Structural Steel Design Awards 2016

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INTRODUCTION

Steel continues to be the most popular frame material and this year's entries reflect the increasingly high standards that are being achieved, not only in design and all aspects of fabrication, but also in the short programmes and accuracy on site.

We look forward to the continuing improvement in demand for the whole of the steel construction industry which will allow specifiers to develop even greater advantages in the flexibility of steel, and in the demonstrable economy and efficiency of steel structures.

It is hoped that the Design Awards will continue to stimulate interest and contribute to the growth of steel-framed construction.

THE JUDGES

D W Lazenby CBE DIC FCGI FICE FIStructE – Chairman of the Panel
Representing the Institution of Civil Engineers

R B Barrett MA(Cantab)
Representing the Steelwork Contracting industry

J Locke MBE FREng DEng MSc CEng FIStructE FWeldI
Representing the Steelwork Contracting industry

M W Manning FREng CEng MIStructE MA(Cantab)
Representing the Institution of Structural Engineers

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

Professor R J Plank PhD BSc CEng FIStructE MICE
Representing the Institution of Structural Engineers

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

O 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 efficiency, cost-effectiveness, aesthetics and innovation."

AWARD

London Olympic Roof Conversion

PROJECT TEAM

Architect:	Populous
Structural Engineer:	BuroHappold Engineering
Steelwork Contractor:	William Hare
Main Contractor:	Balfour Beatty Major Projects
Client:	London Legacy Development Corporation

When the London Olympic Stadium was designed it was with an ethos of 'embracing the temporary' in the knowledge that, post-Games, its function would change and, as a result, the structure would need to change too. Such foresight paid dividends when it was announced that the stadium would become the new home of West Ham United football club at the beginning of the 2016/17 season.

One of the main stipulations for the future use of the stadium was that it would retain its running track. To prevent this from adversely affecting the atmosphere at football matches, an automated system of retractable seating was included in the new design, with all four sides of the lower bowl able to move over the running track when in football mode. To meet UEFA rules, the roof needed extending to fully cover the retractable seating.

Work began on the project to transform the venue in late 2013. The new structure included 8km of steel cables weighing 930 tonnes, 112 steel rafters, 2,308 purlins, 422 struts, 9,900 roof panels and 14 light paddles each weighing 43 tonnes, with the whole structure weighing in at around 4,700 tonnes which is nearly six times the weight of its predecessor.

In order to preserve some of the Olympic Stadium's identity, the iconic triangular lighting tower design that used to stand over the old roof has been inverted and they now appear to hang underneath the new larger roof.

Early works involved the deconstruction of the old roof and the strengthening of the existing structure, foundations, V-columns and the perimeter compression truss.

Strengthening of the existing structure was one of the major challenges. Due to the additional weight of the new roof, it was necessary to replace and/or strengthen the existing V-columns and significant strengthening works were carried out to the existing compression truss.

For the compression truss strengthening work alone the amount of hierarchical complex calculations involved the steelwork contractor developing his own in-house software to process over 10,000 calculations - a task that would have been impossible using traditional methods.

The ambitious new cantilevered roof now stands as the world's largest with every seat in the stadium now covered by the new roof.

The 14 new lighting paddles are positioned beneath the new roof. Each lighting paddle houses up to 41 lamps, many of which are the original lamps that shone over the stadium during the London 2012 games. Four 600 tonne capacity cranes operated in tandem to lift the lighting paddles and the other roof members into position.

The tolerance in the fabrication and quality of finish was expected to be very high and the design was made with security in mind. Most of the geometry was complex and specialised jigs were manufactured to fabricate some of the complex tubular nodes. A total station was employed to set out all of the brackets for the lighting paddles which all lean towards the pitch and are all slanted in three opposing planes.

Not least, the oval shape of the stadium and the movement and tolerance requirements only gave the opportunity for single pieces to be replicated twice, which meant that half of the stadium structure was fabricated with unique members.

Following the V-column and compression truss strengthening work, to maintain equilibrium until the oval was fully formed the erectors worked in two teams at opposite ends of the stadium working in a clockwise rotation constructing the back roof first, then the front roof complete with the lighting paddles and walkways.

To ensure the correct distribution of forces through the cable support structure to the compression truss, the front and back roof are completely independent of each other. However, for the installation of the lighting paddles, the front roof had to be temporarily tied to the back roof to ensure that the lighting paddles did not overturn until the full ring stiffness of a complete oval was achieved.

4D programming using BIM modelling was the key to delivering this successful project to a very high profile deadline, which was originally the 2015 Rugby World Cup taking place in September 2015. However, this was brought forward even more to fit in the Sainsbury's Anniversary Games which took place in July 2015. This meant that all major construction had to be complete by May 2015.

The new structure now has a lifespan of over 60 years and is set to become the new national competition centre for UK Athletics, and in 2017 will host the IAAF World Athletics Championships and IPC World Championships. The stadium has already hosted five games of the 2015 Rugby World Cup and motor racing's 2015 Race of Champions.

The stadium has also been upgraded to a 54,000 all-seater UEFA category 4 football stadium, which is the highest category of football stadium possible in the world.

JUDGES' COMMENT

The need to modify the roof and seating of the 2012 Olympic athletics stadium to accommodate a multi-purpose sports venue posed formidable challenges. The geometry and behaviour of the original structure were very complex but, with extremely detailed study and fine engineering skill, most of the original elements have been re-incorporated.

The challenges have been met superbly and the project is a triumph for the team and for structural steelwork.

AWARD

Harlech Castle Footbridge

PROJECT TEAM

Concept Designer:	Mott MacDonald
Structural Engineer:	David Dexter Associates
Steelwork Contractor:	S H Structures Ltd
Main Contractor:	RL Davies & Son Ltd
Client:	Cadw

Harlech Castle is one of the finest surviving 13th Century castles in Britain - it is a Grade I Listed Building, a Scheduled Ancient Monument and also part of a World Heritage Site. For many years access to the Castle had been via a series of timber steps, with no provision for those with impaired mobility. With the opening of a new visitor centre nearby, the vision was to connect this to the Castle via a new 'floating' bridge,

Due to the sensitive nature of the site, the aesthetics have been a particularly important consideration. Various concepts were explored to satisfy the constraints of functionality, alignment, heritage and visual impacts before finally opting for the 'S'-shaped low profile Vierendeel truss design.

Both horizontal and vertical alignments were constrained by the need to connect straight through the Castle's gatehouse, whilst maintaining a suitable gradient acceptable to those with impaired mobility.

To minimise the impact of the views of the distant mountains of Snowdonia, the profile of the bridge was reduced by tapering the bottom chords of the trusses and eliminating any diagonal bracing, thus avoiding a potentially more cluttered appearance. The visual lightness of the bridge is significantly improved by the selection of a stainless steel mesh infill to the parapets. The deck is 2m wide in general, however it widens up to 3m above the middle support to provide an area where people can enjoy the views.

To ensure that the bridge was future-proof provision was made for services to be run in a duct under the bridge deck, allowing the creation of a new venue within the castle where events and performances can be hosted.

Throughout the design process there was continuous dialogue between the project team using 3D BIM CAD modelling to explain design proposals and ensure the design developments were acceptable. The first key area for development was the truss and deck configuration. The original proposal had fin plates welded to the back of the CHS Vierendeel truss bracing elements, which then became the tee web in the handrail upright. This arrangement posed some fabrication challenges and raised

the possibility of weld distortion in the fin plate attached to the CHS. An alternative solution was adopted whereby SHS bracing was used and the handrail fabricated tee upright orientation was reversed. The face of the SHS Vierendeel bracing then aligned with the flange of the tee to the balustrade which was tapered to give an elegant transition to the handrail, whilst the bracing also gives improved structural capacity particularly at the joint with the CHS chords for a given section width.

To maximise headroom clearances under the bridge, and to give a more efficient structural solution at the supporting columns, the depth of the truss profile was modified and the bottom chord form was achieved from a combination of curved and straight sections of tube.

The bridge's dynamic performance required careful consideration in the design. The columns needed to be very stiff in the transverse direction so an elliptical section was used which, when partly filled with concrete, achieved the required result. This choice also had the added architectural benefit of the elliptical column being less obtrusive on elevation, whilst approximately matching the profile of the truss chord.

