JUNE 2026

NSC

Steel solution for Olympic cauldrons

Portal frames prove worth at Daventry

Steel rises at Ravenscraig

Gantries support Bristol buses electric drive

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Cover image
Milano Cortina 2026 Winter Olympic and Paralympic cauldrons
Main client: Balich Wonder Studio
Structural engineer & steelwork contractor: Stage One Creative Services
Steel tonnage: 15t

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Strong quality offices demand belies predictions of the death of the office

Nick Barrett
Editor-in-Chief

We are living in interesting times, and we are also certainly living in times that are as challenging as most can remember. Threats to the global economy have arisen as far away as Iran, over which we have no control and seemingly little influence. Tariff-based threats to the global steel supply chain create uncertainties all of their own.

Predictions of the 'end to the office' as more and more people are said to want to work from home - or 'from beach', as some sceptics of that trend have observed - might have weakened but are still being made by some. Artificial Intelligence (AI) is the latest threat to demand for office space to house staff, but some optimists can see reasons from history for expecting to see demand for human capital increase because of AI (see Jevons Paradox).

There has been no shortage of doom-and-gloom laden outlook forecasts in recent months; it takes steely nerves to commit significant amounts of capital to speculative projects against that background. But there has always been a substantial group of investors with the courage to peer through the fog of dismal forecasts and see reasons to be more optimistic - and commit investment funds to take advantage of opportunities not obvious to the herd.

Demand for the best office space in at least one key market - the City - has in fact seldom, if ever, been stronger, developers report. There has been a 'flight to quality' in recent years and steel-framed commercial and office developments across the UK have benefited greatly. Alternative materials cannot cost effectively produce the aesthetically pleasing, circular economy beneficial structures made possible by constructional steelwork.

Summer 2026 has kicked off with confirmation that a consortium of Asian investors has commissioned Stanhope to go ahead with the renamed 1 Undershaft - now called One London - which will be the tallest commercial building in the City at 74 floors, 309.6 metres. These investors are taking a long-term view as the building, expected to cost in excess of £1 billion, won't be completed until 2033.

Within a shorter time scale there are other strong signs of life in the offices market. For example, a report from lawyers Irwin Mitchell finds that more UK office occupiers are planning relocations despite a continued focus on reconfiguring existing space. The firm's latest Office Occupiers Survey of 500 UK-based senior decision-makers responsible for office space said that the percentage of firms looking at relocating had risen from 23% to nearly 32%.

Reconfiguring existing space remained the favoured option but the number looking at doing this had dropped from 49% to 43%. The number looking at taking on more space also dropped, from 45% to 33%. Demand for offices is underpinned by expectations of higher staff attendance, the survey found, with some 78% of business leaders expecting office attendance to increase in the year ahead, up from 74% last year.

Personal contacts with office-based workers from London's West End and City to Glasgow suggests that although staff like to work from home, employers are successfully tightening up on 'work from the office' requirements. How these conflicting pressures will be resolved is probably still anybody's guess. But at least a lot of smart money is backing the need for sustained demand for offices. Which is good news for constructional steelwork.

HS2 confirms contractor for Birmingham control centre

HS2 has appointed Taylor Woodrow Infrastructure and Aureos Rail to build the high-speed railway's steel-framed control centre and rolling stock depot at Washwood Heath in Birmingham.

The contract, worth around £856 million, will see the companies work with HS2 to develop the disused 70-hectare site of the former LDV and Metro-Cammell works into a logistics hub supporting thousands of jobs.

The new depot will cover around 30-hectares and include a state-of-the-art Rolling Stock Maintenance Building, Carriage Wash, Automatic Vehicle Inspection Building and sidings where high-speed trains can be stored overnight as well as a test track.

Also on the same site will be the Network Integrated Control Centre (NICC), where staff will manage the dispatch of trains, communicate with drivers and ensure that services run smoothly.

Separate buildings will house offices and facilities for cleaners and drivers. The remaining area will be released for commercial development and used to create new green spaces and wildlife habitat.

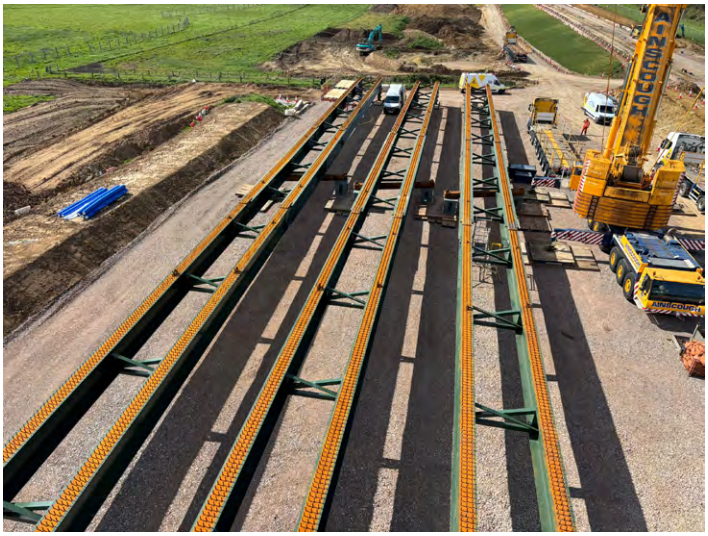
Lord Hendy, Rail Minister, said: "Washwood Heath and the wider HS2 programme will create jobs across the West Midlands - from the construction teams transforming this former industrial site, to the skilled workforce who will operate this state-of-the-art facility for decades to come. Together, they will help deliver faster, more reliable rail journeys across the UK.

"HS2 continues to reach major milestones as we work to get the project back on track and unlock its full potential to drive economic growth, jobs and homes across the country."

Steve Cox, HS2 Area Director, said: "Once complete, HS2 will transform journeys between Britain's two largest cities, freeing up space on the existing West Coast Main Line for more freight and local services.

"The new depot and control centre at Washwood Heath will be at the heart of our day-to-day operation and play a crucial role in the testing and commissioning of the railway.

"Taylor Woodrow and Aureos have a great track record delivering complex infrastructure projects and I look forward to working with them over the coming years."



Hampshire village bypass bridge takes shape

Six steel beams, formed into three pairs, are being lifted into place to form a new road bridge over the River Hamble in Hampshire.

Each pair of 70m-long beams weighs approximately 130t, which is equivalent to 90 average-sized cars. A 700t-capacity crawler crane is being used to install the beams across the river.

The steel bridge is an important element of the 1.8km-long Botley Bypass project, which is being undertaken by M Group, on behalf of Hampshire County Council.

In preparation for the delivery of the steelwork, a total of 130 bridge piles, driven to a depth of 21m, were installed on each side of the river. As the ground conditions are poor and in a flood risk area, more than 1,000 ground stabilisation piles were also installed.

Nusteel Structures is fabricating and supplying the project's steelwork.

Brighton to get women's football stadium

Brighton & Hove Albion has confirmed plans for the UK and Europe's first purpose-built women's football stadium.

The 10,000-capacity ground, to be built adjacent to the existing American Express Stadium, will provide bespoke facilities for Brighton's women's team, its staff and the club's supporters.

The club hopes to have the stadium up and running by the 2030-31 season, subject to planning approvals which will be sought through the neighbouring authorities of Brighton and Hove City Council and Lewes District Council.

Brighton Women's Managing Director Zoe Johnson, said: "The prospect of a bespoke stadium is incredibly exciting.

"It is something we are asked about constantly, and we have worked hard to reach this moment, so it is exciting now to share this news with the wider world."

Brighton & Hove Albion Chief Executive and Deputy Chairman Paul Barber, added: "Our new women's stadium is a powerful statement of our ambitions and will be integral to driving further momentum for the growth of women's and girls' football."

All-electric West End office reaches practical completion

Derwent London has announced that its Network W1 office project, located on the corner of Tottenham Court Road and Howland Street in central London, has reached practical completion.

The all-electric building comprises 12,662m² of fully-let workspace across 10 floors, a double-height reception area, a private terrace and roof garden, as well as two ground-floor retail units.

Designed by Piercy & Company, the scheme is said to deliver an intelligent, mixed-use building that responds to its prominent location by bringing architectural and public realm improvements to the area.

Working on behalf of main contractor Kier, Bourne Steel fabricated, supplied and erected the steelwork.

Throughout the building, steel beams support precast flooring planks for a composite solution. The building's concrete core, the underside of the precast planks, as well as many of

the steel beams and columns, are all exposed in the completed structure, creating modern industrial-looking floorplates.

Makeover at former BBC Elstree studios

BNP Paribas Asset Management has selected McLaren Construction as main contractor for the redevelopment of the former BBC Elstree Centre, which has been renamed Fairbanks Studios in honour of its former owner Hollywood star Douglas Fairbanks Jr.

Approximately half of the 16-acre site will be redeveloped into a 24,700m² campus for TV and the independent film industry, while the remainder was recently revamped by the BBC and is where the corporation films its EastEnders series.

