

SSE HYDRO, GLASGOW
KALZIP LIMITED



Kalzip's aluminium standing seam system with a weighted Sound Reduction Index (SRI) figure of 53 decibels was specified by Foster + Partners for the 125 metre span roof of The SSE Hydro in Glasgow. This impressive, imaginatively designed and flexible 13,000 capacity live entertainment venue was built for the Scottish Exhibition Centre Ltd by Lend Lease and the shallow domed Kalzip roof was installed by Martifer UK.

Elliptical on plan and angled in profile, The SSE Hydro's domed roof comprises over 12,750 square metres of naturally curved tapered Kalzip sheets in lengths of up to 25 metres installed in six concentric, almost circular bands. The facade of this amphitheatre-inspired building is 15 metres high at the rear rising to 33 metres at the south-facing front elevation with the central apex of the roof being 45 metres above ground level.

The tapered Kalzip sheet-ends were welded to their counterparts on the adjoining roof bands as part of the installation process and any exposed raised seam ends carefully sealed to ensure the roof's integrity. The roof sheets were affixed to a Kalzip structural deck system supported on a diagonally latticed steel framework and the decking sheets pre-coated black on the underside to improve the experience within the auditorium.

In order to achieve the roof's aesthetic symmetry and maintain the continuity of the standing seam sightlines, complex geometric calculations were undertaken by Kalzip to ensure the roof sheets were manufactured to the correct length and taper and the 25,000 Kalzip thermally broken halter clips were individually set-out with precision accuracy.

Kalzip manufactured the tapered sheets on site for reasons of speed, economy and efficiency - this involved a two phase mobile production process within a tightly confined area of the site. Kalzip aluminium coils were precision cut into appropriately wedge-shaped flat sheets of the required length and then roll-formed into tapered standing seam sheets before being craned up to roof level in challenging, blustery conditions when required for installation.

With a wealth of experience in the technical design, manufacture and application of standing seam roofing, Kalzip was able to assure Foster + Partners about the company's ability to deal with the detailed geometry required to produce The SSE Hydro's roof. Kalzip also went to great lengths to demonstrate their ability to achieve the stringent acoustic performance criteria needed for the roof through a series of rigorous pre-testing processes.



To meet the performance criteria specified by Foster + Partners, the resulting multi-layer acoustic Kalzip roof build-up achieves a U-value of $0.20 \text{ W/m}^2\text{K}$, a weighted Sound Reduction Index of 53 decibels and a sound absorption performance of Class A.

The specified build-up includes a trough and web perforated structural deck with acoustic lags to the troughs of the deck profile, an acoustic membrane sandwiched between layers of acoustic boards and a layer of high density rockfibre insulation topped with a layer of Kalzip Plus 37 quilt insulation.

Located on the north bank of the river Clyde, The SSE Hydro sits next to the Scottish Exhibition & Conference Centre and Kalzip-clad Clyde Auditorium (Armadillo) which was also designed by Foster + Partners and opened to much acclaim in 1997. The SSE Hydro's bowl-shaped central structure rises majestically from its surrounding lower plinth area which houses the entrances, concourse and accesses to the main auditorium. The façade of the main bowl is wrapped in a continuous translucent envelope of pneumatic ETFE cushions which enables natural daylight in to illuminate the foyers during the day and allows the building to 'glow' from inside at night.



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