



A Tata Steel Enterprise



Case study

Kelvin Hall, Glasgow

Client: Glasgow Life
Glasgow City Council
University of Glasgow
National Library of Scotland

Main Contractor: McLaughlin & Harvey
Construction Ltd

Architect: Page\Park Architects

Structural Engineer: Woolgar Hunter Ltd

Building Envelope Contractor: Lakesmere Ltd

Tata Steel Products: Kalzip® aluminium
standing seam liner roof system

Year: 2016

Glasgow City Council has recently headed a collaborative venture to completely refurbish the Category B listed Kelvin Hall. Built as a major exhibition centre in 1927, the structure has been transformed into a multifunctional centre of cultural and sporting excellence with the aid of financial support from the Heritage Lottery Fund and Historic Environment Scotland.

A key element of this revitalisation programme has been the protection of the building's original concrete barrel vault roof. This has been achieved by the specification of a cost-effective, long-lasting Kalzip® standing seam liner roof system which has excellent thermal efficiency, the ability to resist high wind uplift and a minimum design life of 40 years.



Manufactured inside the main hall, the Kalzip® sheets were then transported up to roof level for installation. The external face of the Kalzip® sheets has a highly durable AluPlusPatina finish providing a traditional appearance that blends sympathetically with the rest of the building and its surroundings.

HELPING TO SYMPATHETICALLY PRESERVE AND REVITALISE AN ICONIC HALL



Located on the banks of the River Kelvin in Glasgow's west end, Kelvin Hall was one of the largest exhibition centres in the UK when first constructed back in 1927. Famously hosting many major concerts in the 1960's and 70's, this iconic building was converted in 1987 to house Glasgow's Museum of Transport and the Kelvin Hall International Sports Arena until its closure in 2010.

A unique collaboration between Glasgow City Council, Glasgow Life, University of Glasgow and the National Library of Scotland is responsible for the current redevelopment and revitalisation of this historic and much-loved venue. Protected as a Category B listed building, the impressive hall with its red sandstone fascia and palatial entrance piazza is in the process of being transformed yet again - this time into an exciting mixed-use centre of cultural and sporting excellence.

Implemented over a 2-year period, the first phase of this extensive redevelopment project saw the hall's doors reopen to the public on 22nd August 2016 with the emergence of the city's largest health and fitness centre, Glasgow Club. Operated by Glasgow Life, the 1,000m² state-of-the-art 'super gym' features over 100 cardiovascular, strength-conditioning and fixed resistance stations, an 8-court multi-purpose sports hall, a gymnastics / martial arts hall together with three group fitness and dance studios.

Spread over two floors, Phase 1 will also provide safe, secure and publicly accessible storage for the internationally renowned Hunterian and Glasgow Museums' collections - some 1.5 million objects that are currently housed at various locations around the city will be gradually brought together at this new facility.

The challenge

Refurbishment considerations

McLaughlin & Harvey Construction and Page\ Park Architects were appointed to undertake this extensive and ambitious refurbishment project which provided a demanding set of challenges - particularly regarding the preservation of Kelvin Hall's internal heritage features and the original concrete shell in its entirety.

The building's valued concrete barrel vault roofs were still intact as they had been protected by a steel over-roof in the 1980's as part of an earlier refurbishment programme. Perhaps the most challenging aspect of this whole restoration project concerned the replacement and upgrading of the failing steel roof, whilst at the same time preserving the historic hall's original 4-bayed concrete barrel vaults which lay beneath.

Ideal for new build and refurbishment projects, a Kalzip® standing seam liner roof system was specified for the task. Able to withstand high wind uplift and with excellent resistance to climatic conditions, the lightweight Kalzip® system is extremely durable and has a minimum design life of over 40 years.

Kalzip® AluPlusPatina pre-weathered roof sheets were specified for Kelvin Hall because it was important that the appearance of the outer roof covering blend in sympathetically with traditional nature of this historic structure. The surface of these stucco embossed matt aluminium sheets is highly resistant to weathering and the additional treatment also significantly reduces light reflection.

