Minarah College

ESD Report

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E-LAB Consulting

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Document QA and Revisions

DESIGN FINALISATION

ISSUE	DATE	COMMENTS	ENGINEER	REVIEWER
1	17/03/2022	Issue for SSDA	CM	CM
2	29/03/2022	Updated for SSDA	CM	CM
3	30/03/2022	Minor Update for SSDA	CM	CM
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Authorised by:

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Sustainability

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1 EXECUTIVE SUMMARY

This report has been prepared by E-LAB Consultants on behalf of Green Valley Islamic College Ltd for the Minarah College development. It provides an overview of the sustainability strategy and elements of the design implemented to demonstrate excellence in sustainability for the Minarah College.

The report addresses Item 6 of the Secretary's Environmental Assessment Requirements (SEARs) for the development, including:

- How ESD principles, as defined within clause 7(4) of Schedule 2 of the Environmental Planning and Assessment Regulation 2000, are incorporated into the design and ongoing phases of the project
- Proposed measures to minimise consumption of resources, water and energy
- How the development is designed to consider best practice sustainable building principles, including design principles inline with a 4 Star Green Star Design & As Built v1.3 rating

Through the inclusion of the various sustainability initiatives outlined in this report, the project clearly puts sustainability at the forefront of the design and addresses the requirements of Item 6 of the SEARs.

2 INTRODUCTION

This ESD report has been prepared by E-LAB on behalf of the Green Valley Islamic College Ltd (the Applicant). It accompanies an Environmental Impact Statement (EIS) in support of State Significant Development Application (SSD-30759158) for Minarah College at 268 and 278 Catherine Fields Road, Catherine Field (the site).

Minarah College will be a co-educational K-12 school accommodating 1,580 students, 840 in primary school and 660 in high school. There will also be an Early Learning Centre (ELC) for 60 students and a School for Specific Purpose (SSP) for 20 students. The new school will be constructed in stages, growing in line with growth in the local population.

The proposal seeks consent for:

- Demolition of the existing dwellings and ancillary structures on-site;
- The construction of the following:
  - One-storey early learning centre with attached two-storey administration building to service the high school and early learning centre;
  - Two-storey primary school building comprising of primary school classrooms, SPP classrooms, primary school hall which attached outside school hours care (OSHC);
  - Two-storey high school building comprising high school classrooms;
  - Two-storey high school hall;
  - Shared one-storey canteen adjoining the high school building; and
  - Shared library located on the second storey above administration building below.
- Site access from Catherine Fields Road at two points with a bus zone, 30 kiss and drop car parking spaces, and car parking;
- Consolidation of the allotments;
- Associated site landscaping and public domain improvements;
- An on-site car park for 138 parking spaces; and
- Construction of ancillary infrastructure and utilities as required.

The purpose of this ESD report is to outline the sustianabilty initiaives within the development in response to the SEARS.

2.1 SITE AND LOCATION

Minarah College is located at 268-278 Catherine Fields Road, Catherine Field and is legally defined as Lot 11 in DP 833983 and Lot 12 in DP 833784. The school site is located within the Camden Council Local Government Area (LGA).

Figure 1 identifies the proposed site within the context of Camden Council. Figure 2 identifies the existing site boundary and site layout.

Figure 1: Site location (Source: Google Maps)

Figure 2: Aerial view of the Subject site (Source: SIX Maps)

2.2 SITE DESCRIPTION

The school site has a total area of approximately 4.5ha. It is located approximately 2.7km from Camden Valley Way, an aterial road between Sydney and Camden. The school is bound by Catherine Fields Road and surrounded by residential houses on large blocks of land

2.3 DRAWINGS LIST

The following table outlines the DA documents used to assess the development

Drawing Number	Drawing Name
A 000	COVER PAGE
A 001	SITE ANALYSIS
A 002	DEMOLITION PLAN
A 003	SITE PLAN
A 004	STAGING PLAN
A 005	SITE PLAN GROUND
A 101	GROUND FLOOR PLAN
A 102	FIRST FLOOR PLAN (1)
A 103	ROOF PLAN
A 111	STAGE 1 GROUND FLOOR PLAN
A 112	STAGE 1 FIRST FLOOR PLAN
A 113	STAGE 2 GROUND FLOOR PLAN
A 114	STAGE 2 FIRST FLOOR PLAN
A 115	STAGE 3 GROUND FLOOR PLAN
A 116	STAGE 3 FIRST FLOOR PLAN
A 117	STAGE 4 GROUND FLOOR PLAN
A 118	STAGE 4 FIRST FLOOR PLAN
A 119	STAGE 5 GROUND FLOOR PLAN
A 120	STAGE 5 FIRST FLOOR PLAN
A 201	ELEVATIONS
A 202	ELEVATIONS
A 301	SECTIONS
A 302	SECTIONS
A 303	SECTIONS
A 304	TYPICAL WALL SECTIONS
A 401	ACCOMODATION SCHEDULE
A 402	GFA + FSR CALCULATIONS
A 403	OPEN SPACE + CAR PARKING CALCULATIONS
A 501	SHADOWS MIDWINTER
A 502	SHADOWS EQUINOX
A 503	SHADOWS SUMMER
A 601	MATERIALS SCHEDULE

