

# METAL IN ARCHITECTURE

10.24

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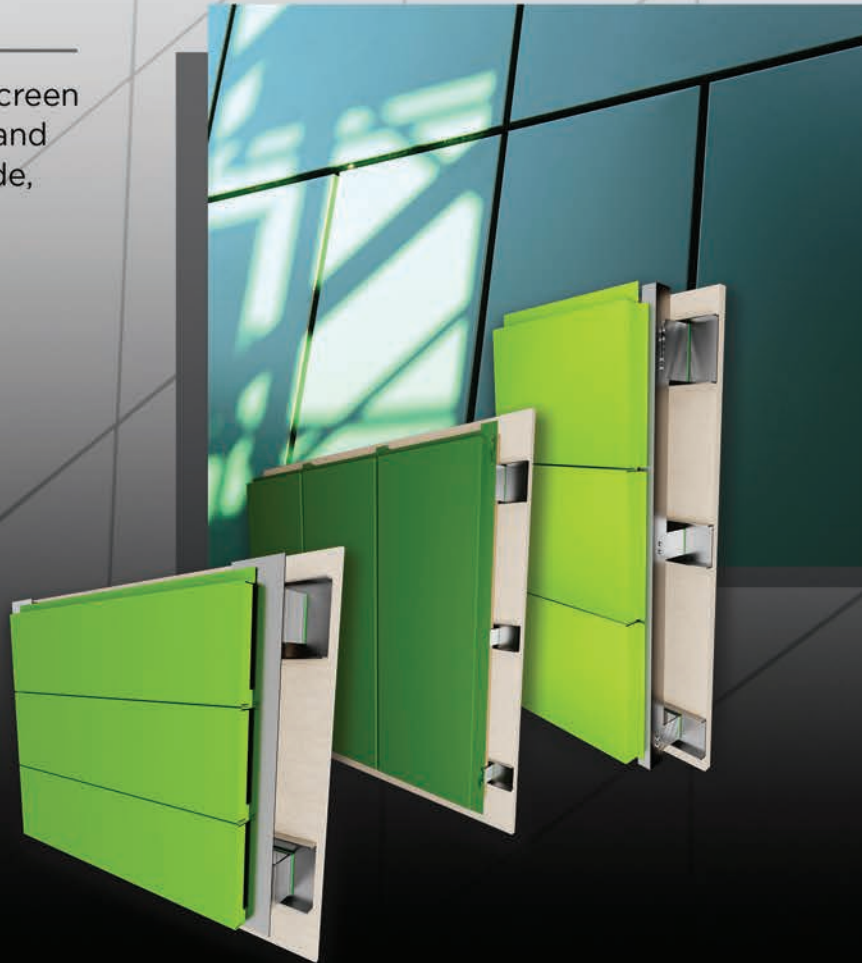


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# Metal in Architecture Supplement

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# FROM THE EDITOR



**M**etal is undergoing something of a transformation, with the economic and sustainability winds of change leading to a melting down of traditional expectations in the market. With subsidised Chinese production having been allowed to compete on a level playing field with the UK steel industry since the 1990s, we have seen our homegrown production sold to overseas investors, and slowly reduced in scope.

1970 is longer ago than I care to admit, but still in living memory for a lot of people! At that point, the UK was the fifth largest steel producer, with around 320,000 staff producing materials for the fully active manufacturing sector. However, cheaper imports have inevitably left the industry as something of an unsustainable white elephant in the UK, and now that the Port Talbot blast furnace has finally shut down, the country has one left, in Scunthorpe.

Indian-owned Tata and Chinese-owned British Steel are however investing heavily (alongside the Government) in new electric arc furnaces, to ensure that steel production continues in a more sustainable way in the decarbonised era. It's still bad news for staff as fewer are required for EAFs, but hopeful given the continued demand for the material as construction of larger-scale projects. And Chancellor Rachel Reeves has left the door open to future 'primary' steel generation if (and it's a big if) green hydrogen can be the source.

In the meantime, steel is going to continue being delivered by importers for the industry, who are now confronting a new sustainability challenge of mountanous proportions. The world's concerted drive to net zero has its latest manifestation in the EU's Carbon Border Adjustment Mechanism, which aims to fix the 'carbon leakage' phenomenon whereby producers move carbon-intensive production like steel and aluminium to countries with softer emissions standards.

The UK won't be going fully into CBAM until 2027, but from this month EU importers are faced with having to comply with the new regulations which will tax their imports, or be prohibited from importing material into the EU. It will be highly educational for the UK construction sector to see what happens to supply chains and prices in the coming months.

We hope you enjoy this supplement devoted to the ins and outs of design and constructions using metals, in a changing and challenging world of materials supply, where no sustainability stone can be left unturned.

James Parker, Editor

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#### ON THE COVER...

One of the last buildings bearing the signature of Zaha Hadid is a mixed use workplace sitting alongside Prague's oldest railway station. Cover image © BoysPlayNice For the full report on this project, go to page 12.

# Design and quality **in a class of its own**

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## COMMENT

# Cascading the benefits of decorative metal in workspaces

Kelly Goldsmith of Amron Architectural unveils the power of ‘architectural drapery’ to creating captivating spaces using metal sculptural elements that also provide the practicality required in workspaces

When integrated into workspace design, decorative metal not only elevates the aesthetic appeal of a space but also transforms it into a functional masterpiece. This versatility has positioned decorative metal as an indispensable cornerstone for architects and designers, offering them the freedom to craft environments that seamlessly blend visual allure with utilitarian efficiency.

## The versatility of decorative metal

Decorative metal, with its intrinsic strength and malleability, has long been a favourite among architects and designers. Its application in architectural drapery solutions exemplifies this versatility, allowing for a range of uses that enhance both form and function within a workspace. From intricate mesh patterns to sleek metallic fabrics, decorative metal can be manipulated to achieve various aesthetic and practical outcomes.

## Aesthetic appeal

One of the most compelling aspects of architectural drapery is its ability to add a distinct visual appeal to any space. Metal drapery can be designed to create dramatic visual effects, serving as statement pieces that draw the eye and evoke a sense of sophistication and modernity. The reflective qualities of metal can amplify natural light, adding brightness and an airy feel to an environment. Additionally, the myriad of finishes available, from polished stainless steel to oxidised bronze, allows for endless customisation to suit any design vision.

Aldgate Tower, in east London, is a high-profile building comprising commercial office space, with tenants including Uber, Aecom, and WeWork. Working closely with interior designers Basha Franklin, Amron Architectural were called upon to activate the space by strengthening the building identity to create a desirable, inviting lobby experience.

Meeting the criteria of creating a stunning central feature in the lobby on the ground floor, we worked with ADS Joinery and recommended our architectural drapery to customise the space by suspending three colourful canopies from the ceiling.

The striking blend of colours and design complements the



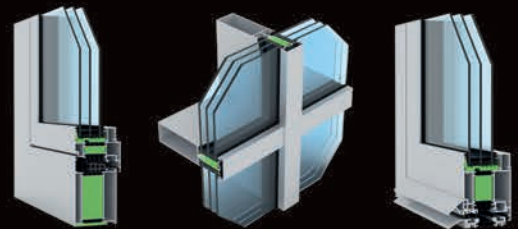
EL&N Café, Saudi Arabia

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Aldgate Tower, London

surroundings of the area, and provides guests and tenants with a social connection, a sense of belonging, and inclusivity.

