NOV/DEC 2024

NSC

Monopile factory first at Redcar

Terminal extension at Leeds Bradford Airport

BREEAM 'Outstanding' targeted in West End

Steel meets special needs in Towcester

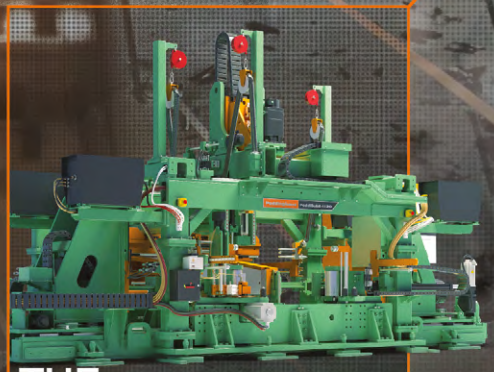
NEW STEEL CONSTRUCTION Volume 32 No 10 www.newsteelconstruction.com

THE IMPACT OF SUB-X

DRILLING, MILLING AND PLASMA MARKING

- Simultaneously mill copes, flange thins, rat holes and more with each drilling axis
- Simultaneously plasma mark piece marks, weld symbols and more on all 4 sides of material
- Each high speed 18.5 kW drill spindle has an operating window of 500 mm

www.peddinghaus.com/steel/subx



THE PEDDISUBX-1120

Peddinghaus STRONGER THAN STEEL®

www.peddinghaus.com | info@peddinghaus.com | +44 1952 200377

NOV/DEC 2024
Vol 32 No 10

NSC

Cover Image
Monopile factory, Teesworks
Main Client: SeAH Wind
Architect: Ashton Smith Architects
Construction Manager: K2 Construction Management
Structural engineer: Clarkebond
Steelwork contractor: Severfield
Steel tonnage: 35,000t

EDITOR
Nick Barrett Tel: 07973 325417
nick@alignmentmedia.co.uk

DEPUTY EDITOR
Martin Cooper Tel: 07966 904599
martincoopernsc@gmail.com

PRODUCTION EDITOR
Andrew Pilcher Tel: 07365 919818
andrew@alignmentmedia.co.uk

COMMERCIAL MANAGER
Kirsty Barrett Tel: 07525 253316
kirsty@alignmentmedia.co.uk

NSC IS PRODUCED BY ALIGNMENT MEDIA 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.bcsa.org.uk
Email postroom@bcsa.org.uk

Steel for Life Ltd
4 Whitehall Court, Westminster, London SW1A 2ES
Telephone 020 7839 8566

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
Alignment Media
7 Linden Close,
Tunbridge Wells, Kent TN4 8HH
Telephone 07973 325417

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 new initiatives and investments from the steel sector that will make significant contributions to achieving the UK's carbon emission reduction goals.

6 **NEWS**
The first *National Light-Gauge Steelwork Specification* is available, while the BCSA and SCI launch *Best Practice for Designing Low Embodied Carbon Steel Buildings*.

10 **STEEL FOR LIFE - HEADLINE SPONSOR**
Barrett Steel is leading the way and has made significant progress in its decarbonisation efforts in order to deliver low carbon steel solutions

12 **INDUSTRY**
Part of the Teesworks development, the world's largest monopile factory is rising up on the site of the former Redcar steelworks.

14 **EDUCATION**
Speed of construction was one of the reasons for choosing structural steelwork as the framing solution for a SEND school in Northamptonshire.

16 **AIRPORT**
A new steel framed terminal extension forms part of Leeds Bradford Airport's wide-ranging expansion plans.

18 **COMMERCIAL**
Aiming to achieve a better embodied carbon intensity than the Greater London Authority target, sustainability is at the heart of the Network W1 project.

22 **INDUSTRY**
Steelwork's numerous attributes have come to fore on a new pharmaceutical factory in North Wales.

24 **TECHNICAL**
SCI's Graham Couchman writes on how composite slabs support concentrated loads and how software can design these slabs.

28 **ADVISORY DESK**
AD 535: Horizontal lateral loading on internal load-bearing walls in residential buildings.

29 **CODES AND STANDARDS**

30 **50 YEARS AGO**
Our look back through the pages of *Building with Steel* features prefabricated units destined for Brazil.

32 **REGISTER OF QUALIFIED STEELWORK CONTRACTORS FOR BUILDINGS**

34 **REGISTER OF QUALIFIED STEELWORK CONTRACTORS FOR BRIDGEWORKS**

Stacker Packers
Engineered Levelling Shims

Trusted by Severfield

"We've already used thousands of them on a premier league football club development project and we intend to use them again on our forthcoming projects. Stacker Packers is a great product".

Steve Burley, Senior Site Manager

- Made from certified material with UV stabilisers.
- High compressive strength – independently load tested up to 14.5 tonnes.
- Interlocking profiles ensure safe and stable structure during installation.
- Applications – steel frame buildings, precast concrete components, modular pods and buildings.

Used on Manchester Arena, La Sagrada Familia Basilica, Sandwell Aquatics, Anfield Main Stand, Lords Cricket Ground and Wimbledon Court One.

80mm shim stack under 143.8kN load

To download our datasheet, please go to: **brilliantideasltd.co.uk/stacker-packers**

Get in touch to find out more

T. 01335 345111 **E.** enquiries@brilliantideasltd.co.uk **W.** brilliantideasltd.co.uk

ALIMATS®
Load Spread Solutions for Cranes and Powered Access

Used by:

Balfour Beatty, Kier, BAM, Willmott Dixon, Tilbury Douglas, Severfield, Elland Steel, BHC, Bourne Group, Snashall Steel Fabrications, Gorge Fabrications, and many more.

- Mat modules manufactured from recycled certified extruded Aluminium.
- Interlocking modules enable easier set up and greater structural performance.
- Sizes 1.34m² to 8.07m² - all handleable for two people to offload and position.

Available for sale and nationwide single day or weekly hire.

To view and download our specifications and drawings for Powered Access and Cranes, please go to: **brilliantideasltd.co.uk/alimats**

Get in touch to find out more

T. 01335 345111 **E.** enquiries@brilliantideasltd.co.uk **W.** brilliantideasltd.co.uk

Steel's carbon emissions on track for striking reductions

Nick Barrett - Editor

The new government has set out its stall to promote growth in a low carbon economy. Major growth areas for the UK economy over the coming years will almost certainly include projects to create carbon reducing infrastructure facilities to support the drive towards net-zero carbon.

A good example is the wind power infrastructure that is replacing carbon emitting industries of the past like coal. Evidence of offshore wind power projects are easy to see on developments all around the coastline, and there is also a lot of steel-built land based development associated with manufacturing these large structures. In this issue we report on steel being used to build what is said to be the world's largest monopile factory, whose products will be used in the growing offshore wind industry. Interestingly, this vast factory is being built on the old Redcar steelworks site.

Another possibly less obvious growth area is the data centres that are needed to support the use of artificial intelligence (AI), as security considerations mean data centre operators are reluctant to reveal locations. But BCSA members can confirm that there are a lot of them, they are big, and they are being built with steel.

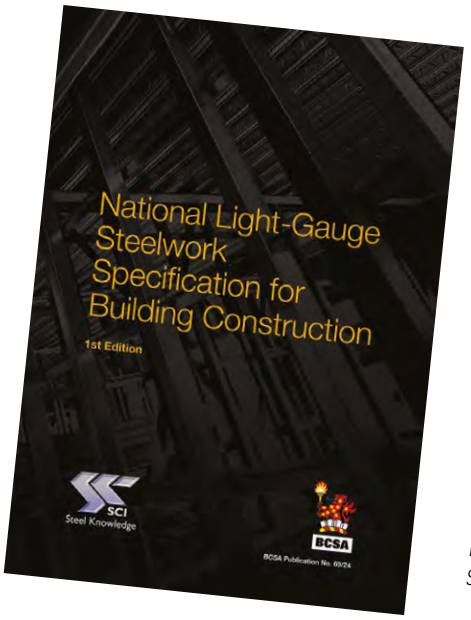
All future infrastructure will of course be increasingly built with low carbon and other sustainability issues in mind, requirements that steel construction is enviably placed to meet. There is no standing still on this and the steel sector makes every effort to improve its sustainability performance. Evidence of efforts being made by BCSA member steelwork contractors to reduce their own carbon footprints is found in this month's Headline Sponsor article from Barrett Steel, who have reduced their carbon footprint by 17% from their 2021 baseline. Evidence of this effort can be found at BCSA members up and down the UK and Ireland.

In News this month we have a story about Tata Steel signing a contract to create a state-of-the-art electric arc furnace at its Port Talbot site, in what will be arguably the most significant development in UK steel manufacturing since 1857, when Sir Henry Bessemer patented the process that made mass production of low cost, high quality steel possible. The EAF will reduce steelmaking carbon emissions at the site by 90%, a striking reduction by any standard.

Another carbon reduction development is the new Best Practice Guide for low carbon embodied steel buildings, from the BCSA and the Steel Construction Institute, that can also be read about in News. It is hoped this will help promote a focus on design efficiency - identified in BCSA's 2050 Decarbonisation Roadmap as a quick and significant contributor to carbon reduction. Efficiently designed buildings are more cost effective as well as more environmentally friendly, so will be welcomed by cost conscious developers.

Carbon reduction isn't the new government's only policy, and tackling the housing crisis has been singled out as a priority in which steel construction can also play a key part. Light-Gauge steelwork will no doubt have a big role to play, and to support that BCSA has just launched the first National Light-Gauge Steelwork Specification. Following the framework set out by the specification will deliver confidence that the Building Safety Act requirements for residential buildings are being properly met. And with all the sustainability benefits of steel.

BCSA launches light-gauge steelwork specification to tackle housing crisis



Modern Methods of Construction are widely expected to prove invaluable in tackling the UK's housing shortages over the coming years, and light-gauge steel will have a key role to play.

To support the more widespread use of cold-formed, galvanized light steel, the British Constructional Steelwork Association (BCSA) has launched the first *National Light-Gauge Steelwork Specification* (*NLSS*).

The new Specification has been developed with input from the wider construction industry and the light steel manufacturing sector.

It is intended to be incorporated into construction contracts, giving clients, designers, contractors and manufacturers confidence that light-gauge steel is being produced and used to the highest regulatory standards.

BCSA Chief Executive Officer Jonathan Clemens said: "Light-gauge steel frame structures use galvanized cold-formed steel sections as the primary structural components, which can be assembled into prefabricated panels. It is an integral part of modular construction because it is strong, lightweight, durable and is becoming a more significant solution for residential buildings.

"The introduction of the Building Safety Act has focused the construction industry on competence and capability to ensure that building projects are robust and are designed and constructed to ensure the safety of those living and working in residential and office buildings.

"The *NLSS* sets out a framework of requirements to reassure designers, clients and contractors that the light-gauge steelwork industry is able to establish and maintain high standards in all areas of its operations."

The *NLSS* will come into force from April 2025 and can be downloaded from *https://bcsa.org.uk/resources/fabrication-technical-design/nlss/*

Severfield opens new apprentice training school

Having just welcomed a record number of 40 new apprentices into the Group, Severfield has celebrated the opening of a brand-new Apprentice Training School at its largest manufacturing facility in Dalton near Thirsk.

The facility provides a dedicated production area that acts as a 'mini-factory' for apprentices to practice manufacturing operations such as welding and grinding in an environment away from the main production lines.

Severfield said this highlights its ongoing commitment to develop future talent and support young people in harnessing the skills that are essential to the future of the construction and manufacturing industries.

Jill Jenkins, Early Careers Manager at Severfield, said: "We are thrilled to welcome this year's intake of apprentices who will be integral to shaping the future of our industry.

"We are deeply committed to investing in young talent, and our apprenticeship programme provides a solid foundation of practical skills and real-world experience for young people. The new training school at Dalton is a great example of how we will support and nurture the next generation of skilled individuals, who will help drive innovation and success across our company and the wider industry."

The training school was officially opened by Mark Bates, Inward Investment Sector Manager – Manufacturing, from York and North Yorkshire Combined Authority, as part of Severfield's celebrations of National Manufacturing Day (24 September).

Steel extension for Liverpool children's hospital

The steel frame for a new facility at Alder Hey Children's Hospital in Liverpool is quickly taking shape.

The state-of-the-art Surgical Neonatal Intensive Care Unit will be the first of its kind in the UK, providing family integrated care and a safer service for babies. It will feature 22 neonatal cots and 18 individual family rooms.

On the ground floor of the hospital's extension, there will be a Same Day Emergency Care Centre, which will accommodate paediatricians, clinicians, and primary care and family support workers. This area will be a 24-bed unit with four rooms for urgent care consultations.

Morgan Sindall, Managing Director in the North, Simon Arnott, said: "Alder Hey Hospital has been an invaluable asset to the local communities in Liverpool and the wider North West region for over 100 years. Its dedication to improving the lives of young people with health difficulties and their families is unmatched. It is therefore an immense privilege for us to play a part in the next stage of the hospital's history."

The steel frame is being fabricated, supplied and erected by Leach Structural Steelwork.

The project is expected to be completed by the end of 2025.

NSC Important update for New Steel Construction subscribers

As of January 2025, New Steel Construction (NSC) magazine will be introducing a fresh approach to keep you up to date on all things in the steel construction sector. To better align with sustainability goals and the digital preferences of our readers, NSC will now produce only four printed editions (March, June, September and November/December) per year, while moving the rest of our publications to an enhanced digital format.

We encourage all readers to make the most of our digital platform, which offers the same expert insights, industry news, and innovative projects in a convenient, environmentally-friendly format.

Make sure you are subscribed to the digital edition to stay connected. Visit *newsteelconstruction.com* to ensure you do not miss an issue. Thank you for being part of our journey toward a sustainable and digitally-empowered future in steel construction!

Best practice guide for low carbon steel buildings launched

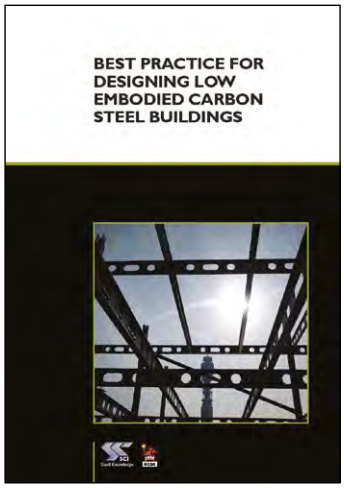
In order to meet Lever 1 of the British Constructional Steelwork Association (BCSA) decarbonisation roadmap, a new publication has been launched.

Produced by the BCSA and the Steel Construction Institute (SCI), *Best Practice for Designing Low Embodied Carbon Steel Buildings* (SCI P449), provides guidance on designing structurally efficient, low embodied carbon steel buildings. It explains how design efficiency is an important component of the roadmap both in terms of its contribution and timescale.

In the short-term, while new steelmaking technologies are further developed and commercialised, material efficiency gains will deliver early, significant carbon reductions. Demand reduction does not mean fewer steel buildings, but rather it involves smarter, more efficient design; performing the same structural function but using less steel.

Specific structural steel efficiency measures include: reducing over-specification of structural steel, the reduction of applied loads, using higher-strength steel to facilitate the use of lighter members, and extending building lifetimes by designing for adaptability and internal flexibility.

Launched in 2021, the BCSA decarbonisation roadmap has a total of six Levers, consisting of circular economy, direct steelmaking emission reductions,



decarbonisation of the UK electricity grid, carbon capture and use and storage, and steel transport, fabrication and erection.

The publication is available at *https://steelconstruction.info/Sustainability#Lever_1_Design_efficiency*

Luxury hotel rises up on Welsh coast

Structural steelwork is forming a luxury hotel and apartment complex at Abersoch in North Wales.

Being developed by Preston-based Providence Gate Group Holdings, the Abersoch hotel, which will be operated by Bespoke Hotels, will house 42 luxury bedrooms and suites, restaurant, bar with sea-view terraces, event spaces, gym, spa with swimming pool, treatment rooms and thermal suite over three floors.

The top two floors above the hotel will also comprise 18 private apartments.

Working on behalf of main contractor CL Projects, Rhyl-based EvadX is fabricating, supplying and erecting 275t of steelwork for the project.

Charlie Openshaw, Development Director at Providence Gate Group Holdings, said: "The demand for staycation accommodation has risen sharply in the Abersoch and North Wales areas as it has throughout the UK.

"Our development, on the site of the previous Whitehouse Hotel, will help meet some of that demand without displacing or converting existing properties.

"We're extremely keen to see the hotel play a full role in the local community and create jobs for local people both during the construction process and the subsequent operation of the hotel."

NEWS IN BRIEF

William Hare Group has reported a strong financial performance for year ending 31 December 2023. The Group recorded a turnover for the year of £315.5M, an increase of £67.2M on the previous year and an EBITDA (Earnings Before Interest, Taxes, Depreciation and Amortisation) of £9.8M – up from £3.4M in 2022.

