SSD DA Report (SSD 7503)

New Ultimo Pyrmont Public School - State Significant Development DA

ESD SERVICES

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CONTENTS

1. EXECUTIVE SUMMARY

This report has been prepared by JHA to identify and summarise the Ecologically Sustainable Design (ESD) initiatives which have been considered in the design of the proposed New Ultimo Pyrmont Public School located in Ultimo, New South Wales.

This report demonstrates compliance with the Secretary's Environmental Assessment Requirements (SEARs) which apply to the project and has been prepared to accompany a State Significant Development Application to School Infrastructure NSW. This report should be read in conjunction with the Architectural design drawings and other consultant design reports submitted as part of the application.

The report identifies how the principles of Ecologically Sustainable Design (as defined in clause 7(4) of Schedule 2 of the Environmental Planning and Assessment Regulation 2000) will be incorporated in the design and on-going operation phases of the development.

2. INTRODUCTION

2.1 Project Description

The New Ultimo Pyrmont Public School project is planned to meet the School Infrastructure NSW's need to provide suitable teaching spaces that meet increased demand in the area. Based on scarce available land in high density areas, the School Infrastructure NSW plans to construct a new four storey school to serve the surrounding community. Ultimo is an inner suburb of Sydney located adjacent to the CBD. The new building will replace the existing Ultimo Public School located on the same site which no longer offers the facilities or capacity to serve the increased demographics of the area. The existing school will be demolished and replaced with a new facility that will accommodate up to 800 students and 33 staff.

2.2 Site Location

Figure 1 – Aerial photo of site

The existing site, as shown above, is bounded by Jones Street, Quarry Street and Wattle Street and is .54ha. It is situated in the heart of the inner-Sydney suburb of Ultimo, located approximately 200 metres from two nearby light rail stations—Exhibition Centre and Wentworth Park—and less than 1 kilometre from the Town Hall railway station.

2.3 Secretary's Environmental Assessment Requirements (SEARs)

This report acknowledges the SEARs prepared by the Secretary which notes the following in Section 6 of the document:

6. Ecologically Sustainable Development (ESD)

1. *Detail how the 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.*
2. *Demonstrate that the development has been assessed against a suitably accredited rating scheme to meet industry best practice.*
3. *Include a description of the measures that would be implemented to minimise consumption of resources, water (including water sensitive urban design) and energy.*

Items 1, 2 and 3 of the SEARS requirements are addressed in sections 3, 4 & 5 of this report respectively.

3. PRINCIPLES OF ECOLOGICALLY SUSTAINABLE DEVELOPMENT

The principles of Ecologically Sustainable Development as defined in clause 7(4) of Schedule 2 of the Environmental Planning and Assessment Regulation 2000 have been incorporated into the design and on-going operation phases of the development as follows:

3.1 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.

Project response:

This development is being designed in accordance with a wide range of ESD goals that pertain to the design, construction and operational stages. The development team will ensure that the building minimises the impact on the environment in the areas of energy, water and materials. A strong focus on electrical and mechanical requirements, including the use of renewable energy contributes to significant strides toward minimising climate change impacts.

The aim of the ESD objectives is to encourage a balanced approach to designing a new public school project; to be resource efficient, cost-effective in construction and operation; and to deliver enhanced sustainability benefits with respect to impacts on the environment and on the health and well-being of students, staff and visitors whilst providing the best possible facilities for a constructive student learning experience.

Initiatives are arranged into the following categories:

- Management
- Envelope
- Electrical Installations
- Mechanical (HVAC) Installations
- Lighting
- Water
- Materials
- Waste
- Sustainable Transport
- Landscaping

In accordance with the above variety of categories, the development will implement a holistic and integrated approach to Ecologically Sustainable Design (ESD), maximising passive opportunities with the selective application of modern technology where appropriate. Initiatives will be chosen with due regard to whole of lifecycle cost benefits to the school.

The ESD initiatives and targets outlined within this document have been compiled based on the following:

- Best practice design principles
- BCA/NCC Section J – Energy Efficiency Targets (i.e.: exceeding targets)
- Australian Green Building Council Green Star benchmarking
- Educational Facilities Standards & Guidelines (EFSG)

3.2 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

Project response:

This development will not cause any significant impact on the health, diversity and productivity of the environment and will provide a community benefit in the form of increased student capacity, upgraded teaching and learning facilities, as well as added amenities such as a communal hall, courtyards, a playground, and a shell space for a 40-space childcare centre. The project will contribute to a lively community environment and add architectural interest to the surrounding area.

