Structural Steel Design Awards 2022

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FOREWORD

"Every year, we're all blown away by the standard of entries received by the Structural Steel Design Awards and 2022 has been no different.

The scale, scope and complexity of the projects submitted are a great example of what can be achieved through digitalisation in the structural steelwork industry, enabling the design, detail, manufacture, and construction of such impressive structures.

As we continue to face challenging times in our economy, it's refreshing to see the industry recognises how essential it is to adopt new technologies and equip designers, detailers and fabricators with the tools they need to streamline collaboration.

The entrants and winners of the SSDA in 2022 demonstrate that our industry is in a strong place, and, on behalf of Trimble, I would like to congratulate the winning project teams."

Steven Insley, Business Director UK & Ireland, Trimble

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INTRODUCTION

"The Panel was this year delighted to be able to return to the usual SSDA judging process no longer constrained by restrictions due to the COVID-19 precautions of the previous two years. We pride ourselves in this award scheme on making visits to see, understand and experience all shortlisted projects 'in the flesh', and to meet the project teams in person. There is no better way to assess a project than to see it and to hear what it is all about from the team that created it.

Again, this year there was a wide range of types of projects entered for the scheme. Scales of entry ranged from the largest prestige city office buildings to beautiful footbridges, and we were particularly interested in projects that reflect a commitment to reducing lifetime carbon use.

The awards, commendations, merits and national finalists rewarded by the Structural Steel Design Awards this year reflect the achievements of the current steel construction industry. Everyone involved should be proud of what has been achieved."

Chris Nash BA (Hons) DipArch RIBA FRSA - Chairman of the Judges Panel

THE JUDGES

Chris Nash BA (Hons) DipArch RIBA FRSA - Chairman of the Panel
Representing the Royal Institute of British Architects

Richard Barrett MA (Cantab)
Representing the Steelwork Contracting industry

Paul Hulme BEng (Hons) CEng FICE
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Representing the Institution of Structural Engineers

Bill Taylor BA (Hons) DipArch MA RIBA FRSA
Representing the Royal Institute of British Architects

Oliver Tyler BA (Hons) DipArch RIBA
Representing the Royal Institute of British Architects

Objectives of the Scheme

"...to recognise the high standard of structural and architectural design attainable in the use of steel and its potential in terms of sustainability, cost-effectiveness, aesthetics and innovation"

1 Triton Square, London

PROJECT TEAM

Architect: **Arup Associates**
Structural engineer: **Arup**
Steelwork contractor: **William Hare Ltd**
Main contractor: **Lendlease**
Client: **British Land**

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1 Triton Square is a 31,200m^2 redevelopment at Regent's Place in London. The original building was completed in the 1990s and, twenty years later, the scope of this redevelopment was to double the office floor area and create an exemplary sustainable and healthy workplace.

British Land saw the potential to increase the building's size and transform it for today's workstyles, opting for refurbishment to save time, money and carbon. Arup was the original designer for the building and worked with the developer to retain and refurbish as much of the existing building as possible, rather than demolishing and starting again with a new building.

The brief for 1 Triton Square was to create a healthy workplace for 3,500 people with exceptional amenity, daylight and social connectivity. The atrium and new structure have been designed to incorporate satellite stairs, 2.7m-high floor-to-ceiling windows that fill offices and stairwells with natural daylight, nearly 500m^2 of green roofs that promote biodiversity, five panoramic terraces that provide space for socialising, working and relaxing and 536 cycle spaces, along with lockers and showers, to encourage active lifestyles and green travel.

The architectural redevelopment of this 1990s office building reimagines it into a 21st Century workplace that is appropriate for today's workstyles.

The new building streamlined the atrium and cores of the existing structure, adding additional floor space to each existing level, and used lightweight materials to add three additional floors of office space and relocated the same amount of plant space to the new roof. Additional terrace space was created with retail, gym and community uses being retained at ground floor level.

With twice as much net office area, the refurbished building re-establishes itself in its urban context, engaging with the street and local surroundings much more.

The original 1 Triton Square building was a six-storey reinforced concrete (RC)-framed structure with steel-framed stability cores in each corner. A striking feature of the building was that it housed a large 36m-wide central atrium, alongside a smaller atrium in the entrance area.

The structural scheme involved nearly doubling the area of the building by adding three new floors on top of the existing, part infilling the central atrium, and infilling most of the entrance atrium. New loading on the existing building was minimised by using lightweight composite steel and concrete floor construction both in the cores and across the main floorplate.

All the new steelwork for the scheme is supported on either the existing steel cores or the main RC frame. Within the entrance atrium the existing structure was cut and carved down to the basement to allow new RC lift pits and a ground slab to be constructed, from which the new steelwork for the entrance atrium was erected.

The new scheme has resulted in the existing structure being exposed to significant increases in loading. As a result, prior to steelwork contractor William Hare beginning its package, Lendlease had to undertake preliminary works that included strengthening existing concrete columns as well as installing 180 new piles in preparation for the new steelwork. This early work also included the removal of a steel-framed glazed roof that covered the atrium.

The addition of three new storeys translates to a significant increase of the horizontal loads on the building. Despite the new scheme making use of the existing RC frame to take some of these stability loads, the capacity of the existing bracing system was exceeded. Therefore, before starting to add the new steelwork to the cores, the existing diagonal braces were sequentially replaced to accept the additional loads. The new levels required some complex column base connections in the cores as the original steelwork below was found to be out of position in some locations.

Where possible, the strengthening of existing steel core columns was typically undertaken by welding steel plates to the existing UC sections. The majority of these plates were positioned between the flanges of the UC section, allowing the size of the columns to remain largely unchanged while achieving a significant increase in capacity. Work within the existing cores was heavily constrained due to the adjacent precast façade, and so the plate strengthening was arranged to suit the limited access. The steel plate strengthening option was significantly lighter than the concrete encasement option, limiting the impact on the structure below.

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British Land set high sustainability aspirations for 1 Triton Square through their Sustainability Brief for Developments, which sets targets for exemplary Wellbeing, Community, Future-proofing, and Skills and Opportunities. The project was awarded a BREEAM 'Outstanding' rating and has been named one of the UK's most sustainable HQs.

The project has been delivered 30% faster than a new build, with 6,000 fewer lorry journeys required. 40,000 tonnes of carbon have been saved compared to a new build with as much of the existing structure and façade as possible being reused.

Judges' comment

This outstanding project is an exemplar of sustainability thanks to the use of steel. It demonstrates how an existing building can be almost doubled in floor area, for a fraction of the embodied carbon of a new building the same size. The achievement was a clear team effort where all options and details were scrutinised to meet the client's tough brief.

Esperance Bridge, Kings Cross

PROJECT TEAM

Architect: **Moxon Architects**
Structural engineer: **Arup**
Steelwork contractor: **S H Structures Ltd**
Main contractor: **Galldris**
Client: **Argent**

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The Esperance Bridge crosses Regent's Canal in central London and opened in summer 2021. The 25m-long footbridge connects Kings Cross and St. Pancras to the south with the shopping and eating hotspots at Granary Square and Coal Drops Yard to the north. It is an innovative take on a traditional Warren truss bridge with tapering and folded steel plates which create an elegant and sculptural form. Named by local school children who were inspired by a pioneering social project created by two suffragettes in 1895, Esperance Bridge has already proved to be an iconic structure that contributes to the community and civic space.

In addition to improving connectivity across Regent's Canal, both the scale and openness of Esperance Bridge were specifically designed to invite the full spectrum of users, encouraging exploration, as well as lingering. The expressive form catches the eye from all angles, forming a spectacular focal point over the canal. Once on the bridge, a generous lean rail invites people to pause and enjoy views along the canal.

A key aspiration of the design was to extend the existing public realm across the structure. The built solution achieves this with Granary Square's distinct porphyry stone paving flowing onto the bridge deck.

The high-quality finishing details, with bespoke drainage channels, tidy movement joints, and custom-made steel balustrades all contribute to a harmonious public realm. Brick-clad bearing shelf doors allow easy access for inspection whilst ensuring a seamless blend with the existing heritage masonry walls.

