Building envelope

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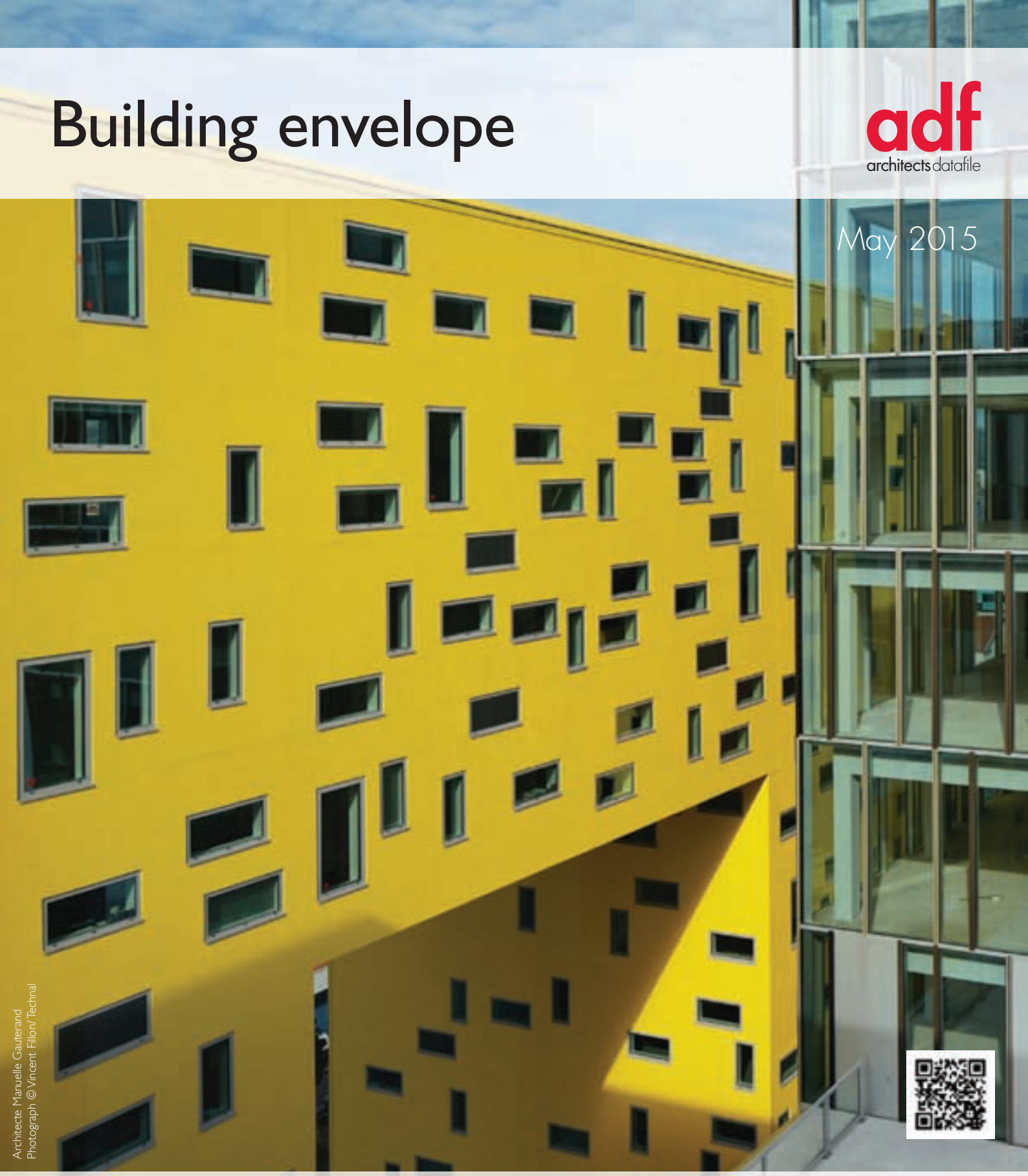
May 2015



Architecte Manuelle Gauterand
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ARCHITECTURAL ALUMINIUM SOLUTIONS

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Building envelope supplement

contents may 2015

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Architecte Manuelle Gauterand
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Annual subscription to Architects' Datafile and supplements costs just £48 for 12 issues, including post and packing. Phone 01435 863500 for details. Individual copies of the publication are available at £5 each inc p & p.

Printed in England

Editor's letter

A very warm welcome to the latest ADF supplement and to the second edition of Building Envelope.

As the structural and environmental performance of a building is dependent on the correct design, materials and construction of the envelope, in this issue we examine whether architects need to change the way they design buildings in order to achieve, or indeed exceed, the latest advisory and statutory requirements for building performance.

We include some of the latest product technologies that aim to achieve this and examine the role they are playing in modern architecture that has to stand the test of time, while addressing the aesthetical and practical needs of architects who are creating buildings that must also inspire!

In this issue we also explore the methodologies that can improve building envelope performance such as following a 'fabric first' approach when specifying the building envelope to help maximise thermal performance.

We are grateful to all our contributors, which include Tom Taylor, principal consultant for BRE, who explains how excellence in building envelope specification can help achieve BREEAM ratings. We also hear from Barry Cope, ATTMA's Registered Testers Scheme manager, along with chair of the ATTMA board of directors, David Pickavance, about how the ATTMA scheme has replaced BINDT's CPS scheme in a bid to improve the quality and accuracy of airtightness testing.

In order to determine if architects can benefit from working with envelope specialists, in an exclusive special report Michael Willoughby asked four leading facade specialists to give us their view about the common pitfalls.

Reporter Michael Willoughby also interviewed USE Architects', Jo Hagan, about his personal journey to develop a residential-commercial building in Hackney using innovative new technology to create a notable facade.

And from one innovative project to another that showcases spectacular building envelope design, Stephen Cousins found out more for us about the challenges faced by Abell Nepp in the creation of the dynamic new EBI South Building in Cambridgeshire, which reflects the dynamics of the cutting edge bioinformatics research establishment that it houses.

Sarah Johnson

COMMENT

Building envelope design can improve the overall BREEAM rating

Tom Taylor, Principal Consultant, BRE, explains how excellence in building envelope specification can help achieve BREEAM ratings

The specification of the building envelope has implications for performance against several BREEAM New Construction assessment issues and could potentially have a significant impact in determining the overall BREEAM rating for a project.

The thermal performance of the building envelope is a significant factor in the assessment of energy use and carbon emissions under issue Ene01 in the energy category. The Ene01 energy calculation methodology uses a 'triple metric' approach that makes it necessary to consider each stage of the energy hierarchy (reducing energy demand, using energy efficiently, and supplying energy from renewable sources) in order to achieve a high overall Ene01 score. The first step of reducing energy demand is of particular importance since any improvements made here will not only increase the demand parameter score, but also feed through and help improve performance against the other two parameters. This means that following a 'fabric first' approach through ensuring high levels of thermal performance when specifying the building envelope will maximise the potential to score well against Ene01 and the energy category as a whole.

The materials category assesses the specification of materials against issues including life cycle impacts, procurement and resilience. The assessment of these issues is undertaken for the main building elements which specifically include the external walls, windows and roof and, as such, the specification of the building envelope as a whole will potentially make a significant contribution to the overall materials category score. In particular, the selection of materials that have been responsibly sourced have a relatively low environmental impact over the life cycle of the building, and that limit material degradation due to environmental factors, will help to improve the materials category score and potentially the overall BREEAM rating.

In addition to having a significant influence on both the energy and materials category scores, the specification of the building envelope will affect other assessment issues including 'thermal comfort' and 'acoustic performance' within the health and wellbeing category, and could potentially even affect others like 'ecological value' and 'surface water runoff' through the specification of green roofs or walls. Given the wide range of assessment issues that are affected, it is clear that the design and specification of the building envelope is a key part of a BREEAM assessment, and one that presents a significant opportunity for improving the overall BREEAM rating.

'The specification of the building envelope will affect other assessment issues'

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COMMENT

BINDT's CPS scheme replaced

ATTMA Registered Testers Scheme has replaced BINDT's CPS scheme, Barry Cope, ATTMA Registered Testers Scheme Manager along with David Pickavance, Chair of the ATTMA Board of Directors explain

Barry Cope

ATTMA has successfully taken the reigns from BINDT to run the authorised testers scheme in the UK. Barry Cope, ATTMA Registered Testers Scheme Manager along with David Pickavance, Chair of the ATTMA Board of Directors, have explained to us the impact that the changes will have on the industry.

"It's not just the same scheme with different branding", Barry Cope said. "ATTMA is a completely new scheme from the ground up, run by its members, for its members. The scheme has a completely new independent management structure, governed by members from English, Welsh, Scottish and Northern Irish Government, LABC, NHBC & BCA, CIBSE, ANC, NEF, BINDT, UKAS and many more.

ATTMA are part of the Qualicheck Forum, dedicated to bringing design and as-built performance closer together.

"There is no point building a super energy efficient building if the air test result is incorrect, it just won't work", Barry said. "ATTMA is actively enforcing the regulations and standards to improve the quality and accuracy of air tightness testing. This will ensure that energy efficient homes are exactly that, energy efficient".

Barry went on to say "We have taken the good work that BINDT has done and taken it a step further. For example, ATTMA has a new board of Directors, consisting of previously active members of the ATA and older hands of the ATTMA Trade Association. The industry has really pulled together to create a scheme that doesn't just 'allow' members to test, but helps develop its member companies to test different building types and helps further their technical knowledge of air tightness testing, improving the industry as a whole".

David Pickavance added. "We have spent a lot of time working with Building Control to make the scheme as robust as possible. We've listened to Building Control bodies and Approved Inspectors and created a lodgement scheme, similar to that of the EPC landmark scheme. Every test that is carried out will have a certificate produced by the database, ensuring that there is consistency in the industry. The lodgement scheme will be smart enough that it will only produce a certificate where that company or tester holds the training & competence to do so, taking the worry of rogue testers away. We truly believe that ATTMA stands for quality and encourage industry professionals to check that they are using an ATTMA member company".

'We truly believe that ATTMA stands for quality'

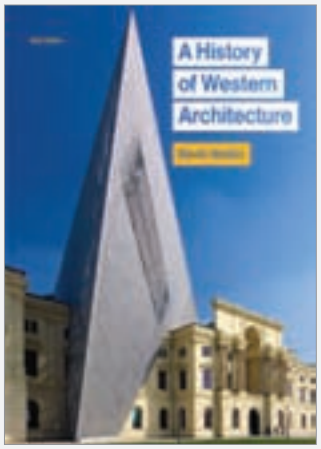
David Pickavance, Chair of the ATTMA Board of Directors

A History of Western Architecture

A History of Western Architecture by David Watkin and published by Laurence King in July 2015 covers the whole history of western architecture from ancient Egypt to the present. This new edition brings the volume up-to-date with a chapter on the dynamic and dramatic architecture of the twenty-first century.

The author emphasises the ongoing vitality of the Classical language of architecture, underlining the continuity between, say, the work of Ictinus in fifth-century BC Athens and that of McKim, Mead and White in twentieth-century New York.

Authoritative, comprehensive and highly illustrated, this sixth edition has been expanded to bring the story of western architecture right up to date and includes a separate final chapter on twenty-first century developments, including the role of computers in architecture, sustainability, humanitarian architecture and very tall buildings.



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GGF unveils post-election plans ...
Ref: 82805

INTERNATIONAL CHURCH DESIGN

Design of New Central Library in Christchurch unveiled

The design of the New Central Library in Christchurch, New Zealand, has been developed by schmidt hammer lassen architects and New Zealand based Architects. The new library, which will be up to 12,000 square metres, is one of the anchor projects in the Recovery Plan for the city of Christchurch after the damaging earthquakes in 2010 and 2011.

