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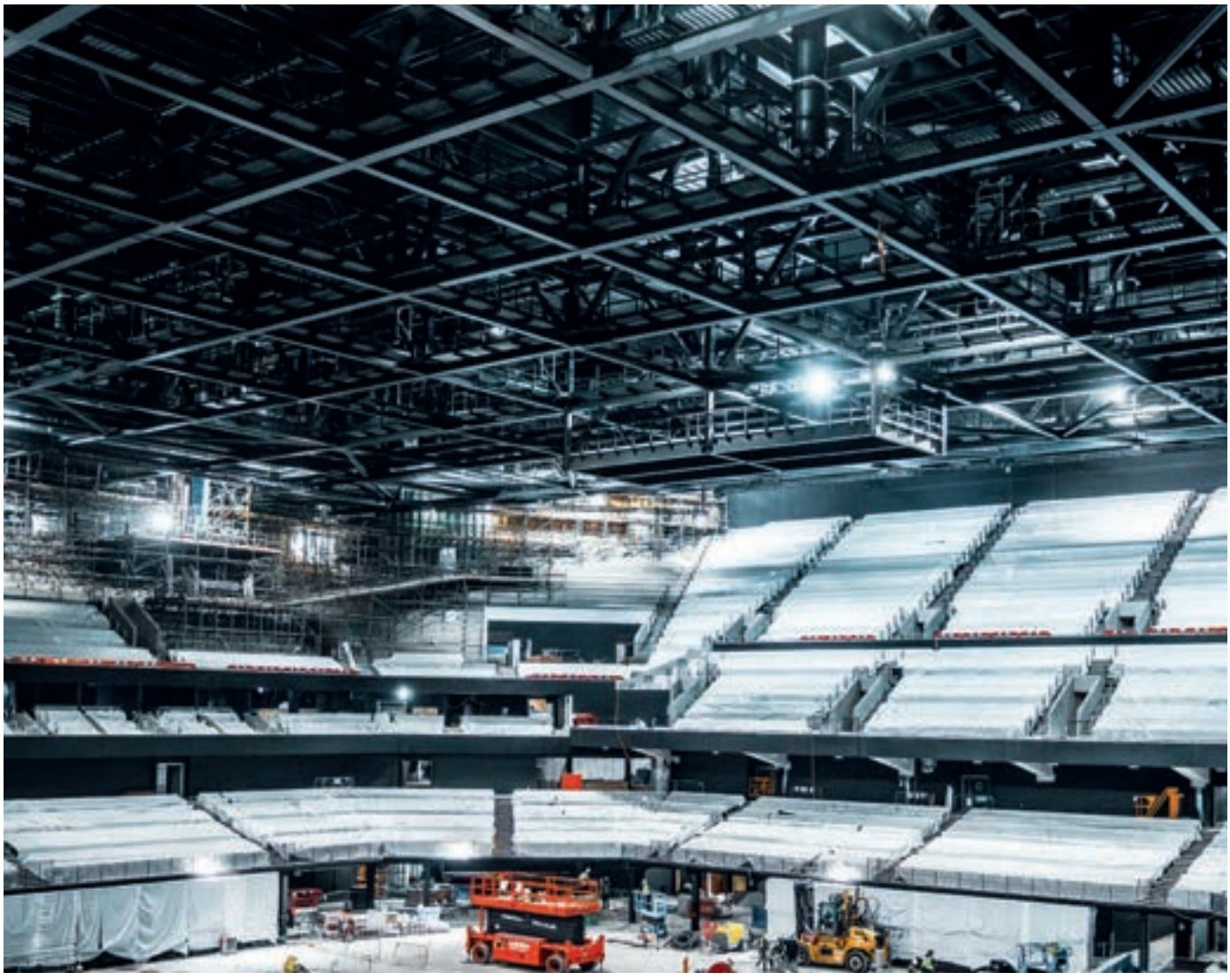

Structural Steel Design Awards 2024

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Introduction

Since 1969, the Structural Steel Design Awards have showcased excellence in modern steel construction. This year's shortlist continues the tradition

Jointly sponsored by the British Constructional Steelwork Association (BCSA) and Steel for Life and celebrating their 56th year, the 2024 Structural Steel Design Awards (SSDA) have once again highlighted and rewarded many of the best examples of excellence, ambition and innovation in our built environment.

The entries this year reflect the wide geographical spread of steel's appeal for a variety of projects, which include prestigious mixed-use schemes, office buildings, entertainment venues and beautifully designed footbridges. The judges were particularly interested in projects that reflected the reuse of existing structures and showed a commitment to lessening a project's embodied carbon.

Twenty-one projects made the shortlist, from which the judges presented six awards, seven commendations and one merit.