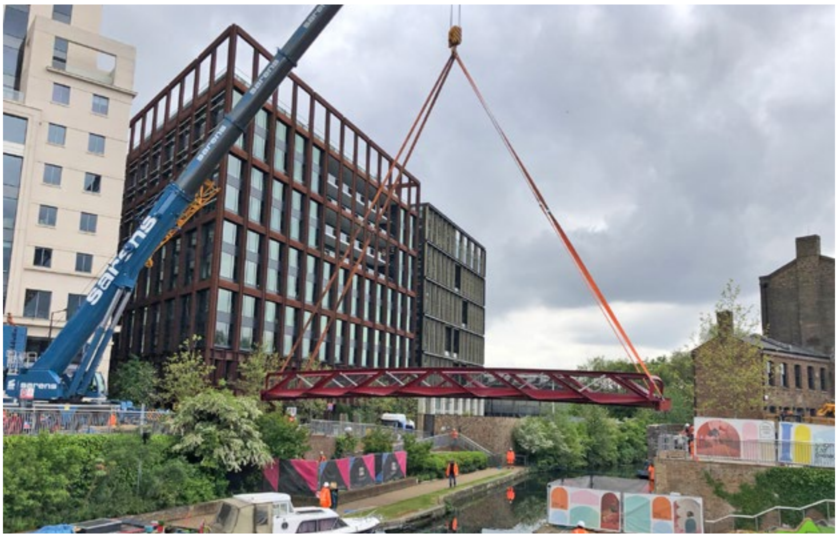
Early consideration of the bridge lighting scheme, along with multiple mock-ups of possible details, resulted in a design that brings the bridge to life at night whilst also minimising light pollution and ensuring no impact to one of London's critical bat corridors.

Esperance Bridge is a simply supported Warren truss made of welded steel plates with a steel-concrete composite deck. The reinforced concrete deck controls the dynamic behaviour and acts compositely with a steel 'bathtub' to carry the deck loads to the trusses. The top chord flows into the diagonal compression struts and continues around the 'bathtub' to terminate at a longitudinal stiffener centred under the deck. In this way, the flange provides improved buckling capacity for the struts and simultaneously restrains the top chord. Fairing plates complete the expression of flow of forces from the top chord, down the diagonal struts and along to the bottom chord. Finally, the ties are stainless steel, expressing their differing function and reducing their visibility to emphasise the repeating truss module.

Recognising that the built environment has a critical role to play in reducing carbon emissions, reuse of existing structures was investigated early in the design process. Reuse of the existing Good's Way retaining wall on the south side was made possible with local modifications to the bearing shelf. Reuse of the existing masonry wall for the north abutment was ultimately not pursued as the durability of the solution for a 120-year design life could not be reliably proven. Nevertheless, the final solution and efficient superstructure design resulted in 20% carbon savings relative to 'business as usual'.

The definition of the geometry and the fabrication of the superstructure was challenging due to the complex curved shapes. The project delivery model had a period of early contractor involvement, which brought designer, architect, main contractor, quantity surveyors and steelwork contractor together at an early stage to define key details that were practical to fabricate. The use of 3D models to review difficult details facilitated effective collaboration. With key details established, a mock-up of a standard truss module was produced to test the fabrication and to confirm the visual appearance of the most important plate interfaces. This allowed the team to hone visual details and push the fabrication and workmanship skills to the highest standard. While complex, the modular nature of the truss form allowed a high degree of repetition, eventually streamlining both design and fabrication.

The curved plates were formed by a specialist subcontractor before being welded into the final assembly by the steelwork contractor. The bridge steelwork was fully fabricated offsite, providing greater control on quality and ensuring minimal disruption to an active and congested site. The bridge was lifted over the canal in one piece.



The choice of steel as a material for this truss bridge follows from an appreciation of the site's heritage, whilst the use of modern design and fabrication methods has allowed the traditional bridge form to be elevated to an elegant sculptural object which is still true to its function. This expressive form meets the client's aspiration of drawing attention and serving as a way marker within the wider pedestrian network. An emphasis on craft and deliberate detailing, together with close collaboration between parties, has resulted in a bridge where pedestrian experience is at the heart, as evidenced in the route's popularity since opening.

Judges' comment

An elegant, pragmatic solution that is carefully crafted and beautifully made. This pedestrian bridge adopts the alignment of a historic bridge with its design appropriately reflecting the site's industrial heritage. Thoughtful detailing of the curved steelwork to create the three-dimensional sculptural balustrade fully exploits the properties of steel and the potential it offers.

Bombardier Maintenance Hangar, Biggin Hill

PROJECT TEAM

Architect: **Civils Contracting Ltd**
Structural engineer: **REIDsteel**
Steelwork contractor: **REIDsteel**
Main contractor: **Civils Contracting Ltd**
Client: **Biggin Hill Airport Development Ltd**

London Biggin Hill is the fastest growing business airport in the UK with major investment transforming it into a world-class centre of aviation. The iconic airport's most ambitious and technically challenging development yet is a spectacular dual cantilever 'super-hangar' for aerospace giant Bombardier, which is the largest of its type in the UK.

The client's vision was for an advanced Maintenance, Repair and Overhaul (MRO) hangar with two 160m clear span entrances and underslung cranes for servicing aircraft, along with offices and a VIP lounge.

Early engagement of REIDsteel, as the structural steel design and build fabricator, the hangar door manufacturer and cladding company was essential to the success of the project given the need for elements to be erected and aligned on 45m-long cantilever trusses with requirements to accommodate complex hangar door head gear and underslung cranes – both of which required more stringent deflection criteria than usually found on a large span structure.

After investigating traditional hangar solutions, a cost-saving design was proposed, which was highly efficient in its structural performance, with a cantilever truss design for the hangar, conventional 'beam and stick' construction for the offices and an elegant, glazed lounge, which has minimal bracing by virtue of a diaphragm within its roof structure.

The value-engineered cantilever design, along with load sharing elements, allowed significant reductions in material use, producing a much lower steel tonnage at 1,600t compared with more conventional designs. The design allowed the roof of the hangar area to safely span without support from internal columns to achieve the client's aspiration for two vast, unobstructed hangar floor spaces of 7,200m^2 each.

Long span cantilevers are inherently vulnerable to disproportionate collapse due to the nature of the tension connections in the top chord. To alleviate this, and to help meet the stringent deflection criteria, load sharing trusses were used to ensure that each frame could be supported by its adjacent frames and to reduce differential deflections under crane and wind loads.

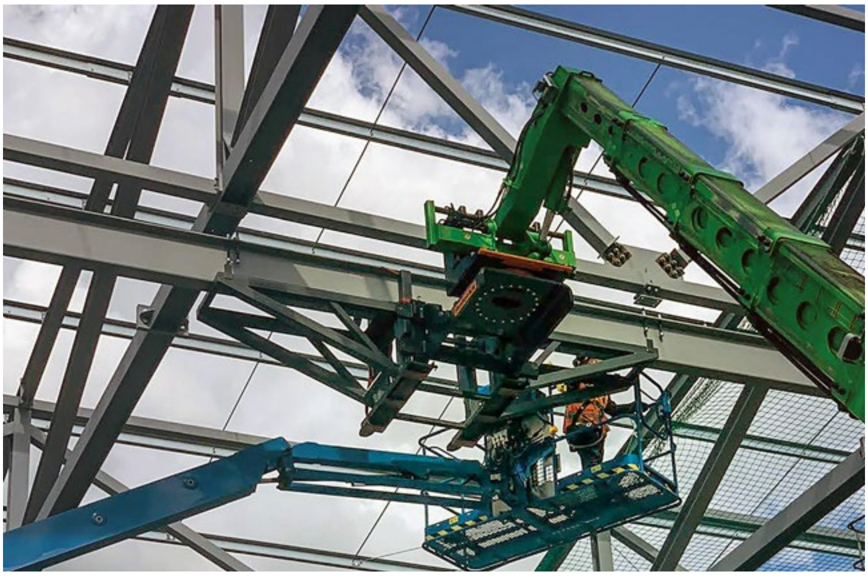
This created a new issue, in that fabrication tolerances could cause a frame sitting higher than its neighbours to attract unacceptably high loads. The solution to this lay in leaving the load sharing trusses 'loose' until all permanent loads were applied and only then tightening up the slotted preloaded bolted connections. In addition, careful planning of the erection sequence and pre-cambering of the trusses was needed to allow for the temporary condition where one side of the hangar was erected but not the other.

Additional floor area above the first-floor offices has been provided which, although not part of the original brief, permitted additional space for all of the M&E equipment, plant and storage. As a result, the mass needed to counterbalance the cantilevers has been used for productive purposes rather than being buried in the ground as part of the foundations.