Designed with an art deco frontage, the scheme will more than quadruple stage space to about 9,290m² across five sound stages. New workshops, offices, a café, and improved cycle and parking facilities are included.

A five-storey 'media hub' will add office and amenity space for media-related businesses directly linked to the studios. Specialist developer-operator Oxygen Studios has been appointed, and construction is planned to start later this year.

Office development to span Bond Street Underground Station

British Land has appointed McLaren Construction to deliver a new office scheme at 75 Davies Street, located above the West One Shopping Centre and Bond Street Underground Station on London's Oxford Street.

The £99 million Design and Build contract, combining new build and retrofit, will deliver premium grade commercial space over seven storeys.

The project includes an expanded office reception area, cycle storage and shower facilities, a courtyard on the second and third floors, terraces on other office floors, a new core and rooftop plant rooms.

The new design is said to minimise the embodied carbon of the refurbished building by retaining around 60% of the existing concrete structure and uses a lightweight steel structure from the second floor upwards to add more floors and maximise the net internal area.

Darren Gill, Managing Director for London & South at McLaren Construction, commented: "All the technical challenges of this project – reusing an existing structure, working around commercial tenants and above a busy underground station – are increasingly familiar as Oxford Street reinvents itself and developers strive to provide quality modern space without wholesale demolition."

Work is due to complete in the first quarter of 2029.

NEWS IN BRIEF

Barnshaws Group has completed the specialist heavy section bending for the redevelopment of 5 Chancery Lane, London. The project incorporated a series of curved primary steel elements within the structural frame, requiring precise geometric control and consistent material performance.

Developer **Panattoni** has acquired a 23-acre site at Wakefield Europort for its latest logistics scheme. The 46,450m² speculative warehouse will target BREEAM 'Outstanding' and feature 56 dock doors, eight level access doors and a service yard with a depth of up to 50m.

US-based Landmark Properties has exchanged contracts to partner with Citrus Group and Galliard Homes for the development of Prince Bishops Place in **Durham**. The plans will provide a mixed-use destination that includes commercial offices, student accommodation and retail outlets.

Bouygues UK has celebrated the official groundbreaking at Rosedale College, marking the start of a transformative project set to future-proof the West London college as a leading institution for technology and applied learning. The project involves the demolition of outdated 1960s structures to make way for state-of-the-art teaching facilities and a dedicated performing arts block.

Developer **Capital&Centric** has revealed its final plans for the £100 million transformation of The Springs shopping centre in Buxton, Derbyshire. Working with High Peak Borough Council, the plans include a residential-led neighbourhood with 332 homes, independent bars, shops and cafés, as well as a more accessible route from the railway station.

PRESIDENT'S COLUMN

At the risk of repeating myself.

One of the difficulties of writing a column on a regular basis is varying the subject matter and trying to avoid just repeating previous comments. Unfortunately, we all have our own pet subjects and when you don't get out much, like myself, it is easy to just revert to type.

However, there are serious issues affecting our industry that haven't gone away and do need to be kept in focus. Not least of these is the Government's Steel Strategy and the imminent arrival of new quotas and tariffs on structural steel products. As I have commented previously, I believe that, while the strategy offers much that is good for our industry, there are unintended consequences and as always the devil is in the detail. The strategy as it currently stands is likely to disincentivise the consumption of both British produced and British fabricated steelwork which is clearly contrary to its stated aim.

If we have to focus on one single problem with the strategy as it currently stands then it must be the omission of fabricated steelwork from the tariffs and quotas. Quite simply, this offers a method to avoid the product tariffs and the BCSA forecasts will result in large amounts of fabricated steelwork from overseas arriving in the UK. Already, our members are receiving offers of supply from overseas fabricators; they have the capacity, all they need is a means of access to our marketplace. There needs to be a quick resolution, even an admission that there is a problem with the stated aim to introduce appropriate tariffs on imported fabricated steelwork within the near future would help at present.

Another issue that I may have mentioned before is the actual method of steel production that will be adopted within the UK in the future. Our old BOF steel furnaces need replacing and we now have the opportunity of a lower carbon future for steel production utilising EAF. However, in the interests of self-sufficiency within an increasingly unstable world shouldn't we also retain the option of BOF and the ability to manufacture steel from basic raw materials? Maintaining this capability in the future could also offer the potential to produce more specialist steels and thereby reduce some of our existing reliance on imports.

If it is accepted that there is a need for BOF, then to ensure the viability of any new furnace we must also acknowledge that there is a place for structural steel produced by this route in the UK marketplace. To this end, procurers; including the Government itself, should not be allowed to specify that the steelwork on their project is sourced solely from EAF mills.

On a different note, the BCSA AGM and Annual Dinner will take place this month and I look forward to seeing as many of you as possible at the Royal Armouries in Leeds. This will be our second year on the road and will hopefully prove to be as enjoyable as our visit to Chester last year. For those of you attending and anyone who has been reading these columns on a regular basis, apologies in advance if I happen to repeat anything mentioned previously during my speech.

Chris Durand
BCSA President

Steelwork installation starts on Ferrybridge logistics site

Working on behalf of specialist industrial and logistics developer Mountpark, GMI Construction has started steelwork installation on the former Ferrybridge C Power Station site in West Yorkshire.

Known as Mountpark Ferrybridge, the scheme has secured planning consent for over 150,000m² of industrial, storage and distribution space.

The first unit to be built is a 6,100m² distribution facility pre-let to Warburtons, while a second unit, being built speculatively, will provide 3,700m² of floor space.

Hambleton Steel is fabricating, supplying and erecting the steelwork for the project.

Both buildings are targeting BREEAM 'Outstanding' and EPC A/A+ ratings. Sustainability features will include roof-mounted photovoltaic panels, air source heat pumps and electric vehicle charging infrastructure.

Brett Huxley, Development Director UK and Ireland at Mountpark, said: "Seeing real progress at this stage of construction is a key moment for the project.

"The strong momentum on site reflects the continued demand for high-quality, sustainable logistics space in strategically located markets. With steel now in the ground, our vision is rapidly becoming a reality."

Contractor named for low carbon City office retrofit

Mace Construct has been appointed to deliver the low-carbon retrofit of 60 Queen Victoria Street, a 16,700m² office building in the heart of London's financial district.

Originally built in the 1990s, the new designs will retain the architectural character of the building, while substantially improving its environmental performance and occupier experience.

The cut and carve approach significantly reduces embodied carbon compared to a full demolition and rebuild, while still enabling major structural alterations and enhancements.

The scheme is aiming to achieve BREEAM 'Outstanding' and will use recycled steelwork wherever possible.

Ged Simmons, Managing Director for Private Sector Mace Construct, said: "This ambitious retrofit opportunity reflects our continued commitment to sustainable construction, where innovative thinking and responsible material use shape our approach.

"At 60 Queen Victoria Street, we are working closely with the team to explore solutions that respect the existing structure while enabling a modern, low-carbon workspace."

Northumberland business park to create 2,000 jobs

Arlington Real Estate has received unanimous approval from Northumberland County Council for its 126-acre West Hartford Park development, which could create up to 2,000 jobs.

The landmark employment development in Cramlington will deliver more than one million square feet of high-quality industrial, manufacturing and logistics space.

The plans include flexible industrial units ranging from 3,700m² to 49,400m² available on either freehold or leasehold terms, alongside office accommodation, innovation-led facilities and supporting retail units.

Each building will be tailored to occupier requirements and will benefit from significant power capacity, modern infrastructure and strong transport links.

Deputy Leader of Northumberland County Council and Cabinet Member for the Economy Richard Wearmouth, said: "West Hartford is a premier employment site ideally located to take advantage of the economic growth taking place in South East Northumberland.

"In particular, the site provides the perfect platform for businesses looking to invest in the vicinity."

Dean Cook, Managing Director of Arlington Real Estate, said: "Securing planning permission for West Hartford Park is a hugely significant moment, not just for Arlington Real Estate, but for the wider North East economy.

"This is one of the most important strategic employment sites in the region, and its scale, flexibility and infrastructure mean it is exceptionally well placed to support a wide range of sectors, including advanced manufacturing, logistics, clean energy and technology."

Speculative warehouses planned for Aylesbury

Main contractor Glencar has been appointed by Newlands Developments to deliver five Grade A speculative industrial warehouses in Aylesbury totalling approximately 17,800m².

Known as Link, Aylesbury, the scheme is designed to meet growing demand for high-quality industrial and logistics space in the Buckinghamshire area.

The scheme is targeting BREEAM 'Excellent' and EPC A ratings, reflecting a strong focus on environmental performance, energy efficiency and long-term operational sustainability.

The project also includes associated infrastructure and external works, including service yards, car parking, landscaping and ground improvement works.

Roy Jones, Glencar Managing Director for the South, said: "We're delighted to have been appointed by Newlands to deliver Link, Aylesbury. This is a high-quality industrial development that aligns strongly with our expertise in delivering sustainable, best-in-class logistics and industrial schemes across the South of England.

