RIBA J

PIP

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Barely February ...

... and there's been a triumvirate of construction stories. First was the government's pandering to the UK's flawed fascination with the garden city, proposing 14 new ones with the 'potential to deliver more than 48,000 new homes'. But at only £0.4 million per project, quite how much will get 'delivered' is questionable; if the Garden Bridge outlay is anything to go by, not much. So it looks like actual delivery may be left to volume housebuilders prodding cash-strapped planning authorities – and ending up with neither 'garden' nor 'city'.

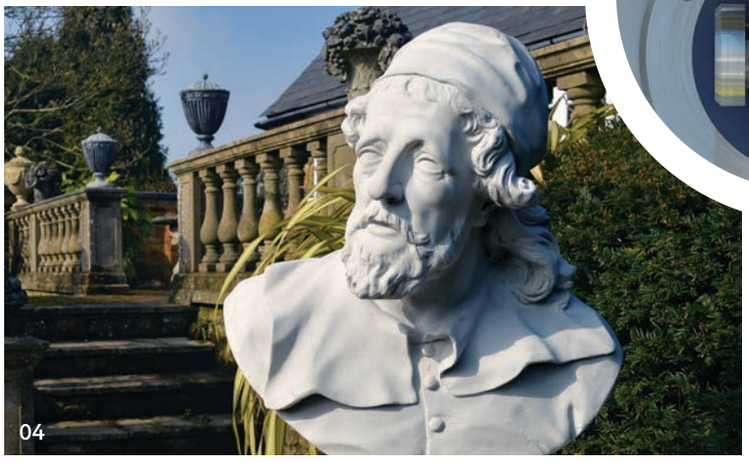
There's more hope on the horizon with the recent Hendry report, which recommended the government invest in tidal lagoons as a low carbon means of contributing to the UK's energy mix. It proposes a small pathfinder scheme that will help formulate best practice (and see effects on local biodiversity) before rolling out on a bigger scale in places like Swansea Bay – but not a penny is committed to this as yet.

And finally, there was Northern Ireland's highly incentivising Renewable Heat Incentive for non-domestic users, promising a £1.60 return on every £1 spent on green heating – which understandably saw a very enthusiastic take up. But the 'more you burn the more you earn' debacle, which could cost the UK taxpayer up to £400 million, has a much higher price; the resignation of deputy first minister Martin McGuinness which triggered an election next month.

Add to this climate change sceptic Scott Pruitt running the Environmental Protection Agency for Trump: let's all hope the year sees a Phoenix rise from these piles of ashes. ●

Jan-Carlos Kucharek, Editor

TAKUMI OTA



EMRE DORTER

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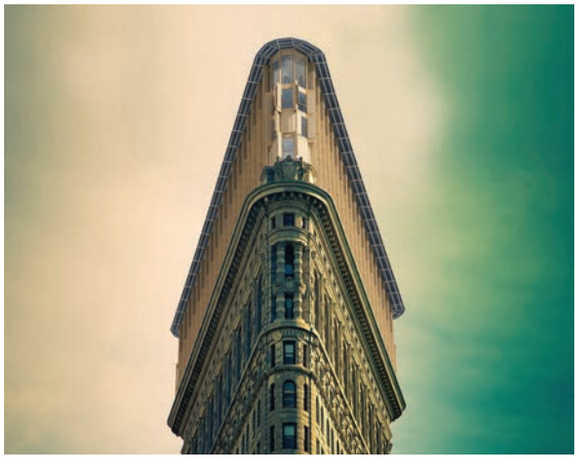
Cover image: Place Rogier photographed by Matthias Van Rossen

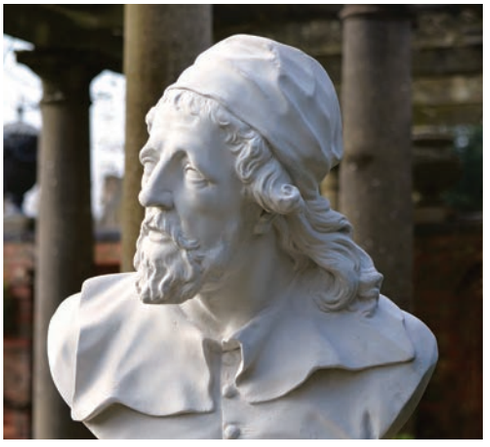
Compendium

UPCOMING
Surface Design Show, Business Design Centre, London, 7-9 February
Eco Showcase, Old Trafford Stadium, Manchester, 14 February
UK Concrete Show, Hall 5, NEC, Birmingham, 15-16 February

Chip off the old block
It's like the adolescent kid of the mild-mannered parents. Literally in this case. Lutyens furniture and lighting has been recreating the designs of Sir Edwin Lutyens since 1987 but 2016 saw the great man's granddaughter, designer Candia Lutyens, take on the mantel with her Lutyens Contemporary range. Her aim is to bring a contemporary twist to the classic designs by using new materials and manufacturing techniques. The range includes chairs made from moulded ply, above, Perspex tables and bedside tables, lanterns and mirrors made from Valchromat, an engineered, self-coloured wood – which can additionally all be purchased pret-a-porter, online! Those with limited levels of lucre for Lutyens might be interested in their more affordable desk and table accessories, like condiment mills, clocks, lamps and candlesticks made from turned walnut and sycamore.



NYC house
Finnish engineered timber company MetsäWood recently announced the winners of its 'City above the City' competition, using laminated veneer lumber, which attracted proposals from architects from 40 countries hoping for a share of the €35,000 prize money. While the winner was a German/Korean duo in Finland, we most enjoyed the audacity of Giuseppe De Marinis Gallo and Gianluca Gnisci's 'Abovealla' proposal for a hat on the iconic Flatiron Building in New York with typical Italian braggadocio.



Superego or bust
Haddonstone, the firm more likely to rustle you up a quick classical portico in its cast stone, is carving a niche into the busts of classical antiquity – yours at a fraction of the cost of the originals. Of interest to architects will be the stone busts of Inigo Jones and Capability Brown – both coming in at under £400. Given the legendary size of architects' egos, PIP's wondering if acquiring 3D printing capabilities at the plant could see the firm's bust business blossom?

Auto Glass
Glenn Howells Architects' Gloucester Gateway motorway service station on the M5 continues to draw in plaudits as well as punters, winning the RIBA's 2016 Client of the Year Award. Trying to be as sustainable as a services can be, all that locally sourced produce is tucked behind Technal's MX curtain walling fitted by Elite Aluminum Systems. The high performance glass has neutral solar control to give clear sight throughout, but its two leaves of 10mm glass offer the kind of acoustic performance you need to repel the sound of gas guzzling cars.

NICK ROCHOWSKI PHOTOGRAPHY

Belly Up
If you were wondering what it's like to live out the plot to Hansel and Gretel, look no further than Andy Martin Architects' new Fucina restaurant in London, meaning 'Forge' in Italian. And the practice has gone hell for leather to push the point home by creating a sculptural and bulbous ceiling of brick slips – supposedly giving hungry punters the impression that they might well be an ingredient in the eatery's next Quattro Stagione. Oven allusions continue below table, where the legs are cut branches seemingly growing out of the floor.

Nouvel's luxury lux
If you're in Paris in February and in need of a sit down it might be worth popping along to the Musée des Arts Décoratifs, where an exhibition of Jean Nouvel's chairs and product design will be on its last legs. The architect has collaborated with Italian lighting designer Artemide on a number of designs such as his installation 'mes meubles d'architecte', right. Over 100 works are being displayed in the museum alongside objects in the permanent collection – revealed, they tell us, through the striking use of light and shadow. Nouvel has worked with the lighting company on the massive perforated dome that is the Abu Dhabi Louvre and the Château La Dominique winery. Given the architect's unorthodox approaches to these, one assumes the show will be quite an eye opener.

THOMAS LANNES

The tiles they are a'changin'
With UK plc apparently not really producing anything anymore and throwing its lot in with the services industry – (received a cold call about life assurance recently? Well serves you right) – it's encouraging that Domus Tiles in West Moseley is still prepared to cut your tiles down to size to create some stunning patterns that make you yearn for the good old days of a manufacturing base. The firm's Lithology porcelain stone collection, expertly water cut to create the likes of its lovely Art Deco pattern, are keeping otherwise idle hands busy and, in uncertain times, the wolf from the door.

I'm Loving It
Save for a serious night on the tiles with the commercial team, there's not much cause for PIP to bring up hamburger giant McDonalds in these pages; but if the subject turns from boozy tiles to some very worthy bricks, then we're all ears. Keppie Design's Ronald McDonald House in Glasgow provides shelter for the families of kids that are undergoing treatment at the adjacent Royal Hospital for Sick Children. The building is a series of simple, pale brick forms arranged around semi-enclosed, landscaped courtyards, creating spaces of genuine quiet and respite – even though part of it fronts onto the city's busy Govan Road. Wienerberger white Marziale brick was specified throughout on the blocks, complementing its white concrete porticos and counter pointing the dark aluminium window reveals and green roof. It's procured by charity Yorkhill Family House, and if this is the level of quality that's possible in national health architecture, can we Go Large with it please?

Moving drawings

Recently I've started questioning the level of detail required for complex buildings. A Melbourne residential tower I've been working on is now on site and one basement deep. The design process has been challenging, with apartment customisation continuing well into the contract. Our client offered purchasers 10 upgrade options, and for a fee, complete customisation of apartments. The resulting construction documentation contained 125 apartment variations and took on quite an organic nature.

Time and budget constraints meant that we couldn't model every option so we developed a series of rules that defined each condition. For instance, some kitchen and bathroom elements had fixed dimensions so when they went beyond a certain range, we created a new type. Ranges were based on tile and carcass modules and appliances. We couldn't in fact have delivered the project without this 'grouping' information.

The D&B contractor on the project offered our client significant cost savings through its own network. Included in its works was an extensive shop drawing and service co-ordination for all prefabricated items. Our tender drawings were used not for construction but for design intent, with mechanical, plumbing and fire services completely redrawn by the contractor's sub trades. In addition to the consultant's documentation, shop drawings were developed for basement piling, pool and spa, facade, lift interiors, interior elements and joinery.

The level of contractor service provision was comprehensive, relieving the architect of intense documentation. Substitutions and innovations were compared to design intent drawings, and responsibility for changes that deviated from it was with the contractor. However the only mechanism for quality control and further design iteration was through lengthy shop drawing review (the facade and bespoke joinery packages still need more iterations to resemble the design intent). The D&B process is evolving, with a significant shift away from architects and engineers as documentation creators.

In contrast, consultant roles on smaller projects appear unchanged, where architectural drawings are still used for construction. Here, I've worked with sub-contractors and fabricators in a direct and positive way to produce less redundant information. Could this not simply translate to a larger scale? Yes, there are efficiencies with sub-contractors documenting and building a product with which they are familiar, but the benefits of the design team's wider project knowledge and momentum surely outweigh this.

Instead, the D&B option should begin with a development phase long enough for the design team to capture project intent without being too prescriptive. If the team was then given the opportunity to work directly with the contractor's sub-trades, there would be no need for a shop drawing process at all. Alternatively the contractor could redirect certain documentation packages to their sub trades earlier on, to avoid producing redundant and conflicting information- cutting overall costs and time! ●

Alan Maclean is an architect at Bates Smart Architects in Melbourne

Books

Buy at ribabookshops.com

Pevsner's Architectural Glossary, 2nd ed.
Nikolaus Pevsner. Yale University Press. 144p HB £12.99
If, in Tolkien-like form, there's many rings with 'one ring to bind them', the analogy with the Pevsner Guides would be the Architectural Glossary, which in effect acts as a key reference document for Pevsner's Guides to the buildings of England, Wales, Scotland and Ireland. Not that the individual guides don't provide you with a limited glossary at the end, but here the technical descriptions are indulged over 144 pages, making it a reference work in its own right and the perfect companion and supplement to the Pevsner Buildings series. In this second edition, illustrations by the late great John Sambrook remain and it brings together for the first time in one volume, the full and revised array of architectural terms from Pevsner's four nations series.

Biomorphic Structures: Architecture Inspired by Nature
Asterios Agkathidis. Laurence King. 160p PB £9.99
The latest in the Form + Technique series, whose author is a lecturer in digital design at Liverpool School of Architecture, the book posits itself as a practical, pocket-sized guide to biomorphism, exploring how natural forms and patterns inform both structural and aesthetic design. After learning the surprising fact that the term 'biomorphism' was first coined by Goethe, this short book gives the reader a potted history of the subject before focusing on 13 case studies, showing approaches and methods developed by academic institutions and architects. These come under three main headings: water, earth and geological formations, plants and branching systems, and animal structures and properties. Well illustrated, it's a good primer for those looking for inspiration but, given how fast technology is moving, light on the technical methodologies.

