www.newsteelconstruction.com

NSC

Raising Guildford retail

May 2017
Vol 25 No 5

Leisure on the rise

Just the ticket for Crossrail

Steel sets the standard at Heathrow

New bridge link for Manchester rail

STRONGER THAN STEEL

ROBUST SHOT BLASTING SYSTEM

MACHINE WIDTHS FROM 1500 MM
TO 4200 MM FOR ANY SIZE SHOP

HIGH PERFORMANCE SINGLE DISK TURBINES

BUILT WITH TOUGH MANGANESE STEEL

www.peddinghaus.com/uk/peddiblast

Peddinghaus

www.peddinghaus.com | info@peddinghaus.com | +44 1952 200 377

Cover Image
Moberly Leisure Centre and
Prime Place, Kensal Rise, London
Main client: Westminster City Council / Prime Place
Architect: Roberts Limbrick
Main contractor: Willmott Dixon
Structural engineer: AECOM
Steelwork contractor: Mifflin Construction
Steel tonnage: 3,000t

May 2017
Vol 25 No 5

EDITOR
Nick Barrett Tel: 01323 422483
nick@newsteelconstruction.com

DEPUTY EDITOR
Martin Cooper Tel: 01892 538191
martin@newsteelconstruction.com

PRODUCTION EDITOR
Andrew Pilcher Tel: 01892 553147
admin@newsteelconstruction.com

PRODUCTION ASSISTANT
Alastair Lloyd Tel: 01892 553145
alastair@barrett-byrd.com

COMMERCIAL MANAGER
Fawad Minhas Tel: 01892 553149
fawad@newsteelconstruction.com

NSC IS PRODUCED BY BARRETT BYRD ASSOCIATES ON BEHALF OF THE BRITISH CONSTRUCTIONAL STEELWORK ASSOCIATION AND STEEL FOR LIFE IN ASSOCIATION WITH THE STEEL CONSTRUCTION INSTITUTE

The British Constructional Steelwork Association Ltd
4 Whitehall Court, Westminster, London SW1A 2ES
Telephone 020 7839 8566
Website *www.steelconstruction.org*
Email *postroom@steelconstruction.org*

Steel for Life Ltd
4 Whitehall Court, Westminster, London SW1A 2ES
Telephone 020 7839 8566
Website *www.steelforlife.org*
Email *steelforlife@steelconstruction.org*

The Steel Construction Institute
Silwood Park, Ascot, Berkshire SL5 7QN
Telephone 01344 636525 Fax 01344 636570
Website *www.steel-sci.com*
Email *reception@steel-sci.com*

CONTRACT PUBLISHER & ADVERTISING SALES
Barrett, Byrd Associates
7 Linden Close,
Tunbridge Wells, Kent TN4 8HH
Telephone 01892 524455
Website *www.barrett-byrd.com*

These and other steelwork articles can be downloaded from the New Steel Construction Website at *www.newsteelconstruction.com*

5 **Editor's comment** Editor Nick Barrett welcomes a new series of guides on the highly important matter of costs.

6 **News** The first of a new series of steel cost guidance articles is now available.

10 **Sector Focus: Light Gauge Steel** This issue's Steel for Life Sector Focus looks at the benefits of light gauge steelwork .

12 **Retail** Guildford's upmarket retail offering is set to be given a major boost when the refurbished Tunsgate Quarter opens later this year.

14 **Commercial** Another steel-framed office block has been added to Heathrow's World Business Centre.

16 **Transport** Steelwork is helping to maximise the useable space being created above London's Crossrail assets.

18 **Leisure/Residential** A new leisure centre in Kensal Rise, London supports a rooftop residential scheme.

22 **Bridges** Manchester's Ordsall Chord railway scheme incorporates nine steel bridges.

24 **Technical** Richard Henderson of the SCI discusses the evolution of Building Consequence Classes.

28 **Advisory Desk** AD 407 – Section Classification.

29 **Codes & Standards**

30 **50 Years Ago** Our look back through the pages of *Building with Steel* features a warehouse in Swindon for W. H. Smith.

32 **BCSA Members**

34 **Register of Qualified Steelwork Contractors for Bridgeworks**

The Tipo G31 - heralds the dawn of a new era in the processing of heavy plate

This is the new technologically advanced, gantry CNC Machining Centre for drilling, milling, marking, scribing, tapping, chamfering and cutting of heavy steel plates up to 100mm thick x 3100mm in width

The Tipo G31 system is one of the most productive and versatile lines currently available for manufacturers of heavy structural steelwork, agricultural, earth moving and mining equipment who are looking to maximise productivity, minimise production costs and increase accuracy when processing large, heavy plate.
It can be equipped with dual spindles with independent sub axis which increase the productivity over single spindle lines by approximately 40%.
The dual spindles can drill, mill and scribe simultaneously even if the holes are not in line - and up to 24 tools can be available for each spindle.
The integrated hold down facility keeps the plate secure during processing, avoiding vibrations that could otherwise compromise the part quality, accuracy and tool life.
In addition to the drilling heads, the Tipo G can also be equipped with a maximum of two plasma torches (straight or bevel) and a maximum of three oxycutting torches.

For more details on how this innovative, small footprint machine can help you to maximise productivity and profitability call - **01924 223530**, e-mail **info@ficep.co.uk** or visit our website at **www.ficep.co.uk**

FICEP UK
STEEL THINKING

STEEL for life SPONSOR

FICEP UK Ltd., 3 Gilcar Way, Valencia Park, Wakefield Europort, Normanton WF10 5QS, UK.

Steel shines under costs spotlight

Nick Barrett - Editor

Market demands can frequently change, placing a different emphasis on the various features of buildings and other structures such as long spans, curving and sustainability. While steel construction most frequently turns out to offer the best solution, a constant market requirement is cost; with cost studies consistently demonstrating steel's ongoing cost benefits compared to the alternatives.

Producing any cost analysis requires relevant background knowledge, so for some years the steel sector - always responsive to requests from construction professionals - has provided all the guidance needed for a robust cost analysis. A new and invigorated quarterly series of studies is now being produced (see News) called 'Costing Steelwork', by Aecom, the BCSA and Steel for Life.

Studies have consistently shown that steel frames have cost advantages over alternative framing solutions and deliver substantial cost benefits from features like being able to use lighter foundations, speedier construction programmes, providing spaces uninterrupted by intermediate columns, adaptability in line with changing occupier needs and offsite manufacture. On multi-storey buildings, integrating the services within the structural floor zone can reduce the overall building height or allow extra floors to be accommodated in the same building height. Little surprise then that steel frames around 70% of multi-storey buildings as well as 90% or more of single storey non-residential buildings.

The new series starts this month with a focus on steel-framed office buildings. Later studies will look at education, mixed-use, retail and industrial buildings. This first study describes the process of cost planning throughout the design stages, identifying the key cost drivers. A detailed cost model based on an actual office building is provided.

A cost comparison on this steel-framed ten-storey grade A office building in central London that was built in 2008 shows steel delivering a 7% cost advantage over a post-tensioned concrete flat slab alternative in terms of the frame and upper floors, and a 5% cheaper total building cost.

The embodied carbon content of this office development on a cradle-to-cradle basis showed steel also delivering an advantage of 11% less carbon compared to the concrete alternative.

There is also a market update on input costs with this quarter's 'Costing Steelwork', which shows input costs for all industries rising at their fastest rate since 2008 according to government figures. There were significant changes for building materials in the last quarter of 2016 although the pace of growth in prices is expected to slow over the next two years and lower UK construction output will put downward pressure on prices. Aecom expects tender prices to rise 3.2% over a year from the last quarter of 2016.

Against a background of rising tender prices the focus on cost is unlikely to ease, so this new series will be eagerly welcomed.

Comprehensive steel cost guidance now available

The first of a new series of structural steelwork cost guidance articles from AECOM, the British Constructional Steelwork Association and Steel for Life has been published and is now available at: *http://www.steelconstruction.info/Steel_construction_news*

Entitled 'Costing Steelwork' the series of articles provides guidance on the key elements of costing structural steelwork.

Published every quarter, they will examine the key cost drivers for different sectors, provide a building type specific cost comparison and include a cost table with indicative cost ranges for various frame types.

These cost ranges can be used to act as a comparative cost benchmark. Subsequent articles will include cost comparison updates for each sector to ensure the cost data remains current.

In the first article's cost comparison, the 10-storey One Kingdom Street project in Paddington, west London (pictured) is examined. This grade A office building was originally part of the Target Zero study, which provided guidance on the design and construction of sustainable low and zero carbon buildings.

The updated cost comparison for this project shows that a steel composite solution was 7% lower than a post-tensioned concrete flat slab alternative in terms of the frame and upper floors, and 5% lower on a total building basis.

Over time the cost guidance series will comprise studies into commercial, education, mixed-use, retail and industrial buildings. Each article will also examine the process of cost planning throughout the design stages, and provide a market update on tender price trends.

FICEP launches new steel plate processing machine

Italian steel processing equipment manufacturer FICEP has launched the Tipo G31 CNC machining centre. It is said to be ideal for drilling, milling, marking, scribing, tapping, chamfering and cutting of heavy steel plates up to 100mm thick × 3,100mm in width.

FICEP says the Tipo G31 system is one of the most productive and versatile machines currently available for fabricators of heavy structural steelwork who are looking to maximise productivity, minimise production costs and increase accuracy when processing large heavy steel plate.

The new machine can be equipped with dual spindles with independent sub axis, which is said to increase the productivity over single spindle lines by approximately 40%.

The dual spindles can drill, mill and scribe simultaneously even if the holes are not in line – and up to 24 tools can be available for each spindle.

The Tipo G31 features a double bridge structure with the spindle or spindles located within the two bridges to maximise spindle guidance and rigidity.

Steel-framed hospital for former BBC Pebble Mill site

Lincoln-based Simons Group has won a £21.85M contract to deliver a new private hospital in Birmingham for Circle Health.

The steel-framed facility will provide a large-scale rehabilitation service and will be built on the former BBC Pebble Mill site in the heart of Edgbaston's world-renowned Medical Quarter.

The hospital is based on a flexible model, which can be adapted and expanded to meet clinical demand now and in the future. The project will be constructed over 77 weeks and includes separate consultant, clinical and hospitality functions in three distinct wings, with all departments accessed from a central atrium.

The clinical wing will contain three operating theatres, an endoscopy suite, recovery bays and a diagnostic imaging department. The main reception will be housed in the hospitality wing which offers restaurant and café areas.

Administration and staff areas are located on the first floor and an inpatients ward, with 19 single en suite bedrooms, on the second floor. The consultation wing includes 10 consultant rooms, a minor operations and treatment area along with physiotherapy and multi-activity areas.

SCCS achieves revised ISO 9001 standard

Following a UKAS assessment, the Steel Construction Certification Scheme (SCCS) has successfully transitioned to the revised BS EN ISO 9001:2015 standard.

The standard has been updated from the previous 2008 version because it is recognised that business has changed radically. Geographical boundaries are almost insignificant in today's global economy, supply chains are increasingly complex and the information companies have to manage has multiplied exponentially.

To ensure that ISO 9001 continues to serve the business community and maintain its relevance in today's market place, the standard has been revised to address these changes.

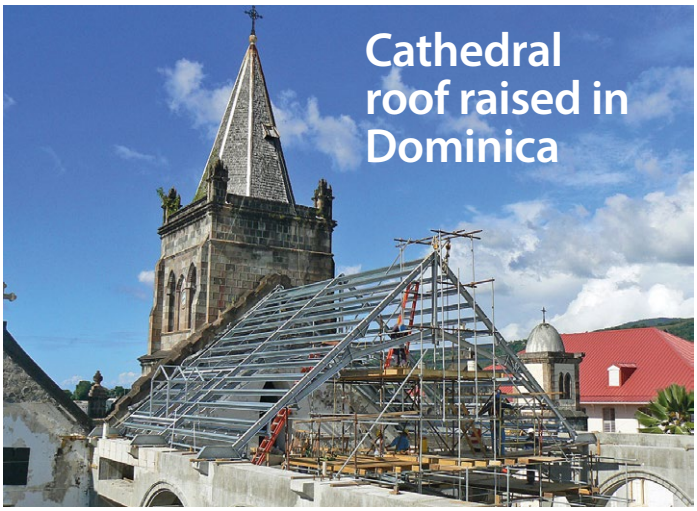
"For the SCCS to achieve this transition is a significant milestone," said SCCS Certification Scheme Manager Stephen Blackman.

"William Hare is the first of our 170 ISO 9001clients to achieve certification to the revised standard through SCCS. Companies have until September 2018 to achieve certification to the revised standard."

The SCCS is a wholly-owned subsidiary of the British Constructional Steelwork Association. It was established in the early 1980s to provide a Quality Management Systems certification service for steelwork contracting organisations.

SCCS now offers additional certification and monitoring services for the structural steelwork sector, including integrated or separate Environmental and Health & Safety management systems, Factory Production Control systems and selected National Highways Sector Schemes.

For more information about SCCS go to *https://www.steelconstruction.org/steel-construction-certificate-scheme-sccs/*



Cathedral roof raised in Dominica

A hurricane resistant steel roof structure has been manufactured and erected by REIDsteel for the renovation of a historic cathedral in the Caribbean.

The Dorset-based company has completed the work as part of the project to breathe new life into the Lady of Fair Haven Cathedral in Roseau, the capital of Dominica.

The Roman Catholic Community, under the leadership of Gabriel Malzaire, Bishop of Roseau, is spearheading the scheme to restore the iconic building for worshippers and the community after it suffered hurricane damage.

REIDsteel carried out the structural design, drawing work and fabrication of the roof's 60t steel frame, purlins and ceiling supports – all at its site in Christchurch. It then arranged for shipment to the Caribbean island.

REIDsteel Project Engineer Richard Hanson said: "The placement of the steelwork for the new roof was a landmark moment in the long-running renovation of the cathedral.

"It was an unusual project as our structure is fixed on top of the reconstructed reinforced concrete columns and arches of the original Cathedral.

"The accurate survey work provided by the Diocesan Engineer, Bernard Lauwyck, helped us overcome the tolerance differences between a steel frame and a traditional masonry/concrete construction.

"Because of its complexity, we manufactured all of the steelwork in Dorset. The new roof will be hurricane resilient and will help the community reclaim its much-cherished cathedral."

The new roof frame includes 44t of galvanized structural steel and 15t of steel purlins and ceiling supports.

REIDsteel has worked on a total of 17 buildings in Dominica in recent years, including three churches, a supermarket and several commercial properties.

Steel up for Midlothian community asset

More than 1,100t of structural steelwork has been erected for the Newbattle Centre in the former mining town of Easthouses, Midlothian.

The project consists of a state-of-the-art community hub and high school, all accommodated within a 15,714m² steel-framed complex.

