Metal in architecture

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Metal in architecture supplement

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From the Editor

The imaginative use of metals in architectural design is increasingly shaping our cities, towns and urban landscapes, leaving an inspirational legacy for future generations.

It is not just the skills of architects we have to thank for our outstanding metal structures, but also the expertise of those who develop and manufacture state-of-the-art products – and those who engineer and construct the more challenging buildings.

Despite glass being its most notable feature, London's icon, The Gherkin (or 30 St Mary Axe to give it its formal title) used 35 km of steel in its construction, and the city's tallest skyscraper, the 309.6 m Shard, despite its 11,000 glass panels and a 56,000 sqm glass facade essentially has a steel framework. Steel beams in the ground also formed part of preparations for the building's concrete core and the tower's steel structure was topped out with a 66 m, 500 tonne steel spire reaching a height of 308.5 m.

In this Metal in Architecture supplement we look in-depth at new buildings that are taking the specification of metals to greater heights in terms of creating durable, cost-effective landmarks of design and environmental quality that will stand the test of time.

We report on JKMM Architects' Travel Centre in Lahti, Finland, a bold copper masterpiece that posed design, structural and infrastructural challenges for the teams involved. Not only does it demonstrate the versatility of copper, it will illustrate its complexity as the metal oxidises over time and the building mellows.

The zinc clad new Met Office supercomputer complex in Devon represents the cutting edge technology that it houses to increase the knowledge of how our climate works. A steel framed structure and other metal aspects are essential components of this BREEAM Excellent, futuristic landmark building.

An important collaborative task for the architectural teams working on Four Pancras Square, King's Cross, London, was to provide an aesthetical link to the past. An external steel frame, an exposed Vierendeel truss and non-structural cast iron columns were key design features that hint of an industrial age in a building designed both for the present and the future.

Lastly Michael Stacey Architects working with KieranTimerlake, architects of the new American Embassy in London, quantified the in-use carbon benefits of aluminium in architecture and the built environment as part of the Towards Sustainable Cities (TSC) research programme. Professor Stacey showcases three aluminium projects from the research: The New Bodleian Library, Oxford, The Hive at Kew and Brighton's new i360 vertical pier.

Sarah Johnson

On the cover...

Travel Centre, Lahti, Finland, designed by JKMM Architects.
© Mika Huisman
For more information, go to page 17.

AWARDS

An eclectic mix of galvanized projects get the gongs at the 2016 GAGAs


Sutherland Hussey Harris – Edinburgh Sculpture Workshop Creative Labs, Newhaven


Hudson Architects – The Gunton's Building, Norwich

'Hudson Architects was recognised by the judges for its glimmering, folded and galvanized sheet staircase'

The 2016 galvanizing awards – the GAGAs – were marked by a record attendance at the chic surroundings of 4 Hamilton Place, home of the Royal Aeronautical Society, in west London.

An extensive mix of entries kept the judging panel on their toes – with galvanized nodes rubbing shoulders with steel for energy from waste plants. The first coveted galvanized watering can went to Sutherland Hussey Harris' Edinburgh Sculpture Workshop: Creative Labs. The project's elegantly detailed concrete, brick and galvanized aesthetic, realised on a limited budget, provides a new space for budding and professional artists alike. The building consists of 30 artists' studios – large workshops for wood, metal, plaster and mixed media gathered around a covered courtyard. External workspaces wrapped in galvanized steel screens provide glimpses out while obliquely screening the facilities.

TSP, the Engineering category winner for the Suffolk Energy from Waste Facility, met exceptionally high standards in all aspects from operation and performance to emissions. The building also provides facilities for the local community to enhance education and understanding of the role of waste management.

Hudson Architects' strategic intervention on the existing campus of Norwich's University of the Arts was recognised for its glimmering, folded galvanized sheet staircase, encouraging greater interaction across the various disciplines taught within the building. The use of a rich palette of robust materials reflects the building's semi–industrial character while creating an elegant and contemporary space at the heart of the building.

The Duplex winner, DunnettCravens' Windhinders, were proposed by the architects as "the minimum intervention that allows a windblown public space to be occupied again." Carefully detailed canopies pared down to a minimal composition of tapered columns, gutter beams and frameless glass integrate into a Dutch cityscape.

Meanwhile the Innovation category winner saw the outdoors brought indoors. Galvanized steel played a crucial role in creating the required identity for Coffee Ground by Kiwi & Pom, a new artisan cafe concept for Wyevale Garden Centres. The project included an interior design, brand identity, art direction and graphic design. The concept takes a symbolic structure and creates a distinctive landmark for the client.

Three projects were highly commended, the stand out – Crossrail Place – recognised for interlacing a timber latticed roof which cantilevers out over the waters of Canary Wharf. 564 galvanized nodes, many of them unique, enable 1418 glulam beams to be connected to form a 30 m arched roof.

In his introductory presentation architect Hugh Strange focused on his passion for unfinished materials. Direct contact with tangible materials, weathering, material compatibility and softer aesthetic were all mentioned as being important design considerations for his practice.

FACADE2016

Call for entries for international facade awards

The Society of Facade Engineering (SFE) has called for entries to the third instalment of FACADE2016, the international competition designed to recognise, reward and promote excellence in facade design, engineering and application. The closing date for entries is 31 October 2016.

Created, managed and judged by leading exponents of facade engineering and design, recognition through the competition is "increasingly regarded internationally as a serious and highly desirable accolade," said the organisers. Previous winners include projects from Abu Dhabi, Canada and the UK with finalists including projects as far afield as China and Australia.

This year the winners will be announced at the prestigious Glass Supper before an audience of some of the world's leading architects and building engineers. The event takes place on 1 December at the historic Gibson Hall in the City of London.

Three Awards will be presented this year: Facade of the Year – New Build; Facade of the Year – Refurbishment and Facade of the Year – Innovation. International applications are welcome from individuals, companies and project teams, commented the organisers.

"Any facade contract practically complete between 31 December 2014 and 31 December 2015 and not previously entered in an SFE competition will be considered for the awards. Prizes will be awarded by a panel of judges that includes some of the foremost experts from the field of facade engineering and design."

Credit will be given to entries that provide a "clear demonstration of excellence in technical design and/or research

that has made a significant contribution to the discipline of facade engineering in the development of technologies, product designs, systems or buildings," the awards' organisers said.

The contribution to facade design may be demonstrated in the form of "technical advances, innovations or advanced engineering systems that result in practical design solutions for the completion of a project." Full entry criteria are available on the competition website which is located at www.sfecompetition.co.uk.

The primary sponsor of FACADE2016 is Reynaers Aluminium, with other awards sponsors including Wedge Group; EH Smith Specialist Facades, Interface Facade Engineering, Powdertech Group, Allies and Morrison, Holloseal Glass, Patrick Ryan Associates, Century Facades, Wintech Facade Engineering, and Skanska.

Steel supplier takes gold as industry sponsor

Suffolk-based AJN Steelstock has announced that it is now a Gold Level sponsor of Steel for Life, a steel industry body devoted to promoting the benefits of steel over concrete as a construction material.

The UK continues to be a "world leader in steel design and construction," said the firm, "with our use of steel in multi-storey buildings well above EU averages." It added: "Steel for Life is committed to maintaining the UK's pre-eminent position as a leading consumer of steel in the construction industry and works with architects, engineers, specifiers and contractors to promote the key benefits and advantages of using steel."

The total demand for structural steelwork in the UK is thought to be one million tonnes in a typical year, with demand for associated steel products creating an additional one million tonnes.

AJN Steelstock's finance director, Courtney Bell commented on the importance of the use of steel in UK construction: "The use of structural steel in the industry far outstrips any other competing material, including concrete. If that position is to be maintained, and we are to continue to lead the world in the use of steel in our construction, it is essential for us to be working with and supporting the aims of Steel for Life."

In 2014 the market share for the steel in single storey buildings was 86 per cent, and 68 per cent for multi-storey commercial buildings – compared with 53 per cent and 25 per cent respectively across the EU.

AJN Steelstock is a family owned business which was started in 1974 by John Boyden in Bury St Edmunds, and is now owned and run by his sons Alan and Neil from its HQ just outside Newmarket.

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ZINC IN ARCHITECTURE

A dozen architects rewarded for success with zinc in VM Zinc's international prize

Twelve years after its creation, international enthusiasm among architects for the VMZinc Archizinc Trophy architecture competition is as strong as ever judging by its seventh edition, which saw over 150 projects entered from 18 countries.

This year, a jury of international architectural professionals awarded 12 prizes: nine across the four categories of Individual Housing/Collective Housing/Commercial Buildings/Public Buildings) plus three 'special' prizes. Going beyond buildings, these prizes were awarded to comprehensive projects combining architectural quality, harmonious integration into the environment and aesthetic balance, using creative applications that highlight VMZinc solutions.

The company commented that this bi-annual competition confirmed the material's and the manufacturer's "capacity to bring together diverse cultures, building typologies and architectural styles focusing on zinc." It added that the competition celebrated how "this natural and recyclable material is used in a multitude of applications and surface aspects, in both new buildings and renovations: from the extension of a

monastery to the construction of a new-generation shopping centre, and from an ecological training centre, via a house designed in an atypical style to the renovation of a historic museum."

The competition also "successfully demonstrates the strength of the connections which have been established between architects and the brand, between construction players and zinc." Following the awards ceremony in June, the winning architects will be showcased in a special issue of VM Zinc's in-house magazine which is distributed to around 30 countries.

The winners of this year's trophy are listed below. Full project descriptions can be found at www.architectsdatafile.co.uk – enter reference number 49994.