Before work started on site the existing façade was digitally scanned and the 3D survey was incorporated into the design model to ensure the critical dimensional interface between the Castle entrance and the bridge was achieved.

Bridge sections were set up in bespoke jigs to control weld distortion and maintain their geometry during welding.

The bridge is lit with a bespoke integrated LED lighting system that delivers bright white task lighting to the walkway, but has the added benefit of having a number of colour-changing effects that can be accessed for special events.

The bridge is finished with a timber deck and handrail for which FSC certified Ekki hardwood was selected, this requires no preservative treatment and little maintenance. The deck boards feature anti-slip inserts and seamlessly follow the curves of the bridge.

The biggest challenge to the installation team was the limited footprint of the site and the restricted access through Harlech. These challenges were overcome with the careful selection of the multi-wheel steer mobile crane and rear wheel steer transport trailers.

Steel erection required meticulous planning and attention to detail to ensure a smooth and safe installation process, however the unique historic nature of the site put even more responsibility onto the erection team. Following offsite matching of the deck units the fit-up on site was perfect and the three main spans were installed without any significant problems. With the bridge sections in place, the careful co-ordination of the fitting of the timber deck, parapets, lighting and services allowed the bridge to be completed in good time ready for its opening for the year's summer visitors.

The new footbridge has been very well received and welcomed as an attractive addition to the historic site, whilst dramatically enhancing the visitors' experience.

JUDGES' COMMENT

In a very sensitive setting this elegant bridge provides level access to the historic castle, whilst minimising its visual impact. The detailing and fabrication of the curved deck are exemplary. The erection was effected with a high degree of precision despite the limited site and extremely difficult access.

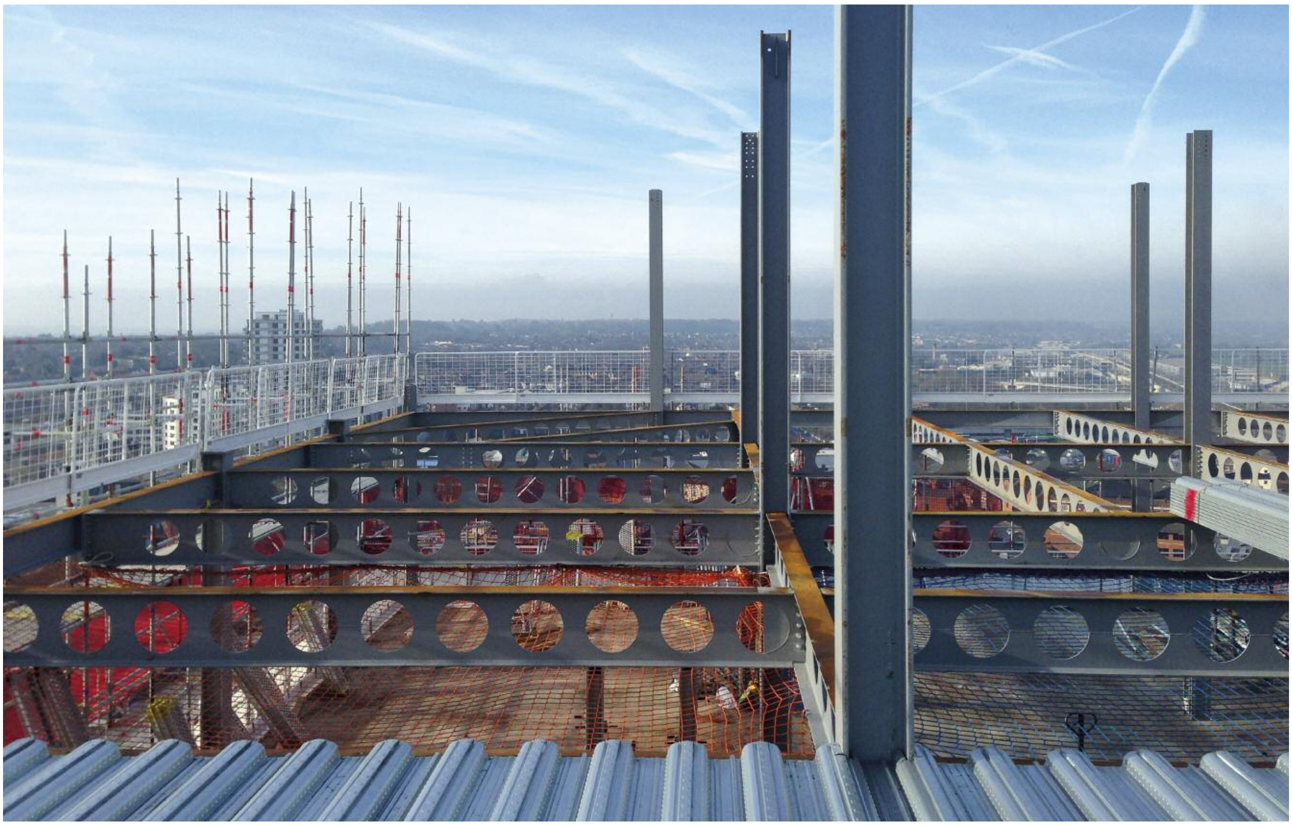
The modern shapes of the bridge create a beautiful counterpoint to the ancient castle it serves.

AWARD

Thames Tower Redevelopment, Reading

PROJECT TEAM

Architect:	dn-a
Structural Engineer:	Peter Brett Associates LLP
Steelwork Contractor:	Shipley Structures Ltd
Main Contractor:	Bowmer and Kirkland Ltd
Client:	Landid Property Holdings Ltd



Located in the heart of Reading town centre, the existing Thames Tower concrete office block has been given a new lease of life with an enlarged footprint at each floor level in conjunction with a five-storey steel-framed extension above level 11.

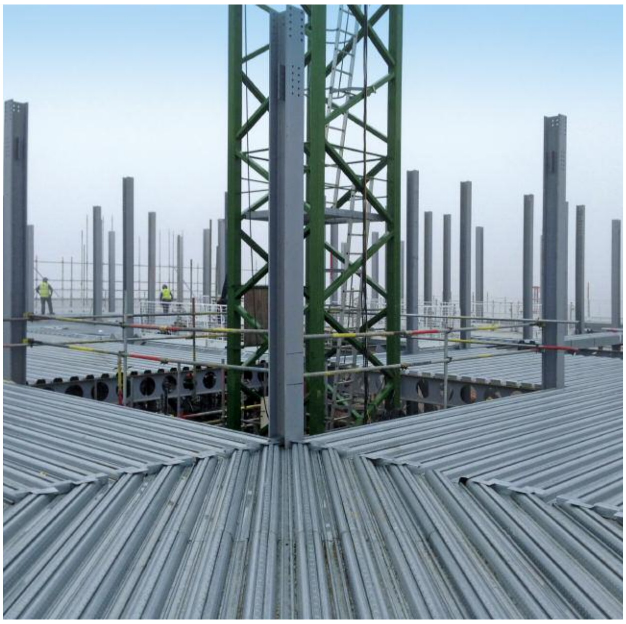
The original scheme concept was to demolish the existing concrete-framed structure and replace it with a new 25-storey high tower, which would have necessitated the requirement for new supporting/up-rated concrete foundations.

However, through an innovative design proposal, the core of the existing structure was maintained and developed using a series of strengthening works throughout the height of the concrete frame, along with the provision of four additional steel-framed office floors to increase the nett usable internal areas. This also provided huge 'value-engineering' savings to the scheme as the basic core of the structure was maintained and no amendments or enhancements of the existing concrete foundations were necessary.

The refurbishment works included stripping the building back to its structural frame and the removal of the existing concrete cladding panels to all elevations, which were then replaced with a new terracotta tiling system to complement the local town centre surroundings.

In order to accommodate the increased dead and imposed loads from the new five-storey extension between levels 11 to 16, it was necessary to strengthen the columns and floors of the existing concrete-framed structure. This was achieved by the following:

i. The supply and installation of 15mm thick stiffening plates to the full width of the concrete columns between levels 6 and 11. The columns were initially ultrasonically scanned to avoid clashes with the steel reinforcing bars. Following the bespoke fabrication of each of the 282no individual stiffening plates, these were fixed to the columns by means of 14no resin anchor bolts and subsequently bonded to the concrete face across the full plate area using a special 'fast-curing' resin.



ii. These were further complemented by fabricated ‘cruciform’ stiffening brackets at the column heads, in order to adequately disperse the upper load transfer.