Future Campus: Design Quality in University Buildings
Ian Taylor ed. RIBA Publishing. 176p PB £40
With the support of the Higher Education Quality Design Forum, the editor, a partner at FCB Studios, has brought together 15 experts to give their comments and reflections on the sector. The central argument is that the quality of learning environments matters to both the staff and students using those spaces – a fact borne out by the number of universities that now use their buildings as marketing tools to sell the academic services in a competitive market. The book is split into four sections covering masterplanning, spaces, design and construction, and value and performance – and is copiously illustrated with up-to-date examples. The end of the book goes into more detail with four specific case studies, and there are good references and bibliography for those wishing to do extra homework.

Left The spiral ramp into the bath means wheelchair users can enjoy the relaxing, healing and regenerating powers of bathing.
Below Constructed of concrete, glass and timber, Suma Architects' design is as minimal as possible to highlight the unusual, intimate programme of the building.

Spiral ramp bath

What: Accessible bath
Where: Shizuoka Prefecture, Japan

Growing old would be a lot more appealing if there were more places like Suma Architects' Jikka house in Japan. Located in the Shizuoka Prefecture, two hours south-west of Tokyo, the Jikka house, a restaurant and guest house, was commissioned by two women in their 60s – one a social worker and the other a cook – who were looking to retire but still serve a local community and continue doing what they enjoy.

Like elsewhere, Japan's models for old age living mostly revolve around conventional large-scale residential homes and nursing homes where older people are put together 150-180 people at a time. But at Jikka, the pair came up with the idea of buying a plot of land in the mountains and building a place where they could either provide meals in the restaurant or deliver them to the many elderly people nearby. They also wanted to offer a guest house where people in need of dedicated respite care could stay with a partner for weeks at a time.

From outside, the house reflects the small individual rooms within, each forming its own conical roof among the trees and clad in Japanese cedar. Inside they are open in an interior that is completely barrier free and single level to cater for less mobile visitors.

And if 2016 was the year for the self-supporting spiral stone stair in PIP, 2017 should be the year for the accessible spiral ramp bath.

'The Japanese love to bath,' explains Issei Suma of Suma Architects, which was commissioned to design the building. 'A refillable bath was essential to the programme of the house, and it had to be accessible for a wheelchair.'

A critical part of the brief, the ramp is finished with a rough surface that makes it possible for people in wheelchairs to get in and out of the bath on their own, or even fill it up and take their electric wheelchairs in with them, he says. And although the idea for a ramp into a bath is fairly common in Japan, particularly in buildings used by elderly or wheelchair dependent people, where this one differs is in the way the ramp spirals down into it.

'I spent a lot of time studying ramps,' says Suma. 'In the end, the spiral was a practical solution. For the bath to reach a depth of 55cm, the ramp had to be 5m long. In such a small room and building, a spiral was the only way to make it fit.'

Surrounded by windows overlooking the trees, the final result is beautiful and calm, a special little place for these two women to care for others and eventually live out their days. ●

HOW IT WAS BUILT

The accessible spiral ramp bath was built into the concrete foundations of the building by excavating a square hole in the plan. This was then waterproofed and a spiral shape built up using blockwork inside. Styrofoam was added for insulation, as well as another layer of waterproofing before the entire form was skimmed in 30mm of concrete, finished with a rough surface on the ramp and smooth on the bath's bottom. Finally the surface was impregnated with an invisible sealant to make it watertight.

Technical details
Depth: 55cm
Widest point: 3m
Length of ramp: 5m
Width of ramp: 85cm
Capacity: 1000L
Material: Concrete

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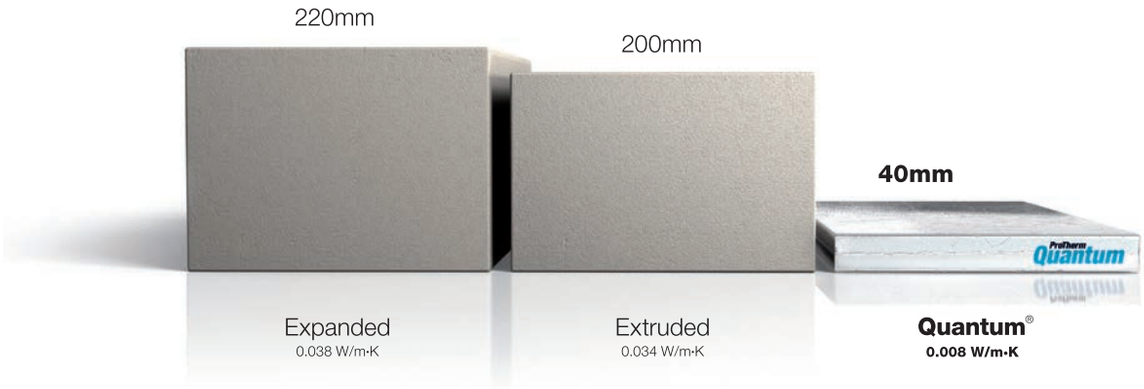

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CROSBY ROW

Guy's and St Thomas' Cancer Centre, London

Balconies, louvres and portholes on RSHP's colourful 'inside out' facade make a homely and human Cancer Centre at Guy's

Words: Stephen Cousins

MORLEY VON STERNBERG/RSHP

Left How the facade reveals its layers to bring intelligibility to the street.

Credits
Client: Laing O'Rourke with Guys & St Thomas NHS Foundation Trust
Architect: Rogers Stirk Harbour + Partners
Co-Architect: Stantec
Landscape Design: Gillespies
Structural Engineer: Arup
Art Commissions and Cultural Strategy: Futurecity

The £160 million Cancer Centre at Guy's and St Thomas' embodies two important, but seemingly conflicting motivations. On the one hand, the client, Guy's and St Thomas' NHS Foundation Trust asked for 'a hospital that doesn't feel like a hospital', a non-institutional building with a home-like environment and a human scale.

On the other, the tight programme and restricted site close to London Bridge Station, dictated a heavy reliance on offsite prefabrication, normally associated with uniformity, repetition and a limited palette of materials.

The solution devised by the design and build team, led by Rogers, Stirk Harbour + Partners (RSHP) and main contractor Laing O'Rourke, was to develop a varied offsite system comprising a range of materials, geometries and structural treatments designed to inject variety and warmth into the architecture. Over 60% of the building was constructed in a factory.

The system includes a hybrid unitised curtain wall with an exterior aluminium frame, brightly coloured panels and horizontal louvres, and an internal glulam frame designed to make patient bedrooms and consulting spaces more welcoming. Main facades feature two vertical exposed concrete shear walls with punched circular window holes, produced by Laing O'Rourke at its Explore factory in Derbyshire, as part of the wider precast strategy for the scheme. Meanwhile, bulging red and blue ductwork on modular panels snakes across the rear elevation in a playful nod to the external services on the Pompidou Centre in Paris.

Steve Martin, associate partner and project architect at RSHP says: 'At Guy's we have really pushed the limits of prefabrication. The range of facade concrete, unitised elements, projecting balconies and external ductwork mean it doesn't resemble your ordinary offsite system and avoids all notions of institutionalisation and "patient processing".'

The 14-storey tower stands on the triangular corner of the Guy's hospital site and brings together facilities previously provided in eight different buildings on two sites.

It is divided into four stacked care 'villages', for welcome, radiotherapy, outpatients and chemotherapy, each with its own ground floor reception area and arranged to break down the scale of the building and simplify orientation.

Organisation of the internal functions is also split, in plan, between the more clinical and technological treatment areas, at the north end of the site, and the more social parts at the south. The top four floors are an entirely separate unit leased to a private healthcare provider to help finance the scheme.

Contextually, the Cancer Centre stands at the centre of a trajectory of decreasing architectural scale, ranging from the 300m height of the Shard and Guy's tower to the north, to

The inclusion of balconies every two or three storeys introduces granularity and breaks down overall scale

David Salisbury

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lower rise buildings to the south.

Martin comments: 'The detail of the facade doesn't really relate to nearby buildings, instead we tried to relate to the context using scale and massing. The first balcony level corresponds roughly to the top of buildings across the street. The inclusion of balconies every two or three storeys introduces granularity and breaks down the overall scale.'

The focus on prefabrication was largely a response to the tightness of the site, on the corner of Great Maze Pond and Snowsfields, which the building almost entirely fills, leaving little space for materials storage or on site assembly. Building in a factory helped reduce the construction programme, and improve quality and safety. However, it also required detailed upfront design coordination, between architecture, structure and M&E.

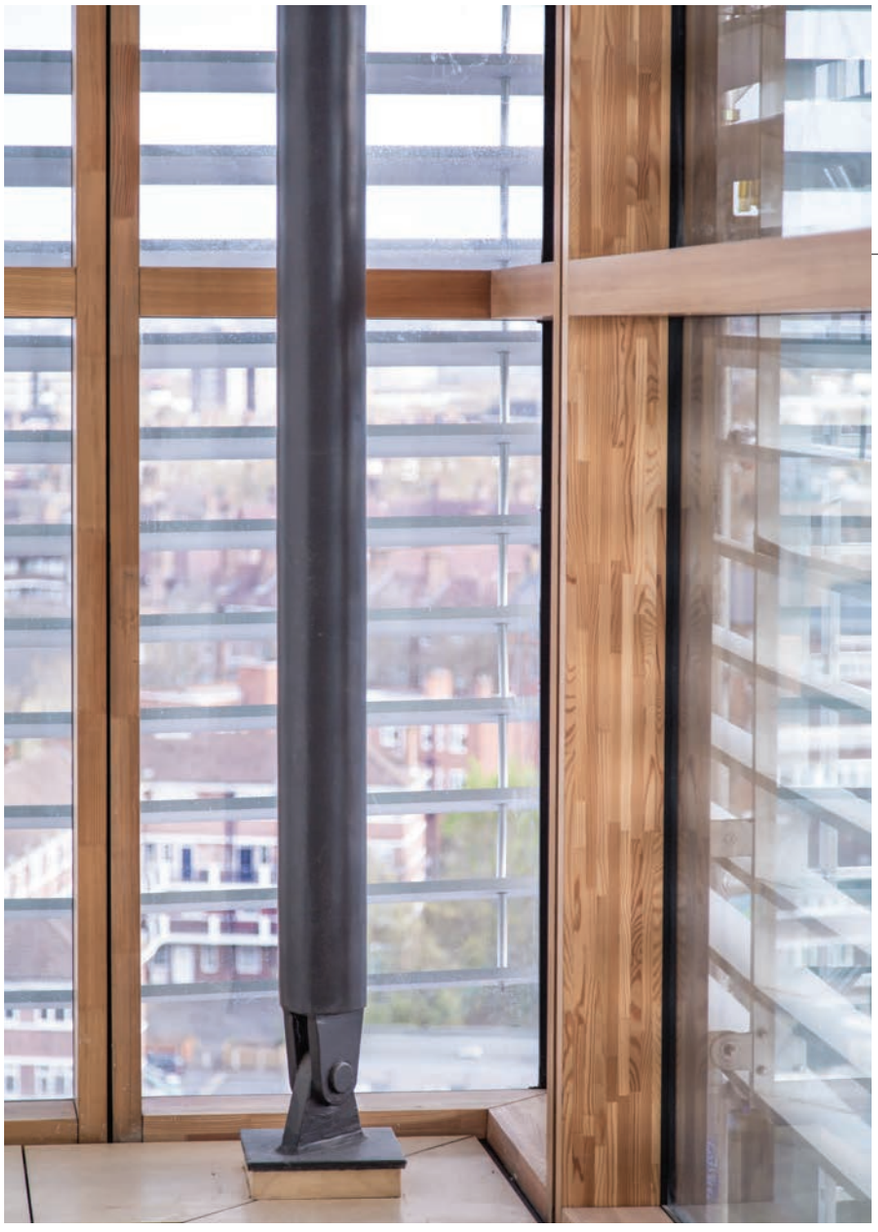
Leonardo Pelleriti, former associate and facade specialist at RSHP, says: 'This was one of our first full-blown building information modelling projects, with clash detection and a federated model, used by the various contractors involved to cut their teeth in BIM. Everything had to be just right when it arrived on site.'

Laing O'Rourke transitioned over 3,000 insitu elements of the original design for the concrete frame into the factory, including 80 per cent of the blockwork walls used for the basement. Its Design for Manufacture and Assembly (DfMA) approach was used to develop the exposed concrete shear walls on the south and west elevations, each of which comprise five precast 'sandwich panels' formed of a 90mm outer layer of architectural concrete, roughly 200mm of insulation, and an inner layer of structural concrete.

Richard Rogers was first to pioneer the idea of turning construction inside-out and exposing the skeleton infrastructure on the outside. At Guy's, pressure to maximise floor-to-floor heights and limit the verticality of the building informed the decision to run ventilation ducts across the windowless north facade.