### Functional benefits

Beyond their aesthetic contributions, architectural drapery offers a host of functional benefits. These installations can serve as effective room dividers, providing a degree of privacy while maintaining an open and connected atmosphere. The permeable nature of the chains also facilitates airflow and natural light diffusion, contributing to a healthier and more pleasant workspace environment. Unlike traditional partitions, these metal dividers maintain a sense of transparency while effectively dividing spaces. This not only fosters a collaborative and open atmosphere but also ensures that the workspace retains a sense of unity.

In a signature building in Manhattan, you can find the offices of MiQ, an international company dedicated to marketing intelligence for which Sydness Architects has designed a space that goes beyond the brand's corporate identity and which harmonises with its exclusive surroundings – the hip NoMad neighbourhood of New York City.

To motivate creativity and the necessary collaboration between the employees, the studio generated several open, wide, and luminous work areas, distributed between the two floors where

straight lines predominate. Straight lines of architectural drapery created a room divider and complemented the company logo with a multi-coloured gradient in high definition and brilliant finish. In addition to breaking the harmony of neutral colours, the chains provided transparency thanks to the shape of their links and the volume of a second black layer that connects the two floors through the stairwell.

### Acoustic management

In open-plan offices, noise can be a significant distraction. Architectural drapery solutions can incorporate acoustic panels, combining metal drapery with sound-absorbing materials. This integration helps to mitigate noise levels, creating a more focused and productive workspace without sacrificing style.

### Sustainability

Decorative metal is a durable and long-lasting material, which contributes to the sustainability of architectural drapery solutions. Metals like aluminium and steel are highly recyclable, and their longevity means less frequent replacements, reducing the overall environmental footprint. Additionally, many manufacturers are now offering options with recycled content, further enhancing the eco-friendly credentials of these solutions.





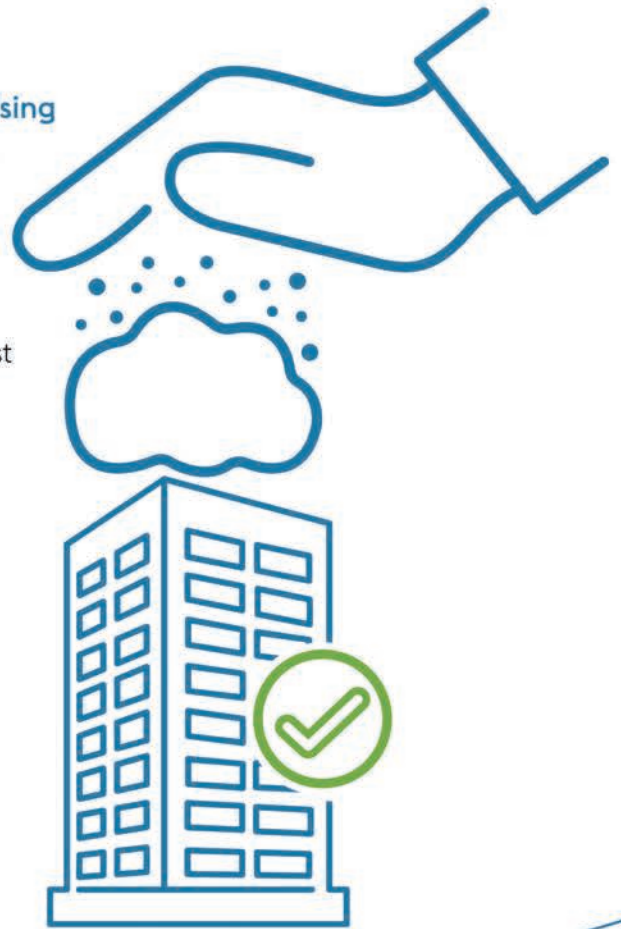
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MIQ offices, New York © Jon Nissenbaum

## From intricate mesh patterns to sleek metallic fabrics, decorative metal can be manipulated to achieve various aesthetic and practical outcomes

### Instagrammability

As well as commercial offices, we are seeing an increasing demand for this trend in the hospitality sector. The EL&N Cafe, renowned for its vibrant and photogenic interiors, tasked the Quadrant design team with creating a unique concept for each location. The goal was to ensure that customers experienced something different at every EL&N cafe worldwide, fostering a fun atmosphere that encourages social media sharing.

For the new development in Jeddah, fondly named Atelier La Vie, the inspiration was drawn from the French Riviera, positioned within a warm, captivating environment in the city. The French Riviera served as the primary muse for Atelier La Vie. Inspired by coastal colours, geometric shapes, iconic bespoke patterns, and bold architectural arches, they crafted a two-story oasis where every seat is the best seat in the house. This approach ensured that each visitor had a unique and visually striking backdrop for their photos, aligning perfectly with EL&N's vision of creating 'Instagrammable moments.'

A mixed palette of bright and bold materials was used to bring the French Riviera theme to life. It incorporated a variety of textures and tones by mixing fabrics, solid surfaces, florals, metal chains, and bespoke terrazzo finishes throughout the space.

Working between the UK and Saudi Arabia, the project was remotely managed using video conferencing, but this didn't hamper the project; it was possible to maintain excellent communication.

The Atelier La Vie in Jeddah stands as a testament to the ability to blend high-spec design with local inspiration, crafting a space that feels authentically European while meeting the needs of the modern, social media-savvy customer.