An intermediate mezzanine steel-decked floor was also supplied and incorporated at level 01, using cellular beams to provide a lightweight steel solution with maximum integrated space for M&E equipment.

The above strengthening works, along with further stiffening plates and brackets at level 11, also facilitated the use of a roof-mounted tower crane for the installation of the new upper five-storey extension. The tower crane was installed approximately halfway through the steel site programme. Initially all of the internal steel members for the strengthening works had to be hoisted through the existing internal lift cores and ‘hand-balled’ into position.

The structure’s original design had the perimeter columns protruding beyond the main floor areas, along with splayed 45 degree corners throughout its full height.

As part of the building refurbishment, and to maximise the internal floor areas, the new design introduced a series of additional perimeter support beams which were connected to the external edge of the existing concrete columns. Metal decking and associated concrete floor infills then created an increase to the building footprint up to the exterior face of the perimeter columns.

The four corners of the building were also altered to create a now perfectly square structure, which has further increased each of the tower’s existing commercial floorplates. This was achieved by installing a new steel column to each of the building’s corners with secondary infill framing. These triangular corner infills were then subsequently metal-decked and concreted throughout the full height of the building. This has increased the tower’s floor space from 13,600m^2 to approximately 17,000m^2 of offices and 740m^2 of restaurant/café space.

The new upper steelwork extension is connected to the existing concrete columns at the newly created level 11 and corner infill sections. Predominantly based around a 6.3m x 5.8m internal grid to match the existing columns below, each floor is formed with a series of cellular beams that accommodate services and support a metal deck flooring system.

The use of composite cellular beams has kept the steel weight to an absolute minimum, thus limiting the additional dead load on the existing structure below, and ultimately allowing M&E services to be distributed within the structural depth of the new steel members at all levels.

Due to limited storage space on site, vehicular restrictions on member lengths and the need to minimise the weight of mechanical plant on the roof structures, it was necessary to construct the upper extension on a floor-by-floor basis.

This was sequentially constructed by means of the primary steel frame, followed by the metal deck flooring and associated concrete topping at each level. Following the adequate curing of the concrete deck at each level, the next level was subsequently constructed, up to level 15.

The steelwork for the new floors up to level 16 was completed in December 2015.

JUDGES’ COMMENT

This is a thorough and rigorous project which has been carried out with ingenuity and skill. With both painstaking analysis and inventive thought, a substantial but unloved city-centre concrete building has been enlarged upwards and horizontally by the creative use of steelwork.

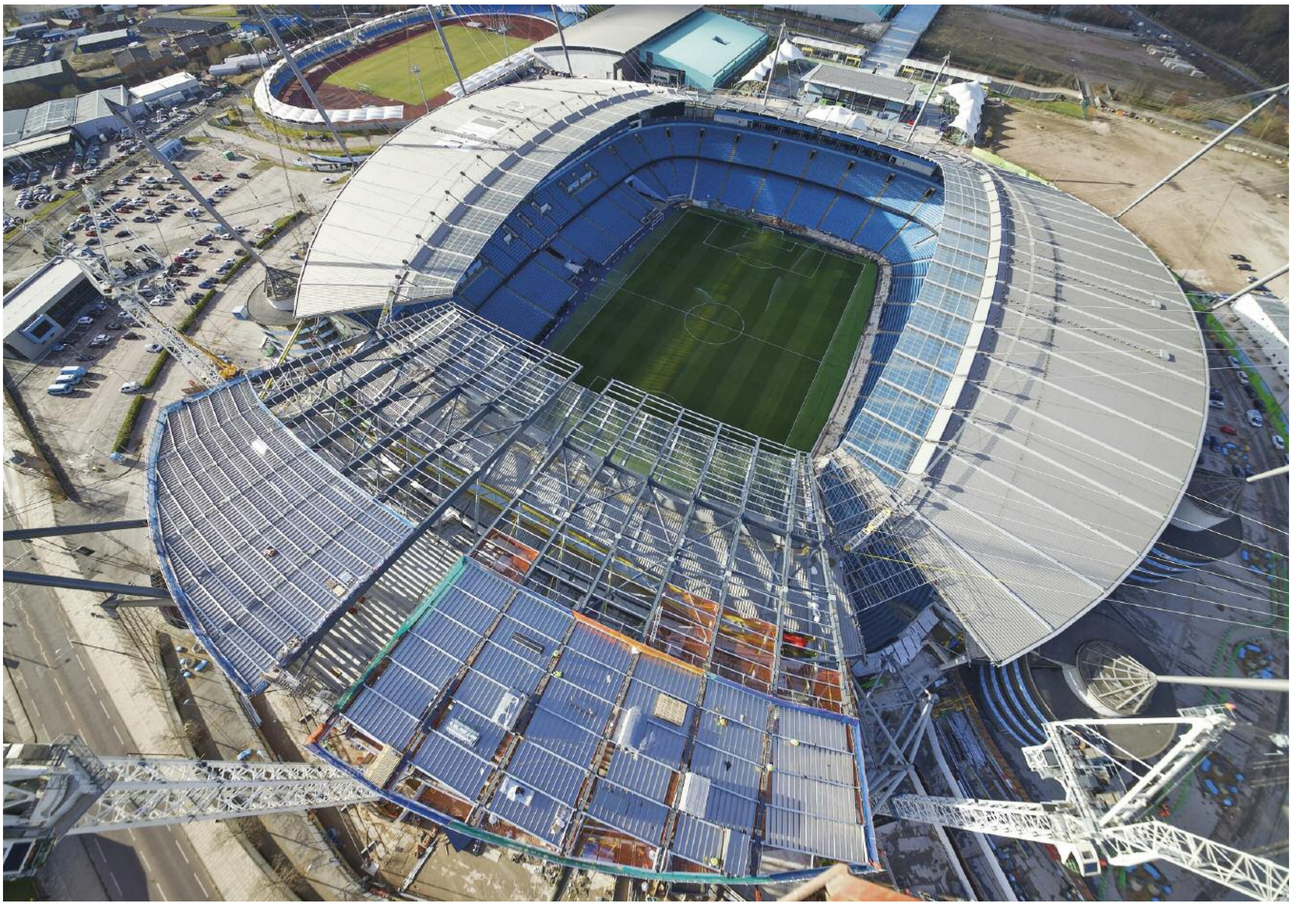
The project was technically and logistically challenging, but teamwork and a committed client have achieved a solution which is exemplary in its calm elegance.

AWARD

South Stand Expansion, Etihad Stadium

PROJECT TEAM

Architect:	Populous
Structural Engineer:	BuroHappold Engineering
Steelwork Contractor:	Severfield
Main Contractor:	Laing O'Rourke
Client:	Manchester City Football Club



The South Stand expansion increased the capacity of the stadium during the 2014/15 football season, adding 6,000 new seats through a third tier on the terraces and 1,500 additional seats around the pitch. An architecturally sympathetic extension of an existing catenary ringed structure was needed, which did not compromise the integrity or capacity of the structure and ensured that the existing stadium remained operational during works.

The design was technically complex as the existing roof involved a cable net structure with a tension ring, from which steel roof rafters hung. The structural integrity of the existing tension ring relies on it running around the whole circumference of the roof; therefore any modification to the roof could not affect this, even in areas where roof rafters were removed. Protection of the existing cable was vital as there was no repair procedure in place, and damage would result in replacement and potentially the closure of the stadium for two years.

Extensive design optimisation exercises were undertaken, particularly for the steel roof and the stability cores. A whole series of geometric studies evaluated the effects of different stay and mast angles, concluding with a solution to satisfy both minimum material requirements and cost.

The stability cores were formed of steel vertical brace planes with the inclusion of outrigger bracing to add efficiency and, although a solution normally adopted on tall buildings, this approach proved effective for the project. A design and costing study of the original stays, which were formed of cable, revealed that bars could be introduced for the new stays. These had marginally more erection work associated with them, but overall were a more efficient solution. Combined 3D modelling allowed the integration of all services within the structural envelope, including the late addition of increased sports lighting requirements in accordance with new regulations.

The project contains a number of highly bespoke details tuned to the complex geometries and design challenges, including the multi-stay connection at the top of the masts and column bases formed of spherically machined plates and rotational bearings, which allow the new design to accommodate differential movements between the new and existing structures.

