Setting a benchmark for sustainability

Fiona Stanley Hospital will set a benchmark for sustainability in health care design in Western Australia through passive solar design, building orientation, shading principles, and water and energy saving technologies.

The building design will also consider contemporary sustainability initiatives – including a trigeneration plant.

What is Ecologically Sustainable Development (ESD)?

ESD is an approach to the design and operation of a facility that results in reduced:

- energy consumption;
- greenhouse emissions; and
- water use.

Fiona Stanley Hospital is being designed to exceed current Australian Best Practice in ESD. It will set a new benchmark in sustainable design for healthcare facilities.

Incorporating ESD into Fiona Stanley Hospital

The design of Fiona Stanley Hospital will include:

- systems that promote the use of fresh air and offer high indoor air quality;
- building design that increases the use of natural daylight and views to nature;
- passive solar design – providing comfortable indoor temperatures using the sun and natural light and, in turn, reducing the use of heating and cooling systems;
- efficient lighting systems, including external lighting that is designed to prevent light pollution/dispersion into the night sky and neighbouring properties;
- low emission paints, adhesives, sealants, carpets and furnishings;
- efficient and effective air conditioning and ventilation systems;
- outdoor spaces that offer a connection to the natural environment for patients;
- heat recovery ventilation to pre-heat or pre-cool incoming outside air;
- use of CO_2 sensors to regulate the amount of outside air supplied in response to occupancy demands to reduce cooling and heating energy consumption;
- economy cycle systems to reduce cooling energy and use free cooling available in the outside air whenever the outside ambient conditions are suitable;
- variable-frequency drives to regulate pump and fan motor speeds to suit demand under part load conditions to reduce fan and pumping energy;
- building finishes that minimise heat gain into the buildings without limiting views to outside nature;
- cycling facilities including bicycle storage, showers and lockers;
- integrated public transport facilities including excellent pedestrian links between the hospital and nearby public transport systems;

- a centralised reverse osmosis water system which will provide water for use in key areas including the equipment sterilising unit, mechanical plant and kitchen cooking equipment. Saline waste water will be collected into underground storage tanks, filtered and treated, before being recycled for use within the non-drinkable water supply system.
- 4A-rated low flow sanitaryware and tapware to reduce water consumption;
- rainwater collection from roofs, storage and reuse on site for irrigation, toilet flushing or treatment;
- fire water storage tanks that will include the reuse of water discharged from sprinkler/hydrant pumps;
- water sub-metering for higher use areas such as the cooling towers, amenity areas, irrigation, wash-down, hydrotherapy pools, kitchens and laundries;
- efficient water irrigation systems;
- the use of native plants in landscaping to minimise water consumption;
- cooling tower water treatment systems designed to achieve better than six cycles of concentration;
- use of eco-friendly materials;
- dedicated recycling storage areas;

- conservation of approximately three hectares of natural bushland;
- 'green roofs' through the inclusion of roof gardens to maintain the natural biodiversity of the site;
- use of refrigerants with zero Ozone Depletion Potential (the amount of degradation of the ozone layer the chemical compounds can cause);
- use of thermal insulation manufactured from zero Ozone Depletion Potential products and processes;
- use of refrigerant leak detection systems; and
- laboratory exhaust systems that include scrubbers and filters.

Planning for trigeneration

Planning for Fiona Stanley Hospital also includes a trigeneration plant.

Trigeneration is the simultaneous production of electricity, heating and cooling from waste energy.

The trigeneration plant at the Fiona Stanley Hospital site will generate a portion of the site's electrical base load, while the waste heat will provide a portion of the site's heating and, via the use of absorption chillers, cooling base load. This will reduce the maximum electrical demand that the site will require from Western Power Corporation.

The trigeneration plant will also be utilised as part of the project's standby power generation plant.

For more information

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Government of **Western Australia**
Department of **Health**