
Products in Practice Mar/Apr 2018

Extreme spec
Shanghai
cultural centre
11

Insulation
Tirpitz museum,
Denmark
12

Special report
Design goes back to
the factory floor
20

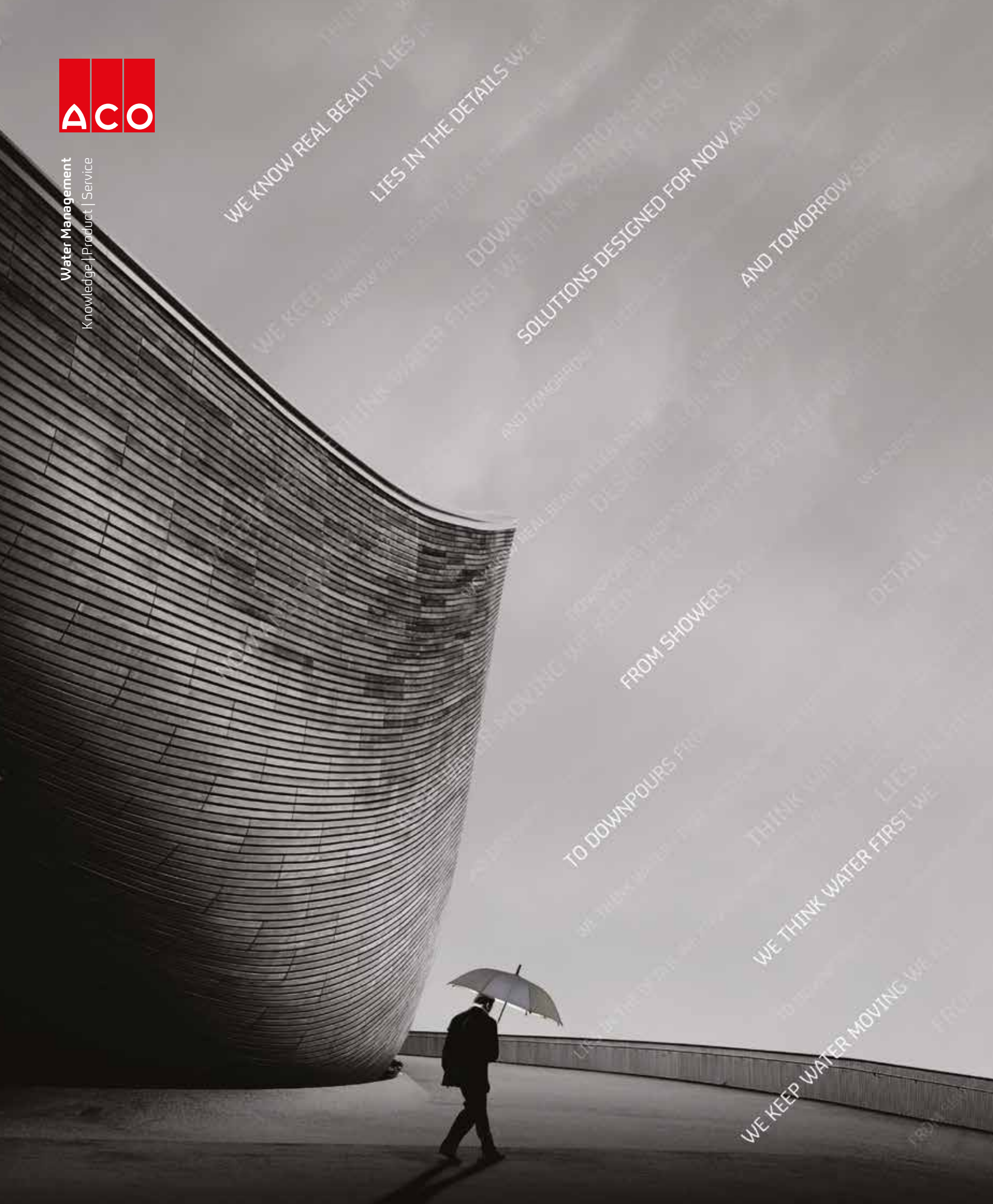
Cladding
Chaoyang Park
Plaza, Beijing
22

Interiors
The Forge,
Isle of Dogs, London
30





Water Management
Knowledge | Product | Service





In a climate . . .

...where injustices levelled against women – from Hollywood to Parliament to vulnerable ones supposedly in the care of aid agencies – are finally being brought to light, it was very encouraging to see that on two occasions last month the profession of architecture seemed to be bucking the trend. First was the appointing of young Mexican architect Frida Escobedo to design the 2018 Serpentine Pavilion. Playing on ideas of the Mexican courtyard house and more esoteric notions of the pavilion's position on the Prime Meridian, she might be the 25th

architect to be directly named as the designer of a pavilion since 2000 but she is only fourth female – a mere 17% of the commissions have been in the hands and minds of women.

Last year's Architectural Review survey of 1,300 women in the profession arrived at greater, but no less alarming percentages. More than 50% say they had experienced discrimination including sexism, bullying and/or sexual harassment, over 80% of which was perpetrated by male colleagues. Tellingly, while only 30% of those women interviewed thought there was

a gender pay gap, salary information they submitted as part of the survey seemed to confirm that there was.

Still a way to go then, so it was encouraging to see Niger-born architect Mariam Kamara in the envious position of being mentored by David Adjaye, no less, as part of the Rolex Arts Initiative (see RIBA J March p39) – maybe a rookie breaking through the profession's glass ceiling. It is about time; let's hope that it's more than just about Rolex. ●

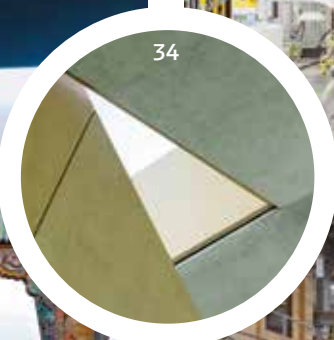
Jan-Carlos Kucharek, editor



04



20



34



22



30

More online...

It will be possible to simply remove various services and systems and replace them with more efficient alternatives as technologies improve over time

The Dutch are making their own mountains, and they are highly adaptable: ribaj.com/dutchmountains

Compendium	04
Tech IT/Books	06
Preview	09
Extreme Spec: Rotating facade	11
Insulation	12

Costed: Insulation	18
Specified: Insulation	19
Analysis: Workplace	20
Cladding	22
Specified: Cladding	29

Interiors	30
Specified: Interiors	32
Sign Up...Sign Off	34

Cover image: Tirpitz Museum in Denmark by BIG, photographed by Rasmus Hjortshøj

Compendium

UPCOMING

Ecobuild 6-8 March. ExCeL, London

International Passive House Conference 9-10 March. MOC, Munich, Germany

MIPIM 13-16 March. Palais des Festivals, Cannes, France

EcoShowcase 13 March. Hampden Park, Glasgow
14 March. St James' Park, Newcastle



Hard sun

I can't write the words warp and weft without thinking of the Bayeux tapestry, about to visit to these shores. However, such historical associations have a modern twist with the specification of GKD's Golden metal mesh on the ceiling of EUMETSAT, the EU's meteorological satellite monitoring HQ in Darmstadt, Germany. The PC-ALU 6010 aluminium mesh now sits overhead the facility's 600 lunching employees in its 250-seat canteen. Architect Pielok Marquardt chose a yellow amber base colour, offset with the shimmer of the mesh. A subtle reference perhaps to the climate change deniers when looking at the facts in the cold light of day.

Sink any glower?

TOTO, Japan's biggest manufacturer of sanitary ware, is concentrating less on the ejector seat technology it made its name on at home, in favour of high-end products for the European market. That includes less emphasis on jets and more on wings – or rather the epoxy resins used on them, from which its Luminist sinks and baths are made. The material can resist scratching, high impacts and temperatures of up to three times the heat of boiling water. The fact it glows seductively when you stick an LED light under it has absolutely NOTHING to do with the reason why you specified it.



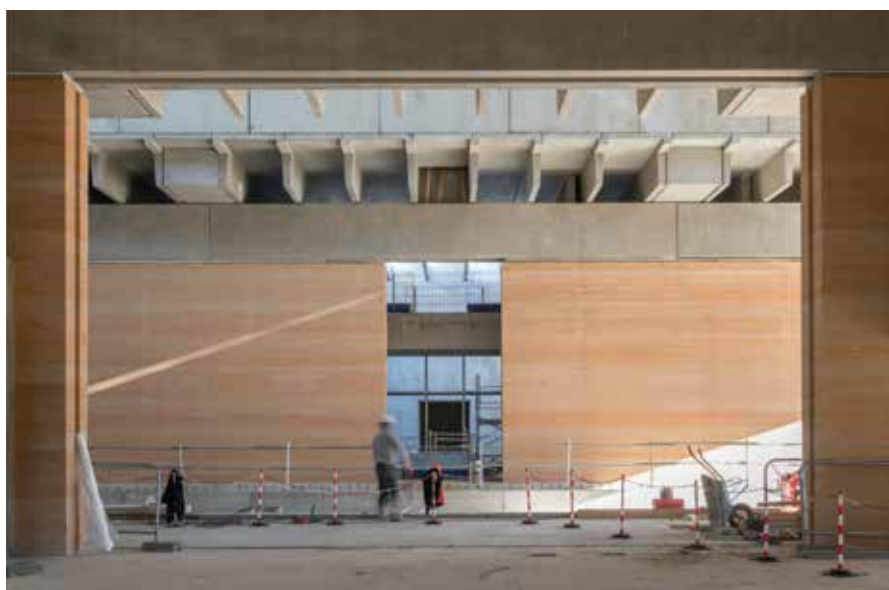
Power shower

What are you looking at here? The tower in the distance? The nature of the beverage sitting on that tray on the floor? The detailing of the underlit floating floor? Good. Because when it comes to shower enclosures, the structure supporting the glass too often becomes the main feature. Not so with Aqata's new Design Solutions range, such as its DS410 walk-in corner enclosure – unless you go for its blingtastic gold finish fixings, in which case your inclusion in MTV's latest series of Cribs will be almost guaranteed.



Earth bound

In a world that's in thrall to high tech, resin bound surfaces, it's a relief to find firms still using old school methods to create interior finishes. Italian family firm Matteo Brioni, whose roots lie in brick-making, has produced the new TerraEvoca range made from natural clays and aggregates. Hand-finished, and suitable for both horizontal and vertical surfaces, the finish is unique to every situation it's placed in. Try and mass-produce that!



Bon bonne

Foster + Partners Narbonne Museum in France topped out last month, its precast concrete roof canopy now firmly supported by its Structural Insulated Rammed Earth Walls (SIREWALLs). The city is dotted with an impressive legacy of archaeological sites and Roman antiquities. Its rectilinear 8,800m² museum is mainly designed around the primary exhibit – 1,000 Roman funerary stones recovered from the city's medieval walls. While the concrete roof pays homage to the ingenuity of the city's Roman founders and provides thermal mass, the SIREWALL system, striped in varying shades of terracotta, reflects the natural earth hues of the area. Perhaps it's a reference to the terroir of its Corbières wine growing region. Unlike the cathedral – only the apse of which was constructed after the River Aude changed course in the 15th century, leaving the city high and dry – it's intended that Narbonne's latest public building will complete this year.



