College of Business

SWANSTON ACADEMIC BUILDING

A SUSTAINABLE RMIT—OPENED JULY 2012

The Swanston Academic Building (SAB) has been designed to a high sustainable standard and has been awarded a Green Building Council of Australia (GBCA) 5-star Green Star Education Rating for environmentally sustainable design.

BUILDING MANAGEMENT—METERING

The Building Management System (BMS) connected to energy and water meters allows for real-time monitoring of water, electricity and gas consumption. The system allows for separate monitoring of each functional area and building element, including rainwater harvesting, lighting and hot water usage. The BMS ensures that the building is efficiently run and spaces are conditioned to meet the building occupant's needs.

DEMAND-BASED CONTROL VENTILATION (DCV)

The SAB has been fitted out with Demand–based Control Ventilation (DCV) technology, which maintains proper ventilation and improves air quality while saving energy. Carbon dioxide gas (CO_2) sensors control the amount of ventilation for the actual number of occupants. DCV reduces the total outdoor air supply to an indoor space during periods of less occupancy.

ENERGY EFFICIENCY—UNDER FLOOR AIR DISTRIBUTION SYSTEM

The SAB has been fitted out with an Under Floor Air Distribution System (UFAD). It is used for ventilation and cooling of large, high spaces such as lecture theatres, where energy can be saved by treating the occupied zone rather than trying to control the conditions of the entire space. Fresh air is delivered to the spaces at a low level through floor diffusers under the seats and extracted at a high level, providing a high-quality indoor environment with lower energy consumption.

ENERGY EFFICIENCY—PORTAL MIXED-MODE VENTILATION

The ten student portals in the SAB are heated and cooled using a number of energy-efficient technologies, also known as mixed-mode ventilation. When the external temperature is between 17°C and 30°C and the wind speed is less than 10 m/s the portal will operate in natural ventilation mode. When these measures fail to keep conditions within the portal acceptable, mechanical ventilation will activate.

SUSTAINABLE SOURCING—SUSTAINABLE MATERIALS

Environmentally sustainable materials, including concrete and timber, were used in the construction of the building. A portion of the cement used in the construction was substituted with industrial waste products, while timber used in the building includes re-used timber, post-consumer recycled timber and Forest Stewardship Council (FSC) certified timber. Many of the fit out items used are certified under the Good Environmental Choice Australia (GECA) label.

ENERGY EFFICIENCY—CENTRAL PLANT

Chilled water for the SAB is sourced from a chilled water plant that is located on the roof of Building 12 across Swanston Street. This option is more energy efficient than the installation of a localised chilled water plant, as the central plant is large enough to service a number of buildings on the City campus.

ENERGY EFFICIENCY—CHILLED BEAMS

Active chilled beams have been installed in cellular and open-plan office spaces in the building. Active chilled beam technology is a building conditioning system that uses convection and water transferred through a hydronic water loop system to efficiently move energy throughout a building for the purposes of heating and cooling. Active chilled beams provide an energy-efficient, comfortable and quiet operation in a robust system and have low maintenance requirements.

ENERGY EFFICIENCY—FAÇADE AND SUN SHADING

The façade is comprised of external panels and triangular elements, which provide different degrees of shading based on the orientation of the building. The façade includes 50/50 panels (half glass and half opaque panels) with diagonal sunshades at varying depths, full glazed panels and solid panels.

ENERGY EFFICIENCY—GLAZING

The combination of shading elements and glazing performance allows for high levels of natural daylight to penetrate the internal spaces without allowing for significant glare. Environments with greater access to natural light are conducive to enhanced staff productivity, health and wellbeing. The use of double-glazed glass units reduces unwanted heat loss, particularly in winter.

ENERGY EFFICIENCY—ENERGY-EFFICIENT LIGHTING

The SAB contains a number of energy-efficient lighting sources that include fluorescent lamps and Light Emitting Diodes (LEDs). These lamps offer a significant reduction in lighting power consumption—approximately one third of that consumed by incandescent lamps. Spaces have also been fitted with occupancy sensors, motion detectors and daylight monitors, which contribute towards reduced energy consumption and costs by only lighting those areas that are occupied and have insufficient daylight levels.

WATER EFFICIENCY—RAINWATER HARVESTING AND GREYWATER TREATMENT

To reduce the use of drinking (potable) water within SAB, rainwater is collected from the roof of the building in an 80 kL rainwater tank and is used for irrigation and toilet flushing. Greywater generated from sinks and showers undergoes a treatment and purification process that recycles approximately 8300 L for toilet flushing. The rainwater collection, combined with treated greywater, will reduce the landscaping demand for potable water by at least 90%.

ENERGY EFFICIENCY—SOLAR POWERED HOT WATER

Solar panels are used to preheat the water for the building, which is then stored in tanks until required. The water then passes into a central, internal gas-fired hot water system, which is located within the plant room on the roof of the building. The combination of solar preheating and instantaneous gas heating has a much lower energy and carbon intensity than an electric system.