SA AQUATIC & LEISURE CENTRE & GP PLUS HEALTH CENTRE

BUILT FOR FINA, FITNESS AND FUN

The commencement of construction work was announced on 16 October 2009 at the Candetti Constructions Project Launch at which the first sod was turned in front of 250 invited guests, including Federal Sports Minister Kate Elllis, State Minister for Infrastructure Pat Conlon, State Minister for Recreation and Sport Michael Wright, and City of Marion Mayor Felicity-Ann Lewis.

The facility was completed for the Australian Aged Championships from 18 April 2011. The project is one of the most advanced facilities in the Southern Hemisphere and the first master planned mixed use Major Health and Aquatic Precinct in Australia. The State Government worked in collaboration with the main contractor, Candetti Constructions Pty Ltd, to bring this spectacular development to the community.

The site includes the SA Aquatic and Leisure Centre, with multiple pools catering for elite level competitive aquatic sports as well as leisure and recreation ranging from a dedicated learn-to-swim pool to spectacular water slides and spa pools. The competitive facilities all conform to the standards of the international swimming body FINA, so it's anticipated that use of the centre will be much sought after by coaches and swimmers to train and compete at international levels.

Also on the site and built as part of the project is the largest GP Plus Health Care Centre in South Australia, including the State's first Community Mental Health Care unit. To accommodate community access, 560 car spaces are available in a new multi-level carpark. The entire project and surrounding transport links are facilitated by a central pedestrian plaza on the site.

With South Australian Government partners, Candetti had an environmental and communications management plan in place throughout construction to minimise the impact of activity during the construction period on local residents, in particular, factors like noise and dust. The development also supported ecologically sustainable design elements to reduce water and energy use across the site. These initiatives included a Building Management System to control digital systems that regulate air conditioning and ventilation. Solar panels were also provided for hot water.

The pool filtration system is highly efficient, being able to regulate itself automatically according to high and low periods of pool use and saves over one million litres per year over traditional filtration technologies. Stormwater is captured for use in toilets across the projects and the

STRUCTURAL AND CIVIL ENGINEERING SOLUTIONS

MAIN CONSTRUCTION COMPANY : Candetti Constructions
CLIENT : Department of Transport, Energy & Infrastructure
PROJECT END VALUE : In excess of $100 Million
COMPLETION : April 2011
ARCHITECTS : Woodhead
STRUCTURAL & CIVIL ENGINEER : GHD
FIRE ENGINEER : WSP Lincolne Scott

buildings have been oriented on the site to achieve the most efficient energy levels possible. The GP Plus Centre is also designed to achieve a 5-Star Green Star Office Design rating for energy efficiency and material recycling.

In the planning, quality was a major focus for Candetti and for this reason some unusual materials and processes were used. Downturn-lipped ZAM purlins were used for their superior corrosion protection. Polysiloxane coatings were applied to steel that is exposed to the chlorine environment. This is a high durability surface coating which will protect against corrosion. The dive tower is ten metres high and was designed so that it could be cast in situ with one continuous concrete pour, thereby eliminating the need for construction joining in the tower itself. The dive platforms were pre-cast and stitch-cast to the main tower later.

In the construction of the pools, Myrtha technology was used - this is state-of-the-art in pool construction world-wide. This modular pool system from Italy employs pre-engineered steel panels for pool walls that are laminated with a hard PVC coating. The system results in little or no maintenance as there is no tile or grout replacement in the first twenty to thirty years. Engineers have shown that, compared with the usual concrete 'tank' construction, the Myrtha system has a significantly smaller carbon-footprint.

This major development is in excess of $100 million and is the culmination of 12 years work by state, federal and local government partners and in particular the South Australian Department for Transport, Energy, and Infrastructure with Candetti Constructions to get this exciting piece of infrastructure built and operational.

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One of the world's leading engineering, architecture and environmental consulting companies, GHD was engaged by Candetti Constructions to provide the structural and civil design and documentation for all three building elements on the site. This included the Aquatic Centre, Medical Centre, and multi-level car park. Both Candetti and GHD have delivered numerous aquatic centres across Australia and hence understand that they have unique requirements.

GHD leveraged knowledge and skill from experience in the design of numerous long-span structures including a number of other sports stadia, to deliver this project. An integrated team of local engineers and drafters in GHD's Adelaide office were dedicated full time to the design and documentation of this challenging project within a very short time frame. Colleagues from the Brisbane team completed design and documentation reviews on a regular basis throughout the design period.

Wind loads on the uniquely shaped building were identified as the critical load case for the exposed roof structure. Candetti invested in specialist wind load analysis, undertaken to determine the wind loading and to provide a fine, trussed roof framing system. Candetti worked with GHD's Material Technology team to investigate a range of protective coating options for the structure before Candetti selected the most appropriate coating to meet the design-life requirements in such a potentially corrosive environment.

The dive tower also presented a unique challenge. It is a highly visual element with complex design requirements that needed to be economical and quick to construct whilst also complying with international FINA guidelines, including the requirement for a natural frequency greater than 10 hertz. A variety of options were prepared by GHD, and evaluated by Candetti, before selecting a specific cast in-situ tower with precast diving platforms. Candetti required the tower to be poured in a single pour over a period of approximately 13 hours. To achieve this GHD prepared a specific concrete mix design to minimise thermal and shrinkage cracking. The precast dive platforms were stitch-cast to the completed tower.

