Dandenong High School Project

Not just another brick in the wall: Sustainable Total Precast

Precast Manufacturer
Hollow Core Concrete

Project Owner
Victorian Department of Education

Architect and Project Superintendent
Hayball

Service Engineer
Wood & Grive Engineers

Consulting Engineers
Wallbridge & Gilbert

Builders
HMC Constructions
Buildcorp Commerical

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Sustainable design principles, a 'smart' Total Precast building and a series of spaces designed around the specific teaching and learning needs of students of Dandenong High School are features of this very 21st century learning centre.

One look at Dandengong High School is enough to confirm that we've come a long way since the 'cookie cutter' approach to education - and its architecture.

Designed by Melbourne architect Hayball, the architecture reflects an innovative approach that takes student needs as its starting point. It called for the creation of a group of spearate 'learning centres' as part of the $45 million 'Dandenong Educational Precinct Project', in which three separate campuses were amalgamated to form one of the largest co-educational public high schools in Victoria.

Each learning centre is designed to house 300 students and a core of 25 teachers, with students based in one learning centre for their entire education at the school.

Principles of sustainable design were integral to the project, which served as a pilot for the Green Building Council of Australia's Education sector Green Star Rating. The project achieved 4-Stars using the GBCA's environmental performance measurement tool.

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Accordingly, as well as passive solar design which maximises the thermal mass benefits of the Total Precast structure, the project uses recycled elements and materials with minimal environmental impact. Soil from teh site was recycled into saleable topsoil by garden suppliers and other waste was sent to a recycling centre. Low-emission paint, skirtings made from rubber, rather than vinyl, eco-friendly plywood and Colorbond metal roof and wall cladding were also used to minimise environmental impact.

The project is also positively pressured, using higher airflows to create access to a continusous supply of fresh, tempered air and limiting the impact on room temperature of open doors and windows.

Playing a pivotal role in the project's environmental performance is the precast hollowcore flooring.

"The building has been designed to reach 27 degrees before an evaporative cooling element kicks in, which happens after the air is pre-tempered by being drawn through the cores of the hollowcore floor planks," explains Peter Healy, Managing Director of Hollow Core Concrete, which supplied the flooring and worked closely with other project participants.

"The main precast beams innovatively incorporated a composite steel and precast design to allow airflow to pass through the support member without compromising structural integrity," he says.

The speed and efficiency of the project was also enhanced by use of other precast elements, including exposed precast walls and precast columns, beams and cantilevered balconies.

Finally, the project's eco-friendly status is confirmed by environmental data transferred through the building management system and displayed on LCDs throughout the buildings, an innovation that both monitors performance and becomes an educational tool, reinforcing the importance of sustainability to the school.

Certainly, its sustainability is well recognised elsewhere – the project was a finalist in the Public Building & Urban Design category of the 2009 BPN Sustainability Awards and won two awards in the Victorian Government's School Design Awards: Best Overall School Design and Best Secondary School.