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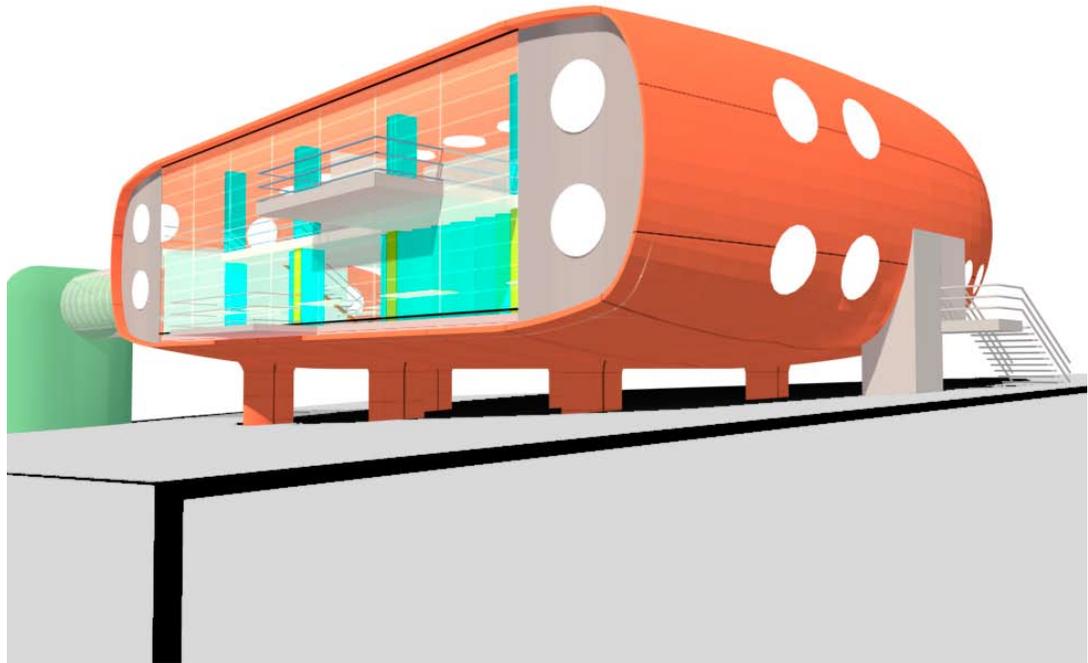
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## THE IGLOO REVISITED

1 September 2003

**An analysis of the dynamics, performance, cost and energy efficiency of a space shuttle, an America's Cup yacht hull, an igloo, a submarine and a tent were all used to generate Allen Jack+Cottier's winning competition entry for a new building system in Antarctica.**

The design of new living quarters at Davis Station, one of Australia's three permanently occupied stations in Antarctica, posed the challenge of meeting the harsh climatic conditions, accommodating the kitchen, dining, emergency response and indoor recreation (lounge, bar, library, museum, theatre) facilities, while being cost-effective, easily transportable and enabling quick erection due to the short summer seasons.

In the extreme weather conditions of Antarctica, the site experiences days of all day sun in summer (11° to 30° sun angle) and 24-hour darkness in July and August (-2° sun angle). Temperature extremes range from -40° in winter to +3° in summer and wind speeds reaching approximately 324 km per hour. The design solution reduces energy consumption for running the building services and utilises renewable energy resources and materials with low embodied energy consumption. Construction methodologies providing quick and simple options are essential. All materials will need to be shipped to the Davis Station and erected in the very short 8-week summer before the thermometer and the sun begin to plummet for the long cold winter.

"This project was great fun because it was a way of approaching a building from first principles," says Allen Jack+Cottier Director Michael Heenan. "We had the confidence to say, "I have no idea what I'm going to do," and put aside any preconceptions about what we should be considering".

The initial concept has an external sheet of resin-bonded material, glass, film, carbon and Kevlar over an end grain balsa wood core block with fire retardant internal lining, all cured in the largest oven in the Southern Hemisphere. It is proposed that the surfaces and insulation are layered over a cambered mould and then vacuum sealed and baked to form a slim skin which, not only provides most of the thermal and acoustic insulation, but also the compressive and tensile strength required to carry the entire structural loads.

"We're developing the building almost the way a yacht hull would be developed, to bring it down to the essence of just what we need," says Heenan.

Australian Antarctic Division project engineer Adrian Young describes the building as an "excellent idea, which uses a type of construction and boat building technology that has never been tried before".

"It was a design option that was of particular interest to us because it was quick to assemble and put together, he says. This gives us the opportunity to put together a larger-scale building in a short time with a small crew. One of our aims to hopefully adopt this system, if it proves successful for other projects, such as field huts," he says.

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