"The project's strong sustainability credentials demonstrate the shared ambition of the wider team to deliver future-focused industrial space that meets the evolving needs of occupiers. We look forward to commencing works and working collaboratively with Newlands and the professional team to bring the development forward successfully."

James Miller, Newlands Developments' Head of Construction, said: "We're delighted to be working with Glencar again and look forward to delivering this project together as part of our upcoming portfolio of mid-box schemes."

Landmark building for Wembley college campus

Willmott Dixon has been appointed to build a landmark £92 million campus building for the College of North West London, part of the United Colleges Group, at Wembley Park.

Secured via the Southern Construction Framework, the project directly supports United Colleges Group's Estate Strategy and Brent Council's ambition to establish an educational quarter within Wembley, contributing to the wider, long-term regeneration of the area.

The new eight-storey building will provide 14,200m² of internal area, designed around three stacked horizontal volumes. Specialist vocational workshops occupy the lower floors, a central student hub opens onto a landscaped deck with views over Wembley Way, and teaching spaces sit above. A central atrium threads through the full height of the building, connecting every floor and filling the interior with light and openness.

The campus will house a wide range of specialist facilities, from bricklaying and joinery workshops to hairdressing salons and science laboratories, alongside generic teaching spaces, a dedicated Learning Support department, and social areas.

Stephen Davis, CEO & Group Principal of United Colleges Group, added: "This new campus on Olympic Way will place students at the heart of one of London's most iconic locations, providing modern facilities to support future skills in areas including construction, digital and green technologies, as well as a hospitality academy, in line with local and national priorities."

The project, which is targeting a BREEAM 'Excellent' rating, will complete in Spring 2029.

Welcome Hub set for Isle of Wight College

Main contractor Wates Group has started work on a Welcome Hub at the Isle of Wight College in Newport under the Department for Education's £7 billion Schools Construction Framework.

The two-storey Welcome Hub will form a new entrance to the college and will accommodate purpose-built vocational teaching spaces for performing arts, hospitality, and travel and tourism.

Hospitality and the visitor economy are said to be major priorities for the Isle of Wight, and the new building will directly support these sectors. It will also feature industry-standard training kitchens, flexible hybrid learning spaces, and a training restaurant offering dining opportunities for external customers and the wider island community.

Sustainability is central to the design, with green roofs, solar energy panels, rain gardens and sustainable drainage systems integrated throughout the project. Materials from the existing site will be reused wherever possible, reducing waste and environmental impact.

The project is due to be completed in 2028.

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/*

Wed 1 July 2026
Eurocode Load Combinations
Webinar - free to all
Eurocode load combinations can cause some confusion amongst building designers, so this webinar has been prepared to explain which combinations are appropriate, in which circumstances. In addition to the orthodox cases, the presentation will also cover specific provisions for roofs, the partial factors appropriate for crane actions, the combination when assessing brittle fracture, the variable action reduction factors and when they may be used, and serviceability.

Tue 7 July 2026
Torsion
Online course
Verifying members subject to torsion can be daunting, especially if the torsion is in combination with bending moments and axial forces. This course will use numerical examples to demonstrate simple, conservative approaches and also the use of publication P385 to determine member resistance and twist with precision. The course will also cover the design of connections subject to torsion for both open and hollow sections.

Wed 15 July 2026
Steel Frame Stability & Second Order Effects
Webinar
This webinar provides an overview of stability and second-order effects on steel structures in accordance with Eurocode 3. The session discusses the various methods available to the designer for the verification of the stability of both individual members and structural frames. The webinar also presents the changes to frame stability assessment introduced in the second-generation Eurocode BS EN 1993-1-1:2022.

Planning secured for major Surrey data centre

Real estate investor Castleforge and Galaxy Data Centers have secured planning permission for a new 15MW data centre in Redhill, Surrey.

Situated on the existing 3.1-hectare Foxboro Business Park, the companies aim to develop a single two-storey data centre with four data halls.

Mike Adcock, Head of Investments at Castleforge, said: "Securing planning consent for our new development at Redhill is a major milestone in our plans to deliver high-quality, sustainable digital infrastructure to one of the world's most important data centre markets.

"Demand for capacity in and around London continues to outpace supply, and this consent enables us to bring forward the additional power and scale required to serve customers."

Paul Leong, Chief Financial Officer and Partner of Galaxy Data Centers, added: "This planning consent is a pivotal step in realising our long-term vision. We are proud to be delivering a development that combines operational excellence with meaningful sustainability outcomes, and we look forward to bringing the project forward in close collaboration with the local community."

Spades in the ground for Excellent Birmingham warehouse

Caddick Construction and property developer Barberry have started work on a £17 million warehouse development at Quinton Business Park in Birmingham.

The 7,250m² distribution and manufacturing facility, known as Barberry Midbox 78, is targeting BREEAM 'Excellent' and EPC A ratings. The project will incorporate electric vehicle charging infrastructure, rooftop solar panels and extensive landscaped areas.

Barberry Development Director Jonathan Robinson, said: "Breaking ground at Midbox 78 marks an important milestone for this scheme and reflects our confidence in the continued strength of the industrial sector.

"This development has been designed to meet the evolving requirements of modern businesses, combining strong sustainability credentials with the flexibility needed to support long-term operational growth."

Ray O'Sullivan, Regional Managing Director of Caddick Construction Midlands, added: "This latest scheme allows us to further strengthen our partnership with Barberry, while drawing on our experience in delivering high-quality, environmentally sustainable industrial and logistics schemes."

Work starts on Stratford-upon-Avon primary school

Construction work has kicked off on the new Shottery St Andrew's Church of England Primary School in Stratford-upon-Avon.

The £11.3 million scheme will create a two-form entry facility for 420 primary pupils, alongside a 36-place nursery.

Johnny Kyriacou, Warwickshire County Council's Director of Education, said: "Commencement of work on the new school is a positive step for the Shottery community. The school has been carefully planned to meet local need, support future growth and provide high-quality facilities for pupils."

Internally, the new school will feature a dedicated hall and dining space and specialist group and intervention rooms, while externally, there will be a playing field and habitat areas, supported by external landscaping.

Mark Hudgeon, Regional Director of main contractor Speller Metcalfe, added: "We're delighted to see work underway and it's a pleasure to be working with Warwickshire County Council.

"We are building a high-quality school that will meet community needs for years to come."

BCSA

Make sure your Steelwork Contractor is RQSC approved

Image courtesy of William Hare Limited

Specify an approved company from the Register of Qualified Steelwork Contractors for Buildings, to ensure your project meets the Building Safety Act requirements. As of October 3rd 2023 it became mandatory in the NSSS 7th edition, 1st Revision that all Steelwork Contractors are RQSC approved.

Tel: 020 7839 8566
Email: postroom@bcsa.org.uk
Web: www.bcsa.org.uk/buildings-directory

RQSC

The Register of Qualified Steelwork Contractor
Buildings

FACT FILE
Peterborough Community Diagnostic Centre
Main client: **North West Anglia NHS Foundation Trust**
Architect: **Pinnegar Hayward Design**
Main contractor: **Tilbury Douglas**
Structural engineer: **Adept Consulting**
Steelwork contractor: **Shipley Structures**
Steel tonnage: **95t**

Healthcare trusts in steel

Having changed its design to a traditional steel-framed solution, a healthcare facility in Peterborough is making quick and efficient progress.

Located in Peterborough city centre, a new Community Diagnostic Centre (CDC), is quickly taking shape with the aid of steel construction.

The state-of-the-art steel-framed healthcare facility will be run by North West Anglia NHS Foundation Trust (who also run the nearby Peterborough City Hospital) and will offer patients more choice on their place of treatment, and help to reduce waiting times for important diagnostic tests.

The three-storey CDC will offer CT, MRI, DEXA, X-ray, Ultrasound & Fibroscan, as well as Cardiology and Respiratory diagnostic services.

"The CDC is of huge benefit to our local communities," says Hannah Coffey, the Trust's Chief Executive. "We know that waiting times for tests to help diagnose a condition are longer than we want them to be, and this can create additional anguish as well as a delay in treatment. The CDC will help us reduce waiting times and give patients a better experience, ensuring they receive results quicker. We are very excited to see this project evolve."

Construction work started in 2025, following the demolition of the site's previous building (an NHS City Health Clinic). Main contractor Tilbury Douglas, initially undertook an extensive groundworks programme to prepare the plot for the project's steel frame.

"Because of the poor ground conditions, we remediated the site to a depth of 2.5m, before installing a ground beam/raft foundation solution on top of the engineered fill," explains Tilbury Douglas Project Manager David Ross.

Originally, the project was going to be built with a modular cold-rolled steel design, but this was later changed by the client and the design team to a traditional beam and column steel frame.

"This has proven to be a better option, as it has allowed us to efficiently form the required internal spans," adds Mr Ross.

The steelwork contractor for the scheme was locally-based Shipley Structures, who initially installed the building's two precast lift shafts. Positioned at either end of the CDC, the shafts provide no stability to the steelwork, but as the frame wraps around them, installing the cores first, made the steelwork programme quicker and more efficient.