“Our client was keen to have a lightweight, highly durable, maintenance-free roof system with a low lifecycle cost. As well as being covered by a comprehensive 25-year guarantee, the Kalzip® liner roof system we specified for the Phase 1 refurbishment of Kelvin Hall also provides excellent thermal efficiency by achieving a U-value of 0.20 W/m²K. The whole on-site production and installation process went so smoothly that we were more than happy to respecify the same Kalzip® built-up roofing system for Phase 2 of the project.”
Karen Pickering, Page\Park Architects

Lakesmere, Teamkal Contractor of the Year 2016, has installed two new Kalzip® roofs on this first phase of the restoration work - the major central barrel vault which covers part of the main building and the side barrel vault over the huge sports complex. As building envelope specialists, the company was also tasked with removing the failing steel roof whilst at the same time avoiding any damage to the fragile concrete roof which now sits just 400mm below the new Kalzip® aluminium roof covering.

On-site manufacture

Rather than risk disturbing the integrity of the original concrete barrel vault roof, it was decided to utilise the existing purlins.



Unfortunately, using a best-fit curve option was not possible in this instance because there was significant variation between the purlins. Working with the Kalzip® technical design team, Lakesmere overcame this problem by dividing the roof into several sections so that the Kalzip® standing seam sheets were able to be manufactured and smooth curved to suit the radius calculated for each section and maintain a smooth roofline.

The site's tight footprint also proved challenging because it meant there was insufficient space around Kelvin Hall's perimeter to create a working site compound. The production team devised an innovative yet simple solution in roll-forming and curving the Kalzip® sheets inside the hall's vast central area - the sheets were then manoeuvred out through the building's main door and up onto the roof when they were required for installation.

The solution

Roof installation

By working cooperatively with the other on-roof teams, Lakesmere was able to ensure that the hall's internal heritage features

remained fully protected from potential water damage by coordinating the careful removal of the old steel sheets with the rapid installation of the new Kalzip® system thereby avoiding any areas of the roof being left exposed to the elements.

Over 4,400m² of Kalzip® standing seam roofing sheets with an AluPlusPatina finish have been installed on this first phase of Kelvin Hall's refurbishment.

“I was very impressed with the way that Kalzip® and their Teamkal contractor, Lakesmere, worked closely with each other to ensure that the roof was installed quickly and efficiently. The quality of the roof finishing is excellent and, most importantly, the roof area remained weathertight throughout the installation.”

Don Dempsey, Senior Project Manager at McLaughlin & Harvey.



The future

McLaughlin & Harvey is currently underway with Phase 2 of this extensive redevelopment project - when finished, a further 6,900m² of Kalzip® roofing will have been installed on the two remaining large barrel vaults over the main hall, helping the historic landmark building to achieve its targeted BREEAM sustainability rating of 'Very Good'.

This second phase of Kelvin Hall's refurbishment relates to the venue's enormous and currently empty central area which offers 10,000m² of floor space. Whilst detailed use of this vast area has yet to be finalised, the venue is set to become the home for the National Library of Scotland's Moving Image Archive, an Academy for Cultural & Heritage Skills and provide the University of Glasgow with collection-based research, teaching and conservation facilities.

Plans for a gallery of contemporary art are still fluid, but by having cultural treasures from National Galleries Scotland and the Hunterian Art Gallery & Museum on display together in the same place, it is hoped that Kelvin Hall will provide Scotland with a venue of similar scale and prestige to rival London's Tate Modern.

Tata Steel products:

Kalzip® stucco embossed aluminium standing seam sheets (4,400m²) with an AluPlusPatina pre-weathered finish were roll-formed and smooth curved on-site. The complete Kalzip® roof liner system was then installed on one of Kelvin Hall's main central barrel vault roofs and on the health and fitness centre's barrel vault roof.

Photographs courtesy of: Page\Park Architects, McLaughlin & Harvey Construction Ltd

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

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