3 RESPONSE TO SEARS

The ESD Report is required by the Secretary's Environmental Assessment Requirements (SEARs) for SSD-30759158. This table below identifies the SEARs and relevant reference within this report.

SEARS ITEM	DOCUMENT REFERENCE
Identify how ESD principles (as defined in clause 7(4) of Schedule 2 of the EP&A Regulation) are incorporated in the design and ongoing operation of the development	Refer to Section 4.2
Demonstrate how the development will meet or exceed the relevant industry recognised building sustainability and environmental performance standards	Refer to Section 5
Demonstrate how the development minimises greenhouse gas emissions (reflecting the Government's goal of net zero emissions by 2050) and consumption of energy, water (including water sensitive urban design) and material resources	Refer to Section 6 and Section 5.1, 5.2 and 5.3

4 SUSTAINABILITY INITIATIVES

4.1 OBJECTIVES

To demonstrate excellence in sustainability, the Minarah College development is targeting the following sustainability outcomes:

- Aligning the overall vision of the project with the ESD principles outlined in the Environmental Planning and Assessment Regulation 2000
- Compliance with the Educational Facilities Standards and Guidelines (EFSG) by the Department of Education
- Designed in line with a 4 Star Green Star Design & As Built equivalency criteria
- Inclusion of initiatives to minimise energy and water demand and minimising overall environmental impacts.

4.2 ENVIRONMENTAL PLANNING AND ASSESSMENT REGULATION – CLAUSE 7(4)

The principles of ecologically sustainable development (as documented within the Environmental Planning and Assessment Regulation 2000) are fundamental drivers for this project. The following provides a direct response to the specific principles as follows:

- **The precautionary principle**

  Serious or irreversible damage to the environment is being avoided through the use of previously developed land for the site. The design principles within the Green Star tool are being applied to this site which will ensure that the risk of environmental damage is considered to be very low.

  An Environmental Management Plan is to be developed by the Head Contractor for the project to implement measures during construction to minimise impacts on the environment.

- **Inter-generational equity**

  To ensure equity in health, diversity and productivity of the environment between this and future generations, the development is being designed to be carbon neutral. Section 6 outlines the initiaives to be implemented that align with a carbon neutral development.

- **Conservation of biological diversity and ecological integrity**

  The development will be designed to ensure biological diversity and ecological value is improved for the site via careful landscape design. Special emphasis will be placed on the introduction of a diverse range of landscaping. Furthermore, the site has a Bio diversity certification, under the Biodiverstiy Conservation Act 2016 as well as a a biodiversity development assessment report (BDAR) waiver which demonstrates that the development is not likely to have a significant impact on biodiversity.

- **Improved valuation, pricing and incentive mechanisms**

  The project will include a number of measures to internalise pollution and consider the life cycle cost of systems. Per the EFSG DG01.03, All design considerations must take into account whole of life, including maintenance, access, quality, life span, future improvements and sustainability.

5 GREEN STAR

To meet the sustainability aspirations within the SEARS a 4 Star Green Star equivalent building has been designed. This will not require a formal rating, instead it will include the design intent of a 4 Star building within this development.

Widely considered as the benchmark environmental assessment tool within the Australian Property Industry, Green Star is an independent accreditation framework which delivers sustainable built outcomes throughout the project lifecycle. Green Star is a credits-based star rating system ranging from one through to six stars.

Green Star assesses the environmental performance of projects in design, construction and operation via the following category frameworks:

- Management
- Indoor Environment Quality
- Energy
- Transport
- Water
- Materials
- Land use & Ecology
- Emissions; and
- Innovation

Some areas that the Green Star framework for Minarah College will cover include:

- Passive design with good levels of external shading
- Installed photovoltaic solar cell on available rooftops
- Improved building fabric
- High efficiency HVAC system
- Rainwater collection, storage and use in toilet flushing and irrigation
- High level of thermal comfort in the building
- Use of low volatile organise compound (VOC) and Formaldehyde products within the school
- Waste facilities with multiple waste streams
- Efficient lighting within the building

Section 5.1, 5.2 and 5.3 provides more details on the Green Star Design principles within the design.