Awards and special mentions

Individual Housing Winner:
Casa Golf, Hondarribia (Spain) – Rehabite-Enrique Echeverría Lecuona, Aritz Berastegui Aizpurua and Josu Laguardia Igiñitz

Individual Housing Special Mention:
Publilettre House, Bordeaux (France) – Fabre/ De Marien, Lesgourgues, Julie Fabre and Emmanuelle Lesgourgues

Individual Housing Special Mention:
Private House, Hohenems (Austria) – Marc Hoffenscher

Collective Housing Winner:
Canopée Résidence, Bordeaux (France) – Brochet Lajus Pueyo - Nicolas Merlo

Commercial Buildings Winner:
The 82 Bank Learning Center, Nagano (Japan) – Nikken Sekkei LTD – Masanori Yano and Yuka Hagiwara

Commercial Buildings Special Mention:
Abdoun Fashion Atrium, Amman (Jordan) – Symbiosis Designs LTD – Khalid Nahhas

Public Buildings Winner:
Museum of Fine Arts, Oviedo (Spain) – Mangado Y Asociados S.L – F.J. Mangado Beloqui

Public Buildings Special Mention: Daoiz Y Velarde Cultural Center, Madrid (Spain) – Rafael De La-Hoz Arquitectos

Public Buildings Special Mention:
Santa-Maria Monastery, Armenteira (Spain) – Rodríguez + Pintos Arquitectos – Jaime Rodríguez Abilleira and Santiago Pinto Pena

Sustainable Building Award:
Moulins High School, Lille (France) – Chartier Dalix Architectes – Sébastien Chevance, Frédéric Chartier and Pascale Dalix; Co-architect – Avantpropos Architectes

Internet Users Award:
Daan Residential, Taipei (Taiwan) – Rogers Stirk Harbour + Partners – David Weng; Co-architect – C.T. Chen Architects & Associates.

Jury's Special Award:
Reconversion and Extension of The Former Hospital, Meursault (France) – Jung Architectures – Frédéric Jung; Co-architect – Simon Buri.

Tata eyes joint venture

Following much press speculation over the future of Tata Steel's UK business, with seven potential buyers having been in the frame, the company announced it was also considering potential joint venture options to take the business forward.

After a further review of the bids submitted in the wake of the EU Referendum and the Government's consultation on pensions for steel workers, the board of Tata Steel "decided to also look at alternative and more sustainable portfolio solutions for the European business." It has entered into discussions with "strategic players in the steel industry" including international flat steel supplier thyssenkrupp AG regarding a potential joint venture.

The talks are at a preliminary stage, however Koushik Chatterjee, Tata Steel's executive director for Europe commented: "We have initiated conversations for a strategic collaboration for our European business. A potential strategic combination of strip products businesses offers the best prospects to create a premium, world-class strip steel business with the scale and scope of capabilities to compete successfully on the global stage."

Chatterjee added: "Such success, especially the inclusion of the UK business in the potential joint venture, would depend on several issues including finding a suitable outcome for the British Steel Pension Scheme, successful discussions with trade unions and the delivery of policy initiatives and other support from the UK Government."

He confirmed that Hartlepool and South Yorkshire based businesses owned by the firm would be treated separately: "We will now begin separate processes for the potential sale of the South Yorkshire-based Speciality Steels business and the Hartlepool pipe mills (other than the 20-inch Tube Mill). Both of these operations are largely independent of the strip products supply chain with their own specific characteristics." He said that interest had been received from several bidders for both business and a formal process would be commencing soon.

Hans Fischer, chief executive officer of Tata Steel Europe, commented: "Although there is much work still to be done on any strategic collaboration I'm confident that the direction is the right one – towards higher performance and capability to serve customers."

Around 200 potential buyers were contacted for the European business earlier this year, after which seven expressions of interest were developed into full bids. The company said that these were then reviewed "in the light of uncertainties caused by the EU Referendum and the outcome of the UK Government's consultation on the British Steel Pension Scheme."

NEW DEVELOPMENT

A new metal-clad tower for Tower Hamlets

Architect Sheppard Robson has submitted plans to the London Borough of Tower Hamlets for a major mixed-use development in Whitechapel featuring a 24-storey tower with striking metallic cladding.

Located on Cavell Street, the project being developed by contractor KTS Group includes Building One, a high-rise, mainly residential building whose cladding has a textured surface detail designed to provide a "subtle representation of the area's heritage of textile making," say the architects.

The tower, housing 85 apartments, will sit alongside an eight-storey building (Building Two) that will accommodate 40,000 ft^2 of new office space as well as 28 affordable apartments on the top four floors. The two buildings will be linked by a series of public and external spaces.

Building One will occupy the north end of the site and house commercial space on ground (street) level. Sheppard Robson commented: "Vertical windows to the north and south elevations will frame views of London and the streetscape below, whilst maximising the amount of daylight into the apartments. The east and west sides are more solid in appearance, with horizontal windows carefully positioned to avoid solar gain and frame panoramic views of the City."

The tower will be characterised by generous communal spaces, and the apartments will have large, recessed balconies, allowing residents to add greenery to the exterior. A landscaped pedestrian route will run between the two buildings.

The low-rise Building Two will have four levels of flexible 0workspace below the apartment levels, and an outdoor communal terrace, as well as brown roofs and photovoltaics. Said Sheppard Robson: "This element is carefully moulded to its urban setting: the upper levels are stepped to integrate into the surrounding urban fabric whilst at ground level the building has curved corners to create visible connections between the development, neighbouring buildings and public spaces."

The overall massing of the project will be consistent with the development plans of the neighbouring site, which will create high-density amenities for a part of London that will soon be connected to Crossrail. The development proposal is based on the density provided being able to allow affordable housing, currently on a neighbouring site, to be relocated within the new development. "This," said Sheppard Robson, "would create an opportunity for a new public space on the adjacent site which will visible from the development."

Alan Shingler, partner at Sheppard Robson, said: "The overarching aim of the project is to provide something new to an area of London that is undergoing significant change. The project – which includes high-quality and high-density homes, as well as catering for SMEs and TMT businesses – is a development that resonates with the ambition of the area and acts as a marker for future plans."

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Aluminium and sustainable cities: three exemplars

Specifying aluminium for windows, structure and cladding is an affordable way of creating durable architecture with performance benefits. Prof Michael Stacey reports.

As part of the Towards Sustainable Cities (TSC) research programme, my practice Michael Stacey Architects, working with KieranTimberlake, architects of the new American Embassy in London, quantified the in-use carbon benefits of aluminium in architecture and the built environment. In this article I focus on three diverse case studies from this research: the New Bodleian Library in Oxford (1940), The Hive, Milan (2015) and the i360 in Brighton (2016).

New Bodleian Library

In the heart of Oxford's historic centre, the Sir Giles Gilbert Scott-designed New Bodleian Library was built as the Bodleian Library has reached full capacity. A grade II listed building, it was constructed on a spacious site to the north of the original library between 1936 and 1940. The windows were fabricated and anodised by James Gibbons, circa 1938 and installed in 1939.

Scott used anodised aluminium windows throughout the library as a prominent architectural detail. He also designed Cambridge Library's oldest extant anodised aluminium windows in the world, which date from 1934.

The recent refurbishment of the New Bodleian Library by architect WilkinsonEyre included a significantly improved and fully accessible entrance sequence. During the refurbishment the anodised aluminium windows only needed to be cleaned and re-glazed as the anodising, which was tested during 2013 as part of TSC research programme, was in good condition on all the windows sampled, ranging from 7.1 to 30 μm. WilkinsonEyre avoided the need for secondary windows by careful environmental design.

The Hive, Milan on its opening day, May 2015
© Fahad Mohammed

(Below left): the refurbished New Bodleian Library, Oxford
© WilkinsonEyre

When the New Bodleian Library first opened in August 1940, it received very mixed reviews from J.M Richards and Nikolaus Pevsner. Reinvented by WilkinsonEyre and reopened in March 2015 as the Weston Library, in honour of the £25m donation by the Garfield Weston Foundation, it now has a very positive public role in Oxford and has been shortlisted for the 2016 Stirling Prize.

The Hive

Designed by artist Wolfgang Buttress and centrepiece of the UK Pavilion Milan Expo 2015, The Hive was reassembled at Kew Gardens in London and opened to the public on 18 June 2016. This pavilion highlights the role of the humble honeybee as a key pollinator of crops and the current risks to the well-being of the apian population. Buttress observes: 'Bees are incredibly sensitive to subtle variations and changes in conditions and their environment...so the bee can be seen as a sentinel of the earth and a barometer for the health of the Earth.'

With its 169,300 components using 50 tonnes of mill-finish aluminium, The Hive is an exemplar of design excellence and design for disassembly (DfD) enabling the reuse of the pavilion without waste, as all the details are fully reversible. The Hive was fabricated and installed by Stage One, who used laser cutting, waterjet cutting, and machining to fabricate the

British Airways i360, Brighton, designed by Mark Barfield Architects

components. It is a fascinating combination of Euclidean geometry and accretive complexity that is probably only possible using 3D computer modelling. Forming a 14 m cube with a 9 m spherical void at its core, it is lifted 3 m off the ground plane by 18 circular hollow section steel columns. In the void at the core of the Hive, visitors experience sound and light that is a direct response to beehives at Kew.

The bespoke LED light sources respond to accelerometers within the beehives. For Toronto architect Philip Beesley, the Hive "exemplifies a deliberately unstable, open boundary, defined by delicacy and resonance – perhaps the very antithesis of the firmness that has defined Western architecture since Vitruvius uttered his famous paradigm."

The i360

In Brighton on 4 August 2016 the first 'flight' of the British Airways i360 took off. Designed by Julia Barfield and David Marks, architects of the London Eye (2000), it is a vertical pier located at the entrance to Brighton's old West Pier. Although the i360 shares design DNA with the London Eye, it has been tailored to work successfully as a regional attraction within a seaside city.

Over four million people visit the Eye annually and the i360 targets about one million visitors a year. Brighton and Hove has a population of over 280,000 people with about 10 million tourists visiting the city each year. The i360 is a 'vertical cable car' with a single pod that has a capacity of 200 people. It is simultaneously a venue, a destination and a symbol of renewal.

The i360 is 160.469 m high and only 3.9 m in diameter, officially the slimmest tall tower in the world, with a width to height aspect ratio of 1 to 41.15. To reduce vortex shedding on this elegantly slender tower, Marks Barfield Architects has clad it in 5 mm thick expanded aluminium, which is finished in 25 μm silver anodising in accordance with BS 3987:1991. This preformative cladding also provides a transparent veil to the tower.

Produced by the Expanded Metal Company and coordinated by James & Taylor this veil was installed by Hollandia. The 2 m tall lightweight expanded aluminium cladding was roll formed to a radial panel width of 3.2 m, weighing only around 10 kg per m^2. One advantage of forming facade panels from expanded metal is no off cuts are produced, unlike perforating sheet metal with a punch tool.

All structures have a natural vibration frequency, a product of the slenderness ratio and stiffness of a structure. The i360 tower has three modes of oscillation, which are the three lowest natural frequencies of vibration this tower will respond to. The starting point to eliminate the risk of wind-induced vibration was the specification of the expanded aluminium cladding to minimise vortex shedding.

