21st June 2019

RE: Lake Cathie Public School Upgrade - Urban Design and Built form

Dear Karen,

Thank you for your letter dated 10.05.2019 regarding the Lake Cathie Public School project. The mandatory ESD criteria in the Educational Facilities Standards and Guidelines (EFSG) have been developed to ensure new school infrastructure is designed and constructed to provide an equivalent level of building performance to a 4-star Green Star rated building (Australian best practice). The proposal is consistent with the mandatory criteria identified in the EFSG and therefore would provide an equivalent level of environmental performance to a 4-star Green Star rated building.

SINSW is not seeking to certify the proposal under the Green Star Design & As-Built rating tool on the basis the EFSG has been designed to ensure new school buildings will achieve an equivalent level of environmental performance to a 4-star Green Star rated building, and educational buildings do not require Green Star certification under the Government Resource Efficiency Policy (GREP) NSW. A revised Green Sustainable Built Form Report has been prepared and is attached at Appendix E.

In your letter, you recommend that green sustainable built form options, including green roofs, walls, etc. be considered for the site. We'd like to confirm that green roofs and other sustainable built form options were considered for this project and while there are a number of benefits associated with these types of construction, they need to be carefully balanced against constraints including upfront and operational costs, ongoing maintenance and safe access requirements. In this instance, green roofs have not been adopted for the following reasons:

- Roofs are being used as an educational tool for electricity production, inter-building electricity challenges and for rainwater capture and reuse. Systems are intended to be ‘familiar’ to students and show what can be done at a local level.
- Light-weight construction systems have been chosen for cost effectiveness and familiarity to local trades.
- Bushfire risks require roofs to be maintained regularly to remove debris and protect from ember attack.
- Increased maintenance access to roofs increase the safety risks associated with working and accessing heights.
- Increased capital cost.
- Ecological focus on upgrading full site to include reforestation and Koala zones, bio-swale and frog-pond. Therefore, no need to expand onto roof space to achieve ecological or outlook objectives.

Attached is an extract from SHAC’s design guide which outlines key Ecologically Sustainable Design Principles for consideration/inclusion in all of our projects. On a project specific level, these principles have been incorporated into the planning and building design along with a large emphasis on the capacity for this education project to be used as a tool to educate students and the wider community about the benefits of sustainable building practices. To this effect, SHAC undertook a workshop with stakeholders to identify project specific strategies. Refer attached Lake Cathie PS sustainability strategies which continue to be developed and incorporated into the project.

We trust that the above information highlights the high level of sustainable design consideration and inclusion incorporated into this project. If you have any questions, or require any additional information, please don’t hesitate to contact us.

Regards,

Christopher Vlatko
Director | Architect
B Arch (Hons1); B Sc (Arch); Dip. Proj Man
The Environmental Design in Schools manual appreciates that environmental factors such as air quality, ventilation, natural lighting, thermal comfort, and acoustic performance have a significant impact on teacher and student wellbeing, as well as attentiveness and overall performance. Passive design strategies are opportunities to make positive, sustainable change in the building or running of a school. With active users sharing the responsibility of making their environment comfortable, people are given tools and an understanding of how they can make small but significant changes to their learning environments from day to day and across the year.

Elements of Passive Design include:

- Ecologically Sustainable Design Principles
  - Natural Shading
  - Thermal Mass: Heat Stored
  - Thermal Mass: Cross-Ventilation
  - Radiation
  - Sun
  - External Shading
  - Sky Lights

Ecologically Sustainable Development 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.

According to the EFSG, all new building or upgrade projects must comply with the measures, targets, and minimum standards of the Government Resource Efficiency Policy, to drive efficiency in energy and water use, waste and improving air quality. The ESD principles to be incorporated in the design, development, or operation of projects for their Whole of Life as identified by the EFSG include:

- Responsible use of energy, water, and resources in the construction, operation, refurbishment, maintenance, management, and their ultimate disposal
- Protect and support biological and ecological diversity
- Restrict the flow of pollutants into our natural environment

Furthermore, according to the EFSG, Ecologically Sustainable Development principles must be included in any new school buildings to a level that the building could be benchmarked to achieve a 4 Star Green Star rating, which is considered to be best practice within the Australian building industry.