The SSDA's cross-industry judging panel includes: chairman Professor Roger Plank and Sarah Pellereau representing the Institution of Structural Engineers; Chris Nash, Bill Taylor and Oliver Tyler representing the Royal Institute of British Architects; Richard Barrett representing the steelwork contracting industry; Paul Hulme and Emily McDonald representing the Institution of Civil Engineers.

PHOTO: PAWEL PANICZKO

Steel performs with flexibility

A world-class cultural venue, capable of hosting a range of events, including the Manchester International Festival, could only have been created with interlinked steel trusses and a host of mega columns

Set within the St John's regeneration area, on the site of the former Granada TV premises, the Aviva Studios are set to enhance Manchester's status as a hub for arts and culture.

The steel-framed venue will be run by the team behind Manchester International Festival (MIF), the city's biennial arts celebration and it is supported by Manchester City Council, HM Government and Arts Council England.

It occupies around 17,000 sq m and includes a large warehouse space and adjoining theatre that can be used independently or together.

"Flexibility is key to the project's design," explains Laing O'Rourke project technical leader Andy Bell. "The performance spaces

▲ Structural steelwork has been used to create a box-in-box design

have movable partitions and are acoustically isolated so they can be used individually or as one large area."

Measuring 68m long, 34m wide and 20m high, the warehouse is the biggest of the two venues. It can be one large performance space, or divided in two by closing a set of large steel-framed acoustic partitions that retract around the interior walls on tracks.

The interconnected theatre can be used simultaneously as an individual venue, but the addition of two 60-tonne acoustic proscenium doors, which can be raised, will allow it to connect into the warehouse, significantly enlarging the stage. The doors are supported by a 23m long x 5m deep truss, which weighs 125 tonnes.

A box-in-box approach has been used on the scheme. This structural design means there are two isolated inner boxes (theatre and warehouse), both surrounded by a void (up to 2.5m thick) and then a larger outer box. The latter box is formed by a series of 300mm-thick concrete panels, which are isolated from the main steel frame via acoustic bearings.

The inner steel-framed warehouse box has an attached series of 200mm-thick precast isolation panels, while the theatre has 200mm-thick timber panels supported by its steelwork.

This complex acoustic treatment not only negates noise ingress between performance spaces but also prevents sound penetrating the venues from outside.

As well as creating the box-in-box design, structural steelwork has formed trusses and transfer structures that help the building bridge over a number of site constraints.

One of the more challenging parts of the steel frame is known as the west mega wall. It spans over Water Street, separates the warehouse from the theatre and contains the connecting proscenium arch. The wall is supported by three mega columns, which measure 2.5m x 2.5m and reach a height of 34m.

PHOTO: PAWEL PANICZKO

▼ Steel trusses support the warehouse and theatre roofs

Award: Aviva Studios, Manchester
Architect: Office for Metropolitan Architecture
Structural engineer: Buro Happold
Steelwork contractor: William Hare Limited
Main contractor: Laing O'Rourke
Client: Manchester City Council

A world-class cultural venue housing a warehouse space capable of supporting 200 tonnes of rigging from long-span steel trusses, and adjoining theatre, to be used independently or together. The result is a visually striking space able to host a wide range of events with large audiences, enhancing the city's status as a hub for arts and culture
SSDA judges

Limited space for the mega columns has been compounded by the fact that the middle member of the west wall's three columns had to be located directly above numerous important arterial service routes.

To solve this, a large truss supports this central mega column, diverting 5,000 tonnes of load via a cantilever into the ground and away from the subterranean services.

An interlinked series of trusses span between the mega columns to form the warehouse and theatre roofs. These trusses absorb considerable loadings as they also support a crane and its two runway beams, which will allow the warehouse to display and move large exhibits hung from the roof.

Produced by the BCSA and Steel for Life in association with Construction Management

Rising high in the City

Soaring from a plot bounded by two of the City of London's busiest thoroughfares, 8 Bishopsgate is the UK's tallest structure to achieve a BREEAM 'Outstanding' rating

PHOTO: DIRK LINDNER

Breaking away from the traditional office block design, the 50-storey 8 Bishopsgate project has also achieved a number of sustainability credentials, making it a standout structure in many ways.

Containing 30% less structural embodied carbon than London tall building benchmarks, the building's design revolves around the breaking down of its massing into smaller blocks. This allows the tower form to address the site constraints and brings human scale to the scheme.

The blocks are differentiated by scale, materiality and structural function, while the building's stepped form is accentuated by terraces and cantilevers that contribute to a visually dynamic composition.

Starting at ground floor level, the steel frame incorporates three distinct blocks that are stacked up to form the overall building.

Each has a unique identity related to the cladding module, the addition of fins to the mullions or how the structure is seen through it. While the building is mainly glazed in a double-skin curtain walling, the lowest block is clad in stone to respond to the street context.