3.3 Conservation of biological diversity and ecological integrity

Namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration

Project response:

This development is proposed on a previously developed area of land adjacent to a main road, in an urban environment in an inner-suburb of Sydney.

The development team shall retain or remove trees based on the recommendations of the most recent Arboriculture report for the site (nominated in Appendix I of the EIS). In addition, the development team shall ensure the viability of trees to be retained by taking into consideration the Structural Root Zone (SRZ) and Tree Protection Zone (TPZ) as specified in the report. Where required the extent of canopy reduction pruning is to be carried out in accordance with Council approval and, where available, the detailed pruning report to ensure no over pruning occurs. Protection of retained trees shall be in line with best practice and AS 4970-2009 Protection of Trees on Development Sites.

3.4 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.*

Project response:

The design of this development has employed lifecycle costing to determine the optimum strategy with regards to major items of plant, with decisions being made based on whole of life costs rather than capital expenditure only.

4. COMPARISON AGAINST INDUSTRY BENCHMARK RATING SCHEME

4.1 Green Star

This project is not pursuing an accredited Green Star rating, however many of the initiatives proposed are based on or share similarities with credits in the Green Star Design and As-Built rating tool.
For the purposes of comparison, the following table has been prepared which outlines where the sustainability initiatives which have been incorporated into this project are recognised by the Green Star Design and As-Built V1.1 tool.

Initiative	Green Star Design and As-Built V1.1	
	Recognised	Credit Reference
ESD Professional	✓	1
Environmental Management Plan	✓	7
Commissioning and Building Tuning	✓	2
Building Users Guide	✓	4
Public Information Display		
Building Energy Performance Improvement	✓	15
Infiltration		
Shading and Daylighting		
Metering	✓	6
Wide Setpoint Control Deadband		
Natural Ventilation		
Lighting Control	✓	27
Lighting to achieve 15% improvement over BCA J6	✓	11.1
Obtrusive Lighting	✓	27
Hot Water Systems		
No Hot Water in Public Restrooms		
Solar Photovoltaics		
High Efficiency Fixtures	✓	18
Rainwater Harvesting	✓	18
Low VOC & Formaldehyde Materials	✓	13.1 & 13.2
Recycled Content	✓	21, 20.1
Construction & Demolition Waste		
Waste Storage and Sorting	✓	8B.1 & 8B.2
Alternative Transport	✓	17B.2 & 17B.4
Water Sensitive Urban Design		

4.2 Education Facilities Standards and Guidelines (EFSG) ESD Guidelines

The EFSG guidelines are a comprehensive set of design guidelines meant to outline guiding principles for school design. In addition to the ESD requirements, the project will comply with all other EFSG requirements, some of which are more stringent than applicable regulatory standards. ESD requirements are outlined at:

https://efsg.det.nsw.edu.au/design/dg02ecologicallysustainabledevelopment

5. SUSTAINABLE DESIGN INITIATIVES

5.1 Management

The New Ultimo Pyrmont Public School project team is committed to achieving sustainability outcomes in the design and construction phases, as well as in operation.

5.1.1 Green Star Accredited Professional

All members of the design team are experienced in delivering sustainable outcomes for engineering services packages and the design process shall be overseen by a Green Star Accredited Professional to provide advice on achieving the sustainability targets of the project.

5.1.2 Comprehensive Commissioning

Comprehensive commissioning procedures shall ensure the building is operating efficiently in accordance with the design intent and carried out in line with the Green Star guidelines.

5.1.3 Building User's Guide

All relevant information about the design and correct operation of the building's environmental features will be transferred to the occupants via the Building Users' Guide.

5.1.4 Public Displays

Should the school wish to communicate any ESD initiatives incorporated into the building; the provision of a public information display can be further considered in the next stage.

5.2 Envelope

5.2.1 Building Fabric Performance

The building fabric will be designed to meet or exceed the thermal and sealing performance of the BCA Section J. Thermal breaks will be incorporated into façade elements of walls and windows.

