Structural Steel Design Awards 2023

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INTRODUCTION

"Again, this year there was a wide variety of entries ranging from the largest prestige city office buildings to elegant footbridges and public sculptures. Following our established practice, we met to make a preliminary selection based on a 'desk-top' examination of the paper submissions to give us a shortlist of projects to be visited. These visits are a special feature of this Awards scheme, giving the judges a firsthand opportunity to understand and experience the selected projects, and to quiz the project teams about any specific points.

Once all visits had been completed the judging panel reassembled to compare notes and exchange views. It is not an easy task to compare such a diverse range of projects, but the judges bring all of their professional experience and expertise to bear and, after a detailed discussion, we were able to reach a consensus.

In conclusion I can say, on behalf of all the judges, that the awards, commendations, merits and national finalists recognised in the Structural Steel Design Awards this year reflect the impressive quality of the current steel construction industry, and everyone involved should be proud of what has been achieved."

Professor Roger Plank PhD BSc CEng FIStructE MICE – Chairman of the Judges Panel

THE JUDGES

Professor Roger Plank PhD BSc CEng FIStructE MICE - Chairman of the Panel
Representing the Institution of Structural Engineers

Richard Barrett MA (Cantab)
Representing the Steelwork Contracting industry

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

Emily McDonald MEng MA (Cantab) CEng MICE
Representing the Institution of Civil Engineers

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

Sarah Pellereau MEng CEng MIStructE
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."

Award

Battersea Power Station, London

PROJECT TEAM

Architect: **WilkinsonEyre**
Structural Engineer: **Buro Happold**
Principal Structural Steelwork Contractor: **William Hare**
Architectural Structural Steelwork Contractor: **CMF Ltd**
Main Contractor: **Mace**
Client: **Battersea Power Station Development Company**

© John Sturrock

The landmark, Grade II* listed Battersea Power Station has been sympathetically transformed from a much-loved industrial relic into a vibrant twenty-first century destination. The visionary redevelopment of the 231,800m² building was carried out alongside the Northern Line Extension, which opened in 2021, at the heart of a major 42-acre regeneration of this former brownfield site.

The Battersea Power Station itself constitutes phase two of this unique project, which has coherently revitalised this central London district. The brief included providing 252 apartments, restaurants, shops, cinemas, six floors of office space and an entertainment venue capable of holding 2,000 people.

The scale, listed status, multiple stakeholders and high-profile nature of the project presented a particularly complex challenge. Working closely with Battersea Power Station Development Company, Historic England and London Borough of Wandsworth, the project team devised several innovative design processes, engineering solutions, and planning & logistic strategies, to support the vision to maximise reuse of the building.

A 'box-in-box' approach was collectively developed to ensure the new framing made best use of the sheer volumes of space; carefully considered its interaction with the existing fabric; overcame the logistical constraints imposed by the existing; and ultimately aimed to express and complement the original fabric.

To bring light into the building, the new floors were set back from north and south elevations of the Boiler House, thereby creating tall atria and exposing the as-found condition of the walls. New support was provided through a bowstring truss and façade restraint beams. In the historic Turbine Halls, new structure was introduced behind the delicate heritage fabric, allowing features such as the new retail gallery decks to be introduced in a 'light touch' manner.

The Boiler House saw five different usages including car park, retail, public/event spaces, office and residential, stacked vertically on top of one another, all ideally needing different column grids. Through frame optimisation and organisation of spaces, these stacked usages were achieved with only two structurally super-efficient transfer levels, one of which doubles as a plantroom. Coordination of key plant equipment with key structural transfers was only possible through the use of steel. The early delivery of Level 05 steelwork was also an essential piece of the plan to facilitate parallel construction of the Boiler House space both above and below Level 05, enabling significant savings on construction programme.

Environmental impact was also a key consideration. The design of the steel beams, trusses and columns was highly optimised to minimise the embodied carbon, while accounting for fabrication and buildability. The reuse of the existing building's foundations, columns, beams and slabs, along with the refurbishment of the external elevations, have led to the reuse of over 40,000t of legacy carbon. This equates to approximately 20% of the total embodied carbon in the structure. Overall, the conservation philosophy follows a 'light touch' approach, with the inclusion of circular economy principles, whilst celebrating the heritage elements through innovative detailing.

The existing building is formed of a steel frame clad in brick. In addition to being sympathetic to the existing building, steel construction facilitated several innovative engineering solutions to benefit the scheme.

The 'light touch' approach within the Turbine Halls required pinpoint accuracy to introduce columns set 75mm away from existing to support new cantilevering Turbine Hall walkways and a new 13-storey building infill inside the Boiler House. To facilitate this proximity without compromising existing foundations, buried concrete-encased 24t steel beams cantilever over new piles to support the new columns.

For the Switch House West duplex apartments, a lean, efficient means to achieve an ambitious 11m 'A-frame' truss cantilever was developed, over the listed Control Room A, increasing the net lettable area of prime residential apartments by approximately 1,860m^2. This cantilever required a carefully considered construction sequence and pre-setting strategy to ensure all tolerances were met when the apartments were handed over.

© William Hare

© Buro Happold

Within the North Atrium, load transfers were achieved with a scheme that utilised a combination of transfer trusses, beams and 'tree' structures. This represented a significant portion of the over 25,000t of new steel infrastructure installed in the retrofitted building.

The 27m-long, 62t beam spanning across the atrium from Washtower to Washtower sat on an innovative steel saddle and rockerplate solution to ensure its high loads were delivered safely into the new core walls. It's installation as one single element was only possible through the use of one of the largest tower cranes in Europe.

The two vast tree-shaped steel structures in the boiler house each support 30m x 30m of office floorplate over eight storeys, while also serving as architectural focal points within the column-free atrium below.

Transforming Battersea Power Station was a complex project that assures a future for this magnificent building. The sheer scale and complexity of the project's aspirations have meant steel was the only viable choice for delivering this vision.

Judges' comment

The iconic Art Deco Battersea Power Station has been meticulously transformed into a contemporary mixed-use destination. The newly revealed steel structures reflect its industrial legacy, seamlessly integrating with the building's aesthetics. From robust steel tree columns supporting heavy loads to intricate tensile restraint frames and footbridges, every element exudes an elegant touch, showcasing a harmonious blend of design and functionality.

Award

Copr Bay Bridge, Swansea

PROJECT TEAM

Architect: **ACME**
Structural Engineer: **Ney & Partners**
Steelwork Contractor: **S H Structures Ltd**
Client: **City & County of Swansea**

© Hufton and Crow

Swansea is a coastal city in Wales with an illustrious industrial past, and a century as the world capital of copper production. The historic centre is only minutes from the glorious beaches of Swansea Bay, but the construction of vast docks in Victorian times, inner city main roads, industrial sheds, supermarkets and surface car park structures have contributed to a city centre that feels far removed from the sea.

