



A Tata Steel Enterprise



Case study

Greenwich Gateway Pavilions, London

Client: Knight Dragon

Architect: Marks Barfield Architects (MBA)

Principal contractor: Wates

Structural engineer: Price and Myers

Tata Steel products: Kalzip® and Kalzip® XT standing seam roofing system

Roofing contractor: Lakesmere Ltd.

Year: 2014

Greenwich Peninsula in London is one of Europe's largest regeneration schemes for the developer Knight Dragon. In a prime location on the River Thames, the project was launched to create a thriving new district including residential, commercial and public buildings. The award-winning Greenwich Gateway Pavilions is the first project to be completed in the ambitious scheme. Marking the southern edge of Peninsula Square, the pair of pavilions – linked by a clear-span canopy – provide an impressive gateway leading south to the cable car and Central Park.



PRECISION-TAILORED ROOF MEETS PROJECT DEMANDS



The challenge

Greenwich Peninsula is recognised as a landmark development. The ambitious project was conceived to deliver a new and thriving London district. The scheme incorporates thousands of homes combined with 48 acres of open green spaces and 1.6 miles of Thames waterfront. It includes a commercial district with shops, hotels, schools and public facilities.

Following a competition in spring 2013, Marks Barfield Architects (MBA) won the design contract for the Peninsula's signature development, Greenwich Gateway Pavilions. Housing an art gallery, food venues, offices and marketing facilities, it would be the first completed project at Greenwich Peninsula. Coupled with the prominent location - defining the southern edge of Peninsula Square - it demanded a design that would exemplify Knight Dragon's ambitious vision for the new district. Gemma Collins, MBA Director,

said: "The Gateway Pavilions would mark a statement of intent - signalling the quality and character of the place that they intend the Peninsula to become. A pair of curved glass pavilions, linked by a clear-span canopy, are inspired by geomagnetic lodestones which were used as early compasses enabling the great world voyages of discovery. The canopy soffit and roof seams trace a 'magnetic field' pattern linking and creating a virtual forcefield between the poles of attraction."

The design of the Gateway Pavilions refers to Greenwich's famous maritime heritage. The curved form of the 82m long canopy posed an exciting challenge for Kalzip® and specialist building envelope contractors, Lakesmere, who provided and installed the roof.

"The shape of the roof incorporated convex and concave curves - dictating a quality roofing material that could be shaped with precision. The roof and substructure design also had to allow for movement vertically of +/- 120mm at mid-point as a result of wind flow across the shape of the canopy."

John Wilson, Technical Manager at Lakesmere.



The solution

A combination of Kalzip® and Kalzip® XT aluminium standing seam profiled sheets were specified to realise the challenging roof design. The roof incorporates 500m² of Kalzip® XT and 200m² of Kalzip® pre-curved tapers. The Kalzip® XT profiles were produced using Kalzip's® patented roll-forming technology. Adaptable Kalzip® system profiles can be formed into any shape and are suitable for any pitch from 1.5° upwards. The multi-component system offers a range of benefits including low weight, durability and speed of construction.

"The striking curved roof was created using a complex combination of curved and tapered Kalzip® sheets including the freeform Kalzip® XT profiles. We also developed and engineered a bespoke substructure arrangement to the unique geometry of the project. This allowed dead and live loadings to be spread evenly across the frame without overloading any single steel beam." said John Wilson

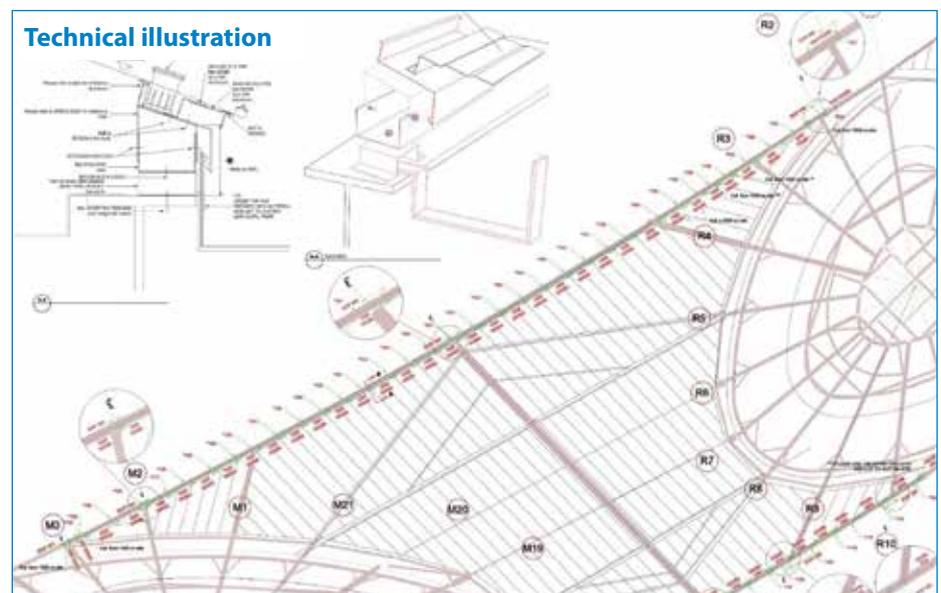
"Over 500 unique, precision-tailored roof sheets were designed and confirmed in the same timescale as a standard sheeting solution – meeting the construction programme demands."