The New Central Library will be the flagship of the Christchurch library network and provide an important civic function as a social gathering point in the rebuilt city. It will provide easy access to digital technologies and local heritage collections. There will be exhibition and performance spaces, a learning centre, spaces to relax – indoors and outdoors – and activities to entertain and educate young people.

New corporate HQ for Wintech

Wintech's growth and recognition as an international Centre of Excellence for the specialist discipline of Facade Engineering Consultancy has driven the need to relocate to larger offices to facilitate the company's continuing commitment to the construction industry.
Company Chairman, Chris Macey, says: "Wintech's new offices represent a significant investment for not only the business but also for the people in the company and the area in general. We look forward to being able to continue the consolidation of our business in international markets"

The new premises benefit from close links to the motorway and rail networks, facilitating easy access to London and the major cities, and are located in the semi-rural environment of Pendeford.

When choosing the new office, the Directors have been careful to select a location where staff can not only enjoy the surrounding green belt area in leisure time, as well as a new gymnasium within the building, but also the proximity of the office in relation to the surrounding Staffordshire and Shropshire countryside whilst still being within easy distance of the main city centres in the area.

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AWARDS

Facade award open for entries

Facades continue to play a critical role in a building's design and performance and this year's award is expected to be even more competitive than last year's which saw a record number of entries.

New materials and control technologies are continually being developed to enhance performance, making the design of the building's facade a highly technical yet immensely creative process.

The WAN Facade Award 2015 champions the most innovative and original projects from across the globe; designs that harness the latest technical advances to create visually stunning, cost-effective and highly efficient envelopes. A panel of industry experts will be judging the entries and singling out designs that continue to take this transformational building element into new and exciting realms.

Simply by entering, your firm will receive invaluable exposure to the profession's most influential players, which we guarantee with each and every entry. The shortlisted and winning entries will gain even greater exposure, which will confirm your practice as a leading creative force within this sector.

Register before 31 May 2015 and you'll receive a 15% discount with no need to upload your project until our competition closes on 30 June 2015. So if your firm is pushing the envelope in facade design, enter the WAN Awards and take your practice to the next level.

SEMINARS ANNOUNCED

Surface & Materials Show announces diverse seminar schedule

As preparations for the inaugural UK Construction Week take shape, Media 10 – the UK's biggest design and build event company – has announced its detailed seminar programme for the Surface & Materials Show.

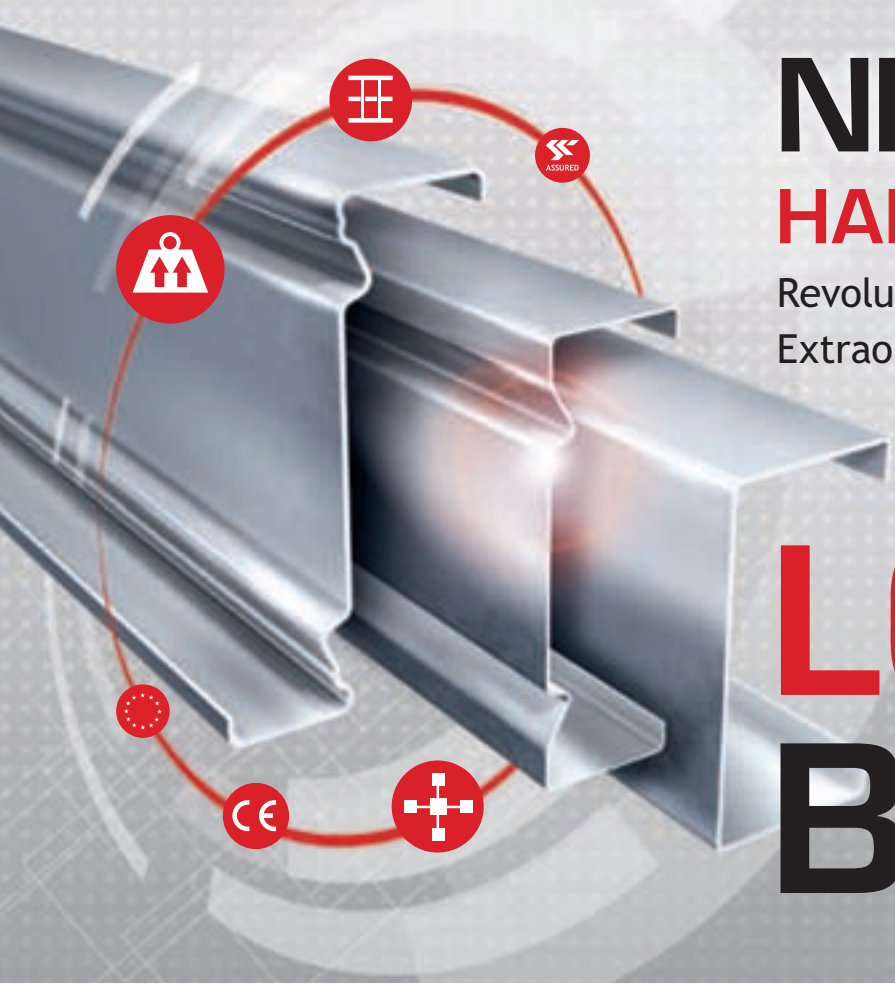
The Surface & Materials Hub will run for the first three days of UK Construction Week, 6 – 8 October in partnership with SCIN Gallery, an industry leader in bringing new and innovative materials to the marketplace. Drawing on the knowledge of the show's event partner, the Society of British and International Design (SBID), the hub will host a comprehensive schedule of debates, workshops and panel discussions that focus on the key issues facing the industry today.

The first day of seminar content starts with a glimpse of some of the latest surface designs with the SBID providing a vital injection of inspiration for all those that attend. The SCIN Gallery will also be leading a discussion on architectural materials and the day will finish with an informative seminar on current flooring surface trends.

Day two of the Surface & Materials Show will feature an interactive debate on future trends and forecasts in the industry, providing a valuable opportunity for visitors to engage in conversation with peers and some of the industry's most influential practitioners. The second day will also feature a dedicated seminar looking at trends in glass and its increasingly diverse use in architecture and furnishing.

The third and final day of seminar content will focus on the growing popularity of re-used materials and how to incorporate them into eye-catching design. Experts will also be giving a master class in facade materials to round the day off.

Taking place at the Birmingham NEC from 6 – 11 October (with the trade only days from 6 – 8 October), UK Construction Week will be the biggest construction trade event the UK has seen in years. Bringing together nine shows under one roof, the event will unite 1,000 exhibitors with more than 55,000 visitors.



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MULTI MILLION POUND HISTORICAL PROJECT

Work to start on Broadway Malyan-designed archive centre

Construction is set to begin on a multi-million pound archive building in Wakefield, UK, which will house historical records of regional, national and international significance – designed by architecture, urbanism and design practice Broadway Malyan.

The £6.4m West Yorkshire Archive Building is to be built in Kirkgate, with construction starting in March, and when complete in 2016 the centre will store more than 10m records over three floors.

The project is being jointly funded by the five West Yorkshire Councils, West Yorkshire Joint Services and Heritage Lottery Fund (HLF) which has awarded a £3.9m grant to create a new permanent home for the region's archives.

Tim Brown, Director of Architecture in Broadway Malyan's Manchester studio, said: "The start of construction is a major milestone in the development of this important scheme. Our expert design team now looks forward to partnering with the client to deliver a home for the region's archives and a place where people can research the records for generations to come."

The iconic building design features a perforated metal mesh wrap, which will be back-lit in the evening to provide a dramatic changing facade. The archive storage areas on the upper floors will be carefully controlled using state of the art equipment to ensure that the unique items remain in excellent condition.

Broadway Malyan won the design appointment through an open competition in late 2013. It developed the concept design, supported the planning process and since the appointment of the contractor, Bardsley Construction, has developed the detailed design.

Distinguished by its global reach with 16 studios across world centres, unrivalled diversity with 500+ design experts and distinctive client focus with over 75 per cent income from repeat business, Broadway Malyan creates world-class and fully-integrated cities, places and buildings to unlock lasting value.

Launch of Crossrail Place Retail and Roof Garden, Canary Wharf

A major new shopping development and roof garden above Canary Wharf Crossrail Station has opened to the public, ahead of the station opening in 2018. Stretching more than 300 metres along the north dock, the above ground scheme designed by Foster + Partners includes four levels of shops, cafes and restaurants, as well as extensive public gardens, which are densely planted with trees and plants, and interspersed with seating and pavilions – all partially enclosed by a timber lattice roof, which wraps around the building like a protective shell.

The gardens are accessible from ground level via two connecting bridges. The roof opens in the centre to draw in light and rain for natural irrigation, and opens along the sides and at either end to allow views of the water and surrounding streets. The spruce beams are sustainably sourced and provide a warm, natural counterpoint to the glass and steel towers of Canary Wharf. Between the beams there are air-filled plastic cushions. The partial enclosure of the space creates a comfortable environment for people to enjoy all year round, as well as providing a gentle microclimate for some of the plant species that first entered Britain through the docks.

The design of the lattice itself is a fusion of architecture and engineering. Remarkably, despite the smooth curve of the enclosure, there are only four curved timber beams in the whole structure. To seamlessly connect the straight beams, which rotate successively along the diagonals, the design team developed an innovative system of steel nodes, which resolve the twist. The visual simplicity of the smooth curving timber lattice belies the geometric complexity of the structure, which is made up of 1,418 beams and 564 nodes, 364 of which are unique. Foster + Partners' specialist modelling group helped to develop an innovative system to enable the roof components to be rapidly fabricated and accurately assembled on site. At night the structure is illuminated, creating a welcoming civic gateway to London's growing commercial district.

CAB STATE OF THE MARKET SURVEY

CAB State of the Market Survey Q4, 2014

The latest CAB State of the Market figures for Q4, 2014 continued to highlight a positive long term outlook for the aluminium in building sector despite rising cost factors with 89 per cent net balance of companies expecting a rise in sales for the year ahead. Headlines are:

- 95 per cent of CAB members, on balance reported a rise in sales over the past year
- Members reported that they anticipate sales rising over the next quarter (72 per cent) and the next 12 months (89 per cent)
- Costs continued to rise with 74 per cent net balance reporting a rise in costs in the last 12 months and 78 per cent expecting a rise over the next year
- Wages & salaries (74 per cent net balance) were reported for the 3rd successive quarter as the major cost factor closely followed by Raw materials (68 per cent), with Fuel Costs negative on balance (-26 per cent)
- 40 per cent net balance of companies expected to operate at over 90 per cent of capacity over the next 12 months, the same as in Q3
- Headcount increase for the year ahead slowed (53 per cent net balance) compared to 87 per cent in Q3 but was similar to the wider construction sector figure of 61 per cent net balance
- Demand (39 per cent) and Capacity (28 per cent) were once again factors 'likely constraints on activity over the next 12 months'. Encouragingly 17 per cent of respondents stated 'No constraints'

CAB CEO Justin Ratcliffe presenting the latest CAB State of the Market Survey at the Lutyens Crypt, Liverpool Metropolitan Cathedral, 19 March 2015

The survey represents another strong quarter for the sector with confidence in forward demand which was supported by a strong continuing commitment to capital investment. The latter should not be underestimated in terms of looking to signs of the sector's long term recovery and stability. In each of the quarters in 2014, there has been a greater (or at least equal) commitment to investment across all the metrics for the 12 months ahead. The metrics being: Property, Plant/Equipment, Customer Research, R & D, Product Improvement and E-business. In Q4, 2014, the three leading areas for increasing capital investment in the year ahead were: Plant & Equipment (63 per cent net balance), Product Improvement (63 per cent net balance) and Customer Research (53 per cent net balance).

