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HMRI

ESD DA Report

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1 Introduction

Arup has prepared an ESD Report identifying proposed ESD measures, which are summarised here. The strategic ESD goals identified for the project are aimed at the project's two key stakeholders – those responsible for the building procurement and those responsible for its operation.

The two key ESD goals are:

- Minimise the impact of the construction process; and
- Minimise the impact of the building operation while improving the researcher experience.

ESD in this context relates to minimising resource consumption impacts directly related to the construction and operation of the HMRI laboratory. Impacts considered include emission of pollution, such as carbon dioxide from carbon intense energy sources, consumption of potable water supplies, and production of waste material. In addition to minimising impacts on the natural environment attention has been given to improving occupant (researchers and visitors) health and well-being (experience).

There is currently no market accepted tool for sustainability certification of laboratory design in Australia. A number of relevant available rating tools are discussed in the ESD report and have informed the selection of measures to address the Director-General's Environmental Assessment Requirements, which requires measures related to:

- Water reuse and demand management;
- Energy efficiency; and
- Recycling and waste disposal.

A number of other measures have been identified that provide additional value to the project.

2 ESD Measures

2.1 Measures Related to Water Reuse and Demand Management

- A rainwater harvesting system to collect rainwater and re-use for toilet and urinal flushing.
- Collection and reuse of reject water from RO plant for toilet and urinal flushing.
- Water demand management will be provided by WELS rated low flow tap-ware, showerheads, flow control devices, instant cut-off sensors, dual flush toilets, waterless or water saving urinals, efficient floor washing machines instead of hosing, collection and recycling of fire sprinkler test water, and water efficient landscaping

2.2 Measures Related to Energy Efficiency

- Meet Section J of the BCA.
- Air conditioning systems will be designed to reduce fan energy consumption, recover waste heat for re-use, utilise ambient air when appropriate for cooling, zone and control spaces to avoid unnecessary cooling and/or heating.
- Energy metering and sub-metering will be used to keep track of energy consumption by systems (e.g. central plant, tenancies).
- Commissioning protocols and operational tuning will be employed to achieve energy efficient operation.

- Plant efficiency will be optimised with variable flow chillers and pumps, insulated piping and spare space in riser shafts.
- The building orientation has maximised the extent of façade facing north and south orientations, improving energy performance by reducing heat gains from east and west low angled sun directions.
- A solar hot water system is proposed for DHW pre-heating.
- Lighting systems will employ efficient luminaires and high frequency ballasts.

2.3 Measures Related to Recycling and Waste Disposal

- Construction wastes will be minimised through an Environmental Management Plan and design for future deconstruction and reuse of elements / materials.
- Construction material consumption will be minimised through recycled content in concrete and steel and sourcing local materials to reduce embodied energy from transport.
- Minimisation of cut and fill earthworks to limit impacts to the existing site and reduce the need for exportation or disposal of excess cut and the importation of fill.
- Operational wastes will be minimised through a waste management plan, dedicated storage areas for waste separation and recycling, and management systems related to harmful chemicals and hazardous materials.

2.4 Other ESD Measures

- Internal environmental quality will be addressed through internal layouts to take most advantage of daylight and views for all, prioritise occupied space for location on north- and south-facing sides of the building, high frequency ballasts to avoid annoying lamp flicker and maintain internal noise levels below levels specified for 'satisfactory' ambient noise levels in AS/NZS 2107:2000.
- Indoor air quality will be addressed through internal planting and specification of low-VOC paints, adhesives, sealants, carpets and flooring, low formaldehyde wood products, low-toxicity cleaning products, and minimised PVC in construction materials.
- An Environmental Management System will be developed for building operations and maintenance, including an Environmental Management Plan for ongoing operations.
- Emissions will be reduced through specification of HVAC refrigerant with low Ozone Depletion Potential (ODP) and external lighting design to avoid light pollution into the night sky.
- Lockable bicycle storage and showers / change rooms are proposed.
- Collection and treatment of water runoff from paved surfaces to remove waterborne pollutants using vegetated swales.