Another departure from the original brief is that the design caters for 100% coverage of both hangars for the underslung crane, rather than 50% of one, providing the future-proofing required by the end user. The dual cantilever design also means the hangar can be extended to meet changing requirements over its 50-year design life. In addition, with steel providing the primary structure, there is potential for life-extension, recycling or reuse in line with circular economy principles.

Value-engineering through the design process saved on steel, fabrication and erection time as well as reducing the environmental impact of the project. The resulting reduction in steel weight was key to saving 850 tonnes of embodied carbon. The roof is also designed to take solar panels and assuming that the client achieves 50% coverage, this has the potential to save 300 tonnes of operational carbon per year.

Close co-ordination was required between London Biggin Hill, Civils Contracting and REIDsteel to ensure the steelwork was delivered efficiently and safely for assembly, which included the choice of opting for tandem lifts of the 45m rafter trusses to reduce jib heights from that required for a single crane. Other logistical challenges of operating in a live airport environment included consideration of flight schedules and restrictions on lifting during poor visibility.



Whilst the design was innovative, it could be constructed using standard equipment. The tandem lift was achieved with two 55-tonne mobile cranes with a 40-tonne mobile used to infill between frames with the load sharing trusses and cold-rolled steel purlins needed to ensure stability in the temporary condition. While the rafter on one side of the core was being erected, the rafter on the other side was being assembled on trestles, ready to be erected the following day.

The completed structure is outstanding as a statement building; both in terms of its structural steel and sleek appearance with cladding and glazing to create a striking and contemporary development, which sets a new benchmark for the highest quality MRO facilities in the 21st Century.

Judges' comment

Bombardier's new headquarters at Biggin Hill Airport is the UK's largest dual cantilever hangar providing two clear spaces of 7,200m², including 160m clear span openings and full lifting coverage from underslung cranes. The central spine of the building anchors the cantilevers as well as housing the building functional spaces. The structure achieves remarkably good embodied carbon figures, in line with the LETI 2030 aspirational values.

Award

Tower of Light, Manchester

PROJECT TEAM

Architect: **Tonkin Liu**
Structural engineer: **Arup**
Main contractor: **Vital Energi**
Client: **Manchester City Council**

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The Tower of Light is a 40m-tall tower that supports the five exhaust flues of a new Combined Heat and Power (CHP) energy centre located in Manchester city centre. The energy centre is a key component in Manchester's Civic Quarter Heat Network project, which will supply several local buildings with low-carbon energy. Due to the city centre location of the site, the need to create a tower with significant architectural merit was a key component of the brief.

The white curved steel perimeter shell of the Tower of Light is the only vertical structure – there is no additional internal frame.

The tower perimeter shell is tailored from 6mm and 8mm-thick laser-cut steel plates which have been curved and welded together to create a stiff, strong shell. The geometric stiffness provided by the curves, folds, and corrugations in the shell enable the thin steel plates to resist buckling without the need for any additional stiffeners. The perforation pattern of the shell is optimised to reflect the flow of stresses in the structure. The perforations and folds in the structure have the additional benefit of making the tower less susceptible to dynamic response to wind effects such as vortex shedding.

The geometry of the shell corrugations and perforations was developed using digital workflows to identify a structurally optimal form. Parametric tools were used to quickly generate and analyse several variations of the geometry, which allowed the design team to study the effect of changes in the form of the shell on the buckling and fatigue performance of the structure.

The perimeter shell structure has the dual purpose of also acting as the façade of the tower. Using the same material to provide both the structure and the façade has a material efficiency benefit over a more conventional braced frame flue tower, which would require a non-structural façade system. A study to compare the embodied carbon of the shell tower with a more conventional flue tower showed that the embodied carbon of the shell tower was lower, with a vastly reduced number of components.

As the forces in the structure due to wind and gravity decrease towards the top of the tower, the shell becomes lighter and increasingly perforated with height, further reducing the steel tonnage.

Due to the high number of edges and corners in the tower shell, there was a risk that a painted corrosion protection system would not be sufficiently durable. Therefore, stainless steel was selected for the tower shell to ensure excellent durability. The tower is painted white for architectural reasons, but this also allowed a lower grade of stainless steel to be used and avoided expensive surface treatments, reducing the project costs.

A series of decks at 4m intervals up the height of the tower support the flues and transfer their load back to the tower shell. The decks also enable access for maintenance of the flues. The site was highly constrained, so the tower design team worked very closely with the flue designer to co-ordinate the design of the deck frames with the positions of the flues. The decks are designed with removable panels to facilitate replacement of the flues if required during the life of the tower.

Belying its apparent complexity, the fundamental geometric principals of the shell structure are deceptively simple. All curved, the panels which compose the shell are developable (i.e. they are singly curved). These singly curved surfaces fit together to form the folded geometry of the shell. This was essential to ensure that fabrication of the tower was practical and cost-effective. Nevertheless, tight tolerances were required, and the structure was fabricated to Execution Class 3 due to fatigue requirements.

The design team issued a 3D CAD model of the tower to the steelwork contractor, who used the model to derive the cutting patterns for each of the 432 shell panels. The perforated shell panels were laser cut from 6mm and 8mm-thick stainless steel plate, before being rolled to the correct curvature. These rolled panels were then welded together to form a series of 4m-high shell modules.

The tower was fabricated as a series of nine modules. Once fabricated, each module was transported to site, stacked on top of one another and fixed together by internal preloaded bolted flange connections at the top and bottom of each module. Installation of all bolts was carried out from within the tower, eliminating the need for exposed working at height, which minimised safety risks during construction.

Flue sections were pre-installed in each of the modules prior to lifting. These flue sections were then connected when the construction of the tower structure was complete.

The Tower of Light is the result of a synthesis of architecture, engineering, and steel fabrication to create a useful and iconic addition to the city of Manchester.

Judges' comment

This shell lace structure exemplifies perfectly the synthesis of striking architectural form, advanced engineering, iterative technical analysis (Grasshopper and LS Dyna) and craft-based fabrication. A superb example of how design can transform a utilitarian chimney into a piece of urban art, intelligently conceived and impressively executed.

Award

Lord's Cricket Ground, Compton & Edrich Stands Redevelopment

PROJECT TEAM

Architect: **WilkinsonEyre**
Structural engineer: **Buro Happold**
Steelwork contractor: **Severfield**
Main contractor: **ISG Construction**
Client: **Marylebone Cricket Club**

Established in 1814, Lord's is renowned as the home of cricket and of Marylebone Cricket Club (MCC), the custodian of the Laws of cricket played around the world. The ground, in the St John's Wood area of North-West London, has been undergoing redevelopment in accordance with a staged masterplan to upgrade facilities and increase revenue generation.

The latest phase encompassed redevelopment of the Compton & Edrich Stands, located either side of the distinctive media centre at the 'Nursery End' of the ground. A three-tier arrangement increases capacity of the stands from 9,000 to 11,600 seats and is accompanied by two new main sponsor corporate boxes. The redevelopment vastly improves sightlines, removes obstructed view seats, creates new wheelchair spaces and additional accessible seating, and adds a steel-framed roof which partially covers the top tier.

The new stands, while providing a high-quality aesthetic, transform the famous Nursery End of the ground, complement the existing media centre, provide world-class facilities, and open up views towards the Pavilion and back towards the Nursery Ground.

The structural layout of floors and seating responds to the functional requirements, with the overall shape developed to complement the media centre. Each stand was spatially offset from the media centre so that the new elevation could be read individually but also allowing the three elements to be seen as a single new composition.

The structural framing is a moment frame in two-directions. In cross-section the structure is largely supported on two main columns, with further support to the lower tier. The outer column being pin-ended to respond to the aesthetic requirement of presenting

a lighter colonnade façade, whilst the inner column, coupled with the bending resistance of the rakers, provides the lateral and longitudinal strength and stiffness. To achieve this, the inner column is a 1400mm x 500mm fabricated box with 100mm thick base plates anchored with Macalloy bar assemblies. The lower tier was not utilised in the radial stability due to its variable relationship to the primary frame around the stands and was isolated using a movement bearing at the connection to the main column.

The steelwork is largely exposed in the completed structure and therefore design and detailing of the connections and position of splices needed to respond to the aesthetic requirements, as well as cater for the significant forces being transferred through them.

