Corus Building Systems

Albion Riverside

Kalzip case study

The architect tendered to a wide range of specialists and had initially looked at a panelised solution, but this posed a problem due to the quantity of different size panels that would be required. Instead, they opted for 3,000 square metres of smooth curved tapered Kalzip sheets - the perfect solution to meet the highly challenging requirements. It was able to follow the profile of the roof perfectly from front to back and could accommodate the curves from side to side by hinging on the seam where each strip of Kalzip is joined to its neighbour.

Virtually every one of the 1400 Kalzip sheets used on the roof had to be custom made with less than 10 per cent of them being identical.

Each and every sheet had different maximum and minimum widths to allow for the curve in section to a radii varying from 24 metres to 18 metres and then back again. Because each section of Kalzip was no more than 600mm wide and the curves to the roof were moderate, there was sufficient tolerance in the standard system to accommodate them. Two different profiles of factory tapered Kalzip, a tighter radius for the back of the building and a gentler radius for the main body of the roof, were used to accommodate the curves and were welded end to end on site.

To minimise the effects of external noise in the residential areas and achieve the very high acoustic specification for the roof, Kalzip incorporated high density acoustic insulation to deliver the required U Value.

Kalzip's bespoke fabrication service provided a series of products to achieve total consistency of appearance and performance right across the roof.

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English

Kalzip
taking roof design to new levels

Project Team

Client: Hutchison Whampoa Property
Architect: Foster and Partners
Structural / Mechanical Engineers: Arup
Cost Consultant: Davis Langdon and Everest / Mott Green Wall
Project Managers: CM International
Construction Managers: Exterior plc
Roofing Contractor: Prater Ltd
Steelwork Supply Partner: Waagner Biro

"The complex geometry generated by the Albion Riverside building, curving in all directions on all facades, required the ultimate flexible roof. Kalzip's ability to arrive pre-tapered and pre-rolled allowed accurate covering and crisp jointing along its undulating seams, thus emphasising the flowing shape of the building. Its durable reflective metallic finish complements the aluminium cladding covering the south elevation of the development"

Justin Nicholls: Associate architect responsible for the external envelope

Architectural inspiration

Built by Hutchison Whampoa, the dramatic new Albion Riverside development, which stands majestically on the south bank of the River Thames, between the Albert Bridge and the Battersea Bridge, has been described as one of the most desirable places to live in London thanks to its stunning design and location.

The main residential building - an impressive eleven storey curvilinear structure faced in glass and aluminium contains 183 apartments, 13 duplex penthouses, a leisure facility and a 20 metre swimming pool. The ground floor of the complex offers retail and business accommodation, cafés and restaurants.

Designed by architects Foster and Partners, the building is equipped with one the most complex aluminium roofs ever designed, using advanced computer modelling techniques.

Advanced geometries

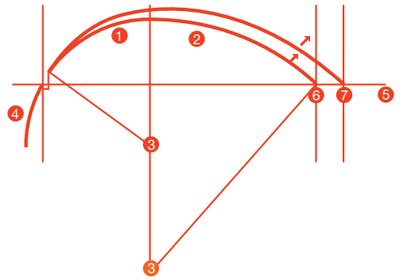
A highly intricate design, the building arcs back from the river in an asymmetrical crescent, with the roof appearing to wrap over and around it in a single sweep, following its curved form.

The challenging geometries of the 3,000 sqm roof meant that the material specified not only needed to accommodate a varying radii but also needed to complement the design of the building aesthetically, and offer high thermal and acoustic performance.

Because of its complexity, great attention needed to be paid when procuring the roof. Joint ventures were established with key contractors to avoid problems in one area being passed on to another specialist. Foster and Partners and approved Kalzip installer Prater Ltd worked closely with the Kalzip technical team to rigorously test and prove the buildability of the design, utilising state-of-the-art CAD technology to create a 3D model.

Perfect in form and function

Because of the curve of the building, a single reference point was created and every part of the building was defined by its spatial relationship with that point. The team had to work out how to generate the roof shape and looked at using hundreds of arcs, but then found the most practical solution was to use just two.



Section through roof

1 Tightly curved area of roof
2 Gently curved area of roof
3 Radii joint
4 Façade with same radius as roof
5 Base of roof
6 Lower narrower part of roof
7 Higher wider part of roof

The primary roof beams spanning the building all follow an identical profile, although they vary in length. The secondary beams are set lower than the height of the primary beams, with plates of varying height welded to them to follow the curve of the roof. Kalzip sits on top of the curved structure, which is defined by a steel structure attached to the plates.

Prater Ltd and Austrian steelwork supply partners Waagner Biro, developed the elaborate roof structure. A 45mm deep galvanised Kalzip structural deck, which was pre-curved along its length and curved across its width to achieve the various radii, was supported on circular hollow section tubular steel.