A low-rise block extends up to level 11, while a mid-rise one, positioned behind it, rises from level six to level 26. A slim high-rise block tops out at floor 48. A pavilion above this incorporates a public viewing gallery and plant zones.

Award: 8 Bishopsgate, London
Architect: WilkinsonEyre
Structural engineer: Arup
Steelwork contractor: William Hare Limited
Main contractor: Lendlease
Client: Stanhope plc

WilkinsonEyre director Oliver Tyler says sustainability has been a key design driver from the project's inception, and one of the main goals was to achieve material efficiency.

"We used bespoke fabricated steel sections throughout, which were optimised for individual unique loads. By rationalising the building's frame, we needed 25% less steel, which saved approximately 5,000 tonnes of carbon."

The primary internal grid for the majority of the building is based around a 12m x 9m column pattern, using 620mm-deep plate girders with circular and rectangular openings to accommodate the building services.

"The column positions were selected in order to mitigate any column transfers, whereby the internal columns in the low-rise block continue upward to become perimeter members on the mid-rise part of the project," says Arup project engineer Jeremy Edwards.

Using the same column grid pattern, the high-rise block has no internal columns. Beams span directly between perimeter steel columns and the core, creating 21 storeys of column-free space.

Providing the stability for the 50-storey building are two concrete cores. The north core extends to the full height of the structure, while the south core terminates at level 24.

Giving some extra stiffness to the structure, the mid-rise block is a braced box, featuring perimeter steel bracing that connects the two cores and mobilises the perimeter columns to resist horizontal loads. This stiffens up the low and mid-rise blocks and allows for a narrower north core for the uppermost block.

To further maximise floor space, the building cantilevers out along its western elevation, oversailing the pavement along Bishopsgate. This overhanging west face reinforces the architectural concept, while providing 15% of the net internal area, improving the scheme's viability.

The western elevation's overhang commences at level six and initially extends up to floor 26. Further cantilevers begin at level 26 and 48, with the former overhanging by up to 3.8m.

"Eschewing the creation of a simplistic City icon, this 50-storey building successfully combines a fragmented form, determined by function and site constraints, with a rigorous structural system. The resulting variety of spaces has proved a letting masterstroke. Impeccably constructed through a construction management contract, this is a top-class project
SSDA judges

◀ 8 Bishopsgate's stepped design has created another City of London icon

▼ Openings in the girders accommodate building services

PHOTO: DIRK LINDNER

East End trader

Exposed steelwork forms a standout retail building adjacent to a historic market

Commendation:
Bishops Square, London
Architect: Foster + Partners, Bond Bryan
Structural engineer: Price & Myers
Steelwork contractor: Elland Steel Structures Ltd
Main contractor: VolkerFitzpatrick
Client: J.P. Morgan

Forming part of the multi-million-pound Bishops Square redevelopment, which has transformed a large area next to east London's historic Spitalfields Market, a steel-framed structure has added 10 retail and food outlets.

The distinctive two-storey building includes an exposed structural steel frame, coated in dark red iron oxide, infilled by glazing, canopies and partitions to give it a modern, industrial feel.

As well as providing the scheme with its integral aesthetic look, steelwork was chosen for its speed of construction. The material created a lighter structural frame than many other forms of construction – an important consideration as the new building is positioned and founded on top of an existing car park substructure.

One elevation is directly supported on an existing basement wall, while the main elevation, containing the shopfronts, has been formed with a series of trusses.

Produced by the BCSA and Steel for Life in association with Construction Management

All change at Victoria

Located opposite London's Victoria railway station, n2 Nova Evolved is an example of how engineering excellence can unlock value in heavily constrained sites without compromising quality and sustainability

Built on a confined site, surrounded by busy roads and neighbouring properties, and with transport and water assets located beneath, the 17-storey n2 Nova Evolved commercial building has overcome numerous challenges during its construction.

Landsec project director Damien Bettles explains: "Built on one of London's most bustling sites, this project could only be supported on a small number of large-diameter foundation piles positioned in between the subterranean assets.

"To overcome this challenge, the ground floor and first floor spaces are cleverly designed around a system of steelwork trusses, able to transfer the optimised commercial grid of the superstructure to the foundation piles. With spans of up to 45m, the use of steelwork for the truss system was key to delivering a sustainable design solution."

▲ Steelwork trusses were positioned at the lower levels

As the space to install new foundations was very limited, the only option was to install a few very deep piles, with one of them as close as 1.5m from a London Underground tunnel. To achieve the required capacity, some of these piles had to be designed to reach almost 80m, which is said to make them the deepest piles in London.

