

# Design in transport infrastructure

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projects

4 Industry news and comment

13 Crossrail's family affair

London's big, bold Crossrail project has given birth to a striking new family of surface railway stations in the western suburbs of the capital. Ray Philpott looks at the two busiest of them

17 An oasis on the motorway

Designed as a cathedral to food, the new Gloucester services on the southbound M5 are the complete opposite to big-brand motorway fuel stops. Could they revolutionise motorway services' design? Alison Harmer investigates

22 Sleek new interchange design delivers the best of both worlds

A striking blend of modern architecture and heritage transport infrastructure makes Altrincham Interchange something of a destination in itself. Ray Philpott reports

features

25 Cracking the flooring challenge

Transport facilities are subject to heavy footfall and tiled flooring offers an aesthetically appealing and hard-wearing solution in this environment. But even the most resilient surfaces are vulnerable to damage after installation. Judith Mawtus, general manager at Dural UK, offers expert advice

27 Paving the way for a better passenger experience

Sally Binns, Marshalls' rail expert, takes us on a journey to find out how good design and carefully selected materials can enhance the passenger experience from the station interface to the platform

29 Planes, trains, automobiles... and street furniture

Transport sector architects and specifiers are faced with a difficult task when choosing the right street furniture. Nigel Kightley, sales director at CIS Street Furniture, spotlights three products vital for any successful transport project



17



22

31 Future-proofing transport infrastructure with steel

As passenger numbers grow, specifying the right materials to future-proof stations and airports has never been more important. Andrew Jackson, director at SAS International, looks at how steel solutions meet the required design flexibility and aesthetic demand while providing long-term value at a reasonable cost

33 The magic of film

Continuing advances in window film technology mean that a range of difficult glazing challenges in the transport sector can be met effectively and cost-efficiently. Micky Calcott, managing director, of specialists, The Window Film Company, reveals how



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See Page 27 for more

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## Editor's letter

Welcome to ADF's first transport infrastructure supplement, which highlights the resurgence of architectural design in an increasingly important sector.

For decades the design of transport buildings and structures had been mostly engineering-led. Now the aesthetics of these structures – and the traveller's experience of them – are considered every bit as important as their operational effectiveness.

Railway stations in particular have been enjoying a steady architectural renaissance, both for new-builds and deep refurbishments, thanks to significant public and private investment. There's also been a demand for new multi-modal interchanges – linking buses, trams, trains and road transport – providing more opportunities for innovative architects.

In the supplement we've an exclusive commentary from Laura Kidd, head of architecture at HS2 Ltd, who sets out the foundations of what is expected from future station designs on Britain's planned new high-speed network.

There's an opinion-piece from the design consultancy tasked with revamping London Underground's retail offering, spotlighting the importance of considering retail from the outset when designing new or refurbished railway stations.

Elsewhere, writer Alison Harmer looks in detail at an architectural project on the M5 in Gloucestershire that's aiming to revolutionise the all too often soul-less experience of using motorway services facilities.

Moving to Greater Manchester we see how a modern interchange for bus, rail and tram services has succeeded in improving the passenger experience and enhancing attractive heritage buildings.

In the capital we take an in-depth look at Crossrail's interesting new family of surface stations in West London's suburbia that, until now, have been out of the spotlight.

Inside, our experts offer guidance on choosing the best paving, flooring, street furniture and window film solutions for transport projects, and the design opportunities offered by steel products.

So, there's plenty of food for thought.

Kind regards

Ray Philpott



## Skanska builds helicopter hangar in Sweden

Skanska has signed an agreement with the Swedish Fortifications Agency to build a combined helicopter hangar and administration building at the wing F17 in Kallinge, Sweden. This contract is worth SEK 310 million.

The assignment includes construction of a hangar for 17 helicopters. The hangar, which also includes space for administration, will have a gross area of more than 21,000 square meters.

Construction start is planned for July 2015 and the hangar will open before the summer of 2017.

Skanska Sweden is one of Sweden's largest construction companies, with operations in building and civil-engineering construction. The business unit has approximately 11,000 employees and revenue in 2014 amounted to approximately SEK 30 billion.



## COMMENT



*'The next phase of design will develop the stations experienced by the public'*

Laura Kidd, head of architecture for HS2 Ltd



## A design vision for HS2

Laura Kidd, head of architecture for HS2 Ltd, outlines the guiding principles underpinning the design of new stations on Britain's forthcoming high-speed railway

**H**igh Speed Two will be the first mainline railway built north from London in more than a century, but that fact does not begin to capture what a transformation it will provide.

It is not just a new, fast rail line but an entirely new transport system, a railway spine that will bring improved connectivity across Britain.

To deliver that, trains, track, signalling, power supply, tunnels, cuttings, viaducts and bridges, and stations will all be designed as one modern integrated system to provide a totally reliable, high capacity service.

When HS2's second phase to Leeds and Manchester is operational seat availability leaving Euston at peak times will be roughly equivalent to a jumbo jet departing every minute.

Within six minutes passengers will pull into Old Oak Common. Currently the site is a large expanse of railway land in west London and it presents the project and the area with a huge opportunity. HS2, Crossrail, Heathrow Express, the Great Western line and London Overground will all be linked, creating unparalleled connectivity right across Britain.

From there HS2's 225mph trains will reach the planned Birmingham Interchange station near Birmingham Airport 31 minutes later before reaching its new Curzon Street terminus in Britain's second city 49 minutes after leaving London.

High Speed 2 will be transformational for train travel in Britain. And HS2 Ltd wants its stations for the first Phase to Birmingham and those on Phase Two to Leeds and Manchester to be transformational too.

But fundamentally, how will HS2 stations differ from those on the domestic network? The sheer number of people they will handle imposes a different scale. Many HS2 trains will be capable of carrying 1,100 passengers. To accommodate their departure and arrival HS2 platforms will be 415m long. In other words the length of four full-sized football pitches.

Underpinning its station design policy is HS2's recently-launched Design Vision, which contains three guiding principles for designing the whole rail system: *people, place and time*. They apply to station design by stipulating that stations should be designed for everyone – *people*; that they should have a sense of *place*; and that they should stand the test of *time*.

The legislation currently going through Parliament to build the first phase of the system gives translucent 3D envelopes where the stations will be. The number of platforms and the functionality of the stations has been set but the next phase of design will develop the stations experienced by the public, as passengers, pedestrians and communities.

Most of Britain's existing mainline railway stations were

*Continued overleaf..*

designed by the Victorians where by the design emphasis was for the train. The impact of the station on the public realm was not a consideration. For HS2 this will be a key driver for the designs as stations are first and foremost public realm.

### Power to regenerate

HS2 understands its power to regenerate. Stations are seen as regeneration catalysts, but to achieve this their design must be contextual – recognising that how they arrive and sit in their environment will vary. Birmingham's Curzon Street terminus will need to connect with the city's growing tram network and augment civic ambition for regeneration, whereas, Old Oak Common will need to respond to the Old Oak and Park Royal Opportunity and Planning Framework.

Central to maximising regeneration potential is involvement of all stakeholders in station development. Firmly knitting stations into the fabric of their neighbourhood is crucial to securing their success and the growth of their surroundings – to see them as intrinsic parts of the public realm. So although the ambition is for all stations to be distinctive they should also be sympathetic to the context of their location.

Perhaps one of the greatest challenges of designing stations on HS2 is longevity of the project and the operational life of the network. Guided by the Design Vision's *Time* principle, stations should stand the test of time encompassing adaptability for future enhancements as well as aesthetic quality.



Here again stakeholder engagement is crucial to developing 'passive provision' for possible future connections and growth. For example Old Oak Common will be developed so that future London Overground services can be integrated, just one example how design incorporating long-term flexibility will ensure stations retain and enhance their strategic value.

This brief summary outlines the essential ambitions for HS2. Through the capacity that it releases and its unique ability to frequently and reliably link Britain's major populations of economic activity it will be a significant component in rebalancing the economy and addressing the country's productivity constraints.

HS2 stations will play an important role in achieving this by unlocking growth and regeneration through their design that integrates them into the economic, cultural and civic life of the places they serve.



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## INTERNATIONAL AIRPORT

# ADPI and ZHA working together on Beijing New Airport Terminal Building

ADP Ingénierie (ADPI) and Zaha Hadid Architects (ZHA) have completed the concept design for the world's largest airport passenger terminal – the Beijing New Airport Terminal Building – in Daxing, Beijing, under the leadership of the Beijing New Airport Headquarters (BNAH), based on the bid-winning planning scheme by ADPI.

Following the 2011 international competition bid, in October 2014 the Beijing New Airport Headquarters created a Joint Design Team bringing together ADPI and Zaha Hadid Architects with competition consortium group members Buro Happold, Mott MacDonald and EC Harris to collaborate on the optimised concept design for the Beijing New Airport Terminal Building.

With Beijing's existing Capital Airport already exceeding its planned capacity, the new airport will serve the world's fastest growing aviation sector and enable further connections between Beijing and cultural, economic and civic centres around the globe. Initially accommodating 45 million passengers per year, the new terminal will be adaptable and sustainable, operating in many different configurations dependant on varying aircraft and passenger traffic throughout



each day. With an integrated multi-modal transport centre featuring direct links to local and national rail services including the Gaotie high speed rail, the new Daxing airport will be a key hub within Beijing's growing transport network and a catalyst for the region's economic development, including the city of Tianjin and Hebei Province.