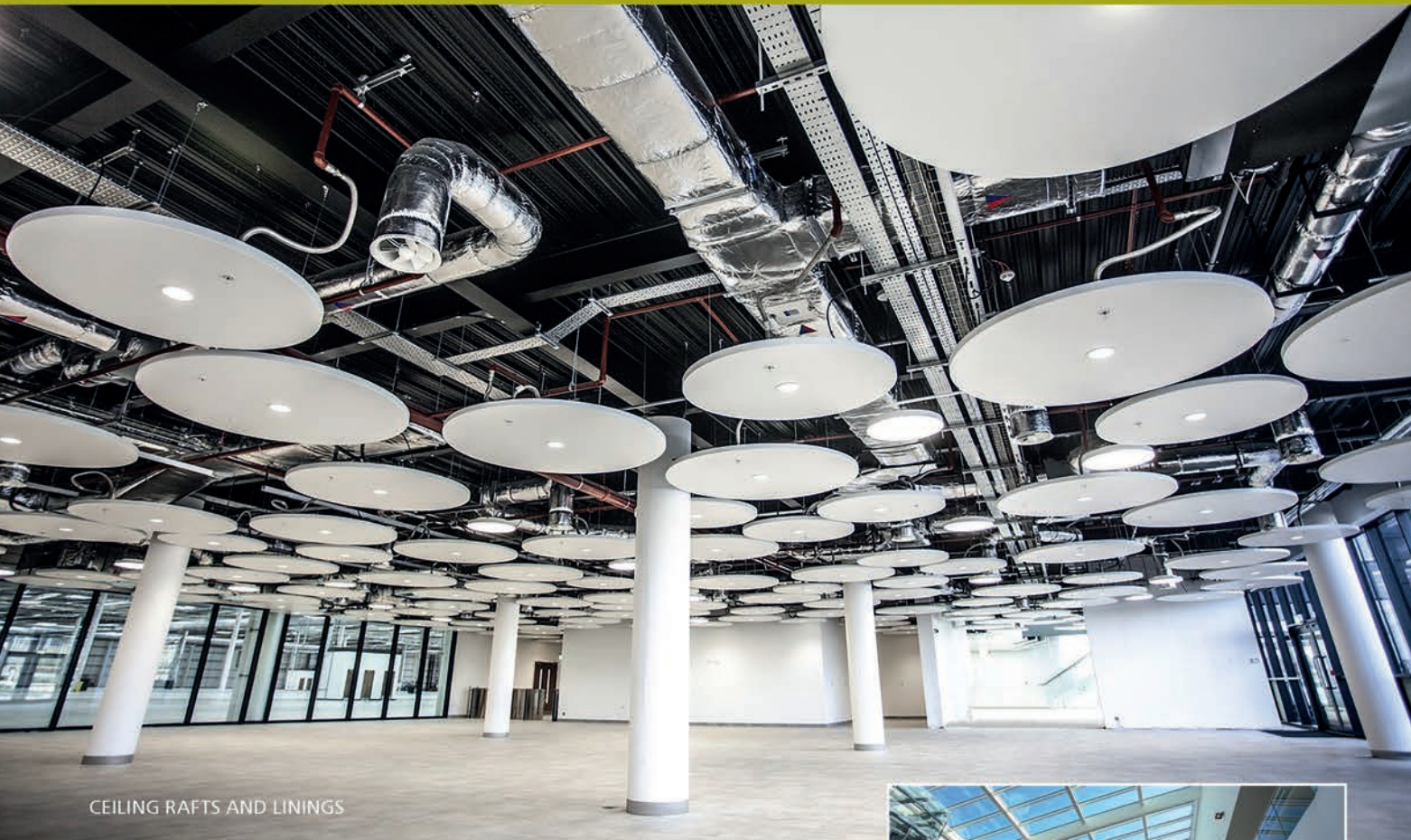
The use of vibrant colours, bespoke materials, and innovative design elements has transformed this location into a true Instagramable hotspot, setting a new standard for flexible and visually stunning space.

Architectural drapery solutions represent a significant advancement in workspace design, offering a harmonious blend of aesthetic allure and practical functionality. The use of decorative metal in these applications underscores the material's versatility and capacity to meet diverse design needs. As architects and designers continue to explore and innovate with architectural drapery, we can expect to see even more dynamic and inspiring work environments emerge, each uniquely tailored to the needs and desires of its occupants.

*Kelly Goldsmith is head of marketing at Amron Architectural*

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# Connections to a golden past

One of the last buildings bearing the signature of Zaha Hadid is a mixed use workplace sitting alongside Prague's oldest railway station, and inspired by the historic 'golden city' and the dynamism of rail travel

“Masaryčka can without exaggeration be described as the most modern and groundbreaking office building in the Czech Republic.” That's the claim of Penta Real Estate, the private equity investor client behind this bold project in the heart of Prague, known as the 'golden city.' The firm's new Zaha Hadid Architects-designed HQ in an unloved part of the historic city, represents an unabashed statement of the firm's prominence in Central and Eastern Europe, in this case turning brownfield into gold.

Completing the puzzle of this new central business district, Czech Railways' renovation of the adjacent Masaryk railway station by Penta Real Estate and Czech Railways will bring further urban renewal to this part of the city. However, the new golden office and retail building, framed by the station's rail platforms to the south, a street to the north, and an elevated freeway to the east, is the star of the show. Penta Real Estate has occupied one of the buildings with its sister company, the major private equity investor Penta Investments (as well as several other office tenants). The project represents an investment worth €100m (CZK 2.5bn), predicated on serving increasing demand for workspace in Prague.

The design maximises the brownfield site that stood abandoned for decades adjacent to the station, and replaces a

car park with a new public square with interchanges between the city's rail, tram, and bus networks. This helps to provide a new, welcoming gateway to the city for rail passengers coming in from the suburbs, as well as those connecting to the international airport using the express rail link currently being built.

Both Penta Real Estate and Penta Investments had already made architectural waves by creating its first Prague headquarters in 2013, in what was also its first large-scale completed office project – the Florentinum with a similar office and retail mix. Having relocated to the glowing new pair of buildings topped with roof terraces, the firms now occupy the two top floors of the larger of the two buildings, with the whole complex providing 28,000 m<sup>2</sup> in total, including copious food, beverage and retail offers in the first two levels.

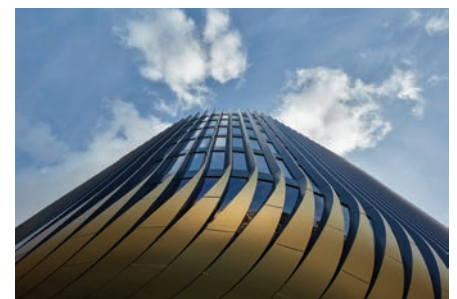
The two buildings offer 2,500 m<sup>2</sup> and 2,200 m<sup>2</sup> of retail space respectively, and 14,300 m<sup>2</sup> office space in the taller of the two versus 7,900 m<sup>2</sup> in the other. The continued volume linking both buildings housing retail areas creates a new commercial 'high street' for the city.

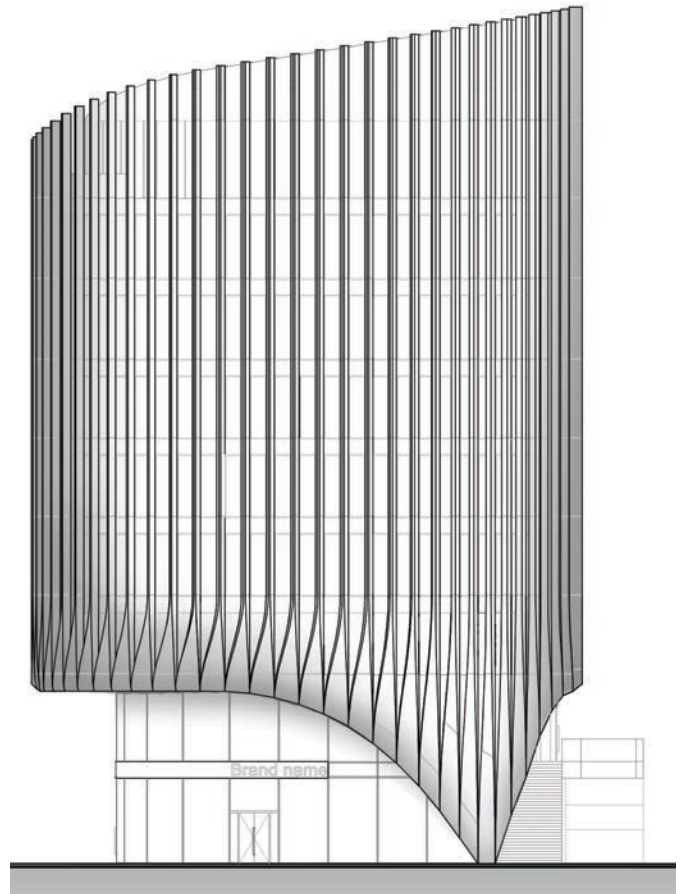
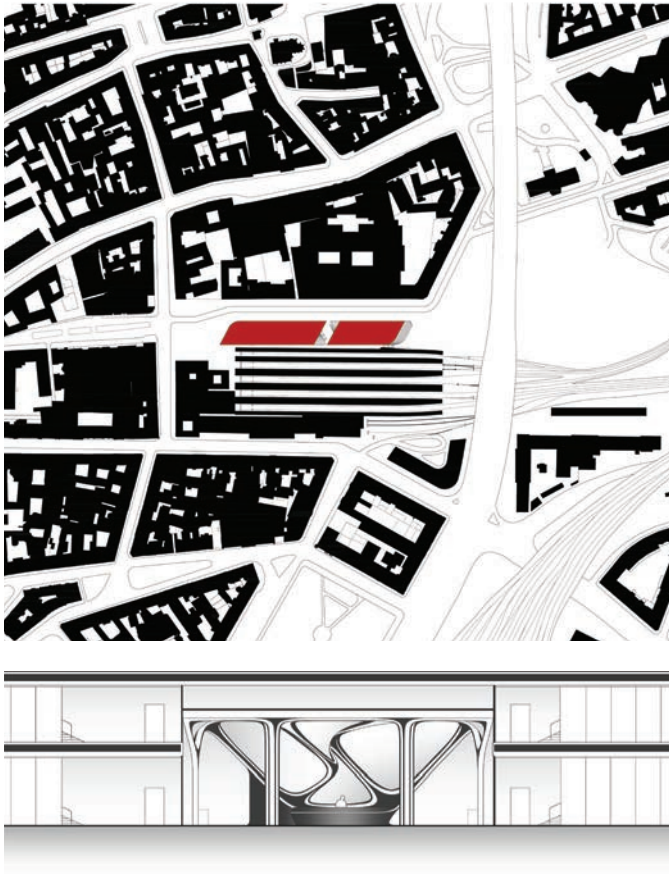
## Design