Structural steelwork starts at ground level, atop a concrete basement substructure. In total, eight trusses are positioned at the lower levels of the building. These

Award: n2 Nova Evolved, London
Architect: Lynch Architects, Veretec
Structural engineer: Robert Bird Group
Steelwork contractor: William Hare Limited
Main contractor: Mace
Client: Landsec

A complex site with congested services restricted building supports to just a few points, resulting in steel trusses creating a distinctive double-height feature at ground floor. Secondary transfer trusses between first and second floors house the plant, with the rest of the building free to create a unique, top-class office space
SSDA judges

not only form bridges between the pile locations but also create column-free spaces for the ground, first and second floors.

"We worked together with the client and architect to provide the optimum superstructure grid for the scheme. However, due to the presence of the assets below ground, we needed to design a series of internal and external trusses to transfer all superstructure loads down to the foundations," says Robert Bird Group associate director Alejandro Cruz.

Positioned between the ground floor and level three, the trusses vary from single- to double-storey-height elements.

Three internal full-height trusses at level two span between the core and an eastern perimeter truss. These internal trusses were integrated with the plant room that is located at level one and level two.

Probably the two most visible trusses are known as A and 6A. These form the main southern and eastern facades of the building. They both start at ground level and extend up to the underside of level two. Truss A measures 44m long and is 10m high and, like all of the trusses, it was fabricated from steel plate ranging in thickness from 25mm to 75mm.

A further five bridging trusses help to create the open-plan column-free spaces for the lower floors, while also supporting the columns for the upper levels.

Landsec is a signatory to SteelZero – a global initiative committed to driving the transition to a net zero global steel industry – and says it is encouraging steel producers to decarbonise steel production. Consequently, a proportion of the steel used on this scheme came from recycled sources.

"We've made a commitment to transition to 100% of our steel requirement to be net zero by 2050 and to transition 50% of our steel requirement to meet the SteelZero interim criteria by 2030," says Bettles.

PHOTO: STUDIO STAGG

▼ The trusses are incorporated as a visible feature of the finished design

Keeping the lights on

Behind the Piccadilly Lights, a steel-framed scheme has transformed a site once occupied by 13 buildings

PHOTO: CENTRAL PHOTOGRAPHY

Commendation: Lucent, London
Architect: Fletcher Priest Architects
Structural engineer: Waterman Group
Steelwork contractor: Severfield
Main contractor: Wates Group
Client: Landsec

An eight-storey steel-framed development known as Lucent, consisting of Grade A office space, retail units and seven apartments, includes a rooftop restaurant that opens up stunning views of the capital.

Two large retained elements are incorporated into Lucent. One is the structure supporting the Piccadilly Lights digital screen and other is a two-storey store incorporating a Boots unit.

Severfield project associate director Nick Scott says: "We had to carefully erect steelwork over the existing Boots store and thread steel beams around the Lights, without damaging them or requiring them to be shut down."

The structure supporting the digital screen was temporarily propped during the demolition and construction works. Once Lucent was completed, the props were removed and the screen now gains its lateral stability from being connected to the new steel-framed structure.

Produced by the BCSA and Steel for Life in association with Construction Management

Sky's the limit

The Sky Innovation Centre represents the latest phase in the redevelopment of the media company's west London campus

Designed to include impressive wellness, sustainability and environmental performance credentials, the Sky Innovation Centre was delivered with a significant focus on driving down embodied carbon.

To this end, waste was reduced through prefabrication and efficient design, and by ensuring materials were responsibly sourced. One hundred percent of construction waste was diverted from landfill and, with its supply chain partners, main contractor ISG says it eliminated the majority of single-use plastic packaging during construction.

Occupying the site of two former buildings, the new three-storey steel-framed building has been designed to maximise natural light within the majority of its open-plan accommodation.

The exterior features a ziggurat-style facade, created with splayed columns. Internally, a full-height atrium is flooded with daylight. Topping the building, a large photovoltaic (PV) array generates emission-free electricity.

Steelwork was chosen for a number of reasons, one of which was speed of construction. The frame was faster to build and required less trade coordination than alternative framing solutions.

Using steelwork also helped the project team maximise offsite construction, which enabled the job to progress during the Covid-19 pandemic. With minimal delay and few workers on site, the steel erection team were able to 'bubble' themselves and maintain effective Covid protocols, which meant the site was only shut down for three days.

▲ The ziggurat-style facade makes use of splayed columns

The steel frame creates floorplates that are column free, with perimeter columns spaced to provide direct support to a series of primary trusses. In this way, 13.5m-wide spans have been efficiently achieved with a minimal steel tonnage.

The trusses' T-plate bottom chords minimise visual appearance, while facilitating simple welding of truss nodes. The internal visual impact of the trusses is further reduced

▲ The steel frame allows creation of column-free floorplates

Award: Sky Innovation Centre, London
Architect: AtkinsRéalis
Structural engineer: Arup
Main contractor: ISG Ltd
Client: Sky

by integrating the top chord box section into the depth of the slab.

During the design phase, several options were considered for the slabs. The choice of hollowcore slabs has provided a durable and robust solution that gives enough mass to control dynamic footfall response.