The Joint Design Team scheme integrates principles originally developed during the competition phase by ADPI and the Zaha Hadid Consortium Group respectively, which included Pascall+Watson, Buro Happold, Mott MacDonald and EC Harris. ZHA's projects include some of the world's most popular, user-focused and adaptable civic architecture that prioritises the public realm and user experience.

*'The new airport will serve the world's fastest growing aviation sector'*

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## Delft's new train station is now in use



On 28 February 2015, Delft's new railway station was officially opened to the public. The station, in combination with municipal offices and the new city hall, sits atop a new train tunnel built in place of the old concrete viaduct that has divided the city in two since 1965. From the outset, Mecanoo's idea has been to design a station that makes it clear to visitors that they have arrived in Delft.

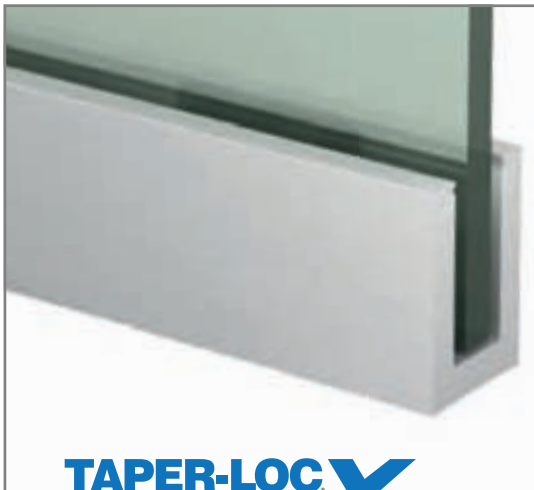
Francine Houben, Mecanoo's creative director said: "Coming up the escalators, the impressive ceiling with the historic map of Delft unfolds."

A vaulted ceiling features an enormous historic 1877 map of Delft and its surroundings, connecting the station with the city hall that is currently under construction. Within the station hall, walls and columns are adorned with a contemporary re-interpretation of Delft Blue tiles.

The glass skin of the building is designed to reflect the Dutch skies. The panels of fused glass with lens-like spheres reference a vernacular window design that can be seen throughout the historic city. The combination and rhythm of open panels of high performance glass and closed fused glass panels enable a high degree of energy efficiency.

Throughout the design process the building volume has been shaved and reformed to create a compact, highly efficient building form. The lowered roof lines at the corners provide a gradual transition towards the existing small-scale development of the Delft city centre and the adjacent Wester Quarter. Incisions in the glass volume form a pattern of alleyways and courtyards, which are themselves inspired by the intricate structure of Delft itself.

The station hall is a part of the first phase of the development of the station and municipal office. When the old railway viaduct will be demolished in 2017, and the city hall and entire municipal offices completed, the whole complex will be open to the public.



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## COMPETITION WINNER

# Foster + Partners wins Cardiff Interchange Design Competition

Foster + Partners has won the competition to design Cardiff Interchange, the city's central bus station and part of the wider Central Square regeneration masterplan for the area, also by Foster + Partners. Bordering a vibrant public plaza, it will be a spectacular new gateway for visitors arriving to the city by train or bus.

The new interchange will be relocated closer to the Cardiff Central train station, allowing greater integration with rail and other transport networks. The new design focusses on legibility and ease of access with the aim of transforming the area into a new transport hub for the city. Designed to provide for a projected future increase in passenger traffic, it features world-class facilities for passengers and staff all under one roof, including an airport-style lounge, shops, cafes and restaurants, and a basement level car-park. With real-time information displays and dynamic stand allocation, it is designed to cater to the growing demands of one of the fastest-growing cities in the UK.

The mixed-use development also features offices and residential units on the upper floors, and the new public concourse opens directly on to the new public plaza on Central Square, creating an exciting new experience for visitors and residents alike.



Gerard Evendon, Senior Executive Partner at Foster + Partners said: "We are delighted that our design for the Cardiff Interchange has been selected. The new bus interchange is a vital component of the entire Central Square redevelopment project, which will completely revamp the image of the city. We are committed to delivering a bus station that provides the best passenger experience to the city's residents, commuters and visitors. We are excited about working with the City of Cardiff council and Rightacres Property Limited to give Cardiff the world-class transport infrastructure it deserves."

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## BDP wins Gloucester Bus Station competition



BDP has won the competition to design the new bus station in Gloucester which will be built as the initial phase of Stanhope's Kings Quarter retail development. BDP beat Roberts Limbrick and AHR (Aedas) in the final stages of the competition, and was one of over 70 practices to submit expressions of interest.

The brief was to deliver a functional and yet architecturally stunning bus station within budget constraints and integrate it into the proposed retail scheme with improved pedestrian links to the railway station and city centre.

The £6.4m facility will include bus stands for 12 vehicles arranged in chevron format to allow a DIRO (drive in, reverse out) method of operation. The public concourse is separated by a full height glazed facade which will have automatically controlled doors allowing access to waiting buses.

The building is highly transparent in order to provide maximum visual contact with its surroundings and a calm, airy environment. The width of the public concourse will allow sufficient circulation space as well as waiting and seating areas for individual stands. Passenger information systems, timetable displays and interactive information points will also form part of the facilities.



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# Retail and rail – the design challenge

Since its creation, the architecture of the railways has been primarily about facilitating transportation. Now, as today's travellers require multi-tasking spaces, architects and designers need to create retail opportunities as an essential part of the journey from pavement to platform, argues Holly Simpson of design consultancy Studio Tait

There's nowhere more conveniently placed for feeding, entertaining or purely distracting our consumer society than railway stations. It's an irresistible opportunity for retailers to engage a captive audience.

The demand for retail in transport hubs swells in line with increasing passenger numbers. A mind boggling 1.3 billion passenger journeys were made last year on the London Underground alone – with some stations achieving a footfall that dwarfs the UK's largest shopping centres.

The need to seamlessly integrate the retail offer within the design of new stations cannot be ignored. Modern stations are the ultimate 'people places' – somewhere to meet, dine, do business and, more than ever, shop.

Retail presentation requires specialist skills. We consult alongside architects, offering insight into the branding, interior design and functionality of commercial operations.

Successful retail in stations means content and prosperous tenants and an assured long-term return for the Landlord. Retailers' long-term needs have to be designed-in at the outset. Elements like clear sightlines, considered lighting and signage and the treatment of flank walls will create a shop front that's an invitation to explore further.

To creatively announce a brand and turn passers-by into customers means working hard on shop-front presentation when you're competing with the tick of the station clock.

## Underground opportunities

As retail design consultants for Transport for London, Tait is two years into understanding, redefining and implementing a strategy of revitalisation across the network. The combination of factors that comes with implementing commercial units in these high-traffic hubs is quite particular, and presents different challenges every time.

London's station architecture is diverse, narrating the city's history. Retail architecture, design and tenant mix has to respond to this, and reflect the personality of its locality. It also has to accommodate the changing demands of retail itself – a well-reported state of affairs that is challenging even the industry stalwarts.

Creating flexible spaces that cater for a higher turnover of tenants or enable an established brand to change its store



fit-out with ease and frequency means that, although the architectural envelope is set, all that falls within it has to be adaptable.

One of the revitalised retail outlets at Old Street

## The new Old Street

These factors came into play when we created TfL's first ephemeral retail destination at Old Street Station, situated on the tectonic plates of vibrant Shoreditch, Tech City and the financial district. Four subways were treated with playful wraps of colour to aid wayfinding, and ten retail units were revitalised into pop-up shops and market stalls on very short-term leases. An intrinsic need for flexibility underscored the design. Units were stripped back to gallery-like spaces, and a consistent signage format provided via projecting lightboxes over each frontage, allowing tenants to implement and change their branding overnight but remain in line with a hierarchy of communication. The tenant mix is curated around a seasonal theme, ensuring commuters are continually re-engaged.

Creating a dynamic hub of activity – and revenue – has been a bold and astute solution, ushering in the change that will come with the major long-term redevelopment of Old Street roundabout.

*Continued overleaf...*

**'The objective should always be for retail to enhance the passenger's journey'**

Holly Simpson, Studio Tait



*'To creatively announce a brand and turn passers-by into customers means working hard on shop-front presentation'*

In an entirely different environment, at Foster and Partner's Canary Wharf underground station, we retrospectively transformed a wall of service cupboards and WCs adjacent to the escalators into four thriving retail units (pictured below).

The objective should always be for retail to enhance the passenger's journey. Convenience is critical, but the impact on circulation must be considered carefully. Our concept at Canary Wharf minimised disruption to the existing architecture, showcasing retailers by re-pitching the louvered ceiling and replacing steel walls with taller, fully glazed facades.

However, the volume of retail opportunities will sometimes be dictated by the station architecture. With the obvious challenges and limitations of being literally underground, many stations don't have the ongoing service facilities required by retailers, such as daily refuse removal.