Located a kilometre east of the central Staroměstské Square, the highly contemporary form has been designed to



**The new golden office and retail building, framed by the station's rail platforms to the south, a street to the north, and an elevated freeway to the east, is the star of the show**





#### UNEVEN KEEL

The fins which form the facade splay at the western elevation to form a pointed, offset 'keel' at the base, which continues into the entrance space

**The ribbed metal facade of the new building offers the practicality of summer shading to internal workspace along the elevations, alleviating cooling bills but sculpted to provide a major architectural presence**

“establish a dialogue with the architecture and urbanism of Prague’s Old Town,” which sits on the other side of the river to the west. Conceived by Zaha herself, the project was realised in collaboration with local practice Jakub Cigler Architekti as delivery architect. The long and relatively low structure has the kinetic, offset feel common to several of Zaha Hadid’s buildings when viewed in section, with dynamic elevations created by stepping back individual levels horizontally from east to west. The two volumes, connected by the ground level retail level and external circulation, step up from the east from seven storeys to nine respectively, deferring to surrounding building heights.

The renowned “golden city of 100 spires,” has a much-photographed skyline created by the preponderance of ornate pointed steeples and spires extending into the sky. The ribbed metal facade of the new building offers the practicality of summer shading to internal workspace along the elevations, alleviating cooling bills but sculpted to provide a major architectural presence. The facade’s ribs

curve dramatically at 90° towards the pointed, taller western facade facing the Old Town’s spires, both responding to the historic skyline but also giving an abstract impression of railway tracks.

The fins splay to form a gently pointed offset ‘keel’ at the base of the west facade, lightly connecting the building to the ground visually, with the ground and first levels otherwise glazed for the retail and F&B units. The keel also extends into the building forming part of the entrance area’s ceiling. As the aluminium elements widen to the lower level the feeling of rails is transformed to the more substantial language of the timbers of a golden ship. Addressing the new square, the statement made by this elevation is appropriately striking.

There are roof gardens on the top two floors on each of the linked buildings, as well as a “cascade” of articulated terraces to each of the facades facing the gap between the two buildings, and further recessed terraces to the long long north facades facing the street, angled to align with the parallelogram forms.





**This is one of the last projects which Zaha Hadid herself worked on, and will be the flagship for a client who is keen to celebrate the personal involvement of the now-legendary architect**

There's similar terracing on the eastern facade, meaning every office floor has direct access to generous outdoor spaces.

#### **Metal facade**

The unique form with curving facades running beneath as well as on the faces of the structure required a complex design to create a variety of elements which would unite to form the curving 'keel.' The most complicated sections reach sizes of up to 3 by 3 metres, and had to be shaped with millimetre precision – according to ZHA's computerised 3D design. Leading Czech facade firm Sipral designed, supplied and installed elements for this complex project, and describes sections as being hung on bespoke metal "spiders," which allow the "rectification" of the panels in all directions. This "achieves an uninterrupted joint across the entire underside of the facade."

"The great complexity and variety of shapes, with many curves" meant a bespoke level of approach was acquired to "details and interconnections of different types

of facade constructions," says the firm. A large number of bespoke facade elements have been installed across the entire perimeter shell, which meant they were designed and manufactured as unique pieces. "This placed high demands not only for the design work, but also on the actual production, installation and our supply chain," says Sipral.

Over 18,000 production and assembly drawings were created for the production of the keel panels, and the finished building has 265 pieces of unique aluminium panels, with around 30 tonnes of steel structure supporting the keel alone. The slats as well as irregular aluminium elements forming the facade were manufactured in gold but also contrasting anthracite.

#### **Sustainability**

Targeting LEED Platinum certification, Masaryčka incorporates a double-insulated facade that ensures optimal natural light in all work areas and communal spaces. Hybrid ventilation is supported









by a high-efficiency plant with waste heat recovery systems while the building's smart management systems continually monitor and adjust environmental controls to reduce energy consumption.

Construction and procurement has prioritised local suppliers and materials with a high recycled content, with a target to meet the 2025 targets for embodied and operational carbon established by the RIBA 2030 Climate Challenge. Planting uses local species of plants, shrubs, and trees irrigated by a rainwater harvesting system, and the street running parallel has been transformed into a tree-lined avenue, bringing cooling summer shading for users. Low-flow systems and greywater recycling will further reduce the building's water consumption.

The interiors offer a typically Zaha 'space-age' feel matching the dynamic exterior, but focusing less on metal materiality in the two lobbies, instead

having organically-shaped glowing ceiling panels of Corian with integrated lighting. The whitish panels are contrasted by black surrounds and a black Barrisol stretched ceiling, the composition extending into desks and walls. Corian is also used on the feature staircase, displaying the potential of the material to be designed and thermoformed into unusual three-dimensional shapes.

### Connections & external spaces

Connections with the surrounding dense and historic urban environment are fundamental to the design approach – the building is “defined by circulation routes which will provide access to new civic spaces for the city,” say the architects. The new public square connecting the building to the railway station is partially constructed over the railway tracks, and the design enhances access to the railway platforms below with new routes, as

### INTERIOR STATEMENTS

The reception area features 3D thermoformed Corian panels and a black Barrisol with integrated lighting

### PROJECT FACTFILE

**Production and assembly drawings**

**for keel: 18,000**

**Unique gold panels for the keel:**

265 pieces (6 km length)

**Facade steel structure: 200 tonnes+**

**Keel support structure: 30 tonnes**

**Numbers of glazing elements: 2,600**



well as providing new pedestrian routes on either side of the station.