With increased sales activity, inevitably, costs are rising with wages the biggest factor for the third successive quarter. The other key drivers were raw materials and energy costs. Fuel costs were negative on balance for the second successive quarter.

While there is no doubt increased activity across the aluminium in building sector (fabricators are increasingly reporting healthy order books into the second half of 2015), there appears to have been a degree of evening out in the final quarter of the year. Interestingly, the net balance of CAB members operating at over 90 per cent capacity remained at 40 per cent for the second successive quarter falling from the Q2, 2014, high of 57 per cent. Likely constraints on activity in Q4 reflect a similar outlook to those back in Q1.

In the wider construction sector, the Construction Products Association's latest industry forecasts are for construction output to have grown by 4.8 per cent in 2014 with projected growth in 2015 of 5.3 per cent. This is primarily due to recovery in private housing and commercial sectors in addition to a return to growth in public sector construction. Some of this growth can be attributed to the National Infrastructure Plan. A number of commentators however forecasted a period of 'uncertainty' around the time of the May General Election.

There have now been six consecutive quarters of increasing tender prices but the benefits of these have to a great extent been undermined by higher costs.

CAB's unique quarterly State of the Market Surveys provide an insight into current and expected trends in the aluminium in building sector. Each quarter CAB members complete a personalised version of the questionnaire which is then integrated into the wider Construction Products Association (CPA) survey. This utilises a balance of respondents to assess results and identify trends. A positive balance of respondents means that the percentage of firms reporting a rise is more than the proportion of firms that report a decline.

Silver Tides Apartments, Westward Ho, North Devon.

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Pictured is part of the Silver Tides Apartment development situated in Westward Ho, North Devon.

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BUILDING INFORMATION MODELLING

The development is in the detail

Building Information Modelling (BIM) is at the forefront of technological advances in the construction industry, with the government announcing that from 2016, all centrally procured government construction projects must be delivered using this innovative process.

BIM is a process model that assists the design, analysis, execution, delivery and overall management of a project. It is applied through a highly collaborative, well-integrated project team that includes the designers, engineers and construction partners. It is crucial that the method is executed in the very early stages of the design process in order to gain the full cost benefits. The process enhances the early design-phase contributions of the individual team member's expertise. Communication across all teams is vital when applying BIM to a project, making principles of trust, transparency, precise communication and availability of information absolutely essential. The outcome of using BIM can be extremely lucrative as well as saving on time and ensuring exceptional accuracy.

As B & K Structures deliver optimised hybrid solutions that are manufactured offsite in a factory environment, BIM plays a critical role in the success of almost all of their projects – from education builds to residential. Member geometry and specifications of B & K Structures' projects are detailed exactly through 3D modelling files as it is passed through the specification, design and detailing stages. Manufacturing and machining of the panels complete with service channels and connection details are factory produced to exceptional accuracy. This facilitates an exact fit and minimises transport costs and onsite waste.

Through the use of BIM, B & K Structures can provide their clients with confidence that project timescales will be met, while problems that relate to non-compliance and dimensional inaccuracies or clashes are kept to an absolute minimum. This ensures a fast and reliable onsite erection – critical to meeting developer's deadlines.

Believe in better buildings with BIM

Under the banner of Believe in Better Buildings (BiBB), BskyB's new educational facility for graduates, apprentices and staff training, reflects the company's sustainable aspirations. Based at the Campus at Osterley, West London, the 3,000m^2 development encompasses a four storey linear building with the top storey accommodating a restaurant and roof terrace – all providing an inviting multi-functional amenity.

Mace appointed B & K Structures to provide an optimised hybrid structure for the build – comprising a glulam frame with cross laminated timber floor, roof and stability walls, together with perimeter prefabricated, insulated wall cassettes. The structure was designed to deliver permanent quality, adaptability and long term energy efficiency, to meet the sustainability objectives.

BIM technology and CNC machines were used to ensure the structures were manufactured to exacting tolerances to guarantee the details of the connections were precise. Architects and engineers worked together in a shared office – allowing them to make real time decisions. BIM goes beyond the planning, design and construction phases to the whole life cycle analysis of the project and can provide the end user with

information from conceptual ideas and building design to cost control and construction management. BIM has changed the dynamic of the construction business, enhancing efficiencies, delivering well-coordinated and well-designed projects.

BskyB has been such a success that it has recently been shortlisted for both 'Project of the Year' and 'BIM Project of the Year' in the prestigious Celebrating Construction Awards, with the winners to be announced on 19 June at the Nottingham Belfry.

Onyx Solar awarded with a new project

Bursagaz, one of the most important Turkish gas companies, will have a new headquarters which is aiming to obtain the LEED Gold rating.

Onyx Solar is responsible of developing originality in the design by superimposing a mosaic double skin onto the facade. The glass, featuring crystalline silicon, will have 20 per cent transparency, allowing homogeneous light into the building and reducing the need of artificial lighting.

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HEART OF LONDON TRANSFORMATION

Bogle Architects re-image 140 Fenchurch Street

'The refined geometry of the new wall is achieved using interlinked highly polished stainless steel convex panels'

Bogle Architects has transformed a corner site building at the junction of Fenchurch St and Cullum St, in the heart of the City of London. The client, aik, required a distinctive intervention that would announce the building and increase its visibility from Fenchurch St, as well as the rationalisation and full refurbishment of the 1st, 2nd and 6th floors, to create 11.700 sq ft of class 'A' office space.

The project's 'signature' element is the dramatic, multi-faceted 'feature' wall. Precision engineered, the refined geometry of the new wall is achieved using interlinked highly polished stainless steel convex panels, extending from the lobby interior through the glazed facade to wrap around the building's street facade.

Holm Bethge, Project Director of Bogle Architects, comments: "The inspiration for the use of stainless steel came from the neighbouring Lloyd's of London building, as well as the sophisticated quality of the classic Rolex watch-strap. The returns of each polished curved sheet are treated in a contrasting hand finished texture, creating additional depth and interest."

The wall's finely detailed design was custom made by Marzorati Ronchetti, leading Italian manufacturers of specialist metalwork, whose international portfolio includes Louis Vuitton's Milan showroom, the lobby area for 30 St Mary Axe in London and a spectacular exhibition installation at MoMA in New York.

The reconfiguration of the entrance and lobby area involved the realignment of the lobby façade with the main building envelope, using frameless glazing to create a seamless connection between the reception area and the street beyond.

The coherence of the design is further enhanced by a new floating canopy and the introduction of a large, acid-etched steel reception desk.





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A friendly facade

We asked four leading facade, cladding and envelope specialists what they would tell architects and specifiers if they had the chance. This is what they told us. Michael Willoughby reports

Chris Macey, group MD, Wintech Group

When windows and facades were first made by craftsmen, they were hand built products. The quality of materials used to create weatherproof integrity was not great. They were usually natural materials like timber or stone.

So if they wanted to make something waterproof they had to do it on the basis of shape rather than performance-specific materials. Tiled roofs are a good example. There are no sealants in a tiled roof.

We seem to have lost that now in facade engineering, becoming more reliant on sealants and gaskets to keep the weather out. Modern materials, technologies and designs become more reliant on performance materials.

These depend on: the quality of the workmanship, the way in which they are installed, the quality with which they are installed, the environment in which they are installed, the quality of the material and its application. With all these variables, there is plenty of opportunity for something to go wrong. It's important to have designs which have a degree of redundancy on the basis of shape rather than materials so that you are not reliant on one component's performance.

For example, we know that thresholds on doors have to be a certain height to keep the weather out. More and more we are seeing designs that rely on compression gaskets. If these fail for one of the reasons mentioned before there will be a problem. On the other hand, pressure-drained and equalised systems apply the redundancy principle. If the gaskets on the products fail and don't work properly, the system itself is drained and ventilated.

Secondly, increasing emphasis on energy conservation means that we have to change the way we design buildings. Traditionally, the architect gets the service and structural engineers to tell him what he needs in terms of environmental and structural performance to create his building. Then at some point in the future, those details find their way into a performance specification for the building envelope.

But we are finding there is a gap in performance terms between the requirements for the required levels of energy conservation that services engineers have to meet to achieve statutory compliance and what can actually be designed and delivered.

Architects have to think of constraints that energy conservation has on their design freedom. This has started to restrict the amount of transparent area you can have on residential buildings. Windows have a lower thermal insulation performance but a service engineer needs to meet a certain U-value.

There is an urgent need for facade engineers to be involved earlier in the design and development of projects so that these things don't become a problem at the point you have planning permission.

We've had projects where the levels of performance are so depressed and certain features of the architecture have meant those performances requirements can't be achieved.

So far, it's usually possible to massage the design to prevent a planning problem but I can see shortly – especially when the new ventilation requirements start to bite – that we will be getting planning permission for buildings that can't be built at all.

Chris Horsfall, group business development director, Lakesmere Building Envelope Specialists

An architect will always scour the market himself for suppliers. He will always look for something unique so he can put his stamp on the building. He gets in touch with the suppliers himself and calls them in. That supplier is likely to sell him what they think will win them the job. This might not be the best thing for the architect. Suppliers will give him what no one else can provide.

The problem is compounded when you have an architect who goes to multiple suppliers. So, on a facade he could end up talking to 10-20 suppliers. Each of these will give him limited support because they are only interested in selling their product. That means they don't have to worry about how it's going to be

'Architects have to think of constraints that energy conservation has on their design freedom'

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'Architects need to take proper notice of their obligations under the Construction Design and Management (CDM) regulations'

engineered or integrated into the other product. They will only give him the selling price and not the final cost.

The architect will end up with a jigsaw of products and expect them to work together. We get called in and we start giving advice. The architect then feels marginalised because we are telling the construction people the reality and the architect is backed into a corner. The process is fragmented.

There are a few risky items out there at the moment. Architects are using a lot of lightweight stone and glass-reinforced concrete products that look like stone but aren't. There are inherent risks in these because you have to understand the supply-chain and the buildability.

There are good and bad suppliers out there. If you don't get the right materials from the right quarries you get wrong batching or colour, or stone which is poor-quality, chipped, damaged and not fit for purpose.

If we do look at a new product, we put 6-12 months due diligence into it before we would even consider using it to make sure it's right. How can someone that's picked something out of a brochure expect it to be correct?

We find it best if an architect builds up a relationship with a facade specialist who is used to the industry and knows all the products and different combinations and how all the interfaces work. They can go and see the architect and give him advice about what all the products can do as well as advice about risks and practicalities and the true cost of the end result on the building, including design, installation, management, purchase and delivery – not just the supplier's selling price.

Simon Armstrong, managing partner, Cladtech Associates

Architects need to take proper notice of their obligations under the Construction Design and Management (CDM) regulations (which have recently changed) and consider the long-term maintenance of the facades for which they are producing the conceptual design.

Some of the most famous architects in the world do not consider this fundamental requirement and the buildings are impossible to maintain or to maintain economically.

There are buildings with quite large pieces of glass in difficult-to-access locations where it can cost between £25-55,000 to replace one piece of glass. The problem with externally clad or glazed buildings is that you have to consider the dead-load of the glass as well as the people needed to replace the glass units. So the unit might cost £1,000 to procure but then it costs another £25,000 to incorporate it into the facade of the building.

If they consider it, they would use smaller pieces of glass unless there was a reasonable method of accessing and replacing larger pieces.