An area of complexity centred on the temporary modes of the stadium. For typical stadium conversions an additional tier can be built behind the existing building and a new roof constructed over the existing roof, with little interaction between old works and new. This was not the case with Etihad as the roof profile and supports at the end stands extended further back behind the seating and the new upper tier would therefore project through the existing roof profile.

The ‘interim roof’ solution involved cutting and removing the existing back of the roof, acknowledging that this meant cutting into roof rafters which had significant locked-in forces from the dead loading of the roof. Significant and complex temporary works were required for the project, with the remodelling of the existing roof completed in the first closed season alongside temporary propping to allow work to proceed above the existing roof. The existing roof was removed in the second closed season to reveal the new terrace behind. The new design respects the geometry of the existing stadium and, whilst the expanded South Stand is significantly larger than the previous one, blends into the original design.

Examples of innovation include bespoke designed solutions such as spherical bearings, cable protection frames, an upper MEWP platform, intermediate roof propping, tie bar installation lifting beams to include remote release features and hidden bolted splices in the rafters. The availability of a CTL 1600 crane, the largest crane of its type in the country, significantly influenced the lifting methodology as it permitted much larger lifts, speeded up construction and reduced the need for working at height splicing components.

In terms of sustainability the project focussed on re-use and recycling, rather than demolition. The team worked exceptionally hard to retain the existing cable net that supports the stadium roof. Much of the original building was retained during construction and existing components from the building’s façade re-used. Steel and aluminium crowd ‘flood gates’ were cleaned, repaired and repainted and the existing lower tier terracing was re-used following careful detailing of the connections to the new building. The client also received a masterplan design which enables the stadium capacity to be expanded further to the absolute limit of the existing cable net, and then only at that point does the roof need to be completely replaced.

A risk assessment considered potential fire loadings throughout the building and established specific design criteria. Intumescent paint was used extensively to enable steel to be exposed to view and corrosion protection is to a high standard and specification.

The extension, completed within 16 months, was opened on the 16 August 2015 in front of a record crowd of 54,331 people.

JUDGES’ COMMENT

This is a complex project which added 6,000 seats above the roof at one end of an existing stadium. The work tested all facets of steelwork construction to their limits, including design, fabrication and construction.

A stunning testimony to all concerned and to the capabilities of steelwork which merges seamlessly into the existing structure.

AWARD

The Memorial Spire, International Bomber Command Centre, Lincoln

PROJECT TEAM

Architect:	Place Architecture
Structural Engineer:	s h e d
Steelwork Contractor:	S H Structures Ltd
Main Contractor:	Lindum Group Ltd
Client:	The Lincolnshire Bomber Command Memorial Trust

The International Bomber Command Centre (IBCC) is being created to provide a world-class facility to serve as a point for recognition, remembrance and reconciliation for Bomber Command. This is an ongoing project being driven by The Lincolnshire Bomber Command Memorial Trust, in partnership with the University of Lincoln, with the aim of opening the Centre in 2017.

Lincoln has been chosen as the site for the IBBC as Lincolnshire earned the title of Bomber County - it was the home of 27 operational bases which in itself was a third of the UK's Bomber Command bases.
At the heart of the IBBC is the Memorial Spire which sits majestically above the City of Lincoln and acts as a beacon marking the courage and bravery of those who served in World War II.

The architectural references are taken from the airframe and wings of an Avro Lancaster Bomber. The structure represents two wing fragments tapering towards the sky, separated by perforated plates similar to those used in the aircraft's frame construction. Further references can be found in the Spire's dimensions, standing 31.9m high this represents the same span of a Lancaster's wing and, at 5m wide at its base, is the same width of the aircraft's wing.

The Spire's orientation was carefully considered and it is placed so that visitors who walk through it will be rewarded with a framed view of Lincoln Cathedral. The Cathedral Spire was very familiar to the aircrew as it was a welcoming landmark to those who returned from their many sorties during World War II.

The facts and figures relating to the role of those young men who flew from airfields around Lincolnshire and other parts of the UK are thought provoking: 364,514 sorties flown, 3,491 aircraft lost and 25,611 aircrew losing their lives, with the average being 22 years old. To recognise the sacrifice of the aircrew the Spire is surrounded by a series of Memorial Walls. The weathering steel panels are laser cut with the names of those who lost their lives.

Steel was the obvious choice for the Spire and the weathering steel plate fulfilled all the structural and aesthetic requirements of the project. The selection of weathering steel gives the Spire a cold austere feel which, whilst not requiring applied surface treatments, will be maintenance-free throughout its lifespan.

The first part of the manufacturing process was to cut the individual plates. Using the information generated by the computer model the plates were carefully nested to minimise the overall waste of material. The external profiled plates had to be curved to create the wing-like form. This was achieved by press-braking the individual plates to the desired shape using files extracted from the 3D model.

The formed plates were built up in purpose-made jigs prior to being welded together to form the complete spire sections that would go to site as two loads. Due to the significant amount of welding, a great deal of care had to be put into the developing of the weld procedure to ensure there was no distortion in the plates, particularly along their leading edges where any defects would be most noticeable on the finished spire.

With fabrication complete the two sections of the spire were shot blasted - a process that would ensure any fabrication marks were removed and allow the structure to develop an even patina as the weathering steel gradually turned its familiar rusty colour.

On 2 October 2015 in front of an audience of 2,600 guests, including 312 Bomber Command veterans thought to be the largest gathering since 1945, the IBBC Memorial Spire was officially unveiled.

We all go about our working lives and spend time with our families and friends and it is easy to forget that the freedom we have today is thanks to those who gave so much during World War II. To be reminded about the sacrifices made by so many is a humbling experience. The Spire is a fitting memorial and, when further funding is in place, the construction of the Chadwick Centre will begin, which will house the Bomber Command archive and tell its story to future generations.

JUDGES' COMMENT

This excellent project is a fitting testament to the memory of the World War II bomber crews that flew from Lincolnshire and other parts of the UK. The architectural arrangement of the various elements has been carefully considered, taking cues from the local context. The choice of weathering steel is most successful.

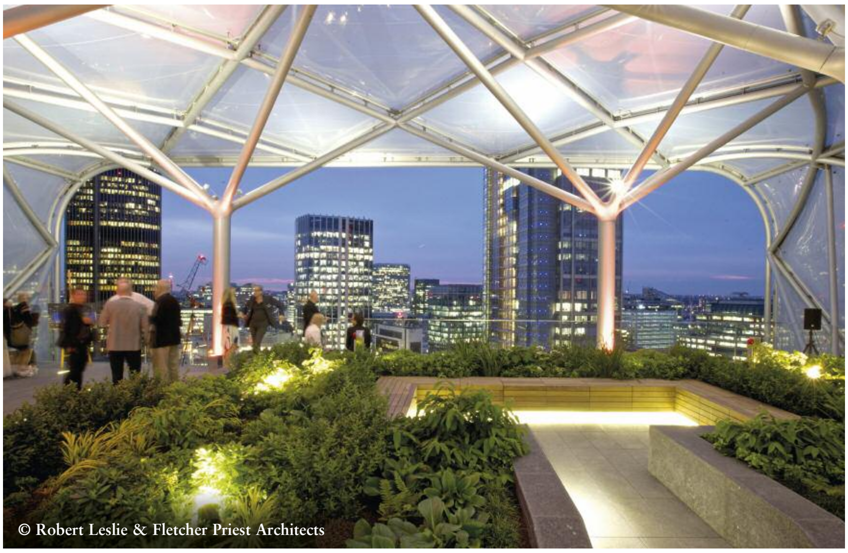
The detail design and particularly the execution of the monument are outstanding.

COMMENDATION

6 Bevis Marks Roof Garden, London

PROJECT TEAM

Architect:	Fletcher Priest Architects
Structural Engineer:	David Dexter Associates
Steelwork Contractor:	Tubecon
Main Contractor:	Skanska Construction UK Ltd
Client:	Bevis Marks Developments Ltd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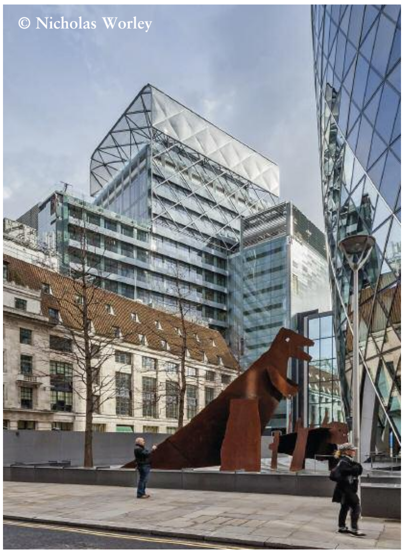
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The striking roof canopy provides all-weather protection for the 204m² sky court. The tubular steel and fritted ETFE canopy frames views out in two directions over central London, wraps up and over the garden and extends four storeys down the face of the southwest façade in a diagrid to assist solar shading.