The plot thins

We might not all live in a home that seems to look out to the opening credits of a Paramount Pictures movie, but we can dream. Luckily AluK can give us something to aspire to with its new range of Infinium aluminium sliding doors. Pooh-poohing the usual assumption that aluminium specification means thicker frame sections, it's created 21mm sight lines to their doors. And as if you weren't already asking for the earth, they'll even sink the outer frames and sashes into the opening for you. How's that for a happy ending?

The wicker man

Danish architect and designer Paul Kjærholm remains central to 20th century furniture design, helping found the Department of Furniture Design at the Royal Danish Academy of Fine Arts under the influence of the Bauhaus and Dutch De Stijl movement. So God knows how spooked Gerrit Rietveld and Walter Gropius would have been to see his classic 1955 PK1 dining chair reimaged IN WICKER by Carl Hansen & Son. Chief executive Knud Erik Hansen says 'the chair cradles the body, providing support where it is needed' and adds that dimensions have been changed to suit today's larger and taller users. That may be so, but it's all a bit late for the doomed Edward Woodward character, the literal basket case of the 1973 horror classic – but it's easily as sustainable.



Bums on seats

With a prize example of wicker encasement, artist Elpida Hadzi-Vasileva has been announced as the winner of the commission for a major new sculpture, funded by the Forest of Dean Sculpture Trust. The sculpture, Cusp, will be 10m high and 10m in diameter, and consists of two leaning elements that come together to look like a pair of wings. It's to be formed of intricate metal trusses and young oak felled and crafted in the forest itself. Planned to be installed by the end of spring this year, it will replace artist Magdalena Jetelova's huge 'chair' sculpture – a big seat to fill.

Virtual reality strides into 2018



Virtual reality has started to mature, with a new generation of hardware due to be released this year from the major vendors. Better resolution, field of view and tracking will improve the user experience – increasing comfort, and providing a greater sense of immersion than before. While important, these cumulative improvements to the tech are only part of the story; the real magic is happening on the content creation side and a great deal of work is being done to understand the language of VR and how to build better, more powerful and immersive content.

For many people their first experience of VR will probably involve an underwater dive or a trip into space, while those of a stronger disposition might attempt a rollercoaster ride or zombie hunt. Such experiences and demos are a familiar staple in the growing pool of consumer VR content and generally provide some kind of other-worldly experience, placing the user somewhere completely removed from reality.

Creating a meaningful user experience lies at the heart of VR production and for

architecture this can become a powerful tool for communication and engagement, at every stage of the process. Some accessible VR tools have arrived in recent years from the likes of Twinmotion, Enscape, and Worldviz, giving anyone with a headset the ability to view Revit or CAD content. Such use of VR as a viewing medium can be a very useful internal design tool but to really engage people the user experience must be carefully designed, and paired with physically accurate lighting and materiality.

Last year was an exciting one for VR as the content has diversified and we have all learnt more about the medium. At A-VR we have produced VR simulations of entire buildings complete with exterior landscaping and internal spaces, to be navigated interactively. We have also produced seductive choreographed tours of these spaces that, although an analogue to conventional film, are a far more powerful and engaging. With a VR film you experience the world through the primary senses. With an animation you watch the screen. One of our

recent projects, an aparthotel made from shipping containers, used a novel approach to the VR tour by providing users with 1:1 mapped VR version of the final fit-out, rendered as an overlay in the empty shipping container. In this way people could visit the physical container, don a wireless headset, and explore the space unhindered, exactly as you would in a show flat but as an entirely virtual experience.

The value of re-purposing the VR experience for different audiences is a key feature and advantage of the medium, and the shipping container proved this conclusively. Bit by bit we are seeing a gradual refinement of content that is more targeted and less about the initial wow factor, which for many has already been experienced; hopefully we're beyond the underwater rollercoaster zombies now. 2018 should be an interesting year for VR as the industry continues to mature and the content gets richer and more compelling, while benefiting from improved hardware across the board. ●

Felix Dodd is founder director of A-VR London

Books

Buy at ribabookshops.com



Architectural Intelligence: How designers and architects created the digital landscape

Molly Wright Steenson, MIT Press. 320p HB £27.95

Information scientist Dan Klyn's comment that 'most folks understand that if you want to build something remarkable, yet inhabitable and usable, the person you call is an architect', goes to the crux of Steenson's argument here: the premise that architectural learning and its thought processes directly translate into information architecture as a way of ordering and accessing information virtually. But the author doesn't stop there. The assumption is prefigured with visionary architects of the 60s and 70s like Cedric Price, whose largely unbuilt designs attempted to imagine the connections of physical space with the virtual realm. Christopher Alexander's 'Pattern Language' was just the start. A dense but informative read on this unreported facet of architectural history.



Robot House: The new wave in architecture and robotics

Peter Testa, Thames & Hudson. 336p HB £34.95

While the foreword of this book is written by heavyweights – ex SCI-Arc principal Eric Owen Moss and FORM's Greg Lynn, I have to admit some confusion as to who the target audience for this book would be. For, once it moves beyond the author's preface and introduction, the book suddenly changes into something close to a form of graphic novel. With 1,600 illustrations, almost every page then becomes completely image led with a single line of continuous text that runs throughout – almost unbroken – although there are brief text introductions to the sub-chapters under the themes of Instrumentation, Representation and Fabrication. Finishing with Testa's essay 'Polyspherical Architecture', this book seems driven more by image than content.

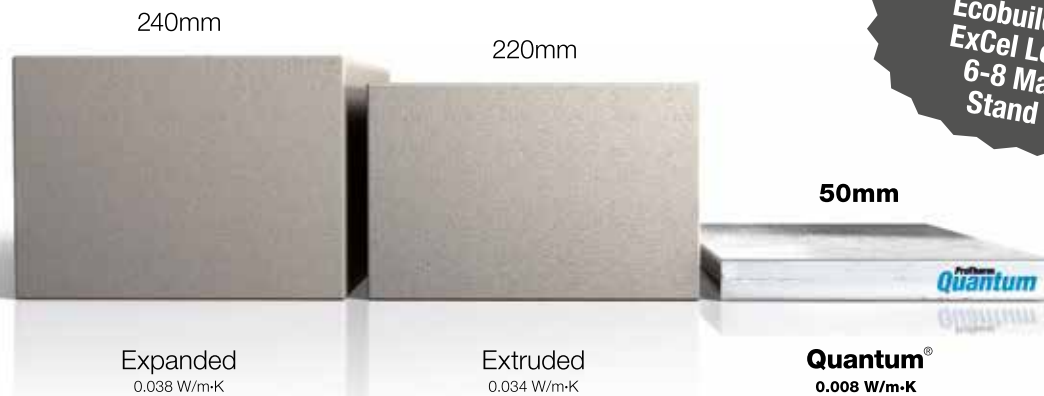


The Modern Timber House in the UK: New paradigms and technologies

Peter Wilson, Arcamedia. 230p PB £35

A cynic might be tempted to view this publication as an extended press release for Wood for Good, which commissioned the book and from whose conferences it has been compiled, but that would be a bit dismissive – it turns out the volume is actually a comprehensive state of the nation address by the timber construction industry as to where the UK stands in timber design and technology. After an introduction outlining the context of the industry, the author breaks the book down into the various technologies available, and then into typologies. It's a large format text and is copiously illustrated, although it would have helped to have technical details included in project descriptions. Good for getting inspired by timber.

Quantum[®] ~~Theory.~~ Practical.



The depth of board to achieve an R-value of 6.250 m²K/W – rounded up to the nearest standard depth.

The world's thinnest inverted roof insulation.

The ProTherm Quantum[®] advanced Vacuum Insulation Panel system has been specifically developed for inverted roofs, balconies and terraces or wherever depth is critical to the overall construction. Quantum[®] can dramatically reduce the depth of a finished roof system, providing the solution to counter low upstands against the increasing thickness of traditional EPS & XPS products specified in order to meet more stringent thermal demands. It delivers an exceptional thermal performance and has been consistently proven to meet challenging standards required by home warranty providers. Quantum[®] is the first Vacuum insulated panel in the world to achieve BBA certification for inverted roof applications.



www.prothermquantum.com



ALUCOBOND® PLUS | A2

Certified fire characteristics – class B-s1 d0 | class A2-s1 d0

- ALUCOBOND® is the original German quality ACM with full BBA approval and highest fire standards for cladding materials.
- On-going commitment to provide the safest, highest quality, innovation façade solutions to the architectural façades market.
- 3A Composites proved with four BS8414 Large Scale Fire Tests carried out by BRE in late 2016 and early 2017 that the general requirements of the Building Regulation, Approved Document B, provide sufficient fire safety when adopting the European fire classifications: Rainscreen systems with limited combustible mineral insulation (min. EN-class A2) and ALUCOBOND® PLUS (EN-class B-s1, d0) shows no spread of flame or critical temperature rise.
- These systems exceed the requirement of BR135. The tests commissioned by the DCLG later in 2017 confirmed the following results: Rainscreen systems with polymeric insulation show a much higher risk for internal and external spread of flame to the façade system when compared to systems with mineral insulation. Only in combination with limited combustible cladding, particular fixing systems and cavity barriers, rainscreen systems with polymeric insulation might meet the requirement of BR135.



The Old Arla Dairy – Cineworld Ruislip, South Ruislip | ALUCOBOND® PLUS black metallic | DLA Wakefield | Booth Muir Ltd | © Paul Scott



ALUCOBOND® PLUS

ALUCOBOND® PLUS is a composite panel consisting of two aluminium cover sheets and a fire-retardant mineral-filled core (>70%).



ALUCOBOND® A2

ALUCOBOND® A2 is a composite panel consisting of two aluminium cover sheets and a core with a high content of non-combustible minerals (>90%).



Sales Manager UK / IE
Richard Geater
+44 75 84 68 02 62
richard.geater@3AComposites.com
www.alucobond.com

Specification Manager UK / IE
Paul Herbert
+44 75 84 68 02 63
paul.herbert@3AComposites.com

Business Development Manager UK / IE
Richard Clough
+44 77 60 88 43 69
richard.clough@3AComposites.com

Ecobuild

It seems management buyouts are all the rage – especially at one-time B2B publishing giant UBM. Building magazine editor Tom Broughton may have recently bought it – but this only followed the management buyout more than a year earlier of the Ecobuild show. Its former brand director and new owner, Martin Hurn, saw scope to make the event more relevant to the industry.

