



Ecologically Sustainable Development Report

Waitara Public School Design

New and Upgrade Works for schools in North and West Sydney
DoEAMD-16-71
December 2017
Revision 1

Architecture
Interior Design
Planning
Urban Design
Landscape Architecture
Sustainable Design

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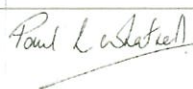
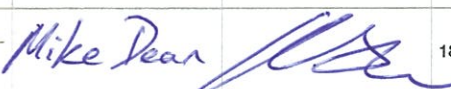
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APPENDIX A - Green Star Self-Assessment

01 Introduction

Ecologically Sustainable Development (ESD) is governed by certain statutory regulations and guidelines, as well as GHDWoodhead's ESD principles and methodology. The following section outlines the statutory regulations and guidelines that this ESD report complies with, relevant to Waitara Public School Design.

1.1 Governance

As a State Significant Development (SSD) the project has been designed in accordance with the Department of Education Secretary's Environmental Assessment Requirements (SEARs), Item 6. Ecologically Sustainable Development (ESD). For the definition of ESD SEARS refers to Environmental Planning Assessment Regulation (EPAR, 2000). As a guide to how this should best be implemented, this assessment refers to EFSG (Education Facilities Standards and Guidelines) DG02 Ecologically Sustainable Development.

1.1.1 Environmental Planning Assessment Regulation (EPAR, 2000)

7.(4) The principles of **ecologically sustainable development** are as follows:

- (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.

1.1.2 SEARS ITEMS

SSD 8574 ITEM	ACTION TO ADDRESS REQUIREMENT	DOCUMENTATION
6. Ecologically Sustainable Development (ESD) · Detail 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 operation phases of the development.	Prepare an ESD report outlining ESD principles (as defined by EPAR [2000]) as they have been applied to the project design	ESD Report
· Demonstrate that the development has been assessed against a suitably accredited rating scheme to meet industry .	Conduct a Self-Assessment of the project against the GBCA Green Star Rating Tool (As per EFSG DG02)	ESD Report, Appendix 01
· Include a description of the measures that would be implemented to minimise consumption of resources, water (including water sensitive urban design) and energy.	Minimisation of consumption of resources incorporated into the project design	ESD Report, Sections 01 & 07

Table 1.1 SEARS Items

1.1.3 EFSG DG02

The Education Facilities Standards and Guidelines (EFSG) are standards and guidelines established by the NSW Department of Education, intended to assist those responsible for the management, planning, design, construction and maintenance of new and refurbished school facilities. This ESD study has used EFSG to guide our approach to ESD on points not specifically outlined by SEARS.

EFSG 02.01 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 development approach.

EFSG 02.02 NSW Government Resource Efficiency Policy (GREP)

NSW Government Resource Efficiency Policy (GREP) to reduce Government's operating costs and lead by example in increasing resource productivity, in three main areas; energy, water and

waste and reduce harmful emissions from government operations. Refer to the NSW Whole of Government Sustainability Principles (2006). *Sustainability in the NSW public sector means addressing the needs of current and future generations through the integration of social justice, economic prosperity and environmental protection in ways that are transparent, accountable and fiscally responsible.*

EFSG 02.03 Environmental Design Policies

The following design policies are applicable to DoE facilities:

Green Building Design and Green Star

The Green Building Council of Australia (GBCA) is an independent body whose key objective is to promote the integration and advancement of sustainable building technologies and design practices into the mainstream building design processes.

To assist the building design industry the Green Building Council have developed Green Star rating tools to assess a building's sustainable design credentials.

The Green Star - Education v1 Design & As Built rating tool* would be the most appropriate for assessing new school sustainable design principles.

Green Star Requirements

SEARS requires the assessment of the development against a suitably accredited rating scheme. The DoE EFSG refers to the green star rating tool. The current green star rating tool was chosen to meet the sears requirements.

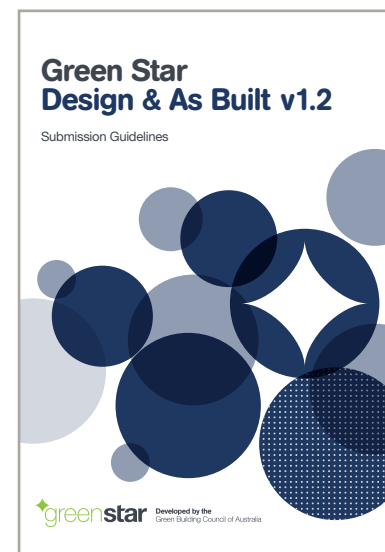
1.1.4 Green Star Rating Scheme

Green Star is an internationally recognised rating system that delivers independent verification of sustainable outcomes throughout the life cycle of the built environment. 'Green Star – Design & As Built v1.2' certification identifies projects that have demonstrated the achievement of a specific level of sustainability. The rating describes to the industry the sustainability attributes of the project in terms that are widely understood and accepted.