To connect Swansea back to the beach, a new pedestrian and cycle bridge now spans across Oystermouth Road, seamlessly connecting the city centre with Copr Bay Phase One, which includes Swansea Arena and a coastal park, and the city's maritime quarter and seafront. The 49m-long single span bridge is an eye-catching structure that is 12m-wide × 7.5m-high that spans six lanes of traffic and provides a safe, continuous connection between the different parts of Copr Bay. Importantly, the bridge reconnects Swansea's city centre to its world-renowned coastline.

Copr Bay Phase One forms part of a wider £1Bn+ urban regeneration programme in the city. The £135M development has reactivated a previously underutilized plot of land by delivering a state-of-the-art, 3,500 capacity new arena, comprising a live performance area and conference centre, as well as new public realm including the city's first new coastal park since Victorian times, high-quality, new social housing and retail space for local businesses.

Copr Bay Bridge provides a new gateway for Swansea and is a celebration of the city's past, present and future. It was designed as an innovative stressed skin bridge, with an impossibly thin steel deck, made from a continuous 15mm-thick steel plate, held aloft by perforated arched steel plates. The iconic arch stabilises the super-slender bridge deck and creates a new urban space floating over the road.

The bridge structure offers a degree of protection from the elements. The steel has been rolled into a double curved surface and butt-welded into a single tube. Openings have been cut into the sides where the structural stresses were lower, offering glimpses across the road, the arena and the new coastal park and to allow the bridge to glow at night from within.

Steelwork was chosen primarily because of its structural properties and ability to span long distances. It provided flexibility to work with an interesting structural solution, which is essentially a deformed bow truss formed of plate steel, allowing the creation of the sculptural form, super thin bridge deck, and the opportunity to create a clear identity through the development of perforations in the truss walls and application of a gold paint finish.

Swansea-born artist Marc Rees designed the pattern on the bridge's sides featuring 2,756 laser-cut origami shapes. The perforations are abstracted and exploded silhouettes of swans, inspired by the emblematic Swansea bird. The bridge colour and lighting are designed to move in synchronization with the illuminating façade of the Arena, to create a Copr Bay district that pulsates with life at day and at night. In acknowledgment of Copr Bay's history as the centre of coal and copper production, the bridge has the colour of freshly smelted copper.

The 140t bridge was delivered to site in sections, consisting of four deck pieces, six roof sections and 11 side panels. The roof sections measured 10.5m × 4.1m × 600mm and the side panels were 2.8m × 6.9m × 15mm. The largest steel elements to be transported to site and also the heaviest, where the deck sections, measuring 24.5m × 6m × 2m and weighing 24.6t each.

As the deck is only 15mm-thick and needed to be split longitudinally for transportation, the open end was extremely lively, both when being transported and during lifting. The solution to this problem was to adopt a bespoke transport lifting beam that strengthened the deck and allowed a multiple eight-point pick-up procedure. Once on site, the bridge deck was assembled on temporary works positioned in an area adjacent to the bridge's final location. The curved plates, which form the sides, arch and roof were then welded into place, before the complete structure was given its final topcoat of gold paint.

The completed structure was then lifted onto Self-Propelled Modular Transporters (SPMTs) and manoeuvred onto its two concrete abutments during a Saturday night road closure. After the bridge structure was in its final position, the steel deck had an anti-slip resin and aggregate finish applied.

© Hufton and Crow

Oystermouth Road, one of the busiest vehicular routes in Wales, has separated Swansea city centre from Swansea Bay for half a century. Copr Bay Bridge provides a safe, enjoyable crossing and finally re-links the city centre with the beach. It creates a seamless link for both pedestrians and cyclists travelling from the city centre to the new Copr Bay district and waterfront, and provides Swansea citizens easier access to nature and new play space for all ages.

Judges' comment

The Copr Bay Bridge provides a dramatic new gateway to Swansea, with its striking form and colour acknowledging the Bay's history as a centre of coal and copper production. Of particular note are the innovative stressed skin design and the quality of the manufacturing which have resulted in an exemplary project.

One Centenary Way, Birmingham

PROJECT TEAM

Architect: **Glenn Howells Architects**
Structural Engineer: **Ramboll**
Steelwork Contractor: **BHC Ltd**
Main Contractor: **Sir Robert McAlpine Ltd**
Client: **MEPC**

© Greg Holmes

Spanning the A38 dual carriageway, the steel-framed, 13-storey, One Centenary Way is the first building to be constructed in phase two of Birmingham's £1.2Bn Paradise development.

Containing 6,286t of structural steelwork, the project is a stand-out commercial building featuring an exoskeleton on all four elevations. The expressed and exposed nature of the steel frame also extends to the interior of the building, where columns, beams and connections are also on display. Below ground level, the steelwork is no less impressive as just over 60% of the total footprint of the building is sat on top of a series of trusses that span the A38 dual carriageway tunnel, a key transport artery through the city. In addition, the site overlays a major services tunnel.

One Centenary Way is an important building for both the Paradise masterplan and Birmingham, not least for its green credentials, but it is the first commercial exoskeleton building in the region.

Approximately 1,950t of structural steelwork was used to fabricate the 12 storey-high trusses, which are up to 34.5m-long and weigh up 130t. Fabricated at BHC's Lanarkshire facility, the trusses were transported to site as complete sections, measuring up to 6.15m-wide. Once on site, a 1,200t-capacity mobile crane, one of the largest in the UK, erected each of the trusses.

Although the trusses were delivered and lifted into place as individual items, 10 of them are installed as pairs, tied together in-situ with cross members, as this configuration was better suited to transferring the loads from the building above to the foundations below. The exceptions are two single trusses at either end.

The trusses form part of the basement level and their top chords help form a platform to support the majority of the building's structural frame. One of the building's two basement levels is accommodated within the trusses' depth. This upper basement floor houses a well-equipped and accessible cycle hub for the whole estate. With up to 350 spaces, this is Birmingham's first city centre major cycle hub offering associated facilities including showers and locker rooms together with servicing and bike hire. The part of this floor level that is not within the trusses accommodates a retail basement area and vehicular ramps for the car parking that is also located in the basement.

The project's steel frame was fundamental to realising the development potential of the site and is architecturally celebrated in the form of Vierendeel exoskeleton frames, which provide lateral and vertical support to the building. Due to the tight site constraints, a typical load-bearing core with columns going into the ground to hold the building up and give it stability was not an option.

As well as the stability provided by the exoskeleton, there is also a centrally-positioned steel braced core that provides some stability. The exoskeleton on its own doesn't provide enough stiffness for the overall structure, so the two stability systems work in tandem. The project used a steel core instead of a concrete one, as the former offered a lighter solution. This was important, as the core had to be positioned on top of the trusses, so it could sit in a central position within the building and thereby satisfy the desired internal office layout.