Project leader Ian Crockford comments: "the expanded aluminium cladding is a key part of the damping strategy, the surface roughness and air blowing through the cladding disrupts the wind speed thus minimising the vortex shedding on the leeside." Aluminium was selected in competition with grade 316 stainless steel. The expanded panels with their many edges and the coastal location convinced Marks Barfield Architects that anodised aluminium was the better option, offering a service life of over 80 years. Knowing that the cladding will need to be washed on a regular basis, the tower is crowned by a circular rail to support abseilers. Used wisely, aluminium has a key role in creating sustainable cities.

Towards Sustainable Cities reports can be downloaded at www.world-aluminium.org/publications

The lowdown on lead

Lead remains highly specified but many construction professionals are unaware of the various types available or the quality standards. Boudewijn Tuinenburg of Midland Lead explores the sector's knowledge of lead's accreditations and green credentials.

Over the past few months, the construction industry has seen a rise in discussions around British Board of Agrément (BBA) accredited machine cast lead and British Standard (BS) accredited rolled lead. Those working with lead sheet have queried 'what are the differences between a BBA and a BS?' and 'how do the rolled and machine cast manufacturing methods differ?'

This has been, in part, down to our recently commissioned industry survey (conducted by Firebrand Insight, an independent research consultancy), which revealed widespread confusion and misunderstanding around the differences between the lead sheet types, both among lead merchants and end users.

A total of 250 construction professionals were surveyed across the UK, from roofing, timber and builders merchants, through to specialist lead roofing contractors, roofers and general builders. The results revealed that while some do have product awareness, many professionals are not confident in their knowledge of lead types and accreditations.

BBA vs BS

The key fact is that high quality machine cast lead has a BBA accreditation, while rolled sheet's general standard is BS 12588. And, while BS tends to have higher awareness than BBA in the construction industry, they in fact share the exact same standard requirements. However, the BBA benefits from additional biannual external surveillance visits, a three-year review on product quality and service levels, and internal quality checks.

BBA-accredited machine cast lead also carries a 60-year warranty, while BS-accredited rolled lead offers 50 years.

An important point to add here is that BBA machine cast lead does in fact conform to the BS 12588 specification. However, it is currently impossible for machine cast lead, no matter how high quality standards are, to qualify for it, as it is only applicable to lead manufactured through a milling process.

Machine cast vs rolled lead

With the exception of different manufacturing methods and warranty lengths, machine cast lead and rolled lead share identical product traits. Rolled lead sheet is manufactured through a milling process, and machine cast through a more modern continuous casting process, but both are manufactured using the exact same chemical specification.

Both are also made according to the same analysis, codes, tolerances and permitted sizes, and consistency in thickness is

'Lead can be recycled and used over and over with zero effect on performance'

Boudewijn Tuinenburg of Midland Lead

also identical, varying by no more than +/- 5 per cent at any given point.

BBA and BS-accredited lead sheet are also both accepted by the NHBC, Building Control, architects, designers and engineers, insurers, building associations and all local authorities and government bodies throughout the UK.

And finally, both are made from 99.95 per cent pure, recycled lead – another hot trend in the industry currently.

Lead's green credentials

We've seen sustainable development and the green credentials of construction materials become increasingly important of late, and have noticed that while lead is recognised for being an environmentally friendly material to work with, many don't realise to what extent.

Now in the BRE Green Guide for the first time with a rating of A+ or A, as a building material that is both fit for purpose and able to improve the sustainability of construction, lead is arguably one of the greenest choices you could make.

One of the main reasons lead is A+ or A in the Green Guide, which considers typical UK construction specifications and compares their environmental impact on a scale of A+ to E (lowest to greatest environmental impact), is undoubtedly down to its recyclability.

Lead can be recycled continually; used over and over with zero effect on performance. It's also easily recovered when buildings need to be demolished, and with its high scrap value, nothing goes to waste.

With some lead sheet companies using the environmental benefits of lead to market their product, in fact more than 95 per cent of lead used in the UK building industry is recycled product, whichfurther reduces the need for primary raw materials across the sector.

Lowest carbon footprint

Boasting the lowest carbon footprint among all hard metals, lead sheet's manufacturing process is also energy-efficient. Due to the material's low melting point (327°C) during the recycling process, less energy is used compared with alternatives.

We're also currently working with MSc graduates from Cranfield University on research projects that aim to improve our understanding of the lead sheet manufacturing process in order to further improve its energy efficiency.

We have a strong belief that engineering and technology will help drive the lead sheet industry and its sustainability forwards. We're excited to be a part of improving the manufacturing process' energy efficiency, while spreading the word on lead's natural green attributes, the different types of lead sheet and, of course, lead's different accreditations.

Boudewijn Tuinenburg is managing director of leading lead sheet manufacturer Midland Lead

© Mika Huisman

Travelling light

Bus and rail shelters are rarely seen as works of art but the copper-clad shelter for a new road-rail intersection in Lahti, Finland, is something of a metal masterpiece. Michael Willoughby reports from the Land of the Midnight Sun.

What if the bus stop was actually the destination? That's what Finnish firm JKMM Architects envisaged when they created the new Travel Centre in Lahti, a shining copper structure helping passengers transition between the city's road and rail transport. Surely there is no better way to mark an arrival into a place than by creating a noteworthy structure – first impressions last.

Both local and bus lines set off from beneath the stunning 60 m-long canopy and the waiting area is connected to the long-distance bus terminal by lifts and stairs in three towers. The centre also includes three local bus stop shelters at street level and an 80 m tunnel beneath, for which the designers created cladding.

The travel centre connects visually with the station, which is protected by Finland's 'National Board of Antiquities'. The

two structures are carefully thought out and minimalist in their own right; they are also both red, with the railway station built in 1935 as a brick structure designed by architect Thure Hellström from the VR Group.

Connecting old and new

"As the most prominent element of the new Travel Centre, the terminal canopy initiates a dialogue between the new and old elements. Its minimalistic sculpture-like form embraces the history and value of the area," explains chief designer, architect and JKMM partner Samuli Miettinen.

The main design solution was created in preliminary design. The contract was agreed by the city and the architect acted as sub consultant, initially for the traffic engineer and then for the construction engineer.

"The design inspirations were founded on the 'economic, contextual and structural approach' familiar with great Scandinavian design. Nonetheless, the principles were mostly new, with a hint of Alvar Alto, Finland's most famous architect." says Miettinen.

"We had no other special source of inspiration for the project than our own process and design history. For the aluminium cladding of the drive-through tunnel we were inspired by the noise barrier design of Tuukka Vuori of Playa architects – which also reminded us of the undulating ceiling of Aalto's Library in Viborg (Viipuri)."

He added, "After presenting various options to the clients, the City of Lahti and the City Museum of Lahti, they selected copper because of its durability, feasibility and dignity. We used the material in a fairly straightforward manner – and the shape of the shelter strengthened the exciting horizontality of the surrounding buildings. And, as in many great projects, collaborating led to the growth of brilliant ideas."

Scope

Miettinen continued, "Our scope of work was small compared to some building projects but we consider it significant when it was a question of how to achieve the specific architectural objectives of the client."

The first sketches of the project consisted of uncovered stairways but the design gradually evolved. Aluminium cladding was specified to cover the tunnel's acoustic panels while the staircases were incorporated under the same roof as the elevator structures. The element which developed the most was a tunnel for bicycles and pedestrians.

Communication, extensive teamwork and ongoing evaluation were key, adds Miettinen: "We were able to convince the client about the need for a consistent

© Mika Huisman

architectural approach. Uniform articulation consisted not only of the treatment of the canopy, bus stops and stairwells but also the additional surrounding structures – entrances of tunnel, bollards, handrails and so on.

While seemingly simple, creating the copper coverings was a complicated matter. Latvian company Three L Technologies assembled them using a hidden fixing incorporating a glue layer which kept the copper and aluminium surfaces separate. If they touched, chemical corrosion would occur.

Although copper is the most obvious material in the travel centre project, glass and aluminium play their part as well. Copper covers both the canopy and the columns of the shelter, but the airy elevator tower is made of glass and the shell inside from copper wire. The shaft is a kind of counterpoint to the streamlined silhouette of the canopy. Part of the scheme involved the creation of the bridge, which is clad with anodised aluminium panels.

Total infrastructure

The design team was set the task of creating a "total infrastructure", i.e. one which also "made sure that the human element was considered," says Miettinen.

The City of Lahti created a brief with their own designers while travel planners Trafix, who brought JKMM onto the project as sub-consultants, worked on developing models for the circulation of bus traffic to ensure that everything was up to scratch.

"Overall, we have gained a good understanding of infrastructures and hybrid typology," explained the lead architect. "We studied traffic and transportation typology including the Herttoniemi hub and Kruunuvuori aerial cable way, where perforated metal envelopes were used in the Verkatehdas Cultural Factory, Seinäjoki Library and OP Headquarters, as well as in the Jyväskylä Music Hall – a project which is still at preliminary design stage."

The architects used this knowledge to accommodate a bridge spanning over a lower level street. They had to remodel the entire vicinity in the process, liaising with the traffic designer, the city planner and the authorities of a nearby museum.

Harmony

Exterior furniture and other enabling work also formed part of JKMM's design programme, including stylish support walls, bridge railings and benches – all clad in copper to create a harmonious visual appearance.

However, with Finland being famously lacking in sunlight for half the year, and the Travel Centre being in use all

'While seemingly simple, creating the copper coverings was a complicated matter'

(This page)
Copper is the key material, covering both the canopy and columns of the shelter

(Facing page)
The corresponding elevator tower is made from glass with the shell inside covered with copper wire

year round – and around the clock – lighting was a key consideration for the project's designers.

In order to foster a harmonious and warm feel for the tunnel, JKMM used sophisticated RGBW lighting technology. Ambient lighting is the order of the day, but the lighting inside the tunnel can be changed for special occasions.

While dealing with the construction subcontractor, the team concentrated on visualisation and 3D modelling, handling geometry and lighting solutions to make sure things were well lit and proportionate.

Meanwhile, the electricity and HVAC equipment is hidden inside the structure and varied light sources have been placed behind perforated copper panels to enhance the character of the copper parts during the darker seasons. The exterior also hides a noise reduction system as well as atmospheric lighting to ensure both acoustics and visuals offer the best experience for the traveller.

If creating a design that incorporates traffic, heritage and aesthetics was difficult, so was the construction process: "The construction site was demanding because of the active city life around it as well as keeping traffic running under the new

bridge," says the lead designer. "It was all accomplished piece-by-piece, with clear break points between the different stages of construction."