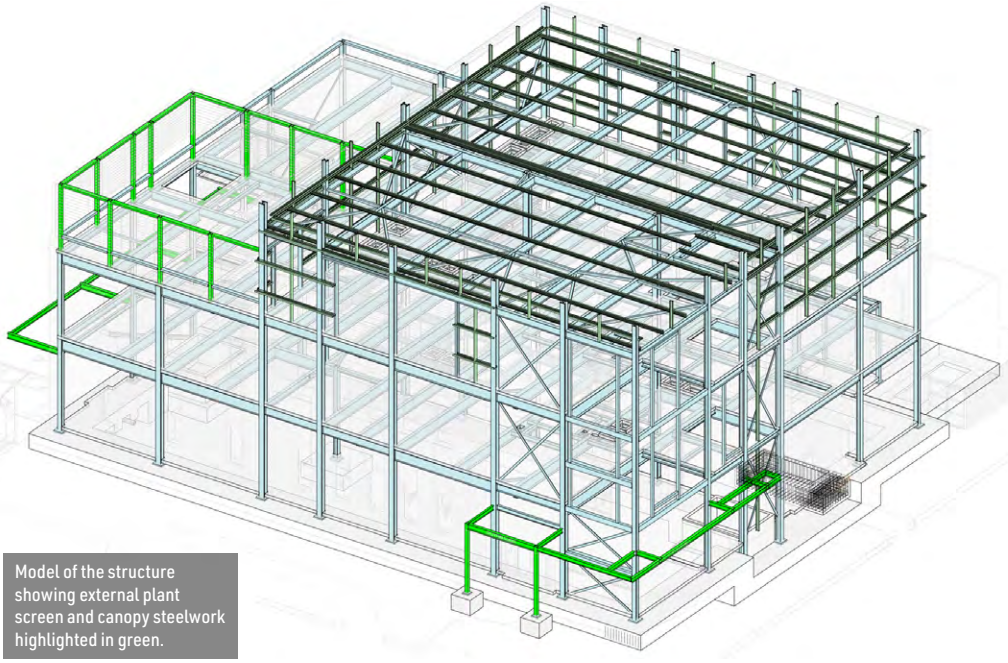
Arranged around a regular column grid pattern, the majority of the building's steel frame features two 11m-wide clear span areas, supported by perimeter columns and only six centrally-positioned internal columns, thereby creating plenty of open-plan floor space.

The steel frame's stability is derived from strategically-positioned perimeter cross bracing (located in areas where there are no windows or doors) as well as the diaphragm action from the compositely formed floors.

A composite flooring solution consisting of steel beams (the heaviest weighing 1.65t) supporting metal decking and a concrete topping has been used for the CDC's first and second floors.

This method has also proven to be the most efficient solution for the project, as the metal

The Peterborough CDC will help to reduce waiting times for patients in the city.



Model of the structure showing external plant screen and canopy steelwork highlighted in green.

Visualisation of the completed CDC.

decking packs were lifted into their respective areas by the same crane used for the main steel erection before being installed by the flooring subcontractor.

A 75mm-thick concrete topping has been used on both floors, as this thickness was deemed suitable to alleviate noise and vibration from the air-handling and plant equipment that will be located on the uppermost level.

Approximately two-thirds of the CDC's second floor will accommodate a fully-enclosed plant room, which sits adjacent to an outdoor plant deck, which is surrounded by a steel-framed screen.

The different uses of the top floor, has required a series of transfer beams, positioned at the underside of the second floor, that support the set-backs designed to accommodate the plant areas.

Sat on a concrete slab, the ground floor of the CDC will house all of the scanning and clinical areas, alongside the main entrance and waiting room. Above this, the first floor will accommodate the facility's admin offices and consultation rooms.

Steel deliveries to the town centre site could have been challenging, as it is surrounded by residential properties and businesses. However, to help negotiate the narrow city centre streets, some of the steel columns were spliced, for easier transportation. Once on site, all of the steelwork was installed using a single mobile crane.

Summing up, Dr Gary Howsam, Chief Clinical Improvement Officer at NHS Cambridgeshire & Peterborough, said: "We are delighted that work is progressing on the new Community Diagnostic Centre in Peterborough. Once open, the centre will provide local people with the opportunity to access much-needed diagnostic tests closer to home, giving them more choice about where and when they have their tests."

Following the fit-out, which will be carried out by Tilbury Douglas, the completed CDC is due to be handed over to the client in October. ■

"(Steel) has proven to be a better option, as it has allowed us to efficiently form the required internal spans."

A steel-framed option has proven to be a quicker form of construction.

Lighting up the Games

One cauldron was positioned within Milan's Arco della Pace.

The twin hosts of the Milano Cortina 2026 Winter and Paralympic Games each had their own intricately engineered and expanding cauldrons to accommodate the all-important Olympic flames.

Breaking with tradition, the Milano Cortina 2026 Winter and Paralympic Games were the first in Olympic history to be hosted by two cities.

The fourth occasion that Italy has held an Olympic Games (one summer and three winter games), the concept of co-hosts was promoted as a sustainable and low-cost model. Easing financial burdens and the need to construct new venues, existing infrastructure (including venues used when Cortina held the 1956 winter games) was used across Northern Italy.

A second cauldron was located at Piazza Dibona in Cortina d'Ampezzo.

With two host cities, there was a requirement for two cauldrons – so each could have a vessel to support and accommodate the all-important Olympic flames. Every Games, summer and winter, since 1928 has had a ceremonial cauldron, as the lighting of the Olympic flame symbolises the opening of the competition and the continuity between the ancient and modern games. Conversely, the extinguishing of the flame forms a major element of the Games' closing ceremony.

This year, two identical cauldrons were located within Milano's landmark Arco della Pace and at Piazza Dibona in Cortina d'Ampezzo.

According to the International Olympic Committee (IOC), the cauldrons are a powerful symbol of harmony between the two host cities and were created by Marco Balich in collaboration with designers Lida Castelli and Paolo Fantin.

Having previously been involved with numerous high-profile sporting events, including all of the Olympic Games since Athens 2004, Yorkshire-based Stage One Creative Services were contracted to design, fabricate, supply and install the cauldrons.

Time, or the lack of it, is the norm when it comes to large global events, as Stage One's Engineering Director, Nic Kidd, explains: "We had five months to design, manufacture and complete this project.

"To make the most of our short timeframe, we

FACT FILE
Milano Cortina 2026 Winter Olympic and Paralympic cauldrons
Main client: **Balich Wonder Studio**
Structural engineer & steelwork contractor: **Stage One Creative Services**
Steel tonnage: **15t**

Milano's cauldron's installation had to be undertaken without the use of a crane, due to the proximity of the arch.

built a concept prototype concurrently with main design, so that we could learn what worked and what didn't. We also designed and manufactured simultaneously with our UK-based LED subcontractor and Australia-based burner assembly subcontractor."

Surrounding the flames, which were enclosed in a glass and metal burner container, the two identical cauldrons are spherical in shape and feature a series of interlacing aluminium struts, offering a nod to the famous geometric designs or knots, created by Leonardo da Vinci.

Made of aeronautical aluminium, among the strongest and lightest materials, the cauldrons are dynamic structures that generate an opening and closing movement, said to bear witness to the continuity of time and the natural alternation between day and night.

Because they open and close, the cauldrons feature variable geometry. They have a diameter that expands from 3.1m when closed to 4.5m when open. Their complex mechanical systems both integrate 1,440 components, mounted on pins and bearings.