The Vierendeel exoskeleton is formed with a series of vertical and horizontal steel sections forming 12m-wide rectangular boxes. The rectangles incorporate 3m-wide horizontal windows, encased within an exposed structural steel façade. The interior of the building offers large office floorplates, as well as retail space at ground floor level. The column grid is based around a 12m × 9m spacing, as this layout requires minimal internal columns, while also providing the desired modern open-plan office layout.

Cellular beams have been used throughout to accommodate the building services within their depth. They support metal decking, which along with a concrete topping forms a composite flooring solution for every level above the ground floor slab.

As well as retail, the ground floor also has a triple-height reception area with a floor-to-ceiling height exceeding 9.5m. To accommodate this much higher and impressive reception area, the first floor does not cover the entire building footprint. The upper floors have a standard 3.8m floor-to-ceiling height.

© Sir Robert McAlpine

© Sir Robert McAlpine

Another unique feature of the building is the lantern area that sits on top of One Centenary Way. The lantern is made up of 504 individual glass units with 576 reflective backing screens. The screens are controlled by a control panel that allows over one million colours to be chosen, meaning the building can play its part in supporting and highlighting key dates and causes.

One Centenary Way is a truly exemplary building that will become one of the city's major landmarks. There's nothing else quite like it in terms of design and it will not only mark out Paradise, but also this whole area of the city centre.

Judges' comment

This elegant, exposed steel structure springs off a system of trusses spanning a busy road tunnel. Despite depths of over 6m and the biggest weighing 130t, the trusses were transported to site and installed fully assembled. The result is a high-quality office building with excellent sustainability credentials which has helped transform this area into a pedestrian friendly campus.

Stockingfield Bridge, Glasgow

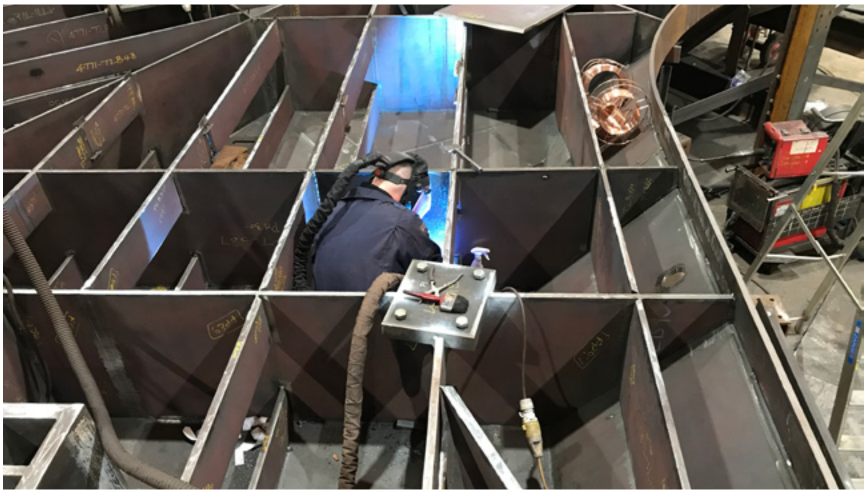
PROJECT TEAM

Structural Engineer: **Jacobs**
Steelwork Contractor: **S H Structures Ltd**
Main Contractor: **Balfour Beatty**
Client: **Scottish Canals**

The completion of Stockingfield Bridge reconnects the communities of Ruchill, Gilsochill and Maryhill in north Glasgow and completes the last link in the Forth and Clyde Canal towpath. Bringing significant improvements for active travel in the area, the new two-way spanning cable-stayed pedestrian and cycle bridge opens routes for leisure and to employment opportunities in the west end and city centre. Funded by the Scottish Government through Sustrans, and the Glasgow City Council's Vacant Derelict Land Fund, the £13.7M, 3.5m-wide bridge comprises two curved single span decks suspended on a network of cables connected to a single inclined pylon situated on the east bank of the canal.

The new crossing allows pedestrians and cyclists to cross the canal at towpath level rather than having to exit the towpath to use a potentially dangerous road tunnel, before rejoining the canal towpath again, which presented a daily health and safety hazard to all users.

The topography of the site was one of the many challenges faced by the project team. The significant difference in level from the top of the site to the towpath led to a cable-stayed design with a 35m-high pylon. At that height, the pylon was potentially unstable in high winds. To overcome this, the natural terrain was used to create a 5m-high platform at the base of the pylon, which was tied back into the hillside. This was developed to improve the overall aesthetics of the bridge, whilst providing the community with a viewing platform and, crucially, mitigating the structural effects of wind.



The client was very keen that community engagement played a vital part in the project's ultimate success. Residents and community groups were consulted from concept to completion, giving them a real sense of ownership. High on the residents' original wish list were attractive landscaping, a viewing point, and the inclusion of public art, all of which have been provided. In addition, to ensure that the space is safe for female users, the project team worked with a Glasgow violence against women and girl's charity, Wise Women. As part of this collaboration, local women visited the site and provided feedback on lighting, access, and layout.

The existing site included an area of wasteland. This has been landscaped with the introduction of trees, shrubs, and hedges, 65% of which are native species, which provides a safe, public space, where anyone can access the community observation platform to enjoy the canal and surrounding area.

Following the initial community engagement, 14 submissions were received for potential artwork to be included on the site with eight being selected. These include ceramic panels and paving stones based upon community-produced artworks.

The fabrication and assembly of the bridge and mast presented a number of challenges. Heavily plated structures, such as the bridge's curved, tapering, trapezoid-shaped twin decks, are prone to weld shrinkage and distortion during fabrication. The use of bespoke jigs, welding control and dimensional monitoring were all employed to eliminate the risks. The team also redesigned the internal stiffening configuration of the bridge decks to reduce the number of longitudinal stiffeners and transverse diaphragms, used to control plate buckling, by up to 50%. This reduced not only the steel weight, saving both cost and carbon, but also, crucially, the amount of welding required, which in turn reduced heat-induced distortion.

The construction team considered various options for the installation methodology. Taking into consideration time, cost, safety and environmental issues, the solution chosen required the temporary closure of the canal. The canal sides were protected with sheet piles and, using carefully selected fill material, temporary working platforms, or causeways, were created within the waterway to facilitate the bridge construction.

The complex nature of the project, combined with the restricted sloping site, demanded close collaboration between the various contractors to ensure the project was installed safely and efficiently.

The reduction of carbon within the construction played an important part in the design and the selection of materials. Various initiatives were introduced to reduce the carbon footprint of the project, through design. As well as the redesign of the bridge decks' internal stiffening, these included the reuse of the temporary causeway material as part of the site's landscaping, the use of recycled materials in the asphalt and the use of more sustainable cement replacements in the concrete mixes. The project also recycled 3.75t of plastic waste.