Replacing an existing school, the Centre will provide a range of facilities to be shared between the school and the local community.

As well as a three-storey teaching block, the Newbattle Centre includes a library, fitness centre and gym, a 25m six-lane swimming pool, a sports hall and outdoor all-weather pitches.

The building is being delivered by Midlothian Council's development partner, hub South East, and its appointed contractor Morrison Construction. Hescott Engineering fabricated, supplied and erected the project's steelwork.

Designed by Cooper Cromar, the £30M project is expected to open in 2018 and will accommodate up to 1,200 pupils.

NEWS IN BRIEF

Kloeckner Metals UK/Westok has released version 10.3 of its cellbeam software package. New features include Eurocode design to EN 1993 and 1994 and enhanced deflection analysis using the stiffness matrix method. The company recommends all users of cellbeams to upgrade to V10.3.

Cheshire East Council has unveiled a future vision for Crewe that seeks to bring 37,000 new jobs to the town by 2043. The master plan will encompass 590,000m² of commercial development, and create 37,000 new jobs by 2043, reflecting one of the prime locations at the heart of the UK and HS2 rail network.

A £140M film studio complex on the outskirts of Edinburgh has been given the go-ahead by the Scottish Government. The decision by ministers overturns an earlier recommendation from the Scottish Government that the **Pentland Studios Project** should be rejected as it will be built on a green belt site at Straiton.

London City Hall has given the green light to German supermarket chain **Lidl**'s plans to build a £70M headquarters in Tolworth, south west London. The Mayor of London, Sadiq Khan, has approved the plans for the company to build a new base at the former site of the Hook Venturer Sports Club, in Jubilee Way.

Tata Steel has partnered with the Steel Construction Institute (SCI) to produce a brand new revised version of their **Blue Book** software tool for use in the design of structures using hollow sections. It is available now via: *http://tatasteelbluebook.com/*

AROUND THE PRESS

Construction News

28 April 2017

Galliford prepares Arena for HSBC

Across the scheme the project team took the decision to standardise the steel frame as much as possible, helping to simplify the job for the frame contractor. By using just one 600 x 600 x 40mm steel section size for the beams, the team lessened the number of difficult connection details.

Building Magazine

28 April 2017

Costing Steelwork

The analysis shows that the cost of the steel composite solution was 7% lower than the post-tensioned concrete flat slab alternative in terms of the frame and upper floors, and 5% lower on a total building basis.

Building Magazine

28 April 2017

Notes from a small island

[Tristan da Cunha health centre] - The building is supported on a grillage of galvanized steel beams [designed to resist seismic loads] which stands on precast concrete pads [also shipped to the island].

Construction News

7 April 2017

Mammoth hospital job links old and new

[Sunderland Royal Hospital] – Willmott Dixon built a steel-frame two-storey building - which was designed with flexibility in mind.

First office building for Jersey finance centre completes

The first steel-framed office building at the International Finance Centre in Jersey has been completed.

Known as IFC1, the building has been described as a world-class business hub providing 6,300m² of high-quality Grade A office space in the heart of St Helier.

The development by the States of Jersey Development Company was designed by MJP Architects, with Camerons acting as main contractor and Waterman providing structural engineering design.

Elland Steel Structures fabricated, supplied and erected 600t of structural steelwork for the project.

IFC1 has been completed as part of the overall master plan that will deliver 43,600m² of office space across six stand-alone steel-framed buildings with private car parking spaces beneath the buildings and 520 public parking spaces on three levels below a public park.

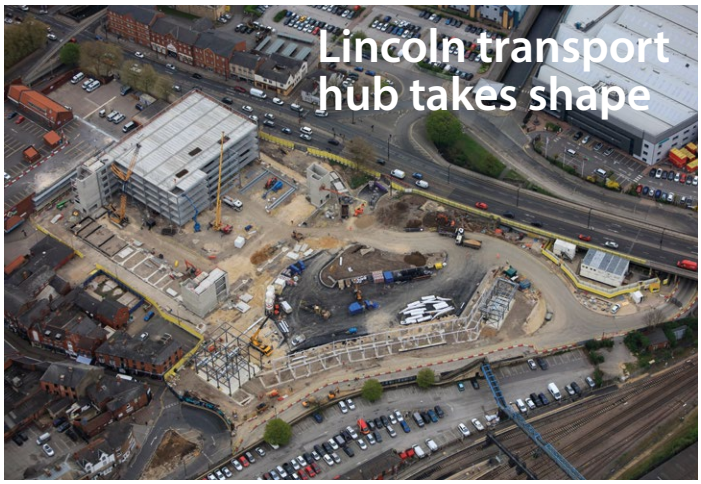
"Using steelwork allowed us to design a building with the required column-free spaces, as well as providing an integrated solution for all of the services within the steelwork's depth," explained Richard Whitehead, Regional Director of Waterman Structures.

IFC1 will be one of the first buildings in the Channel Islands to achieve a BREEAM 'Excellent' rating. Its carbon performance will be 19% better than the minimum requirement with 20% reduction in energy by using low and zero carbon technologies, including air source heat pumps. The offices have also been designed to use the latest low energy LED lighting with daylight dimming control.

The construction of the remaining buildings has been split into phases and is being delivered on a building by building basis in response to demand.

The IFC2 building is currently under construction with completion set for early 2018.

Lincoln transport hub takes shape



Creating a new passenger gateway for the city of Lincoln, a new transport hub is under construction adjacent to the main railway station.

Providing a state-of-the-art bus station, a 1,000-space multi-storey car park, retail space and a new pedestrian plaza, the scheme will also act as a catalyst for further regeneration schemes in Lincoln.

Working on a design and build contract for main contractor Willmott Dixon, Caunton Engineering is currently erecting the car park.

Based around a 15m × 8m grid pattern, the braced structure's steelwork supports precast slabs.

Steel wins at BCO awards 2017

Steel-framed projects have been named as regional winners of the British Council for Offices [BCO] awards 2017.

The new headquarters building in Wrexham for UK telephone answering service and outsourced switchboard company, Moneypenny (pictured), won the Corporate Workplace award for the North of England, North Wales and Northern Ireland region.

Working on behalf of main contractor Pochin Construction, EvadX erected more than 700t of steel for this project.

Chemical giants INEOS Olefins & Polymers' new steel-framed Grangemouth headquarters won the Scotland region's Corporate Workplace award.

Utilising 950t of structural steelwork supplied and erected by BHC, the 6,500m² building provides high quality open-plan office space over four floors and includes meeting rooms, conference facilities and kitchens located on the ground floor.

The Commercial Workspace award for London went to 8 Finsbury Circus. William Hare erected 2,000t of steelwork for this job.

The development was praised by the judges as a delightful new office building, which maximises the development potential of a very difficult site, while respecting the surrounding heritage.

The BCO's mission is to research, develop and communicate best practice in all aspects of the office sector. It delivers this by providing a forum for the discussion and debate of relevant issues.

Established in 1990, the BCO is Britain's leading forum for the discussion and debate of issues affecting the office sector.

Rochdale town centre development approved

Town councillors have approved plans for a multi-million pound shopping and leisure development in the heart of Rochdale.

Phase one of the scheme will be in excess of 18,500m², and will bring around 24 shops, restaurants and a new cinema into the town centre.

Next, Reel Cinemas and M&S have already signed up to the development, which will also have 340 parking spaces.

The scheme, which is being led by Genr8, in partnership with Kajima and Rochdale Borough Council, is a key part of a £250M regeneration package which has transformed Rochdale town centre since 2011.

The extension of the Metrolink to the heart of the town centre, the re-opening of the River Roch, the opening of a sixth form college and the new transport interchange are all part of the £250M programme, which the latest scheme will complete.

Cllr Richard Farnell, leader of Rochdale Borough Council, said: "This is yet more progress for this important development which will bring high street names that are not currently represented in Rochdale, as well as thriving restaurants and a cinema, which will create a fantastic destination for our residents and visitors.

"It will also boost our local economy by more than £17m and create around 1,000 jobs."

Work is expected to start on the site this autumn.

UK's last deep coal mine to become business park

Developer Harworth Group has secured the resolution to grant planning consent from Selby District Council to redevelop the former Kellingley Colliery site in North Yorkshire.

The development, which has good transport links, will provide up to 134,000m² of manufacturing and distribution space.

The colliery was the last deep coal mine in the UK and closed in December 2015. Harworth took control of the site in March 2016, and says it wants to return it back to beneficial use to replace the jobs lost when mining ended.

Harworth has spent the last 12 months undertaking site safety and security works, including demolishing redundant industrial structures, alongside master planning Kellingley for future employment uses.

Harworth Group Chief Executive Owen Michaelson said: "We're delighted to have received the support of Selby District Council for our scheme that will make a significant contribution to Yorkshire's economy.

"We're fully committed to creating a first-class commercial centre that is likely to provide at least several hundred jobs in accordance with local planning policy, replacing the jobs lost when the Colliery closed its doors in 2015."

Leader of Selby District Council, Councillor Mark Crane, added: "This is a key development site for our district and crucial for the delivery of our Economic Development Strategy.

New football stadium for Leamington

Plans for a new community stadium for Leamington Football Club have been approved by Warwick District Council.

The local authority has agreed to buy the land near Leamington Spa town centre for the development of a new 5,000-capacity football stadium. Leamington FC, nicknamed the Brakes, currently play in the Southern League Premier Division.

The council will now undertake a detailed study of the options for the new sports and community hub for the area, which could also include a new primary school, community hall and medical centre.

Councillors also gave the go-ahead for Warwick District Council to acquire Leamington's current Harbury Lane ground which has been identified as a possible location for a gypsy and traveller site.

District council leader Andrew Mobbs said: "These exciting and ambitious plans, will not only help to secure the future of our local football club, but have the potential to bring a new focal point for the community with huge benefits for the health, fitness and well-being of our residents."

Leamington FC's chairman, Jim Scott said: "Leamington FC very much welcomes this key step forward. A new stadium with improved access and facilities will help us fulfil our aspirations to move into higher leagues."

Diary

For SCI events contact Jane Burrell, tel: 01344 636500 email: *education@steel-sci.com*

Tuesday 23 & Wednesday 24 May 2017
Essential Steelwork Design - 2 days
This 2-day course introduces the concepts and principles of steel building design to EC3.
Cardiff.

Tuesday 30 May 2017
VBA – the power behind Excel
This 1 hour webinar will explore the opportunities that VBA provides for Engineers.
Available to BCSA and SCI Members only.
Repeated: **Wednesday 31 May 2017**

Tuesday 6 June 2017
Steel building to EC3
This course will introduce experienced steel designers to the Eurocode provisions for steel design.
Nottingham.

Monday 19 June 2017
Fire Design of Beams and Columns
This webinar will cover design methods for fire protection, and how free design tools can simplify the process. Available to Corporate and Sole Trader Members only.
Repeated **Tuesday 20 June 2017**

An introduction to light gauge steel

Whether it is purlins, side rails, walling, composite panels or built up cladding solutions, light gauge steel products are utilised across multiple building sectors.

Light gauge steel products are known to offer a range of construction related benefits most notably; speed of construction, cost-effectiveness and safety. They are also popular due to the products' unique lightweight characteristic which makes them easy and safe to handle both during fabrication and construction.

William Worthington, Metframe Sales Manager, Metsec, said: "The general interest in offsite construction is at an all-time high, with several reports and research being published focusing on this method of building. It has been further drawn into the spotlight by Heathrow recently stating the important role offsite construction will play in its major expansion project.

"With the residential construction market under pressure, it's becoming increasingly apparent that the construction industry is currently unable to meet the housing demand and government-backed publications and professionals are highlighting problems with quality and capacity."

How are light gauge steel products produced?

A very wide range of lightweight structural sections are produced by cold forming thin gauge strip material to specific section profiles. These are often termed light gauge or cold formed steel sections. In most cases, galvanized steel strip material is used. The cold rolling process begins with coils of galvanized strip steel that are uncoiled, slit into appropriate widths and then cold roll-formed into the final product form.

Profile shapes and section sizes do vary but most sections use lips at free edges and indented profiles to provide stiffness and avoid premature failure by local buckling. Thicknesses for load bearing products typically vary from 1.2 mm to 3.2 mm.

Light gauge steel infill walls

Infill walling is used across many different construction sectors; health, education, commercial, residential and leisure and is the generic name given to external walls that are built between the floors of the primary structural frame of a building, and which provide support for the cladding system. Infill walls do not support floor loads but they do resist wind loads applied to the façade, and may be used within both steel and concrete-framed buildings.

Light gauge steel load-bearing walls

"As well as the benefits of fast track construction and ease of handling, light gauge steel also offers a highly sustainable method of construction. Production is energy efficient, it optimises raw material use, and lighter structures mean that footings can be less extensive," says Kingspan Insulated Panels Regional Manager Paul Grimshaw.

Light gauge steel load-bearing walls are used in light steel-framed buildings and modular construction, supporting floor loads, loads from walls above and resisting lateral wind loads. They generally include bracing to provide lateral stability to the building. Light gauge steel load-bearing walls use vertical C sections of typically 100 mm depth. Both internal and external walls may be designed as load-bearing.

Wall panels are typically pre-fabricated as storey-high units or may be site assembled from C sections that are delivered cut-to-length, but this is less common

Composite cladding panels

Composite cladding panels are used for the external envelope for a wide range of building structures including industrial, distribution, retail and residential. They provide an efficient building envelope with energy efficiency benefits. Composite panel cladding systems are produced as a sandwich construction comprising two profiled sheets bonded either side of an insulating core of foam, mineral fibre or similar material. As the panels act compositely, shallow profiles can be used.

Purlins and side rails

Purlins and side rails are often termed secondary steelwork and are available in a variety of shapes and a wide range of sizes. The depth of the section typically lies between 120mm and 340mm, with the profile thickness usually varying between 1.2mm and 3.2mm.

In single storey industrial buildings where steel commands over 92% of UK market share, the cladding panels or sheets are normally supported by a system of light gauge steel purlins and side rails spanning between the portal frame rafters and columns respectively.

STEEL for life

Sponsors Light Gauge Steel Framing

Gold: Kingspan Limited
voestalpine Metsec plc

Silver: Hadley Group Building Products Division

JAMESTOWN

www.jamestownprofiling.com

email: info@jamestownprofiling.com tel: +353 45 434 288

STEEL for life HEADLINE SPONSOR

Your Partner In Steel

CE BCSA SCCS UKAS

Retail conversion

Installing new steel-framed floorplates into a refurbished 1960s shopping centre is helping to create a contemporary retail and dining quarter.

Surrey's county town of Guildford is recognised as one of the most vibrant shopping destinations in the Home Counties, having been named in a 2013 Experian survey as the 'UK's Luxury Shopping Capital', with an annual retail spend of more than £900M.