5.1 ENERGY EFFICIENCY

Energy consumption on the site will be minimised through excellent design and performance. In order to maximise the overall energy efficiency of the site, demand must first be reduced, then systems must be designed in the most efficient manner. On-site renewable energy will be sized to meet the energy generation on site, as much as practicable. It is only then that projects should look to offset using purchased carbon offsets.

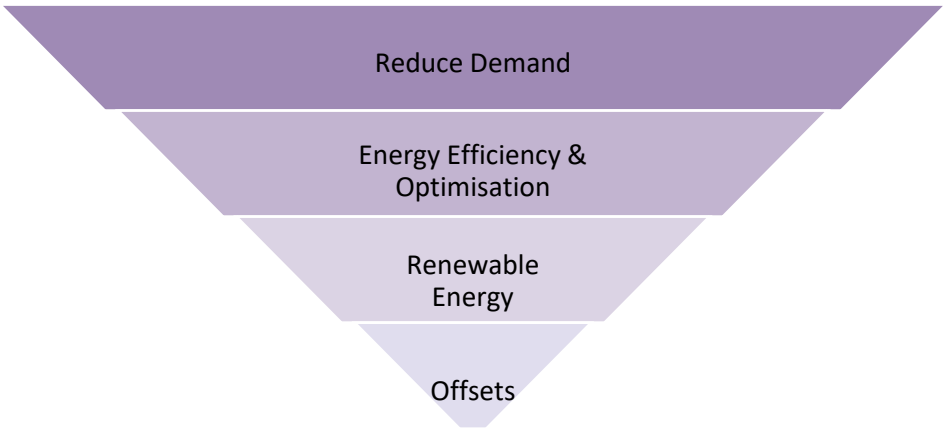


Figure 1 Hierarchy of Design - Energy Efficiency

5.1.1 High Performance Building Fabric

The building fabric has been carefully designed using a combination of solid elements and glazing. Shading devices, overhangs and screens all serve to control heat gains through the façade in summer whilst maintaining good daylight and views

Figure 2: Screens and careful design of window to wall ratios

5.1.2 Natural & Mixed Mode Ventilation

Circulation spaces have been designed to operate as naturally ventilated spaces. The buildings have been designed to allow air to flow between through the classrooms into the walkway areas. This reduces the overall energy consumption of the development.

Air conditioning will be provided to accommodate heating and cooling at peak times of the year; however, each classroom and learning area will be provided with the options to open the windows. This will minimise air conditioning use when external conditions are suitable and serve to reduce the overall energy consumption.

5.1.3 Renewable Energy

The project will incorporate a photovoltaic systems on the roof. The size of the system will be further to ensure that is meets the carbon neutral commitments for the development.

5.1.4 Lighting

High efficiency LED lighting systems are to be provided. This along with lighting control measures such as occupancy sensors and daylight sensors will aid in reducing the overall lighting energy demand.

5.1.5 Energy Metering and Monitoring

An energy metering and monitoring system will be incorporated to measure and monitor the main energy uses within the development. This will allow faults to be detected in a timely manner and rectification to occur to minimise wasted energy use.

5.2 WATER EFFICIENCY

Several considerations have been made to use and discharge water responsibly to improve the development's impact on the water cycle.

- The following **water efficient fixtures** will be targeted:
  - 6 Star WELS rated taps
  - 4 Star WELS dual flush toilets
  - Showers <7.5L/min
  - Urinals will be maximum 0.8L/flush (6 Star WELS)
- **Rainwater harvesting and use** will be incorporated to maximise non-potable water usage on site
- **Landscaping** will be designed to be low water use, with the following to be implemented:
  - Incorporation of native and low maintenance vegetation
  - Irrigation supply from non-potable water sources
  - Sub soil drip irrigation systems to minimise evaporation
- **Water Sensitive Urban Design** is a strong focus for the development reflected in the current landscape design

5.3 INDOOR ENVIRONMENT QUALITY

Improved indoor environment quality is a significant by-product of sustainable building design. The architectural design provides significant consideration to the incorporation of elements to improve indoor environment quality:

- **Covered walkways** have been designed to allow students to move between buildings while being protected from the elements, while providing a connection to nature that indoor corridors are unable to provide.
- **Views** have been considered for each of the buildings to optimise access to the outdoor environment while balancing that with thermal control
- **Daylight glare** is minimised through the use of overhangs on each façade
- **Artificial lighting** will be designed appropriately to minimise glare reduction and providing adequate illuminance levels. This will be done through careful luminaire selection and placement.
- **Acoustic comfort** will be optimised to ensure internal noise levels, reverberation levels and separation levels are achieved in line with best practice standards.
- **Materials and finishes** will be selected to be low-VOC and low formaldehyde to minimise off-gassing and provide a better quality environment for staff and students.