Controversy

While the locals complimented the shelter's modern design and the environmental boost and functions it brought, there had also been complaints.

The cost, which climbed from €17.8m (£15m) in the original brief to €19m (£16.1m), unsettled some. There have also been complaints from drivers about the glare from the copper, but the metal will eventually oxidise and lose its shine.

Another strain of concern came from the fact that the structure is no shelter from the storm, lacking facilities shielding from the rain, wind and cold. Miettinen admits the original brief didn't include "warm inside spaces or exact guidelines for special fixtures", but adds this can change and then the project will be "redeveloped according to necessity."

Hopefully, all these concerns will dissipate in time as the Travel Centre keeps generating a sense of arrival and departure for visitors to Lahti and its citizens.

'An important part of our role was to make sure that the human element was considered'

Samuel Miettinen
partner, JKMM

Samuel Miettinen: "Uniform articulation consisted not only of the treatment of the canopy, bus stops and stair-wells, but also the additional surrounding structures"

Project details

Client: City of Lahti
Architect: JKMM Architects
Building footprint area: 11,000 m^2
Planning commenced: December 2011
Construction commenced: April 2014
Completion: February 2016
Main contractor: YIT Oy
Construction and supplementary design: Sito Oy
General plan and traffic design: Trafix Oy
Building services engineering: Projectus (Ramboll)
Glass contractor: UPPE, Latvia
Copper installer: Three L Technologies, Latvia
Aluminium cladding: Arston, Poland
Steel fittings: Lahtinen & Jumpsuit
Railings and handrails: Rinaldo
Stone claddings: Graniittikeskus
Copper product: Nordic Standard from Aurubis
JKMM Architects project team:
Samuli Miettinen (chief designer, partner), Tuomas Raikamo (project architect in charge), Marko Pulli (3D modelling, visualisation), Jarno Vesa (interior architect, 3D modelling, visualisation, Asmo Jaaski, Teemu Kurkela, Katariina Knuuti, Juha Mäki-Jyllilä

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Steeling the limelight

Part of the swathes of land being revived by the the King's Cross regeneration, Four Pancras Square is a steel giant which conjures up memories of London's industrial heartland. Steve Menary reports.

Replicating rusty metal might not seem an obvious design approach but that is one of the key design features at Four Pancras Square, which forms part of the multi-billion pound regeneration of King's Cross.

Until the relocation of the Eurostar rail terminal to Saint Pancras in 2007, the 67-acre site was an industrial wasteland dominated by a Victorian gas tower. Now such is the scale of the transformation that a new post code – N1C – has been assigned to the site.

This regeneration has seen the University of Arts London relocate to King's Cross, while 2,000 new homes will be built and 20 historic buildings are being restored.

The development is by Argent King's Cross Central Limited Partnership, which comprises Argent, EC Harris,

'The idea was to build an external frame that would structurally support the building and that would have something of that gasometer scaling'

Eric Parry
Concept architect

(Below right) The exposed, weathered steel frame both celebrates the material and the project's industrial scale

Eurostar, Grant Thornton, Google and HS1 among others, but the design has been led by Argent.

Ivan Walsh, BAM Design's architectural principal on Four Pancras Square, explains: "Argent like to have named architects to design the buildings as it mixes up the design and you don't have a repetitive design across the site."

The 'named' architect on Four Pancras Square was Eric Parry, who drew up the concept design that has been taken on by BAM Design and is being built out by BAM Construct. "Eric Parry's concept was to link back to the industrial age," adds Mr Walsh.

Made of steel

Four Pancras Square is one of nine buildings set to provide two million square feet of office space being developed by Argent. It also reflects the site's industrial past through the specification of a weathering steel frame, the key external design feature.

"It's an exoskeleton and the structural frame is on the outside of the cladding line," explains Mike Hayes, structural associate at post planning lead design consultant, BAM Design. "Argent wanted a steel frame that you could see."

A masterplan for the site was drawn up by two architectural practices, Allies & Morrison and Porphyrios, with Argent then choosing different architects for individual buildings.

Other buildings on the site also provide links to the past with non-structural cast iron columns specified by David Chipperfield Architects on One Pancras Square. These utilise tubular cladding over the columns but on Four Pancras Square

the use of metal was both structural and decorative.

In a short film made by his practice about the project, Eric Parry says: "Thinking about this building, it became in my mind a way of drawing a building to the context that spoke to the continuity and the future but also back to the remnants... of the Victorian industrial heritage.

"The idea was to build an external frame that would structurally support the building and that would have something of that gasometer scaling, and then as it came to the ground it should be liberating in terms of its future use."

(Left) Proposed landscaping for roof terrace

(Below left) The exoskeleton features a Vierendeel truss fabricated in 14 sections and weighing up to 72 tonnes

Subcontractor Severfield is providing around 1900 tonnes of steel on the project. This includes the steel exoskeleton which incorporates a Vierendeel truss that runs around the perimeter of the building and provides a more open column grid at ground floor (with spans up to 27 m). The truss sections weigh up to 72 tonnes each and were individually transported from their fabrication plant near Wigan down the motorway on tiltframes.

Installation of each truss has been such a major element for the construction team that each truss is delivered under escort with only one delivery allowed to site per day.

A 500-tonne mobile crane was needed to install the trusses, which can impose up to 165 tonnes of weight bearing on the crane's outrigger.

Hayes describes one of the key practical benefits of an exposed weathering steel frame: "Weathering steel is maintenance free. You don't need to paint it with corrosion protection, as a small amount of elements including chromium copper and nickel are added to the carbon steel, so rusting does take place in wet and dry cycles but it doesn't flake; you just get a stable layer."

This is taken into consideration in the structural design put together by BAM Design. "On an 80 mm section, you'd design it for 77 mm and ignore the outer layer from a structural point of view," adds Hayes. The design also specified an exposed Vierendeel truss formed with rectangular openings, between the first and second floor slab levels.

An enormous beam

Eric Parry describes this key structural element: "I proposed a steel belt which would go right the way around the first floor level of the building. The principle in the square – that rises quite dramatically towards the building – is that public space should be able to slip underneath the building under this enormous beam."

The Vierendeel truss acts as a massive transfer structure, supporting the 10 upper floors but with an exoskeleton design also poses issues for the construction team. Hayes explains:

© Eric Parry

'The bulk of the facade comprises glass and patinated steel reflecting the rich colour and heritage of the site'

"It's outside the building so there's thermal considerations as it will expand and contract."

The design takes into account the impact of a possible change in temperature from 42°C down to as low as -22°C, which the design team estimate will produce movement of between 22 mm and 26 mm.

The decision to use the steel frame as a design element also caused issues with fire protection, and specialist consultants Trenton Fire were recruited to carry out a detailed study. "We couldn't paint it," says Hayes, "so all the columns above truss level are concrete-filled to provide fire protection, and at truss level there are sacrificial steel plates."

The concept design by Eric Parry also specified ceramic glazed terracotta brise soleil. Walsh adds: "That also harks back to the industrial age, and allows for easy cleaning."

The brise soleil are used externally at the upper levels to provide solar shading to the facade. The bulk of the facade comprises glass and patinated steel spandrels reflecting the rich colour and heritage of the site. To achieve this look, Focchi has supplied glazed curtain walling. "In configuring the space and the building in this case, the aesthetics of the finished product are very important," stresses Parry.

Externally, steel balconies have been specified at intermittent floors on the north and south to provide outdoor space. Steel rods hung from the slab soffit above support these balconies structurally.

Sustainability aims

The design and construction is aiming for a minimum rating of 'outstanding' under the BREEAM 2014 scheme, which monitors environmental performance. The design includes the specification of the latest technology to reduce running costs and minimise environmental impact with the building linked to a site-wide district heating network.

Other aspects of the design that contribute to energy efficiency include orientation and solar shading, thermal mass for cooling and passive ventilation systems.

Beyond nine to five

Plans for Four Pancras Square were submitted to the London Borough of Camden in November 2014 and received approval in February 2015. BAM Construct began clearing the site in advance of this allowing piling to start in March.

Nordic Standard. *Project: 'Meripaviljonki' floating restaurant, Helsinki; Architect: Arkkitehtitoimisto Freese Oy; Photo: Esko Tuomisto*

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The 10 floors of offices at Four Pancras Square have all been let to Universal Music

When completed in June 2017, the project will provide 170,000 net ft² of shell and core space over 10 floors with floor plates of 20,500 ft². The ground level will be allocated to retail, while the 10 floors of offices have all been let to international music company Universal Music, the latest in a host of big names moving to the site, such as Louis Vuitton and global communications group Havas.

BAM Construct has delivered four of the nine office buildings within the overall Argent regeneration and each one features either retail or restaurant space on the ground floor. "The whole emphasis is that it's not a nine-to-five building," says Mr Walsh. "There's cafes and restaurants with seating outside so at ten or eleven at night there's lots going on."

Towering above the building on the top floor of Four Pancras Square is a roof garden featuring a landscaped terrace, raised timber decking, water pools and rocks.

Below ground there is a service basement beneath Pancras Square that is big enough for articulated lorries and means no deliveries need to be made above ground.

The overall King's Cross regeneration project is due for completion by 2020. After shell and core completion next summer the 174,570 ft² Four Pancras Square building will be a functioning part of this new community, and following its fit-out will be operational by 2018.

Project details

Project: Four Pancras Square
Location: King's Cross Central London
Client: Argent King's Cross Limited Partnership
Concept architect: Eric Parry Architects
Structural engineer: BAM Design
Post planning lead design consultant: BAM Design
Structural engineer (concept): AKT II (concept)
Quantity surveyor: Gardiner & Theobald
Services consultant (concept): Sweco
Roof landscape architect: Todd Longstaff
Access consultant: All Clear Design
Contractor: BAM Construct
Structural fire engineering: Trenton Fire

Timeline

November 2014: Plans submitted **February 2015**: Plans approved
March 2015: Work begins
June 2017: Completion due

Science fiction and climate facts

A new sci-fi-inspired Met Office base in Devon is set to become an architectural landmark as well as a top destination for environmental scientists exploring how our climate works. Stephen Cousins reports from the scene.

Devon's reputation for cider and cream tea could take a more futuristic turn when the £20m Met Office supercomputer complex near Exeter is completed next year. The cutting-edge 30,000 ft^2 facility in Exeter Science Park will feature a huge IT hall where a £97m supercomputer weighing 140 tonnes will perform 16,000 trillion calculations per second, as part of efforts to better understand the workings of our climate.