Laurence MacBeth, sales and commercial director, Alumet Systems

We try to create something that will be commercially viable – that will look nice, keep the water out, be thermally efficient and make us a profit. Meanwhile, an architect goes for the antithesis: he wants to build something that will be uniquely "him." I try to make it look like the architect's dream by following the quantity surveyor's route! Usually we end up with a compromise that's somewhere between the two.

So, I would ask architects to take a closer look at the products that are available as standard in the marketplace that we can mould into their architectural premise. A bit more thought about what's available would mean they could get what they wanted by using standard subcontractors rather than having to reinvent the wheel.

If they spoke to suppliers individually, the architectural team would find a wealth of experience in what makes a building work that they might not think about. We can make it easier to build, cheaper, lighter and by using less material and achieving a lower carbon-footprint.

So, for example, we might be able to direct them towards other forms of insulation, not just the standard solution. There could be a thinner and better-performing foil-packed insulation with higher U-values which would be more expensive per square foot, but leading to thinner walls so you get more usable floor space.

More practicality wouldn't go amiss, either. There is a general assumption that form is more important than function. They are still very good at the aesthetics of buildings but not so much at how it works.

People like Barclay Homes, who we're doing a lot of work for at the moment, tend to get the specialists together and meet as a team to solve issues of design. You'd be surprised how long that takes. We are almost still designing things until the end of the job because the plan doesn't work and things have to be redesigned.

A recent project we designed had a practical failure in that the enclosed balconies had been designed with almost no thought given to exactly how they were going to drain. It was never going to work. We, the envelope contractor, had to re-design it on the hoof, because the architects had given little thought to the function.

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Everybody needs good neighbours

When Use Architects' Jo Hagan came to develop his own site, he used an innovative material to make sure the block was a welcome addition to his Hackney home. Michael Willoughby reports

How to handle a large residential-commercial building in a sensitive area is a question that exercises many architects lucky to have received such a commission. But as the co-developer on the East London site, Jo Hagan, owner of USE Architects, had a greater opportunity than most to create the building he wanted.

Located on Mentmore Terrace, in one of Hackney's characteristic streets of railway arches, the five-storey mixed-use residential and commercial property faces a combination of long-standing light-industrial units, retro junk stores and more than a couple of trendy cafes.

"I wanted to create somewhere that reflects the aspirations of this gentrifying area," Hagan tells me in his ramshackle studio immediately next-door to his creation. "If properly handled, this could be a great place to live."

He has been living in Hackney for 15 years and was already familiar with the site, having prepared a client's plan for a commercial property on the ground-floor and three residential units on the upper floors back in 2004.

However, the scheme was kiboshed by the 2008 crash and so he bought the site with neighbour, Caz Hildebrand, of Here Design, in 2013. Together they expanded the project to encompass seven upper-floor residential properties.

In creating his own project, the architect was determined to create a building that made a positive statement about a locale in transition and yet embraced by the past.

"This is an industrial area, built predominantly of brick," he says. "The buildings around here reflect the technology of the time. I also wanted to use the latest technology, but not to completely reject the past."

So it was that Hagan came to design the first British building faced entirely in Corian, DuPont's composite material comprised of acrylic polymer and a material found in bauxite ore.

'If you look at it when the sun hits it, it has an ethereal quality, becoming quite luminescent'

Jo Hagan, USE Architects

The material was £400/sq.m, making it twice as expensive as brick but priced comparably with the cheapest curtain-walling option. It's also cheaper from a whole-life perspective due to its low maintenance and longevity.

It's most usually found in high-end kitchen and bathroom worktops but here the white surface - with a hint of grey - was used to create a facade hovering somewhere between the natural and the man-made.

For, while Corian is synthetic, Hagan holds that it behaves more like a material such as brick or wood.

"If you look at it when the sun hits it, it has an ethereal quality, becoming quite luminescent," he says. "When it's dark, it's quite solid and somber. So you perceive it in a different way according to the elements."

This playful translucence and reactivity shrouds a building which is quite sparse and formal - a tall, thin cuboid with concrete, Corian-clad balconies featuring glass balustrades.

"The building has no articulation, no figurative qualities," says Hagan, (hastening to add that he has nothing against decoration as such.)

Instead, to break down the mass of the building, Hagan and Hildebrand devised a proportional system to create the tessellation of the facades. They chose the proportions 4:5:1 as a reference to Ray Bradbury's book Fahrenheit 451 – that temperature being at which books spontaneously combust.

Panels were those dimensions or a combination of those dimensions, creating a sense of harmony, lightness and delicacy in time-honoured architectural fashion.

"We relied on the proportional system to break down the pattern as a counterbalance to the 'monolithic' nature of the building," says Hagan.

The balconies serve a similar purpose: "We wanted to strike a balance between their mass and the way they were detailed – seemingly floating because of the lightweight quality of the Corian. The shadow-gap detailing around them makes them look like they are not connected to the building."

But he had another trick up his sleeve in creating a facade outstanding in its sleekness: windows that were flush with the skin of the building.

These are held in the same plane as the cladding with a 250ml gap between the met-sec and the facing. This was achieved by using a steel-framing system attached to the edge of the slab.

Windows are the (now-discontinued) Helo by Velfac, featuring an unusual one-piece frame construction. These help support U-values as low as 1.

"The design is both an abstract aesthetic and yet practical in that it offers more variety to the vertical elements and makes a

'The design is both an abstract aesthetic and yet practical in that it offers more variety to the vertical elements and makes a stronger pattern with the shadow gaps'

Jo Hagan, USE Architects

Windows are the (now-discontinued) Helo by Velfac, featuring an unusual one-piece frame construction. These help support u-values as low as 1

stronger pattern with the shadow gaps, while also having the appearance of a solid mass from afar."

"As well as creating a look commensurate with the clear, geometric outline of Mentmore Terrace, the device was an anti-Ruskinian commentary on the skin-like nature of modern buildings," says Hagan. The idea was also to give the building presence.

"Some of the skin is solid, some of it is transparent," he says, "but the whole thing is essentially a decorative device. But, if you put in window reveals, it would look like a completely different building."

The building is constructed of an in-situ reinforced concrete frame with load-bearing floors and, therefore, no beams. Wall-panels are of Metsec and the rain-screed are installed on the Hilti aluminium frame using a Kiel fixing system.

DuPont also supplied a Tyvek UV Facade – a type of advanced breather membrane for greater design freedom, protection and enhanced energy performance for open-jointed facades.

The interior of the building makes reference to the solid, industrial past of the area since the soffit of the concrete slab is left exposed along with the brick of the party wall. The rest of the interior walls are either concrete or brick.

"The normal arrangement for such a property," says Hagan,

'The interior of the building makes reference to the solid, industrial past of the area'

"would be for the outside to be rough and brick-like but the interior to be soft, painted and decorative."

"Really, it should have been steel if we had wanted it to be quick and cheap but the concrete is essential for the weight. We wanted a balance between the brutal and delicate."

Meanwhile, the different elevations of the building are fairly simply dictated by keeping the building more open to the elements on the south side and by having fewer openings on the north side in order to reduce heat-loss.

And despite its apparent exterior simplicity, Mentmore Terrace is kitted out with not just roof-mounted PVs supplying 20 per cent of the renewable electricity, but also a green roof.

Further power is saved by the installation of a whole-unit heat-recovery system to prevent people from opening the windows. The grills have been routed out directly into the external panels to assist this process - the circles of which this author confused with a decorative element.

Spanish facade engineers, Urbana Exteriores, were crucial to the construction process, since no English contractors had experience with the cladding system.

"Because they were in Spain, it was a bit of struggle, but they knew where the problems were likely to lie in order to avoid pitfalls and to create a completely flush building."

This was both crucial and a challenge, since there were none of the normal elements such as cornicing to cover up the joints. As a result, everything had to be completely exact.

So, despite the fact the team used laser-sighting to make sure every one of the joints was in the same plane, the course wasn't a smooth one.

In fact, the windows went in first and weren't straight and so had to be sent back for recompletion.

"Even though we used laser sighting, we really had trouble," says Hagan. "Every one of the joints had to be in the exact-same plane so it looks completely flat. Could it have been created without CAD? Yes, but it would have been far more laborious."

Meanwhile, Hagan has nothing but good things to say about contractor, Albion Homes.

"They were great to work with. Even though it wasn't something they were familiar with, they really engaged and were enthusiastic about doing something different."

Hagan was right about the popularity of the area. Every one of the apartments in the development was sold off-plan long before the building was completed. Since completion of the terraced building, a number of extra units have appeared,

'Another benefit of the translucent skin is to create a building that is able to blend in with its surroundings even though it is fundamentally different'

Project details

Start date:
Dec 2012
Completion:
May 2014
Budget:
£1.3 million
Contractor:
Albion Homes
Facade engineers:
Urbana Exteriores

including one-bedders to the north of the development zone and 10 more units elsewhere.

He is aware and perfectly happy that it is not a loud or startling building, given its immediate context.

"After all," he says, "another benefit of the translucent skin is to create a building that is able to blend in with its surroundings even though it is fundamentally different."

"Instead," he adds, "its qualities are appreciated after observation rather than immediately."

Yet he says his desire to create something that started regeneration the right way seems to have paid off based on the reaction of passers-by.

"Since I live next door, I watch them walk up and down," he says. "They always stop and look at it. They think it's lovely."

Brave new world

The sculptural ribbed aluminium form of the EBI South Building in Cambridgeshire is a dynamic reflection of the pioneering bioinformatics research going on inside. Stephen Cousins reports

'A major concept was that from perimeters of the campus you would only see soft building forms, so we came up with the idea of creating a curved back to the building'

Bruce Nepp, Abell Nepp

Hunched down low in a protected rural landscape and clad in a ribbed aluminium and glass shell, the EBI South Building designed by Abell Nepp, does a stylish job of camouflaging its status as one of the most cutting edge research establishments on the planet.

The three storey, 4,900 sqm building, located in Hinxton, Cambridgeshire, forms part of the Wellcome Trust's Genome Campus, and provides research and training space for over 240 researchers working for the European Molecular Biology Laboratory's (EMBL) European Bioinformatics Institute (EBI). The £17.8 million facility is home to the ELIXIR Project, the organisation tasked with coordinating bioinformatics activities throughout Europe and applying sophisticated Big Data data mining techniques to biodata.

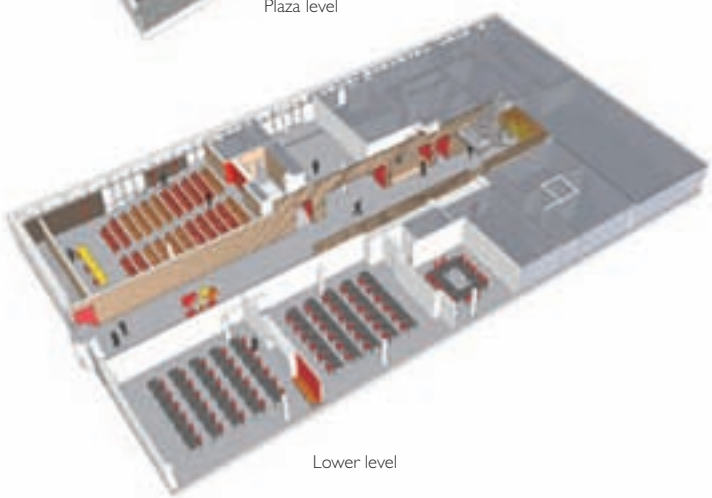
One clue to the pioneering work going on inside the building is its dynamic 'bullet'-shaped profile, formed by a semi-circular aluminium brise soleil on the south side and a flat angular aluminium and glass facade on the north side that leans out towards a central campus plaza. In addition, the entire building envelope is compressed concertina-like, into a series of triangular ribs that run across the facades and up and over the roof.