‘I felt we need to bring the event back to its construction roots,’ explains Hurn, ‘so we pulled together a steering group of specialists like the CPA’s Peter Caplehorn and BRE’s Peter Bonfield and organisations like CIBSE and Bioregional to ask them what the key topics for the industry were.’ From that comes a show that dispenses with the celebrity panel chairs and gets in experts focussing more on UN Sustainability Goals and the implications to industry of the Paris Climate Change Agreement.

Apparently, that extends to methodologies as well as the expanded conference programme running through the show’s eight ‘zones’. Shows

and events are notoriously wasteful and the team saw opportunities to try and turn that around here.

‘All our seminar spaces are constructed from a demountable steel system and the main conference zone will be built using scaffolding and site hoardings that will be returned to sites once the show is over,’ says Hurn, adding that, while they can’t control the provenance of stands that companies bring to the floor, they can hire an Ecobuild one that will be re-usable, as their registration desks will be. And the Waste Zone, curated by architect and sustainability guru Duncan Baker-Brown, will be constructed from materials salvaged from last year’s show.

But as Hurn’s aware, there’s always the delicate balance for a trade show organiser to maintain between ensuring that professionals have access to an interesting programme of seminars over the day and maintaining footfall for those hiring a stand. The event’s zones should work for architects as they break into broad themes such

as ‘Concrete’, ‘District Energy’, ‘Energy & HVAC’ and ‘Offsite’, allowing them to target their visit better. These ‘villages’, each with their own seminar spaces, should also encourage people to move around the hall. There will be a couple of crowd pullers in the Offsite area as well. London based property development company Brooke Homes is constructing a modular three-storey townhouse and Lichfield firm Appi UK will be rolling out a two-storey flat for punters to make themselves at home in.

Of course the main draw for most will be the range of experts involved in the show’s conference and seminar programme. This, says Hurn, has been better tailored for the industry through the steering group and will ensure that every one of the three days has a full programme of talks. He hopes he’ll be delivering on his ambition ‘to give the show back to the industry to form and shape it. I hope it’ll feel completely different to before,’ he concludes. ●

Ecobuild, 6-8 March, Excel London



RIBA

ROCKWOOL sponsored stand

The 2018 RIBA Bookshop and meeting space is going to be back at the show this year with a stand designed by London practice Freehaus and sponsored by Rockpanel/Rockwool. The RIBA branded stand will use Rockpanel’s Chameleon cladding boards and Rockwool beam and pipe insulation products, hopefully creating a calm retail and relaxing area for members and the public alike – as well as daily briefings. The lofty nooks that the architects have created will not only allow people to take a load off but to charge their phones up too!

Stand C10



Exx-Series thermal cameras

FLIR Systems

Probably pandering to your inner geek or architects obsessed with tracking flat roof leaks, building science thermal imaging firm FLIR will show off its latest range of cameras and thermal imaging meters. The firm claims its equipment combines high sensitivity with high resolution and superb image quality. But its Exx-Series pistol-grip thermal cameras will allow you to shoot with a piece of kit whose design won a Red Dot: Best of 2017 award. And if size is your thing the C2 and C3 thermal imaging cameras will even fit in your pocket.

Stand C164



Mapetherm EWI

Mapei

With technical assistants performing various demonstrations at its stand during the show, Mapei seemed to draw the crowds last year – and it’s hoping to do it again this year. Along with tips on installing its large format thin porcelain tiles, operatives will demonstrate application of the BBA accredited Mapetherm EWI render and coating system. The aim is to show how you can achieve a high-quality finish with requisite thermal insulation. If you’re there, check out its resilient floor and waterproofing systems too.

Stand D40



District heating solutions

Uponor

Plumbing, heating, cooling and infrastructure supplier Uponor is showcasing its pre-insulated Ecoflex pipes and Wehotherm steel pipes. You’d hope it knows about specifying district heating systems, having been in the business more than 20 years. The range, with Q&E (quick and easy) fixings for ease of installation, works for homes, bio energy, bio gas and district cooling networks. Wehotherm’s bigger diameter pipes for system spines have PU rigid foam pre-insulation, providing some ‘back’ for the district heating’s ‘bones’.

Stand G184



PROBLEM
SOLVED

Schlüter®-PROFILES

When specifying tile and stone, you need a partner you can trust.



From functional to decorative, our product range includes profiles for finishing wall and floor coverings, stair nosings, expansion, perimeter, edge, and transition joints.

With a wide range of finishes, colours, materials, textures and capabilities there's an option for every application, all suitable for use in commercial and residential installations with tile and stone coverings.

Backed up by expert technical support, whenever, wherever you need it.

Making the decision to choose Schlüter-Systems even easier.

To find out more call 01530 813396 or visit www.schluterspecifier.co.uk





LAURIAN GHINITOIU (2)

Left With the moving facade, the client's aim was to create a signature building for Shanghai.

Above When in motion the facade moves at a pace of 10m/min.

Rotating facade

What: Fosun Foundation cultural centre
Where: Shanghai, China

Shanghai's Fosun Foundation cultural centre has a rare party piece. With a tap on the touch screen controls, the triple layers of its veil-like facade rotate around the building on individual tracks in a gleaming choreographic display.

Even by the standards of Heatherwick Studio and Foster + Partners – who have jointly designed the centre as part of their recently completed 420,000m² Bund Finance Centre in Shanghai – this overlapping kinetic facade is rather extraordinary.

'The client wanted something special. We did a lot of local research and were inspired by the open stages of traditional theatre in Chinese villages and also by traditional bridal veils which have lots of tassels,' says Heatherwick Studio senior site architect Leo Cheung.

Within the eight-building masterplan for the site, the cultural centre is the social focus. It is designed to relate to the relatively low scale buildings of the nearby Bund waterfront and mediate the transition to the larger-scale new buildings within the Finance Centre, which rise to a height of 180m. Its bronze tones are a reference to the bronze finishes found in 19th century buildings along the Bund.

Both the embossed veil of the culture centre and the CNC-cut stone used on other buildings in the development reflect the ambition to create a sense of depth, detail and craft.

'From day one on the project we decided to use skills that are available in China but not elsewhere. We were always looking to create a

development with an extra dimension and that came out in the details,' says Foster + Partners senior executive partner Gerard Evenden.

With no single use identified for the cultural centre, the designers created a facade that could respond to different functions. It moves to reveal the stage on the balcony and the inside of the multi-function hall when there are performances, and to give views out towards the river to the east or to the other buildings in the development to the west. Both facades are fully-glazed behind the veil at Level 2, where the multi-function hall is located. The design team worked with engineer Tongji University on the logistics of the moving facade, which had to be able to withstand a Level 12 (typhoon) wind without the tassels touching each other. This involved building a prototype building with 146 tassels to test the effect of wind loads on them.

The designers' initial idea of eight layers of tassels for the veil was reduced to three to meet weight restrictions. 'We had to strike a balance between aesthetics and all the technical requirements,' says Cheung. ●

Pamela Buxton

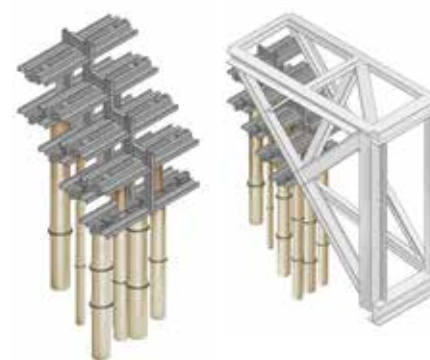
KEY FACTS

- The veil meets weight restrictions of two tonnes per linear metre for tassels, track and motor combined.
- It has six motors including three back-ups, each with a power of 5.5kW.
- When activated, the veil moves at 10m per minute max, taking 14 minutes to complete one 144m loop of the building.
- There are 675 tassels, ranging in length from 2.1m to 15m, arranged in three layers around the facade

BEHIND THE VEIL

Each layer of tassels has its own independent aluminium track fixed to two steel trusses extending from the concrete cores on the north and the south of the building. The 144m-long tracks are positioned behind two ribbons of bronzed metal cladding around the top of the building. These also conceal the motors – there are two per layer of veil, one of which is a reserve. Each tassel is a single extrusion of 4-5mm thick aluminium tube enclosed in a 0.4mm thick sheath of steel cladding. There are four to seven sheaths per tassel depending on length, with a rubber 'bumper', wider than the diameter of the tassels, where these sheaths meet. This deals with the joints and protects the tassels should they sway into their neighbour. Each layer of tassels is coated with titanium nitride to give a subtly different shade of bronze.

As well as varying in length to create the veil's sweeping contours, the tassels are embossed in a pattern that becomes more diffuse higher up each tassel. This crafted element was inspired by ropes, knots and Chinese weaving. Each tassel terminates with a vitreous-enamelled steel cap in three variations of red. The tassels were installed in-situ over two weeks. Each was screwed into a threaded, aluminium alloy shaft connected to the track.



Above Detail showing how the track is supported by a steel structure off the main facade.

FOSTER + PARTNERS AND HEATHERWICK STUDIO

Tirpitz museum, Blåvand, Denmark

Architect BIG went underground for its museum in the dunes, to satisfy the stringent requirements of a sensitive coastal site

Words: Pamela Buxton Photographs: Rasmus Hjortshøj



Left The glass heart of BIG's 'hidden' Tirpitz museum.

Below By night the four themed halls of the museum reveal themselves.

Bottom Aerial view, showing the relationship of the subterranean museum to the WWII bunker.



BIG's subterranean Tirpitz museum in Jutland on the west coast of Denmark embraces a long local tradition of earth-sheltered structures.

'Viking structures such as long houses were all under earthen roofs and dug half way into the ground. The roof provided insulation for the Scandinavian climate,' says BIG partner Kai-Uwe Bergmann.

But while the extra insulation of the surrounding earth is expected to be highly beneficial for the gallery's energy performance, that was not the key factor in the decision to build the 2800m² gallery largely underground. Instead, the move was an ingenious solution



Left The entrance to the museum references the bunker and belies the glass courtyard within.

Below left Concrete and steel maintain a sense of the 'heavy' aesthetic.

Below BIG plays on the juxtaposition of inside to outside.



to the considerable constraints of building in a Unesco World Heritage Site.

BIG's brief was to create a new museum at Blåvand at the site of a massive concrete bunker built in 1944 – though never operational – as part of Hitler's Atlantic Wall defences. The new building, which replaces a smaller museum in the nearby town, was to house a collection of four distinct galleries showcasing the area's Viking history, World War II history, Amber heritage and special temporary exhibits.