Next door to the IT hall, leading international scientists will gather in the two-storey Collaboration building, a hexagon-shaped construction inspired by circuit board patterns and lit by turquoise neon lights. Its unique form is intended to become a new icon for the region, located on a ridge clearly visible from the southbound stretch of the M5 motorway, a key gateway into the city.

The Collaboration building presented several challenges for lead designer Stride Treglown and design and build contractor Willmott Dixon. The envelope includes a range of treatments, including a Euroclad built-up roofing system, zinc roof projections and wood soffits, plus weather louvres and timber fin brise soleil. In addition, the raking form of the hexagon introduced structural eccentricities into the frame, requiring extra support to prevent the building from toppling over.

World leader

The Met Office complex forms part of a major phase two development at Exeter Science Park, which is striving to become a world-leading centre of predictive environmental science.

When it becomes fully operational in 2017, the project will expand capacity within the Met Office's high performance computing programme. Opportunities created by the facility are anticipated to bring £2bn to the UK economy.

The supercomputer will be 13 times more powerful than the current system used by the Met Office and able to run

© Stride Treglown

more sophisticated weather and climate models to increase the UK's resistance to extreme weather events.

The Met Office appointed Atkins and partner Faithful + Gould as concept architects to take the project through to RIBA Plan of Works Stage 3, including architecture, civil and structural engineering and mechanical and electrical engineering design. Main contractor Willmott Dixon was then appointed, under the Scape Group's National Major Works framework, to complete construction working alongside architects Stride Treglown, structural engineer WSP and services engineer Arup. Atkins has remained involved in the project as technical advisor to the Met Office.

Human interaction with computers was a key inspiration in the concept design for both buildings, explains James Harrison, design director for the South West and Wales at Atkins. He explains, "Progressing through the design, we determined there were two separate environments to be created: firstly a large box containing the computer, which, similarly to a plant room, doesn't need natural light and houses mostly static functions, plus related maintenance and servicing facilities. In contrast, the Collaboration building needed to be very flexible in use, with natural light, open spaces, and the freedom to express itself."

Sci-fi attributes

The geometry of both buildings references films themed on computers. The long, single storey computer building resembles the black monolith in Stanley Kubrick's 1968 sci-fi classic *2001: A Space Odyssey*, in which the psychotic computer HAL attempts to kill the crew onboard a space station.

The facade is clad with Kingspan Benchmark Evolution composite insulated cladding panels and the roof with Kingspan KS100 LP low profile composite insulated cladding panels. The building's north gable will feature aluminium louvres to increase shading and the south elevation will feature a living wall of plants formed in the logo of the Met Office.

The hexagonal form of the Collaboration building was heavily influenced by the 1982 film *Tron*, which portrays a computer-generated world inhabited by humans. The futuristic setting features neon-lit backdrops and costumes and the motif of the turquoise blue hexagon.

'The shape satisfied the client's brief to create an instantly recognisable landmark that would reflect the pioneering work undertaken by the Met Office'

"In popular culture, hexagons are often used to symbolise technology, from the control panel inside *Dr Who's* Tardis to Hexbugs, the latest craze of hi-tech children's toys," says Harrison. "In addition, the form represents the chemical make-up of carbon, an important element in climate research."

The shape satisfied the client's brief to create an instantly recognisable landmark that would reflect the pioneering work undertaken by the Met Office, as well as put Exeter Science Park on the map.

The Collaboration building is spread across two levels of large open plan work and meeting spaces, with hot desking, areas of social study and quiet private study areas.

Flexibility in use is key to the building, as it will host visitors from across the globe, working on a disparate range of projects that could last anything from two days to three months. The layout also reflects Exeter Science Park's design code, which aims to encourage different departments to interact, potentially sparking new ideas and innovations.

The steel framed structure was very challenging to build due to the fact that it slopes in a north-south orientation and the triangle shapes forming the sides of the hexagon increase loads on the east and west extremities.

The structure is formed of raking columns, bolted together using stiff connections and built around an internal box structure to resist eccentric forces.

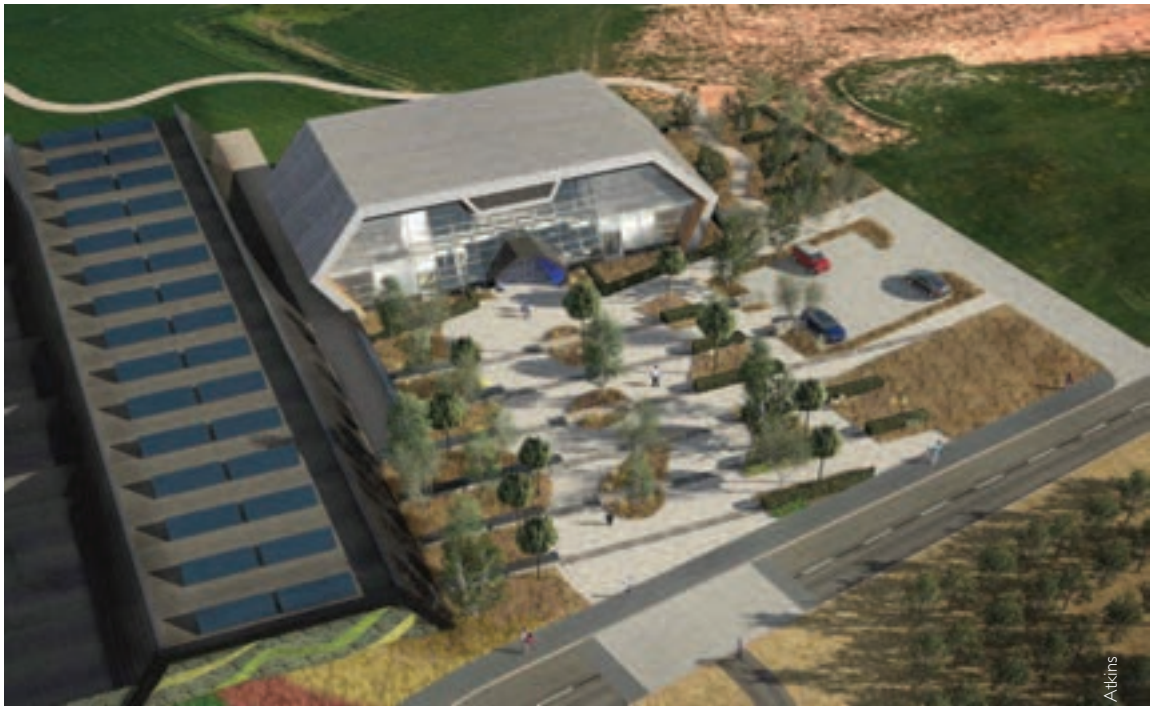
Kristian Cartwright, building manager for Willmott Dixon Construction, comments, "The building is trying to collapse in on itself as well as pull itself over; to deal with this we installed some very substantial foundations and large internal columns. A large diaphragm slab linked into the lift shaft on the first floor and a diaphragm slab on the roof give the structure extra rigidity."

The project is BIM 2-enabled, which enhanced design coordination and clash detection and allowed the design team to coordinate and fix errors before the project reached site. WSP's BIM model was passed directly to the steelwork fabricators to enable swift analysis of the superstructure and speed up production.

Tricky interfaces

A key design challenge was interfacing the many different cladding conditions. The main roof and wall sections are formed out of a Euroclad built up roofing system with raised seam outer sheets and a painted finish of PVF2.

The Collaboration building is designed to BREEAM Excellent standard and features extensive biodiverse



Flexibility in use is key to the design, with the building needing to host visitors from across the globe working on a disparate range of projects

landscaping and a natural ventilation strategy. The curtain walls on the north and south elevations use a Comar 6EFT SSG structural glazing system that includes attenuated weather louvres and timber fin brise soleil. The latter not only form part of the natural ventilation but also visually reference the intricate layout of computer circuitry.

'Feature roof' projections to the sloping north and south elevations, extending beyond the curtain walling, are clad with VMZinc. The soffits of the projections are clad with Thermowood tongue and groove boarding.

Tristan Rhodes, divisional director and head of office and workplace at Stride Treglown told ADF: "The projecting fascia soffits become inverted on the lower part of the building, effectively transforming into a roof condition. As such, the junctions between walls, roofs and soffits had to be developed so they are capable of performing in a variety of orientations."

The cladding sub-contractor developed its BIM model in Google Sketch-up, which was imported into Autodesk Revit to develop the detail and link in 2D construction drawings to ensure accuracy of information.

Rain or shine

The sloping south elevation severely limited the choice of louvres that could remain weather-proof in that condition, but following extensive research the team identified a product, manufactured by the C/S Group, that had been tested and was certified to work on an incline.

The use of louvres, instead of openable windows, was dictated in part by the high level of traffic noise on site, of up to 75 dB, generated by the nearby M5 motorway. Noise was reduced by positioning the building behind the solid mass of the IT hall to create a sound buffer, and by specifying glazing with high noise attenuation.

The Met Office's expertise in weather forecasting has come in handy during construction, as Willmott Dixon had free access to a detailed forecast coordinated with its construction programme to highlight any risks, such as the potential impact of rain on concrete pours or soil excavation.

"Fortunately, it being a Met Office job, so far we have been blessed with brilliant weather, particularly at the start of work when we moved around 11,000 m^3 of soil with no concerns," says Cartwright. Needless to say, when the supercomputer goes live next year, the Met Office's improved forecasts should benefit construction projects across the UK for many years to come.

Project details

Client: The Met Office
Concept: Atkins, Faithful + Gould
Architects: Stride Treglown
Main contractor: Willmott Dixon
Structural engineer: WSP
Services engineer: Arup
Roofing systems: Euroclad
Facade: Kingspan Benchmark
Curtain walling: Comar
Cladding: VM Zinc

Facades for the future

Stephen Anderson of CMS Window Systems discusses what he sees as the bright future for unitised aluminium systems in sustainable facade design and build.

The speed at which the building sector has adopted modern methods of construction (MMC) has been restrained because many promising solutions have not demonstrated clear enough benefits to outweigh the risks of change.

Some new approaches have however shown how it is possible to build better and address newly emerging challenges in line with the changing environmental and social landscape. Nowhere is this more evident than in the way we design and build facades, with unitised aluminium curtain walling increasingly providing the answer to meet sustainability, quality and project efficiency goals.