To develop the required structural stiffness, the rakers were designed to be continuous through the main supporting columns. This required them to be deep fabricated sections. The back-span element was designed to gently taper to the outer façade to maintain the aesthetic brief for the external view. The deep section has significant service openings through the web which allows for M&E services to be accommodated within the structural depth.

The roof form is created by a series of curved, plated rafters located on primary grids which in-turn support the timber waffle (purlins and radials) and the tensioned membrane roof covering. An important visual aspect of the roof was to develop a smooth line for the inner dripline of the canopy forming the leading edge. This required all site-bolted connections to be hidden within the CHS diameter, providing a near seamless continuous member. The complex forces generated within this member, due to its geometry and structural demands, made this particularly challenging and required detailed analysis of specific rather than global forces and careful positioning of splice locations.

The programme had to allow the stadium to remain functional during the summer cricket season, maximising availability of seating in the new stands for major international fixtures, requiring phased handover of the structure. The key requirement being that the 11,600 new seats were available for the new season in Spring 2020 despite demolition work only commencing the previous September. Full fit-out, construction of the canopy roof and completion of hospitality areas was programmed for the following off-season over the autumn and winter of 2020-21.

The project was challenging in terms of the complex architectural steelwork and very tight offsite lead-in and construction programme. There was less than a year for the old stands to be demolished, all the new piling and foundations installed, and the new stands built, in time for what would have been the start of the 2021 cricket season (postposed due to COVID-19 restrictions).

The logistics of the site were particularly challenging as there was only a single access point for vehicles. The route from the access point to the construction site involved driving through areas that remained open to the public, as the cricket academy needed to remain in use throughout the construction works. The single access point needed to feed four work-fronts – involving both steelwork and precast concrete deliveries. Some of the longer abnormal loads had to be delivered to site on rear steer trailers to enable them to be manoeuvred around the site.

Judges' comment

The new twin Compton and Edrich Stands frame the Media Centre as a considered composition to complement Lord's historic festival atmosphere, while accommodating increased numbers of spectators in style and comfort. The apparent easy symmetry belies the many difficulties of planning sensitivities, timetable, site and ground constraints that were overcome.

Commendation

Structural Steel Design Awards 2022

Central Atrium at Hilltop, RHS Wisley

PROJECT TEAM

Architect: **WilkinsonEyre**
Structural engineer:
Michael Barclay Partnership LLP
Steelwork contractor: **Hillcrest Structural Ltd**
Main contractor: **Osborne**
Client: **Royal Horticultural Society**

The Hilltop Building provides the Royal Horticultural Society (RHS) with a new education and science centre within the Garden at Wisley that is intended to attract a wide range of audiences and provide a destination for learning and events, science and research, interpretation, and enjoyment of horticulture.

The building is a 'Y' shape in plan form that integrates with the landscape and encourages visitor flow through the building and surrounding gardens. It is divided into two functional 'wings' with the atrium forming an adaptable, multi-use central public space linking both wings.

At ground level, the atrium acts as a flexible public engagement space and provides the public with access to the cafe, events space, classrooms, and library. At first floor level, via cantilevered walkways and a bridge, the atrium space links the more restricted-access areas such as laboratories and offices. The north end of the atrium forms the main entrance to the building and opens out onto long views across the site.

A steel frame was selected to achieve a lightweight, filigree and curved grillage that could be detailed to incorporate drainage, ventilation, movement, and thermal separation. A steel roof facilitated an elegant, exposed aesthetic with a repeated and cohesive set of unobtrusive bolted connections. With all steelwork fabrication offsite, the finished quality could be controlled to a greater degree than with other materials and site waste minimised.

Sustainability measures were incorporated into the building, which included reducing the building's energy demand by incorporating natural lighting, solar shading, and natural ventilation. A sustainable drainage system (SuDS) was also incorporated, and photovoltaics installed to achieve a 10% reduction in operational carbon emissions.

The atrium roof springs off the eaves of the adjacent two-storey wings, creating the large double-height space. The roof is composed of three roof planes with two lines of supporting columns below. At the north and south ends of the atrium the roof extends over the façades to form glazed entrance canopies.

Building Information Modelling (BIM) was used throughout the design process, which helped the team to overlay the architectural, structural and services to coordinate in detail. The roof geometry with bifurcating, curved and tapered beams was imported into Telka software by the steelwork contractor and formed the basis of their fabrication model. As well as spatial arrangement and connection detailing, the model was used to agree and apply efficient use of different corrosion and fire protection measures across the structure.

Judges' comment

The elegant steel grillage gives a lightweight aesthetic to the glass atrium and external canopy that would not have been possible in other materials. The attention to detailing on all the exposed connections, despite the complex geometry of the roof, was truly commendable.

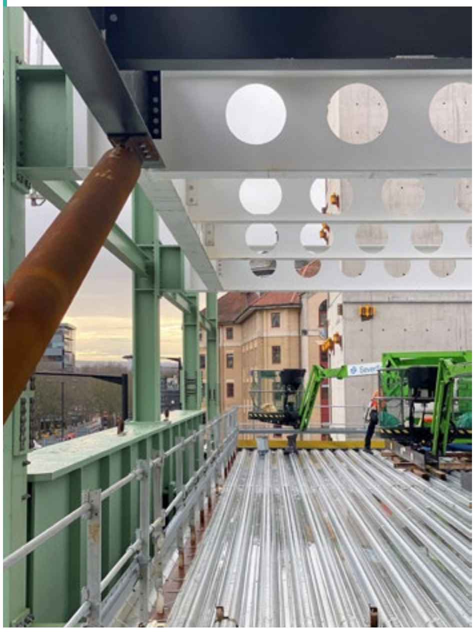
Commendation

Structural Steel Design Awards 2022

Assembly Bristol, Building A

PROJECT TEAM

Architect: **Allford Hall Monaghan Morris**
Structural engineer: **Arup**
Steelwork contractor: **Severfield**
Main contractor: **Galliford Try**
Clients: **Bell Hammer, AXA IM**



Assembly Building A is the development of a landmark commercial office and associated public realm adjacent to the Floating Harbour in Bristol City Centre. It is immediately recognisable for its expressed external steel frame which is painted 'Bristol green'. The 24,000m^2 building is the first of three that will make up the Assembly campus, providing high-quality flexible B1 office space for up to 3,000 people across 13 floors.

The structure is 120m-long, 25m-wide, and consists of a steel frame on a 9 x 12.5m grid, with a composite floor slab on trapezoidal metal decking. The beams on grid project through the façade to take support from the external columns. The secondary beams are spaced at 3m intervals and are supported by a central spine primary, and a perimeter edge primary. The building is stabilised by three separate concrete cores and three 18m-long transfer beams support up to 12 floors and bridge a major brick sewer, which crosses the middle of the site.

The brief was to create a new destination for Bristol through high-quality and cost-effective design that would attract the very best tenants. The ambition from the outset was to make the structure a key component of the architecture. This was achieved through an efficiently designed and meticulously detailed steel exoskeleton. Letting the whole building to BT on a 25-year lease demonstrates the building's commercial success.

A key innovation for a structure of this type was designing out the thermal breaks. This was achieved by using fabricated I-sections for the steel stubs that penetrate the façade, allowing the flange and web thicknesses to be optimised and justified through a combination of iterative 3D thermal modelling and advanced structural analysis. This resulted in a deceivingly simple solution that was thermally 40% more efficient than the traditional approach and eliminated 270 thermal breaks together with associated fabrication, installation and weather sealing complexity.

Steelwork is exposed both internally and externally, and connections have been carefully detailed to ensure visual consistency and elegance. Examples include domed bolt heads on external column splices and specifying whether fin-plates should be on the left or the right side of the beam web. This level of detail was only possible through close collaboration and the use of digital technology - the steelwork contractor's model was regularly federated with the architect's model to assist with coordination.

The building has achieved a BREEAM 'Excellent' rating, is WiredScore Platinum and WELL enabled.

Judges' comment

Part of a new city office complex, Assembly Building A is striking for its robustly designed and detailed steel exoskeleton, coloured 'Bristol green'. It, and a new pocket park, is squeezed onto a site tightly constrained between Bristol's Floating Harbour, surrounding highways and several immovable ground structures. This new destination development, built at regional economic costs, has attracted the very best tenants.

Commendation

Structural Steel Design Awards 2022

Fire Station Auditorium, Sunderland

PROJECT TEAM

Architects:
Flanagan Lawrence, Howarth Litchfield
Structural engineer: **JC Consulting**
Main contractor: **Brims Construction Ltd**
Client:
The Sunderland Music, Arts & Culture Trust

© David Allan

The Fire Station Auditorium is a central feature of the Sunderland Music and Culture Quarter and looks to deliver a destination within the city for music and culture.

