



**MAIN CONSTRUCTION COMPANY :** TCS (Qld) Pty Ltd  
**CLIENT :** Townsville City Council  
**STRUCTURE DESIGN :** STP Consultants  
**PROJECT END VALUE :** \$30 Million  
**GEOTECHNICAL CONSULTANT :** Douglas Partners  
**COMPLETION :** Mid June 2011  
**ARCHITECTS :** PDT Architects  
**SURVEYOR :** K&A Surveyors  
**CERTIFIER :** Incert

# TOWNSVILLE RSL STADIUM

## GOAL SCORING CONSTRUCTION



Previously trading as Total Construction Services, TCS (Qld) Pty Ltd has been leading the construction team for the Townsville RSL Stadium. The company, led on this occasion by Project Manager Simon Jackson, had previously been involved in the design and construction of a number of other sporting facilities, including the design and construction of upgrades to Townsville's Dairy Farmers Stadium, as well as a number of multi-purpose facilities for schools. Evolving from previous projects, the use of arched structures was refined and proved to be a more economical option than the original design for the Stadium.

The site is within the Murray Sports Complex which has recently undergone a \$25 million makeover, including \$15.3 million being allocated to the construction of an International Sports Stadium. The complex redevelopment as a whole is a partnership between the Townsville City Council, Queensland Government, Australian Government and local sporting bodies.

The new centre is built around the foundations of the incomplete Sun Dome which was commenced in the mid 90's and aborted at

the ground level stage of construction. Because the original complex was never completed, there were no details of the exact location of the footings. One of the most challenging issues for the design and construction teams was to take these substantial underground structures into account when positioning the new facility and then having to construct the new foundations around the old.

Inside the new air conditioned building there are three distinct multi-sport courts, with total seating for 2,000 spectators. There are associated meeting rooms, fitness areas, a café and other amenities. These facilities will meet the needs of basketball, netball, indoor soccer, volleyball and badminton sports groups, as well as the varying needs of local schools and the general community.

The project was initially slated to be 'construct only' however the original tenders received were all in excess of the project budget. On this basis the Council appointed TCS as preferred contractor with the intention of working together to reduce the overall project cost without adversely affecting the intended purpose of the complex. To facilitate this TCS (Qld) Pty Ltd Building Division worked closely

with PDT Architects who were the Council's appointed designers. STP Consultants were appointed to undertake the structural redesign including Steelwork, while TCS's Civil Division undertook much of the concreting and stormwater channelling construction.

As part of the redesign process, TCS and Townsville City Council made an investment to conduct wind tunnel tests. This allowed TCS to make significant savings on the overall structure compared with the original design. So after some re-design work, TCS was able to offer a fixed price which included the construction of the building, its fitout, the construction of an 11,000m<sup>2</sup> carpark and 430 lineal metres of access road. TCS's Design Manager Dick Cerny said: "it was appreciated that Townsville City Council gave us the opportunity to review the design. This allowed us to look at alternative designs, construction methods and materials to bring the price down. In the process we didn't lose any functionality". As a result of this process, the price was adjusted down to meet Council's level of affordability.

While the planning and scheduling of the work was sound under normal circumstances, the weather during the course of construction

presented unexpected challenges. During the period, the South East Queensland floods caused many delays in the delivery of materials. To add to the difficulties, the job almost received a direct hit by a Category five Cyclone! Having to work around the lack of materials and one of the worst wet seasons on record demanded constant reassessment and planning.

Construction began mid 2010 with the erection of steel commencing in late August. The Stadium will be completed in June 2011 not long after the originally scheduled hand-over in April.

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## VALUE-BASED DESIGN DELIVERS

**P**DT Architects were shortlisted with two other Architectural consultants following a submission to Council in June 2008. Subsequently in August 2008, a second submission was made, including a concept design which was ultimately successful, leading to Townsville City Council appointing PDT as the Architects for the new multi-million dollar international indoor sports facility at the Murray Sports Reserve in Townsville. It will be completed in June this year, amazingly delayed only by about eight weeks due to the Queensland floods affecting materials delivery and a Cyclone event that almost managed a direct hit on the site. Luckily the building had been designed to withstand a category 5 cyclone event and was sufficiently advanced in construction, to demonstrate its ability to resist such tropical weather events.

Shortly after being appointed to the project, the Main contractor, TCS and PDT Architects were advised by Council that earlier quotes were not affordable. After some research and further work on design options, they were able to present new ideas that modified the price without compromising the purpose of the building or diminishing specifications. One of the challenges in the new design was to avoid substantial footings left by the abandoned 'Sundome' project. Working around these avoided a major cost for their removal. PDT's earlier work on the Logan Sports Centre which was finished in August 2009, proved to be important experience, the finished Sports Centre there received a good deal of favourable publicity, so similar finishes were adopted and updated for the Townsville project.

