Ecologically Sustainable Development Review

For Proposed

Blue Gum Community School – SSD 10444

Mt Errington 1 Rosemead Road Hornsby NSW

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Architecture Masterplanning and Design Agency
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Contents

Introduction

This Ecologically Sustainable Development Review (ESDR) as been prepared by Armada Architects in collaboration with Jill McLachlan, Education Director of Blue Gum Community School (the Proponent) to address the SEARs criteria issued by the Department of Planning Dated 19 April 2020.

It forms part of the Environmental Impact Review (EIS) prepared in support of State Significant Development Application (SSD 10444) for the establishment of a small community preschool and primary school on the site of Mt Errington at 1 Rosemead Road in Hornsby NSW.

Project Overview

The new community school will cater for 32 preschool children (3-5 years old) and 48 primary school students (5 to 12 years old). The proposal seeks consent for the adaptive re-use of an existing heritage listed dwelling and its associated gardens.

The school is designed to be incorporated within the footprint of the existing home with minimal changes proposed. At a high level the proposal satisfies Environmentally Sustainable Design (ESD) principles by promoting adaptive reuse and limiting demolition.

The primary changes relate to toilet facilities, fencing and car parking. The development also proposes the addition of an external fire stair on the Eastern side of the property, an extension of the existing driveway and the incorporation of 12 car spaces on site. Given the new use is a preschool and primary school the changes are limited and effectively respond to the ESD principles of Clause 7 (4) below.

The purpose of this ESDR Review is to summarise the Environmentally Sustainable Design (ESD) initiatives adopted for the design of Blue Gum Community School and to explore how the project has addressed the SEARs requirement in relation to ESD.

Environmentally Sustainable Design Principles

The ESD principles proposed for the school aim to reduce the environmental impacts typically associated with buildings during the construction and ongoing operation of the building.

The SEARs for SSD 10444 note a requirement to:

- 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 a description of the measures that would be implemented to minimise consumption of resources, water (including water sensitive urban design) and energy.

Clause 7(4) of Schedule 2 of the Regulation 2000 provides as follows:

7 Content of Environmental Impact Review

"(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.

In an overall sense, the project has taken a sustainable approach to the design. Sustainable building design involves, holistic and integrated design approach, which builds on an increased awareness of adaptive reuse principles, site opportunities, form and function, to encompass and target a broad range of sustainable design initiatives.

Key Design Priorities

For Blue Gum Community School, the key priorities to support the functional demand of the learning environment, are as follows:

1. **The promotion of natural daylight**
   - There is a direct correlation between access to daylight and student performance, attention, productivity and general wellbeing.
   - The daylight operational hours of the school as well as windows in all rooms will facilitate this naturally through the existing design.

2. **Excellent Indoor Air Quality**
   - In a similar manner to daylight, there is proven correlation between student performance, occupant wellbeing, student attendance and staff retention.
   - Principle strategies for ensuring this will include:
     - Increased levels of outside air through the promotion of mixed mode or natural ventilation strategies
     - Increased outdoor air allowances
     - Mould prevention through the avoidance of thermal bridges, condensation and effective strategies in ventilation, odour and pollution control; and
     - Low pollutant emitting materials selections such as low VOC paints, adhesives, sealants, composite woods etc.

3. **Excellent Thermal, Visual and Acoustic comfort**
   - Thermal comfort ensures teachers, students and administrators are not subject to unacceptable extremes in temperature as they teach, learn and work.
   - Visual comfort ensures the quality of light is supportive of visual tasks such as reading and presenting.
   - Acoustic comfort ensures effective communication can be achieved at all times.

4. **Resource conservation (energy, water, material and waste)**
   In delivering on the functional demands of an educational building (high levels of daylight, thermal comfort, visual comfort, and indoor air quality), it is essential these priorities are supported with minimal consumption of energy and water resources, or the generation of waste and pollution in demolition, construction and operation of the building.

- **Energy Conservation:**
  - **Building Form** has been designed with consideration of facade access for greater access to natural daylight and opportunity for natural ventilation. Passive design principles will be employed to respond to environmental conditions of the building including orientation, solar access, prevailing winds, seasonal and diurnal temperatures changes.

  - **Mixed Mode Ventilation** options already exist in the building and can be utilised as is, allowing for improved indoor air quality, whilst also reducing energy consumption associated with air- conditioning. When external and internal conditions are favourable, external windows to each cluster can open to facilitate natural ventilation.

  1. **Energy efficient LED lighting** will be used wherever possible.