The client needed a space that could be highly flexible and suitable for multiple performance types, with quick transition between events to maximise the use of the venue. At a cost of £7million this is a unique offering with a high functional performance, quality build and architectural excellence for significant value for money.

The high level of acoustic performance required, coupled with the architectural intent, led the initial design towards a reinforced concrete box solution for the primary structure, with elements of steel structure for balconies and walkways. As part of a value-engineering exercise, the collective team revisited the initial concept. By adopting alternative detailing for the acoustic elements, an entirely steel primary structure could be adopted. This made the project more suitable to the local supply chain, as well as improving the sequencing of the works and reducing foundation loads allowing the omission of piled foundations. In all, the adoption of a primary steel structure, in place of the initial reinforced concrete solution, resulted in a saving of approximately £300,000 with no loss in acoustic performance or significant impact on the finished beauty of the building.

The building has some very strong architectural features and is designed to sit alongside and within an environment of heritage buildings. Whilst it is very striking when viewed in isolation, with its overhanging front entrance glass and terracotta façade and the large open atrium, it is only when viewed in context to the entire area that these elements don't show off, but actually give prominence to the surrounding buildings. The foyer feels its own space, but also as if it belongs to the public realm. The use of steel to form the double cantilever is key to the success of this area, allowing the ground floor to be seamless with the inside outside intent.

Internally, one of the key aspects of the project was the ability for the space to be multi-functional with efficient change over between performance types. There are multiple stage positions as well as seating and standing arrangements, so the internal plan was designed around multiple general arrangements. Collapsing handrails, moveable stairs and, perhaps the most significant challenge, the retractable seating all formed part of the brief that had to be considered.

Judges' comment

The century-old fire station has been refurbished into a performance venue in Sunderland's Music and Cultural quarter. Acoustic considerations initially suggested a concrete solution, but the frame was changed to a fully steel structure resulting in excellent acoustic performance in a very flexible facility, that was produced at substantially lower cost.

Commendation

Structural Steel Design Awards 2022

One Braham, London

PROJECT TEAM

Architect: **WilkinsonEyre**
Structural engineer: **Arup**
Steelwork contractor: **Severfield**
Main contractor: **McLaughlin & Harvey**
Client: **Aldgate Developments**

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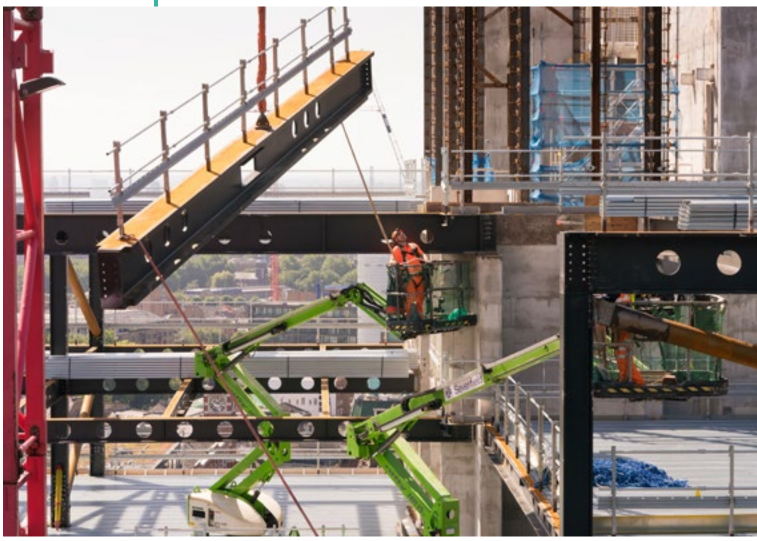

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One Braham is a commercial tower that offers 27,700m^2 of office space across 19 floors, includes two large open terraces on the 15th and 17th floors and an atrium that extends over parts of the 14th to 17th floors. The ground floor accommodates two retail spaces totaling 930m^2, a delivery area and a two-storey reception area that can be accessed from Braham Square to the north and Leman Street to the east. The basement is home to storage facilities, cycle stands, changing rooms, showers and lockers. The office building has received a BREEAM 'Excellent' rating and has been awarded a WiredScore Platinum rating for its digital infrastructure.

The façades to the office accommodation are fully glazed with vertical brise-soleil to the east, south and west façades. The ground floor is set back to form a colonnade modulating between the new park, the building entrance, and adjacent shops.

Once the basement structure to ground floor level and the concrete core were constructed, the preparation for the steel erection could begin. The steel frame begins at ground floor level and is based around a grid that has primary columns spaced at 9m centres with internal spans of up to 13.7m.

Keeping within a permitted height due to project restrictions, the design has used fabricated plate girders to support the metal deck flooring system. These girders have bespoke holes to allow all the services to be accommodated within their depth. This service integration and the use of shallow heavy plate girders allowed one extra floor to be incorporated into the planning envelope.

The client's request was to have an 'industrial feel' to the office, which meant a large amount of the completed steel frame has been left exposed. This required a great deal of care to be taken with the design and detailing of the steel connections.

The stability system of the building has been concentrated at the reinforced concrete core where shear walls provide the stability. This avoids the need for vertical diagonal bracing in the building, which minimises the impact of the frame on the remainder of the floorplate and facilitates the flexible design and open-plan nature of the building. The composite floors act as a diaphragm to transfer the horizontal loads to the reinforced concrete core.

The construction of the project was successfully completed safely and on schedule and benefitted from excellent collaboration between all project partners from an early stage.

Judges' comment

This City fringe office building is a fine example of the use of steelwork to meet the demanding commercial requirements of the client. By applying many intelligent devices, an additional floor was squeezed into the planning envelope. Fabricated plate girders, composite beams, higher grades of steel and pre-cambering resulted in a ruggedly practical finish.

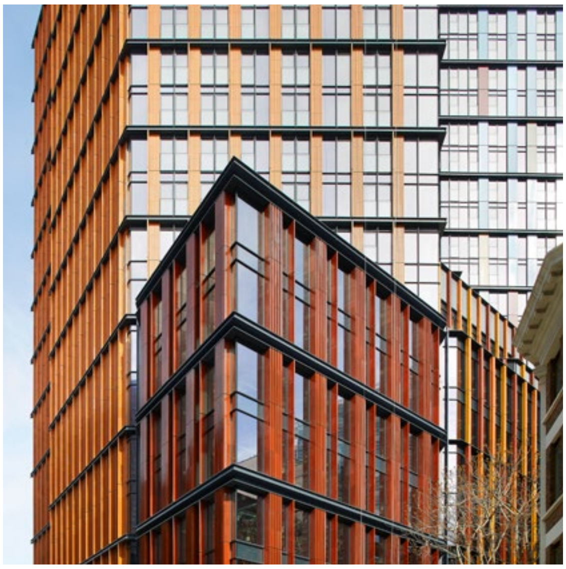
Commendation

Structural Steel Design Awards 2022

One Crown Place, London

PROJECT TEAM

Architect: **KPF**
Structural engineer: **AKT II**
Steelwork contractor: **Severfield**
Main contractor: **Mace**
Client: **AlloyMtd**



© Hufton and Crow

One Crown Place is a true 'city within a city block'. It is located at the boundary of the historic City of London, just within the London Borough of Hackney, and occupies almost all of an island site. The scheme principally introduces a new office block that's topped with two new residential towers, while variously refurbishing and repurposing the site's existing and historic buildings to deliver a diverse mixed-use development.

Positioning two residential towers directly on top of a mid-rise office podium requires a truly bespoke design solution to ensure that each of these two differentiated uses offers an optimum spatial and architectural functionality for its occupants. The six-storey office block is framed in steel up to the start of the upper residential volumes, which are then framed in reinforced concrete.

The change in structural material between the oblique and dense residential column grids above and the larger open-plan office grid below, with spans of up to 12 metres, was achieved using a compact transfer zone of 15 steel trusses.

They accommodate two inhabited floors within their depth – the lower floor provides high-end amenity spaces, while the upper floor is the first of the residential levels. Not only do they support the two residential towers above, but they also form part of the interior architecture. The trusses are up to 25m-long and are supported at each end on 600mm x 600mm double-webbed mega-columns, each of which is fabricated from four plates.