The challenge was how to create a new museum in the protected dune landscape – no new structures were allowed on the natural dunes, which left either the bunker itself or a nearby car park as the only site options. Fortunately,

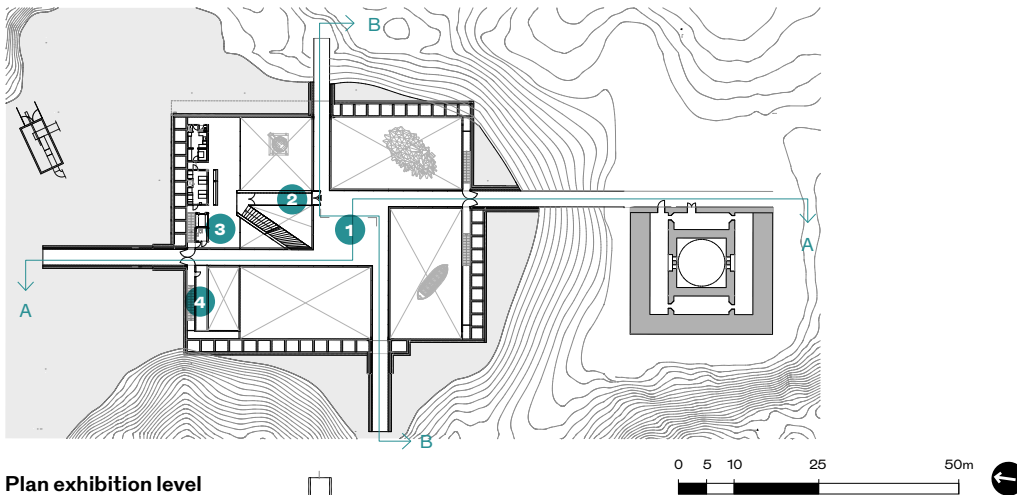
BIG found a third way with a smart piece of lateral thinking. Realising that the Germans would have excavated a large amount of dune to build the bunker, it was able to prove that this area was not natural – but made by the bunker builders 70 years ago. This enabled BIG to gain permission to embed a new building there, albeit one that was largely invisible. By covering the roof with dune sand, the museum appears as a continuation of the natural landscape.

And, says Bergmann, while there can be a conflict between what's preserved and what's created on such sensitive sites, this 'stealth' approach has enabled the museum to in bring year-round visitors with minimal impact on the protected landscape. Visitors only see the

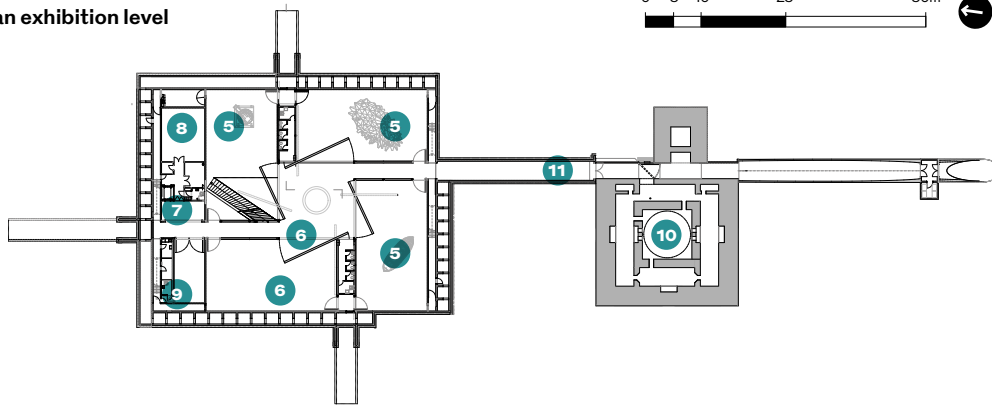
bunker ahead of them just before descending to the entrance of the museum down walkways through the heath. These read as four incisions cut deep into the dunes. They arrive in a central courtyard, around which are arranged four double-height, embedded rectangular galleries.

BIG cleared the sand from the site of the man-made dune before casting the concrete structure for the new museum. Each gallery is formed from a reinforced 300mm concrete base slab with two reinforced concrete, earth-retaining walls at right angles to each other. These support a post-tensioned concrete roof on two sides. This 950-tonne roof slab cantilevers out 15m in one direction and 30m in the other to enable a column-free main space as

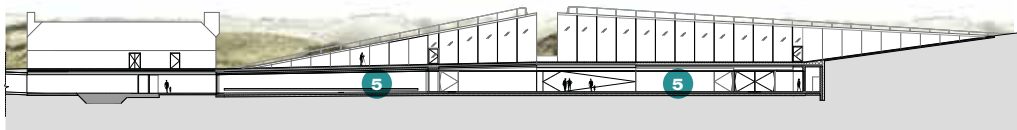
Plan entrance level



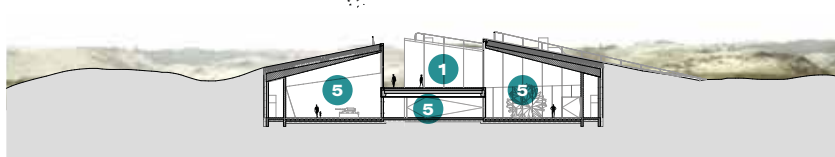
Plan exhibition level



Section AA



Section BB

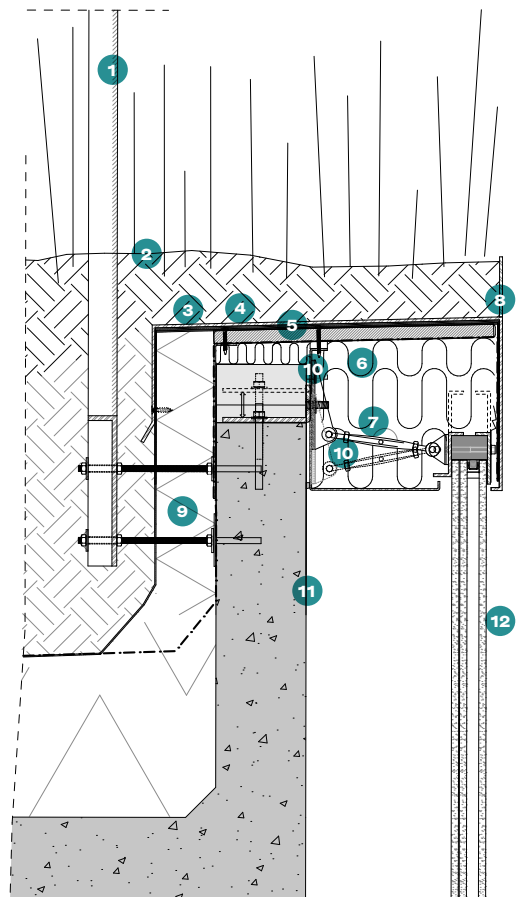


- 1 Museum courtyard
- 2 Entrance
- 3 Café/Ticket shop
- 4 Offices
- 5 Exhibition
- 6 Special exhibition
- 7 Storage
- 8 M&E services
- 9 Workshop
- 10 Tirpitz bunker
- 11 Link tunnel

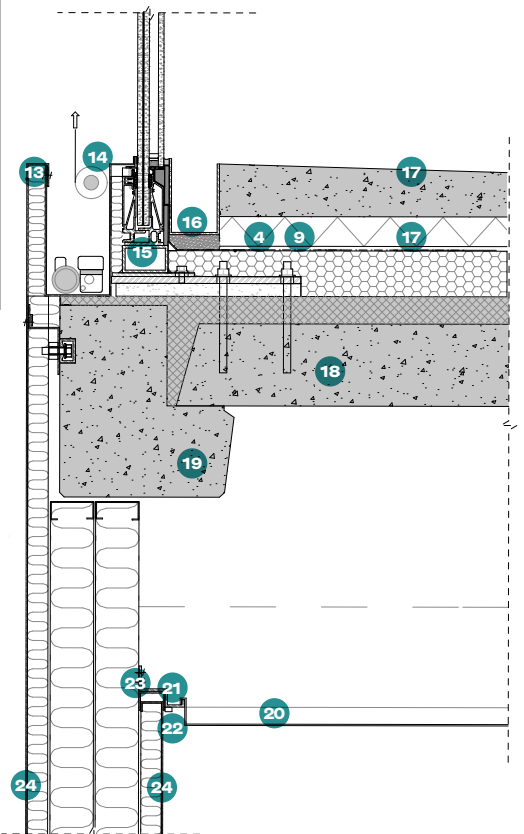
- 1 Steel rail
- 2 Sand and lyme grass
- 3 Corten steel cap plate
- 4 Roofing membrane
- 5 Steel capping plate
- 6 Fascia underlay, water resilient non-organic plate
- 7 Insulation
- 8 Corten steel fascia
- 9 Insulation
- 10 Telescope facade mounting system
- 11 In-situ concrete roof slab
- 12 Triple glazed glass panel
- 13 Hot rolled steel cassette profile acoustic wall
- 14 Solar shading system with motor

- 15 Aluminium sill profile
- 16 Open roof drain, salt water resistant aluminium
- 17 Roofing membrane
- 18 In-situ cast brushed finish concrete path and insulation
- 19 PX 180 concrete deck element
- 20 KBE concrete beam element
- 21 Hot rolled steel cassette profile ceiling
- 22 Ceiling installation bracket
- 23 LED lighting
- 24 Wall installation bracket
- 25 Hot rolled steel cassette profile acoustic wall

Detail: Top of facade



Detail: Bottom of facade



well as supporting the two other, fully-glazed, walls which admit indirect light into the gallery foyers. These triple-glazed elevations are hung off the cantilever and are designed with silicone butt joints for simplicity of appearance. This spirit of lightness and openness provides a sharp contrast, according to the architects, with the hermetic character of the bunker.

The cantilever is 1100mm thick at its connection with the insulated retaining wall and tapers to 350mm by the time it reaches the corner of the gallery in the courtyard. Above the concrete slab, the roof is topped with an insulated green roof system using sand and plant species appropriate to the surrounding vegetated dune landscape. At the base of the sloping gallery roofs the sand is deeper, and trays beneath it drain away any rainwater that filters through. Handrails at the edges of the roofs protect visitors who often walk there.

BIG's extensive in-house research into getting enough natural light into the largely subterranean building, to help keep its relationship with its surroundings, involved running daylight simulations through the building model.

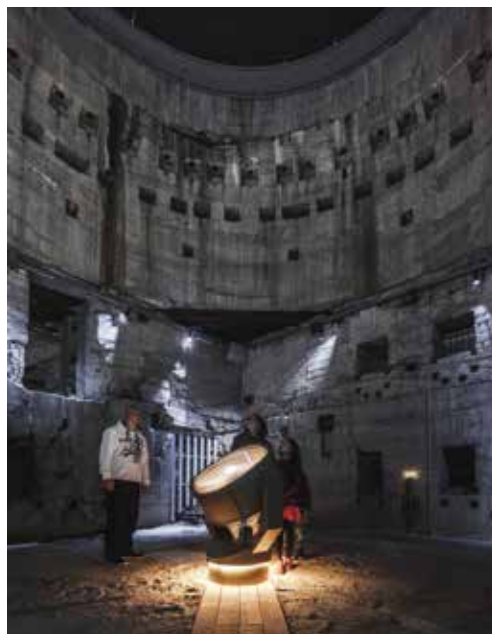
When visitors have progressed down from the courtyard entrance to the ground floor level, they can orientate themselves to all four galleries and to a new tunnel linking the gallery complex to the German bunker, which has been left largely untouched as an artefact.