Officially opened on 3rd December 2022, the project has been overwhelmingly welcomed by the community it serves, who demonstrated their fantastic support for the project by turning out in their hundreds to witness the opening ceremony. Bridges should do more than just get users from A to B, and the community adoption of the scheme demonstrates how this bridge has clearly brought a vital piece of urban infrastructure to the City of Glasgow.

Judges' comment

A well-conceived, finely executed project providing significant practical and social value with new links between disconnected communities and much needed pedestrian and cycle routes across a canal and adjacent road. The project benefited from close collaborative teamwork and the vision of an excellent, motivated client, and has been visibly embraced by the surrounding community with ongoing art projects.

Award

HYLO, London

PROJECT TEAM

Architect: **HCL Architects**
Structural Engineer: **AKT II**
Steelwork Contractor: **Bourne Group Ltd**
Main Contractor: **Mace**
Client: **CIT Group**

Located a short distance from Old Street underground station, just north of the City, HYLO is one of the most pioneering tall-building retrofit projects in London. A 16-storey office block, built in the 1960s, has been reinvented by stripping back the original concrete frame and adding 13 new steel-framed floors to enlarge the structure into a 29-storey tower. The works also included enlarging two podiums that sat adjacent to the building, removing and replacing two existing cores, and substantial strengthening works to the existing columns to allow them to support extra loadings. The scheme delivers modern, flexible workspace together with 25 units of affordable housing, and introduces a new public arcade, with shops, cafés and restaurants that will now transform the locale.

The original reinforced concrete building had become outdated and vacated but, with a primary focus on minimising embodied carbon, it was more sustainable to refurbish and enhance the existing building as opposed to undertaking a large-scale demolition programme, which the local authority and the client were keen to avoid, and a complete new build. This refurbishment and extension solution for the site has doubled the leasable area, from 12,000m^2 to 25,800m^2, while saving 35% of the 'up front' embodied carbon in comparison with an equivalent new construction.

Information on the existing building was compiled from a series of engineering record drawings, and a fundamental redesign of the existing building followed an exercise which back-analysed the structure, verifying initial assumptions. This investigation and analysis showed that the original building had residual capacity within the floor slabs, which were believed to have been designed to accommodate printing works on some floors, and also the large diameter under-ream piles, which meant that large portions of the existing building, basement and foundations could be retained and reused.

However, the tower's two existing cores were demolished, as they were too small for the needs of the enlarged building, and replaced with a new core configuration that facilitated a more efficient floorplate, whilst also providing stability for the 13-storey vertical extension. Interestingly, the areas beneath the new cores were some of the few parts of the scheme that did require the installation of new piled foundations.

© Grant Smith

© Michael Cockerham

The choice of structural steelwork for the new upper floors was made due to the material's lightweight attributes, which minimised the additional loading, and speed of construction. No other framing solution would have allowed the existing foundations to be reused, while achieving the desired spans and floor zones in the extension floors.

Throughout the structure, the concrete columns were strengthened with concrete jackets, installed on every floor. The only exception were some areas where the internal architectural vision required a slimmer solution and, in these places, steel strengthening collars were used.

From level 16, new steel columns were installed on top of the existing concrete members. However, the existing grid pattern is based around a column spacing of 6.1m × 7.6m. This was deemed to be restrictive for the new floorplates and so some column positions have been omitted, with the upper floors having just one row of internal columns and spans of up to 12m.

All of the steelwork is standard S355 grade, and the beams are all custom-made plate girders, with depths ranging from 525mm to 665mm. Modular pieces for the perimeter, weighing up to 7t, were also introduced to reduce the number of crane lifts. The floorplates are generally repetitive up to level 25, but level 26 has a step-back creating a terrace.

Considerable planning was required to devise a construction programme that allowed the works to be continuous. To achieve this, the floorplate was split into three main areas and the steelwork was built three floors at a time. Primary activities involved welding fittings to cast-in plates in the core walls for beam connections, steelwork erection, metal decking installation and on-site painting.

With the steel frame starting at Level 16, dealing with high winds during construction, while maintaining the programme and the tight erection tolerances, was challenging. In addition, the site was a confined high-rise plot, so there was limited storage space, and the steel was generally erected directly from the delivery trailer by tower crane in conjunction with MEWPs (Mobile Elevating Work Platforms).

HYLO is a design-led work and lifestyle office development. As the line between corporate and creative becomes more integrated, HYLO delivers a workplace solution that offers flexible spaces that embrace collaboration and connectivity at the same time. The tenants enjoy the latest building amenities and specification with unparalleled views across London, while the landscaped roof terraces, breakout spaces and dining areas create a relaxed environment away from traditional desks. There are generous locker and shower facilities, as well as cycle storage for over 400 bikes, and an expansive ground floor reception incorporating a modern lounge and café makes HYLO a social hot spot all day.

Judges' comment

This exemplary transformation of an obsolete sixties concrete 'monolith' was made viable only by the ambition of the client, the skill of the team and the use of structural steel. Unrecognisable today and 13 floors taller, this now elegant and permeable building creates high-quality spaces both internally and externally in the surrounding neighbourhood.

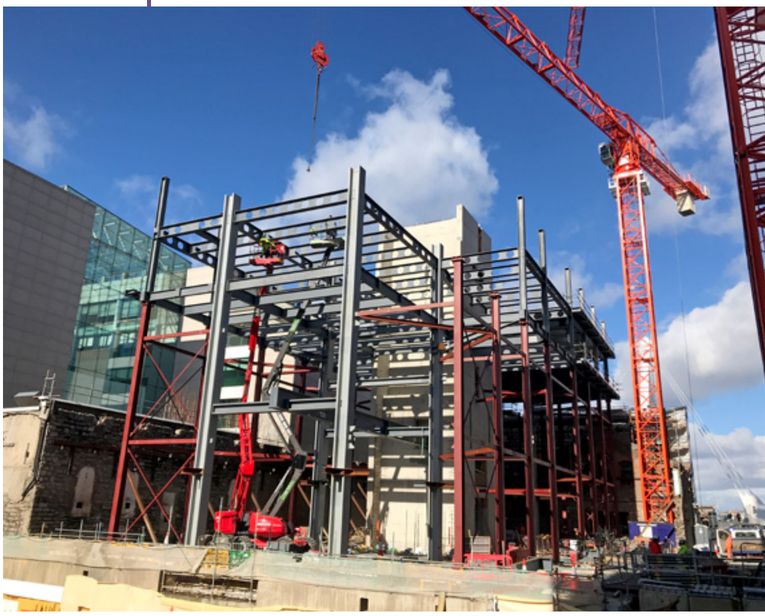
Commendation

Structural Steel Design Awards 2023

Tropical Fruit Warehouse, Dublin

PROJECT TEAM

Architect: **Henry J Lyons**
Structural Engineer: **Torque Consulting Engineers**
Steelwork Contractor: **Steel & Roofing Systems**
Main Contractor: **P.J. Hegarty & Sons**
Client: **IPUT Real Estate**



© Enda Cavanagh

Located in Dublin's South Docklands and overlooking the River Liffey, Tropical Fruit Warehouse comprises two distinct office blocks (Block 1 and Block 2), which are interconnected with a two-storey glazed link bridge at third and fourth floor levels. There is also a single storey glazed atrium connecting the buildings at ground floor level. Block 1 is a five-storey office block over a two-storey basement. Block 2 is a two-storey office block constructed at third and fourth floor levels, over the footprint of an existing two-storey protected structure warehouse.