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Mandatory Measures under the EFSG + NSW Resource Efficiency Policy include:

- Energy Conservation: Lighting, HVAC Controls, Energy Efficient Appliances + Equipment and Renewable Energy Generation,
- Water Conservation: Water Efficient Appliances, Roof Water Harvesting + Tank Storage and Stormwater Management,
- Sustainable Materials: Sustainable Timber, Low VOC + Minimised Pesticides,
- Ecological Conservation: Biological Diversity, Environmental Conservation Learning Opportunities, Environmental Modelling + Biophilic Design,
- Waste Management: Re-used + recycled materials, Waste Storage Area,
- Climate Change Adaptation
- Sustainability Benchmarking: Ecologically Sustainable Development principles

Additional Green Star - Design & As Built categories include:

- Management: Adaptation + Resilience, Metering + Monitoring, Operational + Construction Environmental Management,
- Indoor Environment Quality: Acoustic Comfort, Lighting Comfort, Visual Comfort, Indoor Pollutants, Thermal Comfort, Indoor Air Quality,
- Transport: Sustainable Transport,
- Emissions: Stormwater, Light Pollution, Micropollutant Control, Refrigerant Impacts,
- Innovation: Innovative Technology or process, Market Transformation, Global Sustainability, Innovation Challenges

The three main steps that can help us to make our built + natural environments feel better + work better are:

- Understanding our physical surroundings
- Understanding how our surroundings affect people
- Adopting strategies that will benefit people and our surroundings

Sources:
- Adapted from Environmental Design in Schools Government Architect New South Wales, Issue 01, 2018
- Adapted from Ecologically Sustainable Development Educational Facilities Standards and Guidelines New South Wales, June 2019
- Adapted from Introducing Green Star - Design & As Built Green Building Council of Australia, November 2019
Learning spaces that are efficiently and passively designed whilst harnessing renewable energy, light, shade, connections to nature, be appropriately insulated and ventilated, accommodate rainwater storage and make use of affordable technologies.

Buildings that are designed to be environmentally sustainable are comfortable and safe spaces for students and the community that address the needs of the school environment as well as the natural surrounds of the campus.

**SHAC's Sustainable Design Principles**

- Appropriate Scale
- Solar Panels
- Insulation
- Ecology
- Light
- Material Selection
- Minimising Transport Impact
- Natural Ventilation
- Noise Levels
- Renewable Energy
- Orientation
- Shade
- Thermal Comfort
- Thermal Mass
- Ventilation
- Water Conservation
- Zero Toxicity
- Zoning, Sensors + Control
- Project Specific ESD Principles
1. Dimensions are in millimetres unless otherwise shown.
2. Work to given dimensions. Do not scale from drawing.
3. Check all dimensions on site prior to construction and fabrication.
4. Bring any discrepancies to the attention of the proprietor & architect.
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Be aware of what processes require energy.
Understand the different sources of energy
Monitor school’s energy usage
Implement strategies to minimise energy usage
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**WATER**

Understand the water cycle

Be aware of how water is used within the school

Develop strategies to minimise water use

Monitor water usage and water quality

- Colour coded pipes and rainwater tanks
- Self-closing taps
- Integrate rainwater drainage in landscape and paths
- Frog Pond - monitor water, study aquatic life and ecosystem
- Colour coded down pipes and rainwater tanks
- Self-closing taps
- Integrate rainwater drainage in landscape and paths
- Frog Pond - monitor water, study aquatic life and ecosystem
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WASTE

Dispose of waste

Monitor class/neighbourhood/school’s waste creation

Become familiar with recycling and compost to form long-term habits

Implement waste minimisation strategies

Fun, informative, and clear recycling bins
Composting
Fun games to encourage waste disposal
Worm farm
Recycled materials
Create an environment that can provide habitats for a variety of flora and fauna

Learn about different habitats, animals, and plants

Understand ecosystems, their systems and the interdependency of the natural environment

Biodiversity

Creation of koala habitat

Potential for bird feeder/habitat projects

Interactive signage

Interactive signage

Forest classroom

Interactive, educational signs

Interactive signage
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Native and bush tucker garden

Indigenous art

Natural materials

Bush tucker
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FOOD PRODUCTION

Be aware of where food comes from
Promote healthy eating
Learn gardening, planting, and harvesting skills
Understand the lifecycle of plants
Learn how to care for living things
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**Empathy**

Experience and appreciate the richness of the natural environment

Provide a platform for ongoing environmental education and stewardship

Learn from nature

- Emphasis on nature play
- Human sundial
- Recycled stumps/stones for class seating/playing
- Pulley and channel sand systems
- Storage for loose parts for play and learning
- Sensory Path
Ecology & Habitat Remediation

Integration with Educational Principles

Habitat Corridor Remediation

Nesting Boxes

Fauna reintroduction

Use habitat rehabilitation area as an outdoor classroom

Provide easy access to native flora and fauna for learning
WETLANDS

Understand the processes that involve water drainage & treatment

Be aware of the various organisms that thrive in wetland ecosystems

Educate students of the importance of maintaining healthy ecosystems
KPoM & Vegetation Management

Understand the importance of vegetation as habitats for various native and non-native animals

Be aware of ecosystems and their interdependent systems

Educate students of the importance in maintaining healthy ecosystems
School Branding & Security Integration with Landscape

Vegetation along base of fence

Indigenous art inspired fence paneling

Express the school’s key educational principles

Be welcoming to the community

Provide a visually pleasing, yet secure barrier