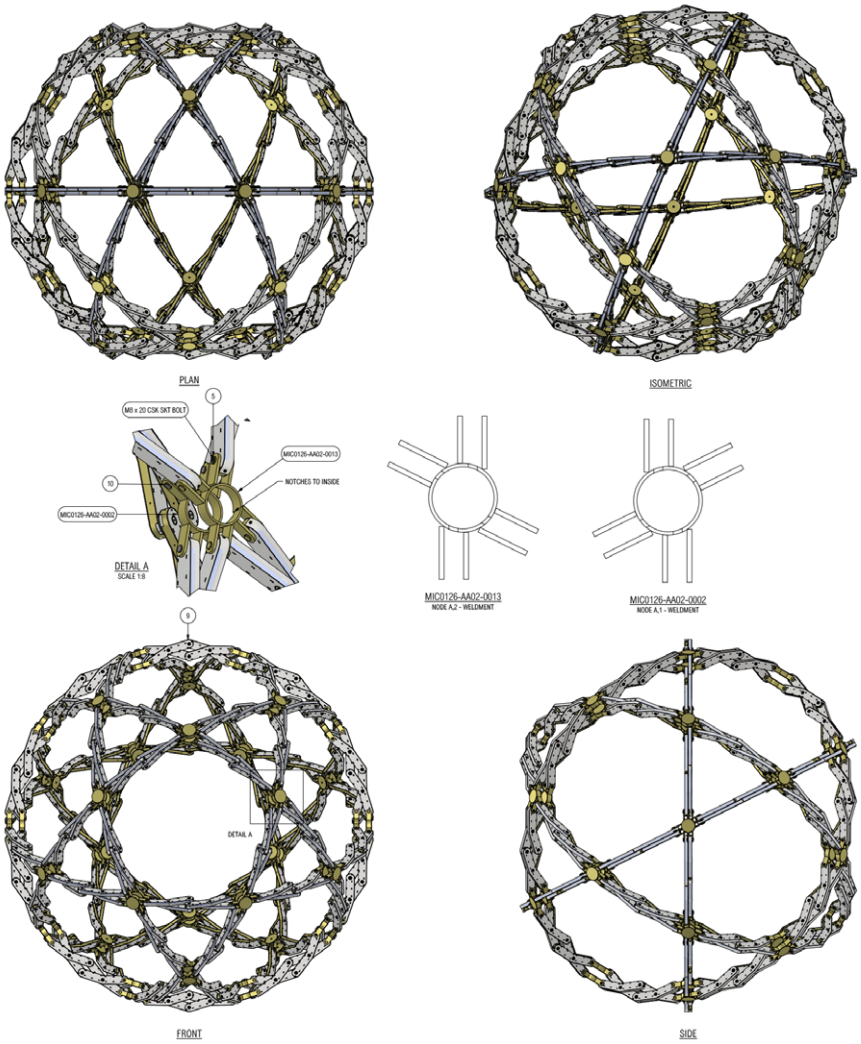
Each cauldron sphere weighs 1,200kg and incorporates more than 50 fixed nodes and 60 opening and closing scissor units. In turn, each scissor includes four struts, meaning each sphere has 240 struts that also support LED lighting.

The symmetrical geometry allows each of the cauldron's support legs to pass through nodal points in the structure.

"Various means of support were considered, including suspension, however the Milano cauldron was not allowed to touch the arch stonework in any way, so it had to be self-supporting," says Mr Kidd.

"It was decided to use four angular stainless steel legs, supported by a steel main frame and base, with the latter hidden under a timber plinth."

In Cortina, the cauldron was much lower to the ground, so it was supported on a steel tripod, which was also supported on a steel main frame, also positioned beneath a plinth. The frames and the associated drive mechanisms also acted as ballast for the two cauldrons.



"To make the most of our short timeframe, we built a concept prototype concurrently with main design, so that we could learn what worked and what didn't. We also designed and manufactured simultaneously with our UK-based LED subcontractor and Australia-based burner assembly subcontractor."

Keeping the design as sleek as possible, the stainless steel legs accommodate slots to hide the power and data cabling as well as the mechanical drive mechanisms. In Milano, the four tubular legs consist of two at 5.2m-high and two at 3.9m-high members, while in Cortina the three legs are all 4.5m-high.

At Stage One's Tockwith facility, the cauldrons were each test built, before being dismantled and transported to Italy for their final re-assembly.

For ease of transportation, the cauldrons were split into sub-assemblies comprising four struts built into a scissor. Each scissor came complete with pre-assembled LED power and data cabling.

Meanwhile, the steel frames and bases were shipped in the largest pre-assembled sections possible and then bolted together on site. Each cauldron required two trucks, plus a third vehicle for drive mechanisms and site kit.

Once onsite in Italy, the two cauldron installations required the same list of procedures, although the Cortina job was said to be slightly easier because it was built closer to the ground and only required a single cherry-picker.

Installing the cauldron within Milano's Arco della Pace offered up a set of unique challenges. Cranes could not be used as there was insufficient headroom, so each assembly had to be manoeuvred into place and installed using a combination of cherry-pickers and telehandlers.

For both cauldrons, the erection of the base steelwork was the first part of the installation sequence. This was followed by the assembly of the legs and the positioning of the burner, which had to be installed before the surrounding sphere was completed.

Requiring numerous dimensional and positional checks, the leg nodes were installed, followed by the cauldron scissor assemblies and struts. Simultaneously, all of the mechanical drive mechanisms and LED power and data cabling needed to be installed and checked. To complete the tasks, a final movement test was then completed on each sphere.

Both cauldrons lit up their respective locations for the duration of the Winter Games (6-22 February) before being extinguished during the games' closing ceremony.

They were relit for the Paralympics (6-15 March) and definitively put out at the conclusion of the Paralympic Closing Ceremony. ■

FACT FILE
Hengrove Bus Depot, Bristol
Main client: **First Bus**
Main contractor: **NG Bailey**
Steelwork contractor: **Four-Tees Engineers**
Steel tonnage: **400t**

Buses go electric

Five 70m-long steel gantries, supporting the all-important electric power distribution, are the centrepiece for a major sustainability-driven revamp at a Bristol bus depot.

One of the most advanced electric bus hubs outside of the M25, has been created in Bristol, following a £44 million revamp.

Aiming to make public transportation more sustainable, the investment at Hengrove (which includes £6.6 million of government funding secured by the West of England Mayoral Combined Authority through the government's Zero Emission Bus Regional Areas (ZEBRA) scheme) will benefit passengers, whose numbers have increased in the region by more than five million in the past couple of years.

Electric buses provide benefits in terms of air quality and reduced carbon emissions, along with a better experience for both passengers and drivers.

With these benefits in mind, the First Bus Hengrove depot in the south of Bristol, has the capacity to operate 74 new electric buses following the installation of five overhead gantries that support the required power distribution plant, cabling and materials to charge the new fleet.

The new electric buses are now transporting more than 230,000 passengers per week on seven key services across the city.

With each bus saving about 75 tonnes of CO_2 each year – the equivalent to taking 54 cars off the road – the completion of the depot's revamp marked another major milestone in the company's commitment towards a zero emissions fleet by 2035.

Working on behalf of main contractor NG Bailey, Four-Tees Engineers designed, fabricated and installed the five gantries, which required 400t of steelwork.

The steelwork includes supporting column towers, positioned at either end of the structures as well as at the midway point. The towers consist of four columns, braced together to form a rigid supporting structure.

For ease of transportation and erection, each of the five identical gantries was delivered to site in four pre-assembled 17.5m-long sections. The sections included the metal mesh flooring and some of the power equipment, which limited the amount of working at height that would need to be undertaken later in the project.

Alex Chilvers, Director for NG Bailey's Electric Vehicle Infrastructure team, says: "The completion of the work at Hengrove marked a significant milestone in First Bus's journey towards a zero-emission fleet and we are pleased to have played a pivotal role in delivering the infrastructure that makes this possible.

"We also worked hard to manage logistics and safety on site, ensuring all the work was completed while the site remained fully operational.

"If the UK is to meet its ambitious goals for decarbonisation, the adoption of EVs across public transportation is vital. Marking one of the largest EV gantry installations in the UK to date, this project will make a real difference to supporting not only First Bus's wider sustainability goals, but the electrification of transport across the UK."

The completed gantries allow cables to be lowered automatically to the vehicles below, minimising any potential loss of parking at the bus depot.

Hengrove Bus Depot is now said to be one of the largest EV gantry installations in the UK, and includes 26 Heliox Flex 180kW chargers with 77 reels and six Heliox Rapid 36kW all in one chargers, both of which deliver consistent power and

The overhead gantries minimise any potential loss of parking at the depot.


The gantries are supported by braced column towers.


The gantries were erected in pre-assembled sections.

maximum uptime, while reducing energy wastage.

Doug Claringbold, First Bus' Regional Director for South and West, said: "Yet again we're hitting more milestones in our electrification of our West of England fleet.

"Not only are we heading towards our Hengrove depot being 100% electric with the arrival of more buses this year, but we are also demonstrating a real commitment to going even further in our efforts to be more sustainable.

"Our company is committed to operating a fully electric fleet by 2035, with 25% of our fleet nationally now electric. By the end of this year almost half the West of England's buses will be electric with about 750,000 of our passengers each week travelling on electric buses making bus travel greener, smoother and quieter for our customers, and contributing to better air quality for our towns and cities."

Helen Godwin, the Mayor of the West of England, adds: "I promised to work with government to get our region moving. The first of over 250 brand-new, comfortable, electric buses for our region are a great start in a new chapter for the West of England, as we work with local councils and bus operators to deliver the best for the West.