### Architectural language

In all station environments, the desire to maximise the value of the space is consistent. The new TfL kiosk (pictured above), launched at Waterloo station, provides a uniform architectural language that diverse tenants can individually brand. The station architecture is crucial to achieving this balance between consistent quality and materials, and encouraging tenants' creative expressions.

We're now finalising the Retail Design Idiom, a set of overarching design principles for the network, ushering in a new generation of retail standards for London rail travellers.

Working alongside architects as retail design specialists we always have three clients in mind – the landlord, the tenant and the consumer. The most successful spaces are those that consider the continuing life-cycle of all three.



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Ealing Broadway station  
© Bennetts Associates

## Crossrail's family affair

London's big, bold Crossrail project has given birth to a striking new family of surface railway stations in the western suburbs of the capital. Ray Philpott looks at the two busiest of them – Ealing Broadway and Hayes and Harlington – to see how a common design approach can be applied in different environments

Crossrail is one of Europe's biggest and most technically challenging infrastructure projects and will deliver a huge boost to London's hard-pressed transport system when it becomes fully operational in 2019.

As the line's engineers and constructors slowly burrow their way beneath the historic heart of London, the central section and its swathe of 10 new underground stations tends to grab the limelight.

Yet the vast majority of this railway is actually above ground, with 30 existing surface stations along the route – from Abbey Wood and Shenfield at its eastern end to Heathrow Airport and Reading in the west.

The majority are being upgraded to accommodate the new services, but in the western suburbs of London five completely

new station buildings have been designed by London architects Bennetts Associates for client Network Rail. Each will be operated by Transport for London.

This feature focuses on the larger Ealing Broadway and Hayes and Harlington stations, but their smaller siblings at Southall, Acton Mainline and West Ealing share the same principles of form and function.

### Common themes

The architects set out to create a clearly identifiable family of buildings that, at the same time, form distinctive focal points within their own public realms.

Studio Director David Laing explains. "Our remit is to design the station buildings and booking halls. The canopies,

*Continued overleaf...*

Ealing Broadway Station  
will once again enjoy a  
commanding street presence  
© Bennett's Associates



footbridges, stairs shelters and other platform-level structures are Network Rail's responsibility. These utilise highly cost-effective and practical modular designs to shorten installation times and minimise disruption to passengers.

He adds: "Essentially we've created a series of glazed pavilions – steel-structured buildings with lots of angles – with the idea of getting as much transparency and light into the public space as we can. Moving through stations is all about clarity and seeing where you are supposed to be going. From each forecourt you can see in to the ticket office and the stairs to the platforms beyond."

In one aspect, the designs have been influenced by one aspect of Charles Holden's celebrated, 1920s Art Deco station designs on the London Underground's Piccadilly and Northern lines.

"Holden designed tall structures with large areas of high glazing. Similarly we've created double-height steel-framed buildings with lots of clear glass, designed to glow like lanterns at night – thanks to carefully located LED downlights and washes of light beaming up from the ground."

Each station has a signature projecting roof to the front and across the board, station signage comprises a large white font mounted directly onto clear glazing, giving the impression that it is almost floating in mid-air.

## Grand entrance

Even before Crossrail arrives, Ealing Broadway is a bustling station – a terminus for the Central and District underground lines and served by main-line commuter services to Paddington and Heathrow Airport.

Yet, since the 1970s the station entrance has been a small, nondescript affair at the bottom of an old tower block – a far cry from the grand, triple-towered Great Western Railway station building it replaced.

Now, says Laing, the station will again become a highly visible landmark, thanks to its most striking feature – a huge canopy, reminiscent of a gigantic aircraft wing that runs along the full front of the glass and steel station and beyond.

Laing outlines the problems he and his team faced. "We're essentially redeveloping an existing station location to enhance a townscape that's never really worked well. This was difficult to co-ordinate because although it's a public space, different parts are owned by different people. Aesthetically, the main challenge was that you couldn't see the station entrance from the actual Broadway. It's set back from the rows of shops and restaurant on either side, and is almost apologetically buried away."





*'Further west, Bennetts Associates' new Hayes and Harlington station design faced the challenge of having two entrances at very different levels'*

Hayes and Harlington station's low-level entrance showing the grand stairs and lifts to the bridge-level booking hall and footbridge to the rail platforms  
© Bennetts Associates

In contrast, the vast new canopy boldly links the flanking buildings directly with the station. It features a wooden clad underside to soften the features and add natural colour to the station forecourt.

"It is uplit from LEDs positioned on the grey metal columns that support it and this light is also reflected back down on to the forecourt," adds Laing.

A number of glass-fronted retail units face into the booking hall, and to the side of the entrance is a vibrant new 'destination' cafe. The tower block entrance at ground level is independently being remodelled to bring about visual improvements complimenting the development.

"Inside, the light, bright booking hall is top-lit by glazed rooflights that extend from the canopy right the way through to the barriers," Laing says. "The walls are clad with perforated bronze-coloured panels and we have suggested commissioning an artist to incorporate images and textures on some of them."

Work on the station begins late summer and will be completed by 2017 while the frontage will be landscaped with appropriate security features by the local authority. "We feel we're bringing back a grand entrance to the station and

restoring the sort of commanding street presence it deserves.

## Unified design

Further west, Bennetts Associates' new Hayes and Harlington station design faced the challenge of having two entrances at very different levels.

For more than 130 years the main and official passenger entrance was at high level via the official, low-key, booking office on the road bridge running over the lines.

Following a revamp a few years back, an additional entrance was created at platform-level via Station Approach, a cul-de-sac formerly used to access the station's once extensive goods yards and parcels services. The original, 1860s-built GWR red brick and stone building on London-bound platform four – once housing toilets, waiting rooms, and storage – was converted to a formal entrance waiting room and ticket office. However, passengers could still enter via the flat, modern 1960s station building on the bridge.

The new glass and steel station has drastically simplified things by smoothly incorporating entrances at both the bridge and lower level as part of a single and clearly unified building with the main ticket hall at bridge level. The

*Continued overleaf...*

*'Hillingdon Council wanted the station to be lit in different ways to reflect various community festivals'*

David Laing, studio director,  
Bennetts Associates

The bridge-level entrance and cafe at Hayes and Harlington station  
© Bennetts Associates



distinctive triangular building separating the roads the entrances are on is being retained.

The new station and coffee shop is actually being built to the side of the current buildings, on the site of a low-rise 1960s block that's being demolished, giving the town an iconic, modern, high-profile transport facility in place of the largely compromised existing one.

"The split access levels were quite a difficult issue to tackle, because they are quite dramatic," explains Laing.

"The local authority, Hillingdon Council, was keen for us to make full use of the bridge entrance as the surrounding public realm is being redeveloped. Large numbers of people from various new residential developments nearby are expected to use this entrance. The plans for the public realm around the station are extensive and the council is very enthusiastic about it.

"Bearing that in mind, we felt the best way to make Hayes and Harlington work was to create a grand external staircase and install a step-free lift at the lower level to reach the bridge-level ticket hall and platform gates. We've made the lift access into a feature.

He added: "The pedestrian flows at the station are tricky because they come from two directions. Using pedestrian flow models we placed the ticket barriers away from the bridge entrance to give people plenty of space to negotiate the area and the models show that it works."

Inside the spacious ticket hall, bronze cladding has been used to add colour and a light-coloured, high quality

limestone flooring, with same finish extends through to the wide external staircase."

Within the station area safety glass and stainless steel balustrades convey a sense of spaciousness and transparency.

"The station is well lit inside and out, mainly using uplighters," explains Laing. "A unique feature is that the LED lighting can change to a wide range of different colours. Hillingdon Council wanted the station to be lit in different ways to reflect various community festivals and events at different times of the year.

"We've provided a coffee shop at the front on the bridge, designed as an integral part of the station, featuring al fresco seating to liven up the area and give it a pleasant ambience."

One historic feature from the original 19th century station building has survived. The red-brick platform entrance building is making way for the new structure. The original brick and brick coursing from the historic station wall is being re-used to form a free-standing wall separating the trains and platforms from the low-level entrance and forecourt.

Laing says: "It was clear people liked the old building, so it made sense to incorporate it as a feature in the new building. It has good brickwork with nice stone detailing at the window heads. So, as you look along Station Approach you'll still see the familiar elevation of the old station building, but in a different location.

"It's good to keep such a tangible link to the station's past, but when Crossrail arrives, a clean, modern transport facility is what people will appreciate most."

### Project details

**Client:** Network Rail  
**Architects:** Bennetts Associates  
**Main contractor:** Vinci Construction  
**Structural consultants:** Hyder Consulting  
**Public realm (Hayes and Harlington):** Crossrail Ltd, London Borough of Hillingdon  
**Glazing:** Schueco  
**Roofing:** Kingspan

# An oasis on the motorway

Designed as a cathedral to food, the new Gloucester services on the southbound M5 are the complete opposite to big-brand motorway fuel stops. Could they revolutionise motorway services' design? Alison Harmer investigates



Stealth: A grass roof and local stone cladding blend Gloucester Services' main building into the landscape

**A**t a stunning rural location flanking the Cotswolds there's an oasis on the UK's motorway network that offers a radical approach to motorway services area design and is setting a new sustainable standard.