The structure consists of a continuous CHS diagrid frame that is supported on eight tree columns which cantilever up from the main building's 16th floor steelwork. Additional struts extend from the ends of the cantilevered main building steelwork that act to restrain the clad sidewalls. Further supports are provided off the façade for the open mesh apron. The geometry of the structure is complex – the asymmetry of the support positions, that are set out based on the main building grid below, results in eight different tree columns and the roof diagrid is subtly pitched in four directions to generate falls.

Due to the number of site and structural constraints, the only feasible option was to fabricate and deliver the structure in individual pieces to be assembled and bolted together on site. However, in order to give a seamless appearance to the structure, it was vital that none of the bolted splice connections were visible.

The roof grid joints are fully welded connections formed with the help of CNC 'cods-mouth' type complex laser cuts to the ends of each CHS branch stub member. Joints in the steel diagrid were achieved using hidden 'hand-cup' type splices where bolted connections are formed within the tubes themselves.

The column branching nodes were formed from a series of fin plates welded around a central stub which, in turn, were slotted into CHS elements that form the branches. The final nodes were then clad in multi-curved nylon shrouds produced using 3D printing.

Trial erection offsite allowed the complex erection methodology to be verified and refined.

The canopy was fixed to the façade of the primary structure using architectural stainless steel pin connections and brackets. The structure was initially painted offsite with a final decorative site applied coat required to achieve the perfect finish. This was quite a challenge at the top of a 16-storey building and required the use of specialist MEWPs and rope access technicians. The final finish was a faultless light metallic sheen to complement the simple elegant nature of the structure.

JUDGES' COMMENT

The diagonal-framed steelwork and ETFE canopy is a most effective feature distinguishing this office building in a densely packed city. Challenging technical constraints were effectively resolved to provide a most desirable and popular roof garden.

Additionally, this provides an often-ignored fifth elevation of the building, as seen from the surrounding townscape heights.

COMMENDATION

Lagan Weir Pedestrian and Cycle Bridge, Belfast

PROJECT TEAM

Architect:	AECOM
Structural Engineer:	AECOM
Steelwork Contractor:	M Hasson & Sons Ltd
Main Contractor:	Graham Construction
Client:	Belfast City Council

Recognising the increasing number of users of the existing bridge connecting Donegall Quay with Queens Quay, Belfast City Council decided it was time for something wider with more capacity. After investigations on the existing 'Pier Houses', the decision was made that a primarily steel-framed footbridge would be most suitable for this scheme.

The overall length of the footbridge is 120m and it is curved both on plan and in elevation. The width also varies along the length up to 8m at the widest point. The total tonnage of structural steel for this project was c 270 tonnes.

One of the main challenges on this project was the need for a crane suitable to lift 25 tonne sections of the bridge deck at a reach of 70m, which resulted in a 1,000 tonne crane being used for the main bridge deck lifts.

The existing four 'Pier Houses' contain the controls for the daily operation of the lock gates which control the flow of the water in and out of the river Lagan. These 'Pier Houses' were to become the main support points for the new footbridge. The bridge is connected to them via four steel truss-type frames or 'trees' made from CHS sections, each of which was unique as a result of the bridge being curved in two directions.

There are nine unique deck sections, the largest being 17m long. The main framing of the deck sections were made from a combination of 610 x 229 x 101 UBs for the internal beams and 500 x 300 x 16 RHSs for the perimeter beams.

Individual bespoke 10mm thick large fin plates were welded to the RHS perimeter member to form the curved profile on plan. The deck plates are all 15mm thick and fully welded to the framing beams and act as part of the main structure.

Due to the size of the large crane it was necessary to erect all of the bridge sections as far as the halfway point from the first side before moving to the other side and repeating the process.

The completion of this bridge owes a great deal to the quality, versatility and efficiency of structural steel used with care and ingenuity. It is estimated that 16,000 people now cross this footbridge each week.

JUDGES' COMMENT

Challenging survey, design and co-ordination were required in order for the bridge to be supported from the existing 'Pier Houses' that were part of Lagan Weir. The complex fabrication and erection of the support 'trees' and bridge deck were superbly executed by the steelwork contractor.

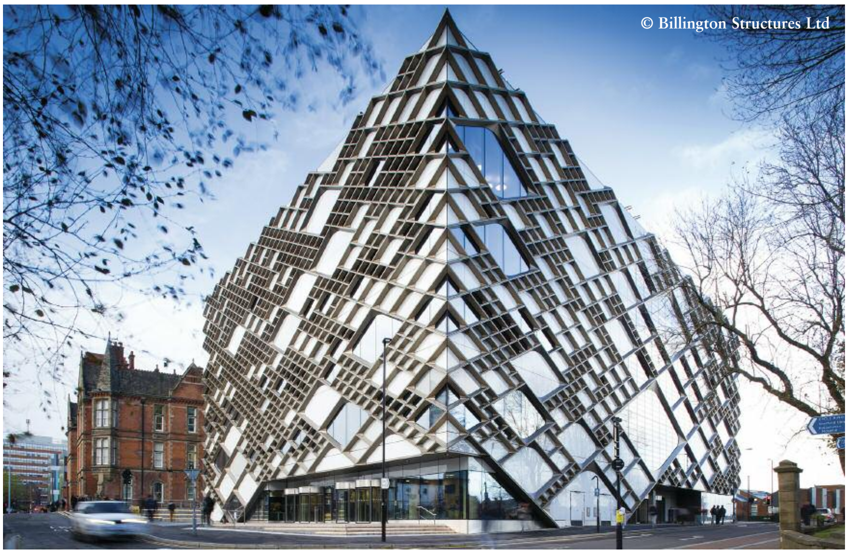
This beautifully finished and important bridge links the city centre and the Arena/Titanic area on the other side of the Lagan.

COMMENDATION

The Diamond Engineering Building, The University of Sheffield

PROJECT TEAM

Architect:	**Twelve Architects**
Structural Engineer:	**Arup**
Steelwork Contractor:	**Billington Structures Ltd**
Main Contractor:	**Balfour Beatty**
Client:	**The University of Sheffield**


© Billington Structures Ltd


Courtesy of University of Sheffield

'The Diamond' is a new Undergraduate Engineering Facility for The University of Sheffield providing specialist engineering laboratories, lecture theatres, flexible seminar rooms, open-plan learning and social spaces, a library and café.

The building's design is both conceptual and practical, as well as being sympathetic to the existing architecture of the area. Its name derives from its unique exterior façade of interconnected diamonds in anodised aluminium that are fitted to the exterior glass cladding.

With a BREEAM 'Excellent' rating the structure is environmentally efficient. The positioning of windows maximises the inflow of natural light into the laboratories, and aids ventilation without the sole reliance on air conditioning. The windows are designed to control solar gain within the building, with larger openings to the north façade and smaller panels on the south side, as well as the inclusion of well-positioned opaque panels.

The ground floor has three access points to the central atrium with full-height glazing on the north and south edges giving internal views into the specialist engineering laboratories. The glazed apertures between the higher levels allow both the roof lights and daylight to flood into the open-plan study spaces below, whilst also creating acoustic separation.

A large proportion of the structure below roof level was neither on grid nor orthogonal in set-out, but the adaptable and slender nature of steel construction lent itself to the unusual design.

The connections to the façade panels were formed using offsite shop-welded propriety studs which reduced costs significantly and saved weeks of additional construction time.

The city centre site produced several challenges and restricted access so timings for deliveries were paramount. The steel was lotted in approximately 5-10 tonne lots to arrive and be erected in numbered sequence for safety, practicality due to limited on-site storage and stability during construction. The programme also had to consider minimising the disruption to the students.

