Universal FABRIC STRUCTURES

Case Study

Canberra Olympic Swimming Pool

Aquatic Sporthall Facility

Inside View - Completed Structure

Client/Main Contractor: ACT Government
Year of Completion: 2009
Architect/Designer: Universal Fabric Structures

Location:
Canberra, ACT, Australia

Application:
Sport & Recreation

Building Type:
S-Span-C

Fabric Type:
Ferrari 702s & 502s PVC

Contract Price:
$1M AUD

Background:

The Canberra Olympic Swimming Pool development was an ACT Government funded initiative to remove, replace and recycle the existing 22-year-old air-supported membrane enclosure in order to upgrade the look, feel, and functionality of the facility.

In late 2008, Universal Fabric Structures (UFS) was awarded the contract to complete the extensive $1M AUD refurbishment.

Scope of Work:

The replacement structure was required to be a clear-span design with curved roofing in the shape of a dome. PVC tensile fabric with a blue and white colour scheme was specified to match the existing structure design.

Key design criteria included:

- Improve functionality and visual appearance compared to existing structure
- Easy to clean, maintain, and repair, with the ability to replace side panels if necessary
- Provide a comfortable, light and airy internal atmosphere without excessive heat or humidity, through all seasons of the year
- Ability to open the sides in summer for weather control

Inside View - Previous Air Supported Membrane

- Incorporate a hanging framework for flags, ropes and other equipment
- Incorporate a mechanical ventilation system and a suspended internal ceiling liner within the roof space to aid internal environmental control
- Capable of supporting heavy duty roof fans, artificial lighting, and electrical cabling
- Structural steel framing to have corrosion protection suitable for an indoor chlorinated pool
- Existing air-supported membrane to be removed and recycled in accordance with the ACT “No Waste” strategy

The Solution:

Universal Fabric Structures customised the standard Supa-Span-C design to incorporate key project requirements. The steel truss framing was engineered to integrate the required electrical and fire detection systems, and manufactured with a special three-coat high build paint, to avoid erosion. Ferrari® 702s membrane was chosen to clad the structure with the 502s range selected for an internal liner.

With the use of translucent membranes allowing natural transmission of sunlight, the requirement for daytime lighting has been significantly reduced. To support and regulate climate control, a mechanical ventilation system operates between the external membrane and interior liner creating an insulation air gap, and mesh vents along the sides of the structure provide the required air and moisture release. A retractable curtain walling system has also been implemented to allow cross ventilation during warmer weather.

In an Australian first, the existing air supported structure was dismantled and recycled using the Ferrari® Texyloop® process. Developed by the Ferrari® and Solvay™ Groups, Texyloop® involves the closed loop method of recycling polyester-PVC composite textiles. Until the arrival of Texyloop®, these composites were not fully recyclable due to the difficulty in separating the PVC from polyester fibres. Now these textiles can be separated, minimising the impact of raw material consumption and landfill or pollution through incineration.

Installation of the structure was very difficult due to the limited site access and construction over the existing in-ground swimming pool. Steel assembly was completed in the adjoining car park with the completed arches crane lifted onto the site. The fabric was also crane lifted from the car park to the top of the completed frame and then spread out over the steel frame, fixed, and then tensioned. The installation was completed in approximately four weeks.

External View - Completed Structure

The existing entrance canopy was also refurbished with new fabric and better blind systems, and mechanical glass sliding doors were added to provide entry into the pool.

The finished structure illustrates the capabillities in tensile design, not only for pool enclosures but for Sporthall structures globally. Using the latest in current tensile membrane technologies, Universal Fabric Structures has produced an industry leading example of both sustainable design and functionality.

Client Feedback:

"After one season in operation, feedback for the new structure has all been very positive. The structure provides a much more hospitable environment for users in the extreme seasonal weather conditions we have here in Canberra. I appreciate that we were experimenting with the design on an aquatic site, but as a user of the site myself I can also add personally that the improvement in amenity is recognisable. It is now pleasing to have both a wet and dry use site in Canberra that incorporates your structure. Again, thank you for your work in improving the amenity of the Canberra Olympic Pool."

Sue Marriage
Director, Sport & Recreation Services
ACT Government

For further information please contact:

Universal Fabric Structures
PO Box 1644, Kingscliff, NSW, 2487
AUSTRALIA

Ph: +61 2 6674 4466
Fx: +61 2 6674 4488
Email: info@fabricstructures.com.au
Web: www.fabricstructures.com.au