Gloucester Services southbound opened on 19 May between junctions 12 and 11a of the M5, a year after its sister site was completed on the northbound carriageway. The new southbound services mirrors the northbound in design, apart from minor changes made due to its different typography and outlook.

The site is on the edge of the Cotswolds area of outstanding natural beauty and the operators Westmorland Ltd – the family firm that runs the award-winning Tebay Services in Cumbria – and charity the Gloucestershire Gateway Trust wanted the buildings to blend into the landscape and be highly sustainable.

After shortlisting six practices in 2009, Westmorland appointed Glenn Howells Architects (GHA) to create motorway services that, like Tebay, would be dedicated to food, farming and the community – this time, in Gloucestershire.

The practice's director and principal designer Glenn Howells created designs that would use natural local materials as much as possible and embed the main facilities building

into the hillside to avoid impinging on long-distance views.

To make the buildings even 'stealthier', a landscape design team from Pegasus Group, led by director Jeremy Peachy, also created a series of imaginative landscape interventions including bunds and plants to screen the buildings and picnic areas from the road.

Clad in local Cotswold stone, it's hard for anyone used to the harsh lines of traditional, homogenous motorway service stations to believe this unassuming crafted building is at an motorway services area (MSA). Even the petrol station roof is grass covered.

## Food focus

Discreet as it might be on the outside, inside travellers are left in no doubt that this business is all about local food and the community.

The dramatic sky-lit interiors include dining areas, kitchens, a farmshop, deli and butcher's counters, and even a fishmonger. Exposed beams of glued laminated spruce create church-like ceilings above an environment that worships local produce.

GHA project manager James Spencer says: "As a young architect in 2009, it was a rare and fantastic opportunity to

*Continued overleaf...*



*'The building was to be read as another natural rise and fall in the Cotswolds landscape'*

Reducing the environmental impact – an extended overhang tempers the light spill



create a building around great local produce.

"Most motorway services take every opportunity to sell people something. They're designed from the inside out, taking the needs of franchises into account. They seem to make the journey to the toilets – where everyone wants to go first after a long drive – as torturous as possible. We wanted to avoid that."

### MSA antithesis

Spencer acknowledges that the major operators have made significant efforts in recent times to improve the architecture of motorway services, but he says "they still house the same basic glass boxes full of franchised food and retail outlets overlooking a sea of cars".

Even new services like the acclaimed £75 million Extra Motorway Services opened at Cobham in 2012, between junctions 9 and 10 of the M25, focus on the same popular brands travellers will see throughout the motorway network. That's fine if you like fast food franchises but it leaves little choice if you don't, he says.

Westmorland is the antithesis of the giant branded MSA operator. With its community-focused ethos, it shuns all franchises in favour of stocking food and craft produce from

local producers in its cafes and shops.

For the build, this thinking also meant placing the largest possible volume of work with local businesses – like Hope Construction Materials. In partnership with Buckingham Group Contracting, the main building contractor on the project, it provided concrete for foundations, ground engineering, pavements and concrete designs from its nearby plant in Gloucester.

The Cotswold stone used in the walls was also sourced from a local source – Tinker's Barn Quarry in Gloucestershire.

By involving the community, Westmorland Chief Executive Officer Sarah Dunning wanted to create an MSA that "looked like it belonged". It also had to be an oasis where people would want to spend some dwell time. She was keen to give travellers the physical and psychological break from the driving experience intended when motorway services were a new concept.

So when they won the bid, GHA began by researching the first motorway services and the buzz they created. When the Watford Gap MSA opened in 1959 at the same time as the M1, the motorways promised an exciting period for architecture. They were the future of travel. In the early 1960s, people even made weekend trips just to use the services.

Spencer says: "Over the years, the concept of a glamorous

**Project details**

**Architect:**  
Glenn Howells  
Architects  
**Main contractor:**  
Buckingham Group  
Contracting  
**Engineering project managers:**  
Frank Whittle  
Partnership  
**Landscape design:**  
Pegasus Landscape  
Design  
**Planning:**  
Pegasus Planning  
**Concrete:**  
Hope Construction  
Materials  
**Quantity surveyor:**  
Frank Whittle  
Partnership  
**Cotswold stone cladding:**  
Tinker's Barn Quarry  
**Glulam beams:**  
B&K Structures  
(northbound MSA)  
**Glass rooflights:**  
Glazing Vision

place where you'd want to stay for any length of time was watered down. Originally they were intended to encourage you to take breaks but people get in and out of most modern services as soon as they can."

With an animated and enthusiastic client behind GHA, Glenn and his team were free to take their design forward into a rigorous planning process.

**Topographical challenges**

Given the area's outstanding beauty, many residents were negative about plans for a motorway services at the site while others welcomed the chance of transforming the region.

For GHA, the planning application was challenging in terms of its many 'green' constraints, which included considering the view from two elevated views at Robinswood Hill and Cud Hill.

The building was to be read as another natural rise and fall in the Cotswolds landscape, so Spencer says they used the topography as much as possible to avoid making a huge impact on the levels.

This involved sculptural work to ensure the building blended seamlessly and earth modelling to bring it back into the landscape.

Although GHA originally wanted to use standardised timber to form the basket shape of beams under the roof, it was decided that the services should feel more human in scale – more like a cruck-framed barn. Glulam, sourced from Austria, was the perfect natural material for the front-of-house areas, such as the foyer, server and restaurant. The back of house, shops and offices are all steel framed.

The roof geometry was complex to model and posed a challenge when GHA tried to produce fabrication drawings for a heavyweight roof system. Although grass-covered roofs have become a standardised product, the implied weight load means care has to be taken building it up in layers.

Westmorland's Lake District visitors' centre at Rheged is the largest grass covered building in Europe but has had problems with rabbit burrows damaging the waterproof membrane. With this in mind, GHA put in a more robust waterproof layer and the grass, which includes a mix of local wild flowers, is less deep.

**Reducing light spill**

Another environmental challenge was to temper the light spill from the buildings to reduce its impact on residents nearby. Although the temptation was to orientate the building so the

*Continued overleaf...*



## BUILDING PROJECTS

Pictured right: The architect used natural materials such as Glulam for front-of-house areas like the foyer, here, and restaurant, below

large windows focused out onto the hills, GHA rotated it further west to create less impact and the overhang of the canopy was brought further out to reduce light spill.

“Over the next 15 years, a local charity will work to plant trees and further screen the site,” says Spencer.

Another example of a change made because of the site’s aspect was a series of studies of long sections from vantage points so that car parking was minimised.

Spencer adds: “Others might have wanted to make a large car park or spread the car parks out, but for us it was about reducing the surface area they took up, so there was less water run-off and the area of parking created was reduced. We also used the landscape banking to screen these from wider views.

“There’s an acoustic change too, so by the time you go through the building and out to the garden at the back, the noise is imperceptible.”

### Sustainability

GHA took a holistic approach to sustainability, encouraging alternative modes of transport for the staff by connecting up cycle-paths and footpaths so they could get to work without using the roads. It also provided an Ecotricity electric vehicle charging point.

Again, with a view to reducing light-spill, the usual huge glowing totem signage and fascia on the petrol station is reduced to a simple 6ft sign with the Texaco logo and no other branding apart from on the pumps. Even the signpost on the slip road leading to the services is subtle – it just says Gloucester Services Farmshop and Kitchen.

Other signs, such as the diagrams on entering the building were made as legible as possible, clearly showing hot drinks on one side and farmshop and shops to the left. Unlike many



traditional MSAs, the toilets are clearly signposted from the entrance so travellers can go directly to them without being tempted to buy anything if they wish to.

“The toilets had to cater for high numbers but there’s a real sense of quality to the fittings. It was great for us to not only think of sheer traffic to these spaces but how we could improve the visitor experience,” says Spencer. “The showers for truckers are equally impressive, as are the family rooms.”

These careful touches and the site’s high sustainability credentials combined to win it a BREEAM Excellent rating award.

As an architect Spencer is conscious of the rarity of such projects.

“They are few and far between, but it was a wonderful opportunity to change something that’s universally miserable and create a sense of delight during a journey, and a sense of drama at such an unexpected building.”

He adds: “I hope it raises the bar for other motorway services. People are becoming more responsible about how they shop, but there will always be those who want a fast-food outlet. At least this provides for people who don’t want them.”

### Quick facts

**Total cost:**

£40 million

**Number of people who worked on its construction:**

200

**Staff now employed:**

300

- Supports 130 food and craft producers within 30 miles
- Local sourcing policy has injected £4.5 million in the local economy





# Solvent-free Kemperol 2K-PUR helps John Lennon Airport stay in control

**M**any roof refurbishments need to take place while the building remains fully operational and sometimes a business-as-usual approach is a business critical necessity.

That was certainly the case at Liverpool John Lennon Airport when wear and tear demanded the installation of a new roof for the control tower without any disruption to its 24/7 operation.

The control tower plays an essential role in ensuring that flights take off, approach and land safely to keep air traffic on schedule.

Not only does Liverpool John Lennon Airport rely on the control tower's 24/7 operation, but Robin Hood Doncaster Sheffield Airport also receives vital data from a transmitter located on the roof too.