The façades had to be accessed partly from the ground and partly from the structure which resulted in numerous challenges. As such, specific MEWPs had to be selected which had a big reach but were sufficiently lightweight so as not to cause load capacity issues on certain platforms.

Numerous protection systems were specified to cater for the multitude of environmental and aesthetic requirements. Finishes provided included galvanized, zinc phosphate and multi-coloured systems to achieve those requirements whilst minimising future maintenance.

Construction work began in July 2013 and the building was successfully completed in time for the beginning of the 2015 autumn semester.

JUDGES' COMMENT

A testament to the success of this imaginatively designed university building is how well it is used by the students. Exposed steelwork elements, including an immaculate spiral staircase, contribute to the architectural language of the interior.

This well-crafted building with its excellent internal environment is bound to inspire all who use it.

COMMENDATION

Land Rover BAR America's Cup HQ Building, Portsmouth

PROJECT TEAM

Architect	HGP Architects Ltd
Structural Engineer:	Reuby & Stagg Ltd
Steelwork Contractor:	T A Colbourne Ltd
Main Contractor:	Allied Developments Ltd
Client:	Land Rover BAR

The new Headquarters Building provides the manufacturing facility for the highly sophisticated racing boats, as well as the ancillary facilities necessary to support the bid to host the America's Cup Challenge in 2021. It was also a requirement to provide a visitor centre for the involvement of the local community.

The ground floor footprint and storey height is dictated by the requirements of the manufacturing process. The architect has avoided producing a slab sided box by adopting a plan shape with the north and south elevations tapering to the curved eastern elevation, whilst the western end provides the access to the three manufacturing bays. In order to reduce the mass of the building each of the upper floorplates at first, second and third levels is of a different size and shape to the one below, providing large external terraces at each level.

A fabric façade resembling sails wraps around part of the elevations which, as well as providing architectural interest, serves the practical purpose of providing solar shading and a wind barrier, enabling natural ventilation even on days with high wind speeds.

The programme to deliver the building was extremely short with a lead-in time of only around 3.5 months from architects' pre-planning concept stage to commencing construction. Hence it was essential that as much of the building structure as possible should be manufactured offsite and delivered on an 'as required' basis.

The large clear span floor areas, some of which act as transfer structures, and the requirement to provide up to four overhead electric cranes within the ground floor area meant that the most economical solution would be a structural steel superstructure. This choice of frame material also had the advantage of minimising foundation loads as, due to below ground obstructions, pile diameters and locations were restricted.

At an early stage it was agreed to use composite cellular beams for the floor construction to accommodate services and allow flexibility in their distribution. During the design phase an area of mezzanine was added which, due to the span and limited headroom, could not be supported by a floor beam. A Vierendeel truss was introduced at high level on the line of a glazed screen and the mezzanine hung from the truss. The use of 3D modelling enabled all the various changes to be incorporated and allowed the fabrication and erection to proceed within the agreed time frame.

Despite the extremely tight programme involved the project was successfully handed over to the client on time.

JUDGES' COMMENT

The world of ocean racing is extremely highly pressurised, hence this critical building project faced very tight timetabling and last-minute client requirements. Encompassing industrial, commercial and public spaces has required varied forms of steelwork, from long-span lattice girders to well-detailed exposed structure in open areas.

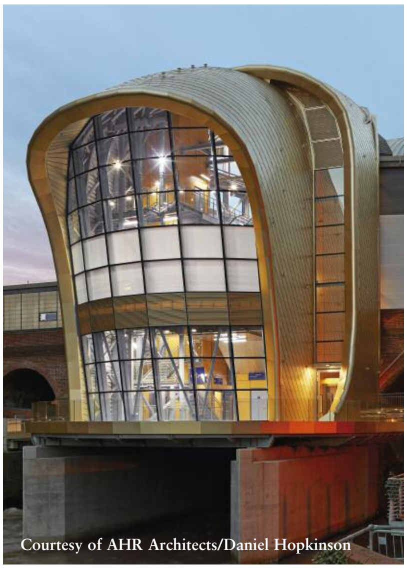
The team worked closely and effectively to produce a striking building and satisfy the client and public.

MERIT

Leeds Station Southern Entrance

PROJECT TEAM

Architect:	AHR Architects
Structural Engineer:	Mott MacDonald
Steelwork Contractor:	William Hare
Main Contractor:	Carillion Rail Ltd
Client:	Network Rail Infrastructure Ltd and West Yorkshire Combined Authority



Courtesy of AHR Architects/Daniel Hopkinson

The Leeds Station Southern Entrance (LSSE) has created a landmark structure to relieve congestion to the existing northern entrance, future-proof ticket gate line capacity and encourage growth in the south of the city by improving pedestrian access.

Located in a prominent yet challenging environment, straddling the River Aire and a busy railway, the concept design envisaged an architectural curved form, utilising glass and gold shingles to create a signature building of the highest aesthetic quality.

The project team rationalised the architectural surface into a steel diagrid structure, comprising repetitive RHS arches of known radii, connected out of plane by SHS diagonal members. This efficient solution reduced the number of radii used to form each arch by a third whilst achieving the original geometry +/-10mm. The framing solution also reduced the structural zone from 700mm to 400mm, freeing up internal space, and shared vertical load to a transfer deck whilst providing an inherently stable structure.

The shallow 600mm steel transfer deck carries the superstructure loads back to concrete piers aligned with the existing viaduct piers within the river. This was quickly erected above the river without the need for temporary works and provides the required clearance above the 1:200 year + 20% climate change flood level.

Steel construction provided the flexibility to span the new ticket concourse above the electrified railway via 25m trusses with the concourse floorplate slung beneath, and modularisation facilitated construction above the railway in 10-hour possessions without disruption to train services. Such offsite fabrication brought health and safety benefits in terms of minimising work above a river, adjacent to an operational railway and in a congested city centre.

At river deck level, access bridges and 50% of the river deck concourse have been erected within the confined space of the existing Victorian viaduct arches. This required the adoption of innovative construction techniques and the fabrication of bespoke lifting frames to hoist structural elements from barges located in the river up into the arches to tight tolerances.

Tight tolerances were also needed for the primary structure, which directly supports the cladding in lieu of a secondary support zone. The width of the building is also constrained to accommodate two lifts, four escalators and a stair within a width of only 12.5m. This resulted in a 25mm allowable erection tolerance across the building width.

Leeds station now boasts an iconic gateway, reducing journey times to the Southbank by up to 10 minutes for the estimated 20,000 people that will use the new entrance each day.

JUDGES' COMMENT

This new gateway to the station provides a route from the fast-growing south side of Leeds, relieving pressure on the busy north entrance. The structure interfaces with the existing Victorian viaduct, station roof and concourses being directly over the River Aire.

The judges were impressed by the team's planning and execution of the erection above the river and within a live station environment.

MERIT

Energy from Waste Facility, Ardley

PROJECT TEAM

Architect:	Architecture & Planning Solutions and TSP Projects
Structural Engineer:	TSP Projects
Steelwork Contractor:	Bourne Steel Ltd
Main Contractor:	Clugston Construction
Client:	Viridor

The facility has been constructed to treat 300,000 tonnes of non-recyclable waste each year, diverting at least 95% of Oxfordshire's residual municipal waste away from landfill and generating enough electricity to power 38,000 homes.

The completed building structure is up to 229m long varying from 38m to 70m wide and between 15m and 35m high. Steel was the natural choice for the main frame due to the convex and concave shapes in both plan and elevation, together with clear height and internal space requirements.

Although the structure looks like one building, internally under the cladding it is split into several zones incorporating different designs and resulting in over 2,000 tonnes of structural steelwork being used. With the processing plant taking up most of the internal areas, the use of models was crucial to make sure there were no clashes between key plant, equipment and their secondary supports and the main frame.

Within the waste bunker, cranes operate at high speeds with high acceleration and breaking forces, together with a grab swing with large pick-up loads. In this area the crane beams and all connected steel members had to be designed and fabricated to comply with Execution Class 3 requirements due to the high fatigue requirements. These areas were located on top of an 18m high concrete structure which limited access for connections to alongside one elevation only. To overcome this, a removable MEWP platform was designed and constructed to fit on the top of the concrete structure so connections could be accessed.

