DETAILED CASE STUDY

Manly Hydraulics Laboratory

Background

This project involved the development of a new facility, to replace a collection of buildings. The redevelopment included a new main building incorporating laboratory facilities, offices, conference rooms, a computer room and staff amenities, with an adjoining building to house a wave basin.

The Manly Hydraulics Laboratory (MHL) is a business unit of the Department of Public Works and Services (DPWS). The business provides solutions for coastal erosion, the water cycle and water conservation. The MHL also manages a coastal data monitoring system that is expanding to become Australia wide.

The client required a building that reflected their leadership position in the water consulting industry. The building needed to be a showcase of innovative, sustainable solutions. A further directive to the design team was that the MHL (and the DPWS executive) were willing to try cutting edge solutions, setting aside the usual requirement for only tried and tested technology.

The building budget did not allow for a fully air-conditioned building.

Environmental Options

The environmental options developed for the MHL resulted in the following being adopted:

- a hybrid natural ventilation system,
- application of passive design such as thermal mass and insulation to assist the hybrid natural ventilation system,
- computer controlled adjustable external sun louvres,
- natural daylighting using pyramid skylights,
- solar thermal hot water heating,
- computer based building management system to optimise the hybrid natural ventilation system and provide time management of all other building functions,
- solar powered external lights,
- solar electric power (10.3 kWp photovoltaic system),
- water saving devices,
- natural gas heating systems.

Budget

The key area for the client to address was an increased building budget as a result of some options above. The benefit was that the building should not at any future time require airconditioning, saving capital costs and recurrent costs. When the total life costs for the building were assessed, the additional capital costs were judged to be a good investment.

Issues

The key issues to ensure the inclusion of the above options were:

- the involvement of the sustainable energy designers at an early stage in the project development. Where this is delayed, there is normally great resistance to any alteration or change to the project.
- client support is vital. The inclusion of these options resulted in an extended design phase. There is also an increased workload placed on the design team during the design development phase. Often, fees negotiated for a traditional building concept do not allow for innovation.
- support from the documentation team. Innovative solutions can only occur where the architect and services engineers are willing to break with traditional thinking.
- an environmental solution has a greater acceptance where the item achieves more than one purpose. An example is the hybrid natural ventilation system that provides thermal mass to absorb heat and the structural support for the suspended floor slabs.

A detailed case study prepared by the sustainable energy designers is attached. It contains detailed descriptions of the solutions and provides further information about the project.