Arup says the highly efficient, beautifully crafted minimalistic steelwork trusses are integral to the architectural feel of the building. They are created with advanced structural analysis and design, achieving a steel weight of 60kg/sq m.

The primary steel frame geometry is linear and regular for direct load paths and ease of construction. The eye-catching ziggurat facade is formed with shaped secondary steel members. This enabled the primary frame fabrication to start while final facade coordination continued, shortening the critical programme path by two months.

The design, and the use of splayed columns, helped reduce stress and deflection in the primary beams. They have also improved the footfall response of the slab, while providing stiff landing points for atrium stairs connecting onto the floorplates. This saved 19% CO_2e compared with vertical columns.

"Beautifully detailed trusses, elegantly tapering splay columns and flat soffits provide Sky's desired sophisticated industrial look and feel," says Arup engineer Timothy Snelson.

"We were able to design out ceilings and other finishes, thereby substantially reducing the overall building embodied carbon."

A further embodied carbon reduction was achieved by designing out any structural topping for the internal slabs to allow future disassembly and potential recovery of the structure.

"We had a clear vision to create a unique and responsible building, steeped in our ethos to do the right thing for the environment and our people," says Diana Foxlee, director, Sky Spaces

"Staying true to these principles and using learnings from previous experience helped us make brave decisions, challenge industry standards and deliver even better outputs."

"This minimalist structure, comprising highly optimised steel floor trusses, supported on splay columns to reduce bending, maximises design for disassembly. A key aim of the client, adopted throughout the supply chain, was to minimise environmental impacts. The result is a very adaptable, high-quality workspace with excellent sustainability credentials"
SSDA judges

Twisting net zero offices

This outstanding steel-framed commercial scheme is the latest addition to a thriving Manchester business district

Commendation: 4 Angel Square, NOMA, Manchester
Architect: SimpsonHaugh
Structural engineer: Buro Happold
Steelwork contractor: Billington Structures Ltd
Main contractor: Bowmer + Kirkland
Client: MEPC

Located in the NOMA district in Manchester city centre, 4 Angel Square is an 11-storey 18,580 sq m contemporary office building.

The steel-framed structure is set around a centrally positioned concrete core that helps maximise the extent of clear-span floor space, while allowing greater penetration of sunlight.

The frame is based around a regular 8m perimeter column spacing, with internal spans of up to 18m long. Most of the beams are fabricated plate girders with bespoke web openings for the building's services.

Adding some architectural drama and creating a standout landmark, the building is split into two blocks, with the upper four levels shifting around a central pivot point.

The upper block responds to city views towards Victoria Station and the structure's 'twist' forms a couple of 3.5m-wide corner cantilevers at seventh floor.

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Award: Beaulieu Parkway Bridge, Chelmsford
Architect: AECOM
Structural engineer: AECOM
Steelwork contractor: Briton Fabricators Ltd
Main contractor: GRAHAM
Client: Countryside Zest LLP

Spanning road and rail

Linking a housing development in Chelmsford with the A12 trunk road, the Beaulieu Parkway Bridge is a vital piece of infrastructure that alleviates congestion around the Essex town

Constructed over an 18-month period, the Beaulieu Parkway Bridge spans both the Great Eastern Main Line railway and the northbound A12 slip road, providing a connection to the new Chelmsford relief highway, while also creating a route to a planned railway station.

Curved on plan, the steelwork elements for the 161m-long three-span weathering steel bridge consist of four lines of 2.7m-deep plate girders, which have been designed to twist into shape under permanent load.

"Accuracy of fabrication, which was vital to this project, was controlled in the workshop, using laser levels and purpose-made jigs," explains Briton Fabricators managing director Dean Morcom.

"Information was gleaned from our advanced steel 3D model, which was prepared in-house by one of our experienced design modellers."

Overall, the steelwork contractor fabricated, supplied and erected 891 tonnes of weathering steel for the bridge.

One of the main challenges was the confined nature of the site and the limited access. Consequently, the plate girders were delivered to site in small sections that were then welded together into 40m-long sections.

To carry out this preliminary work, temporary trestles were designed and deployed to support the girders,

while shrouded areas were installed to allow the team to weld, test and blast the steel sections.

Once the paired girders, weighing up to 132 tonnes each, had been made up into the required lengths, they were then lifted above the adjacent overhead railway power lines and transferred onto another temporary works set-up.

This 'at height' temporary location mimicked the bridge's final abutment and its two intermediate central support piers. With two rows of purpose-built trestles positioned at weld locations, all of the structure's connections were completed.

Once all the preliminary works had been completed, self-propelled moveable transporters (SPMTs) lifted and moved the entire bridge superstructure to its permanent location. The bridge weighed 2,400 tonnes during the installation programme.