Apart from its sporting role, one purpose specified by Townsville Council was for the building to be used as a post disaster recovery Centre. As was experienced during the construction, Townsville is in the Cyclone belt and such a facility will be an important civic resource in the event of damaging storms putting people out of their homes. To be sure that this requirement would be met 'Windtech' was engaged to test the new designs in a wind tunnel before work began. To ensure its integrity in the worst cyclonic conditions, the building design includes precast concrete walls for the first 4 metres for impact resistance.

Other considerations in the final design included orientating the building to the new car park to the west, which also gives it good exposure to Murray Lyons Crescent. Player entry is separate from the general public entry and has its own drop-off area with good access to the existing Townsville Basketball Centre.

Foyer, reception and breakout areas take advantage of the views over the playing fields on Murray Reserve to the south. This also has the potential to connect with any future through-site link between soccer and hockey to the hockey car park.

Initial schematic design work was undertaken in PDT's Brisbane office with advice from Mac Stirling (Consultant). Mac was the lead architect for Suncorp Stadium which was completed in 2003. The Townsville office then developed the design through to construction. Mark Haywood was the Team Leader, with Rob O'Dea heading up the documentation team and Peter Atley was responsible for Interior Design. All the staff in the Townsville office worked on the project at some time during the contract period.

As a separate, but cooperative exercise, PDT's landscape team undertook the landscape concept design work and the documentation for the sports stadium and carpark area. The design involved a meandering harbour walk to lead people from the Stadium to existing playing fields. Stormwater treatment swales were incorporated within the new carpark facilities.

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## ENGINEERS PLAYING ALL POSITIONS

Ashburner Francis was an important part of the team for the new Townsville RSL Stadium, being responsible for electrical, air conditioning, fire detection, alarm system, communications cabling and security system design and construction.

The first challenge was in the choice of an air conditioning system. Based on a reasonable pay-back arrangement, the more expensive yet highly efficient, water cooled chillers were selected.

The building needed to be energy efficient. In order to satisfy this requirement, Ashburner Francis performed an 'Alternative Verification JV3' computation in accordance with the Building Code of Australia (BCA) to confirm the building would at least meet this standard of efficiency. The model delivered a 30% improvement on the BCA 'deemed to satisfy' energy requirements.

Air conditioning and ventilation systems are controlled by a sophisticated Building Management System linked to the Council's head-end management facility. The system automates the operation of the plant, while providing flexibility to adjust the system after hours.

In the provision of power to the facility, two new transformers were installed outside. As it was to be a post-disaster building, electrical equipment was installed as a 'Cyclone Area Reliability Enhancement (CARE) project', which ensures supply. However there is provision to allow up to two diesel generators to be installed at a later date.

At night, the building looks impressive from the street, an effect achieved by re-using old decorative street lights from the now refurbished Flinders Street Mall. Around four sides of the building are pathways for public access to events. Here, wall mounted fittings were used rather than poles. The saving in cost meant that up/down fittings would not only light pathways, but highlight signage and architecture. The provision of a lighting control system allows a single operator to set up the site for different functions from the reception desk.

The brief also required that the centre court be suitable for televised events. Ashburner Francis has allowed for additional lighting of the court in compliance with Free-TV lighting guidelines. There is also a suitable power supply for an Outside Broadcast (OB) vehicle. Floor Boxes with power, data, voice, PA and score-board facilities are fitted into the floor in non-playing areas. When not in use the closed floor boxes are concealed.

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## THE YELLOW BLOCK ROAD TO SUCCESS



Yellow Block Road (YBR) is the brick and block laying company, which was responsible for the masonry work at the Townsville RSL Stadium, to be handed over to the Townsville Council in June.

Yellow Block Road's team undertook the work which included the supply of forty-five thousand blocks and the skilled labour to lay them.

They had approximately 10 men at any given time working on the project. They assigned some of their most experienced bricklayers and managers due to the challenges that came with the contract. Eight metre high raked walls on the second floor were a particular issue. Due to the angle and height of these walls, there needed to be extra handling of materials.

The experience of highly qualified YBR team members was also needed to ensure that the 60 steel door frames were placed accurately and without incident. Due to the size of the project they also maintained key staff on site who could liaise with team leaders from other contractors, to maintain effective communications and ensure that all timelines were adhered to.

The Principal Contractor TCS, was well organised from Yellow Block Road's point of view which made the job much easier than is often the

experience on multi-contractor sites. They reported that they were able to proceed on time, without unforeseen issues.

YBR is keen to tackle jobs that present something of a challenge. Similar to the challenge of the International Sports Stadium, other earlier projects have seen their teams working with coloured blocks and face brick work. These are relatively unusual blockwork and bricklaying jobs for which YBR is gaining a specialist reputation and which because they have the skills, are happy to undertake. The Company can boast that for quite some time, many of the tradesman they've employed, have extensive experience in these less-often, special-talent areas of the bricklaying trade.

Due to their close business ties with Townsville Scaffold Hire, YBR can deliver flexible and cost-effective packages incorporating the brick and block laying team and scaffolding requirements.

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