The existing 1845-built terminus building refurbishment includes the construction of the new public square partially over the tracks, giving access to individual platforms and a direct transfer to Prague's metro line. This is turning the station into a fully accessible, "multi-modal transport hub," extending the number of rail tracks from seven to nine and seeing all platforms reconstructed. There will also be pedestrian access to the train platforms via the gap in the centre of the new buildings

The elevated park above the railway station will significantly simplify the connection between the Prague 1, Prague 3 and Prague 8 districts. The roof gardens' design "reflects the city's flow of people between Na Florenci Street, Hybernská Street and the U Bulhara intersection," say the architects, who have provided a beautiful, fully-landscaped public space. It combines pavements and piazzas with zones for relaxation and social use, and has "the comfort of people with different levels of mobility in mind."

A hotel currently under construction on the busy intersection to the south east corner of the site, on the far side of the railway line, will be connected to Masaryčka via a new covered, landscaped route above the tracks, providing a further important new access across the site.

## Conclusion

This is one of the last projects which Zaha Hadid herself worked on, and will be the flagship for a client who is keen to celebrate the personal involvement of the now-legendary architect. The two buildings-in-one, running alongside the railway lines, are a major new addition in a city famous for architecture of yesteryear, and a brave new image for many arriving by train.

The new mixed use Masaryka building is well on the way to its full completion in 2026, and already has a series of commercial tenants for its workspaces in addition to the client itself. Cafes and other retail units are bringing activity and further connection to the street level, enhancing the buzz already present from the station's pedestrian traffic. This mix, with the golden backdrop and new public realm, ensures that the new addition is playing a full part in the life of the historic city. ■



## Vibrant colours and increased comfort

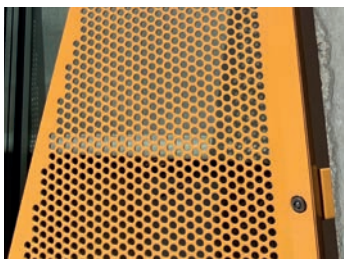
The Lillholm Elementary School outside Stockholm, Sweden, brings more life to a grey industrial area with its premium perforated sunscreens in vibrant colours. In addition, the distinctive sunscreens improve the indoor climate and increase the well-being of both teachers and students.

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**Technical characteristics**  
Size of the project: 450 m<sup>2</sup>  
Material: Aluminium  
Pattern: Round holes  
Thickness: 3.0 mm  
Surface treatment: Powder Coating  
Finishing operation: Bending

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# Making the most of aluminium windows

Director of ASWS (Associated Steel Window Services) Kris Bennell, considers how conserving aluminium window systems can cut cost as well as carbon



As a strong, lightweight and very versatile material, aluminium has seen service for everything from saucepans to the fuselages of supersonic jet aircraft, while also being ubiquitous across the construction industry. Significantly, it is also hailed as one of the most successfully recycled metals, globally – with manufacturers confidently predicting that we will eventually reach the point where mankind will no longer need to expend vast amounts of energy smelting down the world’s abundant reserves of bauxite ore.

Reuse has reached the point where one of Europe’s foremost producers has established a sophisticated supply chain for recovered aluminium, whereby clients can opt to have their shiny new fenestration systems fabricated from ingots certified to contain a minimum 75% recycled material. This approach consumes a fraction of the energy – renewable or otherwise – needed

to produce virgin stock. In refurbishment situations, however, should project teams be seeking an even more sustainable solution?

An increasing number of developers and their design consultants are coming to understand the genuine value of retaining as much as possible of existing properties, even where they are not subject to conservation requirements. They are understanding that reuse can offer the lowest environmental footprint and potentially significant budget savings. While this ethos is well established with regard to steel and even century old timber windows, the poor reputation of early aluminium windows – whose surfaces frequently pitted and became powdery – is such that replacement is the default position for most developers.

## Surveys & thermal performance

Undertaking condition surveys pre-contract can pay dividends. Judging the viability of



## One of Europe's foremost producers has established a sophisticated supply chain for recovered aluminium

retaining and restoring the eclectic mix of 20th century aluminium window systems will be beyond the expertise of most architectural practices, and it is therefore always circumspect to call on the services of an experienced metal window repair specialist to carry out a detailed condition survey. Ideally their report will encompass precise measurements, photographs and drawings, along with a schedule of works being recommended. This document can be not only the basis on which to source tenders, but could also form the part of the planning submissions; carrying significant weight with councils who are increasingly prioritising sustainability across any such work being carried out in their areas.

Unavailable when the first aluminium frames started to replace often rotten timber windows, thermal breaks radically improved the U-values delivered by most systems installed from the eighties onwards. But these slender plastic strips separating the inner and outer profiles are, of course, only part of the overall energy performance picture.

Retained frames with fixed and opening lights can be greatly improved by retrofitting modern gas filled IG units, featuring low-e glass and warm-edge spacer bars. But improving airtightness by upgrading the seals or draught-stripping can be just as important. This, however, can be a very difficult task when working in situ, even once appropriate new gaskets have been sourced. In many instances it proves necessary for specialist sub-contractor to replace the original factory fitted rubber glazing gaskets with manually applied silicone top caps, both internally and externally.

Achieving good airtightness can also depend on the window contractor having the right skillset to realign or reset the frames, and either overhauling or sourcing compatible replacements for the original handles and other hardware.

In some cases, the company may actually keep a physical archive of salvaged ironmongery which will suit, or at least have the industry contacts to obtain compatible fittings in a timely manner. Also, where significant physical damage has occurred, the extent of the repairs may even involve having to cut out and replace sections of the original frame and being able to cosmetically conceal this remedial work.

### Cutting waste

During the pandemic, we helped deliver an integrated repair contract for a regular clients as part of the redevelopment of a landmark London office property. It not only enjoys some of the best views in the capital overlooking Hyde Park, but also now offers sustainability credentials in excess of those benchmarked by the GLA for new-build offices. Completed in 2022, the reconfiguration of No 1 Knightsbridge was led by ISG and has created spacious floorplates totalling 122,000 ft<sup>2</sup> of Grade A space that benefits from low embodied carbon and an all-electric building services package. Pragmatic repair and recycling also meant 99% of all the strip-out material was diverted from landfill, contributing to the scheme earning a BREEAM Excellent rating.

We carried out a full condition survey on all of the existing fenestration, which featured outmoded aluminium windows and curtain walling, and were awarded the full overhaul contract as well as work such as servicing the rooftop smoke vents, and the installation of a large glazed light in the courtyard atrium. The complex geometry of the building and the number of different trades on site required both weekend working and the expert use of both access and tele-handling equipment. Repairs to the 1980s aluminium windows and curtain walling included replacing damaged sections as well as the filling and respraying of frames across all floors, both internally and externally.

*Kris Bennell is director of Associated Steel Window Services*



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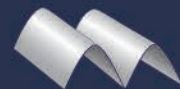


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# Copper's resilient appeal

The Copper Sustainability Partnership (CuSP) explores the benefits of copper in modern day infrastructure – from our homes to hospitals and transportation systems – and how copper is helping to create a more sustainable future through careful and considered design

Copper is a vital material that has been used in architecture for centuries, originally for exterior fittings such as roofs, and then indoor applications such as piping when indoor plumbing was introduced.

Copper is well known for its energy efficiency, durability, versatility and sustainability, making it suitable for windows and door frames, piping, cladding and roofing panels, and structural features in buildings. But what are the benefits of the material in our buildings?

