter keep warmth in to reduce heating energy consumption.

Roof and wall Insulation to achieve the required BCA insulation R values as a minimum.

#### **ACTION:**

Captured in CGAMW Specification.

#### **02.06 VENTILATION**

##### **02.06.01 Natural Ventilation**

Natural Ventilation is the preferred option to maintain good indoor environmental air quality through all school areas.

##### **02.06.02 Mechanical Ventilation**

Generally used only in areas where natural ventilation can not be achieved, such as School Performance Spaces, Duplicating Rooms, Dark Rooms and any internal toilets.

##### **02.06.03 Cross Ventilation**

Is the primary means of achieving good air movement and comfort conditions in all habitable rooms.

Maximise cross ventilation wherever possible.

Single loaded covered walkways are frequently used to maximum cross ventilation.

##### **02.06.04 Roof Turbo Ventilators**

Roof turbo ventilators are an effective way of enhancing the natural ventilation of a single or upper storey of a multi storey building.

Size ventilators to provide a minimum of 7.5 air changes per hour using the local climatic

#### **ACTION:**

Service engineers to attend too

#### **02.07 PESTICIDES**

Schools should be designed, constructed and maintained, without using chemicals for termite and other pest control.

**ACTION:**

Captured in CGAMW Specification.

**02.08 WATER CONSERVATION**

Practical water conservation systems to be incorporated into schools include:

Purchase products where relevant available and fit for purposes with minimum Water Efficiency Labelling and Standards Scheme (WELS) star ratings as stipulated under W3 of the NSW Government Resource Efficiency Policy.

Where WELS rating is not available, use the alternative Smart Approved WaterMark rating scheme.

Internal Flow Controllers can be used to minimise water usage and wastage for staff

Taps with timed flow can be used to minimise water usage and wastage in student

Dual Flushing Cisterns with a minimum WELS rating of 4, to be used to reduce water usage and minimise waste. Appropriate cisterns must be used with a suitably rated pan to ensure effective use.

Manual flushing urinals are preferred.

Waterless urinals should only be considered in new facilities with appropriate drainage.

Roof water harvesting and tank storage for landscape irrigation and flushing of toilets. Rainwater tanks to be incorporated where there is a local identified end use such as irrigation or toilet flushing. Rainwater tank designed preferably with gravity flow.

However, an electric pump should be installed with the rainwater tank where required and economically feasible.

Where schools are required to install a sprinkler system for fire safety, it is recommended to install a closed loop system to capture and reuse fire systems testing and maintenance water, or by using an alternative non-potable water source.

**ACTION:**

Captured in CGAMW Specification.

Service engineers to attend too

## Green Star - Design & As Built v1.1

### Building Information

Building Input	
Name of Building:	Smalls Road Public School
Address of Building:	3B Smalls Road, Ryde
Postcode:	2112
State:	
Office	
Residential	
Retail	
Healthcare	
Education	6460m <sup>2</sup>
Industrial	
Other	
<b>Total</b>	<b>0</b>

Applicant Details	
Applicant:	NSW Department of Education
Contact Person:	c/o Rob Pulvirenti, Coffey

Project Team Details	Company/Organisation
Acoustic Consultant	TTM Group
Architect	Conrad Gargett Ancher Mortlock Woolley
Building Services Engineer	Wood & Grieve Engineers
Building Surveyor	RPS
ESD Consultant	Conrad Gargett Ancher Mortlock Woolley
Landscaping Consultant	Conrad Gargett Ancher Mortlock Woolley
Local Planning Authority	City of Ryde
Main Contractor	TBC
Project Manager	Coffey
Quantity Surveyor	Turner & Townsend
Structural/Civil Engineer	MYD Consulting Engineers

Building Description	
Description of building	Public School

## Green Star - Design & As Built v1.1 Rating Scale

**The Green Star – Design & As Built Scorecard is used to calculate the Green Star score. The methodology for calculating a Green Star rating is as follows:**

The conditional requirements must be met;

The estimated number of points for each credit criterion, within each credit, is entered into the 'Points Claimed' column in the scorecard; and

Once all claimed points have been entered, the Scorecard automatically compares the points claimed against the requirements for each Green Star rating level, for the total score.