A structural steel solution was chosen for the superstructure frame for Block 1 as it facilitated the long spans and shallow depths required to meet the client's brief and keep within planning constraints for building height. The floor solution comprised a series of parallel 'Westok' cellular steel beams supporting a composite slab. Structural stability to Block 1 is provided by two concrete cores. Cast-in plates were fabricated and cast into the cores to facilitate connections between the steel floor beams and concrete cores.

The architectural concept of the two-storey Block 2 office structure is that of a 'floating' glass box above the existing two-storey warehouse, with minimal structural support. A total of six fabricated plate girder columns and one central concrete core provide structural support to Block 2, which measures approximately 19.5m x 40m in plan. The longest cantilevers to the structure are on the north-east and south-east corners of the building and measure 10.35m on the diagonal. These were achieved by using a series of triangular-shaped steel trusses at roof level and at underside of third floor level concurrently. These trusses span from the central core across two fabricated plate girder columns and extend out to the slab edge, where they connect via steel perimeter columns. In this way the entire structure acts as one unit over its full height.

Because the entire structure to Block 2 is suspended above the roof of the warehouse, 18 no. 305UC temporary steel columns were erected around the perimeter at structural node points, to support the primary steel structure during construction. These 13m-high temporary columns were braced laterally, and the head plates were designed to accommodate a hydraulic ram in a central void that could be expanded to allow the release of two outer steel chocks, and then deactivated to allow the completed suspended steel structure with metal decking to become self-supporting.

Judges' comment

A hugely imaginative scheme which revitalises a protected warehouse building. A substantial new five-storey office block at the back, and a two-storey office structure which appears to float above the heritage building. The scheme successfully creates a prestigious and substantial office on the River Liffey waterfront, whilst still preserving the original warehouse.

Commendation

Structural Steel Design Awards 2023

Ed Sheeran Mathematics Tour

PROJECT TEAM

Architects: **Mark Cunniffe Ltd and WonderWorks**
Structural Engineer: **Cundall**
Steelwork Contractor: **Stage One Creative Services Ltd**
Main Contractor: **Stage One Creative Services Ltd**
Client: **1325 Productions**

© Cundall

The Ed Sheeran Mathematics tour is the first known tour to use a temporary demountable self-supporting cable structure. As such, this structure had to be able to be easily transported, unloaded and erected in just 3 days within different stadia in the UK and around the world.

The touring structure consists of six 30m-tall steel truss masts, positioned around the central stage, supporting a 60m-span cable net constructed of 22mm diameter galvanized steel spiral strand cable. This, in turn, is used to suspend the central 21m-diameter, 45t circular transparent LED screen over the stage, as well as 10t of audio systems. Additional audio systems and double-sided LED screens shaped like plectrums, both weighing 22t, are suspended from the top of each mast.

All the production items are suspended from the top of the steel truss mast or the central cable net, which supports them via pure tension. The central cable net is horizontally restrained by the back-stay cables, which also act in tension and are anchored to the base frame, where ballast is provided to prevent any uplift. The masts restrain the central cable net vertically and, acting in compression, provide a way to transfer the gravity loads to the ground. The mast supporting steel base frames are designed to safely spread the loads on the field of play and transfer the horizontal base reactions to the field cover in friction, effectively closing the 'circle' of the load path.

The tension forces in the back-stay cables and the radial cables connected to the top of the masts are constantly recorded using load-monitoring pins. All the values are accessible in real time from control boxes located at the base of the masts, or on a cloud platform, for comparison against those predicted in the 3D finite element analysis.

The entire structure was trial erected and load tested one month prior to the start of the tour. This provided an opportunity to hone the erection process down to 15 hours for 180t of steelwork, and to check that the structural behaviour was as expected.

Two sets of steelwork were designed, detailed and fabricated in six months, comprising 360t of steelwork in total. After one season of touring, comprising 52 gigs and 11 builds of each system, remedial inspection revealed no structural issues and only minor cosmetic repairs were required. The systems are currently in their second season of touring the world.

Judges' comment

This is a very good example of how structural steelwork can provide a temporary demountable structure. By adopting techniques typically used in other areas of construction, the team has developed an easily deployable structure capable of accommodating the variable constraints of multiple locations.

Commendation

Structural Steel Design Awards 2023

The Outernet, London

PROJECT TEAM

Architect: **Orms**
Structural Engineer: **Engenuiti**
Steelwork Contractor: **Severfield**
Main Contractor: **Skanska UK**
Client: **Consolidated Developments Ltd**

© Andrew Parish

The Outernet development provides circa 23,230m^2 of space, across four buildings and a combined basement, for music, arts, leisure, retail, and hospitality industries, in the heart of London's historic nightlife quarter. Whilst the development consists of four separate new buildings (A, B, C and D) and a large basement, the neighbourhood is centred on a 2000-capacity performance space - HERE at Outernet and The Urban Gallery.

The Urban Gallery is a four-storey immersive column-free space that forms part of Building A, a seven-storey steel-framed structure that also contains hotel, office and restaurant spaces. Effectively the face of the project, The Urban Gallery is a flexible, interactive events space that contains one of the world's largest LED screen installations. A series of sliding doors allow it to be open to the general public at ground level or closed for private events, while three-storey-high sliding and pivoting louvres situated above the doors allow the gallery to essentially be a covered outdoor area.

One of the biggest challenges involved the position of an escalator shaft for Tottenham Court Road underground station, as one of Building A's columns in the northwest corner sits directly above this shaft. Foundations were out of the question and consequently this column is hung from cantilevering steelwork. The subterranean parts of the scheme dictated the construction programme and methodology. To construct the scheme efficiently and within the timescale a top-down method was adopted, whereby the basement was dug-out while the steel frames for Buildings A and B were simultaneously erected above.

The basement is where the steel-framed 'box-in-box' HERE at Outernet can be found. This 18m x 30m column-free, three-storey-high entertainment space is acoustically isolated from the Crossrail and Northern line tunnels that sit below and adjacent to the basement. Building the 'box-in-box' frame within the already complete basement structure provided several construction challenges, as the steelwork for the auditorium had to be lifted into the basement through a small opening in the ground floor slab.

Building B is a five-storey steel-framed mixed-use building that houses retail, office, entertainment and restaurant areas. The project's two remaining structures, C and D, are smaller concrete-framed buildings, both featuring steel-framed top floor plant decks.