To facilitate construction, all the project's steelwork, including the trusses and mega-columns, had to be broken down into components weighing less than 9t, in order to stay within the lifting capability of the site's tower cranes. To reduce the required number of lifts, as well as the risk of additional bolting at height, the flange splice plates are profiled with rounded ends, and were partly bolted prior to transit. This allowed them to be simply 'swung' into place to form the spliced connection when the truss section was lifted into position half-way up the building. The web splice plates were then bolted on the remaining, alternate sides to complete the connection. Each of the trusses was trial assembled at the fabrication yard prior to delivery to site to ensure their construction would proceed smoothly.

Throughout the office floors, cellular beams span outwards from the centralised core to the perimeter, creating the column-free floorspace, while also accommodating the M&E services within their depth.

Judges' comment

Two 28 floor concrete-framed residential towers are, remarkably, supported on a steel-framed office block. A two-storey transfer structure of 15 steel trusses transfers the dense residential column loads over the largely column-free workspace floors below. This compact zone also imparts a bold theme to the interior architecture of amenity areas, and of the first of the residential levels.

Commendation

Structural Steel Design Awards 2022

Britannia Leisure Centre, Hackney

PROJECT TEAM

Architect: **Faulknerbrowns Architects**
Structural engineer: **Buro Happold**
Steelwork contractor: **Severfield**
Main contractor: **Morgan Sindall Construction**
Client: **Hackney Council**

Britannia Leisure Centre lies on the edge of Shoreditch Park, a popular public park in Hackney, London, and is part of a wider mixed-use masterplan to help regenerate the area.

The building is a large-scale community leisure centre, with extensive wet and dry facilities. The client's goal was to create a community hub that encourages more people to participate in sport and adopt a more active and healthier lifestyle. Despite the pandemic, the centre has been hugely successful, welcoming 400,000 visitors in its first six months of operation, a 161% increase from the unsustainable and outdated centre that it replaces, and has achieved a BREEAM 'Excellent' rating, a considerable achievement for a scheme of this nature.

Historically, large multi-sports centres adopt a 'groundscraper' design with all the large span spaces such as pool/sports halls and squash courts at ground floor level. The building footprint required for such a design would fill the site, leaving a narrow, pinched access to Shoreditch Park. Hence, a stacked solution was developed, with sports spaces on top of each other, allowing greater generosity to the public realm and more permeability around the centre to the park.

The reduced land take allowed a greater extent of biodiverse green space, including rain gardens and sustainable urban drainage systems. The massing had a positive impact on the masterplan, making the adjacent land plots more attractive for commercial development, a key part of the funding strategy for the centre.

Swimming pools are at ground level, with sports halls, fitness suits and dance studios above, all topped off with tennis and five-a-side courts on the roof. Flexible sports activity spaces must be column-free, necessitating long-span beams. Under rhythmic excitation, caused by the sports users, the structural design becomes driven by controlling the vibration response within acceptable limits. Lightweight steelwork framing, with its high stiffness, especially when designed compositely with the precast concrete floor was the only material that could meet the spatial requirements and limit the vibrations.

Britannia Leisure Centre provides an inviting social hub for the whole community. Steelwork designed to close deflection limits facilitates the high levels of glazing, creating a transparent environment that allows people within the building to look out across Shoreditch Park, while those passing by can see what is happening inside. This ensures the centre stands as a beacon of entertainment and relaxation for the whole community to enjoy – whether you are inside or out.

Judges' comment

A multitude of diverse and highly popular leisure spaces have been cleverly interlocked and stacked to reduce the building footprint. This has generated great civic presence and released land to help fund the development. The structural design has resolved the resulting technical challenges created by the solution.

Merit

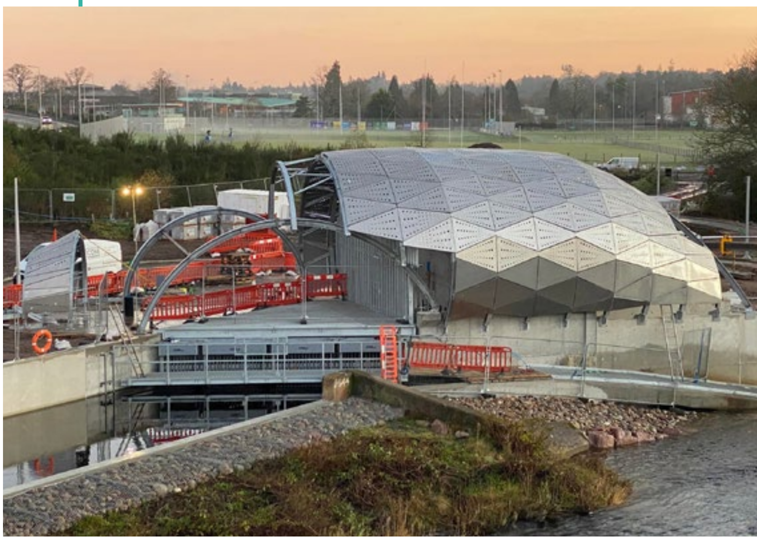
Structural Steel Design Awards 2022

Hydro Ness, Inverness

PROJECT TEAM

Architect: **Leslie Hutt Architect**
Structural engineer: **Hasson Engineering Solutions**
Steelwork contractor: **M.Hasson and Sons Ltd**
Main contractors: **Bradley and Company, Hydro NI**
Client: **Highland Council**

© Keith Hunter



The inspiration for this interestingly shaped structure is to be found in the motif of the salmon, making its way upstream along the beautiful River Ness. The idea was conceived by local artist, Claire Maclean, and further developed by Inverness architect, Les Hutt. The intention from the outset was that this structure would be aesthetically pleasing whilst also signposting the benefits of renewable energy sourced from a historically and ecologically important river.

End client, The Highland Council, had partnered with the Science Skills Academy (SSA) that delivers science, technology, engineering, and mathematics (STEM) activities to school pupils from across the Highlands of Scotland. The Hydro Ness scheme offers a unique and accessible opportunity for young people to visit and better understand key STEM skills and learning in practice.

The scheme is expected to generate approximately 550,000 kWh of renewable electricity annually and reduce carbon emissions by over 140 tonnes per annum.

The structure is highly visible from one of the main arterial routes into and out of Inverness City, and tremendous care was taken to deliver a finished structure worthy of such a prominent and beautiful location in the Capital of the Highlands.

The process of transforming the original vision into a structure suitable for fabrication and erection relied on extensive use of parametric modelling, finite element analysis and detailed BIM modelling. The doubly curved structure, which included blended circular and elliptical arcs, presented numerous challenges in terms of achieving a smooth and visually pleasing faceted surface whilst developing details that were practical to fabricate and erect.

The main frame comprises curved UC sections, all of which were curved to differing radii. The framing for the cladding panels is all made from SHS, welded into co-planar triangles. In total there are 384 cladding panels, with each of these being unique. All the conventional structural steelwork used throughout this project was galvanized to ensure longevity. The cladding panels which complete the canopy are all made from stainless steel with a swirl finish to enhance the architectural intention of 'looking like scales of a fish'.

The safe, accurate completion of Hydro Ness illustrates the quality, versatility, and efficiency of structural steel and is a tribute to the skill of the steelwork contractor, working closely with the architect, the engineer, and the main contractor to deliver what it is hoped will become an iconic and renowned symbol of Inverness, worthy of its stunning Highland setting.

Judges' comment

This unusual steel structure houses a small hydroelectric unit producing renewable energy and providing schoolchildren with a practical educational opportunity. Its eye-catching form is of a leaping salmon with stainless steel perforated panels representing fish scales on an arched skeleton. A small but significant project demonstrating the versatility of steel.

LCT 7074 Canopy, The D-Day Story, Portsmouth

PROJECT TEAM

Architect: **Pritchard Architecture**
Structural engineer: **Mann Williams**
Steelwork contractor: **Hillcrest Structural Ltd**
Main contractor: **Ascia Construction Ltd**
Clients: **The National Museum of the Royal Navy, Portsmouth City Council**

© Peter Langdown

This remarkable project showcases the conservation of the sole surviving Landing Craft Tank (LCT) from the D-Day landings on 6th June 1944. In her new home adjacent the D-Day Story Museum, the 59m-long and 10m-wide historical vessel, along with her protective sculptural cantilevered steel canopy, are now an integral part of the Southsea seafront and a new cultural landmark in Portsmouth.

