

ADELAIDE ENTERTAINMENT CENTRE

ARCHITECTURAL DESIGN + STRUCTURAL ENGINEERING AWARDS 2010 (SA)

DesignInc + Samaras Structural Engineers



Design

The Adelaide Entertainment Centre's \$52 Million redevelopment included a new steel framed EFTE dome with dynamic LED lighting system which forms a dramatic entry statement for the centre.

The project included demolition of the existing Rubicon Function Room and courtyard, demolition of the circular colonnade to the plaza, and significant alterations to the Alchemy courtyard and main arena entry canopy, to make way for the new dome and performance venue named the Theatre.

The redevelopment was designed as a series of three distinct spatial ideas. The 'dynamic dome space' – symbolic of the transparency, movement, changing moods and image of modern performance; the flexible box – conceived as a solid pure form, able to reveal a multitude of performance modes and functions, providing a visual counterpoint to the dome; and the 'interactive foyer' – a visual and functional link between the dome and the box, able to display internal and external imagery. Simplified into overlapping extruded boxes, the Theatre foyer and back of house facilities wrap around the Theatre, terminating within the dome space.

The Theatre is capable of accommodating 2500 visitors in general admission mode, 1700 in seated theatre mode and 800 in seated banquet mode. Large operable acoustic walls can divide the space in two whilst retractable seating also adds to the theatre's flexibility.

The freestanding ticket box and entry portal were designed as a continuous venue threshold addressing Port Road, with red feature cladding and illuminated acrylic wrapping around the edges to link the two. Both provide the dome plaza with shelter and acoustic separation, as well as a security checkpoint when required.

Use of steel products

Samaras Structural Engineers provided pivotal 3-D modelling and assistance with design development, working closely with the designers and architects to ensure the designer's intent was delivered. Detailing, processing, fabrication and treatment services were also undertaken at their new purpose-built site located in Gillman, South Australia.

Weighing over three hundred tonnes, spanning over forty metres wide and standing over twenty metres tall, the semi-enclosed dome forecourt expansion features hundreds of LED lights, designed by DesignInc. Constructed from the same material as the Water Cube Swimming Complex, supported by a carefully detailed steel frame, the Dome can be individually lit in more than 16 million colours and patterns, creating a visual display for patrons at night.

Practicality in fabrication + erection

After successful trial assembly at their Gillman premises, the fabricated steel sections were then transported to site. With restricted access around the existing building and the segmented arc dome requiring complex propping, bracing and central supports in its unfinished state, the dome's unique design, while visually spectacular, provided a significant challenge throughout the construction and erection process.

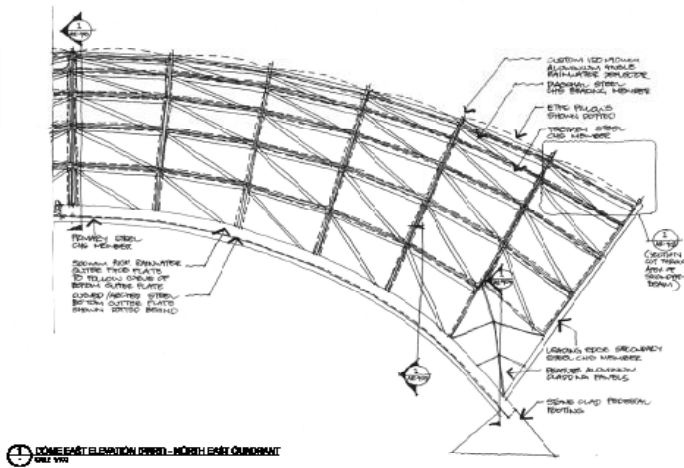
Erection of the fabricated steel sections and pre-cast panels was performed by Samaras Crane Service, with cranes from the Samaras fleet ranging from seven tonnes through to two hundred and fifty tonnes. Crane services were also carried out by the division for other trade contractors on site, and access equipment such as boom lifts were provided as required. Knowledge and experience in complex construction projects such as the Melbourne Aquatic Centre and Port River Bridges was also drawn upon for the redevelopment.

Erection of the fabricated steel sections and pre-cast panels was performed by crane.



Innovation

Around the time of the redevelopment project, Samaras Structural Engineers commissioned their Pipe Profiling Machine, a CNC controlled machine providing a myriad of cutting options for pipe sections 50mm O/D to around 600mm O/D with up to 50mm wall thickness, including bevelling and welding preparations with precision accuracy. This technology allowed for efficient and accurate production of steel members.



Summary

The project utilises a slender steel structure to create three distinct forms, allowing long spans to be held up with minimal supports. Further, the use of structural steel becomes an aesthetic feature, particularly in the dome area which is enhanced by an innovative lighting display.



Project team

Architect:	DesignInc
Structural engineer:	Aurecon
Head building contractor:	Hansen Yuncken
Steel fabricator:	Samaras Structural Engineers
Distributor / manufacturer:	OneSteel Steel + Tube
Steel detailer:	Steel Pencil (performance venue), Samaras (dome)
Coatings supplier:	International Paint
Metal building contractor:	Samaras Structural Engineers