This demanding environment meant that the roof refurbishment had to be carried out without any disturbance to air traffic controllers, who must be able to concentrate fully at all times. As a result,

roofing contractor, W Swindells & Son Roofing selected Kemper System's odourless Kemperol 2K-PUR cold applied liquid membrane for the project.

The control tower's existing roof surface was bitumen which had not been replaced since the building was first constructed. The refurbishment saw W Swindells & Son overlay the existing substrate with the Kemperol 2K-PUR liquid membrane in a single wet-on-wet process.

After cleaning the substrate, the installation team applied Kemper System's D Primer which was left to cure before application of the liquid membrane began.

The Kemperol 2K-PUR resin was applied section-by-section to the roof using rollers. The flexible reinforcement fleece was cut to size and shape on site and laid onto the wet resin. The installation team then immediately applied more resin to fully saturate the fleece removing any air



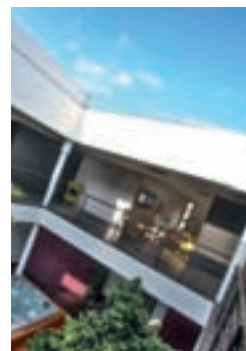
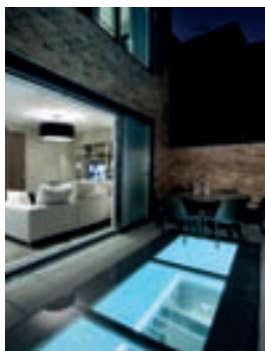
bubbles or creases with the rollers. The resin then cured to form a seamless, durable and U/V stable monolithic membrane.

Once the new roof surface had been installed, W Swindells & Son created a non-slip maintenance walkway by applying a central strip of Kemper System's Kemperdur TC surfacing on the roof along with anthracite-coloured quartz aggregate as the wearing course. This finish was also applied to the section of the roof where access is gained from the control room.

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# Sleek new interchange design delivers the best of both worlds

A striking blend of modern architecture and heritage transport infrastructure makes Altrincham Interchange something of a destination in itself. Ray Philpott reports

*'AHR's design is essentially a glass and steel building with a long, organic, curved facade featuring doors accessing a series of uncomplicated drive-in/drive-out bus bays'*



A truly integrated transport interchange where it's possible to access several different modes of transport with minimal effort is fairly rare.

For more than 30 years, travellers using Altrincham Interchange in Greater Manchester, have been able to hop off a bus and catch a Metrolink tram or mainline train with relative ease.

Now, the passenger experience at Altrincham has just got even better, thanks to a £19 million redevelopment driven by Transport for Greater Manchester (TfGM). What's more, the visual splendours and architectural heritage of the town's 1881-built railway station the interchange is based around, can once again be clearly seen and enjoyed by those using the facility.

At the heart of these improvements is the new bus station designed by Architects AHR. They have created a spacious concourse, linking easy to use bus bays to the historic booking hall and new footbridge to the metro and rail services.

The beauty of the concept is its transparency. From the outside it's possible to clearly see the red brick and stone facade of the station – for so long hidden behind rows of bus stop platforms and islands.

AHR's Regional Director, Michael Gardner, sums up the objectives and challenges. "Historically the previous linear shelters had reduced headroom with low lighting levels and they obscured views of the station building. It was important to ensure people could easily navigate the new interchange and move quickly between the different modes of transport.



“Overall, we aimed to improve the connectivity and to create lighter, airier, more passenger-focused spaces with enhanced waiting facilities where passengers would feel secure.

Alistair Branch, AHR’s project leader, adds: “We needed to make the heritage building visible, not just from within the concourse but from the approaches and road outside, and at night, too. Our brief included cleaning and restoring the heritage buildings, including the historic Grade II-listed clock tower landmark at the front of the interchange. “The clock tower, which is near the main road, forms part of the original grand approach and has been re-timbered, had its attractive clocks restored to their former glory and been set in its own landscaping so that it can be fully appreciated.

## Aesthetic values

AHR’s design is essentially a glass and steel building with a long, organic, curved facade featuring doors accessing a series of uncomplicated drive-in/drive-out bus bays.

The concourse roof is supported by two rows of steel columns and cantilevered back from the facade towards the historic building, while lightweight ETFE roof lights run along its length, enabling daylight to flood down without extensive supporting structure. The rear row of columns stand away from the historic station facade to avoid diluting its aesthetic qualities.

Branch says: “The new, simpler arrangement for bus operations in part shaped the building’s organic, curved

*Continued overleaf..*



## BUILDING PROJECTS

Pictured: top right: The Victorian heritage of the old railway station can be clearly seen through the new facade

Centre: An elegant clock tower at the front of the interchange has been restored

Bottom right: Clean lines in the new concourse do not compete with the heritage building

plan-form, we deliberately gave the concourse clean lines so that it does not compete with the historic building, which we wanted to respect.”

Glass fins are suspended from the back edge of the higher concourse roof descending to the front edge of the Victorian roof lower down. Gardner adds: “The fins don’t actually make contact with the historic roof – the lower edges hang a few centimetres above it – but provide a visual separation, a ‘soft’ boundary between the two roofs.”

“The idea is that it enables people to appreciate the clean lines of the new architecture while enjoying the roof-lines of the heritage building. Getting the levels right was quite a challenge to preserve those sightlines.”

The roof is finished with Kalzip standing-seam roof, and plastered internally in white to reflect light, while the soffit over the bus stops was clad with aluminium cassette planks, utilising a secret fix system. All-LED lighting systems have been used to minimise energy use – with strategically placed uplighters built into the paving to create a solid wash of colour against the Victorian structure, turning it into an attractive night-time feature.



Within the building a separate brick enclosure houses travel facilities, a baby changing area, toilets and staff offices and, on the first floor, access to plant. The bricks reflect the existing heritage structure, but are not a pastiche of it.

External ‘Conservation Smooth’ paving runs from the front of the building through to the concourse itself and some of the paving has been decorated with transport-themed art created by Bikenhead-based cammdesign.

### Logistical challenge

Overall, the project taken time to compile, with planning initiated in 2008, construction beginning in 2013 and completed in 2015. This was in part due to the large number of stakeholders involved in the project including TfGM, Trafford Council, Network Rail and local pressure group the



Friends of Altrincham Interchange.

“Rebuilding around a fully working interchange and working within a fairly constrained site while having to keep all three transport modes running was a challenge. It meant designing the building to be delivered in phases to enable this to happen – although, to the public, it was delivered as one whole project,” adds Gardner.

Things had to happen at certain times, in particular installing the new linking footbridge over four platforms.

Gardner says: “The architecture of the bridge is driven by the need to crane it into place in two large segments in a single possession – or closure – of the railway lines.

This meant it had to fit first time. Each section weighs in excess of 20 tonnes and was lifted-in pre-clad to minimise further work that had to be done over the live railway.

“It’s basically a large box section girder and the architecture is driven from a structural perspective but the idea of a simple elegant box works, especially considering the architectural theme of the rest of the project.

“Many heritage railway structures were engineering based, and people see the beauty in that. I like to think we’re creating the heritage of the future,” he concludes.

Only time will tell – but what is certain is the new interchange, with its skilful blend of old and innovative new, is a catalyst and sparkling showcase for Altrincham’s ongoing redevelopment.



### Project details

#### Client:

Transport for Greater Manchester

#### Architects:

AHR

#### Main contractor:

Laing O’Rourke

#### Structural consultant:

Jacobs

#### Roof cladding installer:

FK Roofing

#### Quantity surveyor:

Faithful and Gould

#### Landscaping & heritage consultant:

AHR

#### ETFE rooflights:

Novum Structures

#### Paving:

Marshalls

#### Bricks:

Janinhoff

#### Steel Fabrication:

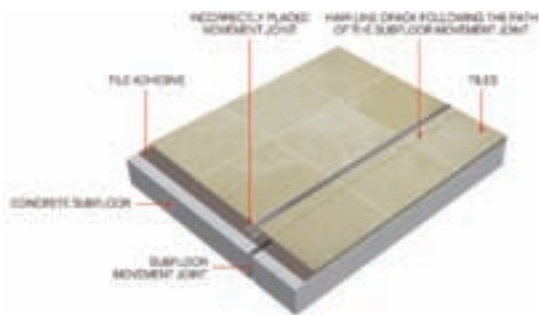
Roll Formed Fabrications

# Cracking the flooring challenge

Transport facilities are subject to heavy footfall and tiled flooring offers an aesthetically appealing and hard-wearing solution in this environment. But even the most resilient surfaces are vulnerable to damage after installation. Judith Mawtus, general manager at Dural UK, offers expert advice on preventing cracks from appearing on a client's flawless floor

Consider the stresses a building is under during its life cycle, expanding and contracting in all directions. Imagine if the floors were sheets of glass, any slight movement and they would crack, break up or shatter.

A subfloor construction within a typical commercial building is commonly laid in sand and cement rafts in bays of approximately 6m by 6m. Each raft will take on average a full mm of depth per day to dry out and as they do they shrink in size. This natural drying time can be a problem if the project completion date is time critical.