A unique, mixed-use destination that fuses events, hospitality, information, retail, workplace and leisure, The Outernet is a dynamic and engaging collection of spaces that are fully integrated with the cultural and physical heritage of the local area.

Judges' comment

The complex Outernet project for music, arts, retail, and hospitality, at the heart of London's nightlife district, cleverly integrates a spectacular immersive digital Urban Gallery above a large performance space built between two underground rail lines, and a grassroots music venue within the sensitively preserved, renowned Denmark Street or 'Tin Pan Alley' heritage neighbourhood.

Commendation

Structural Steel Design Awards 2023

Clery's Quarter, Dublin

PROJECT TEAM

Architect: **Henry J Lyons**
Structural Engineer: **Waterman Moylan**
Steelwork Contractor: **Kiernan Structural Steel Ltd**
Main Contractor: **Glenbrier Construction**
Client: **Oakmount**

Constructed in 1922, the Clery's Building is a protected structure in the Neo-Classical style that has a particular architectural, historical, and social significance and was one of the first dedicated department stores. The reinforced concrete frame comprises columns on a 6.5m x 6.5m grid and beams encased in a protected coffered plaster ceiling. The significant O'Connell Street Portland stone façade comprises a floating colonnade, with stone columns stretching across first and second-floor levels, supporting stone cornices and stone cladding elements to the fourth floor. The original 1922 building was subject to significant alterations in both 1940 and 1978.

The architectural intent of the new scheme sought the repair, restoration and vertical extension of the original Clery's Building and the redevelopment of the overall site into a high-quality, mixed-use precinct of architectural excellence. The scheme included the removal of the 1940 and 1978 alterations to bring the protected structure back to its original 1922 architectural expression and the removal of the limited level 03 and 04 behind the existing stone façade. The building has subsequently been vertically extended with new levels 03, 04, & 05, and a glass cylinder atrium, lift cores, and a bespoke curved roof structure have been added. Overall, the floor area has increased from 10,000m^2 to 16,500m^2.

As the existing structure could not support the vertical extension, the new frame had to be threaded through the existing structure and supported on new micropile foundations. The new perimeter columns could only be positioned behind the existing columns to maintain the façade and minimise their impact on the existing floorplates.

The new levels 03, 04, & 05 were constructed using long-span cellular beams from the new columns adjacent to the perimeter façade to the internal core areas. The use of cellular beams facilitated service integration to maximise the beam depth, whilst minimising the floor zone. The curved bespoke roof structure was also constructed using cellular beams supported on the perimeter columns and internal core elements.

One of the fundamental design drivers for the project was to retain and reuse as much of the existing building as possible. Vertical extension of the building, with limited strategic demolition, offered a significant opportunity to create new useable floor space and contribute towards the circular economy through reduced material consumption and waste generation. Overall, there was a significant reduction in embodied carbon for the project as a whole, versus a scheme involving demolition and reconstruction.

Judges' comment

This landmark building in the centre of Dublin was constructed in 1922. The architectural intent sought to repair and renew the original building, adding a sympathetic vertical extension, turning the former department store into high-quality mixed-use accommodation. A highly complex project involving strengthening of the existing concrete structure and adding three levels of steel framing above.

Commendation

Structural Steel Design Awards 2023

SAS13 Bridge Replacement, Birmingham

PROJECT TEAM

Structural Engineer: **Tony Gee & Partners LLP**
Steelwork Contractor: **Severfield**
Main Contractor: **Skanska UK**
Client: **Network Rail**

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Situated near Birmingham City Centre on the Stechford to Aston (SAS) rail line, the SAS13 bridge is a single-span weathering steel Warren truss structure spanning 92m, making it the longest railway bridge in the midlands. The bridge paves the way for the HS2 line approach into Birmingham City Centre and the planned HS2 Midlands Maintenance Depot.

The new bridge replaced eight spans of an 1890s nine-span viaduct, which consisted of eight masonry spans with a single steel span over the Birmingham to Derby lines. In May 2022, the main contractor demolished the old railway viaduct during a blockade.

Building and installing the new bridge involved precision planning, engineering, and the use of some heavy-duty equipment. A key constraint to the project was to minimise disruption to the operational railways. With two railway lines to contend with, alongside an overhead line equipment (OLE) system, which also feeds the West Coast Mainline (WCML), this proved to be a great challenge.

The whole scheme was designed to make the structure buildable within a short rail blockade, with limited time available to install the bridge. This led to the decision to build offline and use Self-Propelled Modular Transporters (SPMTs) to lift and transport the bridge into its final position.

The replacement bridge comprises 1,095t of weathering steel and 26,715 bolts, which themselves weigh a further 25t. Weathering steel was chosen to minimise future maintenance requirements, as access to such rail over rail structures is difficult, and chimes with the overall aim to minimise disruption to the operational railways.

Once the steel bridge structure was assembled offline, it was jacked up to a height of 5m from a build height of 1.5m. The fibre-reinforced concrete deck slab, upstands and walkways were then cast, comprising 3,601m^3 of concrete, which added a further 1,600t to the overall weight of the bridge. Upon completion of the deck construction, 18 SPMTs were used to lift and transport the bridge into its final position. The entire installation period took just under three hours to complete.

On 23rd May 2022, the first train passed over the new £85M structure, reopening the important SAS rail freight route and marking a huge milestone to ready the existing railway for HS2. Close collaboration within the project team, and with the local community, from design to engineering and ultimately installation, was key to delivering this complex project successfully, on time, and safely.

Judges' comment

Spanning 92m over a busy rail line this Warren truss bridge replaces eight masonry arches with a single span. With careful planning, taking full advantage of lessons learned on earlier projects, the bridge was installed fully assembled with minimal line closures. Constructed in weathering steel it provides a handsome addition to the local environment.

Commendation

Structural Steel Design Awards 2023

Montacute Yards, London

PROJECT TEAM

Architect: **Allford Hall Monaghan Morris**
Structural Engineer: **Heyne Tillett Steel**
Main Contractor: **ISG Limited**
Client: **Brockton Everlast**

© Timothy Soar

© Heyne Tillett Steel

Located in central London, Montacute Yards celebrates the industrial heritage of the area through the creation of a new type of warehouse. Conceived around generous volumes and a legibility of making – from its steel exoskeleton to the finishes within – the project creates two new flexible office and retail buildings with a glazed connection. The refurbishment of a Grade II listed Georgian townhouse and a new two-storey warehouse, complete the development.

The scheme transforms the tight, brownfield site integrating the buildings into the wider public realm, with an external courtyard linking Shoreditch High Street and Anning Street and creating a new landscaped market area beneath the viaduct.

The desire to expose the structure was at the heart of the architect's design for the development, which has been articulated through the external and internal exposure of the steel frame. A steel-framed solution was chosen as it allowed the industrial architectural vision to be achieved whilst using a cost-effective, fast and relatively lightweight form of construction that suited the heavily constrained site with limited loading space.