The protective canopy structure shelters the vessel and its visitors from inclement weather, whilst providing clear access along the entire length of one side for LCT 7074 to be manoeuvred into her final resting place for the public to view. The aesthetics of the canopy required an elegance and simplicity that is empathetic to its sensitive surroundings, while still having a presence that physically relates to the robustness and mass of the ship itself.

A locally-listed historic wall to the rear of the canopy provides weathering protection to the lower part of the tapered steel columns and the hull of the LCT. The canopy has been designed to follow the longitudinal shape of the LCT, which results in each set of front and rear arms being set at varying levels and differing rotations to each other.

The canopy frame primary elements comprise a series of fabricated front and rear tapered cantilever arms. To the front and rear elevations, curved perimeter CHS members fit between the arms and a full roof bracing system provides stability to the frame.

The canopy is supported on one side by 12 bespoke tapered fabricated mast columns, each 12m-tall and weighing 7.5t, formed from 25mm-thick plates, which line through with the piers of the historic wall behind.

The tapered fabricated front rafter arms cantilever up to 13m with a robust preloaded bolted splice positioned 1.6m from the column face. These 300mm-wide plate girders are 1.0m-deep at the column face and taper down to 200mm-deep at the ends. To ensure there were no unsightly breaks in the perimeter edge CHS members where the rafter arms intersect, concealed bolted connections were adopted.

A high tensile fabric covering provided a low carbon option for the canopy and the underside of the primary roof steelwork was detailed with small, profiled angle cleats to support the fabric sail membrane.

The steelwork was fabricated in a quality-controlled workshop environment and the design team worked collaboratively throughout the project using 3D modelling software to coordinate the various architectural, structural and M&E aspects.

Judges' comment

A floating canopy supported by raking steel pylons reminiscent of beach defences of the past announces this new museum. The judges were impressed by the balance of the design which creates a positive sense of place for visitors and whose form is referential and empathetic with the unique landing craft it covers.

Merit

Houlton School, Rugby

PROJECT TEAM

Architect: **Van Heyningen and Haward Architects**
Structural engineer: **Price & Myers**
Steelwork contractor (New blocks):
Mifflin Construction Ltd
Main contractor: **Morgan Sindall Construction**
Client: **Urban&Civic plc**

© James Brittain

The desire to retain structure on a new project is satisfying for any designer. There are not only environmental benefits, but also the ability to retain memory within a community – to preserve identity for future generations. And so it was with Houlton School.

The project involved the refurbishment and alteration of the former Rugby Radio Station (C-Station), to be transformed into a large secondary and sixth form school. The Grade II listed building was built in 1926, hosted the first transatlantic telephone call to New York, transmitted telegraph messages to the Commonwealth, and communicated with nuclear submarines during the cold war.

The design of the new school involves the adaptation of the historically fascinating buildings into new school facilities including two new teaching blocks, a new sports hall, drained external sports pitches, car parking, access roads and sustainable drainage systems (SuDS).

Listed building consent was required to undertake careful investigations into the fabric and condition of the existing buildings. A new steelwork frame was threaded through the first floor of the existing Transmission Block to provide an additional four floors of accommodation, while leaving the existing first floor steel beams exposed and intact. The new steel frame sits on piled foundations, constructed so as not to undermine the existing foundations.

To improve circulation throughout the buildings, two steelwork scissor stairs have been constructed at each end of the Transmission Block, and ring beams added to restrain the existing walls around the new stair voids. Two further steel staircases are inserted into the Accommodation Block.

External openings have been adjusted in the Power Hall to suit its new use as a dining and main hall. New steel frames were inserted, on local spread foundations cut through the existing slab, to support a sixth form dining area over the new kitchen and control room space to serve the main hall.

The upgraded and repurposed historic buildings use significantly less energy than a standard refurbishment through careful insulation, high performance windows, ventilation including heat recovery, and painstaking design to upgrade airtightness.

The school opened in September 2021 and forms the heart of the surrounding Houlton development. The project successfully restores and repurposes the historic buildings as an integral part of a highly sustainable, purposeful and distinctive secondary school that is a key attraction for those considering living at Houlton. It could not have been achieved without the strength, versatility and beauty of structural steel.

Judges' comment

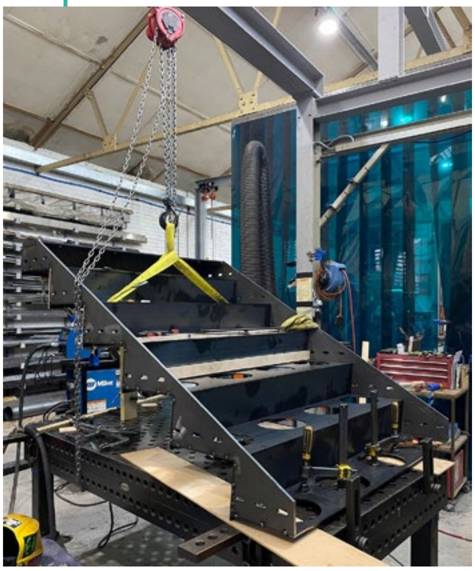
This project has transformed the former listed radio station, built in 1926, into a large secondary school. After cleaning and repainting, the original steelwork was fully expressed and new steelwork carefully integrated, creating an excellent internal environment. A very high-quality heritage project of which all users are justly proud.

Pace Gallery, Hanover Square, London

PROJECT TEAM

Architect: **Jamie Fobert Architects**
Structural engineer: **Price & Myers**
Main contractor: **QOB Interiors**
Client: **Pace Gallery**

© Matt Clayton



The project involved creating a new London home for Pace by reconfiguring an existing gallery space on Hanover Square. Whilst the existing infrastructure was retained, the internal volumes saw a complete transformation. Two elegant galleries were created on the first floor and the basement level was opened up to form an additional 100m^2 of public gallery.

A key feature of the brief was to create the impression of a fully integrated space, which was expertly achieved by the creation of a feature staircase. Exquisitely rendered in black steel, it not only connects the basement and entry level, but its form allows for sunlight to pour into the lower ground offices making them feel more open and connected to the main space. The stair is fabricated from waxed raw mild steel, showing the colours of all the heat marks and manufacturing processes that have gone into the material.

The stair is configured with three flights between two intermediate landings. The bottom landing is supported on the basement slab, whilst the middle landing is both hung from the ground floor and supported on a slender wall panel. Flights were designed as prefabricated treads, risers and stringers that could be assembled along with the balustrade panels on site.

The stair balustrade was designed as a sandwich with three layers of 6mm steel plate, with the middle panel offset to create a continuous rebate detail across the top of the panels. The balustrade panels were integral to stiffening the stair to mitigate vibration and conceal fixings between elements. Steel hollow sections were integrated into the shallow middle landing to resist the high torsional stresses generated at the intersection of the upper and lower flights.

The architectural intention was to express a perfect mill finish across the entire steel stair, presenting an unusual challenge from a fabrication perspective. This meant adapting and implementing new processes in the workshop and on site to ensure each panel could be handled and welded with the utmost care.

Once on site, non-marking plate clamps were used on an overhead gantry to lift each panel carefully into position for site welding. During installation, the stair remained largely covered due to potential damage on a busy site with numerous other trades. Just before the gallery opened the stair could be uncovered; it was then finally sealed and polished with a clear matte wax to enhance the colours and tones of the steel.

Judges' comment

The gallery's feature staircase connects the basement and entry level, blending seamlessly into and contributing to the gallery spaces. The attention to detail in both design and manufacture have resulted in an exemplary and beautiful structure which embraces the steel manufacturing process from rolling mill to final welding.

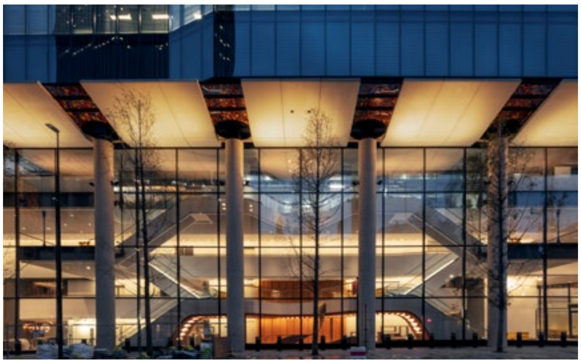
National Finalists

Structural Steel Design Awards 2022

22 Bishopsgate, London

PROJECT TEAM

Architect: **PLP Architecture**
Structural engineer: **WSP**
Steelwork contractor: **Severfield**
Main contractor: **Multiplex**
Client: **Lipton Rogers Developments**



Judges' comment

This skyline-busting office tower, the largest in the heart of the City of London's financial district, has a stepped twenty-three-sided facetted form that responds to the surrounding cityscape. The design made full re-use of existing foundations, necessitating several very substantial steel transfer girders and trusses, in some cases carrying all 62-storeys of load.