As the internal process plant and associated secondary steelwork for access and support were constructed in advance of the main frame enclosure, the use of modular roof assemblies, some weighing 40 tonnes, had to be used so that the 35m high roof could be infilled with steelwork to allow support for the cladding systems. These modular assemblies were installed using 800 tonne mobile cranes due to having to work over the constructed plant and metalwork areas, and also only having access along one side of the building.

The majority of steelwork was hot-dip galvanized to provide the necessary corrosion resistance and low maintenance requirements due to the difficulties in accessing the members whilst the building is in operation. Other areas, mainly accommodation areas or rooms with daily occupancy, were painted with intumescent coatings to achieve the specific fire resistance requirements.

The project was delivered on programme and to budget.

JUDGES' COMMENT

A large and highly complex industrial plant has been enclosed by an undulating structural steelwork envelope. Site logistics and difficult construction phasing resulted in great challenges to the fabrication and erection which required modularisation and bold management.

The construction above column-free spaces to such a complex timetable was impressive.

NATIONAL FINALIST

Energy from Waste Facility, Peterborough

PROJECT TEAM

Architect:	BHP Design (UK) Ltd
Structural Engineer:	MLM Consulting Engineers Ltd
Steelwork Contractor:	Severfield
Main Contractor:	Interserve & Babcock Wilcox Volund
Client:	Viridor Waste Management

The facility annually processes 85,000 tonnes of residual waste generating 7.25MW of electricity, enough to supply 15% of the homes in Peterborough, and reducing the volume of household waste sent to landfill by up to 94%.

The facility needed to be able to adapt to changing floor layouts around the main plant and it was important to minimise movement of the plant-support steelwork. An independent clear-spanning lattice steel column and lattice roof beam structure enabled maximum flexibility of the internal floorplates, and prevented the transfer of wind load to the internal plant support steelwork.

The fabrication and erection was undertaken in stages, allowing for part of the structure to be built and then large items of plant installed, before construction of the remaining building envelope.

JUDGES' COMMENT

This is an architecturally elegant and practical solution, enabled by structural steelwork. The challenge of constructing an envelope around such a complex plant is that the requirements of that plant override all others.

The successful conclusion is a tribute to the great efforts applied.

NATIONAL FINALIST

New Watford Market

PROJECT TEAM

Architect:	tp Bennett LLP
Structural Engineer:	AECOM
Steelwork Contractor:	Nationwide Structures Ltd
Main Contractor:	TSP
Client:	Watford Borough Council

With a restricted budget and a tight one year delivery schedule, using recycled shipping containers was a cost-effective way of creating an open and inviting contemporary look and feel. The canopy roof was seen as a key feature.

An independent steel frame to support the canopy has been carefully detailed and the use of elliptical hollow sections for the portal frame columns and beams is both economical and elegant.

Every steel detail has been carefully considered, with the smallest connections designed to offer a modern, sleek look. The stretched fabric is raised up in conical forms with the use of stainless steel cables acting on a central glazed ring in the centre of each cone. These 1.5m diameter rings allow natural light to stream through. The lighting design works in harmony with the canopy, using fittings that project light both up and down.

JUDGES' COMMENT

This is an inventive response to an awkwardly shaped site next to a noisy ring road with restricted access. It successfully employs a neatly detailed prefabricated tubular frame with a membrane canopy under which shipping containers provide lockable market stalls.

The new market has proved popular with traders and public alike.

NATIONAL FINALIST

University of Cambridge Primary School

PROJECT TEAM

Architect:	Marks Barfield Architects
Structural Engineer:	Parmarbrook
Steelwork Contractor:	William Haley Engineering Ltd
Main Contractor:	Willmott Dixon Construction Ltd
Client:	North West Cambridge Development, University of Cambridge

This is a new school that encompasses classrooms, group rooms, performing arts and multi-purpose halls, dining hall, library, storage facilities, kitchen, WC and changing rooms.

The Communal Block, approximately 35m x 26m on plan, comprises a steel frame with precast hollow core slabs at first floor and roof level.

The Cluster Building is a circular, single storey steel frame with lightweight roof. Its outer radius is 46m and its inner radius is 24.5m.

The Inner Canopy is a circular glazed steel canopy 2.7m wide.

By using steel an open-plan arrangement encompassing long spans with minimum depth was achieved, providing internal flexibility and future adaptability in terms of layout and wall partitioning. The weight of the superstructure was also kept to a minimum which minimised the size and depth of foundations.

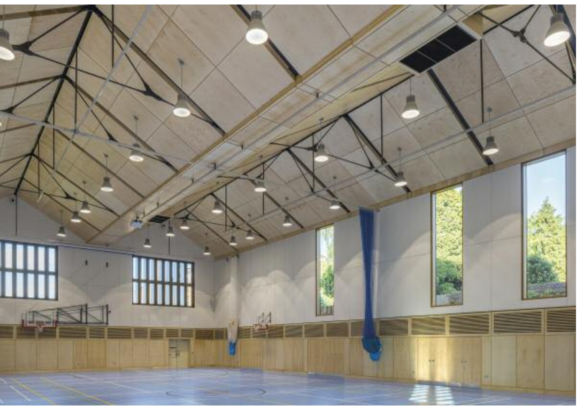
JUDGES' COMMENT

This innovatory school will form the focus of a new community on the outskirts of the city. Circular in plan and arranged around a central garden courtyard, the simple elegant steel frame achieves long-span lightweight construction despite the foundation and programme constraints.

The steelwork framing contributed to a notable completion in two years from inception.

NATIONAL FINALIST

Sports Hall and Sixth Form Centre, Channing School, London



PROJECT TEAM

Architect:	BuckleyGrayYeoman
Structural Engineer:	Heyne Tillett Steel
Steelwork Contractor:	TSI Structures Ltd
Client:	Channing School

Height restrictions for the sports hall roof, from both above and below, led to a creative double-pitched solution with no central support using four sloped steel trusses which span 34m along the length of the building.

With only a 30 degree pitch, large horizontal forces from the roof attempting to spread are resisted by a series of exposed Macalloy ties between perimeter columns and the central valley chords of the trusses. Once all roof steelwork was in place and connections fully tightened, central roof props were lowered gradually in unison.

Stability has been provided by portal action to the perimeter columns and braced bays at gable ends.

The upper floor of the sixth form centre is a clear span steel frame also tied with exposed triangulated Macalloy cables.

JUDGES' COMMENT

This project enhances sports facilities at a well-established girls' school and is on a constricted site in an historic urban context. The latter has led to brick and tile cladding, but with an intellectually elegant steel frame with carefully detailed and articulated connections.

The standard of the finished work is very high.

NATIONAL FINALIST

South Bank Tower, London

PROJECT TEAM

Architect:	Kohn Pedersen Fox Associates
Structural Engineer:	AKT II
Steelwork Contractor:	Severfield
Main Contractor:	Mace
Client:	CIT Developments LLP

The transformation of this 1970s office scheme into a landmark structure was made possible through the use of innovative design solutions that are reliant on the use of structural steel.

The existing podium floorplates have been extended with two new floors added, whilst the podium building's cores have been strategically relocated, opening out office space, promoting the ingress of natural light and encouraging a collaborative working environment. The use of a steel structure helped to minimise the loading onto existing foundations.

Within the tower the loadings from an additional 11 storeys of residential accommodation are carried through the extended core rather than the external columns, which had limited additional capacity. This was possible by hanging the new structure off the central core utilising a combination of a tension bar system and cantilevering steelwork in conjunction with lightweight concrete floor slabs.

JUDGES' COMMENT

The re-use of a redundant concrete office block for upmarket residential accommodation, with extension upwards and horizontally, led to enormous structural complexity. The merits of steelwork enable a great increase in the number of storeys, in spite of the foundation constraints.

The team worked well together to meet the tight programme and satisfy the planners and the client.

NATIONAL FINALIST

Whyke Horizon Footbridge, Chichester

PROJECT TEAM

Architect:	WilkinsonEyre
Structural Engineer:	Balfour Beatty Mott MacDonald
Steelwork Contractor:	Mabey Bridge Ltd
Main Contractor:	Interserve Construction Ltd
Client:	Highways England

The structure is a steel hybrid box girder/half-through trough. This efficient structural form gives both excellent torsional rigidity and allows the bridge to have a low overall structural depth.

The structure tapers over its length, with greatest depth at mid-span and minimal depth at each end. This form provides the structural depth where it is needed the most in the simply supported span.