The town's extensive upmarket retail offering will soon be enhanced when the Tunsgate Quarter project opens later this year.

This job involves the refurbishment of an existing 1960s reinforced concrete shopping centre, turning it into a contemporary destination with the addition of new steel floors.

Overall, the 7,400m² Tunsgate Quarter will comprise 26 units, 18 retail and eight restaurants. A new glazed roof is being added to allow natural light to flow into the central areas of the Quarter, while a feature steel staircase will link the new levels.

On the upper level, a series of flats, positioned along three sides of the Quarter, have been retained. The 12 existing flats are being enlarged to form 10 new apartments.

Stuart Harris, Commercial Director & Co-Founder of developer Queensberry says: "Guildford is an affluent town with an excellent retail offer, with Tunsgate Quarter at its heart. We are creating something very special and new that connects the High Street, Tunsgate and Castle Street.

"The interest and commitment from high quality operators such as The Ivy Collection, OKA, The White Company, Bobbi Brown Cosmetics and Loaf is clear testament to the sophisticated new retail and dining offer we are creating."

Work started on the project during October last year (2016), once the majority of the shopping centre's tenants had vacated the premises. However, two units along the High Street are not affected by the construction and have continued to operate throughout the works.

ISG Project Manager Adam Wright explains the early part of the construction programme: "Basically it was a large cut and carve operation to the existing reinforced concrete frame.

"We have retained the façades and wings of the centre while demolishing internal parts of the scheme around the open central square, and enlarged one area with three new steel-framed floorplates.

"We have also removed the existing roof and glazed atrium and taken out most of the staircases."

Using structural steelwork to create the new floors was always the preferred method for the scheme. The design required a lightweight solution, one that would not

A scaffold system spans the project, helping to keep the site watertight, and supports two gantry cranes

A new glazed roof will allow plenty of light into the Quarter

New steel levels overlook the central area

overload the existing foundations.

"Fortunately, the original foundations were over-engineered and so we have been able to increase their loading by adding three floors where originally there was just a single level," says Jubb Engineering Project Engineer David Friend.

The foundations may have been re-used with no extra work needed, but the basement columns that support the new steel floors have had to be strengthened. This has been done by installing twin steel channels bolted to either side of the existing concrete columns.

One of Guildford town centre's most popular car parks was housed in the Tunsgate basement and work has progressed to keep this facility. Column strengthening work has been planned to avoid the restricted vehicle access points which are currently used for material deliveries.

As the new steel-framed structure is supported on the basement columns, the new steel build is based around the same 5.2m × 10.4m grid pattern.

Stability for the steelwork is achieved from being tied into the surrounding concrete structure and from being designed as a large portalised frame.

As well as adding floor levels to one side of the project's open central square, steelwork has also been used to create balconies and walkways that link to the new levels from the existing concrete areas.

On a project where it has been important to keep the weight of the steel structure to a minimum, the walkways represent the largest and heaviest pieces that steelwork contractor Gorge Fabrications has had to erect.

The heaviest pieces are three 2t, 15m-long beams that form second-storey walkways around three sides of the square.

As with most town centre projects, logistics have played a key role on this job. The Tunsgate Quarter is hemmed in on three sides by roads, and existing buildings on the fourth elevation.

The close proximity of numerous neighbours, both retail and residential, has meant the project team has had to be wary of making excessive noise, while deliveries have to be planned around the need to avoid many of the surrounding narrow streets.

All deliveries have to arrive via Castle Street, where the existing entrance to the old shopping centre's retained basement car park offers access to the construction site.

Once materials, such as the project's structural steelwork, have been delivered, the project team was initially faced with the problem of how to move items around the site and, in steelwork's case, how to unload and erect it.

"It is a very confined site with no room for a tower crane, so we've had to set up three gantry cranes for the majority of lifting duties," explains Mr Wright.

One gantry crane has been installed to unload materials, while two others span the site supported from a giant scaffold system that overhangs the entire project.

Gorge had to bring all of the steelwork to site in the smallest possible loads. This helped with the unloading, but also allowed the sections to be manoeuvred through the existing concrete structure.

Once the steel was on-site the gantry cranes were unable to reach some areas of the project, so most of the steel lifting and installation work was done using mini spider cranes and small spider access units. These small machines proved to be priceless as they could manoeuvre within the tight confines of the job.

"It's been a voyage of discovery as we have had to verify quite a lot of the design as the project progressed," explains Mr Friend. "None of the original design or architectural drawings were available, so we only knew what we had to work with after the demolition work had been completed."

The Tunsgate Quarter is scheduled to open in October 2017.

FACT FILE
Tunsgate Quarter, Guildford
Main client: Queensberry
Architect: Lyons+Sleeman+Hoare
Main contractor: ISG
Structural engineer: Jubb Engineering
Steelwork contractor: Gorge Fabrications
Steel tonnage: 280t

Spacious airport offices take off

Steel offers the solution for the latest office block at the World Business Centre near Heathrow Airport.

Overlooking one of Heathrow Airport's runways, the fourth steel-framed office block at the World Business Centre [WBC] is currently under construction.

Commenced in 1995, the WBC was designed to be implemented in phases; each of the buildings is virtually identical to give the impression of a continuous terrace.

The latest block (WBC4) has been designed to provide a contemporary take on the first three pavilions, including elements such as feature fins and solar glazing replacing the brise-soleil of the previous buildings.

Colour is used to give each building an identity without undermining the overall concept, with the central cores ranging from red in phase one to jade, ochre and navy blue.

The WBC is said to have pioneered the basic format for what has since become the British Airport Authority's standard office product, for use at airports throughout the UK and in several other developments.

The first three steel-framed WBC blocks were constructed in phases between 1996 and 2001 and have flexible floorplates designed to be partitioned down to quarter floors offering suites from 270m².

High profile tenants in these blocks include United Airlines, Barclays, SAS Group, Reed Elsevier and China Southern Airlines.

Being built for the Arora Group, which also manages two of the older WBC blocks, the latest building is a four-storey structure, which will provide 7,900m² of CAT A office space and has been pre-let to airport technology group Amadeus.

Commenting on the project, Surinder Arora, Founder and Chairman of the Arora Group said: "With WBC4 we are building on our existing geographical advantage in the Heathrow area, and are delighted that Arora's Grove Developments business is involved at this early stage of the project's delivery as the group upholds its end-to-end development capability.

"It is still early days in this project, which is set to be the first stand-alone office building to be built in Heathrow since 2001."

Explaining the logic behind the decision to use a steel-framed solution for the project, Shear Design Associate Darren Badham says: "Steel enabled the team to meet the required programme, this was achieved by fabricating the steel frame while the basement in-situ reinforced frame was being constructed, thus enabling the steel frame to be installed in a following sequence as soon as elements of the ground floor were sufficiently cured."

The choice of steel also enabled the team to consider a value engineered approach

FACT FILE
World Business Centre Building 4, Heathrow
Main client: Arora Group [Grove Developments]
Architect: Maith Design
Main contractor: RGB Group
Structural engineer: Shear Design
Steelwork contractor: Apex Steel Structures
Steel tonnage: 500t

The completed WBC4

to the foundations. All the adjacent WBC buildings were constructed on piled foundations and the original site investigation recommended a similar approach for this structure.

However, due to the teams' experience of the area, having completed several buildings in the vicinity they believed a more cost-efficient raft solution was possible.

"Following further geotechnical assessment, we were able to achieve a raft foundation which can easily accommodate a four-storey steel-framed structure," adds Mr Badham.

Following on behind the groundworks team, Apex Steelwork Structures' erection programme was also dictated by the height constraints imposed by the adjacent airport.

Installing a tower crane on this project was out of the question as no piece of equipment can be more than 30m-high on this site. Consequently, Apex had to carefully plan which type and size of crane would be best suited for this job.

"We used a 30t-capacity crawler crane and erected the structure one bay at a time, to the full height of the building," explains Apex's Project Director Peter Gillespie. "In this way, we kept the depth of the steel erection area to a minimum and consequently the height of the crane's jib was kept to an allowed height."

Due to the sequencing of the erection, and in order to help the follow-on trades, Apex also lifted the packs of metal decking into place once each bay of steelwork was up.

Constructed around a regular 9m × 7.5m grid pattern, the structural steel solution has allowed the team to meet the client's requirements for a spacious and open office, with minimal impact from the structural frame.

Stability for the steel frame is derived from braced bays which are positioned within the two central cores, as well as diaphragm action of the floors.

Because of the building's proximity to one of the busiest airports in the world, the consideration of how to demolish the structure was also an important consideration during the design stage.

Using steel proved to be the right choice as it can easily be dismantled when its lifespan is completed. "This is a great benefit with reference to its location, close to an airport, and the approvals that will be required," says Mr Badham.

Summing up the project, RGB Group Construction Director Ian Thomas says: "We are pleased to be involved in the project for Grove Developments at WBC4. It is an exciting opportunity to be an integral part of the newest addition to the World Business Centre along with our Design Team partners Maith Design and Shear Design.

"The project represents a fantastic opportunity for RGB Group and we are pleased to be working in conjunction with our key supply chain members to deliver this stunning office. We hope to further develop our relationship with all parties involved and deliver on time and to the most ardent of standards."

Aiming to achieve a BREEAM 'Very Good' rating, WBC4 is scheduled to complete by the end of this year.

The close proximity of the runway meant the crane's jib had to be under 30m high at all times

Future-proof design for ticket halls

The completed Farringdon western ticket hall

Over-site commercial developments will be constructed on top of Farringdon Station's two new Crossrail ticket halls. Martin Cooper reports on how steel is helping to maximise the railway's useable space.

Steel construction is providing the framing solution for many of the above ground facilities being built for the soon to be completed Crossrail scheme.

Ticket halls for most of the 10 new stations on the UK's latest railway line have been built with a steel frame, providing a quick construction programme and, importantly, a flexible future-proofed design.

Many of the ticket halls are located on prime central London plots and, in order to maximise the space and help Crossrail recoup some of its investment, the steel frames have been designed so that over-site developments can be accommodated at a later stage.

These future developments will also be steel-framed structures that can be bolted to and erected on top of the ticket halls.

Approximately 32,500m² of development space is planned above Crossrail stations, helping create new business space, jobs and new homes for Londoners.

An example of this work is Farringdon Station where two separate steel-framed ticket halls are under construction.

"The Farringdon ticket halls have been designed with a 120-year lifespan, so we envisage a few commercial schemes being built and then replaced during that time. The steelwork has been designed to not only accept the loadings from the over-site developments, but also the loadings that would be generated from the construction work," explains AECOM Technical Director, Advanced Structures, David Sharples.

Farringdon is at the heart of the Crossrail Elizabeth line route and will be a key link in bringing passengers directly from within Greater London and beyond to the business hubs in the City and Canary Wharf. When complete, over 140 trains per hour will flow through the Farringdon interchange.

Farringdon Crossrail station will comprise two platform tunnels, each the length of two football pitches, linking two new ticket halls built either side of the historic Smithfield meat market.

The western ticket hall will have an entrance on Cowcross Street directly opposite Farringdon Tube station. This hall will share its entrance with the existing Thameslink ticket hall (erected by Bourne Steel in 2011, see *NSC June 2011*).

The eastern ticket hall will have entrances at the Long Lane end of the station, on Lindsey Street and Hayne Street. It will also provide an interchange with the London Underground platforms at Barbican station.

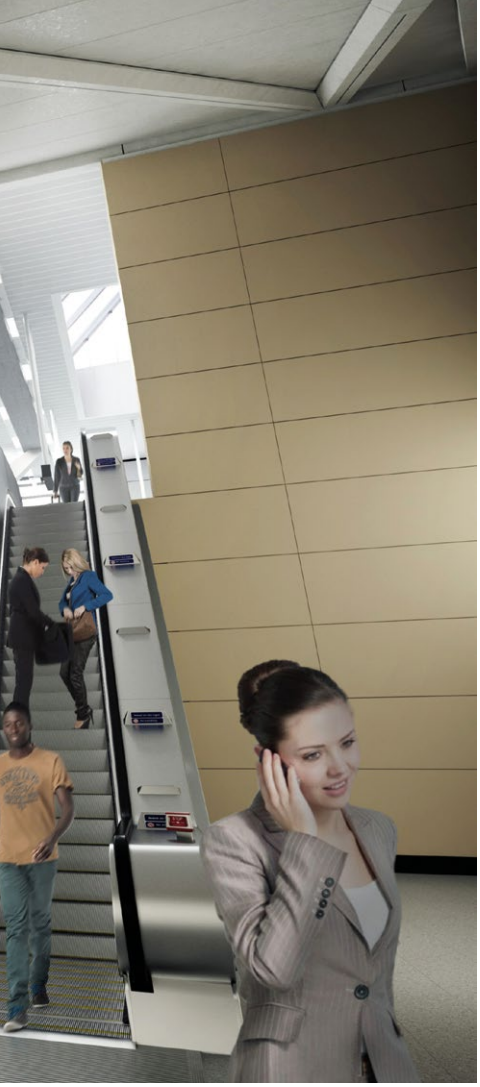
The design of the east ticket hall has used a series of raking columns to avoid loads being transferred to the shallow London Underground tunnel, which passes under its northern façade close to Barbican Station.

"To ensure flexibility and allow over-site office developments to be erected on top of the tickets halls, the steel frames are far more substantial than they would ordinarily be for buildings of this size," explains Bourne Steel Project Manager Richard Cherrington.

To this end, the columns used in each hall are a mixture of heavy sections such as UC356 × 406 × 634 and bespoke fabricated columns weighing up to 25t each. There are also a number of columns which are box girders made out of 100mm thick plate, and these members required four 100mm-thick butt welds running 17m in length.

Because of the provision for the commercial blocks, the ticket halls will initially only have a protected water-proofed concrete slab on metal decking as a rooftop finish. This will allow the over-site developments to be built without causing any interference to rail services or passengers.

FACT FILE
Farringdon Crossrail Station, London
Main Client: Crossrail
Architect: Aedas
Main contractor: Bam Ferrovial Kier joint venture
Structural engineer: AECOM
Steelwork contractor: Bourne Steel
Steel tonnage: 2,300t



Farringdon over-site developments

The over-site development above the western entrance of Farringdon Crossrail station will comprise a 17,400m² six-storey high-quality office space, with retail units at street level.

The building is said to have been carefully designed to integrate with Crossrail's operating station and will also improve local views of St Paul's Cathedral.

Ian Lindsay, Crossrail Land and Property Director said: "By 2018 Farringdon will be one of Britain's busiest rail stations, connecting Crossrail, Thameslink and London Underground services. The developments will accelerate the area's regeneration, helping Farringdon re-emerge as a destination in its own right."