## Versatility

Copper is a strong and durable metal that can be used for various projects, and benefits from malleable qualities meaning that it can be stretched into different shapes depending on design requirements. From specific round shapes to being arranged into wires, the atoms in copper prevent the material from becoming damaged, making the material a resistant and adaptable building material.

This flexibility allows copper to adapt to complex and intricate designs, fitting into tight spaces without losing its qualities. Copper's malleability also makes it an ideal choice for creating custom components and detailed architectural features, further enhancing its value in both construction and design applications.

## Environment

Like stainless steel, galvanised steel and aluminium, copper is extremely corrosion resistant. It is a highly sought-after material for rural, marine and industrial environments as it retains its high quality due to a naturally occurring film that forms on the surface, protecting the material from any natural factors.

Such strong properties make copper the perfect fit for both indoor and outdoor environments, from copper piping to



structural features including handrails, columns, beams, and staircases. Its versatility makes it ideal for use in harsh environments where material integrity is critical, proving to be reliable over long periods of time – unlike plastic pipes, which degrade quickly or dissolve when in contact with certain solvents.

## Protects

A significant benefit of copper is its antimicrobial properties, making it a highly suitable material for areas that require protection against bacteria, viruses and fungi. When microbes land on its surface, antimicrobial copper releases oxidising atoms, ultimately killing the microbe and preventing any bacteria from spreading further, reducing any infection.

The natural resistance copper has against bacteria helps immensely with highly

**Copper's unique combination of strength and flexibility makes it an essential material for design**



## One of the most important aspects of copper as a construction material is its infinite recyclability

bacteria-prone areas, including hospitals, medical centres and all modes of public transport. Copper's ability to actively kill harmful microbes adds an extra layer of protection in environments where hygiene is paramount.

### Sustainability

One of the most important aspects of copper as a construction material is its infinite recyclability. Copper can be recycled countless times without any degradation in its quality or performance and is, therefore, an essential component in the construction industry as it can be reused efficiently.

Copper's life cycle doesn't end when it's no longer needed. Instead, it's recovered, refined, and repurposed into new products, being used for multiple designs within its lifetime. This means that copper is ideal for circular applications and is the sustainable option for building and design, with a lifespan of over 80 years.

### Conductivity

Copper's electrical and thermal

conductivity makes it essential in modern design. When it comes to conductivity, copper is second only to silver among all metals, making it particularly well-suited for use in power generation, transmission, and distribution.

As the architecture industry keeps incorporating and working towards more renewable energy solutions, copper's role in efficient power generation, transmission and distribution will become even more sought-after when the need for sustainable energy systems increases.

Copper can play a crucial role in supporting the growing demand for heat pump installation in the UK – the material is suitable for supplying heating, water and gas into homes thanks to it being an excellent conductor of heat. Copper pipes can be integrated with air-source heat pumps, transporting the heat extracted from outside air to radiators, electric heaters and other outlets.

Its ability to support sustainable energy infrastructure ensures that the material will become increasingly involved in designing buildings that are energy efficient.

### Temperatures

Copper's fire-resistant properties make it a reliable choice for building materials. With a melting point of around 1,085°C, it can withstand even the highest of temperatures. This ensures that copper pipes and wiring remain intact during a fire, preventing the spread of flames and ensuring the design is well-equipped to handle an emergency fire.

Essentially, copper's low thermal expansion rate means that the material maintains its structural integrity even under extreme heat, minimising the damage and reducing the need for extensive repairs after a fire.

### In conclusion – why choose copper in 2024?

Copper's unique combination of strength and flexibility makes it an essential material for design, while its properties, including its natural resistance against bacteria and ability to exceed high temperatures, make it an ideal material for specific environments.

With such diverse benefits, copper's recyclability makes it a sustainable choice for more environmentally conscious designs, while the overall aspects of it ensure longevity and, most importantly, safety, highlighting its importance in modern-day designs.

# Towards a greener steel future

Andy Hackett of voestalpine Metsec puts the case for putting steel at the core of industry moves towards the goal of net zero carbon 2050, as production begins to evolve away from fossil fuels, and advises a holistic comparison of materials

All parts of the economy are coming under increasing pressure to become more sustainable in their operations as national and international governments push towards Net carbon zero. With the built environment being responsible for a significant proportion of global greenhouse emissions, the construction industry needs to adopt practices which minimise carbon emissions and promote sustainability.

Deciding whether to adopt such processes may not be entirely voluntary either, as central government and local authorities are already putting policies in place to encourage a greener approach, a trend which seems likely to continue in the future.

Together with other environmental initiatives, such as the London Plan 2021, which requires medium and large-scale construction projects in London to have an Environmental Product Declaration (EPD) and carbon footprint statements as part of the planning application, these policies place increased pressure on architects to design buildings which can be constructed using sustainable materials and methods.

As designers and specifiers look to make their projects as sustainable as possible, everyone in the supply chain is placed under increasing scrutiny, from the materials manufacturer to contractors, installers and sub-contractors. Every process will have an impact on the environment in some way and have implications for the carbon footprint of the project. The challenge is to make these processes carbon neutral.

When it comes to materials, the challenges are considerable; the major building materials that are used today, and likely to be used for centuries to come, all have some impact on the carbon content of a building project. This is true of concrete, bricks, steel, plastics and timber.

The carbon content can be from a variety of sources: the natural material's intrinsic carbon content, the processes used to extract the materials, their conversion into usable raw materials, conversion/



production processes and all of the supporting functions that contribute towards a product being used, from sales and administration to storage and transportation.

There is also the question of whether this carbon remains embodied within the material after the life of the building, such as when metals are recovered, recycled and/or repurposed, or released into the environment; for example, where timber cannot be re-used and might be burned.

## Steel yourself

Steel and sustainability might not be a connection that everyone makes immediately, but its credentials make a compelling case for its use in construction, with light gauge steel framing systems (SFS) delivering additional benefits. These include:

- steel is easily recoverable and is 100% recyclable – SFS has a reuse and

**The major building materials that are used today, and likely to be used for centuries to come, all have some impact on the carbon content of a building project**



## Steel and sustainability might not be a connection that everyone makes immediately, but its credentials make a compelling case



recovery rate of 85%, compared to just 13% for timber;

- reduction in a structure's embodied carbon by using less steel;
- accurate design and manufacturing processes result in virtually zero waste;
- SFS is a lighter material, reducing the environmental impact of transportation.

There is no escaping the fact that steel manufacture is one of the largest global contributors to carbon dioxide emissions, but European steel manufacturers are making great strides to move away from fossil-fuelled processing by using less carbon-intensive electric arc furnaces which are powered by renewable energy to create a reduced carbon steel.

A few steel systems manufacturers now include this as an option for their product ranges; our own Metsec Decarb being one example. It is available on our SFS ranges, internal non-load bearing dry lining studs and purlins.

This steel is a true move towards a reduced carbon future for the construction industry. It does not rely on the smokescreens of greenwashing, mass balance, carbon offsetting or the allocation of green energy for its environmental credentials, but instead stands by its own impressive outputs; compared to blast furnace manufactured steel. Figures as of July 2024 show Metsec Decarb typically contains less than half the amount of carbon dioxide per tonne for the same quality of steel.

