SOLAR ANALYSIS REPORT
Lake Cathie Public School
School Masterplan & Expansion
REVISION A

SITE
1240 Ocean Drive, Bonny Hills
NSW Australia 2445

CLIENT
SNSW Schools Infrastructure New South Wales

DATE
8/02/2019

PROJECT NO.
3928
### Summary of Revisions

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Note: Some images used for this presentation are sourced from the internet & are precedent only, not necessarily the work of SHAC.
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Aims & Objectives

This report outlines the solar conditions of the proposed design. It focuses on the glazing units most impacted by the sun and demonstrates the effectiveness of the proposed horizontal shading to minimise undesirable solar penetration.

Controlling direct sunlight is necessary to reduce unwanted heat gain and minimise the adverse effects of glare. The EFSG recommends:

• Excluding direct sunlight from all learning spaces, libraries, administrative offices and staff studies for the period of 9:00 to 15:30 between the 21st of September and 21st of March (equinoxes)
• Exclude direct sunlight from desk level in all learning spaces between 9:00 to 15:30

These performance objectives were balanced with the design objectives of:

• Providing some form of outlook (either external or internal) to 50% of every GPLA wall.
• Providing a strong connection to the outdoors with at least one glazing unit extending to the floor level
• Exceed the minimum BCA requirement for direct natural light, i.e. providing external openings that represents 15-20% of the total floor area. This is 5-10% greater than BCA requirements.
Due to various site constraints the three proposed GPLA buildings are orientated east (2) and west (1). These orientations are not ideal in terms of the solar conditions. However, they allow the learning spaces to open up to each other and address the local community. More traditional passive design solutions failed to meet the educational objectives. Initially the glazing units were designed to optimise the learners’ connection with the outdoors by having a portion of all the glazing units extend to the floor level.

The resulting solar conditions were analysed using the Archicad sun study tool to determine the depth and duration of solar penetration of the glazing with no shading, 600mm horizontal shading, and 900mm horizontal shading during the hours of 9:00 - 15:30 at the Summer Solstice, March Equinox, and June Solstice.

The study determined that a uniform 900mm horizontal shade was appropriate for the worst affected windows orientated north. However, the glazing orientated directly east and west needed the sill height to be lifted from floor level to 900mm above floor level. Despite this it was still possible to ensure that at least one glazing unit in each primary learning space was able to extend to the floor level, therefore maintaining the close relationship and direct link between the learning spaces and the landscaped environment while controlling direct solar penetration to a comfortable level.