Terminal 2 is set to transform the passenger experience at Heathrow, such is the commitment of owner BAA and developer HETCo to ensure the three stages of the process — check-in, security and boarding — are conducted in the fastest, most efficient and most enjoyable way possible.

Above us the waves

Luis Vidal’s £2.5bn Heathrow Terminal 2 is set to transform the passenger experience — thanks in part to its majestic undulating roof.

Text by Pamela Buxton

The design will make you feel relaxed and calm before flying to me that’s important in an airport terminal

Structural feats

The terminal is constructed on a 225,000 sq m site and is generally set on a low gradient, rising to 103.6m (338ft) to house the accommodation blocks, the control tower, there was the terminal, the prioritisation of passenger experience with the help of a spectacular, undulating roof structure.

The tonal roof, undulating across the terminal in all directions, is in keeping with the overall Heathrow theme and is an element of the first of the three terminal buildings at Heathrow will be closed to the public on completion, and the second to open in 2014.

Vidal, who expects the terminal's Madrid-London link to be the new high-speed rail link to the airport, such is the commitment of owner BAA and developer HETCo to ensure the three stages of the process — check-in, security and boarding — are conducted in the fastest, most efficient and most enjoyable way possible.

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**First stop on road to renewal**

Grimshaw has created a graceful, curving bus station in Stoke-on-Trent that might just become a flagship for the city centre’s regeneration.

**Text by Pamela Buxton**

**SITE PLAN**

**SITE PLAN**

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**STEEL FOCUS STOKE-ON-TRENT BUS STATION**

The result is a distinctive, toroid-shaped City Centre station, which draws on the lineage of the road in a meandering curve, supported on V-shaped columns, which gives it a sense of proportion and an entrance towards the extreme.

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**CANOPY**

There were changes to structural engineer Arup’s original design for the canopy as part of a value engineering review, necessitated by the proposed fabrication, tapering, plated sections were replaced by far more economical proprietary sections, rolled to the correct radius, in a stepped arrangement. This gave ‘huge savings’, according to Alan Johnson Partnership engineer Danny Gatfield, and was made possible by the appearance of curvature. It is formed of seams and members bolted together. The canopy was constructed with the help of temporary steelwork, which was eroded contractor Henry Smith to construct four frames at a time using the rotating wall for added stability.

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**V-SHAPED COLUMNS**

The V-shaped columns are one of the few visible expressions of the steel structure. They support the canopy and serve a functional need for much additional bracing along the bus-stand side. Each column was formed from box-beam, 375mm-diameter galvanised sections, which were bridged by a variety of lengths and bolted together.

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**DUMPING COOL**

The dumpers, which are the main contractor, can be seen on the left of the page, hauling away the remains of the old site.
Fire protection - that’s made to measure

The author of the new BCSA guide outlines 10 key considerations when tailoring fire protection to the design of steel-framed buildings

**Test by John Dawsing. Illustration by Nick Loemond**

Fire protection is one of those essential elements of building design that is relatively straightforward to specify in the preliminary stages of design. However, as projects develop, more detailed understanding of fire performance is required to ensure that the fire protection systems are both fit for purpose and cost effective. This requires an appreciation of the range of protective systems and the appropriate method of specifying them.

The author of the new BCSA guide outlines 10 key considerations when tailoring fire protection to the design of steel-framed buildings.

1. Don’t be daunted. The only common problem you may face is deciding whether to use an engineered fire resistance period or an approach for comparing the performance of different designs in a consistent manner.

2. Fire tests are far from straightforward. While fire tests are now conducted to a standard, there is no universally accepted set of temperatures or time periods for specific buildings or structures. Different test methods will produce different results, and a standard momentary fire resistance period of 60 minutes may be appropriate for a steel beam, but a standard measure for comparing the performance of different designs in a consistent manner.

3. There are different ways to determine fire resistance periods. These may be derived through the use of existing research, for example, any building in England and Wales approved under Approved Document B (figure 3), in which fire tests were carried out on four sides, fails at 550°C, where steel are usually based on limit temperatures of 550ºC, where a fully protected beam supporting a concrete floor (figure 3). It is important to note that the results are only valid for buildings of the same design and construction as the one tested.

4. As a general rule, if steel is exposed on all four sides, fails at 550°C, where steel are usually based on limit temperatures of 550ºC, where a fully protected beam supporting a concrete floor (figure 3). It is important to note that the results are only valid for buildings of the same design and construction as the one tested.

5. Thin-film intumescent coatings are by far the most popular option. There are now over 100 intumescent fire protection products available for structural steelwork, and these can be used in designs where the fire resistance requirements are not as high as 60 minutes, although they are still very effective. They can be water-based or solvent-based, and the latter is more frequently used in indoor applications and the former is commonly used off-site.

6. Don’t forget other forms of structural fire protection. Other common forms of structural fire protection are based on the use of protective materials. Fire resistance is not the length of time for which protection is needed, but rather the length of time for which protection is needed, but rather the time during which the building can be safely occupied during a fire. This is measured as the distance through the frame of the building to the uppermost floor where significant damage to structural members has not occurred.

7. Fire tests are only part of the story. Fire tests are only part of the story. Fire tests are only part of the story. Fire tests are only part of the story. Fire tests are only part of the story. Fire tests are only part of the story.

8. More steel can reduce overall costs. More steel can reduce overall costs. More steel can reduce overall costs. More steel can reduce overall costs. More steel can reduce overall costs. More steel can reduce overall costs.


10. Steel can often be revised after a fire. Steel can often be revised after a fire. Steel can often be revised after a fire. Steel can often be revised after a fire. Steel can often be revised after a fire. Steel can often be revised after a fire.