The red and blue ducts are fixed to 8.9m-wide prefab panels and vary in diameter from 450mm to 1,100mm. Walkways are attached to panels for access and maintenance and as support. The building's internal space was further maximised by constructing a 100% modularised 12-storey steel plant tower at the

Above The welcoming forum at ground level presages more private access above.
Below Birch ply and red steel furniture form part of the palette of materials for the Care Village atrium.



MARK GORTON (2)

Above Finely milled larch glulam transoms and mullions bring texture and warmth to upper clinical areas.

Right Shear concrete panel with punched circular window holes. Factory production was used for 60% of the Cancer Centre.

north east corner of the building. The tower was constructed in under eight weeks and incorporates five, 4.2m-high sections, each with an air handling unit to service the corresponding floor.

Excluding concrete elements, the entire facade package was delivered by Structal UK, including the unitised curtain walls, external services and balcony sections. The contractor was one of the few able to fabricate the hybrid glulam timber/aluminium panels on the southern elevations – 840 in total – considered crucial to creating a comforting place for staff, patients and their families.

Pelleriti comments: 'The larch glulam is more homely than aluminium. It compliments a series of birch ply and bamboo staircases in the care village atria. Structal UK was very good at responding to our aspirations, it was involved from the start of detailed design and throughout construction developing prototypes.'

Double glazed hybrid panels include coloured sections that correspond to the level of the care village behind. Inward-opening, full height, timber ventilation doors, set behind external louvres in the units, form part of a natural ventilation strategy for the southern portion of the building. The louvres work in combination with the projecting balconies and a steel canopy, at roof level, to increase solar shading.

The prefabricated balconies provide outside space and fresh air for patients and staff, but posed a technical challenge for the designers. The large steel modules had to be hoisted and installed over the top of the completed curtain wall without endangering operatives or pedestrians on the street below.

'It was hugely complicated,' says Martin. 'We carried out detailed analysis with Laing O'Rourke and the cladding and steelwork subcontractors to work out the assembly sequence and how to hoist the units securely fasten them to the frame.'

Where the PFI model has often resulted in delays and inflated costs on NHS hospital projects, here the benefit of early contractor involvement gave reassurance of buildability and helped reinforce the prefabrication strategy. As a result the Cancer Centre was delivered on time and to budget, potentially signalling a new direction for UK healthcare design able to meet the needs of patients and project stakeholders. ●

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1
Conservation range
Mumford and Wood

Nice bit of splintering never did me any harm. The gentle bubbling of rain through perished putty is the music of my childhood. Kitemarked glass? Paff and piffle. Where are the ripples in that? And SBD security accreditation? A modern aberration! This engineered moisture-controlled Siberian larch lark is all very well, but give me an annual bucket of runny linseed paint over three pre-applied microporous spray-coats any day. Conservation range? Looks *and* performance? Mumford and Wood indeed! What does it think it's doing?
mumfordwood.com

2
Steel balustrades & doors
Balconette

A scene cut from the cult sci-fi Disney film, Tron, features a neon youth theatre performing Bugsy Malone in an outdoor community space involving a lot of bright blue jeggings. This stage set is all that remains of the lost movie roll, sometimes happened upon by startled visitors to Eclipse at Slinford in West Sussex. It features concave patio doors, including a six panel door on the upper-ground floor, all fitted alongside over 26m of curved balustrades, adding an architectural swing to Tron's otherwise orthogonal dance moves.
balconette.co.uk

3
Residential door
Origin

Back in '22, Carter and I were a tad concerned about the curse. But in we went through the matching front and garage doors, noting their concealed ingenious thermal core whose polyamide break was no doubt what had preserved the treasures within. The Boy King's hasty burial was confirmed: the Ancients had neglected to secure its 5-point and 8-point locks, installed to deter intruders. It was mere misfortune that all who had laid hands on the wax seal securing the ropes around Origin's furniture options perished horribly within months.
origin-global.com

4
Aluminium glazing systems
Reynaers

If, as Sunderland has just done at Washington Leisure Centre, you're spending £11m redeveloping and refitting a community sports facility, with sauna, steam rooms, pool, flumes, and even international-standard trampoline training, it surely makes sense to specify Reynaers' multi-variant CW 50 and structurally-clamped CW 50-SC large-panel curtain walling, plus high-traffic non-insulated Vision 50 flush doors. For how else will passers-by be able to admire those exquisitely toned lycra-clad thighs on the treadmills?
reynaers.co.uk

FEDDE DE WEERT

DAVID BARBOUR

ANDY MARSHALL

5
EL490 motor lock
Abloy UK

When Crispin Pother, associate director of OMG Architects, disappeared from his Manchester HQ last week, concerned colleagues and family swept the area to track him down. He was eventually traced to this, a Pod Works workstation in a converted red telephone box. He refused to spring the electric Abloy locking solution for several hours, saying he at least had access to wi-fi, plug sockets, internet connection, printer, scanner, VOIP phone and free coffee and tea, even though he had to Sellotape all his drawings to the sides.
abloy.co.uk

6
Wing access gate
Boon Edam

The Winglock Swing gate was named after a little known dance craze that swept the Netherlands in the 1950s. Highly hazardous to physical health, the signature manoeuvre led to a spate of lowland hernias that still dog some of the older generation. This explains the hooks on many Dutch buildings: a whole generation was unable to lift heavy items and materials for girdles were in short supply. The gate's ease-of-opening, supported by a floor plate, is a paean to freedom of movement, especially for those bearing novelty-footwork injuries.
boonedam.co.uk

7
Slim frame system
Velfac

In the long-awaited Clintstones II movie, Donny Trubble occupies White Rock House to thwart Hilma Clintstone's moment of glory in which she hoped to spend freely and right some of her jovial but sometimes foolish husband's earlier wrongs. To regain credibility, she builds the Alder Hey Children's hospital of grass and giant rocks, adding futuristic slim-framed Velfac windows to give excellent views and keep the cave warm and light. Will her liberal ruse reduce Trubble to rubble, or is she already a fossil? Tune in next week kids...
velfac.co.uk

8
Windows, doors and rooflights
IQ Glass

'Let there be light', we mutter increasingly desperately at this time of year, when the miserable darkness of the winter months has lasted far too long. But at Warwick Hall in Burford, Oxon, the over-used quote from the good book has a more meaningful interpretation: redevelopment of community space attached to the grade II listed church is liberally sprinkled with minimally-framed glass doors, windows and rooflights from IQ Glass, revealing an enlightened approach to social responsibility and a welcoming view of the (albeit pagan) spring equinox.
iqglassuk.com

Once in a lifetime

The durability, security and aesthetics of Velfac make windows a decision you shouldn't need to return to

Calculating true lifetime costs is vital when specifying building products – especially glazing.

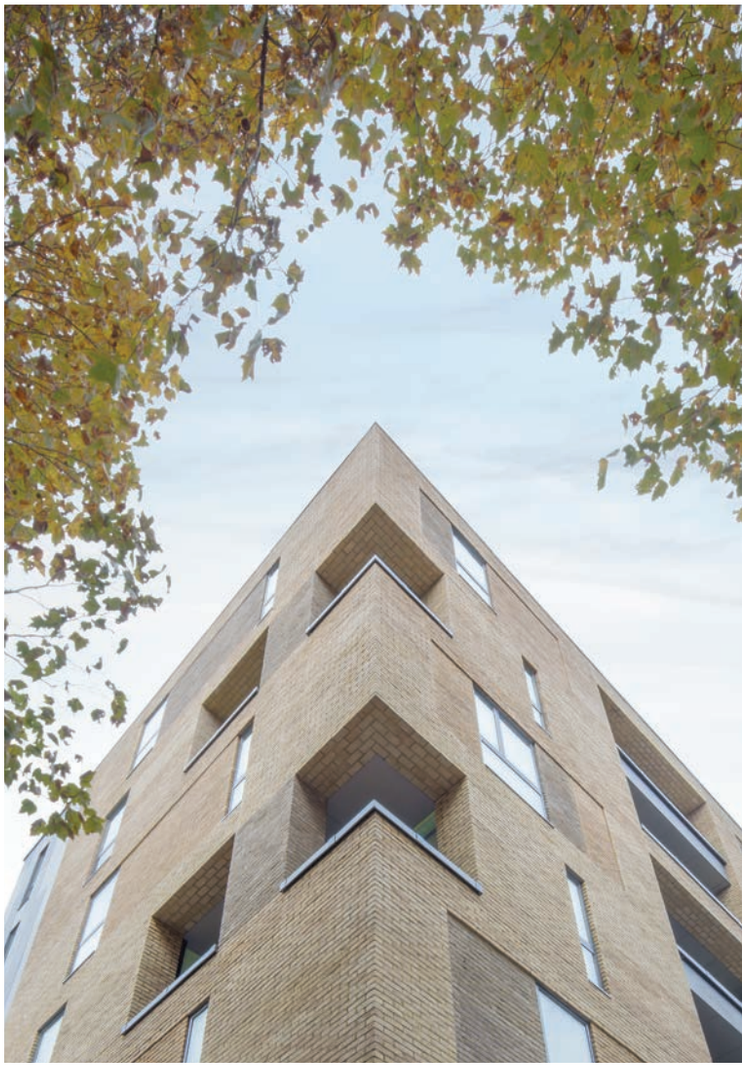
'Velfac aluminium / timber glazing is well known for its architecturally distinctive, contemporary style,' says Velfac sales director Andy Cook, 'but it is increasingly being specified as the most cost-effective solution – the result of a highly durable composite frame construction and low-maintenance design.'

Although lifetime costs for glazing can be significant, they can be minimised, he adds. 'Repainting, repairing and eventual replacement costs often associated with all-timber frames are well documented, but wood is a popular internal finish so architects and developers ask for Velfac composite glazing, as the inner timber frame brings comfort and character to interior spaces, and can be clear lacquered or painted in any RAL colour.' In a Velfac frame, the inner pine frame is protected by a sleek, low maintenance aluminium external sash. 'We say that a Velfac window needs minimal maintenance for the operational lifetime of the unit – which could be 40 years or more,' says Cook. 'This means regular cleaning, of course, but only with soap and water, and an annual oiling of hinges and other moving parts. But our frames should need no repainting, inside or out, and we aim to make cleaning as easy as possible by using reversible hinges.'

With repair and maintenance 'catch up costs' now an important factor in the specification process – especially for public sector or affordable housing projects (as our case study shows) – more architects and developers are considering Velfac for projects of all sizes and budgets.

Cook adds: 'Velfac has long been regarded as one of the best performing, and best looking, window systems. Its proven low maintenance design now makes it one of the most cost-effective as well, and therefore a viable option for an increasing variety of projects.'

JAMES SMITH



CASE STUDY: Avondale Square, London
Avondale Square is a seven-storey block of 18 affordable homes, built above a community centre and office on an established estate owned by the City of London. Velfac glazing was used by reForm Architects in an innovative response to local housing needs, with a building which meets demanding daylight and energy targets while guaranteeing low lifetime costs.

'We specified Velfac for a number of reasons,' says reForm Director Andrew Dawes. 'The composite frame is very popular with tenants as they like the warm inner wood frame and the security of external aluminium. Triple glazing also meets the ambitious low energy targets set by Code for Sustainable Homes Level 4, and those of the City of London Plan, which asks for CO_2 emissions at 19% lower than current building regulations. Triple glazing also provides excellent acoustic insulation – ideal, given the busy inner city location – and the windows meet Secured by Design standards, which again is very relevant to the location.'

Velfac's low maintenance system is also a real benefit for affordable housing, adds Dawes, who notes a growing awareness of the 'whole life costs' associated with cheaper building products. 'Our clients are increasingly specifying higher quality, more durable building products to avoid the inevitable cost-catch up that comes with cheaper alternatives, and this was certainly the case when specifying Velfac.'

Natural light was another design imperative, he says: 'Mayor of London standards ask for dual aspect windows to increase daylight, which we could further enhance by installing slim framed Velfac units. We could maximise daylight with fewer windows, further improving the system's cost effectiveness.' Installed as punch hole units and large patio doors, this ensures plentiful natural light reaches both communal and private areas. External aluminium frames are finished in mid-grey to deliberately 'push the windows back' into a facade featuring colourful tiles and textured brickwork, while clear varnish on internal frames gives tenants the wood finish they like. On the ground floor, full height Velfac units front the community centre and office, adding further visual interest at street level.●

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WINDOWS FOR LIFE

Can intervention boost energy efficiency?

As the government raises its incentives for local, more sustainable energy networks, there's a role for architects

Words: Josephine Smit

The government's Green Deal for home retrofit fell flat, zero carbon policies have largely been abandoned, and the feed in tariff incentive for photovoltaic panels has been dramatically cut.

