Australian and New Zealand College of Anaesthetists Headquarters: 630 St Kilda Road Melbourne 3004

Description of project

The building has been designed within the practices of a sustainable architectural outcome. Concerns centred on two main aspects, the whole world environment and how a building effects that, and the immediate environment of the building project. The building and its environment are designed wholly as an interaction between the dynamic relationship of the building and its environment.
Where possible, passive low energy design attributes were introduced. Concepts were designed to reduce fossil fuel needs for the building, lower and eliminate the use of unsustainable materials, eliminate entirely any rainforest, endangered species materials or unrecycled elements.
The building was constructed using steel frame with precast concrete walls, concrete floors over Bondek, plaster walls and ceilings. It was designed as a large 'house' rather than an office block. The interior of the building encloses a large eight level chasm that enables user friendly visual, aural and human contact throughout the building without the need for mechanical devices.
The building is a partner building to Ulimaroa, designed as Modern to complement the 1980's original. A polished screen between the new and old buildings acts as an architectural foil, a semi-transparent sheer skirt that amalgamates old and new.

General principles

There are a number of general principles that apply:
- Using less resources.
- Regeneration of resources and recycling.
- Reduce energy consumption and improve energy efficiency. Low energy and high performance.
- Reduce global warming by using less fuel and reducing fuel production.
- Long life loose fit.
- Total lifetime costings.

The building is designed to last, not the standard commercially accepted 25 years or so, but for a life cycle of 100 years and greater. It is a loose fit build, capable of easily transforming to suit changing needs. Over the building life cycle, it has been conceived to be lasting, low maintenance, reduced maintenance painting and replacement of materials caused by aging. The fabric of the building is designed to last over 75 years without the need for regular replacements of elements of the building.

Equipment and machines in the building are selected to eliminate greenhouse gas emissions by reducing fuel production needs for the servicing of the house and by eliminating the need for natural forest timber -thereby contributing to a reduction of further greenhouse effects.

Energy efficiency

Insulated and fully sacked walls and ceilings to high level R rating reduce heat build up and loss.

Thick glass is used to eliminate heat build up and loss. Low emission glass and double glazing to reduce heat loss and heat build-up so the building requires less heating and cooling.

Skylights and roof lights to be double glazed polycarb (thermoclear) sheeting which acts as an insulated high-density material.

Exhaust fans for bathrooms and kitchen operate with automatic closing devices to prevent draughts when not operating.

Blinds to be fitted to windows to reduce heat gain in summer and heat loss in winter.

Sunshade devices both horizontal and vertical (as screen shades) to cover all windows to control high summer heat build up but also to allow low winter sun to penetrate.

Cross ventilation within the house to enable natural cooling without equipment.

Building sited using principles of low energy so that sun controls can be simply using the location of windows and doors.

Austint green glass adopted to reduce solar glare and heat transference into the building (30% reduction over normal clear glass).

Windows, doors and all walls, floors and roofs are detailed to ensure no leakage of air between inside and outside.

North facing living areas takes advantage of the natural movement of the sun across the sky.

Living areas separate from sleeping areas, the building is zoned to reduce the need for heating and cooling to all rooms and reduce the consumption of fuels.

Separate stair to first floor to reduce heat loss between levels.

North facing windows in living areas to attract winter heat, solar protection for summer to reduce Need for cooling.

Wet areas zoned together on ground level and vertically to allow for reduced runs of reticulation piping reduces heated water requirements.

Maintain air movement within the house using ceiling fans where necessary.

High level thermal mass external walls to maintain stable internal temperatures and reduce need for heating and fuel usage.

Preheating and off-peak heating for systems to prevent high fuels usage.

Heating system to be by radiant or panel requiring low fuel use, independent room controls, automatic controls for variation between rooms and easy turn-off functions. All controlled by automatic timer devices on each unit. Reduced need for expensive ductwork and deletes need for expensive fan driven air mechanism.

Hot water system located near high-use outlets (ie. kitchen, utility, bathroom) to reduce heat loss in long length pipes. Separate HWS unit for utility where it located.

All hot water pipe lines fully insulated.

Natural daylight used where possible, reducing demand for electric lighting located outside main house.

Low voltage lighting units installed.

Adapt natural daylight for as long as daylight is available to reduce use of electricity.

Use non-polluting paints and reduce painted (high maintenance surfaces generally).

No rainforest timbers will be used in the construction; all materials will be from renewable sources and within acceptable international standards. All joinery will be made using reconstituted granular timbers and laminated surfaces where applicable.

Demonstrated environmental/economic benefits

Reduced material cost.
Reduced waste from building operation using pre-fabricated elements.
Reduced duplication of structure and cladding.
Reduced operation fuel costs.
Reduced fire protection costs using natural airflows in lieu of equipment and ductwork.
Reduced electrical lighting using natural daylight via a central void chasm.
Reduced emission of greenhouse gases via less fuel use.
Reduced reliance on mechanical ventilation and conditioning, adopting opening doors to the Outside, individual controls within building compartments, cutdown on airconditioning where parts of the building are not used, using planning to cater for air flows.
Reduced number of lifts and mechanical transporters using stairs.

Cost impact of SD features

The cost of the building is reduced by reducing capital costs of equipment (reduced in size), not having to fire protect elements of the structure (due to the smoke spill void 'chimney'), low-cost pre finished building fabric (no applied finishes), limited maintenance requirements long term, reduced light fittings, reduced ductwork.

Contacts

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