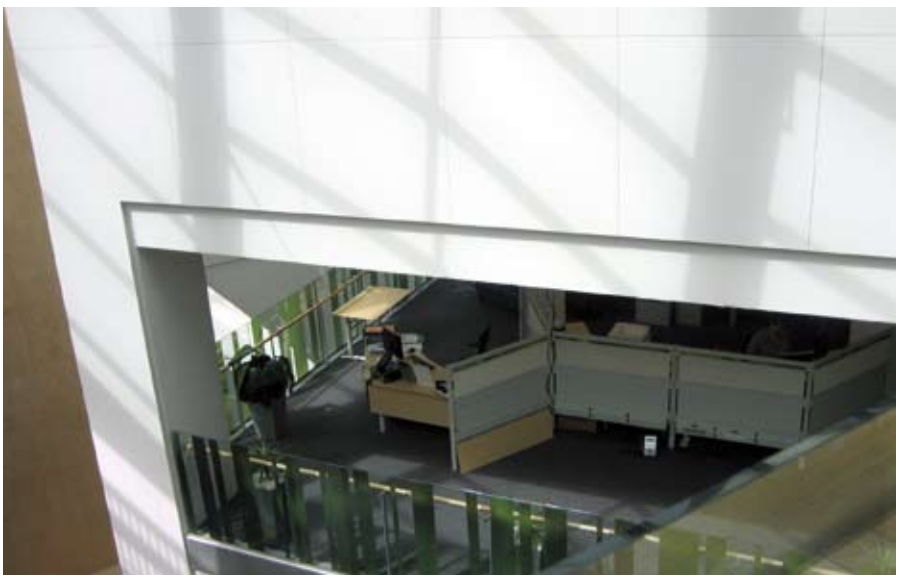
CONSERVATION HOUSE – A COLLABORATIVE INSPIRATION

A revolution in the way commercial buildings are designed in New Zealand has begun – and will gain momentum with the government's call to action on sustainability.

By Chris Wood, Sustainable Industry Advisor, Ministry for the Environment

The Prime Minister's Statement to Parliament on 13 February highlighted the government's commitment to sustainability. Helen Clark outlined two initiatives that the government intends to use to lead by example.

The first is 'moving the public service towards carbon neutrality'. Energy used in buildings is a major component of the government's carbon emissions, therefore improving energy efficiency is crucial in moving towards carbon neutrality. The second initiative is to 'use the government's purchasing power' to help drive innovation, cleaner production, and improved cost effectiveness over the whole life cycle of goods and services.



A workstation enhanced by natural light.

Many pluses for sustainable design

The revolution in commercial building design is underpinned by two factors – a desire to reduce the negative environmental impacts associated with a building's life cycle, and a realisation of the economic and health benefits sustainable buildings can offer owners and users.

The negative impacts of a building include the wasteful use of resources such as energy, water and building materials. Ministry of Economic Development data shows buildings account for about 56% of electricity use in New Zealand while Ministry for the Environment figures show construction and demolition waste contributes half of the total waste going into the waste stream. If sustainability is integral to the design these impacts can be dramatically reduced.

Sustainable buildings use significantly fewer resources and, in turn, cost less to operate. International examples of sustainable buildings have typically shown a 20 to 50% reduction in energy consumption. Locally, the Ministry for the Environment's new office building uses only 40% of the energy of a typical office building of its type in New Zealand.

Sustainable design also fosters better health and productivity. The *Value case for sustainable building in New Zealand* cites international research that shows a 5 to 15% increase in productivity associated with good indoor environment quality.

Getting the design of a building right at the outset is key because 80 to 90% of a building's economic and environmental costs have already been incurred when design is complete but before construction begins. Achieving this requires a more collaborative whole-building design approach than has been typical in the past.

DOC walks the talk

The new Department of Conservation (DOC) head office is an example of this new approach. Conservation House won the Sustainable Buildings/Fit-outs in Development category in the 2006 Govt^3 awards. These awards acknowledge building design and operation that improves economic and environmental outcomes. The judging criteria were: improvements in the use of energy, water and materials; reduction in the generation of waste and waste water; and influence on the travel patterns of occupants.

The Department of Conservation's mission is 'to conserve New Zealand's natural and historical heritage for all to enjoy now and in the future'. So when DOC started looking for new accommodation it saw an opportunity to express these values in its new building.

Before going to the market, DOC approached the Ministry for the Environment's Govt^3 team for guidance on sustainability. Under the motto 'walking the talk', the Ministry runs the Govt^3 programme to help central government agencies become more sustainable. The Govt^3 team works with its members in the four key areas of

transport, waste minimisation/recycling, office consumables and sustainable building.

DOC's Requests for Proposals (RFP) document was developed after its employees were extensively surveyed to ensure their needs were understood and could be included in the design brief. The RFP's guiding environmental principles for the building's refit included minimising energy consumption, protecting and conserving water, using environmentally preferred materials, enhancing the quality of the interior environment, and optimising operational and maintenance practices. The project also needed to be achieved economically using whole-of-life costing.

Transform instead of demolish

Almost all of the sustainable buildings built in New Zealand so far have been new builds. DOC's head office used an existing cinema complex and transformed it into one of New Zealand's most striking offices. This selection suited the Department's requirements and made use of an existing structure and its embodied energy, avoiding the waste entailed in demolishing a building.

The building's owner, the Wellington Company, and DOC worked together to create an environmentally friendly, energy efficient and sustainable space. They established a project management team that worked collaboratively to maximise the interests of both parties. To achieve the building's performance targets required the different disciplines responsible for the design and construction to work closely together so that the building's systems worked in harmony with the design features and building products.

An example is the coupling of passive solar design with active ventilation using chilled beams. The building uses an atrium and double-glass façade on two sides to allow passive ventilation and natural light to penetrate deeply into the building's interior. This approach required the removal of sections of the floors to create light shafts and to allow for adequate airflow.

This is the first time chilled beams have been used in an office building in New Zealand. Chilled beams are a state-of-the-art, highly energy-efficient measure that was integrated with the passive ventilation to ensure the building's internal climate was appropriate all year round.

Inspiration for others

The design team used the Green Building Council of Australia Green Star office building rating tool as a guide for the environmental aspects of the design. The building achieves an equivalent '5 star' rating under this tool and is likely to be the first assessed under New Zealand's recently launched New Zealand Green Building office building rating tool.

The Ministry for the Environment is excited by the prospect that other government departments, their developers/investors, architects and engineers, will collaborate to redevelop other existing buildings. Conservation House is an inspiring example of what can be achieved with an existing building by using a collaborative whole-building design approach.

For a case study on Conservation House by the New Zealand Green Building Council, 'Value case for sustainable building in New Zealand' and other information about sustainable building, visit www.govt3.mfe.govt.nz.

Façade with a wide air cavity between the double-glazed panels.

View through the removed floor sections to the atrium roof.

A row of chilled beams suspended from the ceiling.

Main entrance to Conservation House.