But the energy policy picture is not entirely gloomy. While initiatives, like energy ministers, have come and gone, government is providing support to help increase local heat networks. Its latest mechanism, launched last October, has a funding pot of £39 million in its present pilot phase and the government plans to spend £320 million overall to achieve its objective: a sustainable heat network sector in the UK.

'Decarbonisation, decentralization, digitalisation,' is the new mantra of the UK energy sector, Wilfrid Petrie, chief executive of energy company Engie UK & Ireland, told the Heat 2016 conference in London last November. That means combining localised low carbon supply with digital technologies, such as smart metering, and energy companies changing their customer relationships to drive more efficient energy use.

The technology to produce low carbon heat cost-effectively and pipe it to local users, whether across a university campus or city district, is well established in Europe. But while more than 90% of dwellings in Copenhagen are linked to district heating networks, the UK is estimated to have little over 210,000 connected homes. Networks have largely been established by major estate holders, such as universities and hospital trusts, developers of large-scale schemes – particularly in London – and a few local authorities.

Cullinan Studio's Cryfield Energy Centre provides 4MWe of electricity and 9MW of heating to the University of Warwick.

London's famous Pimlico District Heating Undertaking (PDHU), on the Churchill Gardens estate, was built in the 1950s and now provides heating and hot water to more than 3,000 homes, 50 commercial premises and three schools. Over 60 years after PDHU started taking waste heat from Battersea Power station and supplying it to nearby homes to combat pollution from coal fires, such approaches are still rare in our towns and cities. This is where the government comes in.

The near investables

The government's heat network delivery unit (HNDU), established in 2013, provides local authorities with part funding for feasibility studies. Now around 130 local authorities in England and Wales have more than 200 projects at development stage. They include combined heat and power (CHP) schemes for central Gateshead and Exeter, tapping into geothermal heat in Crewe and Cornwall, and using mine water for a heat network in the Bridgend valleys, in Wales.

The government's new heat network investment project (HNIP) is intended to help these deliver and to develop a self-sustaining heat network market. 'HNDU has unlocked a hidden demand ... there are projects that are near investable,' says Jonathan Graham, head of policy at industry body the Association for Decentralised Energy. 'The challenge now is to get them over the line. HNIP will make a really big difference, especially in retrofitting.'

Still, the process of bringing projects through is far from easy for local authorities, warns Martin Holley, senior technical project manager at energy charity and consultant, the Centre for Sustainable Energy (CSE). 'Planning a local heat network is a drawn-out, expensive and complex business,' he says. 'There have to be studies of project proposals at various stages – that's all risk funding, which an organization will pay out until they know a project is viable.'

He continues: 'Local authorities have limited capacity to manage studies and get buy in from local stakeholders. These projects are quite cross-cutting in both economic development and potential benefits like fuel poverty, so they have quite wide ranging stakeholders'. CSE is leading THERMOS, a pan-European research project, which aims to make things simpler by equipping local authorities with tools to streamline planning processes for systems.

For an estate with a just one owner the process is much more straightforward. 'For clients like universities, a single individual often drives the project, who can look at figures on costs and benefits in economic and environmental terms. Plus you have fewer stakeholders,' says Holley.

Like others, Holley hopes the government's funding will make a difference, but he questions whether many of today's current and proposed schemes should rely so much on gas CHP. 'Grid electricity is decarbonizing at quite a rate and it won't be long before it is on a par with gas,' he says. 'The key will be to produce networks that can plug and play, so they can take on other sources, such as biomass and waste heat.'

Hot stuff

At its most basic, the energy centre at the heart of a network can sit in the basement of a development or in a discrete structure. The architect has conventionally done little more than create an aesthetically pleasing envelope. But energy centres are increasingly architectural statements in their own right, like John McAslan + Partners' projects for London's Olympic Park.

Cullinan Studio has worked on two university energy projects – at St Andrews and Warwick – and the extension to Islington Council's Bunhill heat network, called Bunhill 2. 'As a typology, energy centres are unusual', says practice leader Carol Costello. 'There is not necessarily a conventional approach.'

Key to achieving carbon neutrality at St Andrews are the energy centre and fuel storage facility. The Guardbridge Energy Centre is

CF MOLLER

Left CF Moller and artist Conrad Shawcross' Greenwich Peninsula Low Carbon District Energy Centre, recently completed.

a major district heating project with a 6.5MW biomass boiler and 23km of piping. Housed in paper mill buildings, it relied on the architect and engineer collaborating to design spaces suitable for biomass storage: the plant chips locally sourced logs. 'There are issues to storing woodchip, such as moisture content, dust control and preventing spontaneous combustion with an agitator,' says Costello. 'We minimize the store by chipping roundwood on demand.'

A heat network at Warwick has been boosted with a new energy centre on the rural edge of the university campus. The barn-like building, with a patinated zinc roof and rustic brick base, houses two 2MW gas fired CHP engines and a 5MW boiler, with space for expansion and ancillary uses. Given the location, acoustic attenuation was key to limiting the ambient noise produced by the CHP engines, which operate 24/7.

Energy centres can be locally contentious, not only because of noise and emissions, but also because they can have a significant visual impact. 'A building without windows can be difficult for people to understand,' points out Costello. 'And we have to think about the flue – the flume, height and what it will look like. But it can also be an interesting architectural opportunity.' That thinking has prompted such diverse design responses as the planned re-use of one of Battersea Power Station's iconic chimneys for a new CHP energy centre, which will sit beneath the transformed former power station, and the faceted fuel stack for the Greenwich Peninsula Low Carbon District Energy centre, by CF Moller and artist Conrad Shawcross.

Bunhill 2 – district energy centre collaboration between Cullinan Studio and artist Toby Paterson.

Cullinan is also bringing art to energy, with Bunhill 2. The centre, funded by the council and the EU, is a UK first and could spark a host of imitators. This is because it will capture waste heat from the London Underground. The exhaust air temperature will be boosted from 18-28°C to 70°C using heat pump technology, studies by the project's engineering consultant Ramboll have indicated. The scheme is set to supply 454 homes and other buildings, once operational this year.

'The project is using prefabricated container units with attenuation, so our job was to make an architectural screen,' explains Costello. The architect collaborated with artist Toby Paterson to create a durable and distinctive envelope, with the ground floor featuring black glazed brick, dark grey vitreous enamel steel panels and cast aluminium art relief panels, inset with colour. Above this copper panels and mesh continue the three and four storey centre.

Projects like these demonstrate the benefits of new localized approaches to energy and heat supply. As they become increasingly common features of the streetscape, they also highlight the value architects can bring to these new additions to the built environment. ●

DON'T TOUCH THAT DIAL

Decentralised energy is a bit of a misnomer for householders, as systems can rely on heat, and possibly power too, coming from the neighbourhood centre. That could bring cost savings, but is also unfamiliar.

A study by the Centre for Sustainable Energy (CSE) and social policy researcher Joseph Rowntree Foundation looked at the impact of district heating on social housing residents in three schemes. It found people struggled to understand the system. 'One person didn't understand that if they didn't use their heating system, they still had to pay the standing charge,' says Simon Roberts, chief executive of CSE. Distribution pipes overheated newer blocks, which could be solved with better lagging and design, he adds. Above all, users didn't understand smart heating technology. 'We seem to have failed miserably in involving users,' says Roberts. 'This is a socio-technical system, and we've only thought about it technically. We need to think about how it works for all customers, not only the tech savvy.'

A greater understanding of how energy is used in all buildings could be key to maintaining affordable supply, as the UK reduces reliance on the flexibility fossil fuels provide. 'The quicker, cheaper, place to look for flexibility is on the demand side, to find out how we can reduce consumption at peak times and make better use of energy when it is abundant,' says Professor Nash Dawood, director of the Technology Futures Institute at Teesside University. Dawood is co-ordinating an EU research project into the potential for intelligent electricity systems in buildings to adapt to fluctuating demand.

Key facts (from the Association for Decentralised Energy and government)

- 2,000 UK networks serve 210,000 homes and 2,000 commercial and public buildings
- District heating has the potential to meet 20% of domestic heating and hot water needs by 2030, the government estimates.
- Heating and hot water make up 80% of domestic energy costs
- Heat production accounts for around 30% of UK carbon emissions

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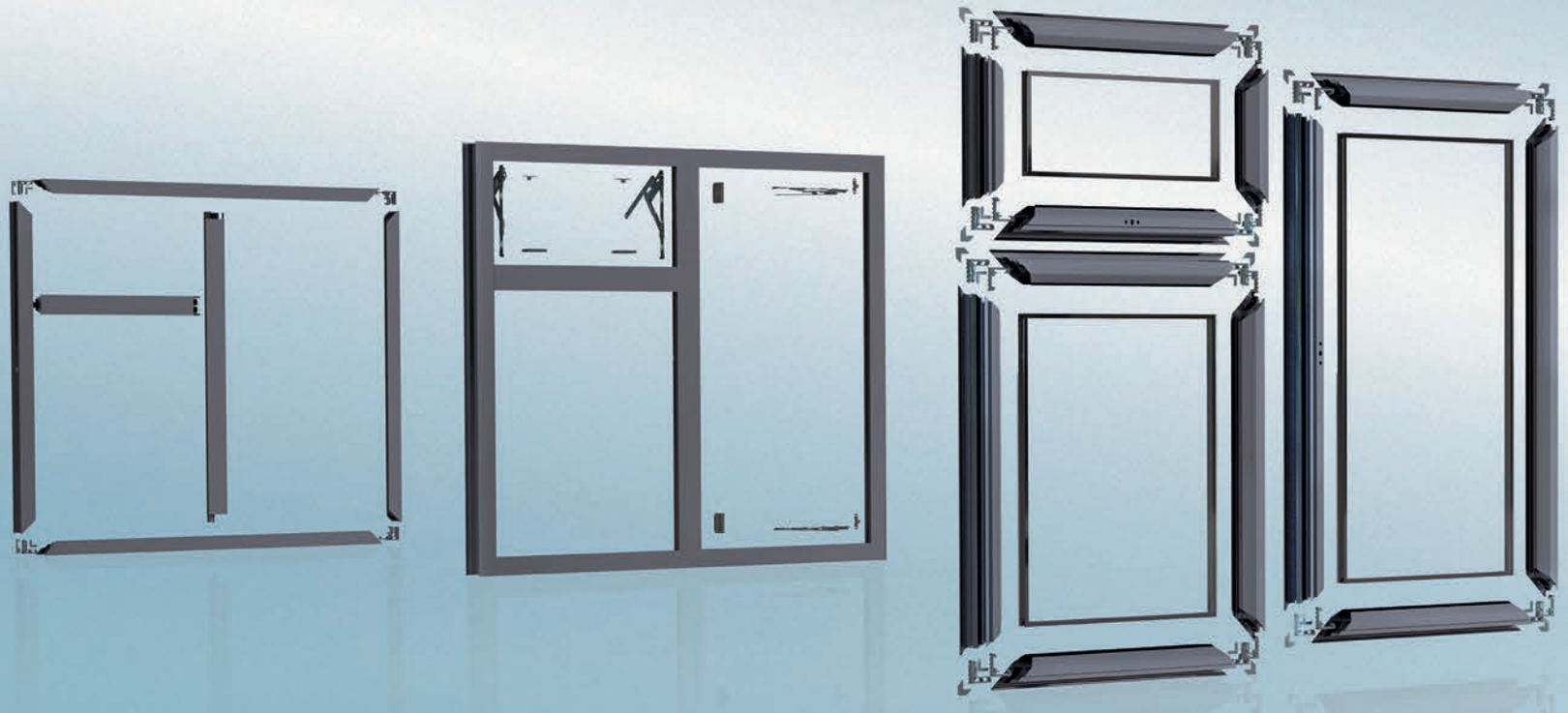

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Place Rogier, Brussels

A steel and ETFE disc has landed in Brussels, bringing long lost excitement to a once grand square

Words: Jan Carlos Kucharek Photographs: Matthias Van Rossen

As an expanding Brussels entered the 20th century, it was Place Rogier that fell victim to the drive to give the city an appropriate infrastructure. The square had originally terminated the axis of a grand shopping street in front of the Beaux Arts North Station, constructed in 1846. But the 1930s saw a proposal to build not only a north south tunnel connecting the city's central and south stations, but also to create a fresh urban quarter further north with its own terminus, unlimited by the strictures of the existing station. Completed in 1952, the new North station made Place Rogier redundant; the old station was demolished, replaced by commercial developments, and Place Rogier shrank from busy urban interchange to windswept car park on the centre's northern fringe.