Visually, the gently curved, sculpted exterior form is deliberately understated with a simple uncluttered exterior. Internal steel stiffeners define a series of gradually morphing skeletal 'ribs'. These regularly spaced 'ribs', required to stiffen the cross section, constantly change shape as one travels across the bridge.

The main bridge was installed within an 8-hour night-time closure, with ramps and stairs being erected on subsequent nights to minimise disruption to the travelling public.

JUDGES' COMMENT

Long approach ramps required complicated curved and twisted box spine beams leading to the main span. The elegant main span is formed of a cleverly shaped box section with upstand edge beams and neatly detailed post and mesh safety barriers providing a visually shallow profile.

The bridge provides a much needed safe pedestrian and cycle link across the busy A27 road.

NATIONAL FINALIST

Strabane Pedestrian and Cycle Bridge, Co Tyrone

© Peter French

PROJECT TEAM

Architect:	WYG/Doran Consulting
Structural Engineer:	AECOM
Steelwork Contractor:	S H Structures Ltd
Main Contractor:	Fox Contracts
Client:	Derry City and Strabane District Council

This landmark cable-stayed bridge crossing the River Mourne provides a crucial missing link for pedestrians and cyclists between the residential areas and schools south of the river and Strabane centre to the north.

A key feature of the inclined and curved main pylon is a wishbone-shaped pair of Vierendeel trusses that stiffen the top of the arch in this zone of highly focussed loading.

The designed profile of the pylon legs was parabolic. This shape was approximated during fabrication by three constant radii, with a discrepancy in geometry of less than 10mm, making fabrication of the pylon more efficient and cost-effective. Offsite fabrication produced a polished, precision-fabricated structure with the desired aesthetic qualities, as well as minimising site activities.

The installation of the mast required two large mobile cranes to safely carry out a critical and complex tandem lift.

JUDGES' COMMENT

This bridge provides a key link between the town centre and the residential and sports areas to the south. The cable-stayed bridge cleverly cantilevers from the south side, minimising the impact of foundations on the north end with its busy roads and critical infrastructure services.

A striking steelwork project.

NATIONAL FINALIST

Information Age Gallery, The Science Museum, London

PROJECT TEAM

Architect:	Universal Design Studio
Structural Engineer:	Heyne Tillett Steel
Steelwork Contractor:	Ermine Engineering
Main Contractor:	Parkeray
Client:	The Science Museum

The key structural element in the new Information Age Gallery is a raised elliptical walkway which runs throughout the gallery and bridges the spaces in between six interactive 'story boxed' zones.

Primary support is provided via these steel-framed 'story boxes' and additional intermediate supports off existing columns, with seemingly invisible connections giving the illusion of the walkway piercing uninterruptedly through the pods.

The deck comprises a simple curved box 'spine beam' with regularly spaced cantilevering 'ribs' at either side, which was well equipped to handle torsion generated by the plan curves and eccentric column supports.

The walkway was delivered as a series of 6.2m long cassettes with the cantilevering 'arms and glass balustrade supporting edge members pre-welded to the 'spine' offsite. These were lifted into position using spider cranes and connected via full strength butt welds.

JUDGES' COMMENT

This imaginative design which achieves its supports from existing columns has been carefully detailed, assembled and installed into a highly constrained existing gallery space.

The merits of steelwork and the close collaboration between the designers, contractors and an informed client have all contributed to success.

NATIONAL FINALIST

Kiosk and Shelter, Bournemouth Pier Approach

PROJECT TEAM

Architect:	Poynton Bradbury Wynter Cole Architects Ltd
Structural Engineer:	Hydrock
Steelwork Contractor:	Weldrite Structures Ltd
Main Contractor:	Willmott Dixon Construction Ltd
Client:	Bournemouth Borough Council

The ‘leaf’ structures provide a visitor information centre and a shelter in the centre of Pier Approach on Bournemouth’s seafront.

Two identical structural forms were conceived - one open to provide shelter and performance space, the other enclosed by an elegant glass structure to create an information centre. Structurally a leaf is a natural cantilever, with a singular ‘stalk’ (cantilever box-girder column) supporting the ‘veins’ (cantilever beams) which reach out to support the surface (roof).

Structure is provided only where necessary. Not only does the structure taper down from root to tip, but the steel plate sections within each box-girder cantilever and reduce in thickness. This saves material and mass, resulting in a highly efficient construction. In addition, a discrete cantilever prop was added to the kiosk in order to further reduce the work required by the cantilever and its foundations.

JUDGES’ COMMENT

Two cantilevered leaf-form canopies focus attention on the pier approach. One provides welcome shade to the public whilst the other has been enclosed for a tourist office.

The steelwork is neatly made and provides models for further regeneration of Bournemouth’s seafront.

The Structural Steel Design Awards Scheme

2017 ENTRY FORM

The British Constructional Steelwork Association Ltd and Steel for Life have pleasure in inviting entries for the 2017 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 efficiency, cost-effectiveness, aesthetics and innovation.

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 2015-2016; previous entries are not eligible.

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, particularly cost-effectiveness
- Environmental impact
- Architectural excellence
- Durability
- Adaptability for changing requirements through its life
- Efficiency of the use and provision of services
- Conservation of energy

Structural Engineering

- Benefits achieved by using steel construction
- Efficiency of design, fabrication and erection
- Skill and workmanship
- Integration of structure and services to meet architectural requirements
- Efficiency and effectiveness of fire and corrosion protection
- Innovation of design, build and manufacturing technique

SUBMISSION OF ENTRIES

Entries, exhibiting a predominant use of steel and satisfying the conditions above, should be made under the categories listed below:

- Leisure (including sports)
- Residential
- Traffic bridge
- Footbridge
- Other (sculptures etc)
- Commercial
- Industrial
- Retail
- Education
- Healthcare

Any member of the design team may submit an entry 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.

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 short list 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.

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.

AWARDS

Each firm of architects and structural engineers responsible for the design receive an award as do the steelwork contractor, main contractor and client.

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.

FURTHER DETAILS

All correspondence regarding the submission of entries should be addressed to:

Gillian Mitchell MBE,
BCSA,
Unit 4 Hayfield Business Park,
Field Land, Auckley,
Doncaster DN9 3FL

Tel: 020 7747 8121
Email: gillian.mitchell@steelconstruction.org

CLOSING DATE FOR ENTRIES
Friday 24th February 2017

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

2017 ENTRY FORM

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 (£): ....

Category under which entry is made:

- ☐ Commercial
- ☐ Industrial
- ☐ Retail
- ☐ Education
- ☐ Healthcare
- ☐ Leisure/sports
- ☐ Residential
- ☐ Traffic bridge
- ☐ Footbridge
- ☐ Other (sculptures etc)

DECLARATION OF ELIGIBILITY

As the representative of the organisation entering this structure in the Structural Steel Design Awards 2017, I declare that this steel-based structure has been fabricated by a UK or Irish steelwork contractor. It was completed during the calendar years 2015-2016. It has not been previously entered for this Awards Scheme.

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

On behalf of: ....

SUBMISSION MATERIAL

The submission material should include:

- **Completed entry form**
- **Description of the outstanding features of the structure (c 1,000 words), addressing the key criteria listed overleaf, together with the relevant cost data if available**
- **Architectural site plan**
- **Not more than six unmounted drawings (eg. plans, sections, elevations, isometrics) illustrating the essential features of significance in relation to the use of steel**
- **Six different unmounted colour photographs which should include both construction phase and finished images**
- **Memory stick containing the images submitted as digital JPEG files at 300dpi A5 size minimum and an electronic copy of description text in Word (not pdf format)**

ARCHITECT

Company Name: ....

Address: ....

....

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

Email: ....

STRUCTURAL ENGINEER RESPONSIBLE FOR DESIGN

Company Name: ....

Address: ....

....

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

Email: ....

STEELWORK CONTRACTOR

Company Name: ....

Address: ....

....

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

Email: ....

MAIN CONTRACTOR

Company Name: ....

Address: ....

....

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

Email: ....

CLIENT

Company Name: ....

Address: ....

....

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

Email: ....

PERSON SUBMITTING THIS ENTRY

Name: ....

Tel: ....

Email: ....

Entry material should be sent to:
Gillian Mitchell MBE, BCSA, Unit 4 Hayfield Business Park, Field Land, Auckley, Doncaster DN9 3FL to arrive by not later than 24th Feb 2017

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