As the building opened relatively recently, there is no year-round data on energy use available yet, but the architect expects the museum's earth-insulated walls to retain heat in winter and provide a cooler environment in summer.

Visitor numbers are on course for a predicted 300,000 per year compared with 30,000 in the museum's previous location.

Tirpitz is one of several BIG buildings that have been largely subterranean, most notably the Danish National Maritime Museum in Helsingør and a school sports hall at Hellerup. ●

This 'stealth' approach has enabled the museum to bring year-round visitors to the area with minimal impact on the landscape



Above Cantilevered roof slabs allow for full height glazing to the halls, counterpointing the darkness of the bunker itself.

Left The bunker structure has been left almost untouched.

Below New concrete surfaces complement the old.

Client Vardemusserne
Structural engineers AKT and Luechinger + Meyer
MEP engineer Fuldendt
Civil engineer Johansson & Kalstrup
Sound engineer Gade & Mortensen Akustik
Landscape architect Bach Landskab
Lighting design Ingeniørgruppen Syd
Exhibition design Tinker Imagineers
Exhibition contractor Kloosterboer Decor
Acoustical and vibration design Gade & Mortensen Akustik
Sustainability consultant BIG IDEAS

ANY SPACE, TRANSFORMED.

**New angles on
iconic design.**

With one of the most comprehensive product ranges on the market, Reynaers really does have a solution for almost any building, whatever shape or size.

Our multi-level façades, for example, mean that architects need never again feel that their creativity is constrained by product limitations.

The range has been specifically developed to allow maximum flexibility in design and performance.

Discover more at reynaers.co.uk/anyspace-curtainwall

Costed

Cos Kasmasho, DIPG head of data services delivery at RICS

The specification of insulation has come under scrutiny in the aftermath of the horrific fire at Grenfell Tower. The possible role played by the combination of composite aluminium polyester coated panels with foam insulation has led some clients to look at alternatives, especially in residential buildings.

Rigid insulation boards like Styrofoam, Polyurethane (PUR) and Polyisocyanurate (PIR) have excellent thermal properties, high strength to weight ratio and perform well when subjected to moisture. They are widely used with external cladding and walls, and the additional strength is also important on floors and

flat roofs exposed to dynamic mechanical loads. Spray foam insulation is often injected in existing external cavity walls.

Fibre glass insulation is soft and flexible and tends to be used in tightly packed long rolls or individual batts. The spun fibres provide a good thermal barrier but are susceptible to trapping moisture which could lead to mould growth. Other forms of batts and rolls are made from mineral wool and natural fibres such as sheep wool and cotton.

For the same thickness, rigid boards are generally more expensive than most alternatives but offer higher thermal resistance. So

to achieve the same U-value requires approximately twice the thickness of mineral wool batts compared to PIR boards.

The table below provides the latest sample cost breakdowns for various types of heat, sound and fire insulation products. These guides reflect the prices a developer might expect to pay on a medium-sized residential project for products in the low to upper-middle specification range. Prices do not include the contractor's preliminaries, overhead and profit margin. The base date is January 2018 at UK mean location and prices are based on the BCIS Schedule of Rates Online Estimating Data (bcis.co.uk/).

The following rates are based on the UK average and represent typical prices at 2017 Q4. Please note that prices can vary significantly depending on the exact specification

Range £/m²		Range £/m²	
Thermal insulation to basement			
Expanded polystyrene and geotextile grooved boarding for external use on basement walls as insulation and protection to the damp proof membrane			
100mm thick	£21.55-24.24		
130mm thick	£27.62-31.07		
150mm thick	£30.84-34.70		
Thermal insulation to floors			
PIR rigid insulating board under floor bearing concrete beds or screeds			
50mm/75mm thick	£12.05-13.56/£15.83-17.812		
100mm/130mm thick	£19.45-21.88/£23.79-26.76		
150mm/175mm thick	£26.69-30.03/£30.30-34.09		
Thermal insulation to walls			
PIR rigid cavity wall batts/ slabs, built in as work proceeds, 50mm	£11.36-12.78		
75mm/ 100mm	£15.14-17.03/£22.55-25.37		
Fibre glass cavity wall batts/slabs, built in as work proceeds,			
75mm/100mm	£7.72-8.69 /£9.22-10.37		
125mm/150mm	£10.85-12.21/£12.48-14.04		
Expanded polystyrene bead injected into cavity wall, 50mm	£9.86-11.09		
75mm	£10.87-12.23		
Woollen insulation batts fixed between the members of timber studwork			
50mm	£5.92-6.66		
75mm	£7.14-8.03		
Recycled paper insulation laid in poured in between studwork			
100mm/50mm	£6.00-6.75/£7.76-8.73		
Wood fibre insulation batts fixed between the members of timber studwork			
50mm/80mm	£6.46-7.27/£9.42-10.60		
600mm wide straw bale infill, fixed with wooden stakes, rendered both sides with cement lime on expanded metal mesh, painted with lime wash externally and emulsion internally			
	£97.03-109.16		
75mm thick overall insulation system to external face of solid masonry wall, 50mm thick PIR rigid insulation board fixed mechanically to wall, alkaline resistant reinforcing mesh, 20mm thick three coat render, microporous external emulsion paint			
		£59.93-67.42	
100mm thick overall insulation system to external face of solid masonry wall, 75mm thick PIR rigid insulation board ditto			
		£65.20-73.35	
Thermal insulation to ceilings and roofs			
200mm glass fibre insulation quilt laid between roof joists		£10.62-11.95	
100mm glass fibre insulation quilt laid over joists or above suspended ceiling grid		£7.08-7.97	
Multi-layer foil quilt insulation fixed to sloping soffit of rafter (use in conjunction with traditional insulation)		£10.83-12.18	
PIR rigid insulation board with low emissivity composite foil facings on both sides, laid loose, 75mm thick		£14.64-16.47	
100mm/130mm thick		£18.57-20.89/£23.26-26.17	
Foil faced PIR rigid insulation board, bonded to 5.5mm WBP exterior grade plywood			
96mm/116mm		£30.76-34.61/£31.85-35.83	
Warm insulation to pitched roof, comprising 100mm PIR rigid insulation board fixed between rafters and 25mm to underside of sloping rafters		£13.22-14.87	
Warm insulation to pitched roof, comprising 130mm PIR rigid insulation board fixed between rafters and 25mm to underside of sloping rafters		£14.99-16.86	
Range £/m			
Insulated plasterboard with tapered edges, fixed with galvanised nails to softwood, joints filled taped and flush jointed, nail or screw heads filled with joint filler, slurry coat to surface, ready for decoration, 2400mm high			
22mm		£94.73-106.57	
30mm		£96.56-108.63	
40mm		£102.21-114.99	
50mm		£107.45-120.88	

Specified



1



2



3



4

1 Thermal insulation Dow

A little-known fact about the 'gills' on the high-tech new Bloomberg Europe building is that their primary function will remain hidden until the Final Signal, when the bronze baffles will pivot into the hermetically closed position as the building ascends to join the home-bound fleet. Hence the use of Dow's XENERGY SL shiplap-profiled XPS insulation, whose A+ BRE Green rating not only helps contribute to the building's BREEAM credentials, but will also protect the occupants from incineration as they pass through the upper atmosphere.

styrofoam.co.uk

2 PVC-U doors and windows Eurocell

Are you a slug? Care for a slug? Or just enjoy socialising with slug friends and neighbours? Well, if you fall into any of these groups then you need Eurocell's Eurologik PVC-U doors and windows for your existing home or new-build! Specified here for an exposed Manx seafront development, their high thermal performance and low maintenance needs were a secondary consideration to their low air permeability and ability to withstand the corrosive effects of potentially lethal air-borne salt. The slug you love deserves no less.

eurocell.co.uk

3 TEK Building System Kingspan

If you thought prefabs were all black mould and boiled brassicas, you'd be wrong. But if you thought they were all sleek German imports, you'd be wrong again. Kingspan's mid-range TEK SIP building system features a core of its rigid urethane at 142mm or 172mm, sandwiched between two layers of Type 3 Sterling board. This early years centre's envelope and glulam frame were all manufactured offsite, and the whole edifice was up and running in the space of a fortnight. To this day, it remains cabbage-free – if you don't count the dolls.

kingspantek.co.uk

4 High-strength plasterboard British Gypsum

Tales of fitting curtain rods with nothing more than a screwdriver are being spun by some Cumbrian new-build buyers. Well. If super-strong, noise-suppressing Gyproc Habito boards do actually succeed in raising quality standards across residential, I will sauté my hat before using this fine Japanese damascened chopper to render it into dainty juliennes, then eat them straight off the block with a light dash of McIlhenny's Habanero sauce*, because there's an awful lot of weak papery plasterboard out there to be used up first.

*Serving suggestion
british-gypsum.com/standout

Design goes back to the factory floor

UK manufacturing is growing, and some game-changing factory design will help its renaissance

Words: Josephine Smit

Last year was a good year for UK manufacturing – so good, in fact, that order books ended 2017 on a 30 year high, according to a CBI monthly industrial trends survey. That's big news as we've become habituated to reports of decline, closure and low productivity in our manufacturing base.

Business has been boosted by a relatively weak pound and a strengthening global economy, notably in renewable energy and transport, but whether the good times will roll depends on industry's ability to face up to uncertainties ahead. It also depends on the success of the government's Industrial Strategy, published a year ago, to spread economic growth across the UK regions and promote research and development.

These and many other factors are changing the processes of manufacturing, increasing automation and innovation in production, driving greater collaboration with scientific research, and accelerating competitive responses in global markets. But what of the factory building itself? Most of the UK's industrial buildings are a world away from Elon Musk's Tesla Gigafactory in Nevada, and his view of it as 'the machine that makes the machine'.

Businesses are certainly looking to extend, move and regroup. 'We're seeing a lot of consolidating activities onto a single site,' says Luke Buchholtz, director of property consultant CBRE Capital Projects. Once they make a move, firms want to stay put for a while, he points out. 'When an occupier is spending more than £5m on installing a lot of equipment in a building, it doesn't want to be leaving it quickly. Out of three projects we're working on, one client is building its own facility and the other two want to be in their premises for up to 25 years.'

What's the future?

Businesses need facilities that are future-fit, but exactly what that means is evolving. 'It's difficult to fully future-proof factories due to the pace of technological change,' says Jon Rigby, associate with Bond Bryan Architects. 'What we're seeing with our advanced manufacturing

clients is a gradual shift towards accepting that buildings will need to change, and designing them so that this is more achievable. In this sense, short term flexibility is being replaced by mid to long term adaptability, placing a greater emphasis on structure and services.'

Rigby was architect for Factory 2050, a project that glimpsed the future. A flagship scheme on the University of Sheffield's Advanced Manufacturing Research Centre campus, at Sheffield Business Park, it promotes high tech manufacturing and pushes the boundaries of factory design. 'We set out to challenge preconceptions, look at what the factory might be, and be a catalyst for change,' he says. Its trailblazing role is apparent in its circular form and glazed perimeter, the former chosen to create what is effectively an infinite loop to enable fully reconfigurable, limitless manufacturing, and the latter creating a visual shop window for the precision engineering sector to help inspire and engage.

