RE: Stage 1 Therry ESD Summary

Vicki

Please find following our summary of the project’s ESD attributes to support the development application planning statement.


Schedule 2 Part 3, 7.4) describes the principles of ecologically sustainable development, to which the project responds in the following ways;

(a) The Precautionary Principle

The design of both stage 1 and the master plan principles embrace sustainability as core design principles and targets. Built form is arranged to maximise the passive (i.e. energy free) performance of the building by introducing abundant natural daylight and harnessing natural ventilation. Building services, lighting and equipment will be specified to be highly energy efficient using current best practice approaches and products.

Roof form has been arranged to maximise the platform for future photovoltaics, and all rainwater from new roofs is to be captured and re-used for toilet flushing, irrigation and wash down.

Master planning considerations have also included a future target for carbon neutrality, with a specific focus on avoiding the emission of greenhouse gases from the operation of College buildings. Whilst this represents a future stretch target for the College, the Stage 1 design makes significant progress towards this target, through the combination of passive design performance, efficient building services, lighting and controls, and through ongoing close management of the building’s performance.

Whilst a comprehensive climate risk assessment has not been carried out on this site, the future climate-driven risks relating to this site have been considered, with the highest risk being an increase in maximum temperatures and the length and frequency of heat events. As such, the current concept design pays particular attention to addressing high external heat loads by providing substantial roof overhangs, shading, and internal thermal mass. Design development will further explore options for high-performance glazing and active cooling systems within the building, which may include in-slab cooling or air conditioning.

(b) Inter-generational equity

The Stage 1 concept design has embraced Indoor Environmental Quality as a fundamental requirement by focussing on delivering abundant fresh air, optimum thermal comfort, quality acoustics, visual connection
with nature and low toxicity materials and finishes. The master plan has adopted these ‘biophilic responses’ as core design principles to which all future works must adhere. All design works also target a reduced environmental footprint (i.e. ecological and carbon), with the long term aspiration to target a ‘one planet’ ecological footprint.

(c) conservation of biological diversity and ecological integrity

Whilst the proposed Stage 1 works do not have any impact on existing vegetation or biological communities on the site, proposed works include re-instating additional site vegetation with a significant portion of that being endemic species. The master plan design process is currently considering a range of biodiversity enhancements on site, including additional plantings, interpretive and educational trails and community initiatives.

(d) improved valuation, pricing and incentive mechanisms

The College is targeting building performance that significantly exceeds current legislative requirements with regards to energy efficiency, carbon footprint and potable water consumption. Whilst the operational cost benefits of more sustainable buildings has been recognised during the design process, the primary incentives for pursuing higher standards are the ecological and educational benefits.


The design has targeted a number of key sustainability principles that, when combined, aim to reduce the project’s overall environmental and carbon footprint. Targets for the Master Plan design include;

- Harvesting rainwater for re-use on site from all new roof surfaces
- Managing and treating stormwater in a way that avoids waterway contamination and returns natural flows to support the site’s biodiversity. Stormwater treatment initiatives are being progressively explored and included in concept planning in order to contribute to the long term vision
- Landscaping and planting that is suited to the site’s climate and rainfall, reducing and in some instances avoiding the need for irrigation
- The sustainability aspects of the project (e.g. rainwater harvesting, stormwater treatment and thermal mass) will also be expressed in the architecture as part of the college’s learning curriculum, providing real-life demonstrations of sustainable building innovations
- The design has also followed an energy/carbon efficiency hierarchy with the aim of minimising energy demand for the building, and harnessing renewable energy and passive building systems to provide a comfortable learning environment. This approach will continue into the detailed design process.

Consumption of resources, water and energy

The following sustainability initiatives have been embedded into the concept design, and form the basis of a sustainability strategy for the project;

- The internal occupied spaces will be supplied with outside air at all times, including through the use of a passive / natural ventilation strategy to take advantage of suitable weather conditions. This will contribute to enhanced indoor environment quality for the occupants and a reduced energy demand;
- All external glazing will be physically shaded from summer heat loads whilst admitting controlled amounts of winter sunlight in order to passively warm the interior;
- The northern facade has been designed to create warm winter air that can be introduced into the interior, without the need for energy;
- The built form has been arranged to maximise the introduction of good quality natural daylight, through the use of internal planning in relation to the facade, central void, and clerestory window to the upper level
- Roof orientation and pitch has also been established to support optimum efficiency from future photovoltaic systems should they be installed
- Rainwater from all new roof surfaces is to be harvested and stored in the on-site rainwater storage tanks, with harvested water reticulated to irrigate landscape and flush new toilets
The roof form has been arranged to support an extensive future photovoltaic system, providing renewable energy on-site for the daily operation of the building and equipment.

**Industry best practice**

The project’s Stage 1 design has been reviewed against the Green Star Design & As-Built v1 rating tool and currently achieves points equivalent to a 4 star rating, considered ‘Best Practice’ as defined by the Green Building Council of Australia. A summary Green Star scorecard has been appended for information – please note that the pathway selected to achieve 4 Stars is to an extent indicative at this stage – some detail may change during the detailed design phase, with the 4 star equivalence remaining intact. Achieving a Green Star equivalent outcome is currently an objective for the project.

**Water Sensitive Urban Design (WSUD)**

As the design concept currently stands there is a clear commitment from the College and the design team to maximise the amount of rainwater that can be harvested, stored and re-used. Whilst specific system designs have yet to be developed, the intention is to capture the optimum amount of rainwater from new roofing areas and store for re-use. The storage and reticulation system is yet to be designed, although concept design to date has considered options such as one large tank Vs a series of smaller tanks inter-connected, with future stage-ability and expansion being a key consideration.

Rainwater will be harvested for re-use in all new toilet flushing, irrigation systems and wash down areas [should they be part of the developed design]. Surplus rainwater will be directed into landscape-based stormwater systems such as bio-swales and surface water features.

Surface treatments are yet to be designed, however during design development a range of options are to be considered, including permeable paving, significant minimisation of hard-paved surfaces, increasing vegetation and shaded areas, and the development of bio-swales and other types of water features. Materials used for site paving and infrastructure will also aim to minimise embodied energy and ecological footprints through the use of recycled content and sustainable procurement.

A master plan target currently being considered is that all stormwater leaving the site is to be of the same quality as pre-settlement stormwater, which would be delivered through a combination of all of the above.

We trust that this clearly responds to the sustainability-related requirements for planning application purposes. Should you have any queries relating to the above please let us know.

Kind regards

Digby Hall  
Principal Sustainability Consultant  
T: 02 9431 9425  
E: digby.hall@umowla.com.au  
Umow Lai