5.2.2 Shading and Daylighting

The building orientation is such that most glazing units are well shaded, allowing for natural diffused daylight whilst minimising unwanted passive solar heat gain. The shading scheme for the building facilitates the application of glazing while mitigating extra heat loads and glare and cutting tinting treatment requirements that reduce natural light transmission. These passive design features allow for enriched daylighting and greater access to external views for occupants. Additional daylighting reduces the reliance on artificial light and benefits alertness, mood and productivity. External views provide a connection to nature and the campus environment and also help to create an environment encouraging constructive learning.

5.3 Electrical

5.3.1 Metering

Electricity metering and sub-metering shall be specified in accordance with the Green Star standards to monitor and manage electricity consumption in the building.

5.3.2 Photovoltaics

Pending roof space availability, collecting solar energy is being considered for the project, with an aspirational goal of providing 10% of the building's energy consumption from a renewable source.

5.4 HVAC

5.4.1 Natural Ventilation

A substantial amount of energy use will be avoided by using natural ventilation in place of mechanical systems to ventilate and cool the building. Operable windows will be provided to all occupied areas. The building has been designed to induce the stack effect, also known as chimney effect, which is a process by which air flows from the outdoors and through different areas and levels of the building due to pressure differences.

5.4.2 Hydronic Heating

Hydronic heating, either in the form of under-floor heating or wall-positioned radiators are planned for the space. Hydronic heating is more efficient that electric systems and has been chosen based on a life cycle costing approach.

5.5 Lighting

5.5.1 Lighting Control

Lighting is to be controlled by Presence Detection (PD) and Photo Electric (PE) methods depending on the application. Lighting is to have an FM accessible master controller to adjust system parameters globally and zone by zone. Closed spaces such as offices and cleaners cupboards are to also have a wall switch. Voltage control (dimming) should be provided where appropriate.

5.5.2 Energy Efficiency

Lighting is to achieve a minimum 15% improvement over BCA Section J6 lighting power density allowances (W/m^2) predominantly through the use of LEDs.

5.6 Water

5.6.1 No Hot Water to Restrooms

To further reduce the energy consumption associated with hot water, hot water will not be provided to public restroom wash basins.

5.6.2 High Efficiency Fixtures

Water consumption shall be reduced by incorporating water efficient fixtures and fittings in accordance with the Australian Government's Water Efficiency Labelling Scheme (WELS).

5.6.3 Rain Water for Non-Potable Uses

Rain water will be captured and used for toilet flushing and any other non-potable uses within the development. A tank sized at 20kL is currently planned for the development.

5.7 Materials

5.7.1 Low VOC / Low Formaldehyde Materials

Adhesives, sealants, flooring and paint products will be selected to contain low or no Volatile Organic Compounds (VOCs) and all engineered wood products used in exposed or concealed applications are specified to contain low or no formaldehyde to avoid harmful emissions that can cause illness and discomfort for occupants.

5.7.2 Recycled Content

Loose furnishings within the building shall be selected based on their recycled content, end-of-life recyclability and product stewardship agreements. By selecting loose furnishings which comply with independent environmental certification, for example Ecospecifier or Good Environmental Choice

Australia, the project will confidently reduce environmental impacts and waste from furnishings over the life of the building.

60% by mass of all steel shall have a post-consumer recycled content greater than 50% or be reused steel. Sustainable timber shall be specified for at least half of the timber products used on the project. Recycled concrete shall be specified using recycled aggregate or manufactured sand and reduced quantities of Portland cement to reduce environmental impacts of concrete production and embodied energy.

5.8 Waste

During the construction phase of the project at least 80% of building demolition and construction waste shall be recycled.

Centralised waste and recycling bin systems shall be provided for the building during operation and a dedicated storage area for the separation and collection of recyclable waste.

5.9 Sustainable Transport

5.9.1 Encourage Alternative Transport

The project promotes and caters for sustainable and alternative transport options. Bicycle parking and a shower facility shall be provided for staff. Car parking shall be limited to the minimum requirements. Building access and pedestrian connectivity allows for building users to take advantage of multiple light rail, train and bus routes in the area.

5.9.2 Vertical Transport

The use of lifts within the development will be discouraged by providing visually prominent staircases for a distance of up to 4 floors plus basement.

5.10 Water Sensitive Urban Design

External area design will implement best practices of water sensitive urban design, including permeable paving and indigenous low water usage plants to increase stormwater retention, decrease total suspended solids and mitigate the urban heat island effect. The carbon sequestration of the plants will also combat climate change contributions.