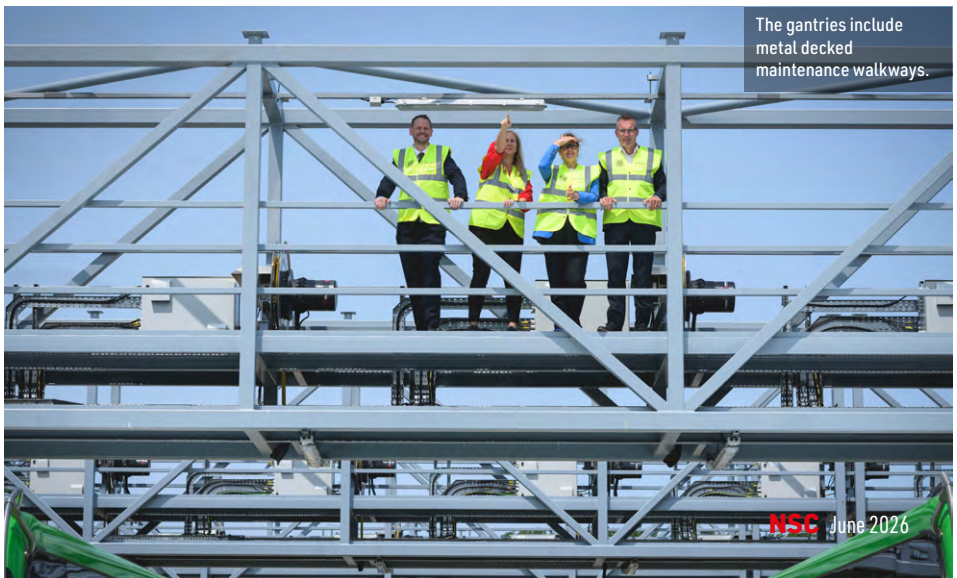
"These new zero-emission buses are a total game-changer for bus passengers across the West Country, with phone chargers at every seat. I was glad to welcome the Minister to our region to see them today, and discuss with him how we can further improve bus services in our region including through the new powers promised by the Bus Services Bill."

"Marking one of the largest EV gantry installations in the UK to date, this project will make a real difference to supporting not only First Bus's wider sustainability goals, but the electrification of transport across the UK."

Summing up, Local Transport Minister Simon Lightwood says: "We've brought cleaner, quieter, and smoother bus journeys to Bristol and beyond - backed by £38 million in government funding and even more from private investment.

"Better buses help deliver our Plan for Change: creating green jobs, boosting the local economy, and building a more sustainable future.

"With our upcoming Bus Services Bill, passengers can expect more reliable services, stronger local control, and protection for vital routes." ■


The gantries include metal decked maintenance walkways.

Steel frames for logistics expansion

Strategically located within the UK's logistics heartland, the Daventry International Rail Freight Terminal is continuing to expand with new steel-framed warehouses.

Offering plenty of internal space, the larger DC11 warehouse features four 34m-wide spans.

Encompassing parts of Leicestershire, Northamptonshire and Warwickshire, the area dubbed the 'Golden Triangle' has been the UK's most strategic logistics location for decades.

This central East Midlands area, close to the M1 and M6 motorways, allows goods to be transported to anywhere in the UK within a matter of hours, while the nearby A14 also links the Triangle with Felixstowe, the UK's largest and busiest container port.

One of the Triangle's premier logistics parks is the Daventry International Rail Freight Terminal (DIRFT), which also benefits from three onsite rail freight terminals.

Originally developed in the 1990s, the site is one of Prologis UK's flagship developments and home to a number of well-known companies, with DHL, Royal Mail and Tesco all having facilities on the site.

In order to satisfy continuing demand for logistics and distribution space, construction and infrastructure work are currently ongoing for the site's phase three, which will initially deliver three build-to-suit projects, completing the northern gateway to DIRFT.

A sequential erection programme saw the larger unit erected first.

FACT FILE
Daventry International Rail Freight Terminal (DIRFT) warehouses
Main client: **Prologis UK**
Architect: **Stephen George + Partners**
Main contractor: **Benniman Construction**
Structural engineer: **Tetra Tech**
Steelwork contractor: **Caunton Engineering**
Steel tonnage: **1,853t**

Two of these units (known as DC11 and DC107) are being built by main contractor Benniman Construction, with Caunton Engineering designing, fabricating, supplying and erecting the steelwork.

Designed to industry-leading sustainability standards, both buildings are targeting EPC A+ and BREEAM 'Outstanding' ratings, as well as net zero in construction.

DC11, the larger of the two units, is being built as a chilled distribution centre for XPO Logistics to service Arla Foods, while DC107 is a speculative development.

Arla Foods is the UK's largest dairy cooperative, owning brands such as Lurpak, Anchor and Cravendale.

Fran Ball, Senior Vice President UK Supply Chain for Arla Foods UK, says: "Consolidating our chilled pallet operations into a single, advanced facility in Northamptonshire is a strategic leap forward for Arla.

The DC107 warehouse features a two-storey office block connected to one of the building's main elevations.

"By partnering with XPO Logistics and Prologis, we are improving the resilience of a critical part of our supply chain and making meaningful progress on reducing waste and road miles."

Phil Oakley, Senior Vice President, Prologis UK, adds: "Partnerships and developments like this play an important role in creating long term economic value for West Northamptonshire, helping to attract investment and underpin jobs across the region.

"At Prologis DIRFT, we've built a community with the capacity and skills to support high-performing logistics operations like this one."

First to be erected, DC11 required 1,355t of steelwork to construct its 185m-long × 136m-wide and 24m-high warehouse frame.

Internally, the warehouse features four 34m-wide spans, which create the all-important open-plan space. The spans are formed with 17m-long rafters, which are spliced at the structure's apex.

Higher than the many of the surrounding warehouse structures, in order to accommodate ▸18

Speculative design

Requiring just under 500t of steelwork, the smaller DC107 warehouse measures 136.9m-long x 72m-wide and is 18.3m-tall.

The building features two 36m-wide spans, consisting of 18m-long rafters connected at the structure's apex. The spans are supported by perimeter columns and internal valley columns, which are also arranged (like DC11) in a hit-and-miss configuration.

The completed DC107 will include a two-storey office block, topped by a plant deck, as well as high-quality, resilient digital infrastructure to support robust and scalable connectivity.

Tariq Khan, Studio Director at Stephen George + Partners, says: "This warehouse unit represents contemporary logistics design, where future-proofing functionality, architectural quality and customer experience work hand-in-hand.

"Our approach focused on creating a building that not only performs efficiently, but also enhances everyday wellbeing, with features helping to elevate the overall working environment."

Creating some uniformity between the two warehouses, both have similar cladding finishes and cantilevering roofs at the gable ends, which are supported by triangular steel buttresses. DC107 will also have a glazed south facing external balcony.

Summing up, James Hemstock, Vice President Capital Deployment at Prologis UK, says: "With a clear focus on developing logistics real estate in the most desirable locations, we aim to meet growing demands and changing industry needs. We anticipate this new development will generate a high level of interest." ■


Two of DC11's elevations feature architectural canopies.


Windows are inset within steel-framed 'eyes'.


The project features a stand-alone steel-framed gatehouse.

▸17 the produce chillers, the structure's columns had to be spliced so they could be transported to site.

The internal valley columns (which are arranged in a hit-and-miss configuration that allows more column-free space) are plate girders. They were brought to site in two pieces – one main 18m-high section and top piece measuring 6m. Weighing up to 5.5t each, these columns represented the heaviest individual steel pieces on the job.

Likewise, the perimeter columns, which are 610mm × 229mm × 125kg/m UB sections, were also spliced. They consist of a main 12.2m-tall section and a top piece measuring 11.8m (creating a series of 24m-high columns).

The warehouse also includes a two-storey transport hub and an office block. The latter is positioned along one of the warehouse gable ends and sits above a row of docks (in total there are 48 docks within DC11).

The office first-floor and the second-floor, which is a plant deck, are both compositely formed with steel beams supporting metal decking and a concrete topping.

Using up to four cranes (ranging in size from 90t to 120t-capacity), DC11 was erected in six weeks. ■

Portal frame design

Dr Yigit Ozcelik of the SCI discusses how axial forces affect the stability of portal frames and why they must be carefully considered in design.