Today's advanced thermally broken aluminium systems have proved themselves in helping architects deliver top performing, sustainable buildings. Materially, aluminium systems are not only efficient to fabricate and install but deliver superb aesthetic results. Lightweight and highly workable, aluminium can be recycled infinitely without noticeable loss in quality.

Unitised aluminium systems are the latest evolution and in many instances are better suited to the challenges of today's European construction sector, accommodating pressures of build schedules, quality and coping with labour and skills shortages. With stick systems, the bulk of the curtain wall frame construction is undertaken on site. Installers fix the mullions and transoms supporting glass, spandrel panels, metal panels and brise soleils, with each mullion normally supported by the floor or perimeter beams. Generally 70 per cent of the work is done on site, with 30 per cent in the factory environment.

Unitised systems are manufactured in a factory and delivered to site as finished modular products ready-made for installation. Being factory-made means greater quality control and consistency; reducing the risk of poor on-site fabrication which can result in serious problems in later years. It is the reverse of stick systems in terms of labour requirements, with 70 per cent of the work in the factory and 30 per cent on site.

And with the BIM era promising better quality buildings through easier access to accurate technical and performance data, unitised aluminium systems represent a more predictable solution for increased client assurance.

Quality and speed

The performance of any site-assembled curtain wall is only as good as site workmanship allows. This will be affected by variables such as weather, access, dirt and dust. This is not ideal when so many critical seals are necessary in the curtain wall, even in systems that are designed to drain or 'weep' rain

'Today's advanced thermally broken aluminium systems have proved themselves in helping architects deliver top performing, sustainable buildings'

penetration from the system back to the exterior. With unitised systems, as many critical seals as possible can be applied in controlled factory conditions, minimising this dependence on installers.

One of the key advantages of pre-fabricated products is speed of installation. It is no different for unitised curtain walling – usually all that is required is a crane for panels to be lifted into position, a process that can eliminate the need for scaffolding which is costly and time consuming to erect and dismantle.

Improving weather tightness

With the UK's climate changing, weather tightness of buildings is more important than ever. Take rainfall – precipitation rates have increased in the UK, for example by as much as 20 per cent in parts of Scotland. This presents more frequent difficulties for installers in fitting/sealing/glazing into stick frames in inclement weather, often when they are suspended high above the ground. If the right result is not achieved in these

challenging conditions, the weather tightness of the curtain wall will be compromised and could require costly remediation work in future.

Airtight buildings and sustainability

Unitised panels make an important contribution to more sustainable building. In addition to comparatively better water tightness, the enhanced quality seals on unitised systems also help improve air tightness levels. Delivering low air permeability is crucial in sustainable building design. It goes hand in hand with the benefits that innovative aluminium frame designs deliver in combination with the right glazing specification. Failure to achieve the right level of air tightness in the curtain wall will threaten the comfort, energy and CO_2 emission reduction benefits that other building elements deliver.

Reach higher, design differently

Unitised aluminium systems can also enable architects to think differently about other design considerations. There is a limit as to how many storeys high a stick build facade is economically viable for. Wind and air turbulence at height means the more rigid stick built facade would need to be supported by a costly rigid central building structure. A unitised aluminium facade is more flexible and can gently sway with the air movement at height resulting in a less expensive central structure being required.

With such important advantages, we see a bright future in Europe for unitised aluminium systems as they will play an increasingly important role in sustainable facade design and build. With the right technical and specification guidance, we have no doubt that unitised systems will give architects and main contractors a credible solution to many of their current and future challenges.

Stephen Anderson is head of aluminium at CMS Window Systems

Notes from the Comar design team...

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Why the UK should think zinc

Zinc has been widely used in Europe for centuries but remains largely overlooked in the UK. Alex Murphy of VM Zinc looks at its key benefits and describes how to make zinc installations a success.

Robust, easy to maintain and long lasting – the benefits of zinc as a roofing material are no secret to Paris' couvreurs (roofers) who have used it to keep the French capital's buildings dry for the last 200 years. Yet while zinc's benefits are well known on the continent, its application here has remained relatively limited. But why?

Its reputation in the UK as a purely contemporary material could not be further from the truth. While specially fabricated interlocking cassettes are often used to adorn the facades of modern buildings, traditional standing seam zinc roofs have protected the likes of Liverpool Central Library since the 19th century.

Longevity

If you needed a reason to trust the durability of zinc, Liverpool Central Library is a case study worth looking into. First installed in 1879, the original zinc roof did not need to be replaced until 2011, and while it is not uncommon for a zinc roof to last more than 80 years, a lot of its longevity on projects depends on how well the substrate has been designed.

Trapped moisture between the build-up and the zinc is often the leading cause of failure in a zinc roof. Without allowing the moisture to escape, white rust can begin to form on the underside of the panels. The best way to avoid any potential problems is to stick to an accredited build up and a product that won't let you down.

For example, backside coated zinc allows the material to be installed on ventilated plywood as well as warm (non-ventilated) substrates. The product consists of zinc (in all finishes) with a 60 µm coating applied to the underside, thus allowing a wide variety of substrates to be used and eliminating the risk of the formation of white rust.

As well as this, BBA Certificates are available for some non-ventilated warm roof systems. BBA certified systems give a wide range of benefits. For over 40 years, Agrément certificates have been supplied by the BBA in order to give unbiased information on the performance of a system. By selecting a BBA system an architect is likely to avoid problems at a number of stages in the building process and queries about the performance of key products.

Durability

Knowing how to construct a roof is important for an architect, but so are the potential restrictions of the material that is being specified. Parts of the UK can be subject to extreme weather conditions, and while zinc cladding and roofs have been applied to buildings up and down the country, wind uplift is an important consideration, particularly given the tightened requirements in BS5534:2014.

Stonehenge Visitor's Centre

A zinc clad wall even survived the 175 mph hurricane winds of Katrina in New Orleans in 2005 when many buildings were destroyed; proof that a properly installed zinc roof or facade can withstand even the most extreme wind uplift.

Correct installation is therefore essential for ensuring the durability of a zinc roof or facade. Stainless steel sliding clips have a moving component to allow free movement of the panel when it is under expansion and contraction. Each clip must resist a pull-out force of 50 daN. Standard panel width is 600 mm, however for aesthetic or wind up lift reasons 530mm or even 430 mm wide panels can be used.

Protection

But what about maintaining the natural aesthetics of zinc? All zinc will develop a patina over time, and though this is truer of natural zinc than of the pre-weathered options available, all zinc types will change slightly throughout their life.

'Simultaneously classic and contemporary, and robust in nature, possible uses are endless and zinc applications are limited only by architects' imagination'

Cleaning is generally not recommended for zinc roofs and walls, as rain water performs this task very well. Non-rinsed surfaces such as soffits and some facades, especially in coastal areas, may exhibit some minor cosmetic staining, but specifiers can rest assured this is purely cosmetic.

Acidic woods such as oak, red cedar and chestnut should be avoided, as well as non-galvanised steels and copper, which can react with and damage the zinc. Contractors and architects alike should look to avoid contact between zinc and these materials, as well as certain others.

While standing seam systems are always a popular choice for architects due to their classic look and relatively easy installation, there are a number of other rain screen systems available which offer alternative aesthetic options. Flatlock and overlapping panels, interlocking cassettes and sinewave panels all offer something visually different for the architect to consider, yet still maintain the durability and long life zinc is renowned for.

Simultaneously classic and contemporary, and robust in nature, possible uses are endless and zinc applications are limited only by architects' imaginations. If an appropriate substrate is used and the zinc is installed correctly, there is no reason why a zinc roof should not provide beautiful, natural, long lasting protection to a roof or facade for years to come.

Alex Murphy is a technical sales assistant at VM Zinc

Parson's Tower, Newcastle College

Shaping our city skylines

Steve Thompson of EOS Facades shares his views on the latest developments in light steel framing for a variety of different living environments.

The speed of construction coupled with enhanced quality and high levels of sustainability make light steel frames an attractive proposition for housing, particularly in the case of medium-rise buildings and apartments in mixed-use schemes.

Research published by the Resolution Foundation in August found that levels of home ownership in England have fallen to a 30-year low. The sharpest drop was recorded in Greater Manchester, where the proportion of home owners dropped from 72 per cent in April 2003 to 58 per cent this year. Meanwhile, the private rental sector (PRS) is capitalising on this trend, with the proportion of private renters in the area having nearly tripled in the past 13 years.

The private rental sector & mixed use

With private rental on an upward trajectory, a Knight Frank Residential Research predicted PRS units to increase from two million in 2004 to over five million by 2018. As interest rates fall, investors and pension funds are seeing Build to Rent and the PRS as a sound investment proposition and this represents an opportunity for the light steel frame sector.

Mixed-use developments generally comprise commercial or retail space at the lower levels and residential units available to purchase on a leasehold basis above. The combined nature of the project may be required for planning reasons or to maximise the return from the investment made in the land – as is often the case with Build to Rent developments.

The key requirement is the lightweight nature of the structure, which minimises the loading on the underground infrastructure, important when building over tunnels or brown field sites. This, combined with light steel frame's ability to span between the transfer beams and to be sufficiently robust to not be affected by the differential deflections of the supports, offers multiple benefits to designers of mixed-use schemes.

A future-ready solution

The benefits of offsite manufacture, and of light steel framing in particular, come to the fore in urban residential projects as they often involve a mixture of apartments and commercial buildings. Being a rapid, reliable and predictable form of offsite construction, the advantages that are sought by the client and contractor are delivered to customers as one structural solution in the case of light steel frame.

As a versatile construction solution that is viable up to

10-storeys, the geometrical accuracy and rigidity offered by the use of light steel frame eliminates cracking and shrinkages, thus reducing the need for 'call backs' after the apartments are occupied.

Light steel framing comprises galvanised cold rolled C-sections of 70 to 100 mm depth in the wall panels, and 150 to 300 mm deep C-sections or lattice joists in the floors. Spans of up to 6 m can be achieved, which can eliminate internal load-bearing walls and therefore leads to flexibility in internal space planning.

Sections can be supplied in 'loose' bundles to make up in-situ or as walling, base or roof elements, and manufactured offsite as prefabricated cassettes. The prefabricated elements

'Research published by the Resolution Foundation in August found that levels of home ownership in England have fallen to a 30-year low'

can also be fitted with insulation, lining boards and decking boards or even assembled into volumetric modular space frames if required.

