Corus Building Systems

Terminal 5, BAA Heathrow Airport

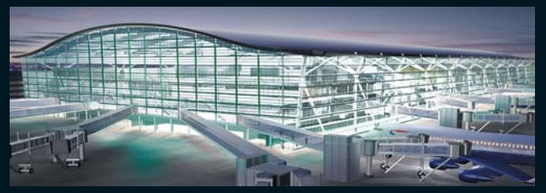
Kalzip case study

www.kalzip.co.uk

Clip art

In order to reduce the excessive frictional force commonly associated with the thermal cycling of long sheet lengths, the new polyamide Kalzip E-clip was thoroughly tested in order to satisfy the demands of the project. The test results confirmed a substantial reduction in the force created between the head of the clip and the Kalzip seam when compared with the alternative aluminium extruded ST clips. In addition, the E-Clip improves the sound reduction performance of the system and also offered no significant thermal impairment when 'hot-box' tested.

The first satellite building to be completed under phase one will also be roofed with 14,000 square metres of Kalzip to provide a consistent appearance with the main terminal building. A special Kalzip 406mm profile was developed to meet the specific design requirements of this project.



Pictures courtesy of BAA Heathrow, Terminal 5

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English

Consistent appearance

Some 30 ancillary buildings, which will accommodate supporting facilities, will also be clad with a Kalzip fabrications system. The architect chose Kalzip fabrications because they are able to manufacture the louvre blades to the same pitch and depth as the sinusoidal profile and prove their performance. A uniquely designed and specially fabricated louvre was manufactured to perfectly match the cladding profile making it indistinguishable from the rest of the elevation.

To complete the package, a range of Kalzip fabrications and accessories were specially developed including clip-fix copings and fascias, claddings, joints and feature flashings, all of which were adapted to suit the varying building sizes.

The development of such a huge scale project is an awe-inspiring feat of engineering made possible by painstaking attention to detail, first class materials and the use of innovative solutions to speed up construction. And when it is complete, the breathtaking expanse of Terminal 5 will surely become a blueprint for the future of construction in the UK.

For more information, please contact:
Tel: 01925 825100

Kalzip checks in at T5

London's newest landmark - BAA's new £4.2 billion Terminal 5 development at the world's busiest international airport, Heathrow - is now well under way and the huge scale of this magnificent development can clearly be seen from both the ground and the air.

When completed, it will be Europe's largest single-span building, measuring a staggering 40 metres high, 396 metres long and 176 metres wide with a total floor space covering an area equivalent to 50 football pitches. It will contain 150,000 tonnes of steel reinforcement, 90,000 tonnes of structural steel and will have used 1.2 million cubic metres of concrete. At its peak, there will be 5,000 workers and 2,000 support staff on site.

Phase one is due to be completed in March 2008 with the roof planned for completion by early 2005. Designed by architects Richard Rogers Partnership, the new central terminal building of the airport will boast a spectacular 55,000 square metre single wave-form roof, made from the longest Kalzip standing seam sheets ever and held up by a frame of 11 pairs of giant steel abutments. Incorporating the new Kalzip reinforced polyamide E-Clips to provide minimal thermal impairment, the massive 170 metre long Kalzip sheets will consist of a 100 metre length with welded 35 metre extensions to both ends.

Assisting the design team, approved Kalzip Teamkal contractor Hathaway Roofing Limited reviewed several roofing system options for the BAA design team before Kalzip was finally selected. Kalzip was the ideal choice because of its ability to provide an aesthetic, durable, non-penetrative roof. The system also has the added benefit of its unique clad alloy to counter the aggressive atmospheric conditions, whilst minimising reflectivity to aircraft overhead.

Logistical challenge

The new T5 development posed a logistical challenge because it is in the middle of the bustling airport and surrounded by some of Europe's busiest roads. Storage of materials was a problem, therefore attention has been given to 'just in time delivery' and off-site pre-fabrication to keep on-site storage to a minimum, improve quality and limit the number of workers on site.

80 per cent of the main terminal roof uses OSP (off site production) in the form of a series of 6 metre by 3 metre roofing cassettes, which incorporate steel structural decking, a perforated under liner and acoustic insulation, a vapour control layer and steel sub purlins. The roof cassettes are pre-assembled, delivered to site and fitted ready for the Kalzip standing seam system and thermal insulation to be installed once the bowstring trusses have been bolted to the eaves outriggers and the roof is in position.

Using these specially developed cassettes dramatically reduces the amount of work on site, particularly on work carried out at height. The cassettes are also pre-punched to further minimise time and costs whilst accommodating the 90,000 Kalzip reinforced polyamide E-Clips.

Client:
BAA
Principal Architect:
Richard Rogers Partnership
Roofing Contractor:
Hathaway Roofing Ltd
Contractor:
Laing O Rourke
Structural Engineers:
Arup

"As the roofing first tier supplier for T5 we were responsible for the sourcing of the most suitable standing seam system available for Concourses A and B. Our decision was to recommend a Kalzip solution. The key factors affecting our decision were our established supply chain relationship with the company, the outstanding capabilities of the product, our own extensive experience of installation and the excellent technical and logistical support available from Corus."

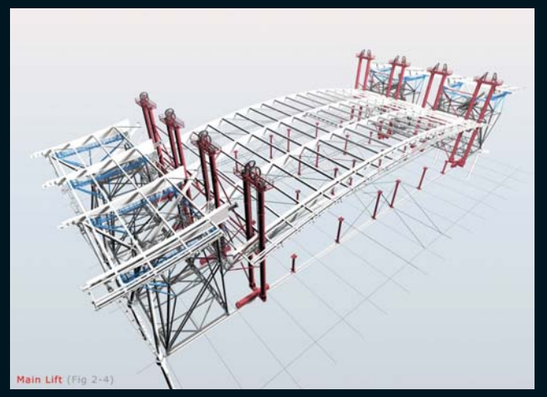
Ian Coverdale, HRL T5 Project Director

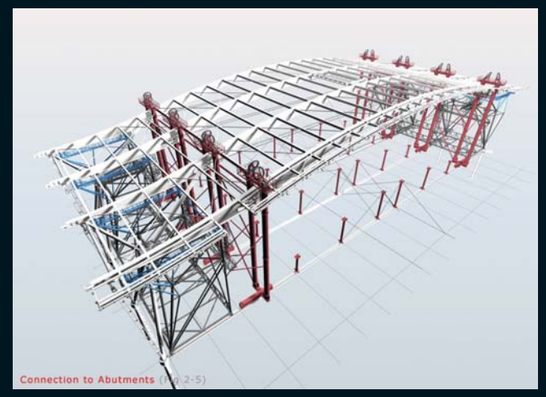
Raising the roof

BAA undertook a full-scale trial build of the main terminal roof to enable the team to perfect this complex erection process under realistic conditions. The mock-up eliminated on-site delays by up to three months and produced savings of around £4 million.

To avoid disruption to the airport's radar and to overcome the limitations imposed on the use of cranes, the Kalzip sheets are being roll formed on site and loaded onto the roof arch below radar level. Constructed at Apron* level, the entire structure will be hydraulically lifted into position in six phases, where they will be connected to the supporting abutments 20 metres above ground. Each roof section weighs 2,500 tonnes and is supported on four enormous bowstring trusses.

There is a considerable reliance on the roof build, to the point that if construction is delayed here, it has a knock-on effect on the whole of the T5 programme. The roof, therefore, is being constructed from south to north with military precision. As one roof section completes, the next section is virtually ready to be lifted into place.





* The Apron level is aircraft ground level.