Bruce Nepp, director at Abell Nepp told ADF: "A major concept was that from perimeters of the campus you would only see soft building forms, so we came up with the idea of creating a curved back to the building. The inclusion of louvres helps further soften this facade, while providing maximum levels of solar shading and daylight. The site can also be seen from neighbouring hills, so we had to be sensitive to this and ensure the roofscape was well designed."

BUILDING PROJECTS

Upper level

Plaza level



Lower level

The South Building was funded through a UK Research Councils Large Facilities Capital Fund grant, led by the Biotechnology and Biological Sciences Research Council. The scheme completes the second phase of the Genome Campus' South Field Development, begun in 2005, and encloses the final side of a large campus plaza, built during phase one. The building links to the Sanger Institute research laboratories (made famous for its leading contribution to the Human Genome Project) a datacentre and other campus amenities.

The scheme features a two-storey research block, including 36 research studios, accessed at plaza level. The site slopes away from this entrance towards the west, creating space for a single storey training centre embedded into the ground on the floor below. This includes a 150-seat lecture theatre, IT training rooms and a media studio.

A full-height atrium extends along the building's central east-west axis, allowing natural daylight to penetrate down to a series of circular glass 'pods' on the top two floors, which function as project leader offices or small Skype/WebEx meeting rooms. Light also reaches down into a breakout space for the lecture theatre and training facilities on the lower ground floor.

The atrium posed an acoustical challenge and Abell Nepp had to balance the need for a lively industry space for training and lectures with the need for quiet studios on the upper floors where full time researchers are crunching data.

"It was a complex exercise balancing acoustic attenuation with open space and connection," says Dan McArthur, project architect at Abell Nepp."It meant extensive use of perforated metal and ribbed cladding inside the atrium to help attenuate the noise."

The research studios are each designed for use by up to eight people and feature closing doors, double-insulated glazing, metal perforated and wood panels with acoustic backing to increase sound control. "As a result of these measures, the building is a pleasant internal environment with a bit of buzz, but not enough to become disruptive. The client was very happy with how it was resolved," he adds.

Dotted around the atrium walkways are a series of "tea points" that offer views of the surrounding wetlands where researchers from different departments are encouraged to meet informally.

The scheme's designers had to observe stringent planning requirements intended to minimise impacts on the nearby historic village of Ickleton and the surrounding conservation area.

Aligning the building along an east-west axis helped preserve views towards the wetlands – created by the Wellcome Trust earlier in the development – and the valley beyond, while minimising the building's profile towards the village.

'The scheme's designers had to observe stringent planning requirements intended to minimise impacts on the nearby historic village of Ickleton'

Partially embedding the building into the ground helped reduce its height, and installing the curved south-facing brise soleil helped soften the building's mass when seen from the village, also optimising levels of solar shading and daylighting to the spaces within. Although the brise soleil effectively forms the south facade, it stands separate from the windows to provide high levels of solar shading.

"We worked closely with the structural engineer, Aecom, to ensure that the density and separation of the individual louvre blades was appropriate to part-shield the sun. When the sun is at its highest the fins are denser, providing a greater level of shade," says McArthur. "Although automatic internal blinds are still required to deal with low-level sunlight, when they are down the blades create a lovely pattern of shadows on the blinds and inside the space."

The internal blinds are controlled by the BMS and automatically deploy at night to prevent light pollution towards the village as part of "Dark Skies Concepts" introduced by planning authorities.

The north elevation leans at an angle towards the plaza in an effort to prevent reflections and to amplify the connection between research studios located behind that elevation and the plaza below.

The roof was an important design feature, as it can be seen from the nearby hills, so the rigid concertina effect, seen on the north facade, was continued across it, also integrating a wide pitched atrium roof and solar photovoltaic arrays designed to provide over 10 per cent of the building's power needs.

In actual use, the solar PV provides up to 26 per cent of the building's power, claims Abell Nepp. The scheme achieved a BREEAM 'Excellent' rating and might have reached 'Outstanding' were it not for a requirement to include comfort cooling to allow users with different thermal comfort levels to be able to control their studio environment.

"EMBL-EBI is an EU organisation with researchers from Greece to Finland with different climates and therefore different comfort requirements, so we created a fully comfort controlled building with individual controls in all of the studios, plus the ability to naturally ventilate. That placed a burden in BREEAM rating, which we had to make up elsewhere," says Bruce Nepp.

During the design stages, the South Building was involved in a research study, 'Design for Future Climate Change', by the Government's Technology Strategy Board (now called Innovate UK). The study used predicted weather conditions for 2080 to assess the impact of future climatic conditions on

BUILDING PROJECTS

'The choice of aluminium for the building was a logical one, its clean, crisp lines are befitting of a scientific research environment'

the building. The risk assessment suggested that the design was resilient to climate change and that there were no high risks anticipated as many adaptive measures were already incorporated into the design.

The South Building is supported on a primary steel frame, based on a steel portal frame, which supports secondary curved steels used to support the south elevation's curved brise soleil and steel out-rigging used to form the leaning north elevation.

"Geometrically there were lots of challenges for the designers and contractors to get the conflicting angles in the structure to work and the north and south elevations had to be set out to a very particular geometry," says McArthur.

Design of all the anodised aluminium cladding was by Colorminium, with specialist subcontractor Bailey Facades fabricating the building's curved and flat cladding panels and Schüco producing the curtain wall and the individual louvre blades on the south elevation. A Champagne coloured anodised aluminium was used for the majority of the exterior panelling and natural silver was used for the blades.

The choice of aluminium for the building was a logical one, its clean, crisp lines are befitting of a scientific research environment, and perforated aluminium panels and external cladding had been used on previous phases of the development. Another material continuity was the use of a flint plinth as a base for the building, which was also used under the Morgan Building on the other side of the plaza, and in the walled garden and other elements at the historic Old Hall at Hinxton, built in 1748. It's another subtle device used to connect the building to its locality and the opposite of the sort of brash, iconic architecture that feels the need to shout about the grand scientific endeavours going on inside.

Project details

Occupier: European Bioinformatics Institute
Project director: Wellcome Trust Construction
Funding agency: Biotechnology and Biological Sciences Research Council
Architect / lead consultant: Abell Nepp
Landscape architect: Robert Myers Associates
Structural engineer: Aecom
Building services engineer: Aecom
IT/AV consultant: Cordless Consultants
Town planning: Porta Planning
Project manager/cost manager: Turner and Townsend

Notes from the Comar design team...

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Part L one year on – it's time to adopt a 'Fabric First' approach

Building stock accounts for nearly half of all emissions in the UK. Paul Forrester, technical specialist at Recticel Insulation, explains why architects and specifiers need to think beyond simple U-value targets to get the best out of their designs and ease the route to compliance

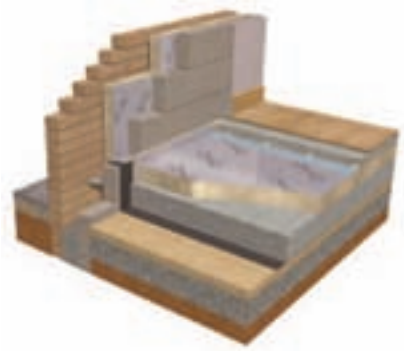
For the construction industry, the General Election campaign has meant an indeterminable wait to see whether the Government's long-promised 2016 introduction of 'Zero Carbon' into the Building Regulations goes ahead.

But amid the speculation about future regulations, it's easy to forget that 2015 will mark the first anniversary of the current Part L regulations in England and in Wales.

Transitional arrangements – whereby sites that had seen work commence before the introduction of the new Approved Documents could still meet the previous version – mean that architects and specifiers could easily have spent much of the last twelve months not having to think about Parts L1A and L2A 2013/14. Given that the U-value targets in Part L1B and L2B were unchanged, the need to consider the Fabric Energy Efficiency Standard (FEES) (England) or tighter U-value backstops (Wales) may still be relatively new.

For Scotland, October 2015 will see a revised Section 6 (Energy). Conversely, its contents have been available since October 2014 in order to give designers time to get acquainted.

Up and down the country, construction professionals are getting to grips with tighter and more complex energy efficiency requirements.



'Adopting a fabric first approach by concentrating on the design and construction of thermal bridging details, pays off'

Basic principles

Beneath the surface of these different approaches, however, the same fundamental principles apply – wherever you are in the country, the specification of a new building must be entered into SAP (Standard Assessment Procedure) or SBEM (Simplified Building Energy Model) and compared to a 'notional specification' of the same design.

The effect of FEES and tighter limiting U-values is to encourage greater focus on the complete fabric of the building, rather than compensating for poor U-values with expensive 'eco-bling' technology that may not meet its efficiency claims and/or has a limited service life.

Of course, building fabric can fail to live up to its intended performance too, but when built correctly it will last for the life of the property. It's the perfect illustration of 'fit and forget', meaning occupants can enjoy the benefits without having to think about changing or replacing it. To achieve this, designers need to turn away from thinking purely in terms of using U-values as a way of meeting targets.

Thermal bridging

When considering the performance of the building fabric, thermal bridging is an important factor. Designers are used to considering repeating thermal bridges, such as timber rafters or studs at specific centres, but perhaps less obvious are linear thermal bridges.

Wherever a thermal element changes direction or forms a junction with another element, the geometry of the element is altered and increases heat loss – particularly if the design fails to allow for the continuity of insulation at the junction. Wall/floor details are an obvious example, as everybody is familiar with perimeter upstand insulation. Insulated cavity closers around door and window openings illustrate another common linear bridging solution.

The heat loss attributed to a linear thermal bridge is called a psi-value. The simplicity of a design to minimise the number of junctions, and to make sure they are 'buildable', needs careful consideration to keep psi-values to a minimum.

The importance of thermal bridging has increased as U-values have lowered for the simple reason that they now account for a greater proportion of heat loss (up to 30 per cent in an otherwise well insulated building).

But how much thought do you give to the issue when working on a new-build property? Do you:

- Arrange for the calculation of bespoke psi-values for each junction on every new project?
- Adopt pre-calculated psi-values, like Accredited and Enhanced Construction Details, in the design and ensure they are built accordingly on site?
- Take no account of thermal bridging and adopt a conservative value to calculate total heat loss due to thermal bridging, as offered by the regulations?

If the last option is your answer, are you aware of the likely effect on your compliance calculations? Take a SAP calculation for Part L1A 2013 in England: adopting the conservative approach to thermal bridging and then specifying everything else to match the compliant recipe offered in the Approved Document would mean failure in terms of both Target Emission Rate (TER) and Target Fabric Energy Efficiency (TFEE).

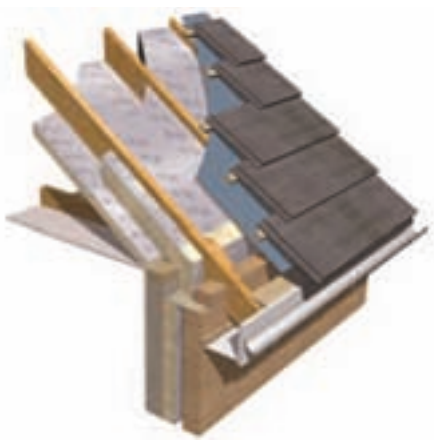
The result? It would take even lower U-values – and a much greater level of air tightness – than prescribed in the recipe to make sure the design met the necessary targets. Every design is different of course, but one example is needing to achieve a U-value of 0.10 W/m^{2}K for the floor, walls and roof – compared to their respective recipe values of 0.13, 0.18 and 0.13W/m^{2}K.