Products are available with swaging technology and dimpling characteristics as standard. Panels and cassettes requiring boarding are presented with completely flush faces, negating the requirement for packers and shims. Tight tolerances can be provided as the stud and track sections effectively self-align, thereby ensuring that dimensional parameters are achieved without the need for complex jigging or clamping.

As an advanced high performance offsite solution, steel's characteristics as a material mean that it is not susceptible to shrinkage, warping, cracking, rot infestation or moisture absorption. Steel is a robust, rigid and dimensionally stable material that does not suffer from movement created by moisture related issues. In my opinion, light gauge steel is perfectly positioned to meet the industry's demands – it is future proof and future ready.

Steve Thompson is managing director of EOS Facades

Powder coating, by design

Richard Besant from Powdertech (Corby) provides tips on how to achieve the best possible coating appearance and integrity in the metal finishing process during design and manufacture.

As with so many things, beginning with the end in mind can pay dividends, and this is particularly true of metal fabrication design. Incorporating the finishing and coating process in design review will enable you to achieve the result that you envisaged.

Within even superb fabrication there can be small features that prove detrimental to a successful finish of any type, including powder coating. With a little bit of knowledge of the powder coating process, and how best to design for it, you can avoid unnecessary complications and achieve the best possible result.

Venting is key

Your fabrication will be immersed in molten zinc if it is to be galvanized, or pre-treatment chemicals if aluminium. Suitable ventilation holes need to be drilled into hollow sections in the correct places to allow air out so the object sinks rapidly.

Steel and zinc have roughly the same densities so a hollow steel fabrication will float in a bath of zinc, much as an empty plastic bottle would do in a bath of water. Ventilation holes allow zinc to flow in and air to flow out but the smallest amount of air trapped in the section will cause it to float and burn. There will also be incomplete internal protection and a poor surface finish. Well-designed drainage makes the fabrication lighter, cheaper and safer.

Your design should avoid entrapment of pre-treatment chemicals which can leech or boil out, causing bubbling in the final coat. Riveted or stitch welded fabrications can also trap chemicals so it is wise to avoid this where possible.

To allow molten zinc to flow uninterrupted along the surface of the steel, the corners of internal stiffeners at the web should be cropped to avoid pockets of air and ash.

Avoid sharp edges

Sharp edges caused by laser cutting, shearing, sawing and punching are a problem in both steel and aluminium. They occur at the trailing edge of a perforation, sheared edges of sheet and the edges of expanded mesh. Sharp edges cause localized thinning of all coatings, including zinc and powder coating. On galvanized steel they can also increase fracturing of the zinc coating along an edge, leaving the area vulnerable to rust. The solution is to round off or chamfer sharp edges, to allow the molten zinc or powder coating to flow around it.

Avoid deep recesses

Deep recesses in a fabrication can be problematic for powder coating. Electrostatically charged powder will resist penetrating a recess that is, as a rule, deeper than it is wide and the coating may be incomplete.

Consider the installed location

In harsh environments such as a marine or heavy pollution, it is advisable to avoid pockets where contaminants may become trapped. Water should always be allowed to flow away.

Secure joining of metal pieces

For bonded items such as butt straps the adhesives must be capable of withstanding powder coating curing temperatures in excess of 200°C. Faces to be bonded must be clean and grease-free. Welding must be continuous to prevent leeching of acid, flux and pre-treatment chemicals from between the weld resulting in incomplete galvanizing and powder coating.

Suitability for the coating process

The completed size of your metal design may determine the type of finishing process you will need to use. Check with your metal finisher / galvanizer to make sure you do not exceed the dimensional and weight limits of their plant. Talk to your supplier or to a trade organisation, to determine how to achieve the best design/metal finishing solution.

Suitable hanging (jigging) points need to be incorporated into the design, in positions that will support the weight of the material. For harsh environments hanging holes must not be in the exposed face.

Unclear specification can lead to lengthy and costly delays in the construction programme and all parts of a building should contribute towards the whole, in appearance just as much as function. Specifications should be consistent for similar elements and applied throughout building. Specification should include applicable industry application standard, powder coating material standard, colour reference and gloss level.

Cleaner metal means better finish

Low tack film residue burnt into metal, welding flux and spatter, as well as grinding and cutting lubricant, silicon, swarf, laminated steel and grinding marks will affect both the appearance and performance of a coating.

Powder coated surfaces offer a high degree of protection and stunning visual appeal which is optimised when these simple design and fabrication tips are addressed.

Richard Besant is sales director at Powdertech (Corby)

Architect: Red Box design

VMZINC® building envelopes

A vast array of possibilities

VMZINC offers a wide range of systems ranging from standing seam roofs to composite rainscreen cassettes. These different options can then be further complemented by an equally wide range of finishes. The world's first engraved zinc, AZENGAR®, is a recent addition to QUARTZ-ZINC®, ANTHRA-ZINC® and the PIGMENTO® range.

www.vmzinc.co.uk Call 01992 822288 for more information, literature or samples.

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Exhibition Centre Liverpool

With views across the River Mersey and the city's UNESCO world heritage site, Exhibition Centre Liverpool is the newest addition to the existing Arena and Convention Centre (ACC) Liverpool, already home to the BT Convention Centre and Echo Arena.

With an ElitePLUS 4 acoustic roof system, the recently-built venue has already been earmarked for a range of exhibitions, from medical wound care to cruise holidays and wedding shows. Acoustic and thermal performance were key aspects of the building's performance so it is not surprising that the overall roof construction provides 45dB sound reduction and thermal transmittance of just 0.15W/m2K.

The Euroseam® outer profile used on this system is mechanically fixed by folding the seams on each edge of the sheet over a stainless steel halter. This is attached to the building structure via the Quattro spacer, which is fixed through the liner sheet into purlins attached to the main structure of the building. Euroseam® forms the outer layer of the ElitePLUS roof, combining with insulation, the MW5 Liner and Quattro as the main constituent parts.

The MW5 liner profile was supplied in black; not a typical liner colour. Bright white or High Reflective colours are usually employed on the inside of metal roof and wall systems to maximise natural daylight and reduce energy consumption from artificial lighting. But in this case a black finish is understandable, providing an influential element in the control of ambient and spot lighting at such a venue; all but eliminating unwanted reflections during performance and theatre events. It also matches the design of the colour scheme, which runs from outside the building to the interior, with a striking monochrome palette that contributes to the clean, modern aesthetics.

To top it all off the Euroseam® profile on the outside of the roof was an ideal substrate for an expanse of photovoltaic (PV) systems. The 250KW PV system featured PV panels attached to

a pitched framework to provide the optimal angle for solar energy capture. The framework was anchored to the roof using a special Euroclad clamp, which avoids sheet penetrations, whilst providing a secure anchor. This 'energy from envelope' ethos combines with excellent thermal insulation to help minimise the environmental impact of the building.

02922 010101 www.euroclad.com

State-of-the art student accommodation strikes in Wembley area

Karma House is outstanding student accommodation located at the northern edge of the Wembley Masterplan area. The three stepped volumes are exemplary in terms of their modern design as well as their fast erection time. The complex fits into its surroundings with an unusual facade made of ALUCOBOND®.

Karma House is a 19 storey student accommodation building on North End Road, Wembley with 450 rooms of student accommodation. The local authorities wanted to increase the student accommodation offer with a high quality design which sits comfortably within the proposed wider area master plan for Wembley.

The design vision for Karma House was to create exemplary student accommodation with communal amenity spaces, meeting and IT rooms, a concierge service, bike storage and a shared communal garden. The vision was implemented by a cluster of three slim, stepping towers to resolve the massing constraints set by the immediate context of low-scale light industrial development. Projecting oriels, combined with handing of rooms, create a rhythmic and textured facade. The combination of ALUCOBOND® Anodized Look C32 and ALUCOBOND® spectra Sahara Crystal supports the modern appearance and elegant design of the building.

Another extraordinary aspect of this project was the building speed with modern methods of construction. The residential units had been formed from prefabricated volumetric construction and arrived to site almost fully finished internally with many services in place. Plumbing and wiring was completed in the module with site connections between adjacent modules and into the cores. Kitchens and bathrooms were complete as well with all fixed furniture in place. The cladding of the facade was realised with ALUCOBOND® cassettes, which are easy to install and thus supporting the building speed as well. For more informaiton, visit the website or contact the company directly.

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

Project details

Project name: Karma House student accommodation
Location: Wembley, London | UK
Facade material: ALUCOBOND® plus Anodized Look C32 & spectra Sahara Crystal
Construction type: Cassettes- Special construction
Planning (architect): HTA design
Fabricator/installer: Century I EH Smith
Year of construction: 2015

Comar 6EFT – Curtain Walling

Due to demand from our Architectural and Fabricator clients, Comar Architectural Aluminium Systems are pleased to launch additional new mullions and transoms for their innovative Comar 6EFT Curtain Wall system, with the highest Ix and Iy values available on the market today. As Comar 6EFT has developed to be the specifier preferred system in the UK, demands for larger transom spans in excess of 3000mm and unsupported multi-storey mullions are a possibility. Where there are different glazed areas in the same envelope we have also extruded high span mullions and transoms in the most popular box sizes, which mean that the same box size can be used throughout the project to ensure that all fixing and plaster lines throughout the facade are continuous.

Today's design complexity, requirements for aesthetics and complex building shapes are key considerations. Aluminium offers the unique advantage of easily being extruded and manufactured into almost any custom shape with

ease. With the current focus on energy efficiency, designs must also take into account 'thermal' criteria and thermal breaks are incorporated.

To provide a flexible approach to aluminium facade engineering Comar's 6EFT Curtain Walling System utilises European wide design and extrusion expertise with Comar's market leading supply, support and delivery. With its exceptional design flexibility, Comar 6EFT provides high performance solutions for both new build and refurbishment facades. It is a flexible standardised system that provides bespoke solutions. Comar's 6EFT delivers capped curtain walling with 50mm standardised sightlines and includes options for:

- Four sided structural glazing which achieves a cutting edge facade with no visible aluminium sight lines.
- Two sided structural glazing with horizontal or vertical capping, concealed vents where a feature and bespoke finish can be achieved through a variety of cover caps.
- Concealed vents all systems can include side or top hung opening vents
- Facetted glazing options for all systems are available in 7.5° increments both convex and concave.

The system is pressure equalised, mullion drained ensuring water drains freely to the outside.

Comar 6EFT has undergone rigorous tests for the latest BS and EN standards at Taywood Engineering Ltd., with exceptional results.

For further information, please visit the website.