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

- Management;
- Indoor Environment Quality;
- Energy;
- Transport;
- Water;

- Materials;
- Land Use and Ecology;
- Emissions; and
- Innovation



GREEN STAR RATING SCHEME

*This Legacy Rating Tool is now superseded by *Green Star – Design & As Built v1.2*

1.2 Description of the Project

This section outlines ESD challenges and opportunities that are specific to the Waitara Public School Design project, including:

- local climate;
- site specific design challenges;
- sustainable design principles; and
- environmental performance targets.

1.2.1 Climate

Waitara Public School site is within Climate Zone 5, Sydney East (ABCB; Figure 1.1). This climate zone is characterised as warm temperate, with a moderate diurnal (day–night) temperature range near the coast to a high diurnal range inland. The zone has four distinct seasons. Summer and winter can exceed human comfort ranges, while spring and autumn are ideal for human comfort. Climate zone 5 has mild winters with low humidity and hot to very hot summers with low to moderate humidity. It is also characterised by widely variable solar access and cooling breeze directions and patterns.

This is an atypical zone in that it includes a more diverse range of climatic conditions than other zones. This diversity is particularly evident in the hours of sunlight, and direction and reliability of cool breezes. For example, waterfront properties in Sydney have very different thermal mass requirements to those in SA's wine-growing regions owing to Sydney's oceanic temperature stabilisation, diurnal ranges and cool breezes.

As demonstrated by Sydney wind rose (Figure 1.3), the site experiences cooling summer breezes from the south-south-east that swing around to north-westerly in the afternoon but can also be subject to severe hail and wind storms, carried by cold winter winds from the west and south.

The graph in Figure 1.2 shows a variable temperature range for the site, which includes an extreme high temperature of over 45.8°C in summer and an extreme low temperature of 2.1°C in winter.

Source: <http://www.yourhome.gov.au/passive-design/design-climate>

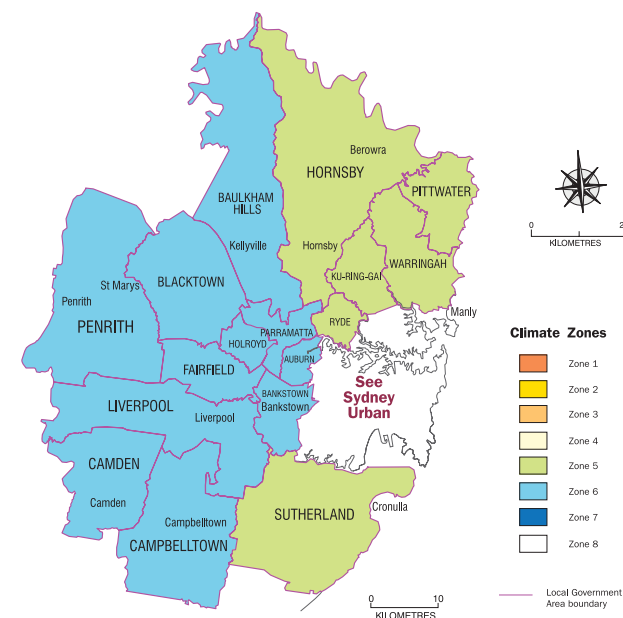


Figure 1.1 NCCA climate zones for the Sydney Region
Source: NCCA

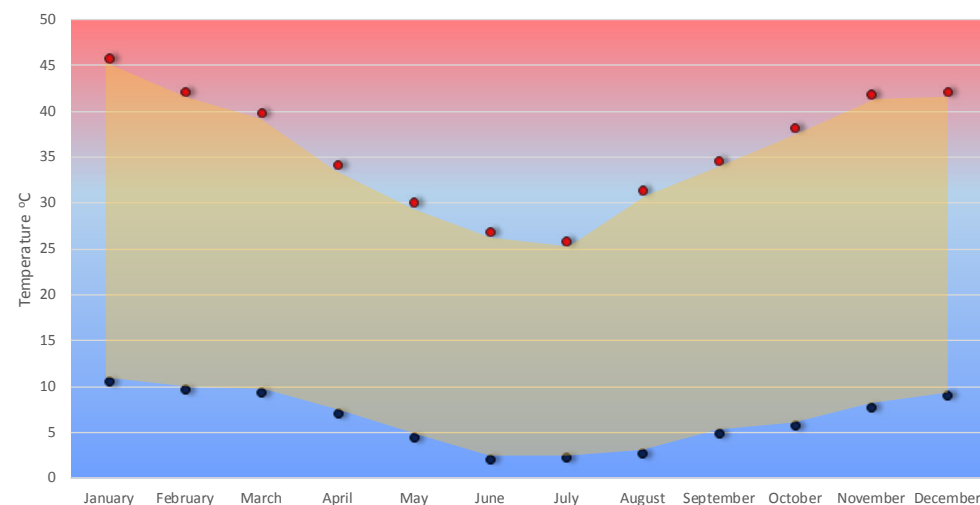


Figure 1.2 Temperature range expressing the lowest and highest recorded temperatures per month for Sydney, NSW Source: BOM Climate (Station 066062 SYDNEY (OBSERVATORY HILL))