One of Europe's largest **artificial intelligence** (AI) data centres is set to be built in the north east of England, creating up to 4,000 jobs. The £10bn investment, by US-based equity firm Blackstone was initially announced by Prime Minister Sir Kier Starmer on his recent visit to New York. Construction on the site, which was originally earmarked for the failed BritishVolt gigafactory, is expected to begin next year.

Kier has started work on a new healthcare project, which forms part of the University of Huddersfield's National Health Innovation Campus (NHIC). Set to open at the end of 2025, the 6,800m² facility, which will be named the Emily Siddon Building, is situated near the centre of Huddersfield and will offer diagnostic services as well as a place for local businesses to thrive.

City planners have given the thumbs up for the redevelopment of Liverpool's historic **Littlewoods building**. Built in 1938, the art deco landmark, which was once the home to the famous football pools company, will be converted into film and TV centre and will include two 1,850m² studios for big budget productions, as well as offices, workshops, studio support facilities and an education space.

Hackney Council has given the go-ahead for a 27-storey office block at One Fairchild Street in Shoreditch, east London. Developed by Rocket Properties and designed by architects AHMM, the project which sits close to the City of London's financial district, will offer 25,500m² of office space, including affordable zones for start-ups and SMEs, as well as roof terraces.

PRESIDENT'S COLUMN

Hybrid working

Being someone who until the UK entered its first lockdown period had spent every working day either in the office or travelling to business meetings, I may not be in the best position to offer an opinion on work-life balance. Indeed, I recall the many times that our children frowned when the phone rang or the laptop was opened while on holiday. But today there is much more emphasis on getting this balance right.

So, is it better to have an inventive, collaborative and connected desk-based workforce, or would you prefer your office staff to be loyal, perform better, and be more productive?

These are the two creative descriptions offered in a polar difference of opinions currently being promoted by our own Government versus global organisations such as Amazon, Goldman Sachs and Tesla who want their staff to return to the office full-time.

As part of the Government's new Employment Rights Bill, staff could soon be given the right to work remotely, undertake compressed four-day weeks and not be disturbed outside office hours (although this last point is currently under review). This has left many businesses concerned that these rules will be applied across the board, thus taking away the ability for an organisation to apply different practices to different working requirements. It would also make it much more difficult for smaller businesses to determine and control their own employment policy and structure.

Make UK, one of our steelwork industry partners, has stressed the need for any new legislation to continue to allow individual businesses to decline flexible working requests where they are deemed inappropriate, and also to allow those same employers to "put in place the right measures to improve work-life balance for their employees, while preserving their ability to respond urgently and flexibly to business-critical needs".

When the spacecraft design and manufacturer, SpaceX, brought in a policy requiring workers to return to the office full-time, it is reported that it immediately lost 15% of its senior-level employees. Logically, it would be safe to assume that at least some of those senior-level employees were not straight out of university, so this is not a generational debate, and I can confidently say that many of the discussions I have had with key figures within the constructional steelwork industry would confirm this assumption.

According to the Office for National Statistics, the UK is already the 'work-from-home' capital of Europe, with 44% of employees working a hybrid or fully-remote week, but we need to get the balance right. Younger employees need the interaction and mentoring of more experienced work colleagues, so it would seem to me that the answer should be a hybrid work structure that allows senior staff to improve their work/life balance while encouraging younger employees back into workspaces.

Research by the Institute of Directors currently shows that around 90% of UK businesses now offer remote working, while 70% also offer part-time working. So, at a time when most industries, including our own, are keen to attract and retain new workers, this seems a very reasonable position to be in.

My own opinion is that the government shouldn't legislate too far, as most employers and employees will be able to reach a satisfactory middle ground themselves. The fact that I found it difficult to switch off during my career was my own life choice rather than any coercion by others. Let's continue to allow people the same freedom of choice.

Gary Simmons
BCSA President

Tata Steel signs contract for green steelmaking technology

Steelmaker Tata Steel has signed a contract with Tenova – a world leading metals technology manufacturer – to deliver a state-of-the-art electric arc furnace (EAF) at its Port Talbot site in South Wales.

When it is commissioned from the end of 2027, the EAF will reduce the site's steelmaking carbon emissions by 90%, equivalent to five million tonnes of CO_2 a year.

Tenova will supply an EAF with an annual capacity of 3 million tonnes of steel – similar to the output of the site's blast furnaces – by melting scrap steel sourced from the UK. The use of scrap will also significantly reduce the UK's reliance on imported iron ore, strengthening the resilience of the UK's manufacturing supply chains.

T V Narendran, CEO and MD of Tata Steel, said: "This landmark agreement will enable us to transform our steelmaking site that will not only support the UK's decarbonisation journey but also provide economic development opportunities for South Wales."

The agreement has been made possible by the £1.25bn joint investment by Tata Steel and the UK Government, with the former investing £750 million and the latter up to £500 million.

UK Business and Trade Secretary Jonathan Reynolds said: "This partnership follows in the footsteps of an improved deal between the Government and Tata Steel, and is further proof of our commitment to a bright future for UK steelmaking."

South Wales bridge provides safer crossing

Replacing a level crossing, a new single-span steel footbridge has been installed to provide a safer route over the railway lines in the Cardiff suburb of Llandaf.

Located close to Llandaf railway station, the bridge is part of the South Wales Metro project and was built following the electrification of the railway lines.

James Price, Chief Executive Officer at Transport for Wales, said: "As we prepare for the introduction of brand new all-electric tram trains next year and an increase in frequency of services to four trains per hour from each of the heads of the Valleys, the majority going through Llandaf, this footbridge will provide a vital safe crossing for the local community.

"I'd like to congratulate the team behind the project and thank residents and stakeholders for their feedback and patience while the work has taken place."

Originally known as the Barry Wrides level crossing after a family of farmers who worked the land in the area in the late 19th century, the new structure has continued this tradition and has been named the Barry Wrides Bridge.

Adey Steel fabricated, supplied and installed the bridge.

More parking spaces set to arrive at Derby hospital

Willmott Dixon has been appointed by developers noviniti to build a new £16.8M multi-storey car park at Royal Derby Hospital to provide an additional 500 spaces.

Spread over five storeys, the new facility will replace the current surface level car park.

Ahead of main works starting on the new car park, Willmott Dixon has also created a temporary car park on a site near the hospital with a park-and-ride system in operation.

Willmott Dixon Director Nick Heath, said: "We're pleased to be delivering this infrastructure improvement at Royal Derby Hospital for University Hospitals of Derby and Burton NHS Foundation Trust.

"We look forward to delivering a project that will help to improve visitor and patient experience when visiting the hospital by significantly increasing parking provision. It will also provide additional facilities, including electric vehicle charging points."

Jonathan Houlston, CEO at noviniti, said: "Working in partnership with Willmott Dixon, this much-needed facility will greatly ease onsite traffic congestion and positively contribute to the patient and visitor experience."

Completion is set for summer 2025.

St Pancras Campus is ready for handover

Developer W.RE's central London mixed-use St Pancras Campus has reached practical completion.

Working on behalf of main contractor BAM Construction, Elland Steel Structures fabricated, supplied and erected 2,000t of steelwork for the project.

Steelwork was used to create the desired long spans for the five-storey office block, which sits adjacent to two concrete-framed residential buildings.

Designed by Stirling-Prize winning architects Caruso St John, the St Pancras Campus is said to have a classic feel, utilising handset brickwork in the residential elements and sandstone and pre-cast concrete cladding for the commercial building.

The steel frame also forms an architectural feature in the offices as it is exposed throughout the structure, creating a modern industrial office environment. Enhancing this design, the steel to steel connections are for the most part hidden, allowing the frame to have a clean smooth appearance.

The office floorplates also have exposed concrete soffits, where the bottom flange of the steel beams are expressed, alongside exposed building services, which are accommodated within bespoke cellular beams.

Wimbledon to serve up 39 new tennis courts

Plans submitted by the All England Lawn Tennis Association (AELTC) to build 39 new tennis courts on a golf course site have been approved by the Greater London Authority (GLA).

The Wimbledon project would more than treble the size of the grand slam tennis grounds. The plans include an 8,000-capacity covered court, which will be the third show court at the venue.

Deborah Jevans, Chair of the All England Club, commented: "We are delighted that the GLA has resolved to approve our applications to transform the former Wimbledon Park Golf Course.

"Our proposals will deliver 27 acres of newly accessible parkland for the community and enable us to bring the Qualifying Competition for The Championships onsite, with all of the substantial economic and employment opportunities this presents.

"Every stage of this project will be delivered with a meticulous attention to detail and the utmost respect for both our neighbours and the environment."

Jules Pipe CBE, Deputy Mayor for Planning, Regeneration and the Fire Service, said: "These plans for the site of a former private golf course will bring significant benefits to the local area, the wider capital and the UK economy, providing increased access to open green space and sport, new parkland and a host of new jobs.

"Hosting qualifying events on the same site as the Championships will put Wimbledon on a global footing with other Grand Slam tournaments and ensure it remains one of the world's top sporting events. The scheme brings a huge range of economic, social and cultural benefits which will contribute to building a fairer, greener and more prosperous London for everyone."

Sustainable factory for Scarborough

Caddick Construction has been appointed by Schneider Electric to build a 16,500m² manufacturing facility in Scarborough, North Yorkshire.

Schneider Electric, a leader in the digital transformation of energy management and automation, is investing £42M in the new facility at Scarborough Business Park.

More than 200 jobs will be created to meet the increased demand for electrical equipment to drive the UK's move to cleaner energy including renewable energy sources, electric vehicles, and intelligent, energy-efficient buildings.

The site, which is almost triple the size of Schneider Electric's existing Scarborough facility, is said to be a blueprint for sustainable design and operations in the manufacturing industry. It is poised to become a net-zero plant and will use modern technology to reduce energy waste and maximise the use of renewable energy. It is expected to be net-zero in Scope 1 and 2 emissions when it opens in early 2025.

Kelly Becker, President at Schneider Electric, UK & Ireland, Belgium & Netherlands, said: "Sustainability is at the core of our purpose, culture and business. We're proud to be investing in and developing innovative solutions which will deliver immediate and lasting decarbonisation in the UK, while bolstering the creation of local, green jobs in Yorkshire."

David Skaith, Mayor of York and North Yorkshire, said: "York and North Yorkshire has a well-established and thriving manufacturing sector, which is home to an abundance of leading and specialist companies.

"So, it is fantastic to see Schneider make this huge investment in their future in Scarborough.

"This new manufacturing facility will drive new, quality jobs in Scarborough and help us go beyond net-zero to become England's first carbon negative region."

Diary

For SCI events contact SCI Education, tel: 01344 636500 email: *education@steel-sci.com* web: *https://portal.steel-sci.com/trainingcalendar.html*
For BCSA events, visit: *https://bcsa.org.uk/events/*

Tue 26 November 2024
Designing in Stainless Steel
Online course
This 4 hour course will equip engineers with the skills necessary to design structural stainless steel in accordance with current European design practice. As the demand for resilient and long-lasting structures with low maintenance requirements grows, applications for stainless steel in construction are increasing. Stainless steels are attractive and highly corrosion resistant steel alloys, with good strength, toughness, and fatigue. They are used for structures in coastal environments, exposed to de-icing salts or in heavily polluted locations.

Mon 2, Wed 4 and Fri 6 December 2024
Steel Frames & Disproportionate Collapse Rules
Online course
This course provides a solid introduction into the design of steel framed buildings to avoid disproportionate collapse. The guidance provided is in accordance with the current Building Regulations, the Eurocodes and Approved Document A which all require that disproportionate collapse must be considered in the design of all buildings.

Mon 9 to Fri 13 December 2024
or Mon 3 to Fri 7 February 2025
Responsible Coatings Professional
4.5-day courses; Manchester
A 4 day technical training course on protective coatings and intumescent fire protection for steel structures. It is endorsed and approved by Elcometer Ltd, Hempel and Sherwin-Williams UK.

Aiming for net zero carbon

Over the past few years, Barrett Steel has made significant progress in its decarbonisation efforts, positioning the company as a leader in delivering low carbon solutions to the market.

Barrett Steel's Groveport distribution facility built from recycled and renewably produced steels

At Barrett Steel, our unwavering commitment to sustainability and decarbonisation is at the heart of everything we do. As the construction industry moves towards a more sustainable future, we are actively driving initiatives that reduce our own carbon footprint while supporting our customers in achieving their sustainability goals.

Lower carbon footprint

One of our core achievements has been reducing our carbon footprint by over 17% compared to our 2021 baseline. This reduction is particularly significant given that it was achieved during a period of substantial growth, with Barrett Steel expanding its number of sites across the UK. Our commitment to sustainability extends across every facet of the business as we work toward our ambitious goal of achieving net zero carbon by 2035.

A key focus in our decarbonisation strategy has been aligning with regulatory changes that are reshaping the construction landscape. The EU Carbon Border Adjustment Mechanism (CBAM), which enters its definitive phase on January 1, 2026, and the phasing out of free ETS allocations for manufacturers, present both challenges and opportunities for the steel industry.

At Barrett Steel, we are already collaborating closely with our customers to provide the required carbon related data, while helping them reduce their carbon pricing liability through decarbonisation strategies. With the UK expected to introduce its own version of CBAM in 2027, we are committed to supporting the industry through knowledge sharing and awareness-raising initiatives.

Webinars

Throughout 2025, we will host open webinar sessions on CBAM and decarbonisation, offering insights into these critical topics and equipping businesses with the knowledge they need to navigate the changing regulatory environment.

Our focus on external knowledge sharing is matched by our investment in internal development. We are empowering our team with the skills and expertise required to drive sustainable solutions by hosting training on the Greenhouse Gas (GHG) Qualification Pathway. This training is part of our ongoing commitment to professional development, equipping our employees with the knowledge they need to better serve our customers. The GHG Qualification Pathway covers essential topics such as GHG emission accounting, verification, reduction strategies, and carbon neutrality. By investing in our people, we are deepening our understanding of sustainability and enabling our team to help customers achieve their carbon reduction goals more effectively.

The construction industry has recently seen a significant milestone in its journey toward sustainability with the launch of the Net Zero Carbon Buildings Standard. This groundbreaking framework provides a clear and unified approach to achieving net zero in the built environment, addressing both embodied and operational carbon. As a key supplier of structural steelwork, Barrett Steel recognises the critical role we play in helping the construction sector meet the UK's legally binding target of achieving net zero by 2050.

Steel, a fundamental component in most modern buildings, particularly in large-scale projects, contributes significantly to a building's embodied carbon footprint. The UK Green Building Council (UKGBC) has identified reducing embodied carbon as a top priority for achieving net zero in construction. At Barrett Steel, we are fully aligned

Top of the range profiling equipment is used at the company's Rotherham centre.

with this framework, offering not only high quality structural steelwork, but also a range of low carbon solutions that help minimise the environmental impact of building projects. Our extensive processing capabilities, which include cutting, drilling, preservation and lasering services, are designed to optimise the efficiency and sustainability of the steel we supply.

One of the key initiatives driving our decarbonisation efforts is the Barrett Green Solutions programme, which we launched two years ago. Through this initiative, we have been actively partnering with our supply chain to decarbonise the structural steelwork we supply to our customers. A key milestone in this journey was the introduction of our embodied carbon reporting tool, which allows us to accurately measure the embodied carbon in our products and the transport emissions from the producing mill to the customer's factory gates. This level of transparency and precision is crucial in helping our customers understand and reduce the carbon footprint of their projects.

In 2024, we took another step forward with the launch of our predictive software, which enables us to not only report on the carbon impact of the steel we have supplied but also to proactively reduce embodied carbon at the enquiry stage. This innovative tool allows us to work with customers from the outset of a project, helping them set and achieve lower carbon targets, while ensuring that the steel we provide meets the highest standards of sustainability. This year, we also made significant progress in increasing the amount of material we purchase that meets Responsible Steel progress level 2, further solidifying our commitment to the SteelZero initiative.