Above the eastern ticket hall (pictured), planning has been approved for a 11,100m² six-storey column-free office space with a ground floor reception area and retail units.

Within the steelwork package, the largest elements that Bourne Steel has erected are two 21m-long × 4m-deep trusses, installed parallel to each other and inter-connected.

The trusses, at the western ticket hall, provide column-free space within the apse, diverting the over-site development's loadings down to the foundations as well as acting as a support to the Crossrail ticket hall's apse ceiling.

The apse feature sloping ceiling is hung from the trusses and spans the escalators that connect the ground floor entrance lobby to the -1 level circulation area, from where a further set of escalators will connect to the underground platforms.

Creating a large open-plan area, the trusses have a combined weight of 111t and are supported by two columns positioned at either end. They are made up of UC356 × 406 × 634 main booms and UC356 × 406 × 393 internal members.

A lot of discussions were held between the project team members about the best way of installing the precast apse roof and the trusses, and in particular which order it should be done in.

Bourne Steel suggested the apse ceiling should be installed first and then its steel, including the trusses, erected afterwards. Following an investigation by the main contractor, Bourne Steel and the concrete sub-contractor, this was agreed as the practicality of lifting the large apse precast units into place with the steelwork already erected would have been extremely challenging.

"The trusses were erected over the precast apse ceiling in sections. The first section, which weighed 24t, was connected to the main supporting column and a jack that was being supported off the apse ceiling, which was itself supported on temporary falsework.

"The trusses also had to be tied into the surrounding steel. Each section was then connected while landing on jacks. Once all sections had been installed and splice connections bolted up - some connections had 120 TCB bolts - the truss was de-jacked in a controlled manner, until it was just being supported by the two columns."

The western ticket hall has dimensions of approximately 75m long × 62m wide. The steel commences at Level -1 and extends to Level 3 which is formed by a series of 18.7m-high columns. The upper levels accommodate the large tunnel ventilation fans and other Crossrail plant rooms, administrative space and staff areas.

The smaller eastern ticket hall is approximately 69m long × 33m wide. The steel commences at Level 0 and extends to Level 3 which covers 15m in total, which equates to just one column length.

Both steel-framed ticket halls will open when the Crossrail Elizabeth line services begin in December 2018. By then both over-site developments may have begun.

The western ticket hall's roof and the adjacent sawtoothed Thameslink hall

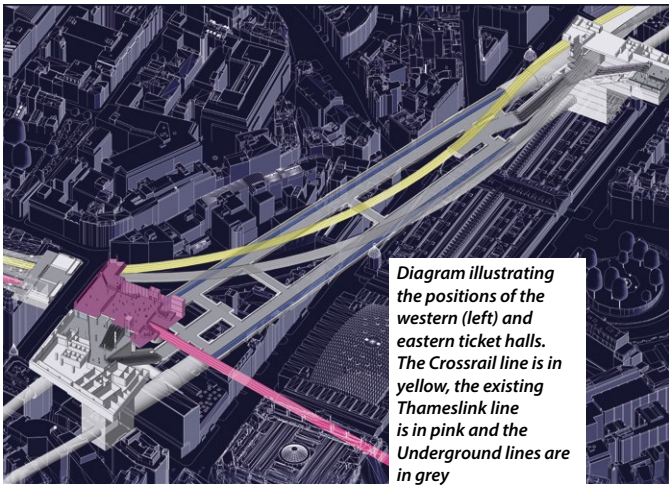


Diagram illustrating the positions of the western (left) and eastern ticket halls. The Crossrail line is in yellow, the existing Thameslink line is in pink and the Underground lines are in grey

Trusses span sporting haven

A series of storey-high trusses create the transfer deck between a leisure centre and a residential scheme in London.

Cellular beams form the Centre's roof

FACT FILE
Moberly Leisure Centre and Prime Place, Kensal Rise, London
Main client: Westminster City Council/ Prime Place
Architect: Roberts Limbrick
Main contractor: Willmott Dixon
Structural engineer: AECOM
Steelwork contractor: Mifflin Construction
Steel tonnage: 3,000t

Replacing a number of old Victorian buildings, North Westminster will soon have a new community sports centre offering an array of leisure facilities including two pools and an eight-court badminton hall.

Known as the Moberly Leisure Centre, the project, which is currently under construction in Kensal Rise, west London, also includes a substantial residential element known as Prime Place, which consists of 56 rooftop apartments and 15 townhouses.

Steelwork is playing a central role in the job as the leisure centre is a large steel-framed structure that supports the light gauge steel-framed apartments above.

Explaining why a steel solution was chosen for the project's design, AECOM Principal Engineer Lloyd Bickle says: "We needed long spans for the sports areas and steel cellular beams offered the most efficient solution.

"Meanwhile, parts of the roof need to act as a transfer structure spanning over the relatively large open areas of the leisure centre to support the load bearing walls of the apartments above. Steel trusses can span these distances picking up the required load with the necessary stiffness."

Work on the project began during April last year (2016) with main contractor Willmott Dixon removing a large amount of asbestos, prior to demolishing the existing buildings and clearing the site.

Steelwork erection kicked off towards the end of last year, and has progressed in a sequential manner starting at the southern end of the site.

Explaining why this sequence was necessary, Willmott Dixon Construction Manager Stuart Rooney says: "When the steelwork erection began, we were still doing groundworks as well as pouring the concrete for the basement and pool areas on the north side of the site. Working this way kept the project on schedule."

The leisure centre is a two-storey structure, albeit with a 9m-high floor-to-ceiling height in most areas. It is a large braced frame with bracing located along elevations and within the core areas.

Interestingly, all of the leisure centre's main cores were changed from concrete to steel in order to speed up the programme.

The ground floor area contains a 25m-long six-lane swimming pool, a learner pool with a moveable floor, a multi-use hall for boxing and gymnastics, changing rooms and a café, as well as the main entrance and reception. This floor also includes a mezzanine level which will accommodate community and meeting rooms.

One part of the scheme, positioned along the main Chamberlayne Road elevation, is however a separate and independent steel frame.

Containing a 225m² retail unit with two apartments above, this area has been designed as an independent structure so that it can be isolated from the leisure centre's adjoining first floor gym to mitigate any potential acoustic transfer.

As well as the gym, the first floor of the

Trusses support the rooftop apartments

leisure centre contains three exercise/dance studios and an eight-court sports hall with seating for 500 spectators.

Westok cellular beams have been installed to form the long span column-free areas on the ground and first floors. Spanning the pools and the gymnastics hall, a series of 15.3m-long × 900mm-deep beams, each weighing 2.3t, has been used.

Spanning the first floor sports hall, and forming part of the leisure centre's roof, is a series of 38m-long × 1.261m-deep beams, each weighing 15t. These beams are cranked at both ends to form a feature mansard roof.

The long span areas of the project are all centrally positioned within the overall scheme. Forming an L-shape around these areas and extending along the two main elevations on Chamberlayne Road to the west and Kilburn Lane to the north, the steel frame is formed by a more traditional beam and column structure.

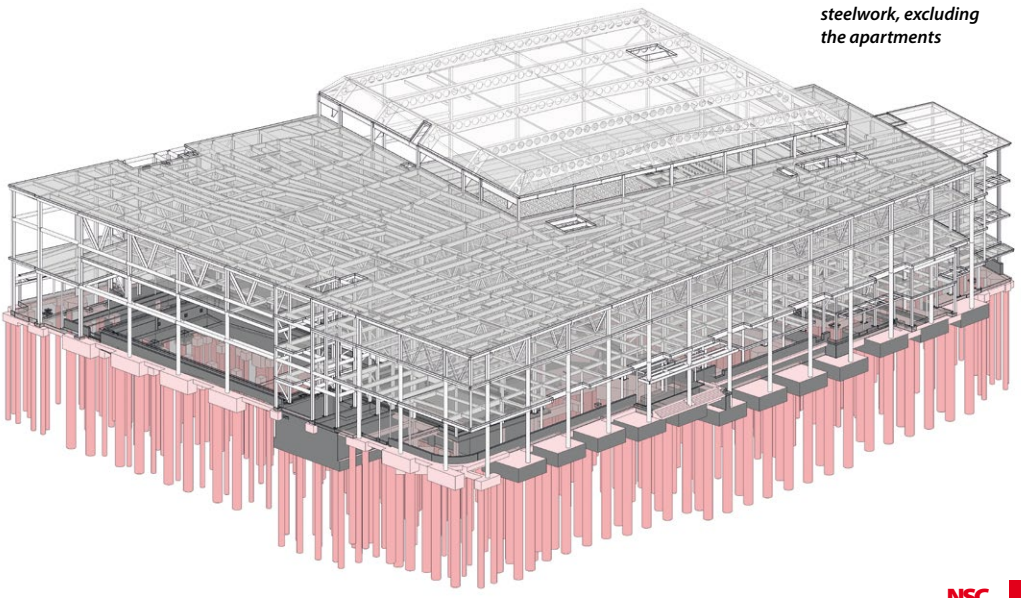
This part of the structure accommodates changing rooms and other facilities that do not need large open-plan spaces.

Above this L-shaped part of the structure sit the project's light gauge steel-framed apartments and their roof gardens. The units are a mixture of one and two-bedroom apartments, containing either one or two bathrooms.

Rising to a maximum height of four levels, the apartments are in a stepped formation falling to a single level of units in the south and east of the project.

There are 30 different configurations ▶20

Model of the main steelwork, excluding the apartments



View of the completed Centre with the apartments above

▶19

of apartment and consequently their column lines seldom match the regular 6m × 6m column grid pattern in the leisure centre. As well as the light gauge framework, a total of 30t of hot-rolled steel columns have been used to form the apartments.

To support the irregular light steel frames, a transfer structure has been designed to sit between the leisure centre and the residences. Formed with a series of 4.6m-deep trusses, they vary in length, with the longest measuring 19m and weighing 14t.

The deep trusses also create useable space within their depth, a de-facto second floor of the leisure centre, where plant equipment will be accommodated.

"The majority of the project's steelwork was erected using the site's two tower cranes, but the trusses were too heavy and had to be installed using a 350t-capacity mobile crane," says Mifflin Construction Project Director Nigel Jones.

The trusses had to be brought to site in small sections and then assembled on the ground, with each one requiring nearly 1,000 bolts.

The majority of the project's steelwork will not be on view within the completed scheme. The only exceptions are the cellular beams and a series of perimeter CHS columns that form the two main elevations beneath the apartments.

The project is due to be complete by Spring 2018.

Light gauge steel is erected to form the apartments

Transfer trusses

David Brown of the SCI discusses the design of transfer trusses

The steel trusses used at the Moberly leisure centre are storey height Warren trusses, carrying plant loading in addition to the apartments above. The development of the truss solution illustrates some of the design aspects to be carefully considered. Design loading might be thought to be straightforward, but in reality can often be a moving target as the design develops. At Moberly leisure centre, the flexibility of a steel solution meant that the final solution of apartments above could be revised, but this also meant that the loads were changing – perhaps a common challenge in the fast-moving world.

Deflection is always important in every structure and often checked under variable actions only. With transfer trusses, the deflection due to permanent actions may have a significant effect on the supported structural elements and so is a situation to be carefully investigated. At the leisure centre, the impact of the construction programme had to be considered, as some construction was proceeding prior to all the permanent loads being applied to the trusses. The fit-out below the trusses was to be completed before the apartments above were erected, so details to accommodate the anticipated deflection had to be incorporated in the fit-out below the trusses.

Given the span and depth of the trusses, welded pre-fabrication in sections and bolted assembly on site was necessary, as would be the case for all very large elements. Design and detailing should be then affected by the need to bolt sections together – a typical first choice is to provide end plate type splices at a node point in the compression chord (at a location also restrained out of plane), and cover plate type splices in the tension chord. This assumes that reversal will not take place – which is unlikely with apartments on top of the trusses. Generally, pre-loaded assemblies are likely to be used in the tension splices to avoid any unexpected additional deflection.

The trusses at the Moberly leisure centre were analysed assuming pinned joints, which is to be recommended for simplicity. Even without applied moments, the joints in a transfer truss will probably involve considerable local strengthening. If the truss members (including the internals) are UC sections, a good starting position is to consider that the axial load in an element is in proportion to the cross sectional area. A single UC flange will therefore be carrying approximately 40% of the axial load in the member, and it can be helpful to consider how this load is transferred to the chord. As the flange of the internal member is generally perpendicular to the web of the chord, local strengthening is probably inevitable.

A longer discussion on the use of trusses appears in the March issue of NSC

TATA STEEL

TATA

The essential aid for the design of tubular steelwork

New online Blue Book for structural hollow sections

Structural hollow sections are a striking feature on many of the iconic structures being created today, popular with developers, architects, structural engineers and building users alike.

To help structural engineers realise even the most demanding and challenging designs, and allow architects to fully express their vision, Tata Steel have revised and updated the essential 'industry bible' online Blue Book for structural hollow sections in collaboration with the Steel Construction Institute.