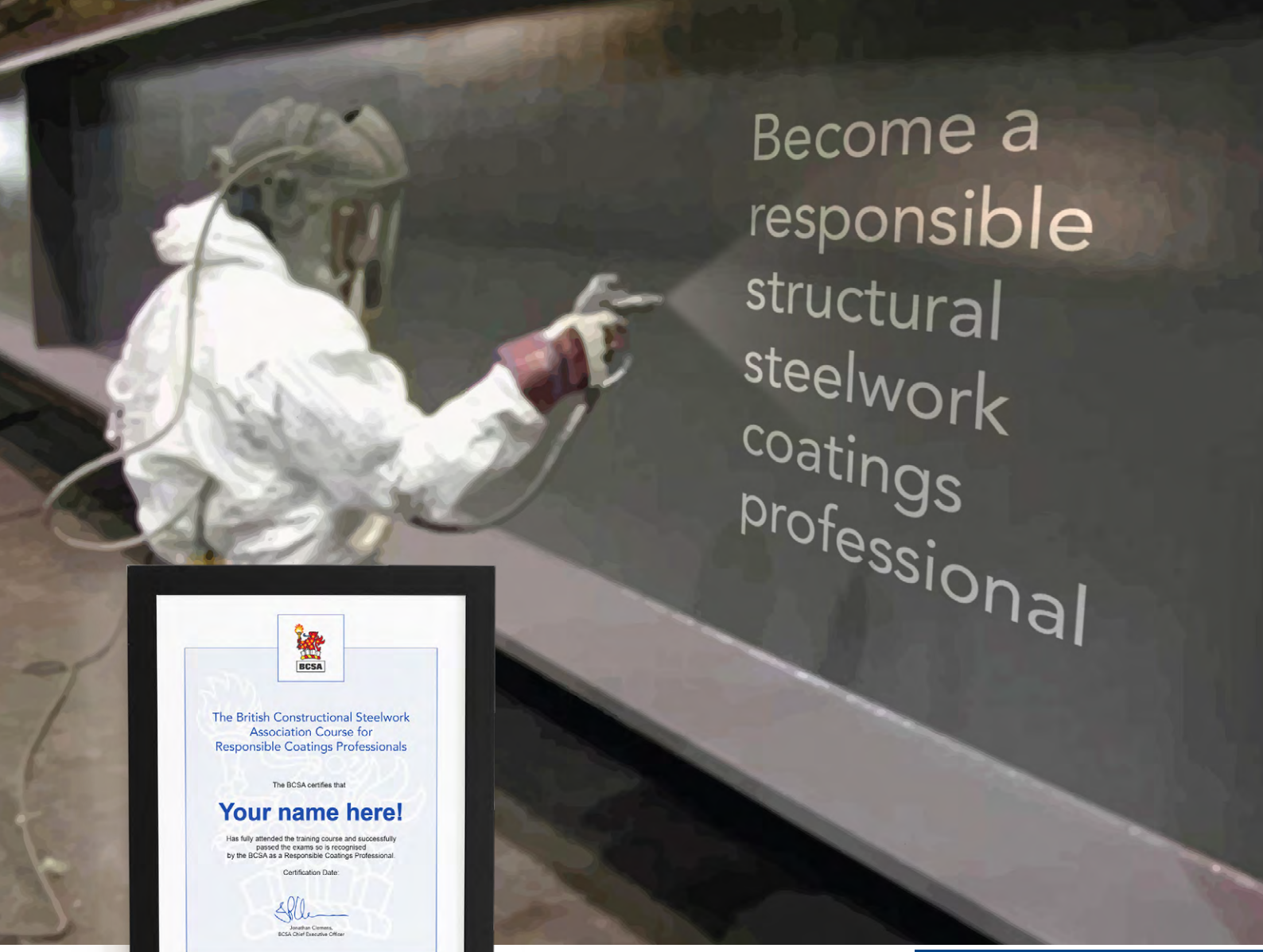
At the Daventry International Rail Freight Terminal (DIRFT), the first warehouse within Prologis UK's development uses a series of long-span steel portal frames to provide four 34m-long spans, enclosing a 24m-high logistics space. Their ability to achieve long spans using relatively lightweight steelwork explains why portal frames remain the most widely used structural system for UK industrial buildings. Their relatively slender form means that they can be particularly sensitive to the influence of axial loads on global frame stability.

Portal frames are inherently sensitive to second-order effects because the frame relies on moment-frame action rather than bracing for stability. Under gravity loading, the rafters develop axial compression through arching action, while the frame simultaneously deflects laterally. As deflections increase, additional moments are generated through P–Δ effects, reducing the apparent stiffness of the frame and bringing it closer to instability than a first-order analysis predicts.

BS EN 1993-1-1 assesses the significance of second-order effects through the elastic critical load factor, α_{cr}. The simplified second-order analysis approach, often referred to as the amplified first-order analysis, uses α_{cr} to amplify the results of a first-order elastic analysis to account for global sway effects. On a related note, while the amplification factor $\alpha_{cr} / (\alpha_{cr} - 1)$ is typically applied to horizontal actions, SCI recommends that it be applied to all actions in portal frame design. The method is only valid when axial compression in the rafters is not significant ($N_{Ed}/N_{cr} \leq 0.09$), a condition frequently not met in portal frames. As a result, the amplified first-order analysis is often inapplicable in its standard form for orthodox portal frame design.

SCI therefore introduces a modified stability parameter, $\alpha_{cr,est}$, to account for the reduction in apparent frame stiffness due to axial compression in the rafters. This is obtained by applying a reduction factor of $0.8(1 - N_{Ed}/N_{cr})$ to α_{cr}, where N_{cr} is the elastic critical buckling load of the rafter pair over the complete span. The approach provides a more accurate representation of second-order effects when axial forces are significant.

In brief, the axial load in the rafters of a portal frame reduces its apparent stiffness, leading to amplified second-order effects. To account for this reduction, the modified stability parameter $\alpha_{cr,est}$ must be used in place of α_{cr} when amplified first-order analysis is adopted. ■



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Steel provides enterprising solution

The regeneration of Ravenscraig is continuing at pace with the construction of much-needed commercial and industrial space.

Once the site of Western Europe's largest hot strip steel mill, Ravenscraig is being transformed into a new community, with thousands of homes, retail and leisure facilities, alongside business and industrial space.

Located on the outskirts of Motherwell, North Lanarkshire, the site covers an area of 4.5km² and has been described as one of the largest regeneration projects in Europe.

Where thousands of people once worked in steel production (Ravenscraig Steelworks closed in 1992), it is fitting that the material is again playing a pivotal role in the site's rebirth.

Two of the first jobs to be completed, were both steel-framed structures; New Lanarkshire College (see *NSC* April 2008) and the Ravenscraig Regional Sports Facility (see *NSC* November 2009).

Now another steel-framed project is underway. Known as the Ravenscraig Enterprise Park, the six-acre site will eventually be transformed into 5,800m² of mixed-use commercial space. Designed to meet modern occupier requirements, the development will offer flexible, energy-efficient space capable of accommodating business, industrial and storage uses.

Phase 2 will involve the construction of a further two warehouse units.

The first phase, which is currently underway, consists of two speculatively-built steel-framed structures that will on completion offer 2,713m² of space within six separate multi-purpose units. A second phase, consisting of two larger warehouses is expected to start later this year.

North Lanarkshire Council successfully bid for £4.4 million for the first phase, comprising £3.05m from Glasgow City Region City Deal and £1.39m from the Scottish Government's Vacant and Derelict Land Fund.

The investment, which aims to address a lack of available modern, high-quality commercial and industrial premises, is being delivered through Fusion Assets, the council's property development and regeneration company.

Russell Wilkie, Director of the Ravenscraig regeneration project, says: "It's excellent news that work is beginning on site adding to the momentum of the Ravenscraig regeneration. These new facilities will bring new jobs and investment to the area, helping to create a sustainable, self-sufficient community and a positive future for local people."

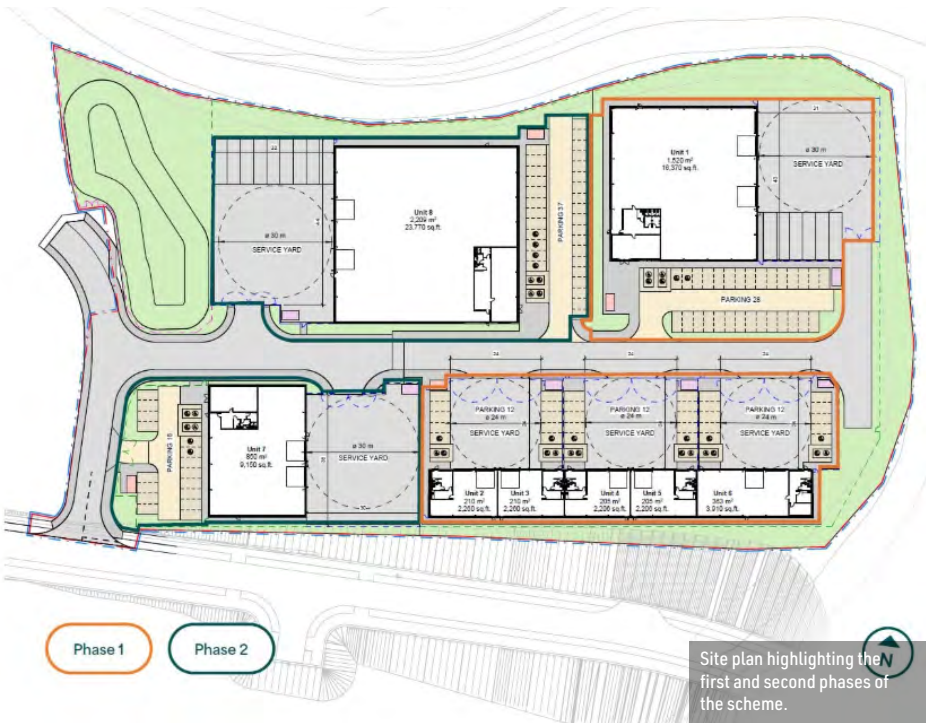
Councillor Alex McVey, Convener of Enterprise, adds: "The project funding is a major boost for North Lanarkshire and will help us unlock the potential of the site, creating high-quality space for businesses to grow and thrive.

"There is an urgent demand for modern, high-quality commercial and industrial spaces for existing and new businesses across the Glasgow City Region. The project will help attract more companies to the area, bringing vacant and derelict sites back into use

FACT FILE
Ravenscraig Enterprise Park
Main client: **Fusion Assets**
Architect: **Hypostyle**
Main contractor: **Luddon Construction**
Structural engineer: **Fairhurst**
Steelwork contractor: **Hescott Engineering**
Steel tonnage: **200t**

A ground improvement programme was undertaken prior to the steel erection beginning.