### Beyond material concerns

The carbon within the material itself

makes a significant impact on the carbon content of the building. However, as mentioned, there are many additional inputs which can contribute towards the environmental impact of the building and the materials used in it; the processes used in manufacturing, administration, storage and distribution. There seems little point in a building materials/systems manufacturer offering a reduced carbon product if the same manufacturer is not committed to reducing the carbon dioxide emissions of its own operations.

Net zero carbon remains part of the government's procurement policy. The previous administration's Cabinet Office Action Note PPN06/21 stipulated how government departments need to take account of suppliers' net zero carbon reduction plans when procuring major government contracts.

While governments at home and abroad have wavered on their commitment to achieving net carbon zero emissions by 2050, there can be little doubt that the objective will remain an integral part of UK policy in the future, even if the deadline is extended.

Manufacturers and suppliers will still need to look at ways in which they can reduce their carbon emissions; as part of voestalpine AG, Metsec remains committed to achieving net zero carbon emissions by 2035.

### A carbon guarantee

As with most things in life, achieving a desired result, in this case a net zero carbon building, will rely on striking a balance between the ideal and the achievable.

Faced with a design brief to minimise a building's carbon footprint, steel might not be the first building material which comes to an architect's mind. But, on closer inspection, steel, and reduced carbon steel in particular, offers a viable solution when all factors are considered, especially when used in the manufacture of efficient construction solutions.

Specifiers can take added assurance of product/system credentials from manufacturer statements and EPDs which can be included in the final project's carbon assessments.

*Andy Hackett is general manager & director at voestalpine Metsec Dry Lining Division*

# Zinc: the natural choice

Jonathan Lowy of VMZinc says the history of zinc specification aligns with its future



**W**hen zinc was first used as a roofing material at the beginning of the 19th century many of the reasons for its choice all that time ago are still relevant today; availability of the metal, the technical advantages of the roofing systems and the attractive aesthetic of the material.

Zinc was first extracted and rolled in Liege, Belgium in 1809, and while this factory has long since closed, zinc is still refined and rolled in western Europe making it an easily available material. In 2024 the majority of zinc used for roofs and facades in the UK and Ireland was produced in France and thus has a relatively low carbon footprint due to the makeup of France's electricity supply. An added attraction is the durability and recyclability of zinc. The BRE gives zinc an expected life of 100 years with over 98% recycling of the zinc roof panels at the end of this long life. Furthermore the maintenance of a zinc roof is little more than clearing out the gutters annually. Environmental Product Declarations for zinc in accordance with EN 15804 offer a more in depth view of the metal's performance.

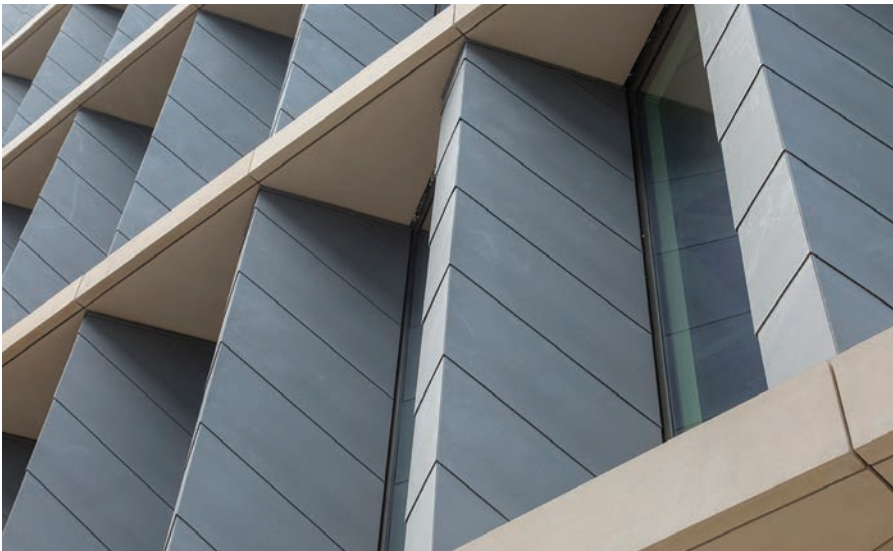
In the early days of zinc roofing the

batten cap system was used, not dissimilar to a lead roll but in recent decades the standing seam system has become more popular with its ability to cover complex shapes and surfaces with slopes as little as 3° all the way to walls and even soffits. This makes it a material and approach that is truly for the whole building envelope. For facades the choice of system is vast and includes traditional fully supported panels such as standing seam and flat lock panels as well as a wide range of rainscreen cassette systems.

Zinc should not be confused with galvanised steel, which is simply steel protected with a very thin layer of zinc or painted metals where the paint either protects the metal beneath and/or enhances the substrate's aesthetics. Metals such as zinc and indeed copper are used both for their inherent beauty and durability as solid non painted metals. It is possible however to chemically modify the surface of zinc thus changing the metal's aesthetics and pre-weathered zinc has now been available since 1978. This form of zinc remains solid and is non-coated.

A further advantage of zinc roofing and cladding is the relative lightweight of this

**The BRE gives zinc an expected life of 100 years with over 98% recycling of the zinc roof panels at the end of this long life**



type of building envelope. The majority of zinc roofs and walls weigh less than 10 kg/m<sup>2</sup> which is far less than tiles, stone or indeed lead, this not only reduces the environmental footprint but can also reduce the size of the substructure beneath the zinc.

If you watched the 2024 Paris Olympics you may have admired how many Parisian monuments were used as backdrops for many of the sporting venues. This almost automatically means that zinc roofs and ornaments were also part of these backdrops, whether it be the quays by the Seine and grand boulevards of Paris or the many zinc ornaments, for example those found on the Grand Palais. Whilst zinc does still have somewhat of a heritage image in France and other parts of continental Europe it has far more of a contemporary image amongst UK architects.

One such example is Sheppard Robson's transformation of 68-86 Farringdon Road in London from a car park to a mixed use scheme, with an exciting streetscape which includes the use of pre-weathered QUARTZ-ZINC flat lock wall panels. Another site that has undergone a significant change is the Rosebank distillery in Falkirk. Michael Laird architects have beautifully blended existing structures with new ones clad in dark grey pre-weathered ANTHRA-ZINC panels. Last but not least and in a way going back to how zinc is used in the French capital, Simpson Brown architects designed a new visitor centre for Lincoln Cathedral which is designated as a Grade 1 listed site thus showing how in this case, QUARTZ-ZINC roofs and walls can be used in such a sensitive setting.

In addition to BRE Environmental Product Declarations and extensive historic examples showing how durable and recyclable and therefore sustainable zinc is, third party accreditation such as BBA system certificates and Brooft4 fire tests are also available. Additionally, architects can tap into a wide range of design services whether it be CAD drawings, BIM models or detailed information on substrates. Correct installation is vital and lists of recognised contractors who regularly install zinc roofs and walls in the many systems that are now available can also be issued. All of these contractors can also install the sometimes forgotten zinc rainwater systems.

*Jonathan Lowy is operational marketing manager at VMZinc*





# Attractive roofs and walls for all styles of architecture

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# Linarte pushes architectural boundaries with One Baelskaai

One Baelskaai is the figurehead of the East Bank, in Ostend's historic port. Binst Architects gave the iconic corner building commissioned by the Versluys Group undulating patios and expressive patio borders. To evoke the dune grass and dune fencing, the architects chose Renson Linarte brown-black/bronze profiled facade cladding to contrast with the flowing



horizontal lines. We spoke to Binst Architects about the search that preceded this.