- Features the complete range of structural hollow sections available including key products Celsius® and Hybox®
- Comprehensive section property data provided
- New flexible and tabular design allows for rapid selection of appropriate section data
- Provides resistances in accordance with Eurocode 3 and BS 5950
- Developed with the Steel Construction Institute, this edition supersedes all previous versions

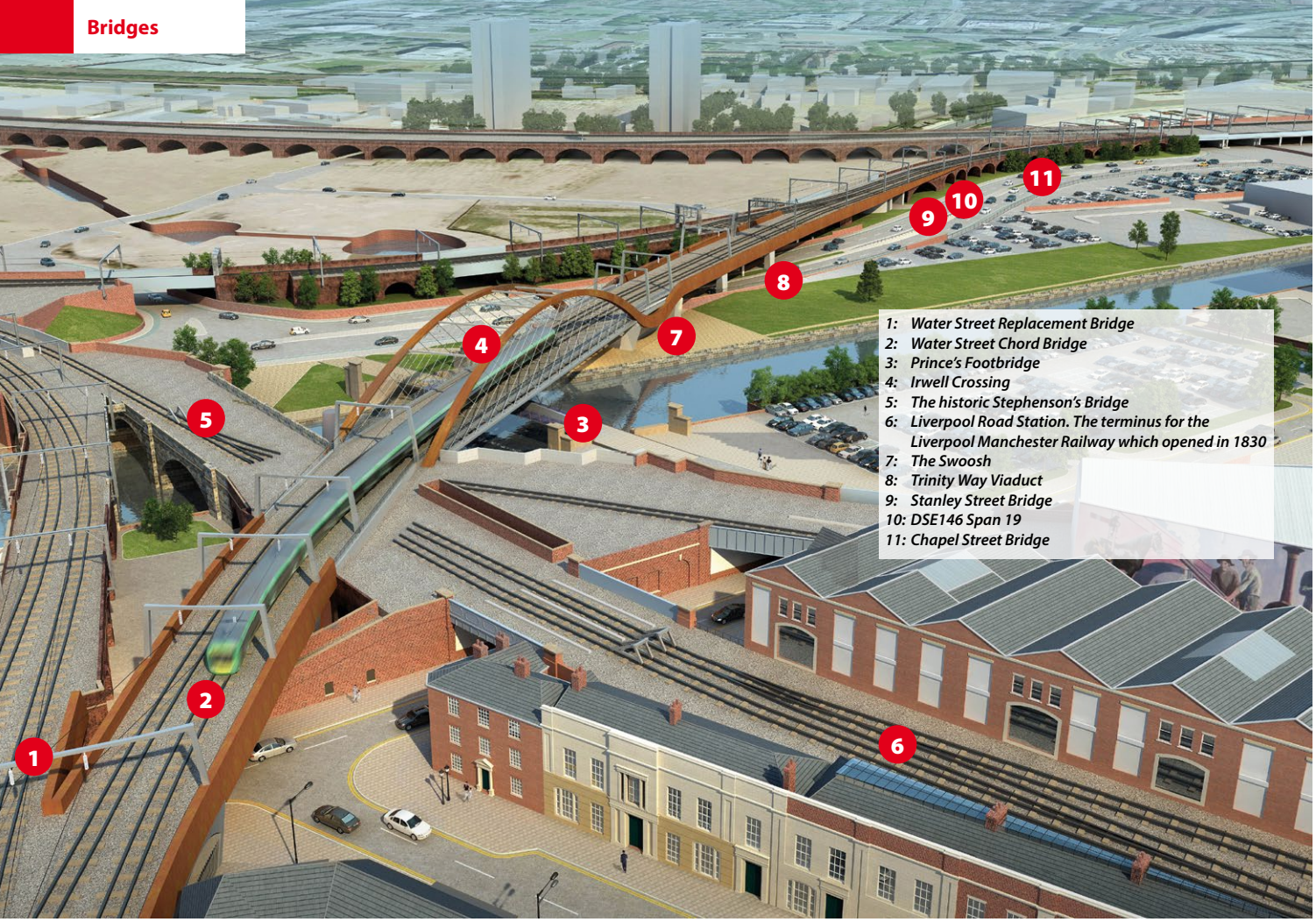
Free, easy-to-use and now available online at:

www.tatasteelbluebook.com

SCI
Steel Knowledge

For further information:
T: +44 (0) 1536 404561
technicalmarketing@tatasteel.com
www.tatasteelconstruction.com

Together we make the difference



1: Water Street Replacement Bridge
2: Water Street Chord Bridge
3: Prince's Footbridge
4: Irwell Crossing
5: The historic Stephenson's Bridge
6: Liverpool Road Station. The terminus for the Liverpool Manchester Railway which opened in 1830
7: The Swoosh
8: Trinity Way Viaduct
9: Stanley Street Bridge
10: DSE146 Span 19
11: Chapel Street Bridge

Striking a chord with bridges

Nine steel bridges are required for the Ordsall Chord rail project, which will link all of Manchester's main stations for the first time. Martin Cooper reports.

FACT FILE
Ordsall Chord, Manchester
Main client: Northern Hub Alliance
Architect: BDP
Main contractor: Skanska BAM JV
Structural engineer: AECOM Mott MacDonald JV
Steelwork contractor: Severfield
Steel tonnage: 1,350t

Part of Network Rail's multi-billion pound North of England programme, the Ordsall Chord will provide 300m of new railway track, creating a link for the first time between Manchester's main train stations; Oxford Road, Manchester Piccadilly and Manchester Victoria Station.

Once completed, the Ordsall Chord will also provide increased capacity, more frequent trains and less congestion at these main stations.

In order to complete this new track a huge amount of work is being undertaken. This includes the realigning of existing railway lines, building new bridges, removing disused arches and restoring Grade 1 listed structures.

As part of the Northern Hub Alliance delivery team, which also includes Network Rail, Siemens, Amey Sersa JV, BDP, Skanska BAM JV and AECOM Mott MacDonald JV, Severfield is responsible for fabricating, supplying and erecting nine new steel bridges.

Following 12 months of careful planning, Severfield successfully installed the project's first bridges last year. This included two structures installed during a 16-day construction blockade over the 2016 Christmas period.

These two adjacent structures, which cross Water Street and are positioned at the western end of the Chord, consist of a 20m span replacement bridge for the Manchester to Bolton line as well as a 32m span bridge for the new rail line.

The bridges, which have steel tonnages of 185t and 266t respectively, were both fully assembled in a nearby compound. Severfield assembled the steel bridges on temporary trestles to enable other trades, such as concrete and decking, to complete their works.

The fully completed structures were then carefully manouvered from the compounds to their final locations using Self-Propelled Modular Transporters (SPMTs). Both bridges were installed within a 24-hour period.

Also during 2016, the new Prince's Footbridge was installed. This central spine box girder structure has cantilever walkways and measures 49.5m-long × 7m-wide, with an overall steel tonnage of 82t. It was assembled in a compound and lifted onto its piers using one 750t-capacity crawler crane.

Getting the footbridge installed was important as it then allowed the team to begin work on the project's centrepiece bridge – the Irwell Crossing. This 90m-long arch bridge is set at a skew and spans over the footbridge as it crosses the river.

Describing the design of this structure, BDP Lead Architect Peter Jenkins says: "The flowing ribbon form of this dramatic new railway bridge for the Ordsall Chord is intended to both complement and contrast with the buildings around.

"It is the first asymmetric network arch in the world, a choice of structural concept we developed with the engineers with the intention of the bridge tapering to a fine point where it approaches the adjacent historic Stephenson's Bridge.

Another key driver for the choice of the network arch concept was its ability to create the smooth, unifying form of the steel

The successfully completed arch lift

'ribbon' where it meets other steel structures on the west bank of the river."

The Irwell Crossing is also the first network arch bridge, let alone asymmetric, of any kind in the UK. The network design, so called as the hangers crisscross in a network pattern, was chosen as it is said to provide a more efficient and stiffer structure as the loads are spread more evenly.

Initially the steel composite deck was installed across the river and over the footbridge on temporary trestles, while on an adjacent compound located on the eastern river bank, the two asymmetric arch members were fully assembled.

"Installing the deck and assembling the arches separately was done to speed up the construction programme and make the erection process safer by lessening the amount of work needed to be carried out over the water," explains Severfield Project Manager Jarrod Hulme.

The two arches were initially assembled on site from 12 weathering steel sections (six each side). Laid out flat they were both rotated into a vertical position after welding and placed on to temporary supports to allow the cross members to be installed.

Weighing 600t, the arches were picked up and installed with a tandem lift using a 750t-capacity crawler crane in conjunction with a 1,350t-capacity crawler. They were then landed on to four bridge positions, only one of which is over the River Irwell.

Giving the bridge its asymmetric design, the arch sections taper from 750mm-deep members on the eastern riverbank up to 2.4m-deep on the western bank.

The next steel structure on the western bank of the Irwell is the 112m-long Trinity Way Viaduct, a three-span structure that crosses the busy A6042 dual carriageway.

This structure was installed in pieces of up to 20m-long and weighing up to 60t each. A number of road closures and traffic diversions were necessary as the bridge was gradually installed east to west.

The thickest end of the Irwell Crossing's tapering steelwork design is intended to match the Trinity Way Viaduct's 3m-deep girders.

However, making sure the steelwork from the arch bridge seamlessly blends into the viaduct's steel, there will be an architectural steel element installed between the two structures.

Known as the 'Swoosh' this intermediate element consists of two separate weathering steel sections that will be installed onto a concrete abutment between the arch and viaduct. This will then give the impression of one long continuous steel structure.

Each weighing up to 40t, the two pieces represent the most complicated steel sections on the project. Both 'Swoosh' pieces curve in two directions and have a tapering cross section which requires various sized stiffeners.

Further eastwards from the Trinity Way Viaduct there are three more steel bridge structures for the Ordsall Chord. Two filler beam bridges are known as the Stanley Street Bridge and DSE146 Span 19. They have spans of 15m and 20m respectively.

Relatively short and spanning over pedestrian areas, there is no headroom issue for these structures. Consequently, simple deck designs formed with pairs of braced plate girders were the solution.

Close to where the new railway link meets the existing lines that leave and enter Victoria Station, the ninth bridge known as Chapel Street is located. This structure required approximately 265t of steel and was erected over the Easter holidays.

Summing up, AECOM Mott MacDonald JV Engineering Manager, Brian Duguid says: "Steel was chosen for the nine bridges because of the long spans of the structures and because the material offered the most efficient solution.

"Weathering steel was used for most of the bridges as it is durable, needs no maintenance or painting, is relatively cost-efficient and is similar in colour and texture to the existing listed structures."

The deck of the Irwell Crossing was completed first

One of the Water Street bridges is transported to its final position

Building Consequence Classes and the link to Execution Classes

Richard Henderson of the SCI discusses the evolution of Building Consequence Classes and the link between them and Execution Classes of structures.

Figure1: Ronan Point Flats

The Building Regulations

Building Consequence Classes have their origin in Approved Document A to the Building Regulations and the provisions for disproportionate collapse in section A3. The need for such provisions was exposed by the partial collapse of the 23-storey Ronan Point flats in 1968 following an accidental gas explosion in a kitchen on the 18th floor. (see Figure 1).

Section A3 of Approved Document A (AD-A) gives the requirement in the Building Regulations itself and its limitations and guidance as to how the requirements may be met. In the 1985 Building Regulations, requirement A3 stated "The building shall be so constructed that in the event of an accident, the structure will not be damaged to an extent disproportionate to the cause of the damage". The requirement was applicable only to: (a) a building having five or more storeys (each basement level being counted as one storey); and (b) a public building, the structure of which incorporates a span exceeding nine metres between supports. The guidance in AD-A advised the Building Regulations could be met for steel buildings by designing to BS 5950: Part 1: 1985 where recommendations for the provision of horizontal ties for all buildings were made. Additional recommendations were made for "tall" buildings for vertical ties and, where necessary, localization of damage. The latter recommendation resulted in the provision of key elements where notional removal of an element resulted in damage over an unacceptably large area.

The 1991 Building Regulations amended the wording but not the sense of the requirement. The limits on application removed the reference to a public building including a span of over nine metres. Guidance given in BS 5950 was that horizontal and vertical ties were to be provided but where effective vertical ties were not feasible, a check on the potential area of collapse was to be made by considering notional removal of the element and limited to a maximum of 70 m^2 or 15% of the floor area, whichever is the smaller. If this check failed, the element was to be designed as a "protected member" or key element.

The Building Regulations 2000 included the same requirement A3 as the 1991 Regulations: "The building shall be constructed so that in the event of an accident, the building will not suffer collapse to an extent disproportionate to the cause". No limits on application were made. Instead, guidance depending on the class of the building was provided in AD-A on appropriate approaches to ensure sufficient robustness of a building to limit the extent of damage or failure without collapse. The building classes were presented in Table 11 in AD-A. The primary function of the building classification was to establish what structural arrangements were to be made by the structural engineer for a particular building to ensure satisfactory robustness.

The Building Regulations 2010 (the current edition) includes exactly the same requirement. In the guidance in AD-A, building classes are renamed building Consequence Classes (CC) and are shown in Figure 2 (Table 11 from AD-A) on p26. The guidance in AD-A states the requirement will be met if horizontal ties are provided for CC2a; vertical ties are added for CC2b and a systematic risk assessment is carried out for CC3 buildings. The alternative notional removal of columns and provision of a key

element where the area at risk of collapse is too extensive is also included. The maximum area is increased from 70 m² to 100 m².

The number of storeys and floor area are the principal determinants of the building Consequence Class. The potential number of people harmed in the event of a collapse is also an important factor.

Table 11 **Building consequence classes**

Consequence Classes	Building type and occupancy
1	Houses not exceeding 4 storeys
	Agricultural buildings
	Buildings into which people rarely go, provided no part of the building is closer to another building, or area where people do go, than a distance of 1.5 times the building height
2a Lower Risk Group	5 storey single occupancy houses
	Hotels not exceeding 4 storeys
	Flats, apartments and other residential buildings not exceeding 4 storeys
	Offices not exceeding 4 storeys
	Industrial buildings not exceeding 3 storeys
	Retailing premises not exceeding 3 storeys of less than 2000m² floor area in each storey
	Single-storey educational buildings
	All buildings not exceeding 2 storeys to which members of the public are admitted and which contain floor areas not exceeding 2000m² at each storey
2b Upper Risk Group	Hotels, blocks of flats, apartments and other residential buildings greater than 4 storeys but not exceeding 15 storeys
	Educational buildings greater than 1 storey but not exceeding 15 storeys
	Retailing premises greater than 3 storeys but not exceeding 15 storeys
	Hospitals not exceeding 3 storeys
	Offices greater than 4 storeys but not exceeding 15 storeys
	All buildings to which members of the public are admitted which contain floor areas exceeding 2000m² but less than 5000m² at each storey
	Car parking not exceeding 6 storeys
3	All buildings defined above as Consequence Class 2a and 2b that exceed the limits on area and/or number of storeys
	Grandstands accommodating more than 5000 spectators
	Buildings containing hazardous substances and/or processes

Notes:

1. For buildings intended for more than one type of use the Consequence Class should be that pertaining to the most onerous type.
2. In determining the number of storeys in a building, basement storeys may be excluded provided such basement storeys fulfil the robustness requirements of Consequence Class 2b buildings.
3. BS EN 1991-1-7:2006 with its UK National Annex also provides guidance that is comparable to Table 11.

Figure 2: Approved document A Table 11

The National Structural Steelwork Specification and EN 1090-2

In 1989, the first edition of the National Structural Steelwork Specification for Building Construction (NSSS) was published for the execution of steelwork by people with full knowledge and understanding of BS 5950. It coincided with the introduction of the British Constructional Steelwork Quality Assurance Certification Scheme (now SCCS), based on the requirements of BS 5750 Parts 1 and 2, precursor to ISO 9001. The NSSS was conceived to achieve greater uniformity in contract specifications issued with tender and contract documents. The first edition covered outline requirements for the design, materials, preparation of drawings, fabrication, erection and protective treatment of structural steelwork which is to be used for all types of building construction. The (current) Fifth Edition CE Marking Version was published in October 2010.

The clauses of the latest version fully complies with BS EN 1090-2: Technical requirements for steel structures, introduced in 2008. This standard introduces the concept of Execution Class (EXC), a significant addition to the original requirements of the NSSS. It is a classified set of requirements specified for the execution of the works as a whole, of an individual component or part thereof. The stated reason to differentiate between the classes is to provide a level of reliability against failure or malfunction of the structure that is matched to the consequences of failure.

