

Maitland Pool Upgrade

The people of Maitland, New South Wales, can now enjoy year-round swimming at their local Swim Centre, thanks to the recent upgrade of its poolside facilities. During the winter months of 1997, the Swim Centre's grandstand was rebuilt and a new solar water heating system incorporated.

Design and Construction

Steel was chosen for the grandstand's roof and supports. This meant that off-site fabrication could be maximised with minimal disruption at the pool site which had to remain open to the public during construction. Steel also allowed for a shorter on-site construction cycle, again minimising user disruption. Once the roof was constructed, follow-on trades could work in weatherproof conditions, which assisted in meeting the short time-frame designated for the project's completion.

Initial design options for the steel grandstand roof were driven by the decision to maintain the existing timber seating and upgrade it at a later stage. However, the ability to completely free-stand the roof, independent of the structure underneath, meant that the new grandstand as well as the new seating could be built together which enabled the ambitious building program to be met.

The grandstand roof is supported by 8 vierendeel trusses spaced along its 40 metre length. Made up from 90 mm diameter CHS, the trusses vary in depth along their length, getting deeper towards the tip. This lowers

the height of the front edge of the grandstand, focussing spectators' views down towards the pool area. The use of vierendeel trusses also allows natural light to pass through the trusses, enhancing the feeling of openness. Nearer to the truss support points, the vertical chords are replaced with a 6mm steel plate with large circular penetrations. This plate provides the shear capacity for the truss while minimising the size of the CHS sections.

The bottom chord of the truss transitions from a single tube near the supports to a double tube extending towards the tip of the cantilever to increase load capacity without detracting from the overall appearance. At the rear edge of the roof, the backspan serves two purposes. Firstly, it provides points of restraint via the truss linking it to the ground. Secondly, it increases the width of the roof to meet the required area for the solar heating system.

Construction of the grandstand roof commenced with column erection, followed by the roofing structure which was erected with the help of temporary props. The tie-down and bracing along the rear edge was then added. The bolts holding down this system were adjustable, allowing the final deflections of the leading edge to be fine tuned during the

construction phase.

As the exterior masonry wall could be constructed under cover, blockwork trades were able to follow the steel erector with no weather delays. Z purlins were used as an economical louvre system along the top of the masonry wall, allowing natural light and ventilation.

Maitland City Council specified that all steelwork be hot dip galvanised and finished with a 2 coat paint system to assist in achieving a lengthy, low maintenance life, typical of steel structures.

Drainage of the roof is catered for by a 2 degree fall of the roof to a box gutter running above the masonry wall. By alternating BHP COLORBOND® roof sheeting with acrylic sheeting, natural light has been accessed wherever possible, enhancing the quest for openness and airiness.

Conclusion

The use of steel for the grandstand roof structure allowed flexible design and construction options to be developed. Steel provided an all weather cover to following trades, contributing to a short construction period while providing an extremely functional solution. Architecturally, the structure drew on the slenderness of steel, with its light weight and spanning capabilities precluding the need for view-blocking columns, while providing a light and airy feel to the grandstand.

Owner:	Maitland City Council
Engineer/Project Manager:	Lindsay & Dynan
Architect:	Aixia Design
Builder:	AC & JA Grieve
Fabricator:	Lindsay & Lange

Steel provides a light, airy, column-free structure.