### The Green Star Rating Scale:

% of available points	Rating	Outcome
Less than 10	Zero Star	Assessed
Oct-19	One Star	Minimum Practice
20 - 29	Two Star	Average Practive
30 - 44	Three Star	Good Practive
45 - 59	Four Star	Australian Best Practice
60 - 74	Five Star	Australian Excellence
75+	Six Star	World Leadership

**Points Allocation:** Each point throughout the Green Star – Design & As Built rating tool is comparable to any other point in the rating tool. This means that one point in the 'Management' category contributes as much to the total score as one point in any of the other categories. The number of points available in each category indicates the relative importance of the impact addressed within that category towards the overall sustainability outcomes.

## Green Star - Design & As Built v1.1 Categories and Credits

The Submission Guidelines is divided into Green Star categories and credits. Each category includes a number of credits, which in turn describe the targets that a project must meet, and requirements. Each credit is structured as follows:

**Aim of Credit:** Outlines the environmental issue that the credit is targeting, the guiding principles behind the credit, and the desired environmental outcomes of the credit.

**Credit Criteria:** Explains the issues within the credit that must be addressed in order to meet the 'Aim of Credit'. Where the 'Aim of Credit' is the guiding principle, 'Credit Criteria' outline performance metrics that the project must achieve. This section also outlines the number of available points and how points are either awarded or 'Not Applicable'.

**Compliance Requirements:** Describes the method for demonstrating compliance with the 'Credit Criteria'. Projects must meet the performance and documentation requirements to be awarded the credit points.

The 'Compliance Requirements' can provide performance methods or prescriptive methods for demonstrating compliance with a criterion. The performance methods rely on demonstrating compliance with the credit criteria via modelling solutions. The prescriptive solutions are pre-assessed conditions that have been found to meet the 'Credit Criteria' (for example, a building applying prescriptive sustainability initiatives for the 'Potable Water' credit, rather than modelling the building's predicted water usage).

**Guidance:** This section contains additional information and clarification on how project teams may demonstrate compliance. The guidance in this section is not mandatory but may offer suggestions on how a project could demonstrate compliance. The Guidance section may also provide a description of how compliance could be demonstrated for alternative space type uses or project delivery type. Definitions and standards in each credit are also listed in this section.

**Documentation Requirements:** Details the submission requirements for a credit for both a 'Design Review' and an 'As Built' rating. In all cases, a Submission Template must be presented alongside evidence justifying claims made within. More information is provided in the section titled 'Submitting for Certification'. For information on Green Star – Design & As Built Submission Templates, see the section titled 'Submitting for Certification'.