Abbey-Chesterton Bridge, Cambridge

PROJECT TEAM

Architect: **Knight Architects**
Structural engineer: **Milestone Infrastructure**
Steelwork contractor: **S H Structures Ltd**
Main contractor: **Tarmac**
Client: **Cambridgeshire County Council**

Judges' comment

This well considered, and carefully fabricated, bridge provides a link across the River Cam as part of a wider cycle/pedestrian network. The bridge's rhythm of diagonal structural members echoes those of an adjacent rail bridge. The shallow curve of the steel parapets, painted in 'Cambridge blue', enable the bridge to sit comfortably in its water meadow setting.

Bloom Clerkenwell, London

PROJECT TEAM

Architect: **John Robertson Architects Ltd**
Structural engineer: **Buro Happold**
Steelwork contractor: **Severfield**
Main contractor: **HB Reavis UK Ltd**
Client: **HB Reavis UK Ltd**

Judges' comment

The significant constraints and interface conditions imposed by the new Crossrail station beneath this commercial building have been overcome by tenacious engineering, much of which is visible from the spaces within. The floorplates achieved are surprisingly free of structure, light, open and interesting and fulfil the client's aspirations for the project.

National Finalists

Structural Steel Design Awards 2022

Joules Head Office, Market Harborough

PROJECT TEAM

Architect: **Edge**
Structural engineer: **Cundall**
Main contractor: **Bailey Construction Ltd**
Client: **Joules**

Judges' comment

This Headquarters for a high street 'lifestyle' retailer comprises a conglomeration of a number of pitched roof forms, invoking the appearance of a collection of rural barns. The complex composition, that includes the reworking of an existing 80's building, provides large free-flowing interior spaces that would be difficult to achieve other than with the extensive use of steel.

St James Quarter, Edinburgh

PROJECT TEAM

Architect: **BDP**
Structural engineer: **Arup**
Steelwork contractor: **BHC Ltd**
Main contractor: **Laing O'Rourke**
Client: **Nuveen**

Judges' comment

Steel is at the heart of this extensive mixed-use development in the centre of Edinburgh. Despite site constraints and the need to keep existing shops open, the speed of construction was impressive. Providing high-quality, modern facilities the development integrates very well into the surrounding streetscape. An excellent achievement.

The Glass Works, Barnsley

PROJECT TEAM

Architect: **IBI Group**
Structural engineer:
Adept Civil and Structural Consulting Engineers
Steelwork contractor: **Billington Structures Ltd**
Main contractor: **Henry Boot Construction Ltd**
Client: **Barnsley Metropolitan Borough Council**

Judges' comment

The Glass Works is a flagship development that has transformed Barnsley town centre with new retail, leisure, and public realm facilities. Construction was meticulously planned to minimise disruption for visitors to the existing town centre facilities. The construction team completed on time and on budget despite the pandemic.

2023 Entry Criteria

The Structural Steel Design Awards Scheme

The British Constructional Steelwork Association Ltd and Steel for Life have pleasure in inviting entries for the 2023 Structural Steel Design Awards Scheme.

The objective is to celebrate the excellence of the United Kingdom and the Republic of Ireland in the field of steel construction, particularly demonstrating its potential in terms of sustainability, cost-effectiveness, aesthetics and innovation.

1. **Operation of The Awards**
   The Awards are open to steel-based structures situated in the United Kingdom or overseas that have been built by UK or Irish steelwork contractors. They must have been completed and be ready for occupation or use during the calendar years 2021-2022; previous entries are not eligible.

2. **The Panel of Judges**
   A panel of independent judges who are leading representatives of Architecture, Structural Engineering and Civil Engineering assess the entries. The judging panel selects award winners after assessing all entries against the following key criteria:

   Planning and Architecture
   - Satisfaction of client's brief
   - Environmental impact
   - Carbon measurement and reduction
   - Cost-effectiveness
   - Architectural excellence
   - Durability and adaptability for changing requirements
   - Efficiency of the use and provision of services

   Structural Engineering
   - Benefits achieved by using steel construction
   - Efficiency of design, fabrication and erection
   - Use of digital technology
   - Skill and workmanship
   - Integration of structure and services
   - Efficiency and effectiveness of fire and corrosion protection
   - Innovation of design, build and manufacturing technique

3. **Submission of Entries**
   Entries, exhibiting a predominant use of steel and satisfying the conditions above, may be submitted by any member of the design team using the appropriate form. The declaration of compliance with the award requirements must be completed by the entrant. Entrants should ensure that all parties of the design team have been informed of the entry.

4. **General**
   The structures entered must be made available for inspection by the judges if they so request. All entrants will be bound by the decision of the judges, whose discretion to make or withhold any award or awards is absolute. No discussion or correspondence regarding their decision will be entered into by the judges or by the sponsors. The decision of the sponsors in all matters relating to the Scheme is final.

   A shortlist of projects will be announced and the project teams notified directly. The results of the Scheme will be announced in the autumn – no advance notification will be given to the project teams as to which structures will receive Awards.

5. **Awards**
   Each firm of architects and structural engineers responsible for the design receive an award as do the steelwork contractor (see note 7 below), main contractor and client.

6. **Publicity**
   The sponsors assume the right to publish the drawings, photographs, design information and descriptive matter submitted with the entry to publicise the award-winning structures in relation to the Structural Steel Design Awards Scheme.

   Any party involved in a project that is no longer in business for whatever reason will not receive any recognition in the Structural Steel Design Awards.

7. **Membership of BCSA Ltd**
   Where the steelwork contractor on any project entered into the Structural Steel Design Awards is a not a member of BCSA Ltd as at the closing date for entries, the steelwork contractor shall not receive any award or public recognition whether at the Awards event, in any promotional literature before the event nor in any booklet or other communication published after or in support of the Structural Steel Design Awards.

Closing date for entries - Friday 24th February 2023

Further Details
All correspondence regarding the submission of entries should be addressed to:
Chris Dolling, BCSA, Unit 4 Hayfield Business Park,
Field Lane, Auckley, Doncaster DN9 3FL
Tel: 020 7747 8133 Email: chris.dolling@steelconstruction.org

Sponsored by
The British Constructional Steelwork Association Ltd
and Steel for Life.

2023 Entry Form

Structural Steel Design Awards

Please complete all sections below in full (including email addresses)

Name of building/structure: ....

....

Location: ....

....

Programme of construction: ....

Completion date: ....

Total tonnage: ....

Approximate total cost (£): ....

Cost of steelwork (£): ....

Declaration of Eligibility

As the representative of the organisation entering this structure in the Structural Steel Design Awards 2023, I declare that this steel-based structure has been fabricated by a UK or Irish steelwork contractor. It was completed during the calendar years 2021-2022. It has not been previously entered for this Awards Scheme.

Signed: .... Date:.................

On behalf of:..

Person Submitting this Entry

Name: ....

Tel: ....

Email:..

Submission Material

The submission material should include:

- Completed entry form (PDF file)
- Description of the outstanding features of the structure (c 1,000 words), addressing the key criteria – see note 2 (MSWord file)
- Architectural site plan (PDF file)
- Six drawings (e.g. plans, sections, elevations, isometrics) illustrating the essential features of significance in relation to the use of steel (PDF files)
- Eight different high resolution colour photographs which should include both construction phase and finished images (JPEG files at 300dpi A5 size minimum)

Architect

Company Name: ....

Address: ....

....

Contact: .... Tel: ....

Email: ....

Structural Engineer responsible for design

Company Name: ....

Address: ....

....

Contact: .... Tel: ....

Email: ....

Steelwork Contractor (see note 7)

Company Name: ....

Address: ....

....

Contact: .... Tel: ....

Email: ....

Main Contractor

Company Name: ....

Address: ....

....

Contact: .... Tel: ....

Email: ....

Client

Company Name: ....

Address: ....

....

Contact: .... Tel: ....

Email: ....

Entry material should be sent via a file transfer service to chris.dolling@steelconstruction.org no later than 24th February 2023