The integration of the structure and services to meet architectural requirements was coordinated through the BIM process, which was also used to carry out clash detection and conduct virtual walk rounds throughout the design phase. This continued into fabrication, when the steelwork supply chain developed their own models using this to check for any discrepancies and inspect the connections. At the point of completion, the combined model was handed over to the client and forms part of the as-built model hosted on digital platform Twin View.

The external steelwork introduces complications with thermal expansion and contraction with changing weather. Rather than resisting such movements by designing the primary structural members for the residual internal stresses that develop, the solution on Montacute Yards was to introduce movement joints into the external steel frame to allow the expansion and contraction to occur. The result is an external steel frame with members sized appropriately for their function, and a structure which can adapt to changes in external temperature.

The office floors are designed for a higher imposed load than required by standard BCO (British Council for Offices) guidelines. This has a marginal effect on the steel sizes, but provides flexibility for the future, allowing the building to be re-purposed for other uses. This, coupled with the efficient use of the space and maximised massing on the irregular site, should maximise the longevity of the building.

Judges' comment

An ingenious backyard development on a severely constrained unpromising site which draws upon the industrial heritage of the area. The legibility of structure leaves one in no doubt that this is a steel building. Together, base building and fit out combine seamlessly to create a well-considered, flexible and attractive project.

Shipbuilders of Port Glasgow

PROJECT TEAM

Sculptor: **John McKenna Sculptor Ltd**
Structural Engineer: **Narro**
Main Contractor: **John McKenna Sculptor Ltd**
Client: **Inverclyde Council**

The project was procured via a design competition in 2013 for Inverclyde Council. The aim was to produce a work of public art that would pay tribute to the strong shipbuilding heritage in Port Glasgow and the workers who contributed to it, while also serving as a modern-day tourist attraction bringing people to Port Glasgow and Inverclyde. The winning design, selected through a public vote, comprises a pair of 10m-high stainless steel men in active positions about to strike downwards with their hammers, with ship hull segments around them. The completed 14t sculpture is in Coronation Park, Port Glasgow.

Initially, a scaled down version of the proposed sculpture was made in clay, which was 3D scanned and transferred into to CAD software. This was used to establish a best fit 'stick form' primary skeleton for one of the figures, from which a 3D structural analysis model was developed to design the structural elements. The primary skeleton comprises a series of circular hollow sections (CHS), with flanged bolted connections. Welded to this are the square hollow sections (SHS) and steel rod secondary elements that act as outriggers to reach the SHS tertiary outer sub-frame that is located just under the 0.9mm to 1.2mm stainless steel faceted surface 'skin'.

Flexibility in the exact positions of the secondary frame and tertiary outer sub-frame was desirable, so exact positions could be finalised based on ease of access and buildability issues during the fabrication. As a result, the secondary and tertiary elements in the overall figure were not modelled, and instead the design was based on spacing rules that could be followed during fabrication to ensure there was sufficient structural capacity in the completed frame.

The design was completed in late 2014, after which fabrication could commence. Initially, human-sized (approximately 2m-high) scaled down accurate steel models were made, which was invaluable for identifying any buildability issues that might be encountered prior to fabricating the full-scale 10m-high figures.

Although the first figure took a long time to complete, the result was spectacular. A trial erection of the first figure was carried out in 2018, to ensure the segments successfully fitted together. Piled foundations were installed in October 2021, the sculpture segments were transported to the site in February 2022 and erected the following month using mobile cranes and MEWPs (Mobile Elevating Work Platforms).

The completed sculpture is a spectacular addition to Port Glasgow and a wonderful tribute to the shipbuilding industry.

Judges' comment

An impressive and well executed piece of public art, which has been many years in realisation since the initial competition win. The sculpture is formed from numerous small folded/shaped stainless steel 'tiles' fixed back to a steel tube subframe, shaped to create the large forms of two shipbuilders. The finished forms have been very carefully considered and are well crafted.

Merit

Structural Steel Design Awards 2023

New Riverside Stand at Fulham FC

PROJECT TEAM

Architect: **Populous**
Structural Engineer: **WSP**
Steelwork Contractor: **Severfield**
Client: **Fulham FC**

© Dave Shopland/Shutterstock

Fulham are a football club with a rich history and strong sense of community - they have played at their riverside ground, Craven Cottage, since 1896. These two characteristics informed the client's brief to create a 21st century facility for fans that would operate 365 days a year and serve the club into the future. The Thames Riverwalk was to be opened up and this was to be done within a very constrained footprint, whilst the club remained playing at their home throughout.

The architecture of the new Riverside Stand seeks to distance itself from the traditional structurally driven approach normally found in football stand design. The structure of the roof is hidden within a clad soffit, affording the opportunity to place plant withing the roof structural depth and freeing up usable floor space in the building below.

The design of the new Riverside Stand has been influenced by the architecture of boathouses that are a feature of this section of the river, and the steel frame has been celebrated throughout with the exposed Riverwalk columns and balcony visible along the full length.

The Riverside Stand itself also has no direct road access. The river therefore represented the projects' biggest opportunity and risk for the construction. A significant portion of the steel frame, all precast concrete elements and a large quantity of the cladding was transported by the river, reducing congestion and the impact of road traffic on the neighbourhood.

Steel roof trusses spanning 35m were assembled together in pairs at Tilbury docks and fitted with roof finishes to both surfaces as well as MEP (mechanical, electrical and plumbing). This offsite construction was then lifted onto barges, sailed up the river, before being craned into position. This pre-assembly significantly reduced work at height.

The steel frame solution allowed the incorporation of some key features to improve space planning and maximise the useable floorplate. Three transfer trusses, up to 22m-long, were included to provide column-free spaces. Vertical Vierendeel trusses provide the support to the cantilever roof to minimise impact on the use of the floorplate. Adaptability was proven during the design development phases as different uses, such as apartments, spa and hotel, have all been introduced to the design.

Close collaboration within the project team and the attention to detail of the exposed steel elements were key to delivering this innovative, iconic stadium building, worthy of the location and befitting of this historic sports ground.

Judges' comment

Most notably the sizeable Fulham Riverside Stand was constructed without interrupting football operations. Prefabricated and partially assembled on Tilbury docks, the substantial components were then transported along the Thames to site for installation. This innovative approach ensured seamless progress and minimised disruptions, showcasing exemplary planning and execution.

Merit

Structural Steel Design Awards 2023

Cody Dock Bridge, London

PROJECT TEAM

Architect: **Thomas Randall-Page**
Structural Engineer: **Price & Myers**
Main Contractor: **Gasworks Dock Partnership**
Client: **Gasworks Dock Partnership**

© Jim Stephenson

© Guy Archard

Cody Dock, near the mouth of the River Lea, is being brought back into use following years of dereliction. This new steel bridge spans over the dock mouth, allowing the passage of vessels into the dock by rolling along a track such that the deck turns upside down. The bridge is carefully counterweighted so that the centre of gravity is level, allowing the 13t bridge to roll using only a hand cranked winch. Despite the simplicity of this movement, the design process and fabrication revealed complex and unique engineering challenges.