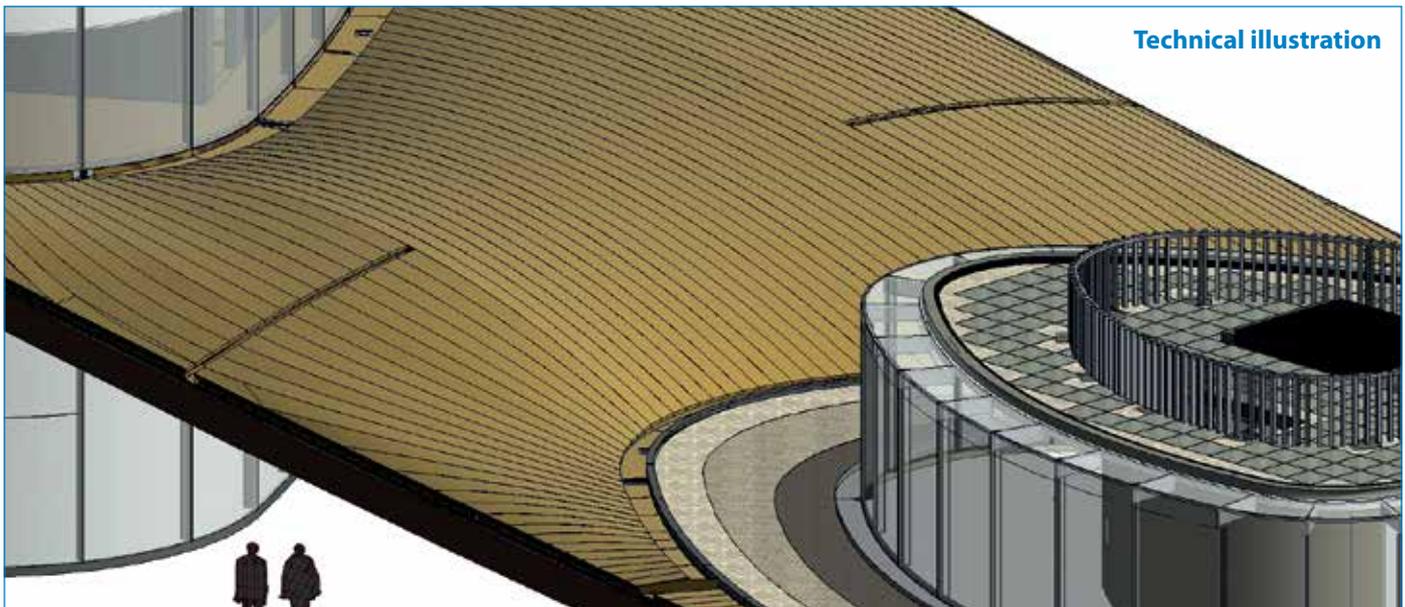
John Wilson, Technical Manager at Lakesmere.

Collaboration and adoption of Level 2 BIM methodology were key to efficient and timely delivery of the roofing project. Kalzip worked closely with the Lakesmere team, the architect, main contractor and steelwork contractor. Data sharing and use of the 3D virtual environment minimised both the design time and the lead time for delivery of manufactured Kalzip XT sheets on site.

Gemma Collins said that the Kalzip® system had provided an effective and appropriate solution for the roof. She said: "The choice of materials for the project was influenced by the peninsula's varied industrial heritage. Brass, copper and other metal combinations have been incorporated where possible as well as steel and concrete.

"The brass-edge canopy is gently curved, forming the last 'ripple' emanating from the geometry of the Dome at Greenwich. To realise the ripple effect, we needed a flexible roofing material that could be reliably and precisely formed to shape. Kalzip® proved to be the ideal solution and met both the structural and aesthetic demands of the design.





Technical illustration

Kevin Turton, Design Manager at Kalzip®, said: "Our investment in computer-controlled manufacturing means we can transform computer-generated designs swiftly into reality. For the Greenwich Gateway Pavilions, we took 3D roofing sheet data extracted from the BIM model to schedule production of each unique Kalzip® XT component.

"This was a complex roof design but our new generation of roll formers means we can readily produce freely-shaped profile sheets to create stunning buildings. Our Kalzip® system has been used to great effect in the Pavilions' impressive and beautiful canopy."

The Kalzip® Technical Team was on hand to offer technical support throughout the project. The team offers a comprehensive support package at every stage of a project – from product selection to design, through to tailored manufacture and on-site inspection.

Greenwich Gateway Pavilions won the RIBA London Award 2016.

For technical advice on the application of Kalzip® for your project, please contact our Kalzip Technical Team:

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Tata Steel products:

Kalzip® standing seam roofing and wall cladding system is a multi-purpose, multi-component system available in a range of straight, curved and/or tapered profiles. It is suitable for roofs, façades and the entire building envelope.

Kalzip® may be used for both warm and cold roof constructions, for any pitch from 1.5° upwards. The system's low weight, durability, speed of construction and adaptability make it equally suitable for new build and refurbishment projects. A Kalzip® roof can be anything from a simple single-skin solution to a sophisticated high-performance system incorporating integral components and accessories. Components include Kalzip® structural deck and cassette systems - providing economical solutions for

long-span installations and eliminating the need for purlins. Depending on the supporting structure and individual application, the roof configuration can be adapted to suit the precise requirements of the building such as snow and wind loading and sound reduction performance.

Part of the Kalzip® range, freeform Kalzip® XT profiled sheets are produced using new generation roll-forming technology. Geometric and organic shapes can be readily and reliably produced from 3D CAD models. Extremely tight radii can be achieved, allowing a wide variety of building envelope shapes including ellipses, cones, semi-spheres, prisms and pyramids.

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Language English 0816