All hard flooring moves independently by expanding and contracting at different rates so it is a requirement for flooring installations to have movement protection.

A time-saving solution is to lay decoupling matting directly over the subfloor. It can be put in place as soon as the subfloor is dry enough for a person to walk over it. Air channels in the matting allow the subfloor rafts to continue to dry out in a controlled way by preventing the top layer of the screed drying quicker than the bottom. This slow drying period leads to a stronger subfloor. The edges of the subfloor will curl upwards if the top dries quicker leaving an uneven surface.

Decoupling matting prevents the subfloor shrinkage and cracking from being passed into the newly laid surface tiles.

Tiling directly onto the rafts that are not chemically dry and without matting will almost certainly cause random 'lightening flash' cracks in the surface tiles and they could potentially 'tent' or pop off the subfloor.

All subfloor rafts will move independently over time as buildings expand and contract horizontally and vertically due to ambient air temperature and below-ground water table fluctuations.

If surface tiles are laid directly onto each subfloor raft and they bridge the gap between each raft a perfectly straight hairline crack would appear the first time any vertical movement occurred in the subfloor. The hairline crack would nearly always follow the line of the subfloor movement zone void on the surface tile.

## Movement joints

To isolate this problem a movement absorber is needed in the surface tile directly over the subfloor movement void between each raft. This comes in the form of a Movement Joint (MJ). Bedded into the adhesive under the tiles the movement zone of the joints allows movement to occur in all directions and isolates stress in the tiles from one raft to its neighbour.

Movement Joints and decoupling matting are specified on all types of transport projects and other projects where there are large expanses of hard flooring, projects such as retail, commercial and large domestic dwellings.

Decoupling matting and movement joints are both designed to cope with heavy stresses and distribute them evenly between the subfloor and floor covering, they can also prevent conduction of noise from footfall and other bodies. Even floors subject to heavy stresses remain in better condition for longer when movement joints and decoupling membranes are specified.

Movement Joints are available in PVC, aluminium, stainless steel and brass. Unless cost is an overriding issue PVC profiles are not used. They're a short-term solution and lack the durability needed for tiled flooring. Aluminium-based profiles will adequately protect the majority of projects. Stainless steel profiles provide the greatest strength and



*Continued overleaf..*

***'For a seamless designer look movement joints can be specified in any of the RAL colour scheme range'***

Judith Mawtus,  
general manager, Dural UK



*'It's advisable to use movement joints designed to exceed BS5385'*



are the least visible due to the design of the profile, these are ideal for Transport projects.

It's advisable to use movement joints designed to exceed BS5385. For a seamless designer look they can be specified in any of the RAL colour scheme range and if a tile sample is sent to the MJ manufacturer, an exact colour match is achievable even if the tile has a speckled effect. This upholds the beauty of a seamless tiled flooring scheme.

### Aesthetics and design

Clients generally don't like movement joints because it's felt they can be obtrusive and spoil the aesthetic appearance of their carefully chosen floor. An added complication is that they have

to be positioned directly above the sub-floor void between each raft. If the position of the subfloor MJ has not been considered at an early design stage then it could end up running through the middle of the floor like a scar and rather ugly if the floor finish has a intricate surface pattern.

In some instances however designers take advantage of the position of the subfloor MJ such as at Barnsley Bus Station. The MJ on the surface followed the grid pattern in the subfloor which created an affective geometric design so in this instance there was no need to try to hide them using coloured MJs.

By incorporating decoupling matting and movement joints into early design concepts, architects and contractors can be confident their clients will have seamless tiled flooring that will remain permanently crack-free.



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# Paving the way for a better passenger experience

Sally Binns, Marshalls' rail expert, takes us on a journey to find out how good design and carefully selected materials can enhance the passenger experience from the station interface to the platform

**A**round 6.5 million passengers travel on Britain's rail and underground network every day and this figure is forecast to increase dramatically over the next decade.

As a result, record expenditure has been planned by the Department for Transport, Network Rail, and Transport for London for the coming years.

The UK rail industry aims to address overcrowding and congestion through a package of improvements focused on enhancements of the full passenger experience, from the point of arrival, through to the station concourses and right up to the platform edge.

It is focused on increasing capacity, improving safety, access, sustainability and customer service within station environments.

## Setting the railway in the landscape

Well designed and managed station buildings and the accessibility of these within the wider landscape is essential to encourage passengers to travel and communities to flourish, creating a sense of belonging, as well as promoting social cohesion and interaction.

Travelling should be as stress-free an experience as possible. Commuters want to minimise travel time and avoid delays, those less mobile need to be reassured that adequate facilities are available within the station complex to cater for their needs and comfort.

The quality of the travelling experience is directly related to the quality of the design of the facilities – providing information guidance and comfort. That means specifiers and architects need to work with paving product suppliers whose expertise is rooted in a deep understanding of travellers' needs based on many years of working with rail industry partners. Good companies will be investing in product design and development, supported by an in-depth knowledge of hard landscaping and street furniture.

Inevitably, rail environment benefits from paving products that promote the seamless integration of the entire building and surrounding public realm from car parking areas, cycle parking, bus or coach arrival, walkways, subways or elevated routes, the station concourse, right through to the platform edge.

The ambience within the station environment can be significantly improved through colour, material finishes and lighting. For example, paving that can be selected to look the



*'Moving out onto the platform... durability and slip and skid resistance is a major concern'*

Sally Binns,  
Marshalls' rail expert



same colour and texture – whether inside the station or in the parking area creating a seamless transition from the exterior to the interior and vice versa. Wayfinding and information points can be accentuated through the use of lighting so passengers can navigate their way around safely and quickly. The use of street furniture, in a wide range of finishes, styles and fixtures can also enhance station architecture encouraging travellers to sit, relax and enjoy the surroundings whilst waiting for their train.

## Meeting public needs

The development and manufacture of products is paramount in meeting the public's needs and that means getting the details right. A product range should provide and maximise comfort, ease of use and ability to maintain without complicated parameters.

Appropriate paving is an important consideration in all areas of the station– from the entrance, to the internal areas and out onto the platform edge.

*Continued overleaf...*

*‘Consideration must be given to the removal of surface water, for which permeable paving is an ideal option’*

The approach to the entrance of a station generally experiences high-traffic and must be able to cope with large volumes of heavy vehicles. Consideration must be given to the removal of surface water, for which permeable paving is an ideal option as it does not direct water to already overburdened sewers.

Associated products such as kerbs and edgings can be used for the delineation of pedestrianised areas, taxi ranks and bus stops. Pavements must be durable enough to cope with high footfall and must also have a high slip and skid resistance.

As you move into the interior of the station, any paving, whether it is concrete or natural stone, should have a high slip and skid resistance and must be easy to clean and maintain. It must also offer a high level of durability to cope with extreme footfall and to reduce the need for repair and replacement. It’s

also important to remember that paving must also comply with statutory requirements for the disabled.

Moving out onto the platform, once again the durability and slip and skid resistance is a major concern. At the platform edge tactile surfaces must be used to assist the visually impaired. Here surface water must also be removed efficiently and safely with the use of linear drainage.

Lighting should meet the luminance design criteria and enhance the architecture and character of the station – including its flooring and paving.

Selecting the appropriate product and materials for people to walk on is as essential as any other design feature when creating a practical, aesthetically pleasing and economically viable space that fully enhances the passenger experience.



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# Planes, trains, automobiles... and street furniture

With tight budget restrictions and a multitude of requirements to fulfil, transport sector architects and specifiers are faced with a difficult task when choosing the right street furniture. Nigel Kightley, sales director at CIS Street Furniture, spotlights three products vital for any successful transport project

**S**ecurity, safety, quality and refinement are just a few the many aspects architects and specifiers need to consider when planning any urban project.

When applied to transport-specific schemes, balancing these demands becomes an increasingly tricky process. Planners must consider terrorism threats and public safety whilst ensuring the street furniture they're specifying has manufacturing quality and remains aesthetically pleasing.

All these must be balanced against budget restraints, leaving architects and specifiers needing versatile products that fit all the necessary criteria without breaking the bank.

## Blast containment in a bin

When considering any transport related project, the question of security becomes a primary concern. With heavy footfall and passenger volumes, the transport sector has been a historical target for terrorism which means that security should filter through to every stage of the planning process, including street furniture.

Bomb-resistant litter bins should be a key consideration in any transport project. Providing waste disposal for passengers and travellers is a basic amenity. Unfortunately bins have also provided opportunities for terrorist bombing activities which

have resulted in litter bin volume being either scaled back or completely removed – at great cost to passenger convenience.

Bomb-resistant litter bins solve the problem of amenity versus safety. Government Departments are increasingly turning to bomb-resistant bins in airports, bus terminals and train stations. Bins are designed to withstand plastic explosives projecting any blast upwards and away from the public. Of course this extra security doesn't impact on the functionality or usability of the bins, which provide a vital facility in terms of the immediate built environment.

## The right bollards

All bollards are created equal – but some are more equal than others. Faced with a vast choice of street furniture, it can often be tempting to look for the most cost-effective solution – but this doesn't always translate after final installation. Specifying the wrong product purely based on price or preference can have serious cost effects further down the line.