GHD's involvement with this project has reinforced its reputation for providing quality technical solutions and meeting challenging time frames, through integrating with a wider project team.

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TOP LEVEL FORM WORK

Form 700 was contracted to construct the concrete structure on this project. This was an interesting project in that it provided Form 700 with some unusual challenges.

Form 700 Pty Ltd was incorporated in November 2002, and has 650 direct employees across Victoria, South Australia and Western Australia, lending their talents to industrial, commercial and high rise residential developments. The skills embedded in the company include project managers, site administrators, engineers, draftspersons, forepersons, leading hands, carpenters, steelfixers, concretors, scaffolders, crane drivers, dogmen and building labourers.

Building the concrete structure included supplying and erecting formwork; supplying and fixing reinforcement; supply, pump, place and finish concrete. Being able to handle all the aspects of the job rather than bring in subcontractors for key tasks contributes to Form 700's efficiency and allows for more comprehensive quality control.

Form 700 had a workforce of 50 persons on this project. To achieve the programme Form 700 used large quantities of formwork material which included proprietary formwork support systems, tableforms and purpose built forms.

One of the greatest challenges was the construction of the main dive tower. The whole structure comprising support blade column and cantilevered dive platforms was required to be poured as one complete element without any construction joints and to millimetre accuracy. Purpose made steel framed plywood faced forms were designed and fabricated by Form 700 in their factory in Melbourne. The forms were transported as oversized loads and then erected into place with mobile crane. The forms were braced and concrete poured. The stripped element is quite an impressive structure.

Reinforcement made from recycled steel was used on this project. Very little timber is used by Form 700 as we use steel formwork and aluminium panel formwork systems. Form 700's special access tower was nominated for the Work Safe design award in 2008.

The Form 700 team were very glad to be involved with the construction of this iconic South Australian development.

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THE TALENT POOL FOR YOUR NEXT PROJECT

The Aquatic Centre at Marion in South Australia has been Designed and Constructed by Candetti Constructions, the largest privately family owned construction company in SA and one of the largest in Australia. Candetti engaged Woodhead International, Peddle Thorp Architects, GHD, AECOM and WSP Lincolne Scott to design the centre. Candetti engaged AVP as the specialist pool contractor. Both Candetti and AVP have extensive aquatic projects experience and worked collaboratively to Design and Construct the Pools and Filtration elements of the project resulting in delivery of the most advanced facility in the Southern Hemisphere.

Established in 1996, AVP Commercial Pools was formed to cater to the particular needs of the commercial industry, specialising outside the domestic pool market the company has specific expertise in every aspect of commercial swimming pools, including the expertise in Myrtha Pool technology for which AVP are licensed agents.

It's recommend that measuring and reducing CO_2 emissions are the first steps we should be taking to lower our impact on climate change. Myrtha Pools commissioned ACOR Consultants, an Australian engineering company, to compare the energy used in building a Myrtha pool versus a traditional concrete tank. Results showed clearly that Myrtha technology has a carbon footprint significantly lower than a traditional pool made with concrete and tiles. The installation phases are much quicker and do not require the use of heavy machinery. The necessity to maintain waterproofing by replacing the grout or the tiles is practically zero for the first 20-30 years.

Myrtha technology has been used here in the construction of pools at the Marion Centre. It is a high tech modular pool system using pre-engineered steel panels permanently laminated with a hard PVC coating. At each panel joint, a buttress gives rigidity to the structure and makes it self- supporting. The overflow gutter is also made of Myrtha material and is an integral part of the wall and buttress system which provides the upper rim of the pool. The floor is lined with a reinforced PVC membrane called Myrtha R-EVOLUTION.

There are two competition pools at the centre, one is 52 x 25 x 3 metres and the second is a little longer and deeper at 55 metres x 25 x 3 to 5 metres deep with a 10 metre dive tower. Both these pools have been built to comply with International swimming body FINA's specifications. These two pools will soon be the focal point for high level swimming events and training including team sports such as water polo.

The recreational pools will provide plenty to attract younger people to the centre, with a dedicated learn-to-swim pool, as well as a 25 metre program pool with a large spa. Just for fun, an aquatower will be attractive to younger children. Two key features of the recreational area are 15 metre high water slides which take the rider beyond the walls of the main building before returning them after a 'spiraling' experience back into the water. To make best use of available space all plant rooms have been located in the basement area. Ultra Fine Filtration type filter systems were selected, being state-of-the-art and offering a small footprint as an added benefit in an area where space is at a premium.

AVP's objective was to maintain excellent water clarity. Traditional backwashing techniques for filter maintenance are minimised in the Defender system. This means that significant water-savings can be realised while chlorine gas and soda ash are used to maintain clean, healthy water with a well balanced ph. AVP have employed Seimens chemical controllers to constantly monitor and regulate the water flow and chemical mix. The Depolox controller can regulate UV output and can reduce recirculation and dose rates during periods of low activity.

AVP teams have worked with many architects, engineers & building companies and have developed an enviable reputation based on experience in site control. They have made many a contribution to award winning projects and are multi-award winners in both pool design and construction in their own right. With offices in WA, VIC and QLD, AVP undertakes projects Australia-wide and specialises in pools in outback Australia.

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