The Gippsland Water Factory's Vortex Centre – Teaching the Story of Water

ATRIUM ASKED DESIGNINC DIRECTOR, JOHN MACDONALD, ABOUT ONE OF HIS RECENT PROJECTS, THE GIPPSLAND WATER FACTORY'S VORTEX CENTRE, WHICH RECEIVED THE UN ASSOCIATION OF AUSTRALIA 2011 WORLD ENVIRONMENT DAY AWARD AND THE AUSTRALIAN PROPERTY INSTITUTE'S 2011 NATIONAL GREEN BUILDING AWARD.

The Vortex Centre is a bold new state-of-the-art interpretive education centre for the Gippsland Water Factory (GWF). Commissioned by an alliance between Gippsland Water, Transfield, CH2MHill and Parsons Brinkerhoff and designed by Melbourne architectural practice, DesignInc, it successfully combines cost performance, aesthetics, water education and ecological intelligence. The 650m2 facility is a beacon of exemplary sustainable design.

Melbourne architect and DesignInc Director John Macdonald explains, "This project is the result of public and private sectors working together and leading the way in recognising the relationship between architectural design, public infrastructure and a sustainable future."

The Gippsland Water Factory is a pioneering wastewater treatment plant servicing over 19,000 homes and businesses across nine towns throughout the Gippsland Region. It treats about 35 million litres of wastewater a day through a 78 km-long pipe system and produces more than eight million litres of recycled wastewater a day from the treated urban wastewater. This water can be made available for purchase by Australian Paper Mills for manufacturing purposes, freeing up three billion litres of fresh water for domestic use in the region. The remaining highly treated industrial wastewater is discharged to the regional outfall system, free of odour-causing organics.

To a scientist, a vortex is a flow of energy

John Macdonald reflects on the design process, explaining: "we wanted to introduce nature's inspiration into the building concept."

Literally translated, a vortex is a whirling motion, such as a whirlpool or whirlwind. This concept of dynamic energy coupled with the Factory's innovative water cleansing process, is the essence of the Gippsland Water Factory, and underpins the Vortex design. While the building includes GWF's administration offices and laboratories, at its core, it embodies the philosophy of 'a building that teaches', showcasing innovative ecologically sustainable technologies and navigating a path toward a preferred and sustainable future.

DesignInc have a solid reputation for environmentally sustainable design based on biophillic methodology and architecture, with award-winning designs that reference the natural world and its processes from their inception. Abstract renderings in the embrionic design for the Vortex show inspiration drawn from sea-shell structures. This early influence evolved into a building within a building in the developed design. "In that sense," says John Macdonald, "The Vortex is working hard as a facility." He likens the design to a "mother and child relationship".

The building's silver metallic shell is comprised of seven barrels, which appear to be floating on water and fit into one another as they decrease in diameter resembling a 'vortex'. Circular, transparent north and south elevations draw in natural light and reveal an extended landscape. The entry foyer sets the mood on arrival, displaying the message Gippsland Water Factory wants to leave with its visitors: "You have a role to play in water conservation".

The architecture and the landscape are intimately bonded

A combination of passive design principles ensures a low consumption of natural gas and power from the electricity grid; the Vortex structure sits on an artificial lake, which cools the building and provides natural ventilation and thermal convection. Due to the lake's stable temperature, the building delivers a very low summer energy outcome. Cool water from the bottom of the lake is passed through heat exchangers, delivering cool air into the interior. At night, the lake water is pumped over the roof to be cooled for use during the day. In winter, waste heat from a biogas powered cogeneration system heats the interior. At the entry to the Vortex, transparent pneumatic ETFE cushions incorporate variable skins allowing the façade to be 'tuned', admitting or excluding sunlight for different seasons and daily conditions.

Since its opening in April 2010, more than 2000 primary and secondary school students have visited the Centre. Over a ninety-minute tour, up to 50 students engage with interactive displays, exhibit galleries, touch screens and videos focusing on water conservation and sustainable water management.

The measure of success will be in the next generation's active participation in a sustainable future, and along the way hopefully finding inspiration in environmentally responsible architectural design.