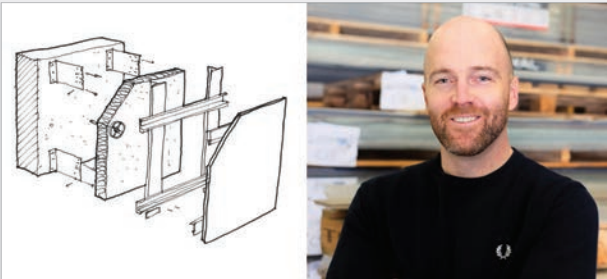
"The facade reflects the character of the site, port area, and coast", explains Ward Lagrain, project architect. "The patios and their expressive patio borders give the complex a unique look and maritime character. The building's undulations mirror the undulating character of the dune landscape in front and the sea. Undulating continuous glass balustrades reflect light, air, and water."

The material usage at One Baelskaai also refers to the surrounding dune landscape. The profiled Linarte facade cladding by Renson evokes the image of the dunes. Although Linarte offers the possibility of personalisation by adding wooden inserts or led lights, the architect chose the clean, sleek look. "As architects, we did say that we wanted a vertically profiled facade that hinted at the dune grass and the wooden posts with barbed wire that demarcate the



dunes. That subtle vertical reference in our facade contrasts nicely with the horizontally sloping patio borders."

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## Pura Facades launches roadshow

Pura Facades, part of the Vivalda Group, has launched a nationwide initiative to improve the understanding of cladding among specifiers and contractors. Developed with the help of architects and designers, the half day course is delivered in person and aims to promote a better appreciation of the history and development of façade systems – focusing on the key elements of rainscreen cladding and vital safety considerations on the wake of the Grenfell Report (Phase 2) in September. While the course covers the principles of effective façade systems, it also looks at the recent regulatory and legal changes affecting building construction and cladding. The session's key message to specifiers is to consider the external envelope of a building as a holistic system that comprises many parts that all work together. Pura Facades' Adam Sumner (pictured) said: "So far, we've undertaken a handful of the sessions at architects' premises and the feedback has been fantastic. We're encouraging architects, specifiers and contractors alike to think differently about cladding."

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## W40 steel profiles an ideal match



The versatile W40 window profiles, specifically developed by the Steel Window Association (SWA) for its members, are a stylish and modern solution that suit both new-build and refurbishment applications. While the classic W20 section continues to be preferred by conservationists and many property owners for early 20th century and older properties, W40 exemplifies how steel fenestration systems have kept pace with modern tastes and technical demands, while retaining key attributes such as strength and excellent daylight transmission.

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# Metalline's innovative rainscreen cladding: Redefining architectural design & performance

Metalline has revolutionised architectural design by delivering over 1,000 square metres of cutting-edge rainscreen cladding for a landmark project. Featuring a dynamic combination of Gold Anodised Perforated UNITY TF panels fixed to the specially engineered ULTIMA 3 spandrel system, this project presented both aesthetic and technical challenges. The intricate perforated pattern of each panel seamlessly fits into the building's design, transforming the entire facade into a work of art. This bold, innovative cladding solution not only enhanced the building's visual appeal but also set a new benchmark for complex rainscreen systems.

The perforated pattern on the UNITY TF panels was carefully distributed across all sections of the building, giving the entire facade a seamless, interconnected look. Each panel was not just a decorative feature but a functional piece of a larger puzzle, with its design contributing to the overall visual cohesion of the structure. Behind the gold anodised rainscreen panels was a black PPC inverted tray spandrel panel, enhancing the contrast of the perforation and providing an added layer of aesthetic depth. The outer rainscreen panels were anodised in Europe to achieve the desired premium finish, giving the building a distinctive appearance that stands out in its urban environment.

One of the most significant challenges faced during the execution of this project was the size and weight of the panels. Due to their intricate design and robust material composition, each panel had to be carefully engineered for both structural integrity and ease of installation. Metalline overcame this challenge by ensuring that each panel was equipped with its own lifting block and pre-drilled anchor points, facilitating precise alignment and safe handling during installation. Given the limited space available on the construction site, this careful planning and the use of specialised lifting apparatus were critical to ensuring the smooth progression of the build. The panels were lifted and positioned with minimal margin for error, ensuring that the entire system fit perfectly within the building's glazing system.

The UNITY TF Through Fix Rainscreen System used in this project is a non-combustible solid aluminium rainscreen



that is designed for both new builds and re-cladding projects. The system's compatibility with either the CLAD-LINE CL1 or Floor 2 Floor Framing Systems made it a versatile and easy-to-install solution. In terms of safety, the UNITY TF system has undergone rigorous testing to verify its fire and structural performance. The anodised aluminium version of the panel achieves an A1 classification to BS EN13501-1, while the powder-coated version holds an A2-s1,d0 classification and has successfully undertaken BS 8414-2:2020 testing, ensuring the highest levels of fire safety. Powder-coated panels were tested to BS EN13501-1 under real-world conditions, including being mounted onto aluminium rails with horizontal and vertical joints, adequate ventilation, and a mineral wool substrate. These tests covered the full range of colour options, making the UNITY TF an ideal choice for high-performance, durable cladding with extensive design flexibility.

In addition to fire resistance, the UNITY TF system demonstrated superior impact resistance, with both soft and hard body impacts fully tested to CWCT TN75/76 standards. The panels were also tested for wind resistance, dynamic water resistance,

and UV exposure, ensuring their long-term durability even under harsh environmental conditions. Moreover, the system's easy installation and cost-effectiveness made it a practical solution for replacing non-compliant cladding panels in existing structures, further broadening its appeal.

Behind the rainscreen, Metalline's ULTIMA 3 insulated spandrel panels provided essential structural support and thermal performance. Available in both A1 and A2-s1,d0 fire-rated options, the ULTIMA 3 panels are constructed from high-density mineral wool insulation sandwiched between two aluminium skins. This design ensures that the panel meets both fire compliance and structural integrity standards while maintaining the appropriate glazing edge thickness for aesthetic and functional consistency. In the A1-rated version, the outer sheet is made from anodised aluminium and is mechanically fixed to the inner aluminium tray. In contrast, the A2-rated version offers a powder-coated outer aluminium sheet with a mill-finished aluminium or pre-galvanised steel inner sheet. Both options use a Fabrock Insulation core and foil-encased Rockwool mineral wool insulation bonded to the back for enhanced thermal performance.

Further bolstering the design's robustness, the ULTIMA 3 panels are fully tested for wind resistance and impact resistance, meeting CWCT standards. With a variety of colour options available, the panels also offer low-maintenance durability and can be fitted seamlessly into structural glazing systems without visible fixings, maintaining the clean, modern aesthetic that was a key design goal for this project.

Overall, this project demonstrated Metalline's ability to deliver a complex cladding solution that balanced high-level design requirements with rigorous safety and performance standards. The combination of the UNITY TF system and ULTIMA 3 panels created a striking visual effect while ensuring the building met the highest standards of fire safety, impact resistance, and weather durability. This unique cladding system has set a precedent for future projects, offering a new benchmark in both aesthetic appeal and functional performance.

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