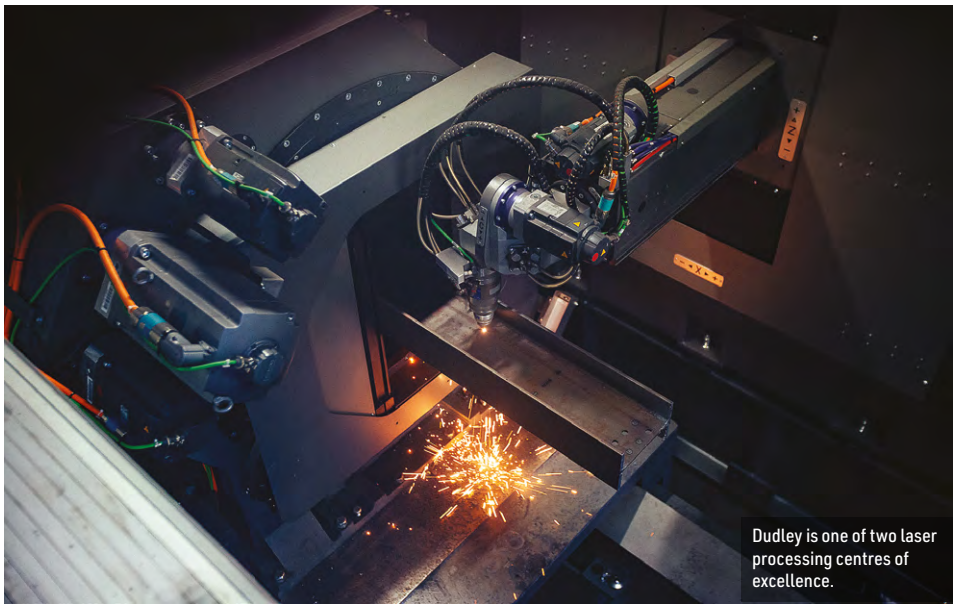
EAF Material

While structural sections have been a natural starting point for our decarbonisation efforts, as they account for the majority of the steel content in framed buildings, we recognise the aesthetic and functional advantages that hollow sections provide to designers. To support these design choices, we are proud to offer low embodied carbon hollow sections with a 70% reduction in CO_2. Additionally, our profiling centre of excellence in Rotherham now offers low embodied carbon plate profiling using Electric Arc Furnace (EAF) material in both S275 and S355 grades, providing further options for customers looking to minimise the carbon footprint of their projects.

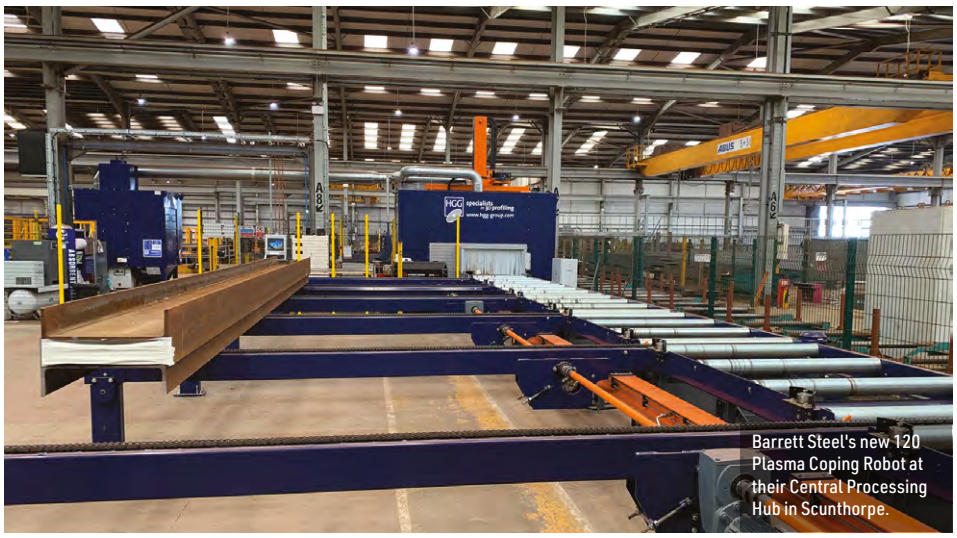
Our advanced processing capabilities are a key differentiator in the market, allowing us to offer a comprehensive range of services to our customers. We have strategically located core processing hubs across the UK, enabling us to offer steel preservation, cutting, and drilling services at scale. These automated bulk processing facilities are complemented by our 2D and 3D laser processing centres of excellence in Rotherham and Dudley, providing customers with a complete supply package that meets the highest standards of efficiency and sustainability.

New equipment

We recently expanded our processing capabilities with the installation of the HGG RPC 1200 Plasma Coping Robot at our Barrett Central Processing Hub in Scunthorpe. This cutting-edge technology allows us to streamline processes and offer a wider range of services to our customers.



Dudley is one of two laser processing centres of excellence.



Barrett Steel's new 120 Plasma Coping Robot at their Central Processing Hub in Scunthorpe.

Richard Gawler, Managing Director for Barrett Central Distribution Hubs, says: "This innovative addition enhances our value proposition by streamlining processes for the future of the general steel industry. The services we now offer not only boost our added value options but also significantly improve customers' efficiency. By enabling Barrett Steel to take on more tasks, we help our customers increase their throughput. Our commitment to outstanding service quality expands our capabilities to include a wide range of processes, such as coping, drilling, notching, marking, and creating access holes. If it can be drawn, it can be coped!"

In addition to our structural steelwork offerings and advanced processing capabilities, Barrett Steel provides a wide range of safety and access products to support any secondary steelwork requirements. Our experienced balustrade and walkways team is on hand to supply fully fabricated open steel flooring and Glass Reinforced Plastic (GRP) options, along with a wide range of walkways products such as handrail standards, bends, clamps, and safety gates. We can also advise on and supply crash barriers for loading bays, car parks, and roof protection systems.

By integrating all of these elements – our low carbon steel solutions, advanced processing capabilities, predictive software, and extensive product range – we are empowering our customers to meet stringent embodied carbon targets and deliver truly sustainable projects. Our vision for the future is clear: we aim to be the go-to partner for sustainable steel solutions in the construction industry. ■

As part of our commitment to knowledge sharing and industry leadership, we invite you to join our first webinar of 2025: **Decarbonisation of Structural Steel in the Built Environment**. This session will explore the strategies and technologies that are helping to reduce the carbon footprint of structural steelwork in construction. Together, we are setting new benchmarks for sustainable steel solutions and building a greener future. Sign up for the seminar via the QR code.

Barrett Steel is a Headline sponsor of Steel for Life

STEEL for life

Mega factory

The vast monopile manufacturing facility will be the first of its kind in the UK.

Being built on the site of the former Redcar steelworks, structural steelwork is helping to create the world's largest monopile factory.

Located on the south bank of the River Tees and standing 40m-high and measuring 800m-long, the £450M SeAH Wind manufacturing facility will, on completion, be the world's biggest monopile factory and the first of its kind in the UK.

Comprising a 93,324m² main monopile manufacturing building, a 3,873m² administration office, maintenance station, paint facility and site-specific power stations, the scheme will also include a range of staff welfare facilities.

The project's design is said to respond directly to the challenges of creating a space with an optimal capacity for monopile construction, and the layout has been carefully developed to achieve a configuration which satisfies SeAH Wind's operational requirements, ensuring each space is interconnected efficiently and safely, with all disciplines operating under one roof.

South Korean manufacturer SeAH's factory will comprise high-quality factory space to produce up to 200 monopiles every year. Forming the foundations for offshore wind turbines, the huge piles will be up to 120m in length, 15.5m in diameter and weigh up 3,000 tonnes.

The monopoles are initially fabricated from flat plates that undergo rolling and welding to create short tubular sections. These sections are then welded together to form the finished monopile.

To help staff this process, SeAH is developing a training programme with local colleges in order to help local young people develop into tomorrow's welders.

Once the piles are manufactured, they will be transported directly from the factory to Teesworks' new South Bank Quay facility before heading to the North Sea, where they will be installed using specialised pile driving equipment.

Located on a 90-acre plot, the factory forms part of the wide-ranging Teesworks scheme, which is redeveloping the land formerly occupied by the Redcar steelworks and described as the largest brownfield site in Europe.

Tees Valley Mayor Ben Houchen said: "Our steel built the world from the Sydney Harbour Bridge to Canary Wharf. Now from our proud past we're building a bright future in the industries of tomorrow – and we're making use of what we do best.

"This once again shows how SeAH and the firms we're bringing to the Teesworks site are fully behind having a local workforce at the heart of making Teesside the green energy capital of the UK."

Further enhancing local involvement with the project, a £100M-plus deal between SeAH, British Steel and Severfield was signed prior to construction works beginning. This has ensured

FACT FILE
Monopile factory, Teesworks
Main Client: **SeAH Wind**
Architect: **Ashton Smith Architects**
Construction Manager: **K2 Construction Management**
Structural engineer: **Clarkebond**
Steelwork contractor: **Severfield**
Steel tonnage: **35,000t**


Visualisation of the completed factory.

steel from the nearby Teesside Beam Mill at Lackenby, near Redcar, is used in this giant development.

Overall, British Steel is suppyling approximately 35,000t of tonnes of steel under the agreement. Recycled steel from former steelworks sites is also being used in the construction to help create the new facilities from the ashes of the old.

Ben Cunliffe, British Steel's Commercial Director for Construction, says: "We're extremely proud that our steel manufactured at Teesside Beam Mill is going into this hugely impressive development by SeAH Wind, and we are delighted to play our part in the exciting regeneration happening on our doorstep in Teesside.

"While we have, a rich heritage having supplied many iconic buildings across the globe, we're focused on the future and delivering the high-quality products our customers require."

Commenting on the build programme, Severfield says the client needed an extremely fast-paced project delivery, requiring a tightly controlled connection design and detailing programme. This required output from all of its Group fabrication facilities, showing the strength and scale of its operations.

To manage the scale of the project, Severfield has deployed 150 people to work onsite to ensure everything runs smoothly and it meets the ambitious programme. At times, the site teams have erected vast amounts of steelwork per week, with as much preassembly being undertaken at ground level where possible to speed up the construction process.

Manufacturing facilities need large open-plan column-free spaces for their production areas and this vast factory is no different.

With a maximum width of 210m, the structure has four spans at it widest point, but just one single span for nearly half of its length. A series of large steel trusses, supported on lattice columns, form much of the overall structure.

As well as erecting the steelwork, the site teams have also managed to work around the delivery of significant amounts of heavy machinery from Korea, requiring agility to adjust the build sequencing to accommodate these deliveries and maintain the demanding build programme.

Almost 400 people are now working on the site. Many more jobs for the plant will come online towards the end of this year – with 750 direct jobs in total and 1,500 forecast to come through the supply chain.

Chris Musgrave OBE, Chairman of Teesworks, says: "It's fantastic to have SeAH Wind at Teesworks, and to have British Steel as the supplier and Severfield as the metal fabricator are massive boosts to our wider steel industry.

"This will further secure jobs at Lackenby and shows Teesworks, and firms like SeAH, are committed to ensuring local labour is used so we make the best use of what we have nearby.

"Teesside and British Steel remain at the forefront of UK steelmaking, and we look forward to working with our partners both on this huge project and beyond in the continued levelling up and transformation of the area."

Summing up, Cllr Alec Brown, Leader of Redcar and Cleveland Borough Council, says: "There is a huge affinity with British Steel for many families in Redcar and Cleveland and it is excellent that the company is contributing to a major development on the Teesworks site.

"The development will be transformational for our borough and we look forward to SeAH Wind employing hundreds of people and providing work for many more in the construction sector and supply chain." ■

Coordination has been key during the erection programme, as the steelwork is being installed around other trades and operations.

Steel goes back to school

Structural steelwork is providing the construction solution for a new school for children and young people with special educational needs and/or disabilities (SEND).

Located just outside of the town of Towcester, West Northamptonshire Council is constructing a much-needed SEND school that will cater for children and young people between the ages of four to 18 with autistic spectrum conditions (ASC), speech, language and communication needs (SLCN), as well as those with severe learning difficulties (SLD).

Tiffield Academy has been designed to physically accommodate 250 pupils, although it will operate to an admissions number of 230, with the remaining 20 places expected to be filled through emergency placements or other extenuating factors.

Commenting on the project, Councillor Fiona Baker, Cabinet Member for Children, Families, Education, says: "It is positive to see work underway at the Tiffield site as we know these additional spaces are very much needed and will make a significant difference to the children and young people who will attend the school, as well as their families. This school will offer an engaging environment and excellent teaching and learning facilities to help our students learn, develop and connect.

"This is a step forward and is part of our wider programme of creating 600 new specialist places locally, as we continue to see a high demand for SEND places to meet the needs of our children and young people."

Construction work for the project started onsite in January (2024), with an extensive groundworks and demolition phase. The plot was previously occupied by an old 1960s-built school, which closed down a few years ago. Most of these buildings had to be demolished before the new school building could be built.

A plateau was also formed on the previously sloping site, which then allowed foundations to be installed in readiness for the steel frame erection.

A steel framed solution is generally considered to be a lighter option than alternative builds, and so taking this into account along with the fact that the ground conditions are deemed to be good, the project team only had to install shallow pad and strip foundations.

Steelwork was also chosen for its speed of construction. The entire steel frame was erected by steelwork contractor William Haley Engineering in less than two months.

Once the frame was up, it then allowed the numerous follow-on trades to get started onsite and thereby helping the school project stay on schedule for its opening.

The school building has been designed as a three-storey structure, featuring general and practical teaching spaces, a lift for upper-floor access, calm rooms, intervention rooms, and group rooms. Classrooms for younger pupils will be located close to sensory rooms.

Two halls, accommodated within a centrally-positioned double-height space, will provide space for physical activities, music and drama, while they could also be used as two dining spaces for groups of pupils.

The design allows the teaching spaces to be arranged around the central space on each of the building's three floors. The longest elevations – east and west – have classrooms on both sides of a corridor, some rooms facing outwards and the others abutting the double-height halls. The shorter north and south elevations only have teaching spaces along the outer zone of the corridor, as the inner zone accommodates store rooms and a precast lift and stair core on the north.

For the majority of the school, the steelwork is based around a regular 7.5m grid pattern,

Speed of construction was one of the main reasons for choosing a steel framed solution.

As the ground is generally good, steel columns have been installed on pad foundations.

"This is a step forward and is part of our wider programme of creating 600 new specialist places locally, as we continue to see a high demand for SEND places to meet the needs of our children and young people."

Bracings are located in partition walls.

FACT FILE
Tiffield Academy, Towcester
Main Client: **West Northamptonshire Council**
Architect: **Associated Architects**
Main contractor: **Willmott Dixon**
Structural engineer: **Hexa Consulting**
Contract administrator and quantity surveyor: **RG&P**
Steelwork contractor: **William Haley Engineering**
Steel tonnage: **280t**

which creates the desired column-free teaching spaces. To this end, internal columns are generally located in one of the corridor partition walls.

Throughout the scheme, the steel beams support precast planks, a flooring solution that was chosen because of the required spans.

All of the building services are positioned below the bottom flange of the internal steel members. Within the corridors, which accommodate the main service runs, the beams are recessed into the slab, in order to create more space, so the services do not intrude into the floor-to-ceiling heights.

Slightly longer spans of 11m-long have been formed in the central double-height halls space, by omitting some columns and using slightly deeper beam sections.

As the halls are surrounded by the three-storey structure, its roof creates a sunken space that will accommodate an outdoor terrace for staff and pupils, alongside a plant deck. Both areas will be separated by a partition.

The school's roof is also formed with precast planks and for ease of construction, all of the project's concrete units (floor and roof) were installed by William Haley Engineering as part of its erection programme.

The building was split into three phases for the steelwork programme. Once each area had been fully erected, the flooring units were then installed using the same mobile crane, negating the need for another trade to come onsite with its own lifting equipment.

Providing the structure with its stability, together with the diaphragm action of the completed floors, bracing primarily located in partition walls, creates a series of braced bays.

This design helped reduce the amount of temporary bracing that needed to be installed during the erection sequence, as the majority of the frame was self-supporting and stable once up.

The Tiffield Academy, which will be run by the Greenwood Academies Trust, is set to be open in time for the autumn 2025 term. ■

The school will provide a much-needed boost for the local area's special educational needs.

FACT FILE
Leeds Bradford Airport terminal building
Main client: **Leeds Bradford Airport**
Architect: **Millar Design + Management**
Main contractor: **Farrans**
Structural engineer: **Dudleys Consulting Engineers**
Steelwork contractor: **Elland Steel Structures**
Steel tonnage: **800t**

There are three floors, with the lowest level being partially subterranean due to the sloping site.

Set for take-off

Leeds Bradford Airport's regeneration programme is relying on structural steelwork's numerous attributes for the construction of a new terminal extension.

'Yorkshire's Airport' it proclaims in large lettering above the main terminal building. A proud boast for Leeds Bradford, which may not be the only airport in England's largest county, but it is the one that can offer international flights.

Currently there are services to many European destinations, with Spain being the most popular. In 2023, just under four million passengers used Leeds Bradford Airport (LBA) and these figures are expected to increase. Consequently, the airport is seeking to expand its facilities and services; there is an aspiration to offer flights to North America and the Middle East.

To facilitate the expansion, big changes are afoot as a phased redevelopment programme, which includes the construction of a new three-storey terminal extension building, is now underway.