In 2006, to turn around the bad fortune of the square, the metropolitan government put out an open call to architects to suggest ways of reinvigorating it. With its proposal for reinventing the existing metro station to make its daily people moving part of the life of the square, local firm Xaveer De Geyter Architects (XDGA) was appointed with Belgian engineer Ney. Ten years later, and after a host of unrelated infrastructure problems, that process is nearing completion: a huge steel disc hovers alongside the R20 boulevard, as it runs west to the Art Deco National Basilica.

The 65m diameter disc is merely the most visible part of a €30 million project to reconfigure the metro station and connect its platform levels to the surface. This involved cutting a 30m by 15m hole into the pavement and opening the lower concourse level two storeys down to the air. The station is now accessed by escalators running diagonally through the space and a dramatic spiral staircase. Above this sits XDGA's 230t bespoke steel structure, a sharp perimeter ring beam inset with a mesh of triangulated steels – some with timber infills, some clear to a tensile ETFE skin that stretches over the canopy. Though centrally supported it leans asymmetrically towards the square; the designers had to jump through engineering hoops for a bigger aesthetic intent. With a total area of 3,200m², architect Tom Bonnevalle explains that the idea was to 'generate a roof form that was visible from all the approaching streets to create a landmark presence along the boulevard. We felt the circle was a simple form that everyone gets,' he continues, 'an iconic form that forges a strong identity for the square as well as becoming part of the wider urban realm.'

But the strategy was easier said than done. The whole canopy structure sits above an operating station and engineers at Brussels Metro were adamant that no extra columns could be brought down to track level to take any additional loads or allow any forces onto the tunnel roof. This meant Ney could only use eight existing columns to take the eccentric loadings of

Above The 65m triangulated steel disc of structure with its perimeter ring beam under construction. The disc dips 5m from edge to centre.

Left Visualisation of the finished canopy looking west to the National Basilica.

Credits
Client Région de Bruxelles
Landscape Michel Desvigne Paysagiste
Structural engineer Ney & Partners
Technical engineer Studiebureau Boydens
Traffic engineer Tritel

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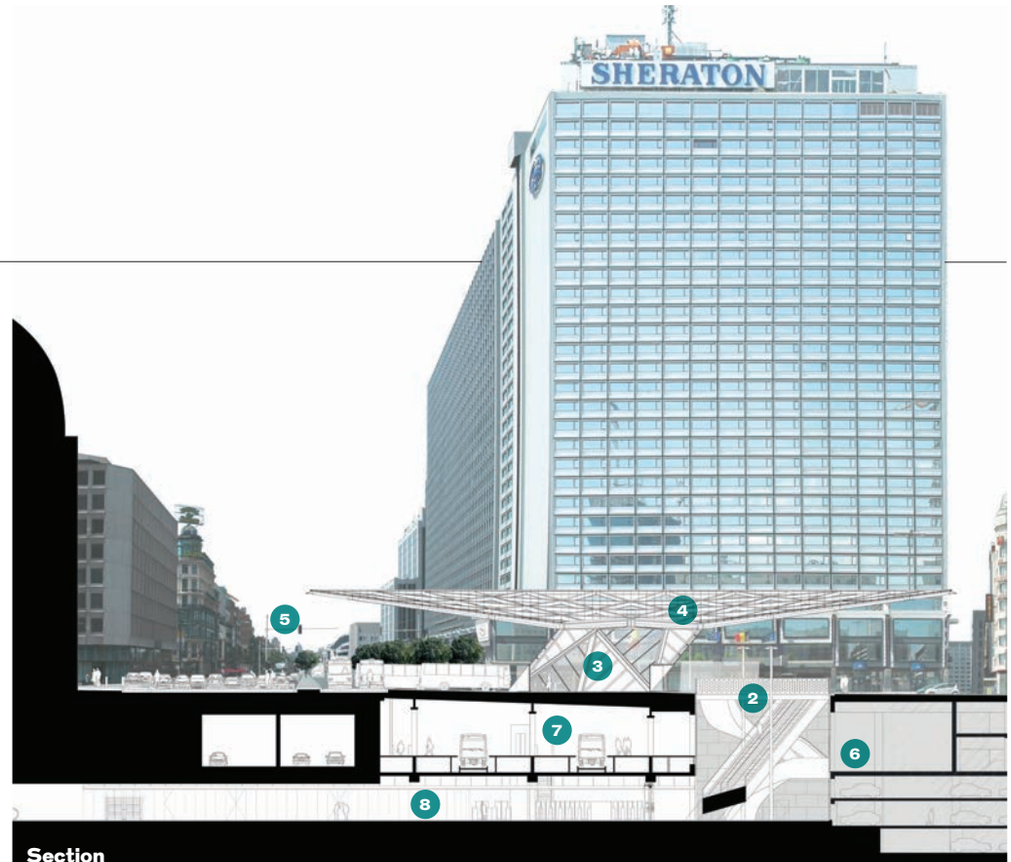
the huge leaning canopy structure above. 'The problem was that centre of the canopy was above one column so all the load forces wanted to transfer into that,' recalls Ney partner Kenny Verbeeck. 'Because we couldn't overload it we had to work out a strategy whereby the loads were more evenly distributed across the columns.'

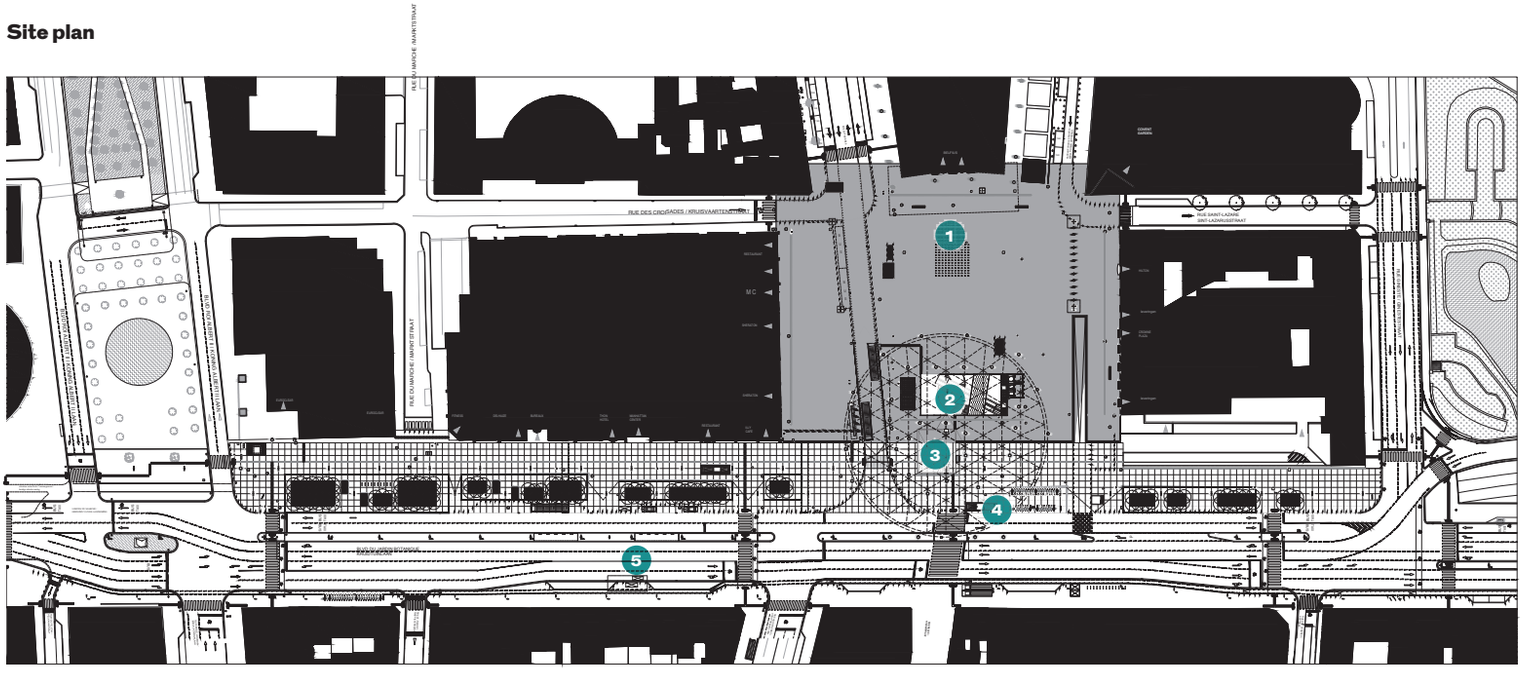
In the end the firm settled on a raft of beams and reinforced concrete forming a rectangular area of 23.2m by 19.8m centre-to-centre resting on the eight columns, sitting above the tunnel roof structure but imposing no load at all on it. Verbeeck explains every single beam within this grid is bespoke, as the raft is acting to try and redistribute the asymmetrical loads of the cantilevering canopy. The problem was compounded by the fact that they were having to deal with environmental factors too. Not only is it leaning out but the down draught from the surrounding towers was potentially causing uplift to the underside of the disc. 'All the time we were having to make the raft not only deal with the self weight forces of the structure but also make sure these upthrust forces were in equilibrium,' he explains. The result is a reinforced 'mesh' of beams that run from 400mm to 900mm depth across their length, successfully evening out the complex loads over the eight



Section

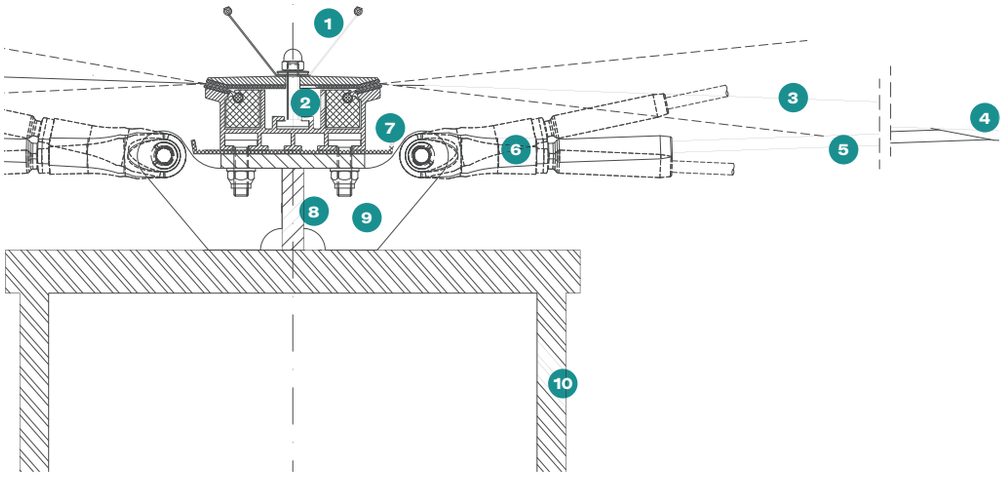
1 Place Rogier
2 Cut out of square down to concourse level with access
3 Central steel support pier
4 Steel canopy structure
5 R20 Boulevard
6 Car park access
7 Upper level metro platforms
8 Lower level metro platforms and concourse

Site plan



Left The complex 3D steel pier structure is a physical manifestation of load transfer: taking the forces from the canopy's central hexagon to the orthogonal column arrangement of the metro structure below.

ETFE fixing detail



Section

1 Anti-pigeon cable
2 Kederprofile (bespoke profile to clamp textile, consisting of an extruded hollow profile and rod), anodized aluminium
3 ETFE foil 250µm
4 Cable pocket
5 Cable, spiral strand etc
6 Turnbuckle with clevis pin and thread, stainless steel, variable diameter
7 Bonded EPDM bar to counter bi-metallic corrosion
8 T-shaped fillet connected to top side of beam, with screw fixings for Kederprofile section
9 Steel plate acting as cable connector, welded directly onto base steel structure
10 Bespoke base steel structural beam

columns. This strategy deals with both compressive forces pushing down on the road side and the upthrust forces on the plaza side, the design team effectively 'using the entire subway station as a counterweight for the canopy'.

Interesting here too was the game of give and take that occurred with the loadings of the footings themselves. The engineers found there was room for play with the weight of the soil they removed to build the foundation raft. The dead weight of soil is about 1.8t/m^3 but lightweight concrete comes in at around 600kg/m^3. 'In replacing the 100sqm soil for concrete below each of the reinforced four columns supporting the canopy's three-dimensional pier we gained around 100t of loadbearing potential that we could offset against the deadweight of the canopy. It turned out to be a very nice equilibrium,' explains Verbeeck.

It is the move from an orthogonal base to a hexagonal ring beam at the centre of the roof canopy that produces the strange, faceted, shapeshifting steel and glazed section of the central pier – a very pragmatic approach to resolving the forces that need to be transmitted down from the disc to the station's columns. The triangular facets this creates in elevation are replicated in plan in the roof, whose circular geometry is resolved structurally through a hexagonal form broken into constituent triangles.