Architects and specifiers need to ensure contractors are installing the right bollard for the right situation.

Bollards are a common feature in airports, train stations and bus interchanges, and are often bought in large quantities. Whether they be passive (flexible bollards) or secure (anti-ram raid bollards) it can be tempting to install a lower specification bollard to keep project costs down, but this is often a short-sighted approach. In a transport environment vehicular traffic is often concentrated and heavy, placing increased importance on the type of bollard installed.

An incorrect bollard design can lead to repeat damage at the very least – or endanger the pedestrians they're tasked to protect at the very worst. However when installed effectively, bollards offer solid protection and access control as well as providing pleasing aesthetics to match any scheme.

## Security planters – another street furniture solution

When bollards are either unsuitable or cease to be cost-effective there is a new breed of street furniture offering an alternative. Progressively, the presence of security planters is increasing in airports and stations across the UK. Security planters can be made from a wide variety of materials including cast iron,

*Continued overleaf...*

*'Security, safety, quality and refinement are just a few the many aspects architects and specifiers need to consider when planning any urban project'*

Nigel Kightley, sales director,  
CIS Street Furniture





*‘Signage such as finger posts and hanging baskets can also be incorporated into the planter structure’*



Security planters make an attractive alternative to unsightly concrete blocks

stainless steel, and concrete among others. Their considerable weight and size makes them an ideal security solution. Large planters can weigh up to four tonnes each – yet they offer a demonstrably more pleasing aesthetic security solution compared to an unsightly concrete block?

Planters can be filled with half concrete, half soil or other materials to provide a base for flowers, shrubs and trees – which can complement any visual design scheme. Signage such as finger posts and hanging baskets can also be incorporated into the planter structure to produce elegant dual-purpose street furniture. Planters can be designed to enhance existing street furniture scenes by including logos and branding that may be specific to a project or visual aesthetic.

### End-to-end support

Most street furniture providers offer free consultation during the specification and design process. Architects and specifiers should use the free advice available to help make informed decisions about the products that best fit their particular project.

Any architect or specifier must be able to rely on firm support from specification through to post-installation.

Planners can expect experienced street furniture suppliers to provide full installation, refurbishment and maintenance services – removing the need for complicated management of subcontractors and multiple suppliers

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# Future-proofing transport infrastructure with steel

As passenger numbers grow, specifying the right materials to future-proof stations and airports has never been more important. Andrew Jackson, director at SAS International, looks at how steel solutions meet the required design flexibility and aesthetic demand while providing long-term value at a reasonable cost.

Airports, train, underground and bus stations are all part of large transport networks that are constantly in the process of development and change.

They're becoming increasingly sophisticated, incorporating shopping malls, restaurants, hotels and entertainment facilities are providing a more attractive environment. The steady growth in passenger numbers means the design of these types of buildings has become crucial. Often giving the first impression of a city, they represent some of the most creative and innovative architecture in the world.

The use of high-performance products to help ensure and improve the overall passenger experience also involves creating innovative and interesting interiors. Selecting the right materials not only helps create the final look to enhance architectural vision, but also ensures future generations will benefit from the facility. Balancing aesthetics with the performance qualities of materials is therefore high on the agenda – the design and integration of the fit-out needs to be visually appealing as well as durable, maintainable and flexible.

## Long-term value

Infrastructure projects require flexible design that anticipates change – transport hubs have to be prepared to cater for future passenger demand.

Materials specified for the interior fit-out of train stations and airports must be robust enough to handle the increased crowd pressure that's forecast in the coming years.

Building materials such as steel are increasingly being used in key transport projects, not only for their general durability, but for their ability to withstand challenging conditions. Particularly in high traffic areas, materials undergo significant stresses.

Alternative materials struggle under conditions that require high performance characteristics, both in terms of durability and aesthetics. Steel's properties suit a variety of product applications for which there is no energy and cost-effective substitutes. In transport environments steel is being used for applications such as cladding, wall panels and ceilings.

Striking use of metal cladding on Waterloo station's 220m-long retail balcony



© Philip Vile

*'Ceilings for the transportation sector tend to be vaulted or tubular to allow for areas to feel spacious'*

Andrew Jackson, director, SAS International



## Bespoke solutions

Transport hubs always have specific design requirements to take into consideration, with many of them requiring bespoke solutions. As security and service integration are important specification criteria, the use of metal ceilings allows for designs to be flexible but also tough enough to cope with the constant wear and tear. Being one of the most robust construction materials, metal isn't easily damaged and can be utilised for regular access to the building services.

Ceilings for the transportation sector tend to be vaulted or tubular to allow for areas to feel spacious while ensuring smoke extraction can take place. London Cannon Street station, for example, was fitted out with a tubular system to be able to handle fire and smoke within the station while also

*Continued overleaf...*

**'Steel is a versatile material and can be installed into a multitude of structures'**

providing an aesthetically pleasing backdrop. The system was specified throughout the public concourse, stretching onto the beginning of the platforms, offering a robust solution for the demanding environment.

Public concourse areas are semi-external spaces where ceilings are exposed to an accumulation of dust and high levels of humidity, therefore, the chosen ceiling had to be a low-maintenance system that retained its appearance over time.

Transport hubs are high-traffic zones, demanding exceedingly durable, attractive, easy to maintain, and impact-resistant surfaces such as protective panels and wall cladding.

### Aesthetics of metal

Milton Keynes Central Railway Station underwent a refurbishment to handle a projected 30 per cent traffic increase over the next 10 years, and features high-impact metal clad columns in the main ticket hall. The attractive metal columns rise up to the ceiling and provide support for the structure, while also breaking up the open spaces and forming a walkway.

An outstanding example for marrying design with performance is the Terminal 4 departure lounge at Heathrow Airport (pictured right). The installed acoustic baffles provide a wave effect to the soffit, and were designed with a secret, fix-formed capping at the bottom edge of the panels for aesthetic

purposes. To enhance the wave effect, LED lighting strips were installed on brackets supported by the baffles. The LEDs are all independently controlled to provide colour and movement and can be varied throughout the day to control the ambience in the terminal.

Steel is a versatile material and can be installed into a multitude of structures. Transport hubs not only have to be designed to make the passenger's journey as comfortable as possible, but to provide a retail experience while waiting for trains and aeroplanes.

Waterloo station, the UK's busiest train station, exploited metal's modern aesthetic for its recently installed, 220m-long retail balcony. Accommodating a variety of shops and restaurants at mezzanine level, the balcony is visually striking, in no small part due to the choice of material.



Image courtesy of SAS International

## Rubb team flies in to support Apple Aviation



A Rubb aviation hangar has assumed a prominent position at Aerohub, the UK's only aerospace focused Enterprise Zone, based in Newquay, Cornwall. The project will provide a large, bespoke space for Apple Aviation Group's (AAG) increased Maintenance, Repair and Overhaul (MRO) operations. Apple Aviation selected

Aerohub @ Newquay Cornwall Airport as the location for its aerospace maintenance facility headquarters. Fabric architecture specialists Rubb Buildings Ltd custom designed the facility. The Rubb construction team erected the main steel framework for the hangar. They then fixed Thermohall insulated PVC cladding to the structure to create its roof and walls.

## Benchmark help passengers rest in style



The £4.5 million Edinburgh Park Station facility was delivered via a partnership between City of Edinburgh Council and new Edinburgh Limited, working with ScotRail, Network Rail and the Strategic Rail Authority. The new Edinburgh Park station will provide a valuable amenity for those working in and around

Edinburgh Business Park. Due to the large footfall at this station a robust yet modern bench design was required. **Benchmark Design's** Centreline range was the obvious choice, and due to its manufacturing process allowed the architects to precisely design the furniture for this difficult space. The CL003 back to back seat, CL003 rail seat and CL005s rail bench were installed.

## Blast protecting litter bins



**Energetics Technology Ltd** design and manufacture blast protecting litter bins. These functional litter bins provide protection of the public against an explosive device placed in the bin. Typical applications are in public spaces, plazas, shopping malls, commercial districts, arenas, airports, academic institutions,

railway stations and transport hubs. The bins are supplied in two sizes and are finished in either a stainless steel outer casing or a plain steel sheath in any standard RAL colour. Utilizing specialist SabreMat blast protecting composite materials, the bins are tested to UK Home Office requirements.

## Levato Mono at Bristol Airport



Levato Mono porcelain paver system from **The Deck Tile Co** has been installed on the new roof terrace at Bristol Airport East Terminal extension. Circa 400m<sup>2</sup> of the system was specified in order to conquer a number of challenges; covering EPDM membrane laid with multiple falls; to hide services and drainage gulleys

but still have accessibility for future maintenance; cutting around the numerous stainless steel posts and glazed partition with accuracy for the shroud detail. The finish the architect specified was Teknotimber Dark oak – offering the client an attractive, flexible and well designed raised flooring solution and with incredible technical properties. Self-levelling head/height adjustable pedestals were used on this project to facilitate a speedy installation.