This privately funded £100M scheme, known as LBA:REGEN, will see the construction of the 9,500m² terminal building as the first phase. Once it is complete, a second phase will then see the airport's existing facilities refurbished.

The work will result in the creation of additional aircraft stands, more seating, faster security, new shops and eateries, a larger baggage reclaim area and immigration hall, as well as improved access for passengers with restricted mobility.

How the completed extension and the refurbished existing facility will look.

Commenting on the construction work, Vincent Hodder, CEO of LBA, says: "This project represents the culmination of thousands of hours of planning, consultation and design. As one of Yorkshire's most significant infrastructure projects, we and our passengers are immensely excited to see it develop in the coming months. Once complete, this project will deliver the airport that our passengers, airlines and region need and deserve."

Rising up on a plot previously occupied by a surface car park, a steel framed solution has been chosen for the terminal building. Connecting to the eastern end of the existing terminal, the new structure is 120m-long × 41m-wide and reaches a maximum height of 15.5m at the apex of its peaked roof.

"The requirement for long internal spans and a tight construction programme, meant that a steel frame with composite beams and metal decking were the obvious material choices," says Dudleys Consulting Engineers Senior Engineer Luke Drinkwater.

To this end, the building is designed around a regular column grid, with perimeter members set at 5.5m and 6.25m centres, while internally the pattern is 12.5m × 11m. The internal structural grid was driven by the client's desire to have a minimal number of columns to facilitate future flexibility and to aid passenger movement through the terminal.

The lowest level of the terminal extension's three floors is partially subterranean, due to the site sloping in an easterly direction, away from the existing buildings.

Steel sequencing

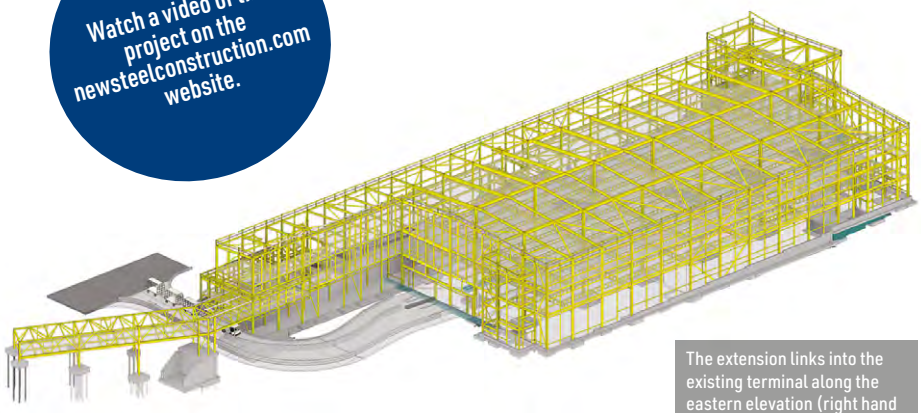
Watch a video of this project on the newsteelconstruction.com website.

Using mobile cranes, Elland Steel Structures installed the project's steelwork and the metal decking in a five-phase programme.

The initial phase involved erecting one half of the new terminal closest to the existing buildings.

Working eastwards, phase two saw the remainder of the terminal completed, phase three consisted of the departure gate wing and phase four was the installation of the passenger bridge to the remote gates.

The final fifth phase of the programme was the erection of a small quantity of steelwork for a goods yard link corridor. ■



The extension links into the existing terminal along the eastern elevation (right hand side of image above).

This level will accommodate baggage handling and will have access, to and from airside operations, via a ramp.

The new steel frame includes a passenger bridge, which spans over the baggage tug ramp and connects the new terminal building to an existing walkway that serves a number of remote gates.

The bridge is a 36m-long, four-span structure, with 2.7m-high Warren truss girders on each side that support a floor deck at the bottom chord level and a roof at the top chord level.

There are some tight constraints, and the design of the bridge had to ensure that baggage tugs have enough clearance to pass underneath, while the structure also had to connect to the existing passenger corridor and aircraft stands which are located on a graded aircraft apron.

Above the baggage handling area, the middle floor of the new building will have arrivals and immigration areas alongside baggage reclaim, while the uppermost first floor will be given over to new shops and eateries. Both of the two upper levels will connect directly into the existing terminal, a factor that has played a significant role in the design and choice of steelwork members.

The floor to ceiling heights in the existing buildings are not very generous and a solution needed to be found whereby this design could be matched, to create a free-flowing terminal, while also accommodating the many services needed in the new extension.

"We chose composite Westok cellular beams, as they allowed us to have an acceptable floor-to-ceiling height, as the services are distributed within the structural zone," says Mr Drinkwater.

Westoks account for the majority of the two levels of floor beams used throughout the scheme. They are typically up to 850mm-deep sections with 500mm-diameter service cells.

Interestingly, this is not the first time these cellular beams have been used at LBA. They can clearly be seen in the existing terminal buildings, installed during previous construction phases. Consequently, Westok Design Team Manager John Callanan, says he was eager to assist with the steel design for LBA-REGEN.

"The first floor was relatively straightforward however the ground floor was more involved, requiring accommodation of complex loads from the baggage handling equipment and service runs. They were at a particularly low level within the beam depth, due to insulation being fixed directly to the soffit of the slab," he says.

Westok provided an economic solution with deep top tees so that the regular cell pattern across the beams could be located below the insulation zone, yet still achieving the tight member depth limit. In certain areas, heavily loaded primary beams were designed and manufactured as Westok plate beams with discreet service openings.

As well as accommodating services, the beams also provide a lightweight and efficient method to form the required long spans. They also support metal decking and a concrete topping for a composite flooring solution. On completion, this will distribute the horizontal load by diaphragm action across the building's footprint to vertical cross bracings along the elevations and other strategic locations throughout the structure.

All of the bracing, columns, beams and services will be left exposed within the completed building. This facilitates easy access for future M+E modifications, while also creating the desired modern industrial-looking interior, which most airport buildings prefer.

Although primarily a braced frame, there is one area that had to be designed differently. The zone that links the new build and existing terminal is slightly remote from the line of primary bracing, so one bay of columns and beams have been portalised to limit lateral deflections, but also to enable easy passenger movement by avoiding the need for bracing.

According to the airport, by 2030, LBA:REGEN has the potential to create 1,500 new direct jobs and 4,000 indirect jobs, as well as contributing a total of £940M to the local economy.

The project will also play a significant part in the airport's Net Zero Carbon Roadmap, with the installation of new efficient heating, lighting and machinery, as well as attracting airlines to deploy their newest, quietest and most efficient aircraft at the airport.

Phase one terminal extension is due to complete in Spring 2025. ■

The overall scheme will allow the airport to significantly increase the number flights and destinations on offer.

"We chose composite Westok cellular beams, as they allowed us to have an acceptable floor-to-ceiling height as the services are distributed within the structural zone"

The majority of the project's beams are cellular members, as the building will have numerous service runs.

Steelwork frames low carbon offices

FACT FILE
Network W1, London
Main client: **Derwent London**
Architect: **Piercy & Company**
Main contractor: **Kier Construction**
Structural engineer: **Elliott Wood**
Steelwork contractor: **Bourne Steel**
Steel tonnage: **1,000t**

Targeting a BREEAM 'Outstanding' rating, sustainability is at the forefront of the design for a nine-storey office development in London's West End.

The floor plates have been designed to create 10m clear internal spans.

Derwent London's Network W1 project, on the corner of Tottenham Court Road and Howland Street, is said to have sustainability at its heart. With carbon reduction as a key focus of the build, the scheme is aiming to achieve a better embodied carbon intensity than the Greater London Authority target of 600 $kgCO_2e/m^2$.

Once complete, the nine-storey building will provide 12,449m² of workspace and 464m² of retail space in the heart of London's prime W1 postcode in Fitzrovia.

According to project architect Piercy & Company, the building comprises three volumes: a base with active frontages for new retail and a street-facing work lounge; a middle volume of workspace; and an upper-level pavilion with terraces and green-roof areas around the perimeter of the building.

Designed with a highly flexible floorplate system to accommodate different types of future use, the middle volume of Network will be used as Category A offices.

A number of framing options were considered during the initial design process and steelwork was the preferred choice as it is less carbon intensive, when high levels of recycled steel (see box) is incorporated. The material also provides a lighter frame, which ultimately has cost savings as there are less foundations works needed.

Starting at ground floor level, the steelwork is founded on a concrete basement substructure with four piled secant walls. Below this, the foundations for the building consist of a 1.2m-thick concrete raft. Stability for the steel frame is derived from a centrally-positioned concrete core, which connects to steel beams via cast-in plates.

Some extra stability has been required during the erection sequence and this has been supplied by temporary cross bracings, which are removed once the floors have been completed and recycled.

As with most steel framed city centre developments, open-plan floorplates are an important part of the design. To create the required spaces, the perimeter columns are spaced at 6.5m centres, while internally there are spans of up to 10m.

The design includes precast flooring planks supported by steel beams and throughout the building there are more than 2,000 of these units, which were all installed and grouted as part of Bourne Steel's package. The company's works also include the installation of safety barriers as well as on and offsite painting of the steelwork. The latter is very important as a decorative finish is being applied to the columns and beams as the steel frame will be exposed within the completed scheme, creating modern industrial-looking floorplates.

"The concrete core and the underside of the precast planks will also be exposed," says Elliott Wood Associate James Hinks. "We wanted a clean and smooth soffit which was best achieved with the precast option."

As well as long spans and the exposed nature of the interior, the building's design prioritises wellbeing in the workplace, with 2.95m floor-to-ceiling heights that allow natural light to flood in, openable windows on every floor plus 259 cycle spaces, 27 showers, 180 lockers and a dedicated drying room.

Although much of the steel frame is based around a regular column grid pattern, there are a couple of significant exceptions. One is the double-height reception area, that faces south onto Howland Street.

▸ 20

Sustainability credentials

With high sustainability aspirations, the Network building is a net zero carbon development that will utilise an all-electric strategy with electricity from renewable sources, low energy cooling and renewables. The façade features a sculptural repeating module that will be fabricated offsite to ensure minimal material wastage. Blue roofs and rain gardens contribute to rainwater attenuation and flood management.

Helping to achieve the sustainability aims of the project, a steel framed solution was chosen, which includes recycled content. This is said to be saving approximately 1,280 tonnes of embodied carbon emissions compared to using non-recycled steelwork.

Furthermore, Bourne Steel says more than 50% of the 1,000t of steelwork used on the project has been sourced from Electric Arc Furnace (EAF) production facilities.

This steelwork is considered to be much greener and more efficient in terms of energy consumption for the production process, as it can utilise renewable energy from wind farms instead of carbon fuels such as oil and gas. ■

"We are implementing our integrated technical excellence, working with our in-house carbon team to reduce embodied carbon through our delivery and also utilising modern methods of construction and offsite production to deliver this showcase development for our client."

The completed building will offer desirable workspaces in the heart of London's West End.

All of the internal steelwork, along with the underside of the precast flooring, will be left exposed in the completed building.

Two onsite tower cranes have ensured there is always enough lifting capacity for the steelwork programme.

▸19

This elevation is slightly indented to signpost the entrance, with a 2m-wide cantilever overhang starting at the underside of the level two.

Meanwhile, helping to create the open-plan reception, some columns have been omitted from the two lowest levels. A series of five plate girders positioned at the underside of the second floor support the columns' lines above and allow them to be discontinued in the reception. Measuring approximately 9m-long, the girders weigh up to 6.5t each and represent the longest and heaviest steel elements in the overall package.

Adding some aesthetics to the reception's internal appearance, column lines that do exist in this area have had their UC sections replaced with CHS members, which have a smooth appearance with no sharp edges.

The CHS columns each weigh 1.2t and were installed using the site's two tower cranes and MEWPs positioned on the ground floor slab. The MEWPs have helped install all of the steel frame and the precast flooring up to level four, after which smaller scissor lifts, working in conjunction with the tower cranes, have been used.

"The ground floor slab has the capacity to support MEWPs, but they could only reach up to level four," says Bourne Steel Senior Project Manager Duncan Wyatt.

"For the upper levels of steelwork, where there is a smaller loading capacity, we had to use smaller and lighter machines, positioned on the installed and grouted precast floors."

The majority of the upper levels of the steel frame is fairly regimented except the two uppermost floors. Here, the building includes set-backs, where the outer bay of steelwork terminates to create terraces that wrap-around the structure.

Summing up, David Rowsell, Managing Director, Kier Construction London, says: "We are proud to be working with Derwent London to deliver this prestigious and sustainability focused commercial development on London's iconic Tottenham Court Road. This high-profile project forms part of our strategic goal for continued market growth in London's private sector.

"We are implementing our integrated technical excellence, working with our in-house carbon team to reduce embodied carbon through our delivery and also utilising modern methods of construction and offsite production to deliver this showcase development for our client."

Network is due to complete in the second half of 2025. ■

Flooring options

The Network W1 project serves as a reminder that precast concrete floor planks should be one of the options considered at the concept stage of a development, writes David Brown of the SCI.

Precast concrete planks are a common floor solution, especially for lower rise buildings. Due to the long-span capabilities of precast planks, fewer steel beams may be required compared to an in-situ composite floor on profiled steel sheet. The look of an exposed precast plank soffit may also be preferred.

There is a wealth of design guidance, including advice on designing the steelwork compositely. Practical issues often have a significant influence on the sizing of members. If the steelwork is to be designed compositely, the resistance of the welded shear studs depends on the gap between planks and the amount of transverse reinforcement. With a given gap, the necessary bearing on the steelwork leads to a minimum flange width.

Precast concrete floor planks can be simply placed on the top flange of a beam, or to minimise the construction depth may be supported on 'shelf angles' or (as was the case at the Network W1 project) on stiffened plates welded to the beam web. If planks are supported on shelf angles or plate, the designer must consider how the planks are installed, if they are to be located in the space under the top flange. A longer outstand may make the installation easier, but the increased eccentricity will introduce more bending into the support and potentially more torsion into the beam in the temporary condition.

Installing transverse reinforcement is straightforward if the planks are positioned on the top flange, as the ends of the plank are usually opened up. If planks are positioned within the beam depth, any transverse ties between planks must be cranked over the steel beam or installed through holes in the beam web.

The designer should consider the erection sequence, since loading from one side only – especially if the planks are supported from shelf angles or similar - will introduce serious torsions and twist the beam. Although erecting planks progressively on each side is recommended, the construction sequence may mean that one sided loading in the temporary condition is a critical load case.

SCI Publication P401 is the latest design guidance on composite beams and precast planks. P351 discusses the use of precast concrete planks in non-composite applications. ■

METSEC DECARB

REDUCING CONSTRUCTION'S CARBON FOOTPRINT

TRUST METSEC

Metsec Decarb, a range of Purlins, Side Rails and Mezzanine Floor Systems utilising the very latest steel making technology. Reducing the CO_2 and carbon footprint of your next project.

The range uses steel made from new, state of the art electric arc furnaces the alternative to burning fossil fuels, in the traditional blast furnace method. It's that simple.

- No greenwashing
- No mass balance approach
- No carbon offsetting
- No allocation of green energy
- Project specific Environmental Product Declarations available which accurately calculate the project savings on embodied carbon.

Contact us for further details.

#TRUST METSEC

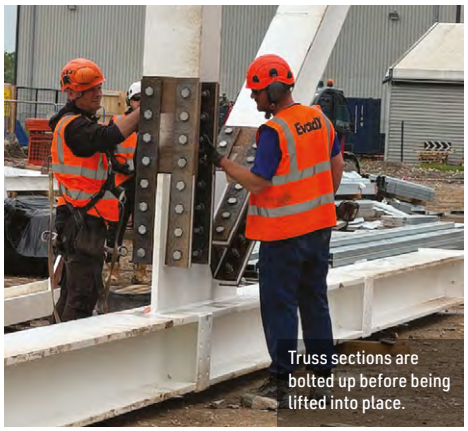
voestalpine Metsec plc
www.metsec.com

voestalpine
ONE STEP AHEAD.

The trusses were lifted into place as two halves, with a central splice completed while the sections were held aloft.

Trusses create industrial solution

Having celebrated 50 years of being based in North Wales, pharmaceutical company Ipsen is expanding its operations with a new steel framed production and office block.



Truss sections are bolted up before being lifted into place.

Structural steelwork is providing the design and construction answers for a new pharmaceutical manufacturing facility at Ipsen BioPharm's Wrexham site.

Part of France-based Ipsen Group, the global manufacturer is expanding its largest site in the UK, where it develops drugs for neurological conditions.

Exporting to more than 90 countries, the facility opened more than 50 years ago and employs close to 500 people, making it one of the main employers in the town. The company says the £75M investment will provide a state-of-the-art facility that will enhance production on the site.

Included in the construction project is the provision of 24 car parking spaces dedicated to the new building, in addition to the 264 existing spaces used by Ipsen staff across the whole estate.