That's a lot of extra insulation to accommodate! And even though the regulations for Wales and Scotland don't feature a TFEE, the same stringent recipe approach means it is still necessary to think about thermal bridging details – and that won't change in future editions of the regulations.

No need to wait

Adopting a fabric first approach by concentrating on the design and construction of thermal bridging details, pays off with instant performance benefits that will ultimately help to limit the impact of climate change.

Whichever part of the UK you are working in, good building fabric improves thermal comfort and reduces heating demand – and that can be achieved under current regulations, without waiting for politicians to make their minds up.



Delivering thermally efficient buildings

Lee Davies, technical director at building envelope specialist, CA Group Limited, explains the role of robust detailing in delivering thermally efficient buildings

The issue of improved airtightness has become a key focus for architects both in striving to deliver increasingly efficient buildings for their clients and in meeting the ever-demanding enhancements to building regulations.

Tests have proven that one of the primary causes of air leakage, or heat loss from a building, is poor detailing. Poor detailing leads to thermal bridging: the transference of heat from the inside of a building to the outside, often via poorly designed details, flashings at junctions and interfaces such as drip flashings, gutters and parapets.

To put this into context, some details such as drip flashings, which run around the entire perimeter of the building at the base of the walls, can, if they are not designed and installed with care, act as huge heat conductors, drawing heat from the warm interior and allowing it to be wasted, by passing to the exterior of the building envelope. Thermal bridging also increases the risk of condensation inside the building.

Pre-empting the issue at the building's conception through the specification of thermally robust details, which mitigate this 'heat-sink' effect, can deliver a thermal performance increase of up to 10 per cent. This translates into a direct saving on the building's energy consumption, reducing Psi values and greatly enhancing compliance with Approved Document L2A.

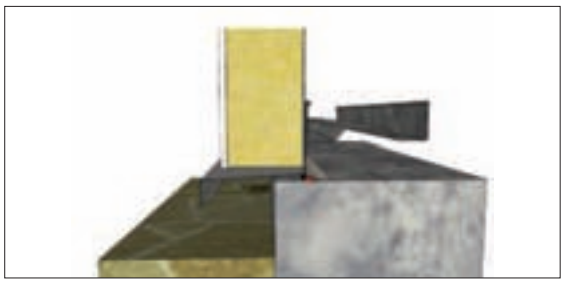
The application of robust detailing can significantly increase levels of airtightness, reducing a building's associated heat loss by as much as 30 per cent. This realisation has led to some building envelope specialists assigning technical teams to develop a 'gold standard' which highlights precise detail specifications, along with their individual U and Psi values, to facilitate to input of calculations into SBEM.

In some cases, these details are delivered as standard, at no extra cost. However, where a choice of 'standard' and 'enhanced' details are on offer, the architect should carefully examine the options to determine which will provide the greatest protection against air leakage, prior to agreeing the specification.

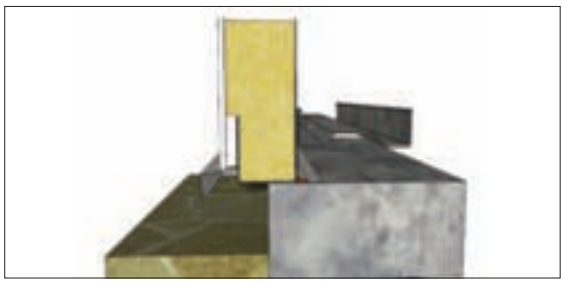
The extent of the thermal bridging effect can vary from one material to another. Interface details comprised of different materials, such as concrete and brick, are common thermal bridges. 3D thermal modelling can be used to accurately assess the areas most likely to cause thermal bridging, enabling those designing the building to make the necessary adjustments and reduce, and sometimes even eliminate, heat loss from specific areas of the roof and walls at the design phase, greatly reducing costs.

Two examples of major heat loss due to poor design are drip details and parapets:

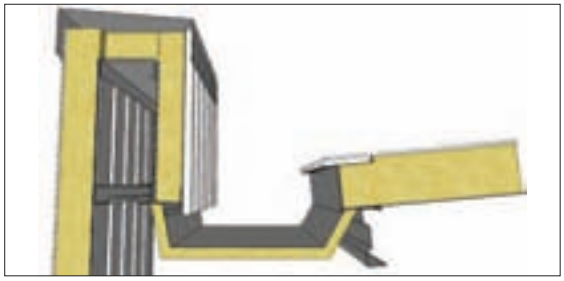
- A typical drip detail, with a drip flashing pinned to the base cladding rail (sketch 1), will produce a psi-value of approximately 1.60W/mK, whereas with properly designed details (sketch 2), this could be as low as 0.00W/mK
- A building with an inboard boundary wall gutter, complete with 1.1m high parapet (sketch 3), will produce a psi-value similar to the drip detail of 1.60W/mK, whereas if the detail was designed with an outboard boundary wall gutter, removing the parapet, the heat loss could be reduced to 0.02WmK.



Sketch 1

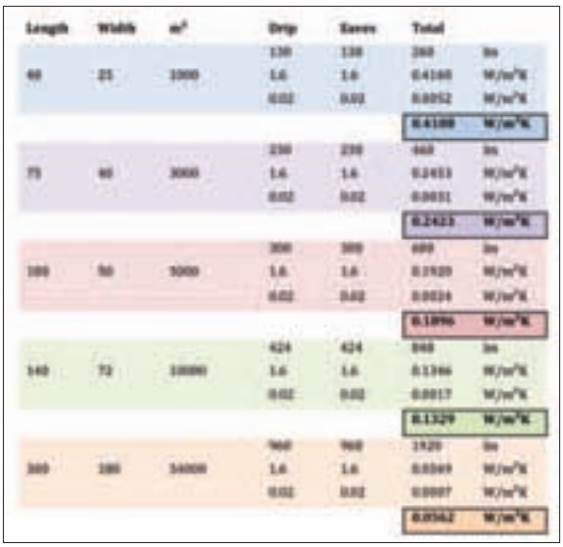


Sketch 2



Sketch 3

The thermal performance of the two details can be easily equated back to a plane element U-value. The table below indicates a variety of building sizes, adopting the same two details mentioned previously:



'Tests have proven that one of the primary causes of air leakage, or heat loss from a building, is poor detailing'

The provision of training for designers in robust detailing is vital and will facilitate the understanding of the associated benefits of improved airtightness from an architectural point of view. Contractors and installers also need to be trained to ensure that the theory is understood and carried through into practice. Regular site checks will ensure the necessary steps have been taken and that the work meets the required standards.

Where robust detailing has been specified, value engineering, at main contractor level, must also be closely scrutinised. It is at this stage, in an attempt to increase profit margins, that the finer attention to detail is often ignored in favour of a cheaper, less effective, alternative. Architects can ensure that main contractors do not deviate from this requirement by specifying precise details – which are available for download from reputable building envelope specialists – along with a stipulation that these should not be changed.

The demand for individual expression is on the rise

Paul Hughes, from FunderMax, comments on the rising trend and demand for individual design within the cladding industry, and subsequent challenges

There are numerous challenges that confront facade producers in today's competitive construction market. All of which have to be balanced carefully. When it comes to choosing preferred rainscreen products, design, price point, longevity and sustainability are all of equal importance as part of the selection process. However, there is now another prerequisite which cannot be overlooked as the demand for individual expression and creativity has never been greater.

As brands look to new ways to stand out, we've seen a significant increase in orders of completely unique 'one off' high pressure laminate panels. From bold geometric designs to large format re-created photographs and intricate motifs, there has definitely been a surge in the desire for individual panels. Subsequently this has placed pressure on the sector to produce a range that allows such expression.

Creative architectural design made possible

Over the past few years companies have seemed to move away from colour blocking, and safe grey and beige palettes, to more emotive photographic effects and naturally inspired facades. There is a real growth in creative architectural design, with imaginative use of large format panel cladding. Today, versatility, creativity and cost effectiveness are on the essential tick list when it comes to rainscreen cladding.

Sustainability & creativity – Intrinsically linked

The importance of sustainable design has been up for debate in recent years, with RIBA president Angela Brady leading on the subject. One of the key things that has come out of these discussions is the need for creators to not just develop sustainable solutions, but ones which are 'irresistible' from a design perspective too. A number of the world's leading architects were involved in the debate at Ecobuild and the concluding thought was that there is a distinct lack of innovation within the industry.

We're moving in the right direction – we're certainly bucking the trend, but as a sector we need to do more to meet the demand and exceed expectations. It was by no means a surprise that sustainability, low carbon building materials and creativity therewith were also on the agenda at this year's Ecobuild, as the industry looks to its fellow creators for inspiration.

When it comes to sustainability, high pressure laminate continues to excel. As well as making great environmental sense, it also enhances energy efficiency when used as an overclad on existing buildings. Created mainly from recycled waste materials – layered kraft paper which is then compacted – it is exceptionally green.

Meeting the demand of a future trend

'We've seen a significant increase in orders of completely unique 'one off' high pressure laminate panels'

As people become more aware of the sustainable qualities of rainscreen and its energy efficiency, the demand continues to grow, as cladding is seen as a versatile, sustainable and cost effective solution.

Though cost effectiveness is definitely a positive attribute, it can sometimes be viewed negatively as designers and creators question its quality. This is one of the prime reasons why I am whole heartedly behind the trend for individual expression. There are seemingly limitless possibilities with today's contemporary high pressure laminate – whatever designers have envisaged can be brought to life, and this goes someway to counteracting that negativity.

The human factor plays a huge role in architecture, so the ability to individualise makes rainscreen a more favourable and expressive choice. And as the demand for 'the unique' rises it's essential that the industry rises to meet that demand, at the same time paying particular attention to sustainability. As Angela Brady asserts 'sustainability' and 'irresistibility' should go hand in hand.

Plugging the BIM gap

Gordon Moffat, technical manager at CMS, Scotland's largest door, window and curtain walling manufacturer and installer, discusses the advantages to architects of 'BIM ready' contractors and how BIM can optimise building envelope performance

As more and more product and system manufacturers invest in BIM to ensure architects have ready to use BIM elements at their disposal, it is crucial that the success of a building project is not compromised due to contractors or sub-contractors lacking the same skills and technology.

Since the emergence of BIM, much of the talk around this shift in the way we design and deliver buildings has been around encouraging architects to adopt BIM and learning how systems manufacturers are making their components available for projects. Somewhat overlooked has been the importance of contractors and sub-contractors being on the 'same page' – after all, they are equally important links in the supply chain.

As contractors, we need to ensure that we have the right level of competence and the right software to work on BIM projects effectively. Moving to this point at this stage in the evolution of BIM, however, is not something that a contractor will enter into lightly – it has to be a strategic decision which demands significant investment in people, training and infrastructure. Fortunately, forward thinking contractors are increasingly making the step up to being 'BIM-ready'.

By being BIM-ready, a contractor is the link between the design team and product manufacturers. What it means to the architect is an additional layer of support. For example, knowing that your facade contractor is able to take your BIM model and detail design elements as much as is necessary will help avoid delays further down the line. It provides a safety net underneath the architectural concept, the standard product

'While there is still a lot of work for the industry to do, contractors are playing an increasingly important role in shaping the long-term success of BIM'

BIM objects which look most suitable for the project and the practicalities of how the system is most efficiently manufactured and installed.

Product manufacturers also value BIM-ready contractors as they recognise how an experienced manufacturer and installer will sometimes need to apply a system in new ways, often to help an architect to overcome a particular challenge. The contractor's knowledge of BIM in these situations therefore helps reduce delays on technical matters which may otherwise have to be dealt with by a hard-pressed and sometimes distant technical department.

