

7.0 Superior Design Outcomes

The buildings has been purposely designed to reflect the intentions of the Bowen Hills Development Scheme by being eligible for development incentives by providing Superior Design Outcomes for a visitor accommodation building. The building will incorporate the next level of high technology while remaining to be ecologically sustainable. .

7.1 Materials

The building will incorporate the following building materials and energy savings to reduce the building's ecological footprint.

Innovative Wall Panel Materials

The external walls of the building will be a variety of composite building materials used in the manufacture of the panels. The fabric of the building will be substantially more thermally efficient than conventional concrete construction and 50% higher than the Building Code of Australia requirements. The MBC Smartwall – Phenolic Fibreglass Laminated sandwich panel will be laminated with a EVA – Latex based Polymer with the following properties:

- a. Closed cell Foam
 - b. Latex base – natural sustainable material
 - c. Used extensively in Acoustic Linings for sound rooms
 - d. Thermal transmission co-efficient “k” 0.03 – Thermally very good
1. Mineral Fibre – Rockwool where extended fire rating is required (Natural Fibre)
 2. Ceramic fibre panel surfacing – Alternative fire rating improvement – (Magnesium oxide base)
 3. Core flute Laminates – Incorporates an Air gap further improving the acoustic performance (PVA)
 4. Skins of phenolic resin – High impact resistance + Structural Strength (Glass Fibre)
 5. Panel Thickness to achieve the required thermal, acoustic and fire rating – 100mm

7.2 Energy Efficiency

The proposed visitor accommodation will incorporate low energy consumption influences within the design. Please note the following items:

1. Solar Hot Water System

The management of legionella is key in the selection of an ESD type Hot Water Systems. The main goal in managing legionella is to keep the hot water at, or above, 60 degrees C, and keeping storage to a minimum. The product that will do this is a Solar Hot Water Heat Pump with temperature control. The hot water system will be a **gas boosted solar** line pump. It is both the most eco at 1/8th the CO₂ emissions of an electric heat pump, as well as the most cost effective at half annual running cost.

2. Air-Conditioning System

The air-conditioning system is anticipated to be a Hybrid gas-fired and electric heat pump. This is designed so that when the temperature is coldest the gas system takes over, as the electric heat pump struggles to produce the volume of heat required from the cold air. The air-conditioning systems will be motion sensor or airflow sensors triggering automatic shut down as the most effective to reduce energy consumption.

3. *Lights*

In order of the most intensive energy consumption in a building, it starts with A/C, then Hot Water, then lights and power. Queensland energy suppliers use predominantly coal fired plants to generate electricity, which has far greater CO² emissions than gas, resulting in the building being comparatively much more sustainable. All lights within the building will be light emitting diode (LED).

4. *Wireless Fire Detection System*

The proposed wireless fire detection system (wireless fire smoke and heat detection) to be installed in factory as part of the modular construction will contribute directly to the sustainability of the building, due to reducing cabling, connection and labour requirements, with reduced capital cost of on-site labour which contributes to global energy usage.

5. *Glass*

Low-E glass is to be used on external facades to reduce heat loss/gain by 39%.