It took some time to arrive at this approach, says project architect Karel Bruyland, having first looked at 'circular patterns, radiant lines and about 20 other alternatives'. It is a solution that, Bruyland admits, is slightly compromised where it interfaces with the steel perimeter ring where the beam form warps slightly to maintain the triangulation. 'It's an unavoidable geometry which you hardly notice in plan but which you can see in reality if you look for it – but the alternative was that the triangular beams wouldn't meet where they hit the ring beam'. While Verbeeck says that, as an

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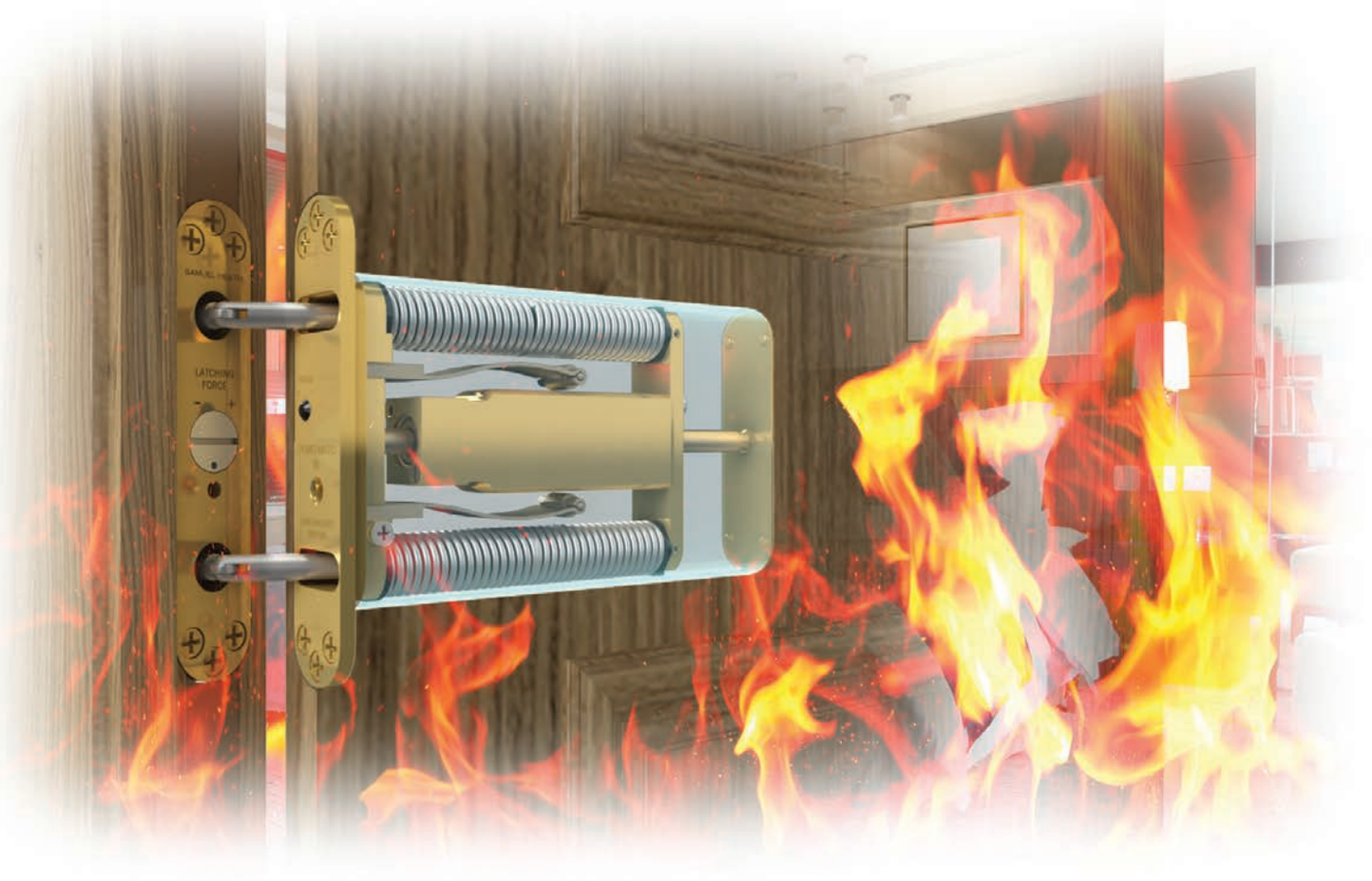

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Green house: how to design a truly resilient home beyond solar panels (MarleyEternit)	4 Apr	25 May	23 Feb	9 Feb	23 Mar	2 Nov	6 Jul	14 Jun	27 Apr	9 May	13 Jul	26 Apr	29 Nov	7 Mar
Fees: how to best calculate, negotiate and monitor	21 Feb	30 Nov	25 May	14 Sep	6 Jul	2 Feb	7 Dec	20 Sep	30 Mar	5 Sep	6 Apr	31 Mar	21 Jun	4 May
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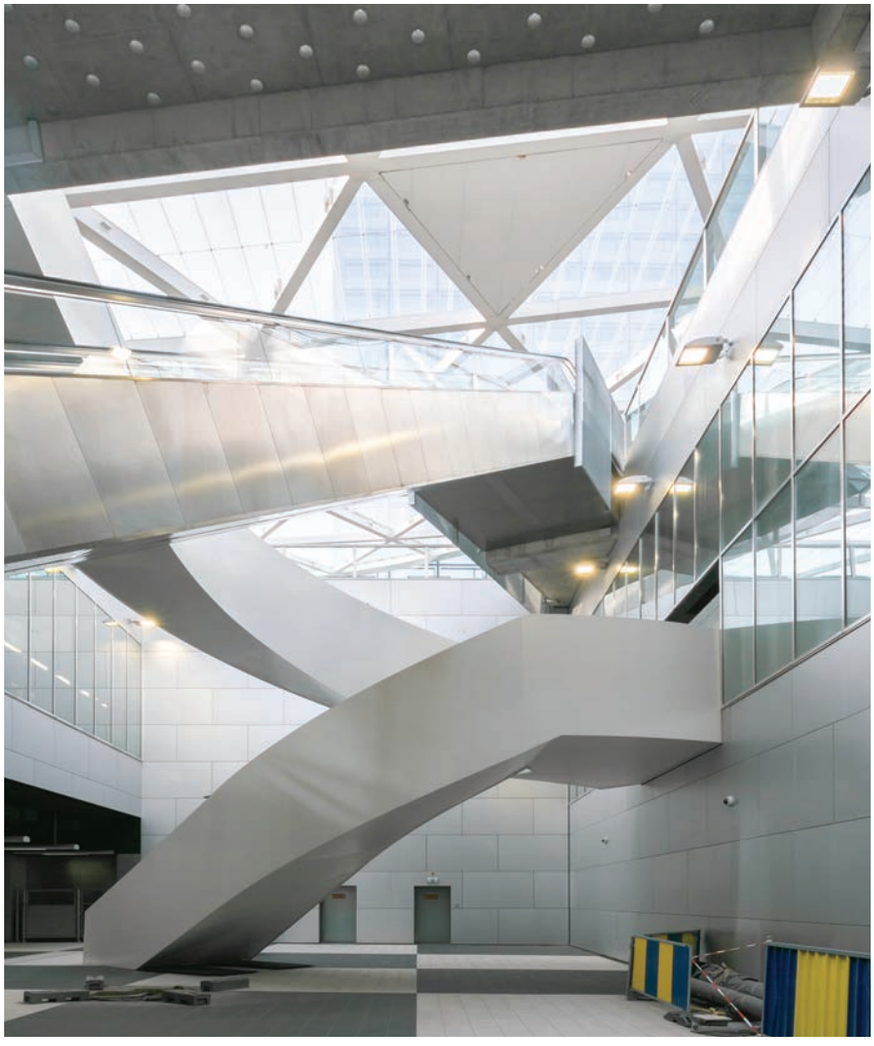

Above Visulisation of the completed canopy by night — a form rather than elemental structure.

Left The dramatic void conecting the station concourse level with Rogier Square above.

engineer, he appreciates the current iteration of expressed structure, he agrees with Bruyland that once timber infill panels are inserted in the canopy, it's less likely that these edge condition anomalies will be perceived. 'It will become less of an elemental thing and more of a homogenous form,' he thinks, 'which should make it feel calmer.'

As for the roofing material, it became clear that, with loadings critical on this project, the extra 400t that glass would have been imposed ruled this out at an early stage. The team instead opted for ETFE, but was concerned by the aesthetic effect of pillows. 'We always felt the idea was to visually clean up the square but the use of pillows, with their seams and tubes, would make a fussy form, which went against our aesthetic intent,' says XDGA's Bonnevalle. So instead it opted for the single layer of ETFE that tops the structure, with a run of fine steel tension wires bonded into the membrane and pinned back to the triangulated beams, which drops 3.5m over its 32.5m radius. The innate flexibility of the ETFE brings additional benefits as it is very forgiving of the 300-400mm 'play' of the eggshell-like structure under wind loading.

And despite being beset by delays due to the recent discovery that Belgium's metro network is plagued with waterproofing issues (which saw half the landscaping on this project having to be ripped out and re-installed) it seems like the end is in sight for Brussels' new UFO. With the far more people-friendly landscaping stretching out from below XDGA's huge, shallow disc, even though the project has involved engineering challenges and compromises with the transport network and two city municipalities, Bruyland thinks the design intent has by and large, been preserved. 'We hope that in creating this massive canopy in Place Rogier at the end of one of the city's most important streets, that we are reminding it of the historical relevance of this place; bringing order back to a square that has only been defined by chaos since it lost its station,' he concludes. ●

Costed

David Holmes of AECOM looks at roofing costs

Choosing the right type of roof is more difficult than most people think. Roofs do more than simply offer shelter. They can make the building more energy efficient, bring in natural light and help define the overall style of the property.

The complexity of design and shape of the roof, including junctions with other building parts, will add to the labour needed for the finish. Also consider the height of the roof to the ground, its location, style or steepness and of course, the labour that will require.

Overall perimeter length can be a significant cost driver, particularly on flat roofs. The ratio between the perimeter and the roof area is an important measure when pricing. Relatively more perimeter can significantly increase the overall rate per m^2. Green roofs have higher capital costs than traditional ones, particularly when allowance is made for the additional structural loads. Maintenance costs are also higher.

Many factors influence both the design and choice of roof coverings.

- What weather needs to be accounted for
- Level of exposure – more nailing and larger laps may be needed. Western and northern locations generally face greater exposure
- The amount and type of insulation required – both thermal and acoustic
- Whether any bending of roofing is required
- Generally the shallower the pitch the more lapping will be needed to maintain weather tightness, so more material will be required to cover the same area
- Flatter pitches take time to dry out after rain or snow, increasing possible maintenance
- Planning requirements may insist that certain materials, design or colours are used

Good design, particularly details around junctions and openings is very important.

Modern roof design on industrial and commercial roofs tend to have a low pitch to minimise heating costs. This has seen the rise in secret fix systems with no exposed through fasteners and minimal end laps (preferably none), which allow pitches down to 1°.

The following rates are based on the UK average and represent typical prices at 2016 Q3. Please note prices can vary significantly depending on specifications.