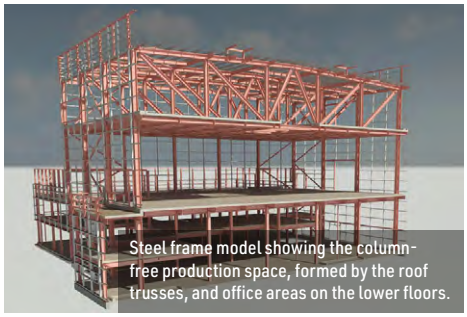
Located on a plot previously occupied by one of the company's old warehouses and a despatch building, the new facility measures 62m-long × 34m-wide and stands 21m tall.

Designed by Lovelock Mitchell Architects, the three-storey, 11,148m² structure will accommodate open-plan ground floor offices, above which there will be a large column-free production level, while an uppermost floor will house plant. Adding some invaluable extra floor space, the building will also have a ground floor mezzanine, which covers approximately half of the entire footprint.

The design of the production floor had a big say in the choice of a steel framing solution for the project, as JPS Managing Director Jonathan Paull, explains: "Steelwork was chosen primarily due to the long spans required to create the desired column-free production floor.

"We also have a very tight programme for design and delivery of the building, and so steelwork was also selected for its speed of erection. It has helped us achieve a watertight shell and core in the shortest possible time."

Prior to the steelwork erection commencing, a



Steel frame model showing the column-free production space, formed by the roof trusses, and office areas on the lower floors.

ground improvement programme was undertaken, which included the installation of vibro-stone columns to support the ground floor slab. Piled (precast driven piles) foundations were also installed, to support the steel columns of the main frame.

Working on behalf of main contractor MPH Construction, EvadX fabricated, supplied and erected 650t of steelwork for the project.

A traditional beam and column design, based around a 7m grid, adequately accommodates the ground floor and mezzanine office spaces, but the production level required something more substantial to form the necessary long spans.

For this part of the building, a series of six trusses, which are 6.3m deep and span the entire width of the structure, have been installed.

"Because of their size, the trusses were delivered to site piece-small and then assembled on the ground," says EvadX Contracts Manager Andrew Roberts.

"We used a variety of mobile cranes onsite, but to lift the completed trusses into place we utilised a couple of 150t-capacity units."

As well as creating the column-free production space, the trusses are also supporting the uppermost plant equipment floor within their depth. Their work does not end there, as suspended from the underside of the six trusses is a maintenance walkway.

A variety of cranes, up to 150t-capacity, were used for the erection programme.

FACT FILE
Ipsen manufacturing facility, Wrexham
Main Client: **Ipsen BioPharm**
Architect: **Lovelock Mitchell**
Main contractor: **MPH Construction**
Structural engineer: **JPS**
Steelwork contractor: **EvadX**
Steel tonnage: **650t**

Throughout the structure, the steelwork supports precast concrete planks with a structural topping to form a composite flooring solution. The exception are some isolated areas where there is open mesh flooring, notably around plant and equipment on the top floor, and a few places on the mezzanine.

The diaphragm action of the completed concrete floors provides stability to the steel frame, and this is supplemented by bracing, located in the walls and roof.

Interestingly, the scheme also incorporates a number of precast lift and stair cores, which were erected prior to the steel frame commencing, but these are not utilised as stability-giving elements.

The initial announcement for this project was made in June 2023, during a tree-planting ceremony to mark the 50th anniversary of the Wrexham site.

At the ceremony, Wrexham's Mayor, Councillor Andy Williams, said, "Through the creation of numerous jobs over five decades, Ipsen's Wrexham site has contributed significantly to the growth of the local economy, while working sustainably and ethically, making it a shining example to businesses locally and globally.

"From driving global health to 'going green' and helping local students pursue careers in the life sciences sector, Ipsen Wrexham has much to be proud of as a community partner and global innovator."

Ipsen CEO, David Loew, said: "The 50th anniversary of Ipsen's Wrexham site marks a proud moment for our company. We have seen huge growth in demand at this important site, and we are pleased to continue our investment in the area and contribute positively to the local economy." ■

"Steelwork was chosen primarily due to the long spans required to create the desired column-free production floor. Steelwork was also selected for its speed of erection. It has helped us achieve a watertight shell and core in the shortest possible time."

The completed state-of-the-art facility will enhance Ipsen's largest UK site.

Dealing with multiple point loads on a composite slab

Whilst placing concentrated loads on composite slabs is not particularly recommended, we are seeing more and more situations where multiple, sometimes quite significant, loads are placed on a slab. Dr Graham Couchman from SCI discusses how composite slabs support concentrated loads, how software designs these slabs, and highlights issues to be taken into account when numerous such loads are present on a given area of slab. He also reminds designers about the need to explicitly consider the transverse reinforcement, normally mesh (fabric), that is needed to distribute a load, and the confusion that has arisen over the definition of a load that is sufficiently small to not warrant this check given in EN 1994-1-1[1].

Why are concentrated loads a concern?

A composite slab supports loads because it has resistance to moment, shear etc. The moment resistance is achieved by the axial force in some of the concrete in compression balancing the axial force in the steel decking in tension, forming a couple. The axial force in the decking is governed by the mechanical shear interaction between the steel and concrete, up to the point at which the steel yields. For typical deck geometries, steel grades and spans the deck does not reach yield and shear interaction dictates the moment resistance.

Shear interaction is achieved through the embossments that are rolled into the deck, and the shape of the re-entrant parts of its profile. This means that the force that can be transferred between steel and concrete is a function of the contact area between the two, therefore for a given width force transfer increases with distance into the span. The moment resistance of the slab increases to a maximum at mid-span. This is analogous to a composite beam, except in the latter case force transferred increases as each stud is 'passed', working away from the support. With an off-centre concentrated load the maximum applied moment, which may also be off-centre depending on relative sizes of coincident concentrated and uniform loading, must be compared with the resistance at the same point in the span (not the maximum resistance). Near a support this resistance could be considerably less than the maximum resistance at mid-span.

A second concern when considering concentrated loads, although this may be more theoretical than practical, is that shear interaction values are determined from tests, and these tests only ever consider unform loading. It is assumed that the interaction that can be achieved per unit contact area will not vary as a function of the type of loading.

How are concentrated loads supported?

The first thing to remember when considering their behaviour is that composite slabs are assumed to be one-way spanning. This is not an unreasonable assumption given the ribs run in one direction only. However, they do still clearly have some stiffness in the orthogonal direction. When a concentrated load is placed on a slab it is assumed to distribute laterally over a width that comprises the stiff bearing width, plus the width achieved by 45 degree distribution through the concrete, plus an additional width due to the transverse stiffness of the slab (see Figure 1, which is a reproduction of EN 1994-1-1 Figure 9.4). The later depends on where in the span the load is placed. All this is quantified in EN 1994-1-1 clause 9.4.3.

For bending and longituinal shear, for simple spans (EN 1994-1-1 Eq. 9.2):

$$b_{em} = b_m + 2L_p\left(1 - \frac{L_p}{L}\right) \le \textit{slab width}$$

For vertical shear (EN 1994-1-1 Eq. 9.4):

$$b_{em} = b_m + L_p\left(1 - \frac{L_p}{L}\right) \le \textit{slab width}$$

L_p is the distance of the centre of the load from the nearest support.
L is the span length.
b_m is the stiff bearing width.
b_{em} is the effective width of the longitudinal strip carrying the load.

Not stated, but the effective widths defined in EN 1994 are maximum values – the load should not be considered to be supported by a greater width when verifying the various resistances (bending, longitudinal shear and vertical shear). This is what a designer would normally want, as it places the least demand on the slab in the direction of span. The rules also assume a certain (unstated but typical) transverse stiffness for the slab. If the slab had less transverse stiffness than this unstated value, the effective widths defined by EN 1994-1-1 could not be achieved. In the extreme one can imagine a slab that had no transverse stiffness and therefore could not resist transverse

▸26

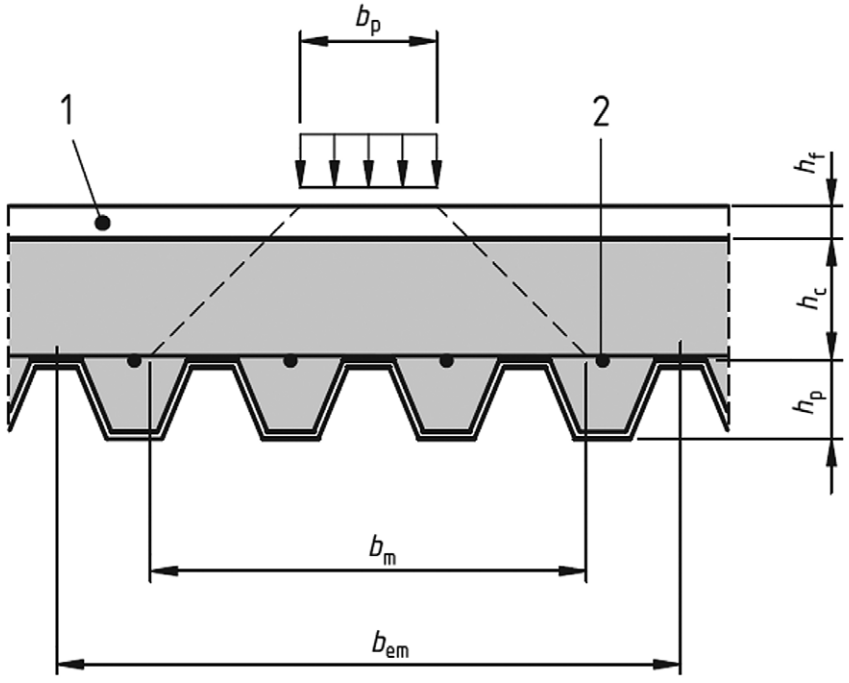
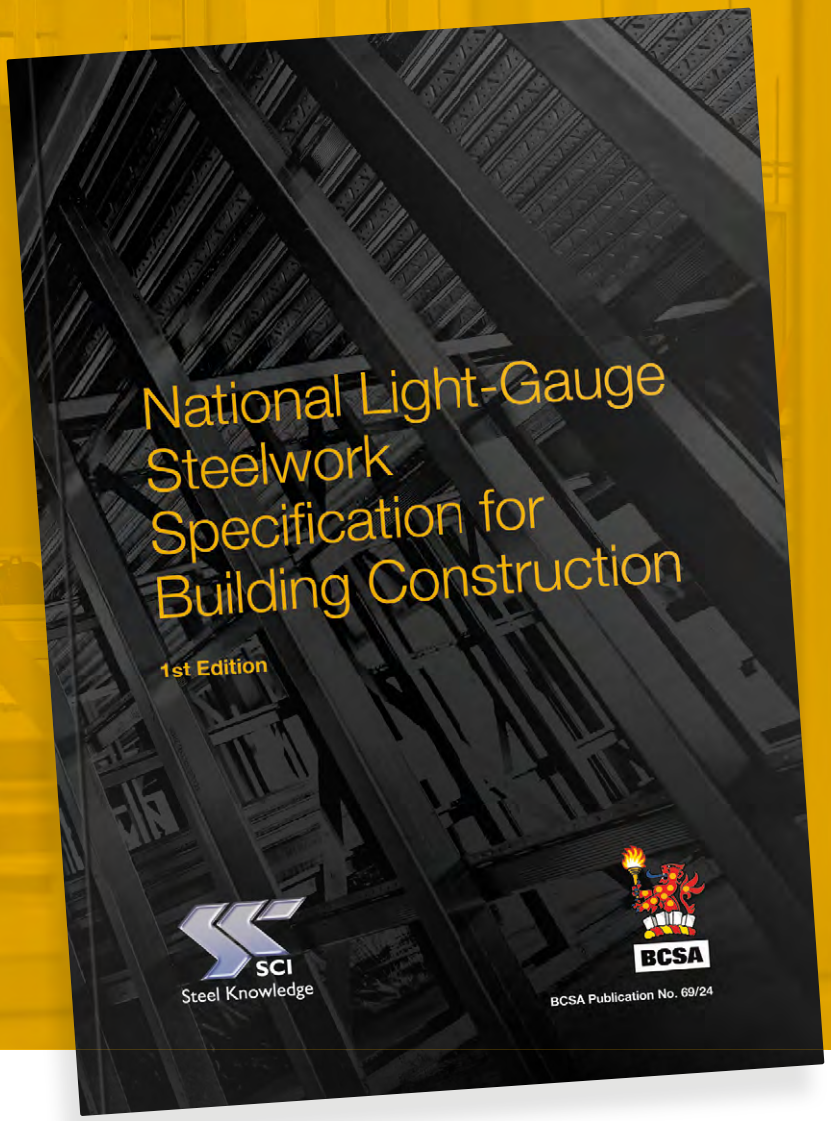


Figure 1: Distribution of concentrated load

Developed by the industry for the industry



The new National Light-Gauge Steelwork Specification (NLSS) will come into effect on the 1st April 2025.

Developed by the industry, for the industry, it provides a framework and set of requirements for the design, manufacture and construction of light-gauge buildings, which will reduce risk, improve communication and raise standards in this sector.

Adoption of the UK national specification is voluntary until 1st April 2025, when it will come into force. **It will be available to purchase from the BCSA website as of the 23rd October 2024.**

Supported by: LIGHT STEEL FRAME ASSOCIATION | LSF Light Steel Forum | SCI Steel Knowledge

Scan to find out more

BCSA Limited, 4 Whitehall Court, Westminster, London SW1A 2ES
Tel: +44 (0) 20 7839 8566 • Email: postroom@bcsa.org.uk • Web: www.bcsa.org.uk

▸24 bending – the load would simply be carried on a longitudinal strip of width defined by the stiff bearing width plus 45 degree distribution through the concrete.

A method for determining the magnitude of transverse moment present in the longitudinal strip, and therefore how much transverse reinforcement is needed to support a given load, is defined in AD450[2]. AD477[3] takes this further, and introduces the idea of reducing the width of a longitudinal strip down to the minimum that will still support the load spanning between end supports, in order to reduce transverse demands. The principle is easy to understand, but the implementation can get complex so SCI has produced a Tedds module[4] that does it for you. It should also be noted that the EN 1994 allowance to assume nominal mesh is sufficient when concentrated loads do not exceed certain limits (9.4.3(5)) has long been misunderstood (including by SCI, with an incorrect explanation given in P359[5]) and should not be relied upon. Recent investigations into the origin of this rule revealed it only applies to slabs that are far different from many designed in the UK (for example the mesh is assumed to be laid directly on the decking, and only one concentrated load may be present in what may be rather a large area of slab).

What does design software do?

It is important to understand that composite slab design software relies on the one-way spanning characteristic to simply design a 1 m strip of slab. A clue is the fact that input values do not ask for the 'width' of slab, only the span. If there are concentrated loads present on a floor plate, a designer will consider the region(s) where those loads are applied. For its 1 m strip, the software will take into account any uniform load that is present, plus whatever proportion of the concentrated load is acting on the strip (so although the input may define a concentrated load P as present, if the EN 1994 rules distribute that load over say 2 m then only 0.5 P acts on the 1 m strip designed by the software).

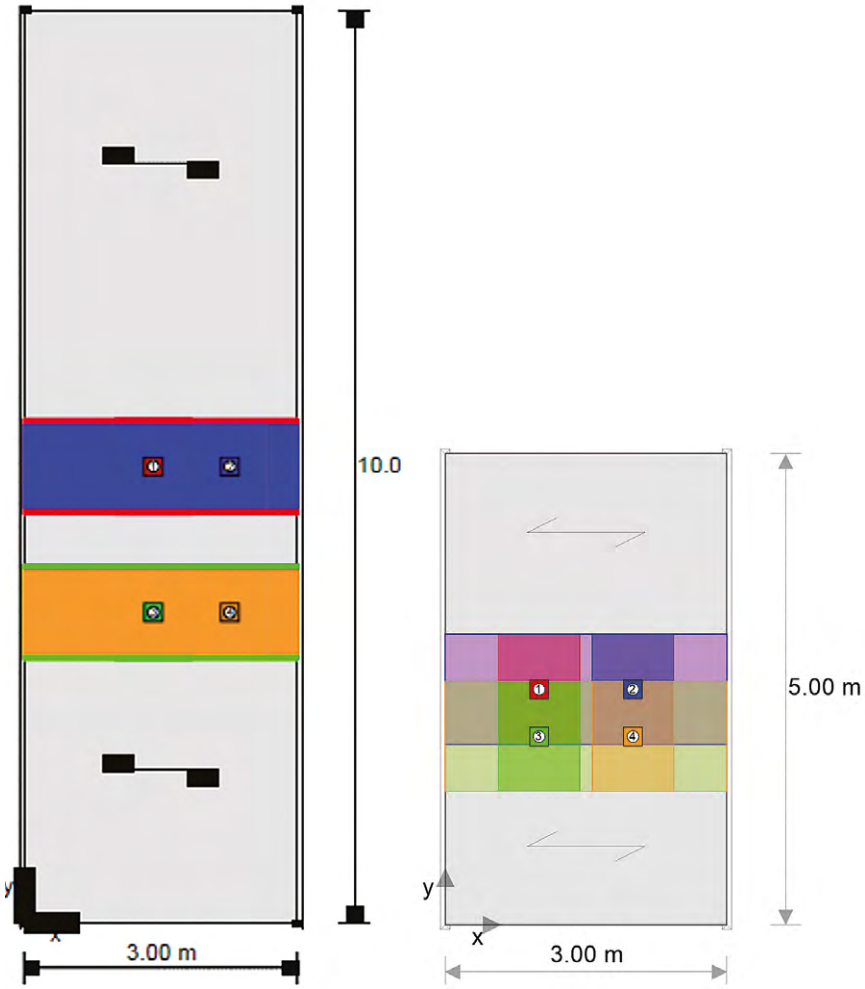


Figure 2: Tedds output showing effective widths supporting lines of loads with a) no overlap b) overlap (of green and pink longitudinal strips)

What about overlapping loads?