The footbridge is a simply supported structure with a monocoque steel deck spanning 7m and tapering in depth from 400mm to 550mm at midspan. Two 5.5m rounded square portals at each end allow it to roll along undulating concrete abutments which are cast into the existing masonry walls. The upper section of each portal is counterweighted such that the centre of gravity is raised to the midpoint of the frame. The path geometry ensures this point remains horizontal when in motion so that the bridge weight is never lifted vertically.

Like its Victorian forbears, the bridge design is tied to its functionality and the environment in which it sits. Most of the structure is weathering steel, which has the desired strength, durability, and fabrication accuracy balanced with minimal maintenance requirements. Oak bearing strips fixed to the hoops roll on the undulating steel track, whilst precision cut weathering steel teeth interlock with Hardox steel pins. The rolling and guiding interfaces are kept separate, and the materials chosen such that the softer component can be easily replaced within each interface, facilitating maintenance over its lifetime.

In order to predict the bridge behaviour during the roll, a staged analysis was carried out to assess how frictional effects affected the rotational and translational movement of the bridge. As the bridge is driven from one side only, ensuring adequate torsional stiffness was paramount to prevent the portals skewing off course. Predictions were made for the frictional forces and resulting cable tensions, that were then tested in-situ, prior to the completion of the mechanical system design.

The bridge aims to be understated when resting but playful in its movement, creating a spectacle when operated. Part of the ambitious footpath and cycleway project along the length of the River Lea, this rolling bridge will become an important landmark and a symbol for the dynamic community growing here.

Judges' comment

This intriguing project was realised thanks to a dedicated team working closely together and applying painstaking analysis with "real time" adjustments as the bridge was being fabricated. This ensured a smooth operation on site with the tight tolerances required of a machine. A project which celebrates its own complexity and encourages the wider community to share the fun.

National Finalists

Structural Steel Design Awards 2023

Arbor, Bankside Yards, London

PROJECT TEAM

Architect: **PLP Architecture**
Structural Engineer: **AKT II**
Steelwork Contractor: **Severfield**
Main Contractor: **Multiplex Construction Europe Limited**
Client: **Native Land**

Judges' comment

Phase One of a major regeneration project, the scheme had to navigate its way around severe constraints arising from the adjacent railway and supporting viaduct. Clearly supported by a row of heroic 'off black' columns as one approaches the entrance, the building provides high-quality flexible spaces where the use of structural steel is always discernible.

Church of Oak Distillery, Ballykelly, Co. Kildare

PROJECT TEAM

Architect: **ODOS Architects**
Structural Engineer: **J. J. Campbell & Associates**
Steelwork Contractor: **Steel & Roofing Systems**
Main Contractor: **Ormonde Construction**
Client: **Oakmount**

Judges' comment

The original 1930s distillery building façade has been retained, with new floors and roof added in steel to create a modern production complex. The new building is also a visitor attraction, with suspended first and second floors, and a glass floor providing excellent views of the whole distilling process.

Dukes Meadows Footbridge, Chiswick

PROJECT TEAM

Architect: **Moxon Architects**
Structural Engineers: **COWI (detailed design and construction engineering), Campbell Reith (concept design)**
Main Contractor: **Knights Brown Construction Ltd**
Client: **London Borough of Hounslow**

© Aerial Essex

Judges' comment

The bridge, featuring a Warren half through truss with a 35m main span, links two parts of the Thames Path around Dukes Hollow, navigating the narrow space between river floodwater level and the rail bridge. The main truss was carefully transported up the river and installed during a brief high spring tide, successfully placing the bridge in position.

National Finalists

Structural Steel Design Awards 2023

Farringdon Crossrail Station, East & West Ticket Halls

© Morley von Sternberg

PROJECT TEAM

Architect: **Aedas**
Structural Engineer: **AECOM**
Steelwork Contractor: **Bourne Group Ltd**
Main Contractor: **BAM Ferrovial Kier JV**
Client: **TfL (Crossrail)**

Judges' comment

The interchange at the centre of the Elizabeth line requires two generous ticket halls built either side of the historic Smithfield market. Both have site-specific substantial steel frames to support large over-site office developments. The Farringdon hall features a diamond vaulted roof reflecting the local Hatton Garden jewellery quarter. The Barbican hall uses a coffered design, referencing modular brutalist construction.

M8 Footbridge, Sighthill, Glasgow

© Peter Devlin

PROJECT TEAM

Structural Engineer: **Jacobs**
Steelwork Contractor: **Severfield**
Main Contractor: **BAM Nuttall**
Client: **Glasgow City Council**

Judges' comment

This weathering steel pedestrian and cycle bridge, integrated with heavily landscaped areas at either end, links a large new residential development to the north with routes to Glasgow city centre. The bridge was assembled on a tight site at the side of the M8 motorway, lifted into place and closing sections welded in-situ to provide its sculpted monocoque form.

The JJ Mack Building, London

PROJECT TEAM

Architect: **Lifschutz Davidson Sandilands**
Structural Engineer: **AKT II**
Steelwork Contractor: **William Hare**
Main Contractor: **Mace**
Client: **Helical plc**

Judges' comment

This central London ten-storey office development features a steel structure which is integral to the building's architectural expression while also newly activating the site's streetscape with public retail and terraced amenity spaces overlooking the historic Smithfield Market buildings. Meticulous detailing, simple connections and recyclability for future retrofit and reuse are impressive.

The National Robotarium, Edinburgh

PROJECT TEAM

Architect: **Michael Laird Architects**
Structural Engineer: **Tetra Tech**
Steelwork Contractor: **BHC Ltd**
Main Contractor: **Robertson**
Client: **Heriot-Watt University**

© Robertson

Judges' comment

The steel-framed building, with a double skin climatic southern façade, houses workshop, laboratories and teaching spaces configured around an elegant central atrium/gathering space. The exposed steel frame is evident throughout the various spaces of the building and is most distinctive in the diagonal arrangement of the roof beams and rooflights over the central double-height space.

2024 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 2024 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 2022-2023; 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 23rd February 2024

Further Details
All correspondence regarding the submission of entries should be addressed to:
Zoe Williams, BCSA, 4 Whitehall Court,
Westminster, London SW1A 2ES
Tel: 020 7747 8139 • Email: zoe.williams@bcsa.org.uk

BCSA STEEL for life

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and Steel for Life.

2024 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 2024, I declare that this steel-based structure has been fabricated by a UK or Irish steelwork contractor. It was completed during the calendar years 2022-2023. 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 marketing@bcsa.org.uk no later than 23rd February 2024

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