

GOOD DESIGN COMES TO THE FORE

by JOHN POWER

A new house at Thirteenth Beach Golf Course Estate, 80kms south-west of Melbourne, features massive window areas while still exceeding 5 Star energy ratings ... no magic or mirrors required, just state-of-the art glass and window installations!

When building a house in a rugged and windswept coastal setting overlooking magnificent scenery, expansive windows are usually high-priority design features.

The dilemma for builders and architects is that while windows are a desirable portal to the natural world, they are also potential zones of unwanted heat loss or gain. For example, up to half of the thermal energy in a building in winter can be lost through glazing, greatly affecting the energy rating performance of the structure and increasing overall heating and cooling costs.

Modern glass and glazing systems, however, are helping designers to maximise window areas without undermining the principles of environmentally sustainable construction. A case in point is the recently completed

residence of Dianne and Murray Hill, whose property is at Thirteenth Beach Golf Course Estate in Victoria, just a short stroll from Bass Strait.

The Hills say their objective from the outset was to create an open-plan home that would "flow into" the prevailing landscape and support their desires to be environmentally responsible. The result is a dwelling that uses no artificial air conditioning, and which incorporates some of the world's most advanced energy efficient toughened double glazing.

"We had a free hand to choose our own architects and builders," Dianne says, "though we were given some planning parameters to make sure the design remained sympathetic to existing homes in the area and the general

landscape."

According to Dianne, who consulted closely on the project with Geelong-based builder David Welsh, the design brief was formulated with a conviction that the house should match its surroundings.

"I was quite firm from that point of view," Dianne says. "What I wanted was something that would blend in with the beautiful trees in front of the property; that's why we chose cedar cladding – so that it would fit in with the environment as the timber aged. We also wanted to preserve the magnificent views over the 14th fairway and the sand dunes."

World-class windows and glazing allowed the Hills to achieve their twin goals of bounteous views and energy efficiency.



Glass company G. James Safety Glass created their EcoTHERM state-of-the art tinted Low-E double glazed units from original glass sheets supplied by US firm PPG. The Geelong-based window manufacturer Bradford Glass & Aluminium supplied the aluminium window frames.

According to David Perkins, Director of George Fethers & Co. (PPG's Australian agent), the windows are extra large, including fixed and sliding windows covering an area of more than 100m².

"The double glazing is Toughened 6mm PPG Caribia spectrally selective blue green tinted glass outer lite, featuring 12mm air space, and 6mm Toughened PPG Solarban 60 super-high-performance Low-E glass for the inner lite, all fabricated by G. James Safety Glass in Melbourne," David says.

The thermal performance of this glass, he explains, is exceptional:

U-Value – 1.65W/m² K. The U-Value measures the thermal transfer through a window. The lower the U-Value the better: Standard single glass panels can have a U-Value above 7W/m² K, so this double glazing achieves a reduction in thermal transfer in or out of the building over 75%.

Solar Heat Gain Coefficient (SHGC) – 0.31. A SHGC (which is expressed in a range from 0–1) indicates how well a window blocks heat from sunlight. The lower the reading the

better. Standard clear single glass panels can have a SHGC above 0.8, so solar heat gain is reduced by over 60%.

Light Transmission – 54%. This is the proportion of natural light that is able to pass through a window. Large windows often need to control glare or brightness whilst maintaining spectacular views so the reduction of light transmission of 54% compared to clear glass of 90% is very desirable in this home for occupant comfort.

"The coastal setting, wind loads and safety code requirements necessitated the glass to be toughened, while the astonishing thermal performance of the Caribia/Solarban 60 insulating glass units enabled the house to exceed a 5 Star energy rating," David says.

"We were able to retain very large windows and areas of glass for the fabulous views, and the tinted blue/green Caribia colour provides some additional privacy, glare reduction for the occupants, as well as a colour that is beautifully harmonised with the golf course and seaside surroundings."

The tinted Low-E double glazed units have amongst the best thermal performance of any glass products available worldwide. G. James is the first Certified Fabricator of PPG in the Southern Hemisphere and is leading the way with an excellent supply of PPG annealed and toughened Low-E products such as Solarban 60, which can be combined with an array of PPG spectrally selective tinted glass such as

Caribia, Optigray, Azuria and even ultra-clear Starphire float glass.

"It is very important to note the extraordinary thermal performance of these PPG products," David says. "In fact, the thermal performance of the glass is so effective that the owners saved thousands of dollars by not having to buy additional infrastructure like air conditioning, and heating costs are much lower." Cooling is achieved by cross-ventilation, taking advantage of the prevailing sea breezes, and ceiling fans.

The remainder of the dwelling was also constructed to provide significant energy efficiency and low maintenance. Builder David Welsh says he included underfloor, wall and ceiling insulation to complement the high-performance window installations, even incorporating insulation into the aluminium window frame cavities to further reduce heat loss.

The aluminium window frames, he adds, will not corrode in the salt air. "In addition, there's zero paintwork on the façade so the entire house is virtually maintenance-free." ■

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