



KES Aquatic Centre

SPORTS FACILITIES AWARD

While retaining the heritage component of the previous swimming pool complex, the roof structure of the KES Aquatic Centre is of particular interest – an apex running diagonally across the structure, requiring meticulous attention to ensure a leakproof roof. **This project won both the metal cladding and roofing, and the sports facilities categories.**

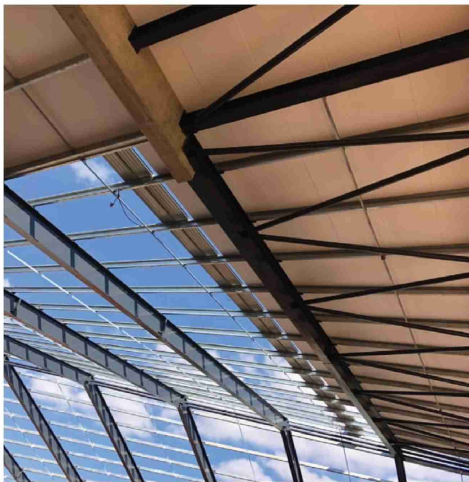
Project brief

The client's brief was to replace the un-covered pool and stands with a covered arena while retaining the original 1927 northern entrance.

The roof split into the repetitive reinforced concrete eastern portal bay of 9m span by 8m height, and an irregular long-span portal steelwork roof over the pools. The apex is sliding on plan by 20m over the full length of the roof (360mm

INTERESTING FACTS:

- **Brief:** Replace the uncovered pool with a covered arena.
- The connection between the RC and plate girder rafters transfers up to 544kNm.
- The new design encompassed 2 750m² under the roof.



step per metre run), but at the same height of 13,25m above ground level. The main span is a 38m span between the eastern RC portal and western RC column, an RC cantilever of 5m and then a 720x300x137kg/m plate girder steel rafter spanning 33m.

The connection between the RC and plate girder rafters are high-moment connections, using Peikko COPRA M39 couplers – the first of their kind in Africa – transferring up to 544kNm on the beam-to-rafter connection and 848kNm on the rafter-to-column connection. The stability of the main roof is provided by two CHS braced bays and RC portal beams in these bays for the north-south

direction, and by double-portal frames in the east-west direction.

Cold-rolledlipped channel purlins take double curvature of the roof surface to support Lambdaboard thermal and sound insulation and Zip-Tek 420 sheeting by GRS.

Over the 1927 heritage northern entrance, RHS columns are used to support the last bay at the facade line, plus UB cantilever purlins for the entrance canopy facade. The support girts are SHS elements between columns. The new design encompassed 2 750m² under the roof, including changing facilities, a multi-purpose area and two state-of-the-art pools for water polo and swimming.

Benefits of steel in this application

- High strength-to-weight ratio is ideal for long-span roofs.
- Off-site fabrication lends itself to the irregular components of the feature roof – itemised component design and fabrication.
- Compatibility with regular support RC frame.
- Speed of erection.
- Competitive market locally.
- Local skills set of subcontractors.
- Aesthetic simplicity.

Project team

- Tass Engineering
- Allied Steelrode
- Macsteel Service Centres SA (Pty) Ltd
- Global Roofing Solutions
- Shed Architecture & Design

Full acknowledgement and thanks go to <https://www.saisc.co.za> for the information in this editorial. WR