The fact that a given concentrated load may be carried by a longitudinal strip that has a width in excess of the 1 m designed by software gets complicated if you have adjacent – side-by-side - concentrated loads. Although not present on the line of slab the designer assumed to be most critical they could still affect it (Figure 2 b). For a typical slab spanning 3 m, the EN 1994 rules tell us that a concentrated load placed at mid-span will be carried by a strip of width around 2 m. If you had two adjacent loads 1 m apart, the critical 1 m strip would be centred about the mid-point between the loads (not about a line on which one of the loads was present), and subject to both loads. Failure to take this into account, and instead design a strip that one of the loads was directly applied to, could result in a significantly under designed slab. To avoid this some side calculations may be needed to increase the level of load used as a software input.

We can also envisage more complex situations where adjacent loads well into the span (so with significant effective width) overlap on a strip between their points of application, but there are other loads, on the same adjacent lines, near the support that will not overlap because they have a smaller effective width. It then becomes less easy to predict which is the most critical strip, and more than one case may need to be designed.

Conclusions

It seems that composite slabs are more-and-more being used in situations where there are numerous concentrated loads present. It is therefore more important than ever that designers using slab design software have a good understanding of how composite slabs behave, particularly the way they support concentrated loads. Before deciding what concentrated loads to include as inputs, designers should ensure there are no adjacent loads that could also affect a given area of slab. ■

References

1. BS EN 1994-1-1:2005, *Eurocode 4 - Design of composite steel and concrete structures - Part 1-1: General rules and rules for buildings*, BSI, 2005.
2. AD450 *Resistance of composite slabs to concentrated loads*, SCI
3. AD477 *Transverse bending of composite slabs subjected to point loads*, SCI
4. *https://steel-sci.com/sci-tedds-modules-for-specialist-steel-design.html*
5. P359 *Composite design of steel framed buildings*, SCI, 2011

Better credentials, better contracts, better working

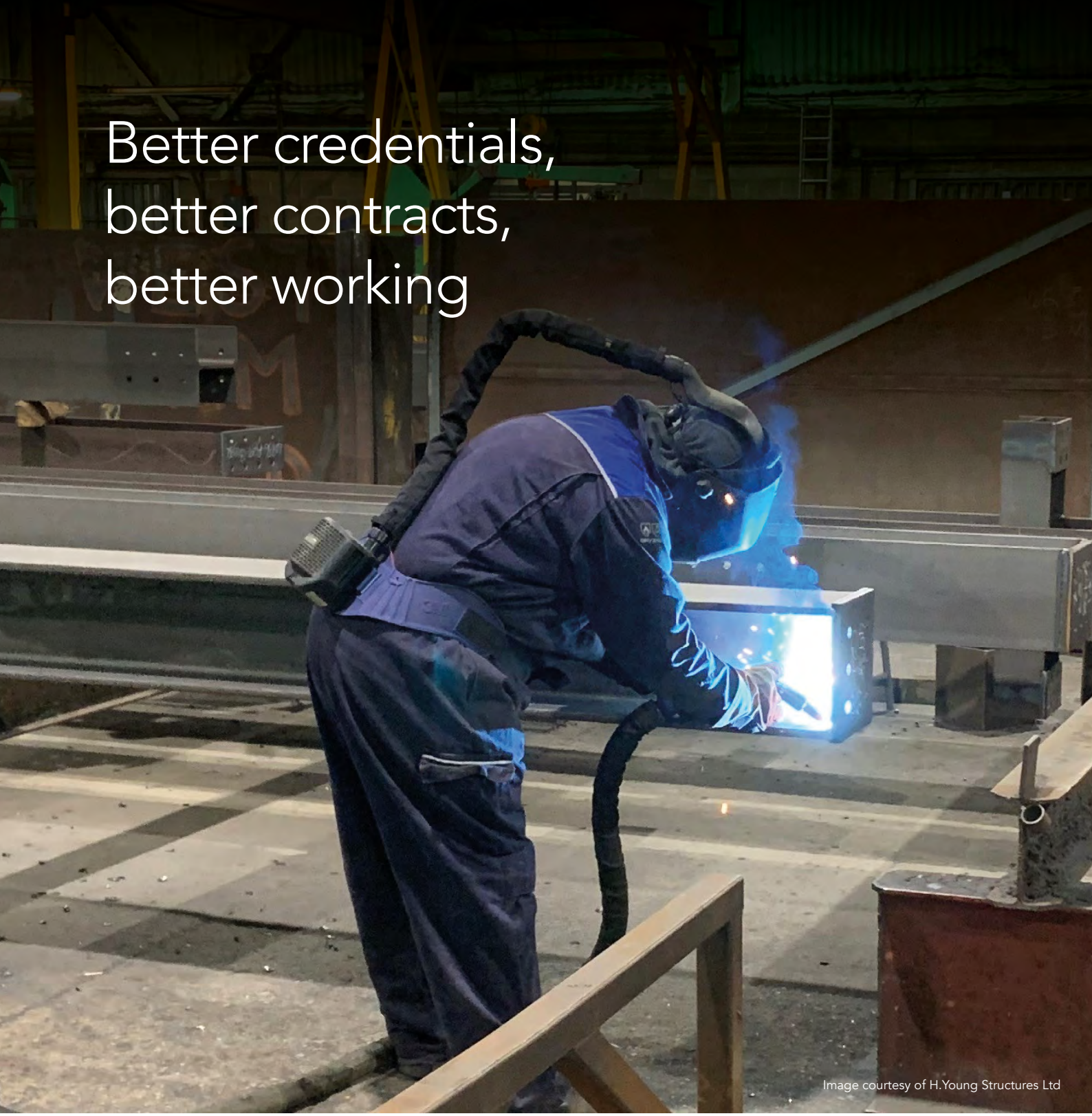


Image courtesy of H.Young Structures Ltd

Better internal operating systems help in winning more business

SCCS is the go-to certification body, dedicated to servicing the constructional steelwork industry. With over 30 years of industry knowledge and with the core objective to provide excellent and tailored quality services to our clients. Increase your client base and win more projects with welding quality management system and National Highways Sector Scheme accreditations, as well as UKCA &/or CE+UKNI markings for your products.

www.steelcertification.co.uk • sccsinfo@steelconstruction.org

SCCS

Serving the steelwork industry since 1989

Understands your processes and operations

UKAS accredited - Accredited number (0021)

Both a UK Approved Body and a Notified Body

One-stop-shop for all your certification needs

UKCA or CE + UKNI Mark your products

Over 30 years experience in the sector

AD 535:
Horizontal lateral loading on internal load-bearing walls in residential buildings

There are two sources of horizontal lateral loading on internal walls in residential buildings that should be considered in their design. These are loads caused by:

- Building occupants (e.g. crowd loads)
- Differential internal air pressure.

These loads should be considered as a leading or accompanying variable actions in combinations determined in accordance with BS EN 1990[1] e.g. using expression 6.10 or expressions 6.10a and 6.10b.

Horizontal loads caused by building occupants

Values of horizontal loads acting on internal walls due to building occupants are defined in Table NA.8 of the UK National Annex to BS EN 1991-1-1:2002[2]. These values should be used in place of those given in Table 6.12 of BS EN 1991-1-1:2002[3]. The loads are specified for categories and sub-categories of loaded areas based on their specific use. Some examples are given in Table 1.

The characteristic horizontal load acting on walls (q_k) should be applied as a line load at a height of 1.20 m above the floor level.

BSi published document PD 6688-1-1:2011[4] specifies values for uniformly distributed and concentrated loads applicable to infills for walls and parapets in Table 2. These are specifically for the infill panels within a wall or parapet acting as a barrier (e.g. glass panel) and should not be used for the design of the primary elements of the wall or parapet. The loads given in Table NA.8 of the UK National Annex to BS EN 1991-1-1:2002 and those given in Table 2 of PD 6688-1-1:2011 are not additive and should be considered as three separate load cases.

Horizontal loads caused by differential internal air pressures

Horizontal loads caused by differential internal air pressures lead to a bending moment on the walls that act in combination with the applied vertical loads. Additional moments due to eccentricity of vertical loads from unequal floor spans or unequal loading should also be considered in the design.

Guidance given in SCI publication P394[5] states that for multi-storey buildings the internal wind pressure coefficient (c_{pi}) is "commonly taken as the more onerous of +0.2 and −0.3". This approach is adopted on the basis that the probability of a dominant opening occurring during a severe storm is considered negligible. Adopting the more onerous case for c_{pi} of +0.2 and −0.3 in adjoining compartments results in an overall pressure coefficient for the internal walls of 0.5.

Clause 2.6.1.2 and Table 16 of the now withdrawn BS 6399-2[6] state that for buildings in which the four façade walls are equally permeable, the internal pressure coefficient may be taken as -0.3. It is also states that the maximum net pressure across internal walls should be taken as 0.5.

Category	Specific use	Sub-category	Description	Characteristic load (q_x)
A	Areas for domestic and residential activities	(i)	All areas within or serving exclusively one dwelling including stairs, landings etc.	0.36 kN/m
		(ii)	Residential areas not covered by (i).	0.74 kN/m

Table 1: Examples of horizontal loads on internal walls due to building occupants
Note: For full definitions and descriptions see Table NA.8 of the UK National Annex to BS EN 1991-1-1:2002.

Modern residential buildings are designed with high levels of airtightness for effective thermal insulation and therefore their external walls are relatively impermeable. Internal separating or compartment walls in multi-occupancy residential type buildings are also likely to be of low permeability which can lead to significant differences in pressures on either side of these walls.

The value of c_{pi} can be estimated by iterative calculation of balancing the inward and outward flow through the various faces, as described in Section 6.2.1 of P394 and Appendix C of SCI-P286. The flow balance is sensitive to the relative permeability of walls and therefore to variations in build quality. Designers may therefore judge it prudent to use values +0.2 and −0.3 and an overall pressure coefficient 0.5 in preference to a more refined calculation. Further guidance on pressures on internal walls and an example of the iterative airflow calculation is provided in BRE Digest 346 Part 8[7].

SCI has conducted a limited number of airflow calculations for a building with a regular arrangement of units positioned either side of a central corridor. Calculations were conducted for various wall permeabilities and the resulting overall pressure coefficients varied from zero to 0.5 depending on the wall permeabilities used. Wall permeabilities based on guidance given in References [8] and [9] were used.

The balance of airflow does not occur instantly. The size effect factor C_a of the standard method in BS 6399-2 accounts for the non-simultaneous action of gusts across an external surface and for the response of internal pressures. As suggested in Reference 8, the size effect factor C_a may be used to account for the response time of the balance of airflow and reduce the resultant internal pressures. Values of the size effect factor are given in Figure 4 of BS 6399-2 and are dependent on the site exposure and the diagonal dimension a. For exposure category B and a diagonal dimension a of 40 m, the size effect factor is 0.85.

Using load combinations given in BS EN 1990 expression 6.10 or expressions 6.10a and 6.10b requires variable actions to be assigned as leading or accompanying.

When the imposed floor loading is taken as the leading variable action and the internal wind pressure is taken as the accompanying variable action, there is an additional factor ($\psi_{0,i}$) of 0.5 to be applied to the wind as the accompanying variable action. When the internal wind pressure is taken as the leading variable action there is no additional partial factor to be applied to the wind.

In many cases, for loadbearing light steel frame walls in multi-storey buildings the critical design case will be when imposed floor loading is taken as the leading variable action and the internal wind pressure is taken as the accompanying variable action.

In the absence of a detailed airflow calculation, it is recommended that an overall pressure coefficient of 0.5 is used for the internal loadbearing walls of residential buildings. The factors discussed above can be used to reduce the design actions of the internal wind pressure.

For double leaf light steel framed walls, the lateral loading due to differential air pressures on either side of the wall can be assumed to be resisted equally by each leaf of the wall.

For internal walls within a dwelling it is not necessary to carry out airflow calculations to determine the air pressure on each side of the wall as there will be significant air leakage between rooms due to gaps around doors and in many cases doors being open.

Large windows or doors (which would be classified as dominant openings) being open during high winds should be treated as an accidental load combination which has lower partial factors applied to the loads.

Contact: **Andrew Way**
Telephone: **01344 636555**
Email: **advisory@steel-sci.com**

[1] BS EN 1990. *Eurocode - Basis of structural design*. BSI, 2010.
[2] BS EN 1991-1-1:2002 UK NA. *UK National Annex to Eurocode 1. Actions on structures - General actions. Densities, self-weight, imposed loads for buildings*. BSI, 2019.
[3] BS EN 1991-1-1:2002. *Eurocode 1. Actions on structures - General actions. Densities, self-weight, imposed loads for buildings*. BSI, 2002
[4] PD 6688-1-1:2011. *Recommendations for the design of structures to BS EN 1991-1-1*. BSI, 2011.
[5] SCI P394 - *Wind actions to BS EN 1991-1-4*. SCI, 2014.
[6] BS 6399-2:1997. *Loading for buildings - Code of practice for wind loads*. BSI, 2010.
[7] BRE Digest 346 Part 8. *The assessment of wind loads. Part 8: internal pressures*. BRE, 1990.
[8] *Wind loading: a practical guide to BS 6399-2*. N. Cook. Thomas Telford, 1999
[9] BS EN 1991-1-4:2005+A1:2010 UK NA. *UK National Annex to Eurocode 1. Actions on structures - General actions - Wind actions*. BSI, 2008.

New and revised codes and standards

From BSI Updates October 2024

BRITISH STANDARDS REVIEWED AND CONFIRMED

BS EN ISO 15609-3:2004
Specification and qualification of welding procedures for metallic materials. Welding procedure specification. Electron beam welding.

BS EN ISO 15616-1:2003
Acceptance tests for CO_2-laser beam machines for high quality welding and cutting. General principles, acceptance conditions.

BS EN ISO 15616-2:2003
Acceptance tests for CO_2-laser beam machines for high quality welding and cutting. Measurement of static and dynamic accuracy.

BS EN ISO 15616-3:2003
Acceptance tests for CO_2-laser beam machines for high quality welding and cutting. Calibration of instruments for measurement of gas flow and pressure.

BS ISO 21931-2:2019
Sustainability in buildings and civil engineering works. Framework for methods of assessment of the environmental, social and economic performance of construction works as a basis for sustainability assessment. Civil engineering works.

BS ISO 4305:2014+A1:2016
Mobile cranes. Determination of stability.

PD ISO/TS 20273:2017
Guidelines on weld quality in relationship to fatigue strength.

BRITISH STANDARDS WITHDRAWN

BS EN ISO 15012-2:2008
Health and safety in welding and allied processes. Requirements, testing and marking of equipment for air filtration. Determination of the minimum air volume flow rate of captor hoods and nozzles.
superseded by BS EN ISO 21904-4:2020

BS EN PUBLICATIONS

BS EN ISO 15614-5:2024
Specification and qualification of welding procedures for metallic materials. Welding procedure test. Arc welding of titanium, zirconium and their alloys.
supersedes BS EN ISO 15614-5:2004

BS IMPLEMENTATIONS

BS ISO 8504-5:2024
Preparation of steel substrates before application of paints and related products. Surface preparation methods. Water jet cleaning.

DRAFT BRITISH STANDARDS FOR PUBLIC COMMENT

24/30474247 DC
BS ISO 11124-7 Preparation of steel substrates before application of paints and related products. Specifications for metallic blast-cleaning abrasives. High chromium white cast iron grit.

24/30474876 DC
BS EN ISO 5577 Non-destructive testing. Ultrasonic testing. Vocabulary.