The bridge was manoeuvred and cantilevered over the railway line and the A12 slip road, and installed within a 10mm tolerance. This is believed to be the longest bridge installation ever undertaken in the UK using SPMTs.

Martin Leach, managing director, major projects, Countryside, says: "We were enormously proud to announce the opening of the new Beaulieu Parkway bridge and relief road for Chelmsford, the final stage of a £35m infrastructure programme which will have such a positive impact on the local community."

Councillor Lesley Wagland OBE, Essex County Council's deputy to the leader with principal accountabilities on major infrastructure projects and freeports, says: "The bridge provides an important strategic link for commuters and is intended to help ease congestion around the town as people journey to and from Braintree, Stansted and the M11.

"Essex County Council has worked hard with partners to put in place a number of transport developments in this part of Chelmsford, from the relief road to the new bypass and train station, which are vitally important for making sure the transport network is fit for the future and giving local people safer, greener and healthier choices in how they travel."

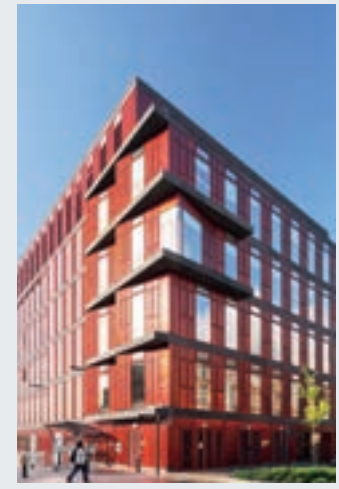
"This three-span highway bridge has an extraordinary construction story. The structure, which spans a road and live railway, is curved in plan and section. Built on the ground, complete with much of its deck, the structure was then driven into position on multiple SPMTs
SSDA judges

◀ The entire bridge was assembled on a site close to its final position

▼ The bridge was manoeuvred over the railway line and A12 slip road

Learning with steel

Different research groups come together under one roof, with a design that encourages collaborative engagement



Commendation: Clarice Pears Building, Institute of Health and Wellbeing, Glasgow
Architect: AtkinsRéalis
Structural engineer: AtkinsRéalis
Main contractor: Multiplex
Client: University of Glasgow

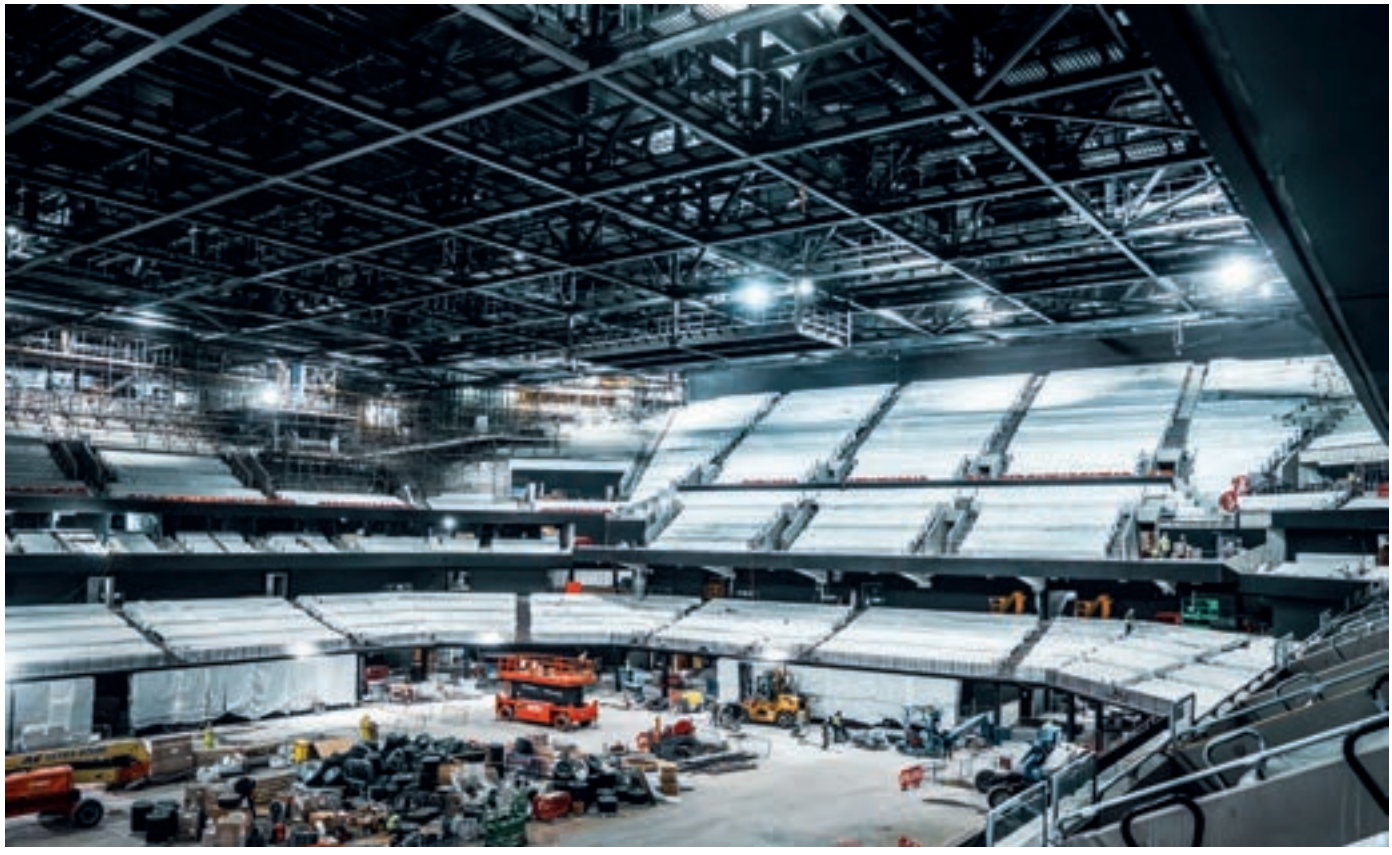
The Clarice Pears Building at the Institute of Health and Wellbeing in Glasgow is a braced steel-framed structure incorporating a number of sustainable features, such as roof-mounted PV panels.