6 NET ZERO

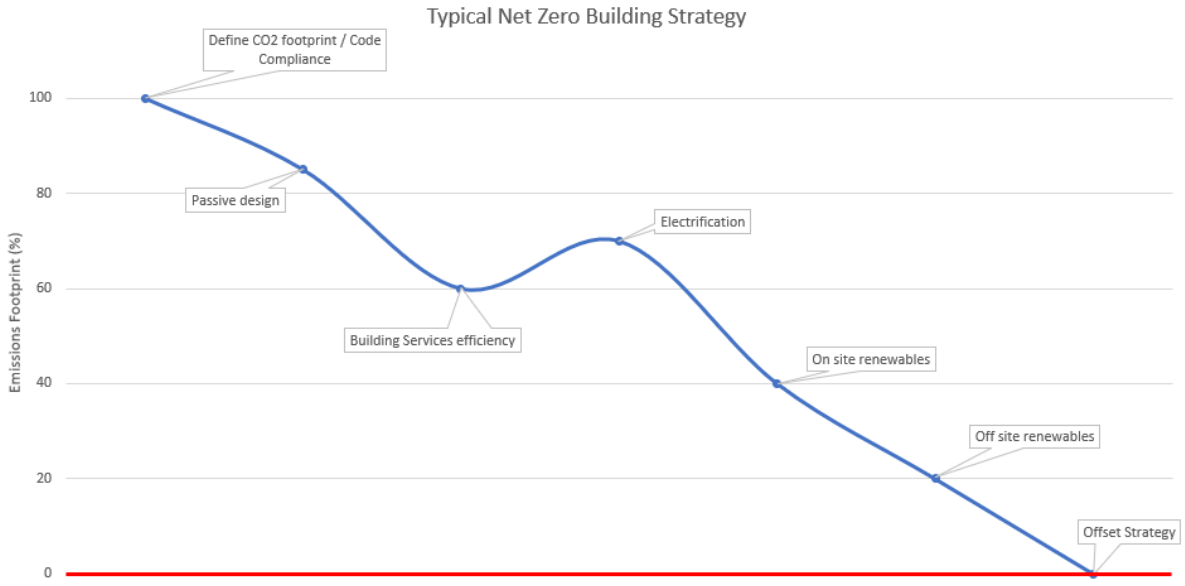
Many organisations have committed to net zero carbon goals as part of their sustainability pledges. School Infrastructure is looking to join these ranks by ensuring all new assets are designed to be net zero carbon emissions. The Minarah development is being designed to be carbon neutral ready, this means that the development will be designed to be all electric with large a large solar array. As electricity generated on the grid moves away from coal and towards renewables it will enable the site, in the future, to be supplied by 100% renewable energy.

Buildings account for 40% of the global greenhouse gas emissions, and as such this is one of the best opportunities to tackle carbon emissions.

To enable the building to be net zero ready the following is recommended:

- All electric design
  - All HVAC and hot system systems to use electricity. No gas use on site
- Design an energy efficient building
- Install Solar PV to meet the generation of the site
- Minimise embodied carbon within the development
- Purchase offsets where required

The table below outlines the typical approach and carbon improvements for each stage of the strategy. Note fully electrifying a building increases the overall CO_2 because the NSW grid is predominantly coal fire powered. However, all electric design enables all the services to be offset by electricity.



7 SUMMARY

The sustainability initiatives outlined in this report demonstrate how the Minarah College meets the objectives of the SEARs. This includes:

- How ESD principles, as defined within clause 7(4) of Schedule 2 of the Environmental Planning and Assessment Regulation 2000, are incorporated into the design and ongoing phases of the project
- Proposed measures to minimise consumption of resources, water and energy
- How the development is designed to consider best practice sustainable building principles, including the design principles of a 4 Star Green Star Design & As Built building
- Compliance with the principles of the Educational Facilities Standards and Guidelines (EFSG)

The development is committed to sustainability through the provision of various sustainability initiatives, as such, the project clearly puts sustainability at the forefront of the design and addresses the requirements of Item 6 of the SEARs

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