- **Water Conservation**
  - Water conservation will be supported through Water efficient fixtures / fittings that will be specified during the Construction certificate stage. These include fittings such as taps, showerheads, toilets, etc certified under the WEL rating scheme;

- **Material Conservation**
  - Environmentally preferable material selection will be a key priority for the project, limit consumption of energy and natural resources during manufacture, transportation and construction on site. Preference will be given to materials that contain high-recycled content and/or are highly recyclable.
    - Recycled bricks are proposed for the paved area.
    - Large branches from trees removed will be reused as natural climbing structures in the playground.
    - Timber products used for concrete formwork, structure, wall linings, flooring and joinery will be sourced where possible from reused, post-consumer recycled or FSC-certified, or PEFC certified timber.
    - Steel – will be specified to meet specific strength grades, energy-reducing manufacturing technologies, and on-site fabrication. Steel will also be sourced with a proportion of the fabricated structural steelwork via a steel contractor accredited by the Environmental Sustainability Charter of the Australian Steel Institute.
    - High recycled content or recyclability – Furniture items with high recycled or recyclability content will be incorporated where possible.

- **Waste Minimisation**
    - A thorough **Waste Management Plan** accompanies this EIS, developed and implemented, to optimize recycling of demolition and construction waste and to guide waste management and minimization once the school is operational.
    - **Waste storage** has been allowed for, dedicated to the separation and collection of recyclable waste.

5. **Storm Water Management**
   - On-site Stormwater Detention has been considered by Storm Water Engineers, however it was deemed that the site will not require OSD due to the minimal works proposed and sufficient existing storm water drainage was incorporated on site.

6. **Cycle parking and end of trip facilities**
   - Bicycle parking racks, changing and shower facilities will be provided for staff to encourage people to walk or ride to work.

7. **The creation of an integrated community resource**
   - The school can play a role within the local community through the use of shared community vegetable garden to be incorporated into the outdoor playground.

Mt Errington ESD response

Below is an overview of the project in relation to the broader ESD principles (as defined in clause 7(4) of Schedule 2 of the Regulation), which will be incorporated in the design and ongoing operation phases of the development.

ESD Principle	Comment
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	None of the physical works proposed in this change of use are deemed to have a serious or irreversible environmental impact. It is considered that the adaptive reuse of an existing building will result in no threats of serious or irreversible environmental damage. A full assessment of the potential impact of trees, flora and fauna are outlined within the Arboricultural Impact Review and the Ecological & Biodiversity assessment and report provided by Cumberland Ecology. All care has been taken to ensure the proposed changes to the site are done sensitively and with the softest impact possible on the environment. All reasonable and practical steps have been undertaken to avoid, wherever practicable, serious or irreversible damage to the environment. All tree removal is offset by new tree planting in accordance with the landscape plan. As mentioned above on site harvesting of timber. The use is bound to operate in accordance with the conditions of consent that collectively serve to manage and limit impacts on the environment.
Inter-generational equity, namely, that the present generation should ensure that the health, diversity	The long-term impact of this proposal will be protection and enhancement of the environment.

and productivity of the environment are maintained or enhanced for the benefit of future generations.	This proposal will ensure the house and gardens of Mt Errington are able to be enjoyed and used for generations to come. The existing health, diversity and productivity of the environment will be maintained.
Conservation of biological diversity and ecological integrity, namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration.	The Arboricultural Impact Assessment and the Ecological & Biodiversity assessment and report provided by Cumberland Ecology thoroughly consider and set out mitigation strategies to conserve the biological diversity and ecological integrity of the site.
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.	The environmental factors noted have been considered in the proposal and will act as guidelines for ensuring the continuing ecological sustainability of the site.

Conclusion

This Review presents a concise summary of the key ecological priorities that informed the design phase of the project and outlines the key ESD opportunities and initiatives that are likely to be implemented at Blue Gum Community School. The strategies presented in this Review are based on the documents and resources listed below.

In summary, to ensure ecologically sustainable outcomes for the project, the following key strategies are addressed within the proposed design:

- Design in a manner that ensures energy efficiency as well as occupant comfort (including thermal, visual and acoustic comfort)
- Incorporate appropriate passive and active design strategies to ensure a low-energy as well as low-maintenance design outcome
- Adopt an intentional approach to resources conservation (energy, water and water)
- Adopt practices to minimise demolition, construction and operational waste
- Provide facilities to encourage staff to cycle or walk to work
- Create an integrated community resource through the development and maintenance of a community vegetable garden
- Maintain and continually improve upon the current landscape of the property to improve upon the existing natural environment year after year, protecting it for future generations
- Take responsibility and great care with the removal of any pollutants in a timely and cost effective manner.

Referenced Documents

- Architectural Drawing Set Prepared by Armada Architects (Revision H)
- FSC-certified or PEFC certified timber - https://www.mathewstimber.com.au/sustainability
- Mt Errington – Waste Management Plan prepared to accompany SSD 10444
- Mt Errington – Arboricultural Impact Report prepared to accompany SSD 10444
- Mt Errington – Ecological & Biodiversity assessment and report prepared to accompany SSD 10444
- Mt Errington – Acoustic Impact Report prepared to accompany SSD 10444