020 8685 2318 www.comar-alu.co.uk

Emsea is making a difference

Emsea Ltd was carefully selected by collaborating artists Rachel Barbaresi and Emma Reynard for a project with a difference.

Lead artist, Rachel Barbaresi, headed up a commission by Arts at the newly refurbished Old Fire Station in Oxford. Working alongside ten artist participants, recruited from homeless projects around the city, the contributors experimented with a wide range of artistic processes centred round the theme 'Growth' at the beautiful Botanic Garden of Oxford University.

Posing an interesting project for the Tewkesbury-based engineering firm, Emsea engineers took the vector drawings created from the imaginative handiwork of the contributors, and carefully oversaw the cutting process on the Bystronic laser cutter.

The overall design of the main atrium wall consisted of 40 panels, with some repetition of designs at different scales to construct a 'scatter' effect. Emsea were able to craft each panel

individually using a mix of finishes including mirror polished steel and brushed steel, to contrast with the industrial look of the building.

Rachel Barbaresi noted: "Emsea staff were very accommodating and spent a lot of time explaining how the machines and processes work. By imparting their knowledge and ensuring we fully understood the processes, we were able to work alongside the engineers to find solutions to design obstacles."

Rachel added: "This work has come to symbolise the ambition of the Old Fire Station – supporting the professional development of artists and giving homeless people opportunities to develop skills and confidence; we are proud to have played our part."

Further information on the project can be found by visiting the company's website.

01684 299156 www.emsea.com

CMS set to make waves

CMS Window Systems has secured the contract to provide glazing solutions for the redevelopment of the ferry terminal at Brodick Harbour on the Isle of Arran. CMS's contract comprises the fabrication and installation of over 600m² of Metal Technology curtain walling for the terminal building, along with doors and an internal screen system. This is part of a £22.2m project for client Caledonian Maritime Assets Ltd (CMAL), which aims to maintain and enhance the vital ferry services between the island of Arran and mainland Scotland, providing solutions which will endure for at least the next 60 years.

01324 841398 www.cmswindows.com

Metalline specified on iconic refurbishment

Metalline glazed in Ultima insulated panels have provided the finishing touch to the external facade of the recently refurbished council offices in Eastleigh Hampshire. The refurbishment has turned a dilapidated 1970's office block into a 'BREEAM Excellent' building with a bright and airy interior and a visually stunning exterior that has created an iconic landmark within Eastleigh city centre. Metalline's Ultima insulated panels are extremely versatile and possess excellent acoustic, thermal and fire performance ratings. They are typically produced from high grade aluminium and can be adapted to fit a variety of facade details.

01543 456 930 www.metalline.co.uk

London fire stations receive new lease of life with building systems from HUECK

The UK branch of global supplier of aluminium window, door and facade systems, HUECK, has helped rebuild four London fire stations that were no longer fit for purpose.

As part of a Private Finance Initiative project, the London Fire Brigade commissioned a rebuilding programme for some of its facilities that were in a poor condition and did not meet modern standards and requirements.

Four of these – Mitcham, Plaistow, Orpington and Old Kent Road, have been reconstructed using HUECK's high-performance, thermally insulated aluminium window and door suite, Lambda 77 L, and its popular Trigon 50 curtain wall system.

The project was delivered by Blue 3, a consortium led by the giant construction group Kier, and was finalised this year.

HUECK UK project development director, Leon Friend, said: "The modern buildings replace facilities that were 50-100 years old, and offer state-of-the-art premises, suitable for a 21st century fire service for the City.

"We've helped deliver sustainable, energy efficient buildings with our high-performance systems, which can meet even the toughest requirements of insulation, functionality and aesthetics, with industry leading U-values.

"HUECK has designed a bespoke building envelope solution that helps to minimise the facilities' environmental impact through a series of innovative energy efficiency features. As a result, all the new fire stations supplied by HUECK achieved an 'Excellent' BREEAM rating," added Leon.

The Lambda 77 L range from HUECK can deliver U-values as low as 1.0 W/m²K, with sash weights of up to 160kg visible/170kg concealed, while the 50mm Trigon facade system offers slim

sightlines and high thermal performances, and is available in a passive house-certified version. The systems were chosen by developers and architects for their optimum performances and integration of functional elements, as well as the design flexibility and versatility they offer.

0044 121 7671344 www.hueck.com

Adapta stays true to its innovative vocation with Adapta SDS

Thousands of adverts plaster streetlights, traffic lights, road signs, and urban buildings in cities. The proliferation of this type of publicity incurs high costs for municipal coffers for cleaning and maintenance services. The situation has got to such an extreme point in the centre of large cities that councils have been compelled to penalise the practice. **Adapta**, staying true to their innovative vocation in the search for new solutions, has developed a powder coating which enables the easy removal of a wide range of these adhesives. The product has been designed in super-durable quality (Adapta SDS) and its finish has a smooth texture or micro texture and can be manufactured in any colour. This product incorporates other functionality such as anti-graffiti features as well as its anti-adherent feature. Its high durability, alongside these possibilities of removing unwanted adhesives and easily cleaning the surface, allows the owners to keep several community elements clean in the face of vandalism, all at a low maintenance cost. Adapta called on the services of the INESCOP Department of Adhesives and the Packaging, Transport and Logistics Research Center by means of standard methods approved and developed internationally by the FINAT European Association to carry out materials tests for auto-adhesive material.

+34 964 46 70 20 www.adaptacolour.com

Albany Court: It's all in the lintel

When full service building company Randall Watts required a range of bespoke lintels for Albany Court, a new housing development in Essex – the team turned to **Catnic**. The trusted steel building component manufacturer had the expertise and capability to provide a vast amount of bespoke lintels that were fit for purpose and met the necessary performance requirements. Catnic provided an extensive range of its CG, CX and CH 90/100 Cavity Wall Open Back Lintels. The lintels encompass continuous CFC and HCFC insulation, which extends along the full length of the lintel and cannot be dislodged – leaving no room for potential 'cold spots', and offering an excellent thermal performance.

029 2033 7900 www.catnic.com

Halestem – Steel edging for hard landscaping

EverEdge Halestem is a galvanised, high tensile, steel angle edging, perfect for landscape contractors who need a robust 90° edging system for use with tarmac, resin-bonded and paving surfaces. Designed specifically for use in all hard landscaping projects, the Halestem range offers a versatile solution for straight lines, or curves, where an L-shape edge is required. Available in two versions, it allows contractors and architects to choose either the rigid option for straight lines or a flexible alternative to work with curved borders. Separate corner sections are also supplied to ensure a neat and clean finish.

01630 657629 www.everedge.co.uk

21st Century aluminium facades from ALM

The alu-fx® Patina 'Timeless Collection' from ALM (HM) fills a gap in the metal facade and roofing markets by providing aluminium with a 'high end aesthetic' at low cost. The vast array of colours available in traditional aluminium has always been too numerous for distributors to stock and the lack of similarity to more subtle hard metal finishes has limited its design scope.

By contrast, the six finishes in the alu-fx range are all available from stock at ALM and Jamestown Metals in Scotland. They include oxidised and semi-oxidised steel, brushed and textured black, grey and bronze finishes which replicate pre-weathered zinc, oxid copper, steel, bronze and anodised aluminium. At 0.7mm thick and with an installed width of 530mm the weight per m^2 is just 1.9kg. This makes it up to 60 per cent lighter and, consequently, 50-75 per cent lower in cost than other metals. The product is lead, chrome and isophorone-free, has a life expectancy of up to 60 years and a Class A1 Fire Classification (EN13501-1). All finishes are suitable for both flat or curved standing seam roofing and cladding. Thicker gauge sheets for shingle tiles and non-supported panels are available on request.

07000 256467 sales@associatedlead.co.uk

Multimesh... making wirework for you

Available in many different patterns, architectural wire mesh is woven using rigid wire, or a combination of rigid wire and braided wire cable where a more flexible mesh is required. **Multimesh's** range of woven and welded mesh is the perfect solution for Balustrade panels and can offer a range to suit individual preferences, compete with desired edging strip, and comply with Health and Safety requirements. Multimesh's Stainless Steel Grating is manufactured from high quality materials. The Wedge Wire finish is designed to complement driveways and tiled areas, giving an elegant and prestigious feel to patio and drainage areas.

01744 820 666 www.multimesh.co.uk

Levolux takes off in Boston

Boston Logan International Airport's new ten-storey West Car Park showcases some innovative design features, including an impressive external screening solution from **Levolux**. Levolux was the preferred choice as it has an unparalleled track record, delivering screening solutions on a diverse range of multi-storey car park projects, including new-build schemes in Liverpool, London and Bournemouth and even in Gibraltar. Levolux's popular Infiniti® Fin system was utilised to incorporate aerofoil-shaped fins on the south and west elevations. The fins, each measuring 500mm wide by 90mm thick, are formed from extruded aluminium and are fixed vertically to the face of the structure.

New architects' brochure from Q-railing

Q-railing presents a brand new architects' brochure – Q-designs by Q-railing. It gives a complete overview of all the company's designer balustrade systems – in total, around 20 glass railing systems, baluster railing systems and handrail systems. The chapters are accessible, full of practical details and richly illustrated with plenty of inspiring photos. It is an essential tool for planning balustrade projects and helping clients to visualise your architectural ideas. The architects' brochure can be downloaded or requested in print on the Service page of Q-railing's website. The brochure is not the only resource available for architects on the website. You can also download the BIM objects, specifications and CAD drawings for Q-railing designer balustrades.

Stainless steel shingles for Borders rail link

Aperam UGINOX® TOP has been installed as shingles to provide a durable matt facade on the new £5.2m Galashiels Transport Interchange. Forming part of the highest profile rail restoration project in Scotland since the 1960's Beeching closures. Stainless steel was specified in preference to aluminium for its lasting appearance, sustainability and lower installed cost. Design work on the facades was done by specialist contractor Longworth Metal Roofing, all the stainless steel shingles were made off-site so as to minimise waste and ensure that the highest standard of consistency was achieved. The project was voted Town Centre Regeneration Project of the Year in the 2016 Scottish Property Awards.

0161 655 0694 www.aperam.com

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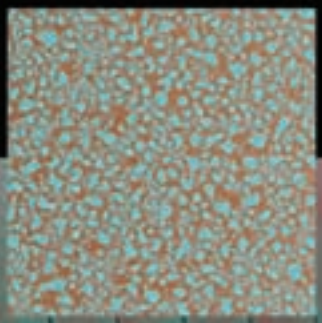

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