

## BARRABOOL HILLS ESTATE, CERES

*This 7.6 Star rating home showcases that an energy efficient and fire resistant home can also be a beautiful home.*

**Project name:** Barrabool Hills Estate

**Location:** Ceres, Victoria

**Designer:** Solar Solutions Design

**Structural Engineer:** Cardno Engineers

**Builder:** Owner Builder – Glenn Batson

**Energy Rater:** Energy Sustained

**Geotechnical Engineer:** CivilTest

**Products:** PowerPanelXL

**Project size:** 240m<sup>2</sup>

**Energy Rating:** 7.6 Star

**Building type:** Residential Home



### **Project Overview**

The home needed to be a showpiece for entertaining, with the ability to have indoor and outdoor entertaining, whilst taking advantage of the 180 degree views of the surrounding hills. Sustainability and energy efficiency was very important, with an emphasis on reducing the need for heating and cooling. The large site was situated amongst rolling hills in the rural setting of Ceres. The wind gusting from the south west would need to be taken into account into the design.

### **Challenges/ Requirements**

With energy efficiency in mind, the design incorporated as much northerly aspect as possible. Solar passive design was integral for the placements of rooms to allow for comfortable living, and the northern deck created the indoor/outdoor living area the client was after. Timber double glazed windows were used throughout, with a louvre shading system used to shade the northern windows in summer, whilst allowing the winter sun to penetrate into the home. A concrete slab, Hebel PowerPanel wall system with great thermal properties and a strategically placed masonry internal wall have been integrated to gain excellent levels of thermal mass.

The building materials used incorporated aspects of efficiency, sustainability and the need to blend with the surrounding rural environment that existed on site. The sandstone blocks and muted render tones capture the subtle tones of the rural landscape, with feature timber cladding used to bring rich colour to the façade. Hebel was the preferred building material for the external cladding, offering a 30% lower environmental impact than concrete or brick veneer.

The Hebel PowerPanelXL system is a high performance masonry panel system which provides solid, secure, steel-reinforced walls boasting strong acoustic values for added privacy and sound insulation. With up to three times the insulation R-value of a traditional 110mm house brick, the unique combination of thermal resistance and thermal mass assists in reducing energy costs.

The house design has been able to trap the winter gain within the home through the use of these thermal mass elements, which helps stabilize internal temperatures from day to day, maintaining a comfortable living environment throughout the year.

The correct insulation was selected for the different areas of the home. In the walls a combination of breathable reflective foil and R1.5 polyester bulk insulation stapled to the studs was used to maintain a 25mm air gap between the two. In the ceiling again a combination of foil and bulk insulation was used, the bulk was R2.5 polyester bulk insulation with Concertina double sided foil insulation placed on top of the bulk with foil under the metal roofing. This is a good example of when you use minimal levels of bulk insulation coupled with high performing wall and ceiling systems, you can achieve far beyond the minimum levels required.



Roof ventilation was achieved by using a thermostatically controlled roof fan that switches on when the roof space exceeds a set temperature, this will not run during the cooler months, thus keeping the roof space warmer and placing a buffer between the occupants and the elements. Windows on the hot western side of the house have been kept to an absolute minimum with the garage also acting as a buffer to stop the summer sun from overheating the house in the afternoon.

Internal spaces are filled with ample natural light, with white used for the internal spaces to emphasize the rich colour from the timber flooring and timber windows. Clean lines create a simple, yet stunning indoor living area overlooking the rolling hills.

As the site had limited services, harnessing the natural benefits of the sun and rain were paramount. Solar power cells and a huge water tank were installed to minimise the home's environmental footprint. The 130,000L water tank harvests all the rain from the roof of the home and shed and supplies all of the

homes water needs. A specialised heat recovery ventilation system is installed in the home which circulates the air from the northern rooms to the rest of the home, whilst replacing stale air with fresh air, creating a user defined humidity level for a comfortable home all year round. This system maximises the heat gain from the northern windows in the home by circulating it around, while only using the equivalent power of a 60watt light bulb.

The location of the house on the sloping site allowed the deck and wet edge pool to emphasize the falloff effect, while creating an entertaining area with brilliant views. The overall finish of the home was un-compromised with the owner builder's attention to detail and quality finishes used throughout the home. The outcome was a stunning looking home that satisfied the clients desire to combine contemporary style and energy efficient living in a home sympathetic to its rural location.

### **Product and Application**

Product: CSR Hebel PowerPanelXL wall system

Application: External wall cladding

Benefit: Hebel PowerPanelXL is a strong reinforced aerated concrete panel system that when combined with reflected house wrap and R1.5 insulation gives an outstanding overall wall system value of more than R3. Being aerated concrete the product is considered a lightweight material and hence can be installed easily.

### **Results**

Darren Evans from Solar Solutions Design chose Hebel for this project for a variety of reasons including the ease of install, knowing he can have it specified and sent to builders around the country who will be able to easily use it without problems. As well as the ease of use, Darren says the thermal qualities "ensure the comfort levels inside the home are more even and controlled" and the product provides a "nice rendered" finish as there is no movement. Also important for clients who are building in rural areas prone to bushfires is Hebel's fire resistant properties.

The implemented high end energy efficient measure to this house has resulted in the client not needing to use the heating or cooling through all seasons. The owner's ongoing costs are around 50% of what they used to be in a non-energy efficient house. In most cases the fixed service charge for the services is actually more than the usage cost itself. As utility costs increase with time the benefit of developments such as this are outstanding. This house has showcased that extremely high end energy efficiency can be achieved in the suburbs at an affordable rate without compromising the style, comfort, health and lifestyle that today's clients demand.

The home achieved a 7.6 Star rating with first Rate 5 providing the indoor/outdoor living the client desired whilst showcasing that an energy efficient home and fire resistant can also be a beautiful home. Evans sums up a Hebel home saying, "Most clients are blown away, they've never lived in a house like this."

For further information about CSR Hebel please visit [www.hebel.com.au](http://www.hebel.com.au) or call 1300 443 235.

#### **About CSR Hebel**

Hebel is part of CSR, Australasia's leading building product supplier, driving innovation in the building and construction industry through continued investment in research and development to further improve building systems and solutions.

Hebel is Autoclaved Aerated Concrete (AAC) manufactured from sand, cement, lime, gypsum and aerating agents. It is specially wet moulded to create the aerated structure, semi-cured so it can be handled and cut to shape in various lengths and profiles, then finally fully cured in a steam pressure autoclave to create the hard, finished, AAC material.

Environmentally friendly, Hebel products and systems are the sustainable choice. Independent testing shows that overall, Hebel has a 30% lower environmental impact than concrete or brick veneer. Using over 60% less embodied energy, and producing at least 55% less greenhouse emissions than concrete or brick veneer, Hebel is the cleaner, greener choice.

Hebel products and systems are developed in Australia by CSR Building Products Limited. With CSR you can depend on the product quality, technical expertise, warranty and stock supplies of Hebel products and systems.