Execution Classes

The default Execution Class to which BS EN 1090-2 is applicable is EXC2 (cl. 4.1.2). The NSSS scope states the specification is based on the execution of structures in EXC2 and it is not intended for structures which are subject to fatigue or seismic loading. The requirements of the NSSS are in general more onerous than those of EXC2 in BS EN 1090-2. Additional requirements of EXC3 over EXC2 are principally aimed at reducing defects in the material, producing a higher quality of welding and increasing the level of inspection of the work. The National Foreword to BS EN 1090-2 suggests that as a default basis, EXC2 could be specified for structures/components/details used in buildings, and EXC3 could be specified for structures/components/details used in bridges where fatigue needs to be considered in design. The additional requirements in EXC3 may therefore be considered to be at least part of those necessary for structures subject to fatigue.

BS EN 1993-1-1:2005+A1:2014 was issued in June 2015. Amendment 1 involved the inclusion of Annex C which places the basis for the selection of Execution Class in the design standard. The UK National Annex issued at the same time sets out the UK approach to selecting the Execution Class. Structures in Consequence Classes one and two are to be minimum EXC2. Structures in Consequence Class three are to be EXC3. The NSSS is therefore applicable un-amended to structures in CC1 and CC2 but structures in CC3 require additions to the NSSS, as outlined in BS EN 1090-2.

Effect of the Consequence Class as a differentiator

The use of the Consequence Class to differentiate between

Execution Classes is a blunt instrument. As in all circumstances where there is a step change in requirements on either side of a boundary between regions of a continuum, instances which just fall on the more onerous side of the boundary may be considered to be unreasonably penalized. This issue is illustrated in the following two figures which show hypothetical building arrangements. Both buildings are of conventional simple construction with a regular grid, with braced frames providing stability. Neither building is subject to fatigue.

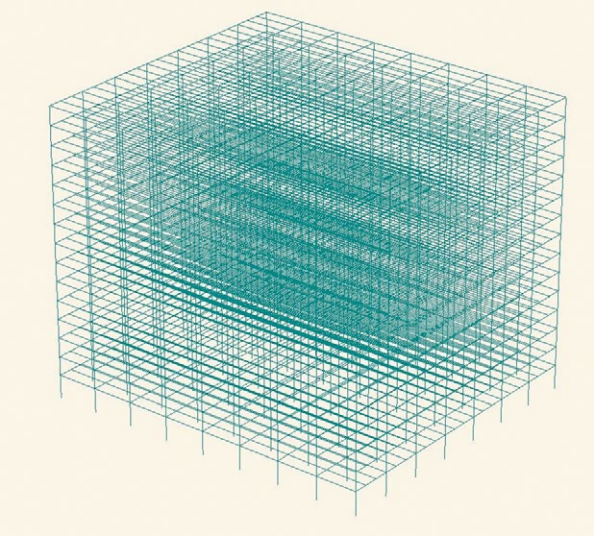


Figure 3: 15 Storey office building

Figure 3 is a stick diagram of the structure of a 15-storey office building with 9 m by 9 m bays. The floors are 8 bays by 7 bays giving a floor area of 4,536 m^2 and a total area over 15 floors of about 68,000 m^2. At an occupancy rate of one person per 10 m^2 of net floor area, the number of occupants could well exceed 5000 people. This structure does not exceed 15 storeys or 5000 m^2 per storey and therefore meets the requirements for Consequence Class 2b. The execution class for the structure is therefore EXC2.

Figure 4 is a stick diagram of the structure of a 2-storey shopping centre, also with 9 m by 9 m bays. The floor is 8 bays square giving a floor area of 5,184 m^2. The floor area exceeds 5,000 m^2 and therefore falls outside the requirements for Consequence Class 2b and the structure is Consequence Class 3. The Execution Class for the structure is therefore EXC3.

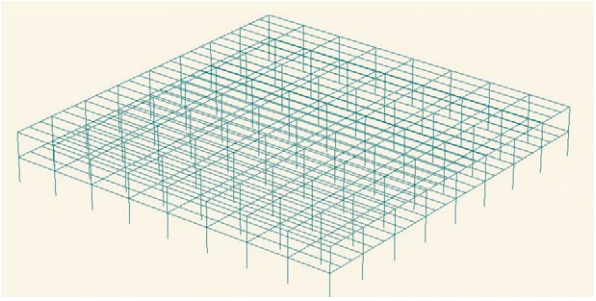


Figure 4: Two storey shopping centre

The office building requires horizontal and vertical ties. The shopping centre requires a systematic risk assessment to determine the provisions for robustness. Such an assessment may well conclude that no special provisions for robustness are required and in practice, horizontal ties alone will be sufficient. As the columns are all likely to be continuous over the two storeys, no consideration of vertical tying is necessary. Nevertheless, the office building is in EXC2 and the shopping centre is in EXC3.

In the case of the shopping centre with a regular grid and conventional structure, what benefit is there of requiring that the Execution Class is 3? Does either the employer or the user gain from greater reliability? Compared with the office building, the potential number of occupants is likely to be less so fewer people are likely to be affected by any loss of a column.

Approved Document A does offer an alternative approach to using Table 11 to determine the Consequence Class of a building, set out in documents referred to. These documents give the background to the building classes in Table 11. The approach is specific to a building and may result in its allocation to a lower Consequence Class than Table 11.

Conclusion

Execution Classes can be applied to a whole structure, a part or specific detail. If a transfer structure was included in a CC2b building, it is likely to be designed as a key element and EXC3 can be specified for this part at the discretion of the structural engineer. It seems equally appropriate in the case of a regular, conventional structure which falls outside the requirements of CC2b, such as the shopping centre illustration above, that the structural engineer be given the ability to choose Execution Class 2. Perhaps a more appropriate approach would be to place building structures not subject to fatigue in EXC2 and require significant parts such as transfer structures to be in EXC3.

AD 407: Section Classification

SCI have been advised that some checking authorities have questioned the approach to calculating α and ψ, which are found in Table 5.2 of BS EN 1993-1-1:2005 and used when classifying the web of a section under combined bending and compression. The Eurocode is silent on how these two factors should be calculated, which leads to some differences across Europe.

In the UK, SCI provided the following formulae for both α and ψ, in Table 5.1 (page 37) of P362[1]

$$\alpha = \frac{1}{2}\left(1 + \frac{N_{ed}}{f_y c t_w}\right) \text{ and } \psi = \frac{2N_{ed}}{Af_y} - 1$$

These formulae may be found in a number of authoritative sources, including Gardner and Nethercot[2] (page 32). Conceptually, these formulae imagine that the axial force N_{Ed} remains constant, and the moment is increases until f_y is attained (across the section in Class 1 and 2; at the extreme fibres in Class 3). The UK and France follow this approach, as do a number of European guides[3,4].

Some other European authorities follow a different approach, increasing both N_{Ed} and the applied moment in proportion. A different value of α and ψ will result, and potentially, a different Class of section. In some circumstances, if this second approach is followed, the Class becomes more onerous.

These different approaches are discussed in more detail in ECCS publication[3] (Section 2.4 pages 110/111, Section 3.7.2 pages 243/246 and Example 3.17 pages 279/281).

A second issue is that using the above formulae may lead to values of α greater than 1.0. This simply indicates that (in the case of α), all the web is in compression. α should be limited to the range between -1 and 1. ψ will be between 0 and -1.

When the calculated value of α exceeds 1, and thus is limited to 1, the limiting c/t ratio for a Class 1 section is given by $\frac{396\varepsilon}{13\alpha - 1} = \frac{396\varepsilon}{12} = 33\varepsilon$

which is simply the same as the value for "part subject to compression". Similar comparisons may be made with the other Class limits when the calculation of α and ψ indicate that the web is entirely in compression.

References

1. SCI P362 Steel Building Design: Concise Eurocodes (2009)
2. L. Gardner, D.A. Nethercot. Designers' Guide to EN 1993-1-1 (2005)
3. ECCS Eurocode Design Manuals. Design of Steel Structures 2nd Edition. Eurocode 3: Design of Steel Structures. Part 1.1: General rules and rules for buildings (2016)
4. ECCS Eurocode Design Manuals. Fire Design of Steel Structures. Eurocode 1: Actions on structures. Part 1-2: Actions on structures exposed to fire. Eurcode 3: Design of steel structures. Part 1-2: Structural fire design (1st edition, 2010) (Pages 114/115)

Contact: **Abdul Malik**
Tel: **01344636555**
Email: **advisory@steel-sci.com**

Search for Advisory Desk articles on newsteelconstruction.com

Use the search bar at the top of every page of ***newsteelconstruction.com*** to search out Advisory Desk articles by name, number or subject, or list them (most recent first) by hovering over *Technical* in the main menu and selecting *Advisory Desk* from the resulting pop-up menu.

New and revised codes & standards

From BSI Updates April 2017

BS EN PUBLICATIONS

BS EN ISO 8502-2:2017
Preparation of steel substrates before application of paints and related products. Tests for the assessment of surface cleanliness. Laboratory determination of chloride on cleaned surfaces
Supersedes BS EN ISO 8502-2:2005

BS EN ISO 8502-3:2017
Preparation of steel substrates before application of paints and related products. Tests for the assessment of surface cleanliness. Assessment of dust on steel surfaces prepared for painting (pressure-sensitive tape method)
Supersedes BS EN ISO 8502-3:2000

BS EN ISO 8502-4:2017
Preparation of steel substrates before application of paints and related products. Tests for the assessment of surface cleanliness. Guidance on the estimation of the probability of condensation prior to paint application
Supersedes BS EN ISO 8502-4:2000

NEW WORK STARTED

EN ISO 888
Fasteners. Bolts, screws and studs. Nominal lengths and thread lengths

EN ISO 11463
Corrosion of metals and alloys. Evaluation of pitting corrosion
Will supersede BS EN ISO 11463:2008

ISO 5952
Continuously hot-rolled steel sheet of structural quality with improved atmospheric corrosion resistance
Will supersede BS ISO 5952:2011

DRAFT BRITISH STANDARDS FOR PUBLIC COMMENT – ADOPTIONS

17/30334103 DC
BS ISO 9364 Steel sheet, 55% aluminium-zinc alloy-coated by the continuous hot-dip process, of commercial, drawing and structural qualities
Comments for the above document were required by 5 May, 2017

17/30334106 DC
BS ISO 13887 Steel sheet, cold-reduced, of higher yield strength with improved formability
Comments for the above document were required by 29 April, 2017

17/30334109 DC
BS ISO 14788 Steel sheet, zinc-5% aluminium alloy-coated by the continuous hot-dip process, of commercial, drawing and structural qualities
Comments for the above document were required by 6 May, 2017

17/30334112 DC
BS ISO 20805 Hot-rolled steel sheet in coils of higher yield strength with improved formability and heavy thickness for cold forming
Comments for the above document were required by 3 May, 2017

17/30342169 DC
BS EN ISO 11666 Non-destructive testing of welds. Ultrasonic testing. Acceptance levels
Comments for the above document were required by 29 April, 2017

ISO PUBLICATIONS

ISO 8503-5:2017
(Edition 2)
Preparation of steel substrates before application of paints and related products. Surface roughness characteristics of blast-cleaned steel substrates. Replica tape method for the determination of the surface profile
Will be implemented as an identical British Standard

BUILDINGWITHSTEEL

Twelve columns support roof over 250,000 sq ft area

Because their premises near Lambeth Bridge, London were inadequate for their needs, W. H. Smith & Sons Ltd, the well-known booksellers and stationers, have now moved their supply and distribution centre to a 17-acre site on the Green Bridge Industrial Estate 1½ miles from Swindon. The development comprises a huge warehouse, a six-storey office block and a two-level car park and is the largest on the estate. All buildings are of steel-framed construction. The project which, including equipment and fittings has cost 3¼ million, used approximately 3,000 tons of structural steelwork. The total floor area of the three buildings is 380,000 sq ft but should it be necessary at some future date, this figure can be increased to 450,000 sq ft by extension of the warehouse and the addition of two more floors to the office block.

The warehouse

The warehouse is of outstanding interest because of its very large unobstructed floor areas and excellent natural lighting, two essential requirements for a building that is to be used for storage purposes. It is a single-storey structure with a floor space of 250,000 sq ft, covered by three 150-ft wide by 525-ft long curved spans of steel truss girders and reinforced concrete roofing supported by only 12 internal columns.

The arched roof is designed on the German Silberkuhl system which is able to provide clear spans of up to 210 ft, although in the case of this particular building each of the three roofs spans 150 ft. The system is based on the use of steel and concrete under optimum static conditions, ie steel in tension and concrete under compression, and consists of curved pre-stressed concrete plates mounted between the top boom of one steel arch and the bottom boom of the next. As well as supporting the roof plates, the arches, spaced at 25-ft centres, also provide framing for the north light glazing; the tie rods across the arches may be used to carry services and lighting. The columns of the building are encased with concrete to a height of 6 ft and all other steelwork is sprayed with asbestos.

South gable arches are infilled with vertical aluminium cladding backed by asbestolux with a 1-in. mat sandwich, a design that gives a thermal insulation value of 0.25. The roof plates are covered with ½-in insulation board and a built up felt providing a 'U' value of 0.3. Perimeter walls are 9-in concrete blockwork stiffened with encased steel tie beams and faced externally with exposed aggregate cladding panels.

The building and the car park together use about 2,000 tons of structural steelwork.

Very modern equipment has been installed in the warehouse. For instance, a central conveyor feeds a 240-ft sorting conveyor having 24 spurs and controlled by a 'Memory Logic' system which routes goods to the appropriate spurs irrespective of the sequence of arrival or the presence on the conveyor of other containers: it is believed that this is the longest sorting conveyor in the country to be equipped with this system. The storage capacity of the building is considerable: there is 45,000 ft of shelving for half a million books, 2,000 ft of 18-ft high pallet racking holding 5,000 pallets, and 2,600 ft of racking accommodating 7,000 bins for the storage of 15,000 items other than books.

The office block

At one end of the warehouse is a six-storey steel-framed office block, which has a total floor area of 87,000 sq ft. The offices include administration areas, restaurants, welfare and recreation rooms, service equipment areas and an air-conditioned, double glazed computer and data processing suite. The structural steelwork is part encased in concrete, suspended ceilings providing the chief means of fire protection for the floor beams. The exterior is clad with exposed aggregate panels matching those of the warehouse.