Steelwork was chosen because the design brief required a lightweight building with minimal internal columns.

The round floor of the building has been designed as a marketplace, where social, learning and gathering spaces create informal work zones interlaced with teaching hubs.

Above this area, spread over the uppermost floors, are numerous teaching areas. At the centre of the building, a four-storey internal atrium is surrounded by complex projecting cantilevering balconies, which have been efficiently formed through the use of structural steelwork.

Produced by the BCSA and Steel for Life in association with Construction Management



Co-op shops with steel

Structural steelwork has helped create the UK's largest indoor venue, which boasts a 23,500 capacity alongside 41 bars and restaurants

With the largest floor space of any UK indoor venue and a significantly lower ceiling, the Co-op Live's tiered seating allows fans to be closer to the artist. Unlike venues designed primarily for sporting tournaments or public exhibitions, the arena is also claimed to be the first of its kind to be built around concert acoustics.

In accordance with the client's brief, sustainability was at the heart of the project's construction. The venue, which has been designed to support Manchester's Zero Carbon 2038 commitments, includes numerous sustainability features to create an inclusive, low-carbon and low waste structure.

The building is powered entirely by electricity with no reliance on fossil fuels, while renewable energy purchased from the National Grid will be supplemented by the large photovoltaic array mounted across 10,500 sq m of roof.

▲ Three-tiered seating has flexibility to wrap around the bowl

The venue is a large steel-framed structure that is set out on a regular 8.5m column grid pattern. It comprises steel members supporting precast terrace units for the seating areas. Below these, horizontal beams support a composite metal decked flooring to create the circulation and concession zones.

Stability for the steel-framed structure is provided by the arena's seven precast concrete cores, which work in conjunction with some strategically located internal bracings.

Award: Co-op Live Arena, Manchester
Architect: Populous
Structural engineer: Buro Happold
Steelwork contractor: Severfield
Main contractor: BAM Construction
Client: Oak View Group

A 100m-clear spanning roof forms the dramatic focus of this state-of-the-art purpose-built black box performance venue. Skilfully controlled surrounding spaces are defined, but never dominated, by the expressed structure that creates them. Built to exacting standards, this is a holistic and architecturally confident solution of high quality
SSDA judges

Around the bowl, the arena is predominantly three-tiered, with the middle tier containing hospitality boxes. The exception is the east stand, which accommodates the stage for concerts but also has a single upper tier of seating. This adds flexibility, as the stage can be removed where events require the central standing area of the bowl, allowing the seating to wrap around the four sides.

Once the main bowl superstructure had been completed, the roof steelwork was installed. Due to site constraints, this was brought to site in small components, assembled into larger sections on the arena floor and then erected from within the building's footprint.

The size of these components was dictated by the size of crane that could be rigged safely within the bowl's footprint, combined with the requirement for it to be subsequently derigged underneath the completed roof structure.

A series of 100m-long trusses, each capable of supporting approximately 30 tonnes of equipment, make up the roof.

"As well as forming the roof, all of the trusses are also supporting walkways, rigging strong-points and a host of important equipment for the lighting and sound," explains Buro Happold partner Rob Amphlett. "The roof is a machine that enables the various productions. It is also the engine room of the arena."

Because of the short design programme, the team adopted a strategy of suspending most of the building services beneath the steel floor beams and composite decks. Meanwhile, the venue's location close to residential buildings, meant the roof cladding had several strict acoustic requirements.