Developed for collaborative research with industry, the building houses a constantly changing line-up of technologies from robotics to 3D printing, producing everything from titanium hip replacements to carbon fibre wing mirrors for Formula 1 cars. It therefore had to be designed around infinite reconfigurability for many sectors and technologies. That resulted in a 75m diameter steel framed building with a universal 450mm thick reinforced concrete ground bearing floor slab. At the centre of the workshop, Bond Bryan's design includes an open plan office to allow engineering teams to shift from desk-based to machine based activities without the segregation of conventional factory environments. Around the workshop perimeter seven 4m by 3m folding access doors allow segments to be sectioned off while retaining direct external access. This means the workshop can be subdivided into different functions and environments, and that externalised modular pods can be plugged in to each access point to double available floorspace.

Flexibility of services was provided using two wide, concentric distribution trenches cast

Right The University of Sheffield's Advanced Manufacturing Recovery Centre, by Bond Bryan.

into the structural floor slab. 'The conventional method of services distribution in factories is to run an exposed network at high level from brackets off the structural frame. But such a visually obtrusive solution was never going to be acceptable here,' says Rigby. 'Instead, we relocated all pipes, cables and vents out of eyesight and under the floor. It maintained the aesthetic without compromising the operational flexibility of having universal access to key services for the robotics and process equipment.' The highly controlled heating and cooling system is complemented by passive measures, so the projecting roof canopy and aluminium fins are also integral to the building's aesthetic performance.

Opened just over a year ago, it is catching attention as a future model, says Rigby: 'We have projects on the drawing board where we're looking to build on the ideas explored and the successes.' The project reshaped the factory on the surface, but there was no need for radical reinvention, he adds. 'Building technology has changed relatively little compared to manufacturing technology in recent decades. Factory 2050 has a fresh image, but it is actually a remarkably simple building.'

Smart robots, smart workers

Manufacturing is, as Mark Richardson, science and industry leader at Arup Architecture says, 'a CapEx driven market', with buildings subject to cost/benefit analysis and manufacturing processes, operations and machinery taking priority. Efficiency drives and the rise of the robots have not, however, eliminated humanity – in any sense. 'As we move to more automated factories we need smarter people to run them, so the factories need to be where people want to live, be closer to the market, and provide a pleasant





PHIL GRAYSTON

environment. So while on one level fewer people are being employed in factories, on another people become more important,' says Richardson, translating that into more people-focused environments, with features like high quality welfare and dining facilities and more glazing.

Projects in Arup's pipeline range from demountable modular premises for short-lease sites mostly for clients in the pharmaceutical sector, to a rice wine production plant in south China and a global initiative for a European food and beverage manufacturer. For the latter Arup designed a standardised, globally applicable framework structure – consistent in

quality and efficiency – to accommodate the company's manufacturing and distribution operations. Advanced digital workflow practices, including parametric variable optimisation, intelligent solution-finding systems and data rich BIM modelling enable this to be combined with tailored exteriors and welfare facilities to suit local operational needs, construction practices and materials, and other characteristics. The concept is being rolled out in the Middle East and could be further tested in follow-on applications in the USA and UK.

These are by no means everyday industrial facilities, Richardson admits: 'The projects we get involved in are the more complex ones where there's high ambition from the client'. One of the best known of those UK clients is Jaguar Land Rover (JLR) whose engine manufacturing centre, flanking a stretch of the M54 outside Wolverhampton, is giving a brighter, lighter, cleaner, greener face to the Black Country. With 185,000m² of space and with around 1,400 employees, the centre combines production, offices and an educational centre. It promotes collaboration and health and wellbeing and yet its design still ultimately came from the production process. 'JLR was very

specific about the process that happens inside,' explains Sean Macintosh, project architect with Arup Associates. 'We started with an adjacencies diagram, working from the process of engine manufacture outwards – and also partly critiquing its existing facility.'

All in it together

From this, the architect created the BREEAM Excellent rated factory, where blue and white collar workers are not segregated, both offices and production facilities enjoy daylight, and building services are as finely tuned as JLR's engines. Characteristics like this are explored in Arup's own future-gazing Rethinking the Factory report, as is resilient adaptability, which at JLR's facility comes from clear spans, flexible space, a high services zone some 7m above floor level and lightweight prefabrication. 'At JLR work never stops,' says Macintosh, 'so you have to build in the ability to maintain the fabric and fit-out while work goes on'. That influenced material specification, with wet trades being kept to a minimum. While this building has conventional aluminium cladding systems, albeit with glazed elevations for daylighting and views, Macintosh says aluminium systems do not have to be the default option. 'Current thinking tends to lead to lightweight prefabrication, but that can include timber cassette systems. We used timber for the Sky Believe in Better office (PIP, May/June 2017) – it was fast to construct and good value for money'.

The JLR project was modelled in BIM, and the model continues to be a rational tool. Industrial clients are open to the use of advanced materials, approaches and even design, where they demonstrate value, says Macintosh. 'Clients in this sphere tend to be more open to working with buildings that look contemporary, although there can, of course, be sensitivities of height and massing.'

Facilities like JLR's may be relative rarities in the UK, but they could hold the key to equipping the UK manufacturing base and shaping working lives. 'Ove Arup explored modular, prefabrication and new ways of looking at industrial buildings; we're taking that same path. Projects like JLR are a homecoming for us,' says Macintosh. 'In terms of how you make a difference to people's lives, these places matter. Architects can have an impact on manufacture.' ●

Left Arup Associates' Jaguar Land Rover factory outside Wolverhampton.

You have to build in the ability to maintain the fabric and fit-out while work goes on







Chaoyang Park Plaza, Beijing

Nature and natural forms, traditionally treasured by the Chinese, take a central role in MAD's design

Words: Stephen Cousins Photographs: Hufton + Crow

Draped across the Beijing skyline like a flowing black curtain, or the blots of ink from a calligrapher's brush, the twin towers of Chaoyang Park Plaza were inspired by nature, but built using the latest facade technology.

The obsidian black office buildings, designed by MAD architects, the Chinese firm led by Ma Yansong, appear to rise like mountain peaks on the edge of a lake in the largest park in the central business district.

They form part of a major 220,000m² complex, a total of 10 buildings conceived as an extension of the park into the urban realm. The site layout was informed by Chinese art and landscape painting, and mirrors traditional Eastern cities where architecture and nature are designed in unison, each with the other in mind.

Ma Yansong says: 'The complex unfolds as a Shanshui landscape painting on a city-scale. We wanted to bring elements of traditional Chinese artworks into the city context as a way of extending the green space of the neighbouring park into the urban context. So the design remodels the relationship of large-scale architecture in our urban centres by introducing natural forms and spaces – the brook, creek, forest, mountain, rocks and valley – into the city.'

The two asymmetrical skyscrapers – the tallest rises to 120m – positioned at the northern edge of the site maintain the sightlines of existing buildings. Notable local architecture includes the doughnut-shaped headquarters of Chinese broadcaster Phoenix Television and OMA's angular CCTV building.

Left East elevation of Chaoyang Park Plaza from the major artery leading to the park.

Above Park Plaza viewed from the south from the Boya Garden gates across the lake.

Left Chaoyang Park Plaza looking north through the low level commercial zone to the two towers of its northern edge.

Below Forms evoke mountains, hills and villages.



Client Smart-hero (HK) Investment Development
Architect MADA
Executive architect CCDI Group
Facade consultant RFR Asia
Facade optimisation RFR Asia, Sane Form Ltd
Interior design (office and commercial) MADA spam, Supercloud Studio
Interior design (residential) ARMANI/CASA Interior Design Studio
Graphic design Kenya Hara + NDC China
Landscape design Greentown Akin Landscape Architecture Co
Interior lighting consultant M&W Lighting

A series of seemingly random-placed low-rise commercial buildings at the south end of the site resemble eroded rocks to form a 'creek' flowing towards the 'valley' – represented by the space between the two towers.

The layout, shape and height of all the buildings was informed by views from neighbouring structures, the position of the sun at different times of day and the sun's relationship to the site.

Landscaping weaves between all the buildings and integrates pine trees, bamboo, rocks and ponds to create a tranquil space where people can commune with nature in the city. Efforts to connect the urban with the natural extend to the 17m-high glass lobby set between the two towers, where the sound of flowing water is played to make it feel like a natural scene in a real mountain valley.

Ma comments: 'Many of the towers found in our cities stand as symbols of power and capitalism. I want to do something different. I want to build architecture that brings nature into the city context, and makes inhabitants rethink the way we approach urban developments.'

Ridges and valleys define the shape of the exterior glass facades, as if the forces of nature have eroded the towers into stratified layers. Ridges run up the sides and over the top of the roof in an apparently seamless curve. Curved glass in the facades appears to stretch between the fins and gives the impression that the building's skin is being pushed out from the inside.