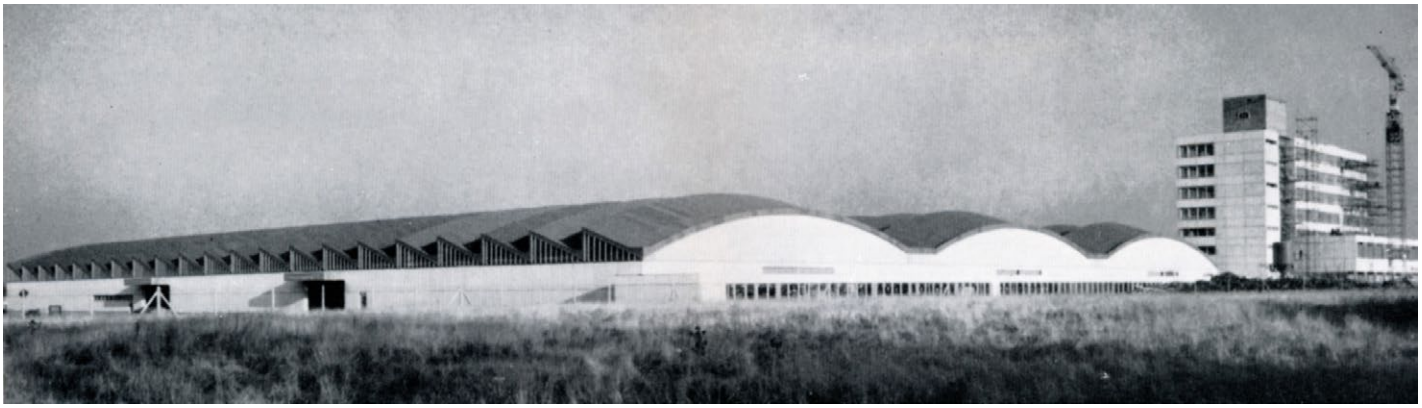
The car park

Adjacent to the office block and joined to the warehouse is the car park, having a floor area of 105,000 sq ft and accommodating 342 cars on the first floor and 60 cars together with cycles and mopeds at ground level. In addition, there is a garage and repair bay for the firm's transport, workshops and various ancillary sections. Electric heating elements embedded in the ramp in the first floor provide protection against icing in cold weather. Also included in the building are the loading and dispatch bays for the warehouse, these occupying 18,000 sq ft.

The entire project was planned and designed by H. F. Bailey, LRIBA, chief architect of W. H. Smith's Estate Department, in conjunction with the consultant architects, Johns, Slater & Haward.

Reprinted from Volume 4 No. 6
May 1967

1



2

1 Special arched roof system for the warehouse provides clear spans of 150 ft and considerable areas of unobstructed floor space.
2 Warehouses and office block built for W. H. Smith & Sons Ltd at a cost of nearly £3.25 million.
3 The six-storey steel-framed office block with panels matching those of the warehouse.

3

Steelwork contractors for buildings

Membership of BCSA is open to any Steelwork Contractor who has a fabrication facility within the United Kingdom or Republic of Ireland.
Details of BCSA membership and services can be obtained from
Gillian Mitchell MBE, Deputy Director General, BCSA, 4 Whitehall Court, London SW1A 2ES
Tel: 020 7747 8121 Email: *gillian.mitchell@steelconstruction.org*

Applicants may be registered in one or more Buildings category to undertake the fabrication and the responsibility for any design and erection of:

- **C** Heavy industrial platework for plant structures, bunkers, hoppers, silos etc
- **D** High rise buildings (offices etc over 15 storeys)
- **E** Large span portals (over 30m)
- **F** Medium/small span portals (up to 30m) and low rise buildings (up to 4 storeys)
- **G** Medium rise buildings (from 5 to 15 storeys)
- **H** Large span trusswork (over 20m)
- **J** Tubular steelwork where tubular construction forms a major part of the structure
- **K** Towers and masts
- **L** Architectural steelwork for staircases, balconies, canopies etc
- **M** Frames for machinery, supports for plant and conveyors
- **N** Large grandstands and stadia (over 5000 persons)
- **Q** Specialist fabrication services (eg bending, cellular/castellated beams, plate girders)
- **R** Refurbishment
- **S** Lighter fabrications including fire escapes, ladders and catwalks

FPC Factory Production Control certification to BS EN 1090-1
1 – Execution Class 1 **2** – Execution Class 2
3 – Execution Class 3 **4** – Execution Class 4
BIM BIM Level 2 assessed
QM Quality management certification to ISO 9001
SCM Steel Construction Sustainability Charter
(● = Gold, ● = Silver, ● = Member)

Notes
(1) Contracts which are primarily steelwork but which may include associated works. The steelwork contract value for which a company is pre-qualified under the Scheme is intended to give guidance on the size of steelwork contract that can be undertaken; where a project lasts longer than a year, the value is the proportion of the steelwork contract to be undertaken within a 12 month period.

Where an asterisk (*) appears against any company's classification number, this indicates that the assets required for this classification level are those of the parent company.

Company name	Tel	C	D	E	F	G	H	J	K	L	M	N	Q	R	S	QM	FPC	BIM	SCM	Guide Contract Value (1)
A & J Stead Ltd	01653 693742			●	●					●	●			●	●		2			Up to £200,000
A C Bacon Engineering Ltd	01953 850611			●	●	●	●				●			●			2			Up to £3,000,000
A&J Fabtech Ltd	01924 439614	●					●		●	●	●		●	●		✔	3			Up to £400,000
Access Design & Engineering	01642 245151					●				●	●			●	●	✔	2			Up to £4,000,000
Adey Steel Ltd	01509 556677	●		●	●	●	●	●	●	●	●			●	●	✔	3		●	Up to £2,000,000
Adstone Construction Ltd	01905 794561			●	●	●	●									✔	2	✔	●	Up to £3,000,000
Advanced Fabrications Poyle Ltd	01753 653617				●	●	●	●		●	●			●	●	✔	2			Up to £800,000
AJ Engineering & Construction Services Ltd	01309 671919			●	●					●	●			●	●	✔	4			Up to £2,000,000
Angle Ring Company Ltd	0121 557 7241												●			✔	4			Up to £1,400,000
Apex Steel Structures Ltd	01268 660828			●	●	●	●			●	●			●			2			Up to £2,000,000
Arc Fabrication Services Ltd	01709 557654			●	●	●	●	●	●	●	●			●	●	✔	3			Up to £200,000
Arminhall Engineering Ltd	01799 524510	●			●	●		●		●	●			●	●	✔	2			Up to £400,000
Arromax Structures Ltd	01623 747466	●		●	●	●	●	●	●	●	●	●		●	●		2			Up to £800,000
ASA Steel Structures Ltd	01782 566366			●	●	●	●			●	●			●	●	✔	4			Up to £800,000
ASME Engineering Ltd	020 8966 7150				●	●				●	●			●	●	✔	4		●	Up to £2,000,000
Atlasco Constructional Engineers Ltd	01782 564711			●	●	●	●				●			●	●	✔	2			Up to £1,400,000
Austin-Divall Fabrications Ltd	01903 721950			●	●		●	●		●	●			●	●	✔	2			Up to £800,000
B D Structures Ltd	01942 817770			●	●	●	●				●	●		●		✔	2			Up to £1,400,000
Ballykine Structural Engineers Ltd	028 9756 2560			●	●	●	●	●				●				✔	4			Up to £1,400,000
Barnshaw Section Benders Ltd	0121 557 8261												●			✔	4			Up to £2,000,000
BHC Ltd	01555 840006	●	●	●	●	●	●	●			●	●		●	●	✔	4		●	Above £6,000,000
Billington Structures Ltd	01226 340666		●	●	●	●	●	●	●	●	●	●		●	●	✔	4		●	Above £6,000,000
Border Steelwork Structures Ltd	01228 548744			●	●	●	●			●	●				●		4			Up to £3,000,000
Bourne Construction Engineering Ltd	01202 746666		●	●	●	●	●	●	●	●	●	●	●	●	●	✔	4	✔	●	Above £6,000,000
Briton Fabricators Ltd	0115 963 2901	●		●	●	●	●	●	●	●	●			●	●	✔	4			Up to £6,000,000
Builders Beams Ltd	01227 863770			●	●	●	●			●	●			●	●	✔	2	✔		Up to £3,000,000
Cairnhill Structures Ltd	01236 449393	●			●	●	●	●	●	●				●	●	✔	4		●	Up to £3,000,000
Caunton Engineering Ltd	01773 531111	●	●	●	●	●	●	●		●	●	●		●	●	✔	4	✔	●	Above £6,000,000
Cementation Fabrications	0300 105 0135	●			●			●			●		●		●	✔	3		●	Up to £6,000,000*
Cleveland Bridge UK Ltd	01325 381188	●	●	●	●	●	●	●	●	●	●	●		●		✔	4		●	Above £6,000,000*
CMF Ltd	020 8844 0940				●		●	●		●	●				●	✔	4			Up to £6,000,000
Cook Fabrications Ltd	01303 893011				●					●	●			●	●		2			Up to £1,400,000
Coventry Construction Ltd	024 7646 4484			●	●	●	●		●	●	●			●	●	✔	4			Up to £800,000
D H Structures Ltd	01785 246269			●	●		●				●						2			Up to £100,000
D Hughes Welding & Fabrication Ltd	01248 421104				●	●	●	●		●	●		●	●	●	✔	4			Up to £800,000
Duggan Steel	00 353 29 70072		●	●	●	●	●	●	●		●	●			●	✔	4			Up to £6,000,000
ECS Engineering Services Ltd	01773 860001	●		●	●	●	●	●	●	●	●			●	●	✔	3			Up to £3,000,000
Elland Steel Structures Ltd	01422 380262		●	●	●	●	●	●	●	●	●	●		●		✔	4	✔	●	Up to £6,000,000
EvadX Ltd	01745 336413			●	●	●	●	●	●	●	●	●				✔	3		●	Up to £3,000,000
Four Bay Structures Ltd	01603 758141			●	●	●	●	●		●	●			●	●		2			Up to £1,400,000
Four-Tees Engineers Ltd	01489 885899												●		●	✔	3		●	Up to £2,000,000
Fox Bros Engineering Ltd	00 353 53 942 1677			●	●	●	●	●			●				●		2			Up to £2,000,000
Gorge Fabrications Ltd	0121 522 5770				●	●	●	●		●				●	●	✔	2			Up to £1,400,000
Gregg & Patterson (Engineers) Ltd	028 9061 8131			●	●	●	●	●				●		●		✔	3			Up to £3,000,000
Company name	**Tel**	**C**	**D**	**E**	**F**	**G**	**H**	**J**	**K**	**L**	**M**	**N**	**Q**	**R**	**S**	**QM**	**FPC**	**BIM**	**SCM**	**Guide Contract Value (1)**

Company name	Tel	C	D	E	F	G	H	J	K	L	M	N	Q	R	S	QM	FPC	BIM	SCM	Guide Contract Value (1)
H Young Structures Ltd	01953 601881			●	●	●	●	●		●	●			●	●	✔	2		●	Up to £2,000,000
Had Fab Ltd	01875 611711				●				●	●	●				●	✔	4			Up to £3,000,000
Hambleton Steel Ltd	01748 810598		●	●	●	●	●	●				●		●		✔	4		●	Up to £6,000,000
Harry Marsh (Engineers) Ltd	0191 510 9797			●	●	●	●			●	●				●	✔	2			Up to £1,400,000
Hescott Engineering Company Ltd	01324 556610			●	●	●	●			●				●	●	✔	2			Up to £3,000,000
Intersteels Ltd	01322 337766	●			●	●	●	●					●	●		✔	3			Up to £2,000,000
J & A Plant Ltd	01942 713511				●	●									●		4			Up to £40,000
James Killelea & Co Ltd	01706 229411		●	●	●	●	●				●	●		●			4			Up to £6,000,000*
John Reid & Sons (Strucsteel) Ltd	01202 483333		●	●	●	●	●	●	●	●	●	●		●	●	✔	4		●	Up to £6,000,000
Kiernan Structural Steel Ltd	00 353 43 334 1445			●	●	●	●	●	●	●	●	●		●	●	✔	4		●	Up to £6,000,000
Kloeckner Metals UK Westok	0113 205 5270												●			✔	4			Up to £6,000,000
Leach Structural Steelwork Ltd	01995 640133			●	●	●	●	●			●					✔	2		●	Up to £6,000,000
Legge Steel (Fabrications) Ltd	01592 205320			●	●		●		●	●	●			●	●		3			Up to £800,000
Luxtrade Ltd	01902 353182									●	●				●	✔	2			Up to £800,000
M Hasson & Sons Ltd	028 2957 1281			●	●	●	●	●	●	●	●				●	✔	4			Up to £2,000,000
M J Patch Structures Ltd	01275 333431				●					●	●			●	●	✔	2			Up to £1,400,000
M&S Engineering Ltd	01461 40111				●				●	●	●			●	●		3			Up to £1,400,000
Mackay Steelwork & Cladding Ltd	01862 843910			●	●		●			●	●			●	●	✔	4			Up to £1,400,000
Maldon Marine Ltd	01621 859000				●	●		●	●	●	●			●	●	✔	3			Up to £1,400,000
Mifflin Construction Ltd	01568 613311			●	●	●	●				●						2			Up to £3,000,000
Murphy International Ltd	00 353 45 431384	●			●		●	●	●		●				●	✔	4			Up to £1,400,000
Newbridge Engineering Ltd	01429 866722	●	●	●	●	●	●	●	●		●			●	●	✔	4		●	Up to £1,400,000
Nusteel Structures Ltd	01303 268112						●	●	●	●				●		✔	4		●	Up to £4,000,000
Overdale Construction Services Ltd	01656 729229			●	●		●	●			●				●		2			Up to £400,000
Painter Brothers Ltd	01432 374400								●		●			●	●	✔	3			Up to £6,000,000*
Pencro Structural Engineering Ltd	028 9335 2886			●	●	●	●	●	●		●			●	●	✔	2			Up to £2,000,000
Peter Marshall (Steel Stairs) Ltd	0113 307 6730									●					●	✔	2			Up to £800,000*
PMS Fabrications Ltd	01228 599090			●	●	●	●		●	●	●			●	●		2			Up to £1,400,000
Rippin Ltd	01383 518610			●	●	●	●	●						●	●		2			Up to £1,400,000
S H Structures Ltd	01977 681931	●			●		●	●	●	●	●	●				✔	4	✔		Up to £2,000,000
SAH Engineering Ltd	01582 584220			●	●	●				●	●			●	●		2			Up to £800,000
SDM Fabrication Ltd	01354 660895	●	●	●	●	●	●				●			●	●	✔	4			Up to £2,000,000
Sean Brady Construction Engineering Ltd	00 353 49 436 4144			●	●	●	●			●	●			●	●		2			Up to £800,000
Severfield plc	01845 577896	●	●	●	●	●	●	●	●	●	●	●	●	●	●	✔	4		●	Above £6,000,000
SGC Steel Fabrication	01704 531286				●					●				●	●	✔	2			Up to £800,000
Shaun Hodgson Engineering Ltd	01553 766499	●		●	●		●			●	●			●	●	✔	3			Up to £800,000
Shipley Structures Ltd	01400 251480			●	●	●	●		●	●	●			●	●		2			Up to £3,000,000
Snashall Steel Fabrications Co Ltd	01300 345588			●	●	●	●	●			●				●		2	✔		Up to £1,400,000
South Durham Structures Ltd	01388 777350			●	●	●				●	●	●			●		2			Up to £800,000
Southern Fabrications (Sussex) Ltd	01243 649000				●	●				●	●			●	●	✔	2			Up to £800,000
Taziker Industrial Ltd	01204 468080									●				●	●	✔	3			Above £6,000,000
Temple Mill Fabrications Ltd	01623 741720			●	●	●	●				●			●	●	✔	2			Up to £400,000
Traditional Structures Ltd	01922 414172			●	●	●	●	●	●		●			●	●	✔	3	✔	●	Up to £2,000,000
TSI Structures Ltd	01603 720031			●	●	●	●	●			●			●		✔	2	✔		Up to £1,400,000
Tubecon	01226 345261						●	●	●	●				●	●	✔	4		●	Above £6,000,000*
Underhill Engineering Ltd	01752 752483				●		●	●	●	●	●			●	●	✔	4			Up to £3,000,000
W & H Steel & Roofing Systems Ltd	00 353 56 444 1855			●	●	●	●	●						●	●		4			Up to £2,000,000
W I G Engineering Ltd	01869 320515				●					●					●	✔	2			Up to £400,000
Walter Watson Ltd	028 4377 8711			●	●	●	●	●				●				✔	4			Up to £6,000,000
Westbury Park Engineering Ltd	01373 825500	●		●	●		●	●	●	●	●				●	✔	4			Up to £800,000
William Haley Engineering Ltd	01278 760591			●	●	●			●	●	●			●		✔	4		●	Up to £4,000,000
William Hare Ltd	0161 609 0000	●	●	●	●	●	●	●	●	●	●	●	●	●	●	✔	4	✔	●	Above £6,000,000
Company name	**Tel**	**C**	**D**	**E**	**F**	**G**	**H**	**J**	**K**	**L**	**M**	**N**	**Q**	**R**	**S**	**QM**	**FPC**	**BIM**	**SCM**	**Guide Contract Value (1)**