## Green Star - Design & As Built v1.1

### List of Credits

INDEX	CREDIT	POINTS AVAILABLE	POINTS TARGETING	POINTS TBC	POINTS NOT TARGETING
<b>MANAGEMENT</b>					
1	Green Star Accredited Professional	1	1	0	0
2.0	Commissioning and Tuning - Environmental Performance Targets (Prerequisite)	-	-	-	-
2.1	Commissioning and Tuning - Services and Maintainability Review	1	1	0	0
2.2	Commissioning and Tuning - Building Commissioning	1	1	0	0
2.3	Commissioning and Tuning - Building Systems Tuning	1	1	0	0
2.4	Commissioning and Tuning - Independent Commissioning Agent	1	0	0	1
3.0	Adaptation and Resilience	2	0	2	0
4.1	Building Information - Building Operations and Maintenance Manual	1	1	0	0
4.2	Building Information - Building User Information	1	1	0	0
5.1	Commitment to Performance - Environmental Building Performance	1	1	0	0
5.2	Commitment to Performance - End of Life Waste Performance	1	0	0	1
6.0	Metering and Monitoring - Metering (Prerequisite)	-	-	-	-
6.1	Metering and Monitoring - Monitoring Systems	1	1	0	0
7.0	Construction Environmental Management - Environmental Management Plan (Prerequisite)	-	-	-	-
7.1	Construction Environmental Management - Formalised Environmental Management System	1	1	0	0
8	Operational Waste	1	1	0	0
<b>SUB TOTAL</b>		<b>14</b>	<b>10</b>	<b>2</b>	<b>2</b>
<b>INDOOR ENVIRONMENT QUALITY</b>					
9.1	Indoor Air Quality - Ventilation System Attributes	1	1	0	0
9.2	Indoor Air Quality - Provision of Outdoor Air	2	2	0	0
9.3	Indoor Air Quality - Exhaust or Elimination of Pollutants	1	1	0	0
10.1	Acoustic Comfort - Internal Noise Levels	1	0	0	1
10.2	Acoustic Comfort - Reverberation	1	1	0	0
10.3	Acoustic Comfort - Acoustic Separation	1	0	1	0
11.0	Lighting Comfort - Minimum Lighting Comfort (Prerequisite)	-	-	-	-
11.1	Lighting Comfort - General Illuminance and Glare Reduction	1	1	0	0

11.2	Lighting Comfort - Surface Illuminance	1	1	0	0
11.3	Lighting Comfort - Localised Lighting Control	1	1	0	0
12.0	Visual Comfort - Glare Reduction (Prerequisite)	-	-	-	-
12.1	Visual Comfort - Daylight	2	1	1	0
12.2	Visual Comfort - Views	1	1	0	0
13.1	Indoor Pollutants - Paints, Adhesives, Sealants and Carpets	1	1	0	0
13.2	Indoor Pollutants - Engineered Wood Products	1	1	0	0
14.1	Thermal Comfort - Thermal Comfort	1	1	0	0
14.2	Thermal Comfort - Advanced Thermal Comfort	1	0	1	0
	<b>SUB TOTAL</b>	<b>17</b>	<b>13</b>	<b>3</b>	<b>1</b>
<b>ENERGY</b>					
15A	GHG Emissions Reduction – Performance Pathway	20			12
	OR				
	GHG Emissions Reduction – Prescriptive Pathway				
15A.1.1	Greenhouse Gas Emissions - Building Fabric	1	1	0	0
15A.1.2	Greenhouse Gas Emissions - Glazing	1	1	0	0
15A.1.3	Greenhouse Gas Emissions - Lighting	1	1	0	0
15A.1.4	Greenhouse Gas Emissions - Ventilation and Air Conditioning	1	1	0	0
15A.1.5	Greenhouse Gas Emissions - Hot Water System	1	1	0	0
15A.1.6	Greenhouse Gas Emissions - Building Sealing	1	0	0	1
15A.1.7	Greenhouse Gas Emissions - Accredited GreenPower® Projects	1	0	0	2
16	Peak Electricity Demand Reduction	2	2	0	0
	<b>SUB TOTAL</b>	<b>22</b>	<b>7</b>	<b>0</b>	<b>15</b>
<b>TRANSPORT</b>					
17A	Sustainable Transport - Performance Pathway	10			4
	OR				
17B	Sustainable Transport - Prescriptive Pathway				
17B.1	Sustainable Transport - Access by Public Transport.	3	2	0	0
17B.2	Sustainable Transport - Reduced Car Parking Provision	1	1	0	0
17B.3	Sustainable Transport - Low Emission Vehicle Infrastructure	1	1	0	0