24/30486968 DC
BS EN ISO 8502-5 Preparation of steel substrates before application of paints and related products. Tests for the assessment of surface cleanliness. Measurement of chloride on steel surfaces prepared for painting (ion detection tube method).

24/30494187 DC
BS EN 10338 Hot rolled and cold rolled non-coated products of multiphase steels for cold forming. Technical delivery conditions.

CEN REPORTS

CEN/TR 18077:2024
Building information modelling. Digital twins applied to the built environment. Use cases.

ISO PUBLICATIONS

ISO 16368:2024
Mobile elevating work platforms. Design, calculations, safety requirements and test methods.

ISO 544:2024
Welding consumables. Technical delivery conditions for filler materials and fluxes. Type of product, dimensions, tolerances and markings.

ISO 8504-5:2024
Preparation of steel substrates before application of paints and related products. Surface preparation methods. Water jet cleaning.

NEW WORK STARTED

NATO EN 1990
UK National Annex to Eurocode. Basis of structural and geotechnical design.

NATO EN 1991-2
UK National Annex to Eurocode 1: Actions on structures. Traffic loads on bridges and other civil engineering works.

CORRIGENDA TO BRITISH STANDARDS

BS EN ISO 21904-4:2020
Health and safety in welding and allied processes. Equipment for capture and separation of welding fume. Determination of the minimum air volume flow rate of capture devices.

CEN EUROPEAN STANDARDS

EN 17942:2024
Welding and allied processes. Gas welding equipment. Safety requirements for thermoprocess equipment with open firing oxy-fuel gas welding equipment.

PUBLISHED DOCUMENTS

PD CEN/TR 18077:2024
Building information modelling. Digital twins applied to the built environment. Use cases.

where the nuts go to...

...and the bolts, and the structural steel and the cladding services and so on. This is the story of Coseley Engineering's 41 unit contract to provide the buildings for a medical service for the newly developing state of Amazonas in Brazil.

Brazil has in recent years celebrated the 1 50th anniversary of her independence from Portugal and with her growing exports, notably of sugar and coffee, she is increasingly making her presence felt in world markets.

The prosperity resulting from this increased world trade has allowed the Government to meet the cost of a wide range of domestic developments. These include the big new Transamazon highway system through the hitherto impenetrable Amazonian jungle and a complete health infrastructure for the State of Amazonas.

Amazonas is the largest State of Brazil, covering an area equal to the whole of Europe. It is covered by dense humid rain forests through which runs the largest river system in the world, based on the 6,500 km long river Amazon.

With a population of one million, 300,000 of whom live in and around the State Capital Manaus, Amazonas is sparsely populated. Herein lies one of the major obstacles to the provision of a viable health s'ervice.

Investigations show that health facilities in the interior are grossly inadequate, primarily dependent on the services of a few missionaries. Water supply, sanitation and living standards in general are unhygienic and no facilities exist for the education of the population in the requirements for a basic health standard and the prevention of disease.

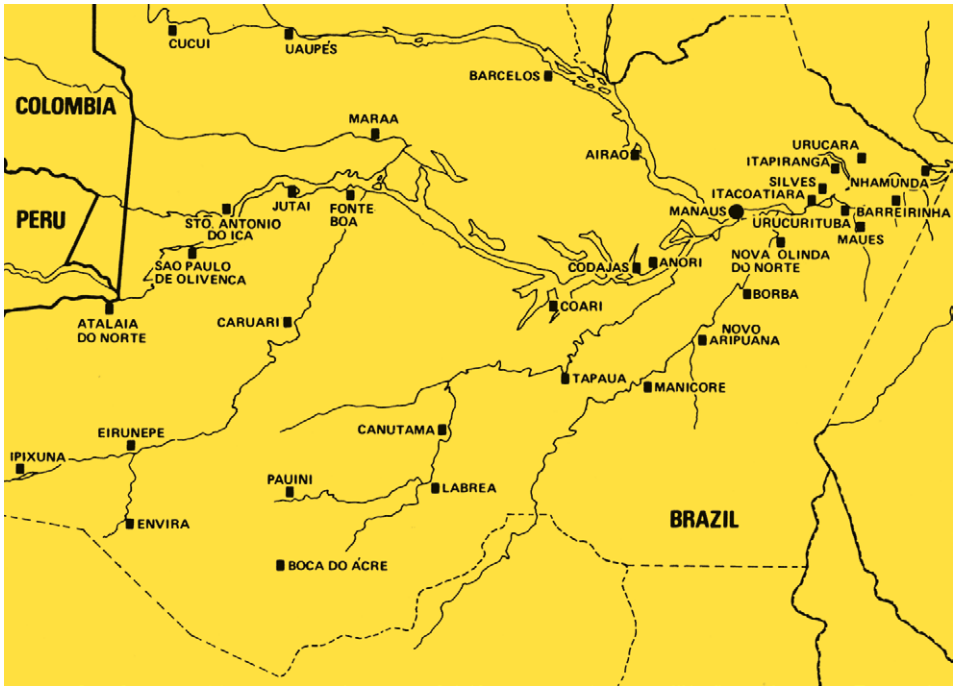
It is against this background of immense forests, enormous distances and lack of communication that the State Government gave its attention and resources towards the provision of a health infrastructure for the interior.

Because of the size of Amazonas and the dispersed nature of the few villages and towns, the first planning step was to divide the State into a convenient number of zones. Each zone was then provided with a graduated system of facilities ranging from peripheral units serving small outlying communities containing modern sophisticated equipment.

The river provides the only practical means of travel through the dense jungle so sites for the health buildings were almost invariably fixed on the banks of the Amazon.

Brazil is a relatively fast growing country within a continent which is itself growing very fast by world standards. And although the Government has an impressive list of programmes to combat present deficiencies in housing, education and health it has so far been unable to achieve a rate of construction which matches population increases. This is due in part to a shortage of skilled tradesmen and materials.

To overcome the shortages of labour and materials - the latter becomes more acute as the



FROM

Building with Steel

September 1974

more remote areas are penetrated - prefabricated buildings were chosen for the hospital buildings.

The chosen contractors, Coseley Buildings Limited erected a prototype building on their premises in Wolverhampton and invited a party of experts from Brazil to visit and examine equipment and discuss the scheme fully with the project team.

Impressed with what they had seen and influenced by the record of achievement set by this British company in worldwide construction, the Brazilian Government finalised arrangements with Coseley for the supply of fully equipped hospital units to be located on 44 sites throughout Amazonas. The schedule of facilities to be provided and dispersed around the zones included 7 hospital units, 24 health centres, 13 outpatient/emergency units and 25 doctors houses.

All the buildings, which are single storey, steel framed, with profiled metal cladding wue prefabricated in Wolverhampton and shipped out together with medical equipment, furniture, and fittings, in consignments matched to the appropriate health zones.

The major hospital units include operating theatres, obstetric wards, radiography rooms, laboratories and outpatients departments as well as kitchens, staff canteen and administration block.

The first unit was built in Manaus well in advance of the main construction programme and the Bazilian foremen who, in conjunction with a team of Coseley engineers, were to supervise construction, were instructed in the necessary techniques. In addition to this training programme, instruction manuals printed in both Portuguese and English were supplied.

Whilst this training programme was in progress the delivery of the buildings and equipment destined for sites remote from Manaus was being made by river barge. Unloading was made particularly difficult due to the seasonal rise and fall of the water level, which can be as much as 60ft., combined with the absence of mechanical lifting gear.

Coseley engineers used light amphibious aircraft to enable frequent visits to the many sites to ensure satisfactory building progress. Once the foundations had been prepared it was a simple matter to erect .the steel framework without the use of ,heavy lifting gear. All the parts which simply required bolting together were marked for easy identification and step by step instructions were contained in the specially prepared erection manual. The cladding sheets and thermal insulation material also simply bolt on to the steel framework.

All furniture and fitted units were supplied in knock down form to be assembled in accordance with instructions and drawings. Prefabricated plumbing and electrical kits were supplied, once again to simplify installation.

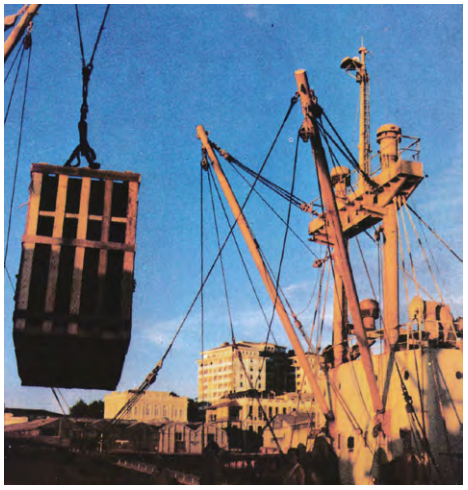
Every building complex contains a water purification system supplied from its own elevated water storage tank and electrical generators are installed to supply the complete power requirements.

Basically these buildings are adaptations of designs which have been used all over the world in the construction of schools and hospitals. Designed specifically for use in the tropics they comply with the highest standards with regard to ventilation, insulation and protection against vermin and insects.

In the larger hospital units the doctor or consultant lives with his family in one of the houses provided within the hospital complex. The smaller units are under the control of a nurse who is assisted by locally recruited and trained staff. A flat is provided as short-stay accommodation for a visiting doctor who will regularly visit several clinics within his zone.

From its conception this unique project presented a challenge. A challenge to administrative and technical skills, of communication and of transportation; but the scheme is now operable and the peoples of the interior have access to modern medicine and methods.

Coseley Buildings Limited have made a 16mm co)our film of this unique project and it is available on free loan by contacting the Public Relations Division at the head office in Wolverhampton.



RQSC The Register of Qualified Steelwork Contractors Scheme **Buildings**

Steelwork contractors for buildings

BCSA

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

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, ● = Bronze, ● = Certificate

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	C	D	E	F	G	H	J	K	L	M	N	Q	R	S	QM	FPC	BIM	SCM	Guide Contract Value (1)
A C Bacon Engineering Ltd	01953 850611			●	●	●	●				●			●		✔	2			Up to £6,500,000
Adey Steel Ltd	01509 556677			●	●	●	●	●	●	●	●		●		●	✔	3		●	Up to £5,000,000
Adstone Construction Ltd	01905 794561			●	●	●	●	●								✔	2	✔	●	Up to £3,400,000
AJ Engineering & Construction Services Ltd	01309 671919			●	●		●		●	●	●			●	●	✔	4		●	Up to £3,400,000
Angle Ring Company Ltd	0121 557 7241												●			✔	4			Up to £1,200,000
Arminhall Engineering Ltd	01799 524510	●			●	●		●		●	●			●	●	✔	2			Up to £2,400,000
Arromax Structures Ltd	01623 747466			●	●	●	●	●	●	●	●				●		2			Up to £1,200,000
ASD Westok Ltd	0113 205 5270	●	●	●	●	●	●			●	●	●	●		●	✔	4		●	Up to £6,500,000
ASME Engineering Ltd	020 8966 7150	●		●	●	●		●	●	●	●		●	●	●	✔	4		●	Up to £5,000,000
Atlasco Constructional Engineers Ltd	01782 564711			●	●	●	●			●	●			●	●	✔	2			Up to £1,200,000
BD Structures Ltd	01942 817770			●	●	●	●				●	●		●	●	✔	2	✔	●	Up to £2,400,000
Barnshaw Section Benders Ltd	0121 557 8261												●			✔	4			Up to £1,200,000
BHC Ltd	01555 840006	●	●	●	●	●	●	●	●	●	●	●		●	●	✔	4	✔	●	Above £10,000,000
Billington Structures Ltd	01226 340666		●	●	●	●	●	●		●		●	●	●		✔	4	✔	●	Above £10,000,000
Bourne Group Ltd	01202 746666		●	●	●	●	●	●	●	●	●	●	●	●	●	✔	4	✔	●	Above £10,000,000
Briton Fabricators Ltd	0115 963 2901	●		●	●	●	●	●	●	●	●		●	●	●	✔	4		●	Up to £10,000,000
Cairnhill Structures Ltd	01236 449393	●			●	●	●	●	●						●	✔	4		●	Up to £6,500,000
Caunton Engineering Ltd	01773 531111	●	●	●	●	●	●	●		●	●	●		●	●	✔	4	✔	●	Above £10,000,000
Cementation Fabrications	0300 105 0135	●	●	●	●	●	●	●	●	●	●	●	●	●	●	✔	3		●	Up to £10,000,000
CMF Ltd	020 8844 0940				●		●	●		●	●				●	✔	4			Up to £6,500,000
Coventry Construction Ltd	024 7646 4484			●	●	●	●		●	●	●			●	●	✔	4			Up to £1,200,000
D H Structures Ltd	01785 246269			●	●		●				●						2			Up to £500,000
Duggan Steel	00 353 29 70072		●	●	●	●	●	●			●					✔	4			Up to £10,000,000
D Hughes Welding & Fabrication Ltd	01248 421104				●	●	●	●	●	●	●		●	●	●	✔	4			Up to £500,000
ECS Engineering Services Ltd	01773 860001	●		●	●	●	●	●	●	●	●			●	●	✔	4		●	Up to £5,000,000
Elland Steel Structures Ltd	01422 380262		●	●	●	●	●	●	●	●	●	●		●	●	✔	4	✔	●	Up to £10,000,000
EvadX Ltd	01745 336413		●	●	●	●	●	●		●	●	●			●	✔	3		●	Up to £5,000,000
Four Bay Structures Ltd	01603 758141			●	●	●	●	●		●	●			●	●	✔	2			Up to £1,200,000
Four-Tees Engineers Ltd	01489 885899	●		●	●		●	●	●	●	●		●	●	●	✔	3		●	Up to £2,400,000
G.R. Carr (Essex) Ltd	01286 535501	●		●	●			●			●			●	●	✔	4			Up to £1,200,000
Gorge Fabrications Ltd	0121 522 5770				●	●	●	●		●	●			●	●	✔	3			Up to £1,200,000
BCSA steelwork contractor member	**Tel**	**C**	**D**	**E**	**F**	**G**	**H**	**J**	**K**	**L**	**M**	**N**	**Q**	**R**	**S**	**QM**	**FPC**	**BIM**	**SCM**	Guide Contract Value (1)

BCSA steelwork contractor member	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			●	●	●	●	●			●			●	●	✔	4	✔	●	Up to £3,400,000
Had Fab Ltd	01875 611711				●		●	●	●	●	●			●	●	✔	4			Up to £6,500,000
HBE Services Ltd	01525 854110				●	●				●				●	●	✔	2			Up to £1,200,000
Hescott Engineering Company Ltd	01324 556610			●	●	●	●			●				●	●	✔	2			Up to £3,400,000
Hillcrest Structural Steel Ltd	023 8064 1373			●	●	●	●	●		●	●			●	●	✔	3		●	Up to £3,400,000*
Integrated Water Services Ltd	01282 777739									●	●			●	●	✔	2			Up to £1,200,000
Intersteels Ltd	01322 337766	●			●	●	●	●	●				●	●	●	✔	3	✔		Up to £5,000,000
Jamestown Manufacturing Ltd	00 353 45 434 288		●	●	●	●	●	●	●	●		●	●			✔	4			Up to £10,000,000
Kiernan Structural Steel Ltd	00 353 43 334 1445			●	●	●	●	●		●	●	●	●	●	●	✔	4	✔	●	Above £10,000,000
Leach Structural Steelwork Ltd	01995 642000			●	●	●	●	●			●					✔	3		●	Up to £6,500,000
Legge Steel (Fabrications) Ltd	01592 205320			●	●					●	●			●	●		2			Up to £600,000
Littleton Steel Ltd	01934 311670			●	●	●				●	●			●	●	✔	3			Up to £1,200,000
Loaninghill Fabrications Ltd	01506 858466				●		●	●	●	●				●	●		3			Up to 600,000
M Hasson & Sons Ltd	028 2957 1281			●	●	●	●	●	●	●	●			●	●	✔	4		●	Up to £1,400,000
M&S Engineering Ltd	01461 40111				●				●	●	●				●	✔	3			Up to £2,400,000
Mackay Steelwork & Cladding Ltd	01862 843910			●	●		●			●	●			●	●	✔	4		●	Up to £2,400,000
Midland Structures Limited	01384 411201				●	●	●	●	●	●	●		●	●	●		2			Up to £5,000,000
Murphy International Ltd	00 353 45 431384	●		●	●	●	●	●	●	●	●			●	●	✔	4		●	Up to £6,500,000
Nationwide Structures Ltd	01924365883			●	●	●	●				●					✔	4			Up to £10,000,000
Newbridge Engineering Ltd	01429 866722	●	●	●	●	●	●	●			●	●				✔	4		●	Up to £2,400,000
North Lincs Structures	01724 855512			●	●					●					●		2			Up to £600,000
Painter Brothers Ltd	01432 374400				●				●	●	●			●	●		3			Up to £5,000,000*
Peter Marshall (Steel Stairs) Ltd	0113 307 6730				●	●				●	●				●	✔	3			Up to £2,400,000*
PMS Fabrications Ltd	01228 599090			●	●	●	●		●	●	●			●	●		3			Up to £3,400,000
REIDsteel	01202 483333			●	●	●	●	●	●	●	●	●	●		●	✔	4		●	Above £10,000,000
SAH Luton Ltd	01582 805741			●	●	●				●				●	●		2			Up to £600,000
SDM Fabrication Ltd	01354 660895	●	●	●	●	●	●			●	●			●	●	✔	4		●	Up to £6,500,000
Severfield plc	01845 577896	●	●	●	●	●	●	●	●	●	●	●	●	●	●	✔	4	✔	●	Above £10,000,000
Shaun Hodgson Engineering Ltd	01553 766499	●		●	●		●			●	●			●	●	✔	3			Up to £1,200,000
Shipley Structures Ltd	01400 251480			●	●	●	●		●	●	●			●	●	✔	3			Up to £2,400,000
Snashall Steel Fabrications Co Ltd	01300 345588			●	●	●	●	●			●				●	✔	3	✔		Up to £3,400,000
Southern Fabrications (Sussex) Ltd	01243 649000				●	●				●	●			●	●	✔	2			Up to £1,200,000
Stage One Creative Services Ltd	01423 358001				●		●	●	●	●	●		●			✔	2			Up to £6,500,000
Taziker Industrial Ltd	01204 468080	●		●	●		●	●		●	●		●	●	●	✔	3		●	Above £10,000,000
TSI Structures Ltd	01603 720031			●	●	●	●	●			●			●			2	✔		Up to £3,400,000
W I G Engineering Ltd	01869 320515				●					●	●			●	●	✔	2		●	Up to £600,000
Walter Watson Ltd	028 4377 8711			●	●	●	●	●				●				✔	4		●	Above £10,000,000
Westbury Park Engineering Ltd	01373 825500	●		●	●	●	●	●	●	●	●				●	✔	4		●	Up to £1,200,000
William Haley Engineering Ltd	01278 760591			●	●	●	●				●		●			✔	4			Up to £5,000,000
William Hare Ltd	0161 609 0000	●	●	●	●	●	●	●	●	●	●	●	●	●	●	✔	4	✔	●	Above £10,000,000