Corporate Members

Corporate Members are clients, professional offices, educational establishments etc which support the development of national specifications, quality, fabrication and erection techniques, overall industry efficiency and good practice.

Company name	Tel
A Lamb Associates Ltd	01772 316278
Balfour Beatty Utility Solutions Ltd	01332 661491
Griffiths & Armour	0151 236 5656
Highways England Company Ltd	08457 504030
Kier Construction Ltd	01767 640111

Company name	Tel
PTS (TQM) Ltd	01785 250706
Sandberg LLP	020 7565 7000
Structural & Weld Testing Services Ltd	01795 420264
SUM Ltd	0113 242 7390

Steelwork contractors for bridgeworks

The Register of Qualified Steelwork Contractors Scheme for Bridgeworks (RQSC) is open to any Steelwork Contractor who has a fabrication facility within the European Union.

Applicants may be registered in one or more category to undertake the fabrication and the responsibility for any design and erection of:

- **FG** Footbridge and sign gantries
- **PG** Bridges made principally from plate girders
- **TW** Bridges made principally from trusswork
- **BA** Bridges with stiffened complex platework (eg in decks, box girders or arch boxes)
- **CM** Cable-supported bridges (eg cable-stayed or suspension) and other major structures (eg 100 metre span)
- **MB** Moving bridges
- **RF** Bridge refurbishment
- **AS** Ancilliary structures in steel associated with bridges, footbridges or sign gantries (eg grillages, purpose-made temporary works)
- **QM** Quality management certification to ISO 9001
- **FPC** Factory Production Control certification to BS EN 1090-1
  1 – Execution Class 1 2 – Execution Class 2
  3 – Execution Class 3 4 – Execution Class 4
- **BIM** BIM Level 2 compliant
- **SCM** Steel Construction Sustainability Charter
  (● = Gold, ● = Silver, ● = Member)

Notes

(1) Contracts which are primarily steelwork but which may include associated works. The steelwork contract value for which a company is pre-qualified under the Scheme is intended to give guidance on the size of steelwork contract that can be undertaken; where a project lasts longer than a year, the value is the proportion of the steelwork contract to be undertaken within a 12 month period.

Where an asterisk (*) appears against any company's classification number, this indicates that the assets required for this classification level are those of the parent company.

BCSA steelwork contractor member	Tel	FG	PG	TW	BA	CM	MB	RF	AS	QM	FPC	BIM	NHSS 19A	NHSS 20	SCM	Guide Contract Value (1)
A&J Fabtech Ltd	01924 439614	●	●	●	●				●	✓	3					Up to £400,000
Bourne Construction Engineering Ltd	01202 746666	●	●	●				●	●	✓	4	✓		✓	●	Above £6,000,000
Briton Fabricators Ltd	0115 963 2901	●	●	●	●	●	●	●	●	✓	4			✓		Up to £6,000,000
Cairnhill Structures Ltd	01236 449393	●	●	●	●			●	●	✓	4			✓	●	Up to £3,000,000
Cementation Fabrications	0300 105 0135	●	●						●	✓	3			✓	●	Up to £6,000,000*
Cleveland Bridge UK Ltd	01325 381188	●	●	●	●	●	●	●	●	✓	4		✓	✓	●	Above £6,000,000*
D Hughes Welding & Fabrication Ltd	01248 421104	●		●			●	●	●	✓	4			✓		Up to £800,000
Donyal Engineering Ltd	01207 270909	●						●	●	✓	3			✓	●	Up to £1,400,000
ECS Engineering Ltd	01773 860001	●	●	●	●		●		●	✓	3					Up to £3,000,000
Four-Tees Engineers Ltd	01489 885899	●	●	●	●		●	●	●	✓	3			✓	●	Up to £2,000,000
Kiernan Structural Steel Ltd	00 353 43 334 1445	●		●				●	●	✓	4			✓	●	Up to £6,000,000
Millar Callaghan Engineering Services Ltd	01294 217711	●				●		●	●	✓	4			✓		Up to £1,400,000
Murphy International Ltd	00 353 45 431384	●	●	●	●				●	✓	4			✓		Up to £1,400,000
Nusteel Structures Ltd	01303 268112	●	●	●	●	●		●	●	✓	4		✓	✓	●	Up to £4,000,000
S H Structures Ltd	01977 681931	●		●	●	●	●		●	✓	4	✓		✓	●	Up to £2,000,000
Severfield (UK) Ltd	01204 699999	●	●	●	●	●	●	●	●	✓	4			✓	●	Above £6,000,000
Shaun Hodgson Engineering Ltd	01553 766499							●	●	✓	3			✓		Up to £800,000
Taziker Industrial Ltd	01204 468080	●	●	●	●			●	●	✓	3		✓	✓		Above £6,000,000
Underhill Engineering Ltd	01752 752483	●	●	●	●			●	●	✓	4			✓		Up to £3,000,000
Non-BCSA member																
Allerton Steel Ltd	01609 774471	●	●	●	●	●		●	●	✓	4			✓		Up to £4,000,000
Centregreat Engineering Ltd	029 2046 5683	●	●	●	●	●	●	●	●	✓	4					Up to £1,400,000
Cimolai SpA	01223 836299	●	●	●	●	●	●	●	●	✓	4					Above £6,000,000
CTS Bridges Ltd	01484 606416	●	●	●	●	●	●		●	✓	4			✓	●	Up to £800,000
Francis & Lewis International Ltd	01452 722200							●	●	✓	4			✓	●	Up to £2,000,000
Harland & Wolff Heavy Industries Ltd	028 9045 8456	●	●	●	●	●		●	●	✓	3					Up to £2,000,000
Hollandia Infra BV	00 31 180 540 540	●	●	●	●	●	●	●	●	✓	4					Above £6,000,000*
HS Carlsteel Engineering Ltd	020 8312 1879	●	●					●	●	✓	3			✓		Up to £40,000
IHC Engineering (UK) Ltd	01773 861734	●							●	✓	3			✓		Up to £400,000
Interserve Construction Ltd	020 8311 5500							●	●	✓	N/A					Above £6,000,000*
Lanarkshire Welding Company Ltd	01698 264271	●	●	●	●	●	●	●	●	✓	4		✓	✓	●	Up to £2,000,000
P C Richardson & Co (Middlesbrough) Ltd	01642 714791	●						●	●	✓	N/A					Up to £3,000,000
Total Steelwork & Fabrication Ltd	01925 234320	●						●	●	✓	3			✓		Up to £3,000,000
Victor Buyck Steel Construction	00 32 9 376 2211	●	●	●	●	●	●	●	●	✓	4		✓	✓	●	Above £6,000,000

Industry Members

Industry Members are those principal companies involved in the direct supply to all or some Steelwork Contractor Members of components, materials or products. Industry member companies must have a registered office within the United Kingdom or Republic of Ireland.

1 Structural components
2 Computer software
3 Design services
4 Steel producers
5 Manufacturing equipment
6 Protective systems
7 Safety systems
8 Steel stockholders
9 Structural fasteners

CE
CE Marking compliant, where relevant:
M manufacturer (products CE Marked)
D/I distributor/importer (systems comply with the CPR)
N/A CPR not applicable

SCM
Steel Construction Sustainability Charter
Gold,
Silver,
Member

Company name	Tel	1	2	3	4	5	6	7	8	9	CE	SCM	BIM
AJN Steelstock Ltd	01638 555500								●		M		
Albion Sections Ltd	0121 553 1877	●									M		
Arcelor Mittal Distribution - Scunthorpe	01724 810810								●		D/I		
Autodesk Ltd	01252 456893		●										
AVEVA Solutions Ltd	01223 556655		●								N/A		
Ayrshire Metals Ltd	01327 300990	●									M		✓
BAPP Group Ltd	01226 383824									●	M		
Barrett Steel Services Limited	01274 682281								●		M		
Behringer Ltd	01296 668259					●					N/A		
British Steel	01724 404040				●						M		
BW Industries Ltd	01262 400088	●									M		
Cellbeam Ltd	01937 840600	●									M		
Cleveland Steel & Tubes Ltd	01845 577789								●		M		
Composite Profiles UK Ltd	01202 659237	●									D/I		
Cooper & Turner Ltd	0114 256 0057									●	M		
Cutmaster Machines (UK) Ltd	01226 707865					●					N/A		
Daver Steels Ltd	0114 261 1999	●									M		
Daver Steels (Bar & Cable Systems) Ltd	01709 880550	●									M		
Dent Steel Services (Yorkshire) Ltd	01274 607070								●		M		
Duggan Profiles & Steel Service Centre Ltd	00 353 56 7722485	●							●		M		
easi-edge Ltd	01777 870901							●			N/A	●	
Fabsec Ltd	01937 840641	●									N/A		
Ficep (UK) Ltd	01924 223530					●					N/A		
FLI Structures	01452 722200	●									M	●	
Forward Protective Coatings Ltd	01623 748323						●				N/A		
Graitec UK Ltd	0844 543 8888		●								N/A		
Hadley Group Ltd	0121 555 1342	●									M	○	
Hempel UK Ltd	01633 874024						●				N/A		
Highland Metals Ltd	01343 548855						●				N/A		
Hilti (GB) Ltd	0800 886100									●	M		
Hi-Span Ltd	01953 603081	●									M	●	

Company name	Tel	1	2	3	4	5	6	7	8	9	CE	SCM	BIM
International Paint Ltd	0191 469 6111						●				N/A	●	
Jack Tighe Ltd	01302 880360						●				N/A		
Jamestown Manufacturing Ltd	00 353 45 434288	●									M		
John Parker & Sons Ltd	01227 783200								●	●	D/I		
Joseph Ash Galvanizing	01246 854650						●				N/A		
Jotun Paints (Europe) Ltd	01724 400000						●				N/A		
Kaltenbach Ltd	01234 213201					●					N/A		
Kingspan Structural Products	01944 712000	●									M	●	
Kloeckner Metals UK	0113 254 0711								●		D/I		
Lindapter International	01274 521444									●	M		
MSW UK Ltd	0115 946 2316	●									D/I		
Murray Plate Group Ltd	0161 866 0266								●		D/I		
National Tube Stockholders Ltd	01845 577440								●		D/I		
Peddinghaus Corporation UK Ltd	01952 200377					●					N/A		
Pipe and Piling Supplies Ltd	01592 770312	●									M		
PPG Performance Coatings UK Ltd	01525 375234						●				N/A		
Prodeck-Fixing Ltd	01278 780586	●									D/I		
Rainham Steel Co Ltd	01708 522311								●		D/I		
Sherwin-Williams Protective & Marine Coatings	01204 521771						●				M	○	
Structural Metal Decks Ltd	01202 718898	●									M	●	
StruMIS Ltd	01332 545800		●								N/A		
Tata Steel Distribution UK & Ireland	01902 484000								●		D/I		
Tata Steel Ireland Service Centre	028 9266 0747								●		D/I		
Tata Steel Service Centre Dublin	00 353 1 405 0300								●		D/I		
Tata Steel Tubes	01536 402121				●						M		
Tata Steel UK Panels & Profiles	0845 3088330	●									M		
Tension Control Bolts Ltd	01948 667700						●			●	M		
Trimble Solutions (UK) Ltd	0113 887 9790		●								N/A		
voestalpine Metsec plc	0121 601 6000	●									M	●	
Wedge Group Galvanizing Ltd	01909 486384						●				N/A		
Yamazaki Mazak UK Ltd	01905 755755					●					N/A		

STRUMIS V10.1

NEW FEATURES GREATER FLEXIBILITY FOR ALL STEEL FABRICATORS

A WORLD LEADING STEEL FABRICATION MANAGEMENT INFORMATION SOFTWARE, USED WORLDWIDE TO REDUCE COSTS WHILE MAXIMISING PRODUCTIVITY AND INCREASING PROFITABILITY.

STRUMIS V10.1 HAS BEEN RELEASED, CONTAINING EXCITING AND UNIQUE NEW FEATURES SPANNING THE ENTIRE SYSTEM.

COME SEE THE STRUMIS FEATURES THAT OTHER PROVIDERS ARE ONLY TALKING ABOUT.
OTHERS PROMISE; WE DELIVER.

THE FUTURE OF STEEL FABRICATION.

Stay connected to STRUMIS:

STRUMIS

BRINGING STRUCTURE TO STEEL

SALES@STRUMIS.COM | 01332 545800 | WWW.STRUMIS.COM

SOFTWARE BY STRUMIS LTD. PART OF THE GLOBAL RDS GROUP