17B.4	Sustainable Transport - Active Transport Facilities	1	1	0	0
17B.5	Sustainable Transport - Walkable Neighbourhoods.	1	1	0	0
	<b>SUB TOTAL</b>	<b>10</b>	<b>6</b>	<b>0</b>	<b>4</b>
<b>WATER</b>					
18A	Potable Water - Performance Pathway OR	12			6
18B	Potable Water - Prescriptive Pathway	6			
18B.1	Potable Water - Sanitary Fixture Efficiency	1	1	0	0
18B.2	Potable Water - Rainwater Reuse	1	0	1	0
18B.3	Potable Water - Heat Rejection	2	2	0	0
18B.4	Potable Water - Landscape Irrigation	1	1	0	0
18B.5	Potable Water - Fire Protection System Test Water	1	1	0	0
	<b>SUB TOTAL</b>	<b>12</b>	<b>5</b>	<b>1</b>	<b>6</b>
<b>MATERIALS</b>					
19A	Life Cycle Assessment (LCA) - Performance Pathway	7			
19A.1	Comparative Life Cycle Assessment	6	0	0	6
19A.2	Additional Life Cycle Impact Reporting OR	1	0	0	1
19B	Life Cycle Impacts – Prescriptive Pathway	5			-2
19B.1.1	Life Cycle Impacts – Concrete - Portland Cement Reduction	2	1	0	1
19B.1.2	Life Cycle Impacts – Concrete - Water Reduction	0.5	0.5	0	0
19B.1.3	Life Cycle Impacts – Concrete - Aggregates Reduction	0.5	0.5	0	0
19B.2A	Life Cycle Impacts – Steel - Reduced Mass of Steel Framing	1	0	0	1
19B.2B	Life Cycle Impacts – Steel - Reduced Use of Steel Reinforcement	1	0	0	1
19B.3.1	Life Cycle Impacts – Facade Reuse or	2	0	0	2
19B.3.2	Life Cycle Impacts – Structure Reuse	2	0	0	2
20.1	Responsible Building Materials - Structural and Reinforcing Steel	1	1	0	0
20.2	Responsible Building Materials - Timber Products	1	1	0	0
20.3	Responsible Building Materials - Permanent Formwork, Pipes, Flooring, Blinds and Cables	1	1	0	0
21	Sustainable Products	3	2	1	0

22	Construction and Demolition Waste	1	1	0	0
	<b>SUB TOTAL</b>	<b>14</b>	<b>8</b>	<b>1</b>	<b>5</b>
<b>LAND USE &amp; ECOLOGY</b>					
23.0	Ecological Value - Endangered, Threatened or Vulnerable Species (Prerequisite)	-	-	-	-
23.1	Ecological Value - Ecological Value	3	0	0	3
24.0	Sustainable Sites - Conditional Requirement (Prerequisite)	-	-	-	-
24.1	Sustainable Sites - Reuse of Land	1	1	0	0
24.2	Sustainable Sites - Contamination and Hazardous Materials	1	1	0	0
25	Heat Island Effect	1	0	1	0
	<b>SUB TOTAL</b>	<b>6</b>	<b>2</b>	<b>1</b>	<b>3</b>
<b>EMISSIONS</b>					
26.1	Stormwater - Reduced Peak Discharge	1	1	0	0
26.2	Stormwater - Reduced Pollution Targets	1	0	1	0
27.0	Light Pollution - Light Pollution to Neighbouring Bodies (Prerequisite)	-	-	-	-
27.1	Light Pollution - Light Pollution to Night Sky	1	1	0	0
28	Microbial Control	1	1	0	0
29	Refrigerant Impacts	1	1	0	0
	<b>SUB TOTAL</b>	<b>5</b>	<b>4</b>	<b>1</b>	<b>0</b>
<b>TOTALS</b>		<b>100</b>	<b>55</b>	<b>9</b>	<b>36</b>
<b>INNOVATION</b>					
30	Innovation	10	0*	10*	0*

**NOTE:**

Credit points with a \* after the number are not linked to the individual credit tabs

**REQUIREMENT: 45-59 - Four Star Australian Best Practice**

**OUTCOME:**

This project has the ability to seek GBCA certification for a 5 star Green Star rating if additional funds are available