An offsite solution was used, with acoustic cassettes that slotted into the main roof steel structure. Metal decking and a concrete topping was then added to the top of the acoustic liner to carry waterproofing and the photovoltaic units.

▼ The roof steelwork was erected from inside the building

Capital design

Two office blocks form an integral element of a new multi-use destination in central Edinburgh

Commendation:
Haymarket, Edinburgh
Architect: Foster + Partners
Structural engineer: Arup
Steelwork contractor: BHC Ltd
Main contractor: Sir Robert McAlpine Ltd
Client: Qmile Group, M&G Real Estate

The 1.6ha Haymarket development includes three Grade A office buildings, a 190-room hotel and a 172-room aparthotel, alongside future provision for retail and leisure space.

Two of the office buildings, known as Buildings Four and Five, are separate steel-framed structures that are connected by a full-height 12m-wide glazed atrium.

Both have been designed to span over the railway tunnels that serve the adjacent railway station.

The southern portion of Building Four spans directly over the station's northbound tunnel. Its central, 16m-wide office floorplate is formed with columns that are supported on piles founded either side of the tunnel.

Building Five, which sits above the adjacent southbound tunnel, is partially supported by a Vierendeel truss, positioned from level three to level seven, that spans the 30m distance over railway infrastructure.

Produced by the BCSA and Steel for Life in association with Construction Management

PHOTO: GARY BRITTON

Retain and redevelop

A steel-framed office and retail development combines a retained facade with a new modern interior

Commendation:
One Great Cumberland Place, London
Architect: Allford Hall Monaghan Morris
Structural engineer: AKT II
Steelwork contractor:
Bourne Group Ltd
Main contractor: Galliford Try
Client: The Portman Estate

Located directly opposite the Marble Arch monument, a 10-storey development behind a retained facade has significantly upgraded a building originally built in the 1920s.

The project has created three floors of retail space and seven floors of high-quality Category A office space.

Once demolition was complete, a temporary retention system for the facade was installed and the existing basement enlarged into a two-level subterranean area.

New steelwork connects to the retained facade's steel columns via bolted connections and provides the support for the old structure.

The majority of the new structure's steel beams are fabricated plate girders with bespoke cells to accommodate the building's services within their depth.

The exposed steel interior of the office plates presents a modern and industrial-looking environment.

Other National Finalists
- Allerdene Bridge, Gateshead
- Battersea Power Station Phase 3B, London
- Devon Place Footbridge, Newport
- Maggie's Royal Free Hospital, London
- Plot 7B New Bailey, Salford
- Sky Studios Elstree, Borehamwood
- Tommy Taylor Memorial Bridge, Barnsley

Aesthetics in the frame

Comprising 19 floors above ground, Paddington Square has been designed as a visually striking structure with a significant portion of its steel frame left exposed

Commendation: Paddington Square, London
Architect: Renzo Piano Building Workshop, Adamson Associates
Structural engineer: WSP
Steelwork contractor: William Hare Limited
Main contractor: Mace
Client: Great Western Developments Ltd

Steelwork was chosen for the Paddington Square commercial project to fulfil the design aesthetic of a transparent frame.

This not only includes exposed beams and columns within the building's interior, but also an expressed exoskeleton that can be viewed through the structure's glazed elevations.

As the steel and connections are on view in the building, a high-specification fireproofed paint with a quality finish was specified.

As well as the aesthetic qualities of steelwork, the material was chosen to provide the best framing solution to achieve the required spans and long column-free areas within the development.

This is most noticeable on the ground floor, which includes a large column-free reception space, terrace and workspace.

All of the perimeter columns are circular hollow sections, which were chosen for their aesthetic visual qualities.

PHOTO: HUFTON AND CROW

PHOTO: PHILIP VILE

Reused steel adds sustainability

A 1980s-built office block has been redeveloped with reclaimed steelwork making up one-third of the overall steel tonnage

Merit: Holbein Gardens, London
Architect: Barr Gazetas
Structural engineer: Heyne Tillett Steel
Steelwork contractor: Cleveland Steel and Tubes Ltd
Client: Grosvenor

Holbein Gardens has been redeveloped with the addition of a two-storey steel-framed extension and a rooftop terrace to the existing four-storey building.

According to the client, the project was committed to circularity and prioritised retention over demolition. This was achieved by retaining the existing concrete frame, while the new areas of the building utilised low embodied carbon materials.

The scheme, one of the first to champion this level of circularity, became Grosvenor's flagship sustainability project and first net zero development.

The process of designing with and sourcing reclaimed steelwork has demonstrated how reusing steel can be achieved within a standard procurement route.

Approximately 9 tonnes of steel was obtained from other Grosvenor sites in London, with the remaining 16 tonnes procured from reclaimed stock.