This case study was written at the time when OneSteel was part of BHP. In that context, in some instances within this case study, reference may be made to BHP.

Steel makes

Opened in December 1995, the new Hurstville Aquatics and Leisure Centre provides a vital service to the southern suburbs of Sydney. Facilities include a 25m eight lane main pool, a 30m wide wading pool, gym and creche, as well as changing and shower facilities. The client, the Hurstville City Council, performed extensive local consultations before deciding on a design to meet the needs of its customers.

Architecturally, the building's form was driven by the design philosophy of 'Fun, Fitness & Relaxation' and the Hurstville City Council required all three aspects to be catered for in the design. Openness internally was provided, so parents could monitor their children in either pools and to aid with overall safety. The requirement for an open, light structure lent itself to the approach driven by Peter Hunt Architects, who have designed several other similar structures throughout Australia.

Curved ceilings and smaller, more slender members were used to promote 'openness and fineness', developing the use of tubular 'butterfly' trusses as the main roof elements across the two pools. These three chord triangular trusses were designed individually due to differing spans and load configurations, although similar truss depths (typically 1200mm) and member sizes were maintained wherever possible for continuity throughout. Top and bottom chord members were generally 114x4.8CHS, with the web members typically 76x3.2CHS. Trusses were built full length in the fabrication shop and painted prior to delivery on-site minimising both on-site painting and welding.

Along the structure's centre, a large box truss was used to support the two sides of the roof trusses, which itself was supported on a single line of columns (310UC137), spaced at 7.2m.

With only a single row of columns supporting the central box truss, large eccentric loadings, especially during construction, were a major design consideration. Opposing trusses on each side of the box truss were lifted into place to minimise the overturning moment on the columns.

Two different lateral bracing systems for the building were used. Along the length of the building (parallel to the pools), cross bracing was incorporated and hidden in the wall cavities in the changing room areas. However in the other direction, the extensive glass windows prevented the use of cross bracing. Instead the main curved roof trusses were rigidly connected to the columns to provide portal action in this direction.

Surface treatment on the internal steelwork was critical to the success of the Leisure Centre. Utilising a proven system that Peter Hunt Architects has used successfully on other projects throughout Australia,

a SPLASH !

steelwork was first given a Class 2½ grit blast, then coated with 75 µm of Taubmans Interzinc 2105. Over this was applied 150 µm high build epoxy mastic and the top coat a high gloss acrylic.

The site was reclaimed land which had previously been used as a sports field. With a combination of a low bearing capacity and the light steel structure, large concrete pad foundations were used for most columns to provide both a large bearing area and mass to resist uplift. Column holding down bolts were typically M30 Grade 8.8 bolts, embedded up to 800mm into the concrete foundations.

External roofing consisted of a combination of Spandek Hi-Ten, Klip-Lok Hi-Ten and Custom-Orb sheeting on C200 purlins, which were typically at 1200mm spacings. Where possible, sheeting was precurved prior to delivery allowing for easier on-site construction.

Project Participants

Client:	Hurstville City Council
Architect:	Peter Hunt Architects
Engineer:	Miller Milston & Ferris
Builder:	Belmadare
Fabricator:	Sebastian Constructions

Roof trusses spanning the pools.

Left: The open, light interior promotes fun and safety.