As in the pre-BIM era, the contractor is best placed to understand how a given product or system will work in the application, taking a project from the theoretical to the reality. Early stage involvement by a contractor is almost always beneficial and this is another way in which BIM is revolutionising things – we can now collaborate with architects by having the 3D model accessible online and in a format that can be edited with ease.

Looking ahead to the immediate future, while there is still a lot of work for the industry to do, contractors are playing an increasingly important role in shaping the long-term success of BIM. Nowhere is this more evident than with our curtain walling projects.

Much of this is to do with the way design software integrates with estimating and production software. By potentially bringing together the major software systems routinely used by aluminium curtain walling fabricators and installers, we will make the design and delivery of buildings more automated and smoother with less scope for errors. Steps towards this integration have already been taken and it should be just a matter of time before the benefits are realised.

As a result, the widespread adoption of BIM is set to deliver multiple efficiency benefits, including in terms of building performance. BIM encourages truly integrated design approach, all collaborators in the design and build process can feed their expertise into the 3D model at an early stage. The envelope design can therefore be refined for improved performance – as required – taking the predictability that comes with the BIM object's data, including embodied carbon figures.

This is a much more accurate way to create a building envelope with the most appropriate levels of thermal and acoustic insulation, as well as aiding solar control and natural daylighting objectives to manage overall energy efficiency of the building in-use. This BIM model data is also fundamental to performance monitoring during the building's whole life cycle, ensuring easier comparison between predicted and actual.

BIM software typically incorporates an integrated thermal performance module too. At the product selection phase, this allows architects to explore different options for their design to ask environmentally based "what if" questions. So crucial aspects of the design can be modelled and evaluated, such as building orientation and building massing, which will have a significant impact on the design of the building envelope.

There are also direct advantages with the ability to cut through the BIM model's 3D sections throughout the building design. This can highlight design issues, such as thermal bridging, which can be resolved prior to construction and avoid costly delays or redesign further down the line.

The use of natural stone in modern architecture

Ian Robottom of Lithodecor discusses lightweight natural stone ventilated rainscreen facades and the requirements of modern architecture

The advent of modern architecture has fundamentally changed the way buildings are constructed. This is particularly relevant when looking at how the use of stone in construction has changed. As architecture has required more modern methods of construction, so too the use of natural stone in modern architecture has had to adapt and adopt modern methods, such as ventilated rainscreen cladding, to compete alongside other innovative facade finishes.

To fully appreciate how the use of stone has adapted we need to go back to the early 20th century. At this time skilled masons and a large workforce served the building industry at quarries throughout Britain. Today's UK stone industry is substantially smaller, with fewer dimensioned stone quarries; however, quarrying principles are similar and only differ according to the extracted stone's geological type. Block sizes depend on the quarry, which is a consideration when designing buildings, and are processed in primary saw sheds, where large blocks of stone are transformed into slices which are then cut to their final size using secondary saws.

In traditional ashlar construction, huge chunks of stone were often used to form a single leaf, which might be 3-400mm thick. Current handset ashlar cladding, covered by BS 8298:2010, is typically 75-100mm thick, often with 5mm joints. With this form of construction it is necessary to consider a number of factors such as weight and time constraints, wet trades and scaffolding. Additionally support is required, usually provided at each floor level on angle irons, with each stone requiring restraint fixings doweled into the beds of the stone.

Since many city centre sites had and still have limited storage/working areas, and in some instances, scaffolding restrictions, alternative construction methods were developed, such as stone-faced precast units. This construction method requires designers to consider how to divide facades into large, if possible, repetitive panels which can then be hung on the

'There are a wide range of glass colours available with some systems able to incorporate printed designs'

building frame. Two further major factors to consider however are panel curing times and weight.

With the growing popularity of rainscreen cladding products, there was a demand for natural stone to be fixed in a similar manner which leads us to the introduction of rainscreen cladding. Ventilated rainscreen cladding is a layered system, typically comprising an outer facing layer that forms the primary rain barrier, a ventilated air gap and an impermeable backing wall.

The principle involves allowing the ingress of air at the base of the system and its egress at the top. The ventilated cavity allows any water which penetrates the open panel joints to be removed by the stack effect and by running down the rear face of the panels and out at the base.

Panels are lightweight and easy to position, often using scissor lifts, mast climbers or hydraulic platforms. A further advantage is that large format panels can be produced off-site to exacting standards; these are then quickly fixed to pre-positioned rails, with all application being dry fixed.

The relevant standards for rainscreen cladding are BS6399 – wind loading design; BS8118 Part 1 – structural use of aluminium; CWCT (Centre for Curtain Walling and Cladding Technology) standards for systemised building envelopes and BS EN 8200 – Impact Load Testing for hard and soft body impacts.

Most of the primary stone types, ie. Limestone, Sandstone, Slate and Granite are available on a rainscreen system but limited in panel size by each specific stone's geology. To create a typical panel, natural stone is quarried and cut into slabs, then bonded to an aerated concrete backing, circa 16.5mm thick. The large slabs are then cut into finished panel sizes, calibrated, honed and polished, before fixing points are drilled and ceramic plugs inserted.

Panels are extremely impact resistant with the advantage of being one-third the weight of 40mm-thick natural stone and one-fifth the weight of 75mm-thick handset stone and can be produced in sizes up to 3.75m^2. Some manufacturer's systems incorporate an invisible fixing system and can provide bespoke specialist features such as fully mitred corners, window reveals and soffits.

The typical method of fixing utilises "helping-hand" brackets and vertical "T sections" which are used to support the rainscreen system. These can be installed with isolation pads to prevent cold bridging with horizontal rails attached to the T-sections and the support system fixed back to either light-gauge steel framing or blockwork. Clips are attached to the backs of panels with ceramic fixing points, and all fixings are aligned and attached using the correct torque before panels are simply clipped on to the horizontal rails.

Some rainscreen cladding systems can incorporate a glass finish, with panel sizes of up to 4.7m^2. There are a wide range of glass colours available with some systems able to incorporate printed designs. It is possible to create a facade using both natural stone and glass using the same fixing system.

Ventilated rainscreen systems provide designers and contractors with a solution to combine the use of natural stone and glass, using modern methods of construction, in accordance with the architecture's requirements, while also ensuring creativity in design.

The changing face of window design and specification

Jon Palethorpe, commercial director at architectural aluminium systems specialist, Technal, looks at current trends in fenestration design and specification, and some of the latest technical advancements engineered for high performance windows

In the UK, building regulations are imposing ever more stringent targets with the aim of achieving zero carbon performance in non-domestic buildings by 2019. As a result, developers and building occupiers are becoming more informed about the need for energy efficiency to minimise the demand for mechanical heating, ventilation and cooling, with the aim of reducing running costs and future-proofing their buildings.

The facade of any building is one of the most important factors in determining energy efficiency and window systems are therefore a critical part of the specification process. Effective fenestration design has to achieve the balance between aesthetics, thermal and weather performance, natural ventilation, acoustics, security and cost – and the challenge is that these factors often work against each other.

The trend for exceeding building regulations to further improve thermal performance

We are seeing much greater demand for levels of thermal performance which exceed current Building Regulations. These require Uw values for the glass and frame of 2.2W/m2K but we are often now asked to achieve values of 1.5 or as low as 1.2 W/m^{2}K. These performance levels exceed the requirements but for a relatively small additional cost, the building occupier will gain a much more thermally-efficient system to help reduce future running costs over the life cycle of the building.

The thermal performance of window systems can be enhanced to deliver lower U values with the use of:

- Increased thermal breaks
- New materials for thermal strips
- Increased module depths
- Accommodation of larger glazed unit sizes – 24mm was the standard but this has been increased to 28mm and up to 52mm is now common
- Additional insulating gaskets
- Profile engineering.

These features should now be available as standard for high performance aluminium window systems.

Architecte Manuelle Gauterand
Photograph © Vincent Fillon/ Technal

'Increasing the mullion and transom sizes will allow architects to achieve larger spans and greater vision areas'

Developments in natural ventilation

There have been technical advancements in trickle ventilation to allow fresh air to circulate when the window is closed but with no passage area for sound. This is particularly useful for high rise apartment schemes. The vents can be fitted into the window system or can be installed independently above the window.

Casement windows can also now incorporate hinges for wider opening up to 90 degrees rather than the previous standard 50 degrees but specifiers should be aware of the safety considerations for wider openings. There are also parallel opening options to optimise air flow.

How to minimise solar gain

Solar gain can be an issue with windows as well as curtain walling and reducing it is increasingly a requirement, particularly for offices and schools. Building occupiers need the benefit of natural ventilation and high levels of natural light to help maintain comfortable working environments and fresh air has been proven to contribute to concentration levels, but highly glazed buildings are vulnerable to heat gain.

Glass and building orientation are part of the solution, but if not sufficient, the building designer should look at external solar shading to help reduce the reliance on mechanical cooling.

Weather performance issues

Air tightness is becoming even more critical in building design and very low levels of air or heat loss that are well in excess of Building Regulations are now being demanded.

The requirements currently permit air leakage rates of up to 10m^3/hour but increasingly levels of 3m^3/hour or less are being asked for, and this is particularly a requirement on commercial schemes in central London.

It is also more common now for specifiers to request an EPDM perimeter seal between the structure of the building and the window system. This can make a considerable difference to reducing heat loss and improving the overall building performance.

For water tightness, it is vital contractors and developers employ well trained glazing fabricators and installers to ensure correct manufacture of the system and accurate fitting on site.

During the economic downturn when there was huge pressure on cost, there were too many issues with the quality of fabrication and installation across the glazing industry which resulted in poor weather performance on some projects. Specifiers and contractors are now much more aware of this issue.

Specifiers should check that fabricators are working to current fabrication manuals and that they have had sufficient training in assembly and installation from the systems company.

Window and door sizes

Increasing the mullion and transom sizes will allow architects to achieve larger spans and greater vision areas for maximising natural light and striking aesthetics. The most advanced aluminium window systems will have less visible aluminium for further visual appeal.

Specifiers should always check the maximum recommended weight and sizes as there will be variations between systems suppliers, and they should ensure that fittings are sufficiently robust to take the loadings of larger window units.

Occupier comfort and usability can also be an issue with larger windows or doors. Specifiers are demanding ever bigger doors but do need to balance aesthetics with ease of operation. A 3m high door, for example, will be too heavy for children to open in a school environment.

Enhancing aesthetics

Technical advancements in window design have included the increased use of concealed drainage and fittings – such as hinges, restrictors and closers for an improved finish. Concealed fittings can also be supplied for open-in windows and tilt/turn configurations.

Leading suppliers of facade systems will also offer visual compatibility. This allows the specification of profile module depths, sight lines, accessories and fittings to be consistent across a building envelope and fully integrated, whether for curtain walling, doors or windows.

Balancing specification considerations for effective design

There are multiple considerations that affect window and glazing specification – from size limitations, occupier comfort, impact on running costs, location and orientation of the building, ventilation requirements, security, solar gain, acoustics, maintenance, finish, cost, compliance with disability legislation, current and future Building Regulations, environmental impact, life cycle costing and recyclability.

A good systems company will have a wealth of technical expertise that architects and building designers can draw on to develop the most effective fenestration solution for every project.

'Technical advancements in window design have included the increased use of concealed drainage and fittings'

Q-Clad pre-stained featheredge cladding

Hoppings Softwood Products Q-Clad Featheredge is now available finished with a unique pigmented water based coating, called Q-Shades. Q-Shades is available in semi-transparent black, brown and grey shades, designed to work specifically with Tanalith® E wood preservative. The coating is a simple and quick factory controlled application prior to a standard Tanalith® E high pressure preservative treatment making finished wood products great value for money. Q-Shades gives a consistent coverage and durable performance on rough sawn or planed timbers and weathers gracefully, a process that is even and natural. A durable and easy to maintain colour coating that allows the natural beauty of the wood grain to show through. For a free sample please contact Hoppings.