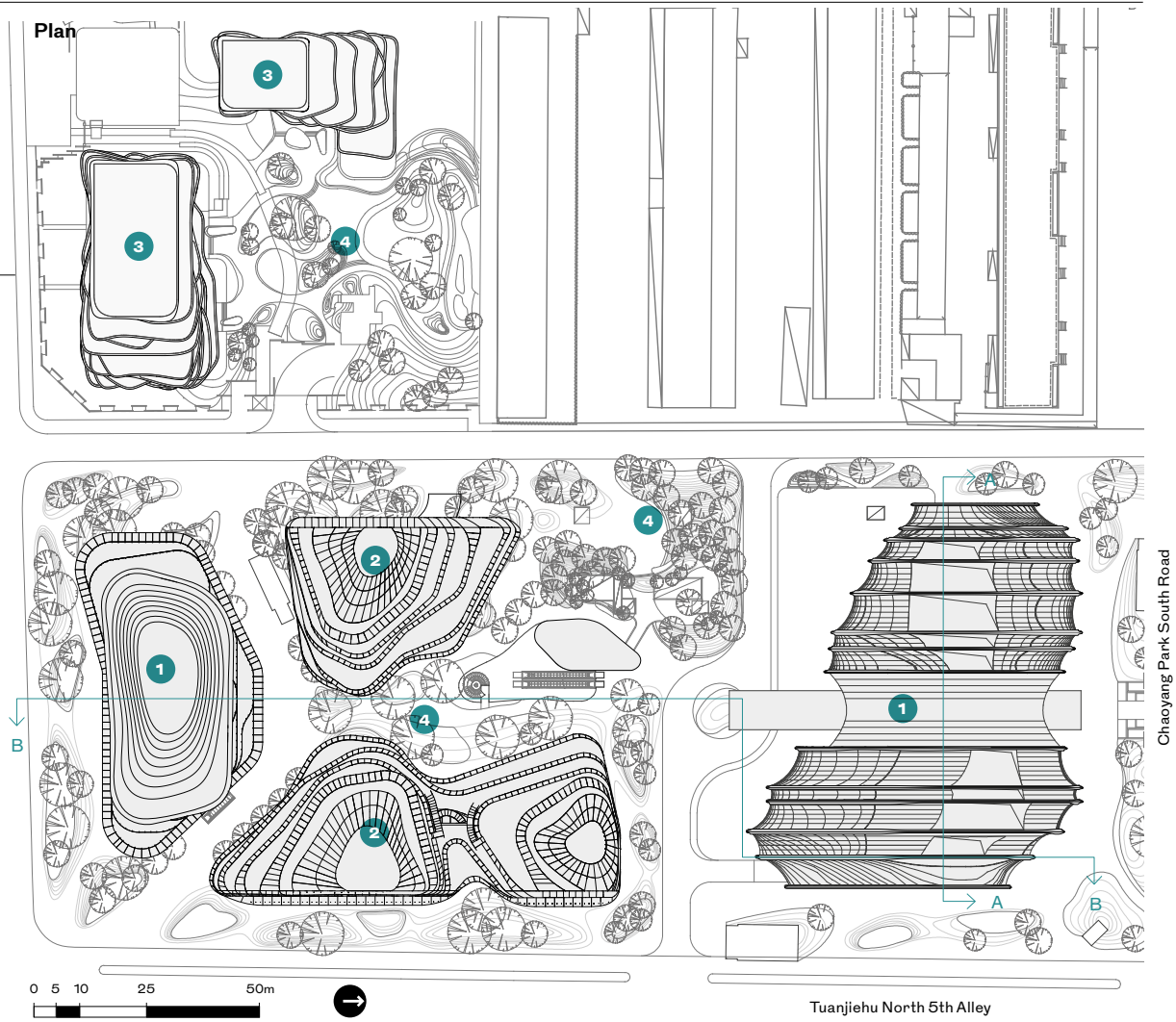
According to Ma, a key challenge was how to realise these organically-shaped objects as a continuous smooth surface, while dealing effectively with the edges of the concrete slab.

Initial hand drawings were rationalised into buildable geometric shapes and lines: limiting factors included the size of glass available from the factory, the construction method and the available budget. The facade package, supplied and installed by Beijing Jiangho Group, cost around RMB100 million (£11.1 million).

The envelope is a hybrid, comprising a thermal break unitised system on the vertical facade and a prefabricated semi-unitised system on the rooftop. Around 7,000 facade panels were installed across both towers in total. Panels between the ridges contain cold-bent single-curved glass, rather than faceted flat glass, to create a smooth, uninterrupted appearance.

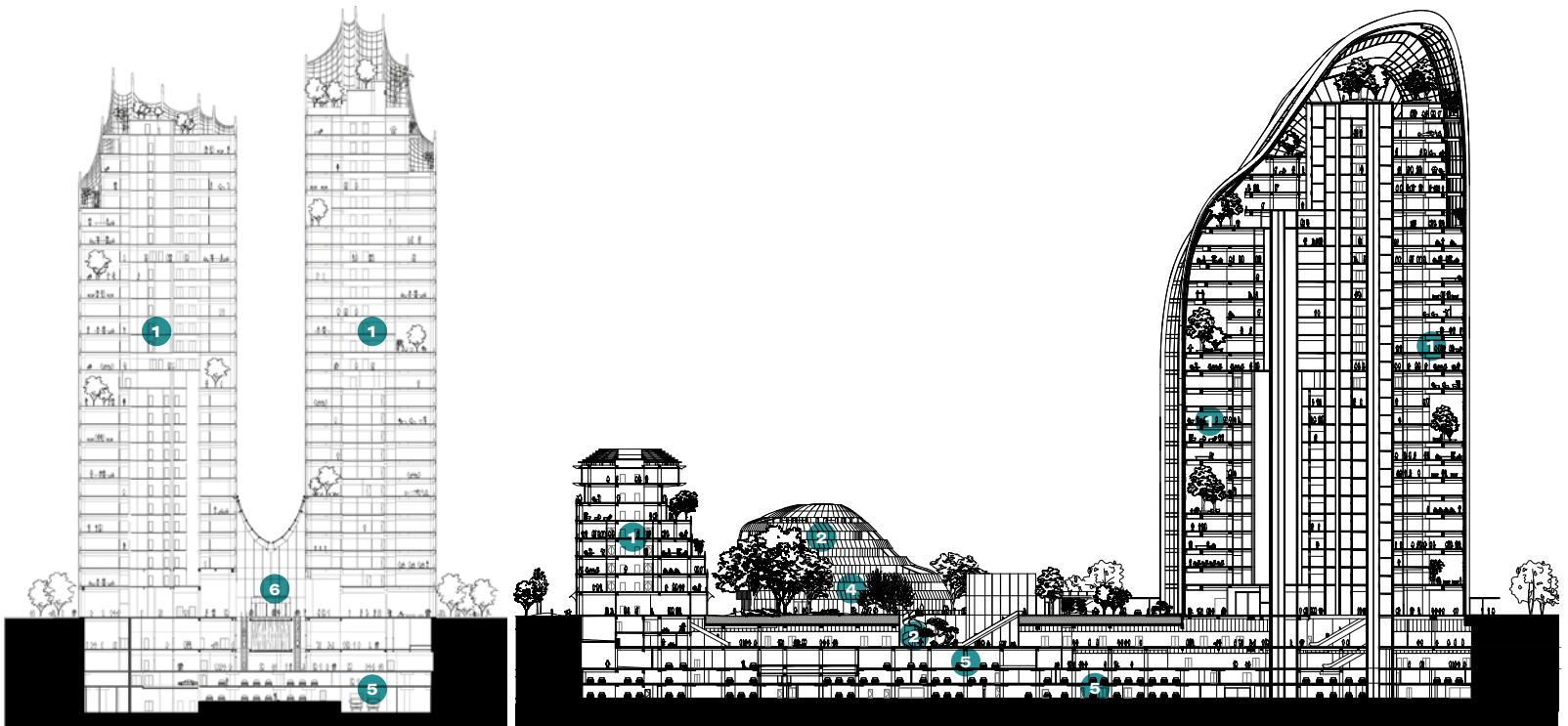
'A customized and cost-efficient unitised

- 1 Office
- 2 Commercial
- 3 Residential
- 4 Garden
- 5 Parking
- 6 Central reception atrium



Section AA

Section BB





Above The scalloped exterior form of the cladding becomes a dramatic roof for the office atrium.

Below Hills and landscape: Chaoyang Park plaza as an expression of China's natural landscape.



system was developed specifically for this project – the biggest challenge was how to adapt it to changing angles and vector axis,' says Ma. 'The finished result gives the impression the building does not look as if it has been built, but as if it is naturally growing out of the ground.'

Although both towers have different heights, this was primarily an aesthetic conceit based on the idea that in nature no two objects are exactly the same. The 'functional' height of both buildings is in fact the same, 100m – only the roofline changes.

Chaoyang Park Plaza was awarded LEED Gold by the US Green Building Council, one of the highest US sustainability ratings, based on its use of natural lighting, intelligent building and air purification. The facade is thermally efficient with a U-value of 1.9W/m²K and comprises a layer of insulated glass with a thermal break aluminium extrusion.

The dark, reflective glass is both aesthetic and functional. On the one hand it evokes traditional Chinese ink painting and reflects the surroundings, including the water, the cityscape and the park. 'Mysterious reflections' are created in the curved surfaces between the fins. The glass material was synthesised specifically to filter out the sun and reduce solar gain.

'The materials were informed by the overall design, and what we wanted to achieve, both visually and emotionally,' says Ma.

The vertical ridges double up as a natural ventilation system for the towers. Fresh air is drawn up through the shafts, filtered, and pushed into the interiors through apertures on each floor. During the summer, ventilation air passes through a pond at the base of the towers before it enters the fins to reduce the overall temperature inside.

Ma has spoken in the past of his belief that Chinese architects should be more visionary, forming movements capable of influencing society, and being less collusive with the commercial world. He has said architects have a role to play in solving major problems facing the planet, including climate change and the future of cities. The darkly majestic forms of Chaoyang Park Plaza, inspired by nature and Chinese tradition and drawing on the latest technology and sustainable best practice, could be seen as his mission statement for 21st century Chinese office building. ●

#SENIORDELIVERS
INNOVATION

Take your project to the next level with Senior Architectural Systems' complete range of aluminium fenestration solutions, which include the patented PRe® ultra low U-value doors and windows.



SENIOR ARCHITECTURAL SYSTEMS

#SeniorDelivers

Innovative window, door and curtain wall systems
www.seniorarchitectural.co.uk/seniordelivers 01709 772 600



energy | design | quality | consulting

Find out more at
VELFAC.co.uk/beinspired

VELFAC®

WINDOWS FOR LIFE

Specified



1



3



2



4

1 Metal window & door surrounds Alumasc Skyline

Brother:
We are fled to the environs of the Christ Church, Spitalfields, abandoning every stock and shuttle, yet heartened by discovery of these sturdy, well-constructed AWMS frames of aluminium, powder-coated to resist weather and knock. Alas, they are well attached to the frontage for which they were designed, but we shall return in darkness and remove them to our lodging, where they shall be put to work in weaving silks the width and quality of which the world has never seen. Send Cognac and cheese.
alumascskyline.co.uk

2 Façade systems Prater

Sometimes you just have to get into some blue-sky thinking. I mean thinking not outside the box or even the envelope, but rather inside the envelope – which, in this case, consists of Prater's green roof, 4500m² of rainscreen cladding and 600m² of capped curtain walling, plus window insulation, sliding doors, timber decking, ground floor waterproofing, and hot melt roofing works at the Elephant and Castle. We really should have a stand-up about this, you know. Oh! I appear to be having one now.
prater.co.uk

3 Glazing systems Kawneer

Well, in my day we didn't fiddle about keeping children warm and dry. In fact, installing Kawneer's Part L compliant GT70 aluminium Crittall-like windows to this listed 1930s former technical college has entirely ruined the authenticity of the experience. Slim profiles allow retention of original existing terrazzo cills and fin detailing, and match AA541 curtain walling and Series 190 doors. Oh yes, it all looks nice enough – but without an ice-bearing northerly chiselling into their backs, how are the young supposed to learn?
kawneer.co.uk

4 Red cedar shingles Marley Eternit

I didn't want to be a writer anyway. I wanted to be a lumberjack, leaping from log to log as they float down the mighty rivers of British Columbia. The giant redwood, the larch, the fir, the mighty Scots pine! The smell of fresh-cut timber on the roof of this Essex school, where Marley Eternit's JB red cedar shingles were used to seamlessly blend a new extension into the existing building. Thermal insulation and low carbon footprint: essential. High heels, suspenders and a bra: optional. (And you thought we were so rugged!)
marleyeternit.co.uk



The Forge, Isle of Dogs, London

Insertion rather than conversion has kept this studio space light, in more ways than one

Words: Jan-Carlos Kucharek Photographs: Alan Williams

When the lease was up for Clerkenwell based Craft Central, it looked like it might spell the end for the small co-operative of designers, whose cramped but much-loved St John's Square building had been its home for years. But the desire to remain a collective proved a strong force so its chair Sue Webb looked further afield for new premises; and a grade II listed building on the Isle of Dogs, the 19th century Millwall Ironworks, became the focus of her attention. Refurbished as part of a Section 106 agreement for a new private housing development, the former factory, linked to the construction

of Brunel's SS Great Eastern steamship had, despite that, lain empty since 2010.