Flat Roof: Membrane and built-up systems	**Range £**
Includes insulation (U-value = 0.25W/m^{2}K) and vapour barriers as necessary; excludes decking	
Single layer polymer roofing membrane; insulation	**£75-95/m^2**
Bitumen three-layer polymer modified bitumen system	**£83-120/m^2**
Bitumen two-layer modified bitumen system	**£65-100/m^2**
Bitumen felt roofing system, laid flat, with solar reflective paint finish	**£90-150/m^2**
Mastic asphalt; applied flat; to concrete substrate	**£25-60/m^2**
Single layer sheet roof; composite system; warm roof covering; vapour control layer; insulation and water proof membrane	**£75-110/m^2**
Polymeric waterproof membrane; 1.2mm thick fleece backed membrane; cold roof	**£50-75/m^2**
Air cushion roof (ETFE type membrane) supported on lightweight metal structure (included)	**£850-1100/m^2**
Roof walkways; 600mm x 600mm x 50mm precast concrete slabs on support system	**£45-65/m^2**
Pitched roof: Tiles or slates	
Includes reinforced underlay and battens as necessary; excludes roof structure	
Natural Welsh slate tiles	**£115-140/m^2**
Natural Spanish slate tiles	**£70-110/m^2**
Synthetic slate tiles	**£65-90/m^2**
Reconstituted stone slate tiles; random slates	**£60-80/m^2**
Clay pantiles	**£38-45/m^2**
Clay tiles; handmade; sand-faced plain tiles	**£85-110/m^2**
Concrete tiles; interlocking; troughed / bold rolled	**£33-50/m^2**
Concrete tiles; plain	**£33-50/m^2**
Fibre cement slates	**£40-55/m^2**
Red cedar sawn shingles; preservative treated; uniform length	**£60-85/m^2**

Pitched roof: sheet metal	**Range £**
Includes breather membrane, underlay or vapour barrier as necessary; excludes roof structure	
Copper sheet; mill finish; flat seam or wood rolled	**£140-170/m^2**
Copper standing seam roof; mill finish	**£150-200/m^2**
Extra for pre-patinated copper finish	**£40-70/m^2**
Aluminium sheet; mill finish; wood roll; insulation (U-value = 0.25W/m^{2}K)	**£80-125/m^2**
Aluminium sheet; standing seam; mill finish; insulation (U-value = 0.25W/m^{2}K)	**£80-90/m^2**
Extra for Pvf2 aluminium finish	**£10-20/m^2**
Stainless steel; terne coated sheet	**£115-140/m^2**
Lead roof covering; code 7; welded seam; milled lead; laid flat	**£125-150/m^2**
Lead roof covering; code 7; welded seam; milled lead, pitched roof	**£150-155/m^2**
Zinc; Natural Bright Rheinzink; pitched	**£95-140/m^2**
Extra for pre-weathered zinc	**£20-30/m^2**
Pitched Roof: Fibre-cement sheet	
Excludes roof structure	
Profile 6 fibre cement; single skin; natural grey finish	**£28-40/m^2**
Insulated system (U-value = 0.25W/m^{2}K); Profile 6 fibre cement external skin; metal lining panel internally	**£55-70/m^2**
Extra for coloured fibre cement	**£1.75-2.25/m^2**
Double skin GRP translucent sheeting	**£55-66/m^2**
Triple skin GRP translucent sheeting	**£60-75/m^2**
Landscape roof	
Excludes decking	
Extensive sedum type flat roof; growing medium; waterproof layer; separation layer; low maintenance	**£180-250/m^2**
Extensive rockery type green flat roof for planting; growing medium; waterproof layer; separation layer; low maintenance	**£190-275/m^2**

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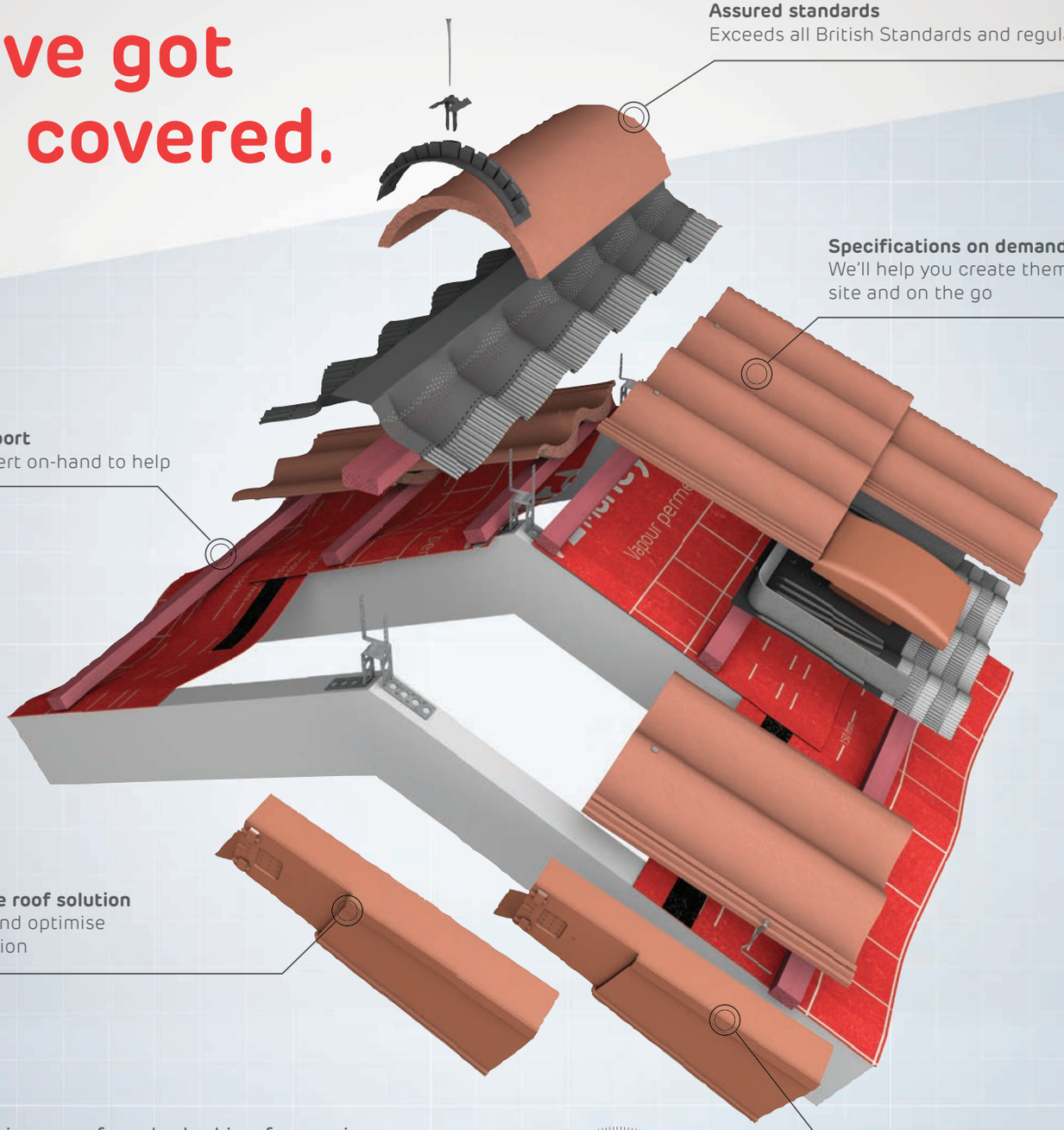

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Specified

1
Solar array and waterproofing
Bauder

Trump would be pleased to see that the very smart people (the best people) at the UWE are leading the way with Mitie Tilley's installation of the largest (the greatest, I'm telling you) roof-top solar array so far seen on any British university: a Bauder-manufactured system with a potential capacity of 400 MWh/y. Unlike the US president, this is an installation intended to keep its ample promises, not spring a million leaks, conserve budgets, and not crash into the Enterprise Zone, one of the two departments now enjoying a projected 50% reduction in energy bills.
bauder.co.uk

2
TWS Fastcoat
Triton systems

As vinyl is to the muddy shellac of a 78, so Triton's elastomeric resin is to bitumen and crusty felt. At the residential conversion of EMI's Old Vinyl Factory in Hayes, TWS Fastcoat has been used to waterproof lightwells lying 1.5m below ground. It's a liquid single-pack resinous compound which moisture-cures to a continuous and elastic membrane, adheres to even complex shapes and contours, and is impervious to both water and gas. As you might expect, it's also highly resilient when subject to movement. As am I, when enjoying my precious 10in Dame Clara Butt.
tritonsystems.co.uk

3
Sarnafil
Sika

Blurring the boundary between outdoor and indoor might be a theatrical conceit but is a concern in many domestic projects. Architect Andrew Leckenby has taken things to a new level by building his home around an established tree. He chose Sika's Sarnafil single-ply waterproofing membrane, and post inspection the covering has earned its 15-year guarantee. It's disappointing to note, however, that he has yet to install the customary wardrobe, lamp-post, or supply of fur coats. Perhaps he's still waiting for the parcel-bearing faun to pitch up.
gbr.sarnafil.sika.com

4
Standing seam roofing
Architectural Profiles

I've seen some industrial sheds, man. You weren't there. I was there, man, 20 years lost in the U Minh Forest, and the Redditch ringroad – and I've tried ever since to see 'metal enveloping' finally settle down to civilian life. I have to say, Architectural Profiles' contributions to Derry's new Foyle sports arena do give some hope. A standing seam skin over StrongBak structural framing lends acoustic control, budget compliance and even some understated good looks to a technically demanding project. It's a Full Metal Jacket with medals, but without the PTSD, in fact.
archprof.co.uk

DOMINIK REIPKA

5
Cruiser green roof
ANS

In the future, with ever longer queues for allotments, the GLA has had to create floating growing platforms. Now, would-be self-sufficient urbanites must queue to get on board the daily boat trip to the Thames Estuary and back, hauling their sacks of seed potatoes up the gangplank. The new service has had to get special dispensation from Port of London health and safety, concerned that pitch forks might puncture the inflatable life jackets. By way of a pre-empt, the image shows an ANS trial green deck for a Danube cruise company replete with Alpine flora.
ansgroupglobal.com

6
JB red roofing batten
Marley

Marley's mechanically-graded roofing batten is made using a laser scanning process called Goldeneye – sounds very high tech. But I made a Bond with my editor, even though these meet a very British Standard: I was Never to use 007 puns never again. So I should be able to come from in from the cold. It's sad – once he loved me and my eight cats. It was all going fine 'til he put me through a thorough thunder balling in the staff canteen. If views could kill! After that I really needed a quantum of solace just to gather myself. End of the day though I thought hell, you only live once, eh? Or twice…
marleyeternit.co.uk

7
Tile and snow guard
Klober

Ah, the crunch and swish of traversing snow… taste that fresh air and perfect your parallel turns as we bomb down the black to a vin chaud and croque monsieur at the bottom of the piste. But however scenic those snowy villages look, danger lurks behind beauty like a Mario Bava film. Luckily, Klober Trapac's tile and snow guard should catch fragments of the white stuff before it slips off the roof to flatten your little ones this half term, the lightweight frame allowing gently thawing drops to drip harmlessly through. No wipe outs in the white outs here!
object-carpet.com

8
Solid surface material
Hi-Macs

In the world of architectural language and buildings that speak, the Hanse Merkur building in Hamburg is all about tenses. You know, the old wing and the new wing have been linked with an entrance hall of the future. This edifice performs seamlessly thanks largely to Hi-Macs' solid surface material, which offers thermoformability – which means there is no limit to form or shape – and protects occupants from all weathers within its homogenous presence. Thus the building is then, now and to come for Hanse Merkur, which as an insurance provider no doubt likes to cover all the bases.
himacs.eu

Looking at the smaller picture

When it comes to housing, the detail is all important

Words: Ruth Slavid

Robert Evans of Evans Vettori experienced what could have been an architect's worst nightmare while speaking at the PIP seminar this autumn on housing and residential buildings. There in the audience was a disgruntled resident of the Parkside development in Matlock Bath that Evans was discussing. Fortunately, he was a fan of Evans' architecture and his complaints centred on why the developer had refused to allow the practice to carry through its designs to the internal common spaces, instead saddling residents with a space that was poorly specified and didn't work properly.

Evans agreed, of course, and said that as he was doing more work with the same developer he was arguing to extend his sphere of influence. Stephen Proctor, on the other hand, who had described Proctor & Matthews' Abode development outside Cambridge, was relatively philosophical about his lack of influence on interiors. Those won't last he said, whereas the building envelopes and place-making should have an enduring influence.

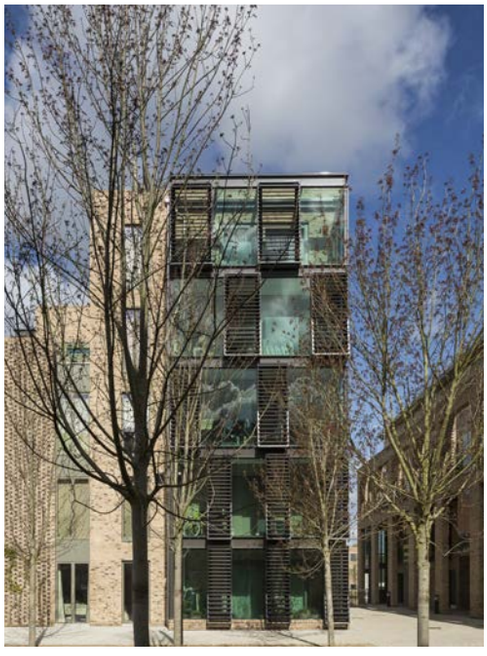
Proctor explained how the Abode design worked to create a sense of place and of community, in part by echoing some of the ways houses in the area were built, and in part by differentiating between different types of places – courtyards, streets, mews – through both the building typology and the detailing. This included the use of split bricks and some golden panels that were backlit at night.

Evans Vettori has taken an equally detailed approach at Parkside, where it benefited from a client with excellent access to nearby Birchover Quarry. The architect developed a reeded profile for the cladding panels which Evans described as 'quite inventive – for Matlock!' There were numerous differences between panels, especially when dealing with the lintel details.

