



Artists impression of the Ice-Lab installed at Cape Evans.

VICTORIA UNIVERSITY SCHOOL OF DESIGN ANTARCTIC RESEARCH OFFICE

ICE-LAB

Antarctica New Zealand and Victoria University of Wellington School of Design have joined forces to design and build a portable field research station that can run predominantly on renewable energy.

During the International Polar Year (2007-08) a prototype of the station, known as Ice-Lab will be trialled at Cape Evans, site of Scott's Hut. The station will be used by a number of remote scientific field programmes and the Antarctic Heritage Trust, which is undertaking restoration of historic huts on Ross Island.

Students from the School of Design came up with the concept for a modular, cubed structure, whose main components – panels, windows, doors and the supporting structure – are interchangeable and re-configureable, to accommodate the range of living and working needs. Lightweight materials used in the yachting industry were selected so that each module is light enough to be towed by a Högglund or lifted by a Bell helicopter. Module components can also fit inside a Twin Otter aircraft.

The cubed modules can be linked together in any number of configurations and will withstand wind gusts up to 300 km/hr. Infrastructure for mounting photovoltaics and wind turbines is also included – Ice-Lab will act as a test rig on which to trial existing and future renewable energy solutions on an ongoing basis.

For more information on sustainable solutions for extreme environments contact Professor Roy Fleetwood, School of Design Antarctic Research Office, Victoria University of Wellington – roy.fleetwood@vuw.ac.nz.

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The architectural features of the Ice-Lab enable it to be transported by Bell 212 helicopter or Högglund (pictured) or inside a Twin Otter aircraft.

Station on skis



HUGH BROUGHTON

Sometime in the next decade the British Antarctic Survey (BAS) research station, Halley V, could float off into the Southern Ocean, when the Brunt Ice Shelf, on which it is situated, calves off the Antarctic continent.

To prevent this scenario, BAS and the Royal Institute of British Architects launched a competition to design a new, relocatable station, to be situated 16 km further inland. Out of 86 entries worldwide, Hugh Broughton Architects and engineering firm, Faber Maunsell, emerged victorious, with the first Antarctic station on skis.

Construction of the modular, mobile design will commence in 2007 on the existing station site and the completed station – Halley VI – will later be towed inland using bulldozers. The station will house 16 people during winter and 52 in summer.

Architect, Hugh Broughton, said the design consists of a series of interconnected, lightweight, steel modules on two platforms.

One platform provides the main living and sleeping areas and some plant and operational equipment, the other platform houses scientific and plant equipment. The two are separated by a walkway, in case of fire or other emergencies. Extra modules can be added as needed and each module is supported by jackable steel legs on skis. The legs enable the station to be raised above the surface in areas of very high snow accumulation, while the skis allow the whole structure to be moved inland as necessary.

A range of environmentally sensitive design and engineering options have also been added, including solar panels to augment hot water heating during summer, and infrastructure for the addition of photovoltaics and wind turbines.

'The steel frames of each module will be shipped to Antarctica and offloaded onto the sea ice as one complete unit, with legs and skis attached. These will be towed onto the ice shelf and skied to the construction site,' Mr Broughton told delegates at the symposium of the Standing Committee on Antarctic Logistics and Operations.

'The completed modules will weigh around 80 tonnes – light enough to be towed to a new site during their projected 20 year life time – making Halley VI a visitor to, rather than a resident of, Antarctica.'

More information: <http://www.hbarchitects.co.uk> <http://www.fabermaunsell.com>



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The large living module (left) of the Halley VI Antarctic Research Station contains a dining room, recreational area for games, arts and crafts, library, office space, hydroponics and other modern conveniences. Standard modules in blue (above) house science, plant, operations and bedrooms.