Aluminium: the trusted building material

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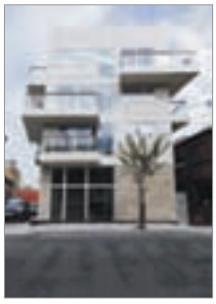
USE Architects breathe new life into Hackney



In one of the major applications in the UK for DuPont™ Corian® high tech surface as a structural facade, architectural practice USE has created a distinctive new residential building in an area of London experiencing significant regeneration. As evidence of both the revival of its Hackney neighbourhood and the attractions of this pioneering design, every apartment in the development was sold off plan long before the building was complete. For further details of external Corian® cladding please contact **CD UK** or visit its website.

0113 201 2240 www.cdukltd.co.uk

Midroc chose VIVIX® facade panels

Contractor Midroc chose VIVIX® exterior facade panels from **Formica** to clad the outside of the residential building Bohus, in Malmö, Sweden. Altogether nearly 3,000 square meters of the lightweight and impact-resistant facade material was fitted. Midroc has used VIVIX facade panels before. For them, customisation and material properties were decisive factors in the choice of cladding material. For this project, Midroc commissioned panels at the exact dimensions, but the panels can also be easily cut to the desired dimensions in the workplace.

0191 259 3100 www.formica.com

Queen Elizabeth Olympic Park

Make Architects has helped transform the former Olympic Park site in Stratford into an exciting new riverside destination with the opening of its first legacy building, the Podium.


© Matt Wreford

The new visitor centre for the south part of the park and the ArcelorMittal Orbit visitor attraction, includes ticketing and retail space and flexible events space with a roof terrace providing panoramic views over the park. The project also includes four kiosks of different sizes, installed at intervals through the new area of parkland along the South Park promenade.

The Podium is close to several major venues including the stadium, ArcelorMittal Orbit and the Aquatics Centre. Its design complements these imposing structures rather than trying to compete with them. The building has a simple, elegant form and long lines that follow the riverside promenade. The design also engages people passing by with an interactive 'pixel wall' art installation that they can stop to enjoy.

Selina Mason, former Director of Design Integration for London Legacy Development Corporation (LLDC), said: "Make understood what kind of building we needed in this location – a simple building, designed around its function within a park, but also a building that has a strong presence in its own right, capable of sitting comfortably alongside the Orbit and the Aquatics Centre across the river."

The building is set within newly landscaped gardens, waterways and play areas that connect the park's prominent stadia. The South Park Landscape Master plan, led by James Corner Field Operations (JCFO), the New York-based landscape architects famous for their work on the High Line in Manhattan, provided the design vision for this area. It was selected from a shortlist of five schemes in December 2011 following an international competition. Make's design for the building was one of the main features within this proposed new environment.


© Make Architects

The low-lying rectilinear, pavilion-like structure appears simple, calm and considered, and works with the landscape as part of a wider master plan. It's been designed to offer a strong visual connection with the surroundings.

The traditional Japanese technique of charring timber known as 'Yakisugi' was used to preserve the cladding on the vertical plane and give it a dark, textured finish. This is in contrast to the white aluminium roof on the horizontal plane, for which ALUCOBOND® panels were used.

The retail space is clad in full height glazed panels to maximise the view.

Make's design specified prefabricated materials that were manufactured in a controlled factory environment to produce a more consistent quality. Cross-laminated timber was used for the walls and roof, and precast concrete was used for the building's spine wall, which separates the public and private areas.

Paul Herbert, Specification Manager **07584 680263**
Richard Geater, Sales Manager **07584 680262**
www.alucobond.com


© Make Architects

'The traditional Japanese technique of charring timber known as 'Yakisugi' was used to preserve the cladding on the vertical plane and give it a dark, textured finish'

New VMZINC roof for Grade 1-listed church

As one of the nation's Victorian architectural gems on a UNESCO World Heritage Site, the Grade 1-listed Saltaire United Reformed Church is a unique example of Italianate religious architecture. Restoration work on the mausoleum involved **VMZINC** craftsmen hand crafting a new ornamental, stamped natural zinc roof and hand-working of panels on site by restoration specialists Norman and Underwood Panels. Zinc was authorised by English Heritage to remove the threat of lead theft, the result being a restoration which has brought the building back to a standard not seen for more than a century.

01992 822288 www.vmzinc.co.uk

Levolux makes the grade in Stamford

Following a comprehensive refurbishment project, the old gym building at Stamford School in Lincolnshire has been transformed into an ultra modern Performing Arts Centre, with an external Timber Fin screening solution from **Levolux**. To satisfy the client's demanding requirements Levolux was invited to develop a custom external Timber Fin screening solution. The solution comprises 478 rectangular shaped Timber Fins, fixed vertically to three elevations of the three-storey building. The vertical Fins are set at 236mm centres, extending to screen an area measuring almost 60 metres in length and up to 6.6 metres in height. Each Timber Fin, which measures 285mm deep by 44mm thick, is engineered from untreated Western Red Cedar.

Cladit – cladding repainting made easy

Cladit from **Bradite** has been formulated to revitalise metal cladding – the profiled exterior metal finish on industrial and commercial buildings. A water thinned polyurethane semi-gloss acrylic finish for a long lasting protection it provides an easy to maintain finish that offers good colour retention and weathering resistance. Cladit provides an easy to maintain finish that offers excellent colour retention, UV resistance and excellent weathering protection for all types of cladding including steel, galvanised steel and aluminium. Full BS 4800 and RAL Colours including Aluminium are available while specific corporate colours can be specified from Bradite's massive colour mixing database.

info@bradite.com www.bradite.com

A rich heritage and tradition of innovation

A global leader in architectural building products such as window coverings, wall cladding and ceiling systems, **Hunter Douglas** also has a rich tradition of manufacturing high quality ventilated facade systems. From Multiple Panel to Quadroclad, Hunter Douglas facades offer an unparalleled degree of design freedom through the availability of shapes, joint options, materials, finishes and colours. Quadroclad consists of honeycomb core panels with facings in coated or anodized aluminium, zinc and stainless steel. MPF, or Multiple Panel Format, offers a plank style, single skin panel in the same range of metals as Quadroclad. It is a versatile panel with widths from 150mm to 600mm x 6metre maximum length.

01604 766251 www.hunterdouglas.co.uk

RMIG depict a new Golden age

Precision perforated panels from **RMIG** have helped to create a unique, show-stopping facade for Bang & Olufsen's (B&O) new flagship store in Herning, Denmark. This new building reflects the audio-visual giant's new design concept for its stores. The striking flagship store was designed by Arkitec as who, through RMIG's City Emotion programme, chose perforated TECU® Gold panels for the building's facade to cover approximately 350m². Using RMIG ImagePerf, each bespoke panel has its own specially designed perforation pattern, which when assembled, runs across the whole envelope of the building creating an unusual and fascinating design that resembles entangled snakes.

01925 839 600 www.city-emotion.com

London Gateway

London Gateway Port Terminal is an automated deep-sea container port developed by DP World on the north bank of the River Thames in Essex. **Sapa Building System's** Elegance 52 SX curtain walling was chosen for the project as the architect wanted an external frameless curtain walling system that could accommodate the glass panels which are a major feature of the project. A special recessed channel detail to emphasise the flooring levels was produced to give the distinct feature required by the architect whilst still maintaining a thermal bridge within the curtain walling screen. As a result of using the Sapa Elegance system the project achieved a "Very Good" rating under BREEAM.

01684 853500 www.sapabuildingsystems.co.uk

Lathams' latest cladding gets TRADA approval

Accoya®LathamCLAD – the modified, highly durable and dimensionally stable certified timber cladding – is now available from all eight of James Latham's timber depots.

Created from sustainably sourced wood and completely non-toxic, Accoya®LathamCLAD is a revolution in wood technology. And with the 15mm profile having recently received TRADA approval for use as an external cladding product, Accoya®LathamCLAD is a perfect solution for exterior cladding, siding and facades where the wider board offers numerous features and benefits including enhanced aesthetics, less frequent maintenance, dimensional stability, durability and improved insulation values.

Suitable for horizontal or vertical installation, Accoya®LathamCLAD can be used to create simple or complex designs. And with a choice of factory coating finishes, it can be opaque coated or, for those wishing to enjoy the natural look of wood, translucent coated.

Plus, with a 50-year guarantee when used externally, Accoya®LathamCLAD's low maintenance requirements add to its 'whole life' cost effectiveness and environmental credentials and this versatility makes it ideal for use in residential, commercial and industrial applications.

Paul Leach, James Latham's group product sales & development manager for Accoya said: "When it comes to cladding, Accoya®LathamCLAD ticks all the boxes and is the perfect solution for many exterior applications which were once only feasible with non-sustainable material. Use of the wider cladding boards is allowed by the improved dimensional stability, plus cladding joints do not open, tolerances remain tight and twist is prevented. In addition, the wood's natural appearance is retained for longer, thanks to the superior resistance to the effects of UV exposure."

He added, "Accoya®LathamCLAD is a fantastic material for external specification and fits perfectly with our already established range of sustainable products."

In addition to cladding, sidings and facades, Accoya® wood is also ideal for windows, doors and decking.

0116 257 3415 www.lathamtimber.co.uk

Aluminium: The trusted building material offering future proof capability.

Aluminium is the ubiquitous construction material, constantly evolving with design. It is a building material that offers the designer reassurance as well as catering for new demands. For construction professionals gaining a grasp of its capability is a future proof skill. Aluminium gives the architect the opportunity to design feature and style to a building every time it is specified. Naturally, each project is different and aluminium can complete the design concept of even the most innovative practice. Developments in 3D modelling and extrusion now mean that aluminium is the building material which literally pushes the envelope to the forefront of design. Not only is design aspiration catered for but this is a material which is both sustainable and offers longevity. In a Delft University pan-European study 86 per cent of aluminium used in the old Wembley stadium was recycled and reclaimed. Longevity and life cycle analysis is also favourable with standard 25-year guarantees for polyester powder coated aluminium and 35 year guarantees for anodised applications. The lifespan of aluminium, if properly maintained, can be indefinite: the top of the Empire State Building was one of the first examples of anodised aluminium and is still a gleaming, eye catching feature today. **Comar Architectural Aluminium Systems**, continually develop and refine their profile catalogues to meet the demands of designers, providing support and calculation at any stage.

Crittall's stylish windows solution

A prestigious headquarters building has been created within the stylish Harley Street Conservation Area in central London with the help of **Crittall** Corporate W20 windows both inside and out. Architects Morrow+Lorraine, who have particular expertise in the London commercial office, residential and retail sectors, were engaged to refurbish the building converting it from D1 non-residential use into a B2 self-contained Grade A office building. 'The building frontage had been badly altered in the past and we wanted to recreate the elegance of the original façade which was achieved using a combination of glazed bricks, bespoke joinery and new steel windows,' says director of Morrow +Lorraine Julian Morrow. The Crittall Corporate W20 units were employed front and rear in the refurbishment and the front elevation at ground floor level was reconfigured to reflect the original drawings from the architectural practice Forbes & Tate who designed the building in 1926-27. Internally, the designers wished to reveal as much of the original fabric as possible. This was achieved by stripping back finishes and exposing the steel columns of the building's structural frame. This emphasis on the use of steel was enhanced by the fenestration of the facade, a new steel staircase and the use of steel internal partitions.

01376 530800 www.crittall-windows.co.uk

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