Non BCSA member	Tel	C	D	E	F	G	H	J	K	L	M	N	Q	R	S	QM	FPC	BIM	SCM	Guide Contract Value (1)
Eden Fabrications	02825 821000			●	●	●	●	●		●	●		●		●	✔	3			Up to £1,200,000
Non BCSA member	**Tel**	**C**	**D**	**E**	**F**	**G**	**H**	**J**	**K**	**L**	**M**	**N**	**Q**	**R**	**S**	**QM**	**FPC**	**BIM**	**SCM**	Guide Contract Value (1)

RQSC

The Register of Qualified Steelwork Contractors Scheme **Bridgeworks**

Steelwork contractors for bridgeworks

BCSA

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

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

FB Footbridges
CF Complex footbridges
SG 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
SRF Site-based bridge refurbishment
FRF Factory-based 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 ● = Bronze ● = Certificate

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	FB	CF	SG	PG	TW	BA	CM	MB	SRF	FRF	AS	QM	FPC	BIM	NHSS 19A	NHSS 20	SCM	Guide Contract Value (1)
Adey Steel Ltd	01509 556677	●	●	●	●	●	●			●	●	●	✓	3			✓	●	Up to £3,400,000
AJ Engineering & Construction Services Ltd	01309 671919	●		●	●	●	●	●	●	●	●	●	✓	4				●	Up to £3,400,000
ASD Westok Ltd	0113 205 5270	●		●	●							●	✓	4				●	Up to £6,500,000
Beaver Bridges Ltd	01204 668773	●		●	●	●	●	●	●	●	●	●	✓	4			✓		Up to £3,400,000
Billington Structures Ltd	01226 340666	●		●	●	●	●					●	✓	4	✓	✓	✓	●	Above £10,000,000
Bourne Group Ltd	01202 746666	●		●	●	●				●		●	✓	4	✓		✓	●	Above £10,000,000
Briton Fabricators Ltd	0115 963 2901	●	●	●	●	●	●	●	●	●	●	●	✓	4			✓	●	Up to £10,000,000
Cairnhill Structures Ltd	01236 449393	●	●	●	●	●	●	●		●	●	●	✓	4			✓	●	Up to £6,500,000
Cementation Fabrications	0300 105 0135	●	●	●	●	●	●	●	●	●	●	●	✓	3			✓	●	Up to £10,000,000
D Hughes Welding & Fabrication Ltd	01248 421104	●		●		●			●	●	●	●	✓	4			✓		Up to £1,200,000
ECS Engineering Services Ltd	01773 860001	●		●	●	●	●		●			●	✓	4				●	Up to £5,000,000
Four-Tees Engineers Ltd	01489 885899	●	●	●	●	●	●		●	●	●	●	✓	3			✓	●	Up to £2,400,000
Jamestown Manufacturing Ltd	00 353 45 434 288	●	●	●	●	●	●					●	✓	4			✓		Up to £10,000,000
Kiernan Structural Steel Ltd	00 353 43 334 1445	●		●	●	●						●	✓	4	✓		✓	●	Above £10,000,000
M&S Engineering Ltd	01461 40111	●		●		●	●	●		●	●	●	✓	3					Up to £2,400,000
M Hasson & Sons Ltd	028 2957 1281	●	●	●	●	●	●	●	●	●	●	●	✓	4			✓	●	Up to £1,400,000
Millar Callaghan Engineering Services Ltd	01294 217711	●	●	●	●	●	●	●	●	●	●	●	✓	4			✓		Up to £2,400,000
Murphy International Ltd	00 353 45 431384	●	●	●	●	●	●			●	●	●	✓	4			✓	●	Up to £6,500,000
Nusteel Structures Ltd	01303 268112	●	●	●	●	●	●	●	●	●	●	●	✓	4		✓	✓	●	Up to £6,500,000
REIDsteel	01202 483333	●			●	●	●		●			●	✓	4				●	Up to £10,000,000
Taziker Industrial Ltd	01204 468080	●	●	●	●	●	●	●	●	●	●	●	✓	3		✓	✓	●	Above £10,000,000
William Hare Ltd	0161 609 0000	●	●	●	●	●	●	●	●	●	●	●	✓	4	✓	✓	✓	●	Above £10,000,000
Non-BCSA member																			
Allerton Steel Ltd	01609 774471	●	●	●	●	●	●	●	●	●	●	●	✓	4	✓		✓	●	Up to £5,000,000
AmcoGiffen	01226 243413	●	●	●	●	●	●		●	●	●	●	✓	4			✓		Up to £1,200,000
Carver Engineering Services Ltd	01302 751900	●		●	●	●	●		●	●	●	●	✓	4			✓		Up to £5,000,000
Centregreat Engineering Ltd	02920 226088	●		●	●	●	●	●	●	●	●	●	✓	4		✓			Up to £3,400,000
Cimolai SpA	01223 836299	●	●	●	●	●	●	●	●	●	●	●	✓	4		✓	✓	●	Above £10,000,000
CTS Bridges Ltd	01484 606416	●	●	●	●	●	●	●	●		●	●	✓	4			✓		Up to 1,200,000
Donyal Engineering Ltd	01207 270909	●		●						●	●	●	✓	3		✓	✓		Up to £2,400,000
Eiffage Metal	07511 177815	●	●		●	●	●	●	●	●	●	●	✓	4			✓		Above £10,000,000
Harrisons Engineering (Lancashire) Ltd	01254 823993	●	●	●	●	●	●	●	●	●	●	●	✓	3		✓	✓		Up to £3,400,000
HS Carlsteel Engineering Ltd	020 8312 1879			●						●	●	●	✓	3			✓		Up to £2,400,000
J&D Pierce Contracts Ltd	01505 683724	●	●		●	●	●	●	●			●	✓	4		✓	✓		Above £10,000,000
Kelly's Welders & Blacksmiths Ltd	01383 512 517											●	✓	2			✓		Up to £350,000
Lanarkshire Welding Company Limited	01698 264271	●	●	●	●	●	●	●	●	●	●	●	✓	4		✓	✓		Up to £5,000,000
North View Engineering Solutions Ltd	01325 464558											●	✓	3					Up to £1,200,000
Shaw Manufacturing Ltd	01642 210716			●						●	●	●	✓	4			✓		Up to £1,200,000
Total Steelwork & Fabrication Ltd	01925 234320	●		●		●				●	●	●	✓	4			✓		Up to £5,000,000
Victor Buyck Steel Construction	00 32 9 376 2211	●	●	●	●	●	●	●	●	●	●	●	✓	4		✓	✓	●	Above £10,000,000

BCSA

Stakeholder Members

Stakeholder 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
Bonham and Brook North Ltd	020 3523 9125
Griffiths & Armour	0151 236 5656
Highways England Company Ltd	0300 123 5000
Keiths Welding Limited	07791 432 078

Company name	Tel
Magna Inspections Ltd	01377 229632
MMCEngineer Ltd	01423 855939
Paul Hulme Engineering Ltd	07801 216858
Sandberg LLP	020 7565 7000

Company name	Tel
Solent Commercial Management Limited	07852 309104
Structural & Weld Testing Services Ltd	01795 420264
SUM ADR Ltd	07960 775772
Thames Welding Ltd	07912 691704

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.

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
NHSS National Highway Sector Scheme

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

SCM Steel Construction Sustainability Charter
● = Gold ● = Silver
● = Bronze ● = Certificate

SfL Steel for Life Sponsor

Steel for Life sponsors

Level	Company name	Sector	Tel	QM	CA	FPC	NHSS	SCM	Website	Email
Headline	Arcelor Mittal Distribution - Scunthorpe	Steel Stockholders	01724 810810	✓	D/I	4	3B		https://corporate.arcelormittal.com/	david.chapman@arcelormittal.com
Headline	Barrett Steel Limited	Steel Stockholders	01274 474314	✓	M	4	3B		https://www.barrettsteel.com/	sales@barrettconstructional.com
Gold	Cleveland Steel & Tubes Ltd	Steel Stockholders	01845 577789	✓	M	3	3B		https://www.cleveland-steel.com/	sales@cleveland-steel.com
Gold	Jamestown	RQSC Buildings and Bridges	00 353 45 434 288	✓	N/A	4	20		https://jamestownmanufacturing.com/	info@jamestownprofiling.com
Gold	National Tube Stockholders Ltd	Steel Stockholders	01845 577440	✓	D/I	4	3B		https://nationaltube.co.uk/	sales@nationaltube.co.uk
Gold	voestalpine Metsec plc	Structural Components	0121 601 6000	✓	M	4			https://www.metsec.com/	metsec.plc@voestalpine.com
Gold	Wedge Group Galvanizing Ltd	Protective Systems	01902 601944	✓	N/A				https://www.wedge-galv.co.uk/	info@wedg-galv.co.uk
Silver	Barnshaw Section Benders	RQSC Buildings	0121 557 8261	✓	N/A	4		●	https://www.barnshaws.com/	sectionbending@barnshaws.com
Silver	FICEP UK Ltd	Manufacturing Equipment	01924 223530		N/A				https://www.ficep.co.uk/	info@ficep.co.uk
Silver	Hempel	Protective Systems	01633 874024	✓	N/A				https://www.hempel.com/	sales.uk@hempel.com
Silver	IDEA StatiCa UK Ltd	Computer Software	02035 799397		N/A				https://www.ideastatica.com/	info@ideastatica.uk
Silver	Joseph Ash Galvanizing	Protective Systems	01246 854650	✓	N/A				https://www.josephash.co.uk/	sales@josephash.co.uk
Silver	Voortman UK Ltd	Manufacturing Equipment	+31 (0)548 536 373		N/A				https://www.voortman.net/en/	info@voortman.net

Structural components

Company name	Tel	QM	CA	FPC	NHSS	SCM	SfL
Albion Sections Ltd	0121 553 1877	✓	M	4			
Cast Connex UK Ltd	01416 806 3521		M				
Cellbeam Ltd	01937 840600	✓	M	4	20		
Composite Profiles UK Ltd	01202 659237		D/I				
Construction Metal Forming Ltd	01495 761080	✓	M	3			
Daver Steels Ltd	0114 261 1999	✓	M	3			
Farrat Isolevel	0161 924 1600	✓	N/A				
Hadley Industries Plc	0121 555 1342	✓	M	4		●	
Hi-Span Ltd	01953 603081	✓	M	4		●	
Kingspan Structural Products	01944 712000	✓	M	4		●	
MSW UK Ltd	0115 946 2316		D/I				
Prodeck-Fixing Ltd	01278 780586	✓	D/I				
Structural Metal Decks Ltd	01202 718898	✓	M	4			
Stud-Deck Services Ltd	01335 390069		D/I				
Tata Steel – ComFlor	01244 892199	✓	M	4			

Computer software

Company name	Tel	QM	CA	FPC	NHSS	SCM	SfL
Autodesk Ltd	01252456600		N/A				
Fabsec Ltd	01937 840641		N/A				
StruMIS Ltd	01332 545800		N/A				
Trimble UK Limited	0113 887 9790		N/A				

Steel producers

Company name	Tel	QM	CA	FPC	NHSS	SCM	SfL
British Steel Ltd	01724 404040	✓	M		3B		
Tata Steel – Tubes	01536 402121	✓	M		3B		

Manufacturing equipment

Company name	Tel	QM	CA	FPC	NHSS	SCM	SfL
Behringer Ltd	01296 668259		N/A				
Kaltenbach Ltd	01234 213201		N/A				
Lincoln Electric (UK) Ltd	0114 287 2401	✓	N/A				
Peddinghaus Corporation UK Ltd	01952 200377		N/A				

Membership services

Company name	Tel	QM	CA	FPC	NHSS	SCM	SfL
Deconstruct UK Ltd	02035 799397	✓	N/A				
Keltbray Holdings Ltd	0207 643 1000	✓	N/A				

Protective systems

Company name	Tel	QM	CA	FPC	NHSS	SCM	SfL
Forward Protective Coatings Ltd	01623 748323	✓	N/A				
Highland Metals Ltd	01343 548855	✓	N/A				
International Paint Ltd	0191 469 6111	✓	N/A				
Jack Tighe Ltd	01302 880360	✓	N/A		19A	●	
PPG Architectural Coatings UK & Ireland	01924 354233	✓	N/A				
Sherwin-Williams UK Ltd	01204 521771	✓	N/A				
Vale Protective Coatings Ltd	01949 869784		N/A				

Safety systems

Company name	Tel	QM	CA	FPC	NHSS	SCM	SfL
Easi-Edge Ltd	01777 870901	✓	N/A				
TRAD Hire & Sales Ltd	01614 304666	✓	N/A				

Steel stockholders

Company name	Tel	QM	CA	FPC	NHSS	SCM	SfL
ASD Metals UK	0113 254 0711	✓	D/I	4	3B	●	
AJN Steelstock Ltd	01638 555500	✓	M	4			
British Steel Distribution	01642 405040	✓	D/I	4	3B		
Dent Steel Services (Yorkshire) Ltd	01274 607070	✓	M	4	3B		
Dillinger Hutte U.K. Limited	01724 231176	✓	D/I	4		●	
Duggan Profiles & Steel Service Centre Ltd	00 353 567722485	✓	M	4			
European Metal Recycling Ltd	01925 715400	✓	N/A				
Murray Plate Group Ltd	0161 866 0266	✓	D/I	4	3B		
Rainham Steel Co Ltd	01708 522311	✓	D/I	4	3B		
The Alternative Steel Co Ltd	01942 826677	✓	D/I				

Structural fasteners

Company name	Tel	QM	CA	FPC	NHSS	SCM	SfL
Advanced Bolting Solutions Limited	0116 251 2251	✓					
BAPP Group Ltd	01226 383824	✓	M		3		
Cooper & Turner Ltd	0114 256 0057	✓	M		3		
Howmet Fastening Systems Ltd	01952 290011	✓	M				
Lindapter International	01274 521444	✓	M				

Welding equipment and consumables

Company name	Tel	QM	CA	FPC	NHSS	SCM	SfL
Air Products PLC	01270 614167		N/A				

STRUMIS

Estimodelling: 100% Model-Based Costing

For many years, STRUMIS Estimating has been a leading choice for structural steel fabricators, known for its speed and accuracy in generating estimates. However, our ground-breaking STRUMIS Estimodelling feature is about to redefine the industry.

Our new Estimodelling feature extracts precise welding and connection data from 3D models, providing a level of detail and accuracy, comparable with production times.

Time to redefine accuracy in fabrication.

STEEL FABRICATION MANAGEMENT SOFTWARE

01332 545800
sales@strumis.com