Anti-graffiti film is optically clear

## The magic of film

Continuing advances in window film technology mean that a range of difficult glazing challenges in the transport sector can be met effectively and cost-efficiently. Micky Calcott, managing director of specialists, The Window Film Company, reveals how

**T**he world of transport utilises glass in an ever-increasing variety of ways – its aesthetic and architectural benefits make it popular from a functional and design point of view.

Despite its widespread use, glass brings with it potential problems and difficulties and window film can help with some of these issues.

The good news is that window film can be retrofitted, making it an ideal solution for new or unforeseen issues, removing the need for expensive and time-consuming glass replacement projects.

Installation can usually be undertaken without shutting down operations, allowing for a seamless integration into the make-up of the building, delivering virtually immediate solutions, improvements and benefits

### Solar control and energy efficiency

The view. It's one of the main reasons for using glass and incorporating windows. Everyone likes to be able to see their surroundings, but where there's a view, there can also be heat.

Left unchecked, the sun's energy streams through glazing, slowly raising the internal temperature. The effect can be twofold. Firstly, it can make the property uncomfortable for those working within or visiting the building. Secondly, it adds to the reliance on expensive, energy-hungry cooling systems.

An application of window film will provide relief in both

instances. Solar control film works by reflecting or absorbing a percentage of the sun's solar energy, preventing heat from passing through the glass and raising the internal temperature.

The most effective solar control films are reflective in appearance, but are available in a range of grades and finishes to ensure the necessary level of performance as well as an appropriate aesthetic finish.

In addition to ensuring a comfortable internal environment, cutting down on excess heat can reduce rising energy costs. By using specialist software, window film companies are able to carry out energy efficiency surveys, the results of which provide an accurate ROI for a window film installation.

Solar control window films also offer other benefits including glare reduction and ultraviolet (UV) protection – helping to reduce potential eye strain as well as providing a barrier to the unwelcome side effects of UV such as skin damage and fading.

### Protection from vandalism

Graffiti continues to be one of the most common forms of vandalism and can take many forms; spray paint, magic markers and etching or scouring are widely used to mark and disfigure glass. Removing graffiti from untreated glass is notoriously difficult, with etching virtually impossible to repair. Anti-graffiti window film is the answer.

The specially manufactured coating on the film means that

*Continued overleaf...*

**'The view. It's one of the main reasons for using glass and incorporating windows'**

Micky Calcott, managing director, The Window Film Company



*'Digital wallpaper, printed vinyls and optically clear film all provide excellent options for delivering full colour graphics'*

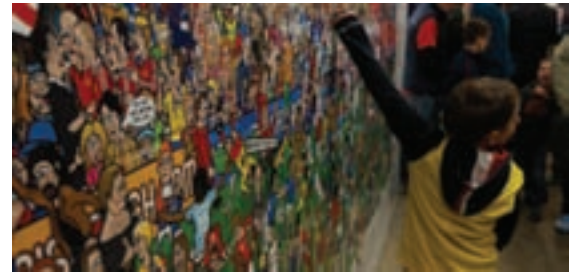
paint and other markings can be removed using domestic window cleaning products, allowing you to return your glass to its former state with the minimum of fuss. In the event of more serious defacing such as etching, the film provides a sacrificial barrier, protecting the glass from damage.

In these cases the film can be removed and replaced at a fraction of the cost of replacement glass. Anti-graffiti window film features a quick-release adhesive that allows the film to be removed quickly and cleanly, making the replacement process straightforward and quick as well as cost effective.

The window film is optically clear in appearance, meaning that once applied it is practically undetectable to the naked eye. This makes it suitable for use in locations that require a view from both sides of glazing. In addition to being highly effective when applied to glass, the film can also be used on a range of other surfaces including marble, stainless steel and mirrors, protecting valuable material from potentially irreversible damage.

### Printed Graphics

The nature of window film means many products provide an ideal surface to print on. In turn, this opens up an almost limitless range of opportunities for adding bespoke designs to glass and glazing, with wide format print technology delivering high quality graphics at virtually any size. The combination of materials and print means that entire buildings can be transformed to feature branding, information and



other design elements.

Digital wallpaper, printed vinyls and optically clear film all provide excellent options for delivering full colour graphics, while specialist technology such as the Contra Vision print method allow for the delivery of see-through graphics – maintaining the view from one side of the glass whilst delivering a full colour graphic on the other. The benefits of such a technique are clear, with applications to vehicles and buildings a common application.

In summary, if there is an issue caused by glass, the chances are it can be solved with window film. The possibilities don't end with the traditional perception of the product though, with cost effective creative opportunities being seized upon by an increasing number of savvy customers.

If there's glass involved in your next project, it's time to consider window film.

## Sky's the limit for security doors



Security Doors, a division of ASSA ABLOY UK, has successfully completed a £5 million design, supply and installation of Powershield steel doors to the new Terminal 2A at Heathrow Airport. To help provide the highest level of security for the project, ASSA ABLOY Security Doors supplied

Powershield fire and personnel doorsets, all of which have special polyester powder coat finishes and full height wrap-around stainless steel push and kick plates for added durability and a high-end finish. Barry Weekes, head of Design Development, at Heathrow, said: "The superior strength, durability and security of all the steel doors supplied to this project, combined with their relatively low maintenance requirements makes them the ideal choice."

## Comar in design vision at Southend Airport



Comar Architectural Aluminium Systems; with its approved fabricator Anglia Fixing Ltd completed works on the first phase of London's newest airport terminal at Southend Airport. The design vision was to create a continuous glazed facade to the new terminal clearly identifying its location to passengers.

Comar 6EFT 4-sided SG was selected as it offers architects a flexible system, providing a structurally glazed solution, with options for facets, concealed vents and an extensive range of profiles that cater for large structurally glazed panes. Comar 6EFT 4-sided SG also offered the slimmest silicon or EPDM joints in the industry, which means the eye catching glazed area is maximised.

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## Bison receives seven-figure precast concrete order for Southampton vehicle terminal extension



Bison Manufacturing has secured a substantial order for its market leading precast concrete units to be used in the extension of one of the Port of Southampton's vehicle handling terminals. Bison's appointment by main contractor Morgan Sindall to supply 56,000m<sup>2</sup> of its 150mm deep Hollowcore units comes two years after the manufacturer was initially brought on board to provide materials for use in the facility's construction. Selected due to Bison's proven ability to provide high quality units to tight tolerances and with mechanically inserted lifting hooks, the slabs will be delivered to the site from summer until December 2015. Meeting European Standard EN 206-1:2000 exposure class XS1, the units are certified as suitable for use in areas where they will be exposed to airborne salt, making them ideal for installation in coastal areas. Paul Finch, Morgan Sindall contracts manager, said: "Having worked with Bison during the terminal's initial construction, we were aware of the company's ability to manufacture and deliver high quality units in line with construction time frames. In using Bison units for the extension works we're confident that the same advantages will also be provided for this project." Mike Nelson, sales and commercial manager at Bison added: "We are proud to have been appointed to this large scale extension project."

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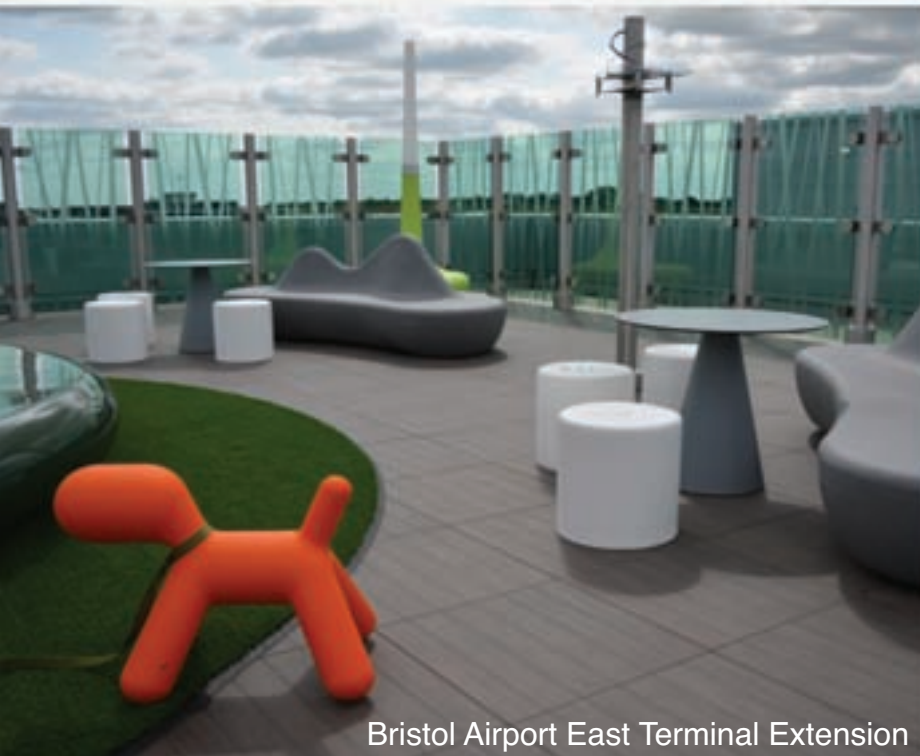
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## LEVATO MONO porcelain paver system

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Bristol Airport East Terminal Extension

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