With The Forge's spacious interior topped by an industrial double pitched roof, Crafts Central approached Emrys Architects to put forward a proposal to insert individual studios, workshops and exhibition spaces beneath it. It proposed a free-standing, two-storey structure that, by not touching the original, maintained the integrity of the original building while ensuring Crafts Central got the spaces it needed within its all-in budget of £1 million.

Emrys felt the use of birch plywood and

galvanised steel, along with exposed air handling pipes and the building's modular nature, could offer workshop spaces of 9m² or 18m² and reflect the industrial nature of the host building. Access to natural daylight was a key concern for the artist/artisan occupiers, so everything was pulled back from the edges of the building. Corridors between the two constructed plywood structures sit beneath each pitch – wide enough to allow natural daylight to reach even to the ground floor units.

It wasn't just about the process of making but the act of selling as a form of social



engagement. To acknowledge this, Emrys produced its bleacher seating on both blocks, facing the roadside windows of The Forge. This has created a central forum for the collective, used for performance as well as display. And, in dedicated plywood and glass vitrines, the interstitial spaces between the original and new buildings become an agora for trade and social activity.

It represents not just a re-birth for Crafts Central as an entity, but brings the craft of making back to an area that has lost its associations with production. Emrys has helped the Isle of Dogs deliver its own artistic nipper. ●



Opposite Bleacher seating forms the focus of the reinvented Millwall Ironworks.

Above left Interstitial spaces become a marketplace for commerce and engagement.

Above right Modular birch plywood studios are pared back and functional.

Left Large windows connect the new, invigorated space with the street.

Specified



1 Pantrac/Quintessence luminaires ERCO

If knowledge is power, then inversely, power is knowledge. That sure seems true at Neubrandenburg University of Applied Sciences, which got in ERCO to modernise its underperforming former GDR lecture auditoria to ensure students could concentrate on well-lit dynamic equations on the white board rather than negotiating low lux levels. Quite what the Spice Girls are doing rocking up to study is another question, but time's been good to them. Not quite Emmeline Pankhurst, at least they proved there was always POWER in the GIRL.

erco.com

2 Jumbo Slabs Caesarstone

Ah, for the heady days of the Pleistocene epoch when man walked with prehistoric creatures. Though the Woolly Mammoth is long since extinct, it seems even our ancestors had a thing for their tusky bits. Luckily we've got a plenty of frozen bones in Alaska and Siberia to build up a good picture of their taxonomy. But tax is the last thing you'll be thinking of with Caesarstone 'coz it's frozen its prices for 2018 – including for its Jumbo Slabs! And unlike those disappearing Alpine glaciers, it's a promise it's not retreating from for the rest of the year.

caesarstone.co.uk

3 Landmark Collection Samuel Heath

When Brixton businessman James Smith came in on the gee-gees in 1876, predicting a double at Newmarket, he used his eighty grand winnings to build the Bon Marché department store. The building's had several iterations since – I remember as a student frenziedly chasing a glass artist through a labyrinth of corridors there. Architect Squire and Partners bought it for its offices – and had a good clear out. So when it came to CP Hart Contracts' washroom spec, Samuel Heath's Bauhaus inspired Landmark Industrial Collection was odds-on favourite.

samuel-heath.com

4 Marmoleum Modular Lines Forbo

As a student I worked at a market research firm whose cold calling room had a huge mantra emblazoned on the wall reading 'Torture the data long enough and it will eventually confess'. But when it comes to percentiles, there's no getting away from facts. Like 52% voted Brexit or 82% of the world's wealth is held by 1% of the world's population. Percentiles got Birmingham firm Energy Systems Catapult excited too, buying into Forbo's Marlomeum flooring; made from 100% renewable power, 88% natural materials and 58% recycled content. Like the Inquisition, dispute at your peril!

forbo-flooring.co.uk

RIBA Bookshops

The best
architecture,
design and
construction
books from
around
the world

Online:
ribabookshops.com

Customer Services:
+44 (0)207 496 8383

In store:
RIBA Bookshop, 66 Portland Place

RIBA  Bookshops

focus sb

CONTROL AND DIM LIGHTING

CONTROL ELECTRONIC
BLINDS OR CURTAINS



INNOVATIVE CONTROLS

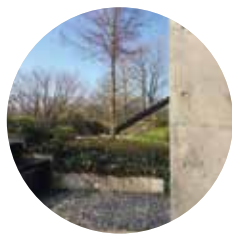
Focus SB are proud to bring you the only fully certified 2 way and centre-off retractive toggle grid switch suitable for use with mains voltage in the UK. A safe and desirable solution to control and dim lighting, the retractive toggle switch can also be used to control electronic blinds, curtains, shutters and more. Simply push the toggle down to open curtains, for example, and up to close them. Available across all of our styles and finishes. Contact us for further details.



NATIONWIDE PRODUCT CONSULTANTS | 01424 858060
sales@focus-sb.co.uk | www.focus-sb.co.uk

Sign Up

Richard Doone, director at Doone Silver Kerr, gives us three of his specification favourites



IN-SITU CONCRETE

One of the pleasures of working on projects in Japan over the last 20+ years has been learning first-hand about their mastery of in-situ concrete – and I've been fortunate to collaborate with some true craftsmen there. Recently returning after 10 years to one project in the Nasu region, it was wonderful to see how the concrete has aged with a rich patina developed over time. We've used exposed in-situ concrete quite a bit in our UK projects too, such as at 63 Compton Street in Clerkenwell. It's robust and timeless.



MODULAR CONSTRUCTION

Modular construction is becoming increasingly important in our projects. Currently arriving on site we have a 20-room aparthotel project on Lower Marsh in London, where we are recycling shipping containers. Next we are working closely with CIMC, a Chinese manufacturer, on a 300-apartment scheme in Leeds. Each 16m long steel module will arrive at the site fully fitted-out and lifted direct from the lorry onto the building. There are real benefits in reducing site storage, off-site production, quality control and speed of construction.



PLYWOOD

We've used plywood as an interior finish on several projects – for example, wall and ceiling linings to shipping containers, cantilevered balustrading to an insitu concrete stair and bespoke apartment furniture. Whether birch-faced, oak-faced, laminate-faced, or stained black, there is a simplicity and flexibility to plywood that, together with its structural properties, especially when bonded into thicker elements, provides a wide range of design opportunities.

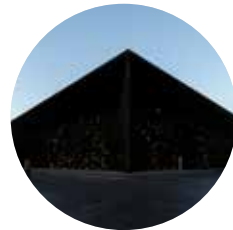
...Sign Off

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



NO. 1 IRON

Golf has its 'birdies', 'eagles' and 'albatrosses' – now it can have its chicken too. Puttshack, 'the world's first super tech indoor mini golf experience' has leased 21,000ft² of basement in James Stirling's grade II* listed No1 Poultry on Cheapside, 'catapulting mini golf into the future' for drunken hedge fund managers. Puttshack differentiates itself by sticking a computer inside the ball, allowing you to record in minute detail your unlikely hole in one. Given the propensity for ramps and steps in Big Jim's best work, it sounds the perfect venue for crazy golf. We await Puttshack's Neue Staatsgolferie franchise in Munich with bated breath.



BLACK ICE

Quite how Asif Khan prised the chemical formula of the world's blackest black 'Vantablack' from artist Anish Kapoor is beyond us, but surely it wasn't just by changing its name to VBx2? But now he has, he's slathered his latest pavilion for Hyundai at South Korea's PyeongChang Olympic Park in it, making it as black as the Winter Games' snow is white. But with North Korean 'pinkos' forming part of a joint Korean ice hockey team, perhaps Khan missed a trick. He should have just gone to artist Stuart Semple for a few vats of his super-fluorescent magenta (on sale to anyone BUT Anish Kapoor) and 'synch the pink' to ensure he was right on political point.



TAPS AND DYES

How many words can you think of with three sets of double repeating letters in them? Committee? Greenness? Sullenness? Well done if you got more but the truth is there aren't many – and probably even fewer work as a brand name. But with Italians, for whom even gesticulation overcomes the woodenness of language, with a keenness to adopt other forms successfully to an addressee, this doesn't seem to be a problem. Italian tap firm Rubinetterie Treemme took a whole press release to explain how it got its almost unpronounceable name; luckily it managed to squeeze in allusion to its pretty, cool-coloured Arcobaleno taps with virtually no doublespeak at all.

Editor-in-chief Hugh Pearman
Editor Jan-Carlos Kucharek
Design Richard Krzyzak
Interim director, RIBA Services Debi Lyon
Director of commercial development
Steven Cross

Telephone +44 20 7496 8300
Fax +44 20 7374 8500
firstname.surname@riba.org

Advertisement manager
Richard Tomlin +44 20 7496 8329
Digital operations manager
Pete Songi
Digital assistant
Alexandra Kiss

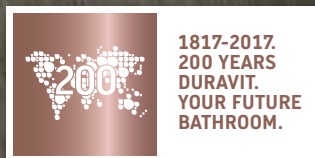
RIBA Journal
ribajournal.com

Published by the Royal Institute of British Architects. Registered office:
66 Portland Place, London W1B 1AD.
Registered charity no. 210566

RIBA # Enterprises

RIBA Journal is published 12 times a year by the Royal Institute of British Architects. The contents of this journal are copyright. Reproduction in part or in full is forbidden without permission of the editor. The opinions expressed by writers of signed articles (even with pseudonyms) and letters appearing in the magazine are those of their respective authors; the RIBA and the RIBA J are not responsible for these opinions or statements. The editor will give careful consideration to material submitted – articles, photographs, drawings and so on – but does not undertake responsibility for damage or their safe return. Printed by Acorn Web Offset Ltd in association with Logical Connections
ISSN 1463-9505 © RIBA 2009





Vero Air. A new interpretation of timeless geometry.

With the bathroom series Vero, Duravit laid the foundation for architectural bathroom design. Vero Air is the new interpretation of the classic Vero bathroom series. Developed and manufactured using the latest technology, Vero Air is more striking and retains the unmistakable character of the original Vero series. For more information, visit www.duravit.co.uk or pro.duravit.co.uk.

A modern interior space featuring a staircase with red carpeting and a large, dense living wall. The staircase has a stainless steel railing system with glass panels. The living wall is composed of various green plants. The walls are made of light-colored wood panels. The floor is a light-colored, polished material. The overall design is clean and contemporary.

Rise above convention.