Spanish architect Ramon Bosch had paid similarly close attention to a material, winning a Tile of Spain award for the way he used ceramics on the refurbishment and reordering of a property in the Catalan city of Girona. His house centres on two courtyards, one filled with light and the other more shaded. By re-using old tiles and designing new ones to complement them, he kept a sense of the house's history and brought a feeling of the inside of the building into the courtyards.

At a second house, by the sea, Bosch used tiles to create an effect that was, he said, 'time-proof, heat proof and waterproof'. Although the toffee colour tiles are relatively plain, they were made in a local works at La Bisbal, and have a pleasing irregularity, enhanced by some circular openings which create a semi-permeable screen.

The purpose of these seminars is to look at products and specification from all directions. So in addition to these architects talking about the way they had specified and used products, manufacturers shared their expertise and developments. Jordan Kingman, from AIUK,



BET CAPDEFERRO

discussed a project at Orchard Village for Circle Housing where the firm had worked with PRP and Willmott Dixon. He explained how complex it could be to achieve a range of standards.

For example, to achieve Lifetime Homes accreditation, it is necessary to make provision for moving the handle of a window to suit a wheelchair user, and to test the gearing. Similarly, the height of the transom has to be appropriate. Meeting the needs of Secured by Design and Part F of the Building Regulations for ventilation bring other demands. 'Everybody looks at the window in isolation,' Kingman said, 'but you have to look at it along with the reveals, as these can reduce the ventilation space.'

John Parsons, from Recticel Insulation, showed the range of PIR products that are available with different facings, and how, with the use of a clever rebate, the overall size of a cavity can be reduced. Although his product is widely used in applications such as car seats, a show of hands confirmed his suspicion that is relatively unknown in construction. He plans to change that.

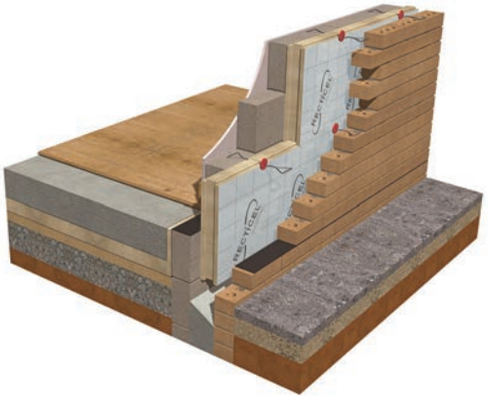
It is all too easy to make assumptions, about both materials and building types. John Lineen of Bell Phillips Architects demonstrated how his practice had successfully challenged the stereotype of retirement housing and, in particular, the bungalow. Working for the London Borough of Greenwich, Bell Phillips produced single-storey homes with pitched roofs that were light-filled, appropriate for their residents and an inspiring addition to the streetscape.

With so much mediocre housing around, it was inspiring to hear from organisations that are determined to make it better. ●

In addition to architects talking about the way they had specified and used products, manufacturers shared their expertise and developments

Above Ramon Bosch Architects' refurbishment of a period house in Girona, Spain.
Above left Proctor Matthews' Abode project outside Cambridge.
Left Bell Phillips' retirement homes in the London Borough of Greenwich.

Above and above right PRP Architects' Orchard Village development, Rainham, Essex.
Below Evans Vittori's Parkside development in Matlock Bath, Derbyshire.



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Beyazit State Library, Istanbul

In a city littered with ancient remnants, upgrading and restoring a historic building can require a fine sense of balance

Words: Jan-Carlos Kucharek Photographs: Emre Dörter

Left The multi-domed reading room provides a serene and well balanced atmosphere for readers, many of whom are high school or university students.

Opposite Dedicated glass vitrines provide optimal storage conditions for rare books and manuscripts.

Founded in 1884, the Beyazit State Library is the oldest library in Istanbul. But it is actually made up of a far older grouping of buildings adjacent to the Beyazit Mosque, the oldest surviving imperial mosque in the city. Originally the building had been the caravanserai of a small complex that also housed a school, hospital, hammam and stable block, all set around the small square beside the mosque. Perhaps it was its proximity in the old quarter of Divan Yolu to the bazaar, Istanbul University and the booksellers district that saw it finally converted to the state library, its vaulted ceilings painted to register its newfound status.

Over 130 years later the sensitive restoration and upgrading of the library by Turkish firm Tabanlioglu Architects has made it winner of this year's World Architecture Festival Retrofit Award. After restoration in the 1970s, the library fared badly in the 1999 earthquake, leaving it ill-placed to hold its collection of more than 30,000 precious manuscripts and books.

The challenge for the architect was to adapt the building to contemporary use while safeguarding the existing structure – a strategy manifested most palpably in the black glass climate controlled vitrines that now populate its domed interiors; modern interventions standing out in stark contrast to their surroundings.

'Our idea was to bring the fabric back to its original condition and graft the new infrastructure on,' explains Tabanlioglu Architects partner Melkan Gürsel. 'This meant using the ground plane as much as we could for servicing and trying to leave the rest of the fabric untouched.' It resulted in a raised poured resin floor to hide the servicing for the glass book vitrines. At its edges the detail remains pulled away from the restored walls, allowing a discreet slot for air feed and for recessed lighting to wash up their faces invisibly. The lighting is part of a light touch approach, which sees pendant luminaires hanging elegantly from the domes or incorporated into the reading room furniture.

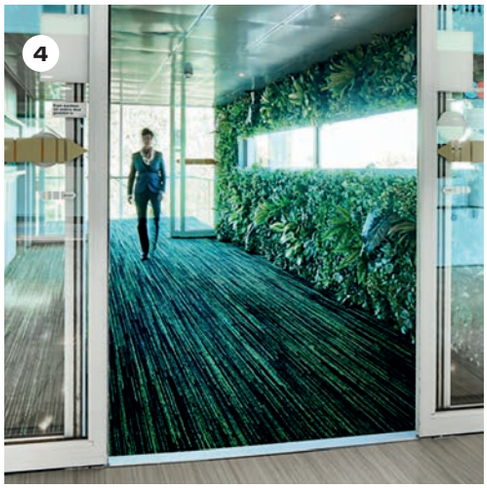
In the earlier restoration, the old external courtyard had been covered over with a concrete dome, which was removed in the latest iteration. In its place the architect designed a light PTFE membrane roof subtending a shallow arch between the supporting walls, and allowing light to once again pour in while offering climatic control and low levels of solar gain. It now serves a dramatic new entrance to the library complex, counterpointing the relative darkness of the reading rooms.

The firm has also designed a modest extension, respecting the scale of the building, on the library's north east facade. Modern Turkish publications are now on the second floor, Turkish and Ottoman periodicals on the first and Ottoman, Arabic and Persian rare books and manuscripts kept safe in the ground floor vitrines.

Gürsel adds that the work also realised new spaces by accident, adding that 'during the restoration enabling works, the remains of a Byzantine church were found, whose walls were left in situ and covered with a glass ceiling, revealing it for all to see.' The architect seems unphased: this is the kind of thing that happens when, to reveal the layers of history in one of civilisation's melting pots, you start to scratch beneath the surface.

Above The courtyard, covered with an inflatable membrane structure, welcomes the visitors.

Specified



1
Water Jewels sanitary ware
VitrA

The Vitra and Burgbad bathroom brands may once have been just the stuff of your most excitable dreams. For example, the 'Water Jewels' rectangular basin (above), in a range of high-gloss metallic glazes, is some contrast to Burgbad's clinical white mineralcast Coco range. The V-care shower-toilet meanwhile puts paid to boringly, conventionally specified separate loos and bidets on your next hotel. With a range of washing/drying options and an automatic open and close mechanism, what you gain in bathroom space with the V-care, guests may gain in nocturnal surprises.
VitrA.co.uk

2
Landmark bathroom fittings
Samuel Heath

Samuel Heath takes Corb's prime principal to its ultimate conclusion with its new 'Landmark' range of bathroom fittings. With two lines – 'Pure' and 'Industrial' – the usual high-spec detailing and coatings adorn the kind of flinty utilitarian forms which would more commonly be found in authentically 1927 pitted aluminium, streaked verdigris, or grimy variants thereof. Deep chrome, polished nickel, bronze, two-tone stainless steel/matt black chrome and matt/polished brass finishes bring a glow of health to the castings' Bauhaus-inspired efficiency.
samuel-heath.co.uk

3
ONI radiator
Vasco

Even Victoria Coren-Mitchell might hesitate to play poker with Vasco's brand new Oni radiator – it gives nothing away. But behind its blank expression is a svelte slice of energy-efficient heating technology which would give the coolest card-sharp cause to blot her visor'd forehead just a little. At a mere 8mm thick and just 16-23kg in weight, the reinforced aluminium plate has a winding copper tube rebated into its back only 2mm from the surface, giving minimal water consumption, maximum radiance, and speed in heating to warm even Victoria's iciest glare.
vasco.eu

4
Coral entrance system
Forbo

Darling, if there is one thing I have mastered, it's the art of making an entrance. Step one: ensure that your fit-out is sufficiently expansive and colourful to catch the eye of even the most ambivalent observer. Step two: ensure said fit-out is in tune with the very latest trends. Step three: engineer said colourful and on-trend fit-out to ensure that dirt, moisture and pollutants are removed from visitors' feet in just six steps. Though that walk might here require giant steps, the fact that Forbo's 'Coral' is made from abandoned fishing nets doesn't make it just one more old yarn.
forbo-flooring.co.uk/coral

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Sign Up

Chris Taylor, Associate at Rio Architects, gives us his three specification favourites

STERLING SERVICES PRECAST CONCRETE FACADE

Rio Architects' concept for One Central Square involved wrapping the building in a precast concrete and glass skin. Using off-site fabrication and modularisation for the facade, Rio worked closely with Sterling Services to realise the concept design through Sterling's specialist precast knowledge. To create a random facade appearance, three different sized modules (1.5m, 3m and 4.5m) were produced, each designed to create a standard opening for installation of the aluminium windows.
sterlingservicesltd.com

RIMEX STAINLESS STEEL CLADDING PANELS

The Royal Mint Experience is based on the concept of a simple gift-box containing the 'treasure' of the 1,100 year history of The Royal Mint. The cascade of blanks and coins produced during manufacturing appear to project individual colours creating a dazzling array of different effects. Cladding the building with a tessellated system of identical irregular hexagons was to reflect this. Rimex creates coloured stainless steel which can be pressed to provide textured finishes. After rigorous trials by the design team, four coloured and textured panels were applied in a random pattern.
rimexmetals.com

VANCEVA COLOURED GLASS

Rio's facade incorporating hexagonal geometry is a symbolic representation of the molecular research conducted in the School of Biosciences at Cardiff University. To unify the appearance of the hexagonal modules and mask the building structure, a combination of clear, translucent and opaque panels were used to create a graduation from opaque panels at the top and bottom, through translucent, to clear in the middle. The highly polished coloured facade reflects the surrounding buildings, and in turn, imagery from the facade reflects back onto the surrounding masonry.
www.vanceva.com

...Sign Off

Jan-Carlos Kucharek enjoys three of this issue's out-takes

BRASSED OFF

Perhaps it's because we're living in the 'post-truth' era, but here's a thing. The glamorous New York duo behind product design firm Apparatus has built a big business on chic minimalism; but is it truly the 'form follows function' kind we were all brought up on? Take its latest creation, 'Block'. Eyewateringly pricey hand cast crystal plinths and brass capsules brought together to evoke a sense of 'harmonious displacement' that are 'chambers for undivulged use.' Alluring they may be, but they do leave PIP asking the question that might well have issued from the mouths of our 20th century modernist pioneers: 'WHAT THE HELL DO THEY DO??'

SAL-TYRE

On site at the V&A Dundee, whose Michelin Design Gallery is cracking on apace, and someone's really gone overboard with the PPE. Maybe Bibendum, straight from its local factory, is concerned about how the museum's going to hang the 2,000+ stone panels on its sunken walls, each weighing 3,000kg. PIP's more bothered about what will hang on the gallery walls, an 'inspiring space for community participants of all ages to see what they design showcased'. Visitors, gird yourselves for 'here's one I made earlier' Blue Peter efforts, botched Bayeaux tapestries and (sorry Kengo) iffy-ikebana. Frankly, the only 'Show and Tell' we're interested in is the final cost.

ENGINEERING FEET

London Bridge is digging down in its 21st century guise, which includes Grimshaw's half-complete station – and dragging up lots of clay in the process – but what to do with it? Network Rail has signed up to a WRAP programme but there's still 91,275m^3 of construction and demolition waste to shift. So thank God there are five clay artists there to deal with about 0.00012% of it. Here's Jo Pearl's offering, 'Votive feet', inspired by a 1st century Roman oil lamp found there. Disgruntled commuters may see it differently – maybe as the added legwork to platform escalators or something that's faster than Southern Rail. Either way, it accounts for why it's in pieces.

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