A single mobile crane was used for the steelwork installation.



Site plan highlighting the first and second phases of the scheme.

creating jobs and supporting the local economy."

The arrival of new space at Ravenscraig is said to have come at a pivotal time for the industrial market across the wider Central Belt, where vacancy rates remain low and the supply of modern, high quality accommodation is constrained, leaving demand continuing to outpace availability.

Ravenscraig has benefited from significant public and private investment as part of its long-term regeneration, and this latest phase represents a further step in unlocking its full commercial potential. Strategically positioned within the Glasgow City Region, the site offers convenient connectivity to both the M74 and M8 motorways, providing direct access to key markets, labour pools and national transport networks.

Main contractor Luddon Construction, started work on the first phase earlier this year, preparing the brownfield plot for the steel erection programme to commence. As well as constructing access routes, the two buildings' foundations, which comprise of a vibro stone column solution, were also installed.

According to the project's design team, a steel-framed option was the best method for this job as it easily and efficiently provided the required clear spans and speed of construction. Hescott Engineering has fabricated, supplied and erected the two steel-framed buildings.

Using a single mobile crane, the smaller of the two portal-framed buildings was erected first. Accommodating units two to six, the mono-pitched structure is 101m-long, has an 11.9m-wide clear internal span and reaches a maximum height of 7.66m (5.5m on the opposite side of the five-degree pitch).

The supporting perimeter columns are set at 5.9m centres, helping to create four industrial units measuring three bays wide and a slightly larger Unit 6, which is five bays wide.

A series of non-structural internal walls divide the building into its five parts.

Each unit has an internal welfare and office zone, with its own dedicated door, as well as a large goods-in/goods-out shutter door, with access to a service yard.

Second to be erected, unit one is a single warehouse building measuring 47m-long and featuring a six-degree duo-pitched roof that reaches a maximum height of 8m (7m to the underside of haunch).

Creating the all-important column-free space that warehouse projects require, the structure comprises a single internal span, which is formed with a pair of 18.96m-long rafters.

The rafters were spliced together before being lifted into place as complete 37.92m-long sections.

Offering some flexibility to the future tenant, unit one's internal office space has been designed with a capping slab, which could allow the area to be enlarged with the addition of a mezzanine deck.

Summing up, Murray Collins, Managing Director of Fusion Assets, says: "We are grateful to North Lanarkshire Council for their continued support and look forward to delivering much needed modern energy efficient commercial facilities to the local area, bringing with it new jobs and investment."

Work on phase one is expected to be complete by November. ■

Fire boundary conditions and the distribution of unprotected areas

The so-called "fire boundary condition" is an important consideration for designers of single-storey buildings. Max Cooper of the SCI offers some thoughts on the use of Approved Document B Table 13.1 and its suitability for use with large buildings.

Where a building is situated close to a site boundary, its external walls must provide fire resistance to limit the risk of fire spreading to neighbouring property. Approved Document B sets out simplified rules for determining the allowable proportion of wall which is not required to provide fire resistance.

There is scope for confusion in the Approved Document B guidance regarding the allowable percentage of "unprotected areas", and in particular the relationship between the simplified table in Approved Document B (Table 13.1) and the guidance it was preceded by, and broadly derived from, BRE Report 187.

Background

The Building Regulations for England and Wales state that a building must be constructed so that "its stability will be maintained for a reasonable period" in the event of fire, and external walls must offer "adequate resistance to the spread of fire" between buildings. It is the second of these requirements regarding the spread of fire, that concerns this article. Though not the only route, compliance with Approved Document B is the most common way to demonstrate compliance with the Building Regulations.

Radiation is the principal mechanism of the spread of fire between buildings, and the external walls of a building serve as a barrier to this radiation. Approved Document B requires that walls close to a site boundary have fire resistance (defined as stability, integrity and insulation in the presence of a fire). Parts of the wall that do not meet this standard, such as windows, doors, or non-fire-rated cladding, are termed "unprotected areas" and are also commonly referred to as "openings".

Determining the suitable boundary distance

The peak radiation intensity emitted during a fire depends on the size and distribution of unprotected areas across a façade. The larger an unprotected area, the greater the radiation intensity, thus requiring a large distance to the site boundary to ensure fire does not spread. As a general approach, Approved Document B refers to BRE Report 187, External fire spread: building separation and boundary distances, which provides a physical model and associated calculation method for determining acceptable boundary distances based on these parameters. Each unprotected area may be considered individually, or as a collection across a building façade within an "enclosing rectangle", for which an approach based on the average unprotected percentage is permitted.

A building with internal fire compartments is treated by assessing each compartment independently, essentially as separate buildings. This may benefit the designer by reducing the width and height of the enclosing rectangle.

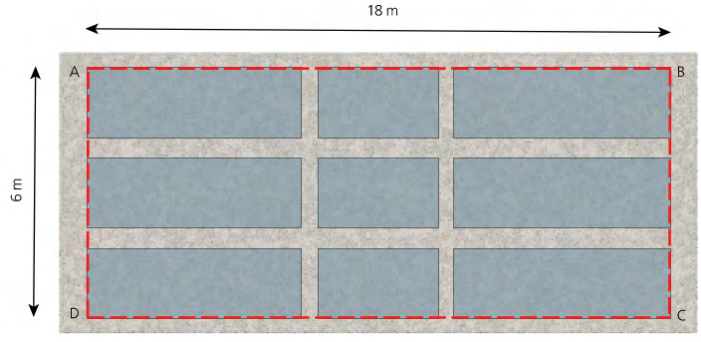


Figure 1: Example of unprotected areas (blue) within an enclosing rectangle (red dashed line) (from BRE 187)

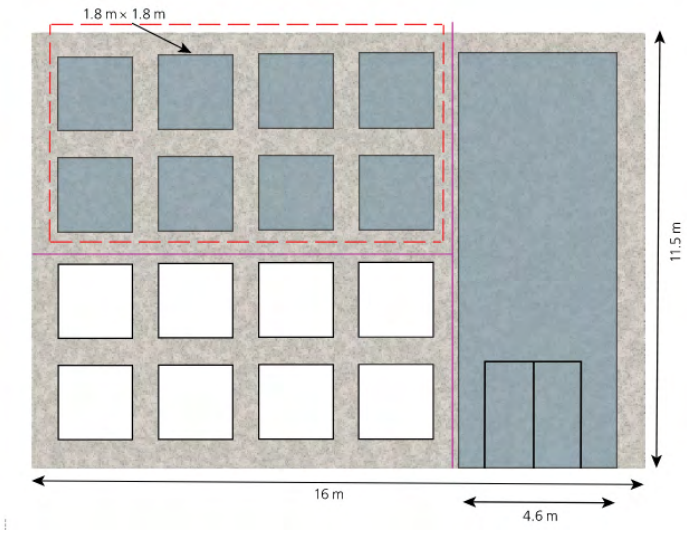


Figure 2: Example of building with internal compartment (from BRE 187)

It is also possible to use the same calculation principles in reverse: for a given boundary distance, one can calculate the acceptable percentage of unprotected area within an enclosing rectangle. The greater the distance, the more unprotected area is permitted. At a sufficient distance, the entire elevation may be unprotected.

It is the second of these approaches that is adopted in the simplified tables provided in Approved Document B.

Approved Document B Table 13.1

Approved Document B provides two simple methods for calculating the acceptable percentage of unprotected area based on the distance to the relevant boundary.

Method 1 applies only to small buildings not exceeding three storeys or 24m in length so is not relevant to most industrial buildings.

Method 2 is intended for buildings or compartments of any use for which Method 1 is not appropriate, provided the building does not exceed 10 m in height. It is clear that any building taller than 10m must follow the guidance in BRE 187 directly. Method 2 states "Each side of the building should meet the limits in Table 13.1." It is worth noting that the title of Table 13.1 still refers to "Permitted unprotected areas in small buildings or compartments" yet provides no definition of what constitutes a "small" building in this context other than the 10 m height limit.

Table 13.1 lists the maximum permitted percentage of unprotected area for a

Method 2

13.20 This method may be used for buildings or compartments intended for any use and for which method 1 is not appropriate.

13.21 Except for an open-sided car park in purpose group 7(b) (see paragraph 11.2), the building should not exceed 10m in height. Each side of the building should meet the limits in Table 13.1. Areas falling within the limits in Diagram 13.5 can be ignored.

Table 13.1 Permitted unprotected areas in small buildings or compartments

Minimum distance between side of building and relevant boundary (m)		Maximum total percentage of unprotected area (%)
Purpose groups		
Residential, office, assembly and recreation	Shop and commercial, industrial, storage and other non-residential	
(1)	(2)	(3)
Not applicable	1	4
1	2	8
2.5	5	20
5	10	40
7.5	15	60
10	20	80
12.5	25	100

NOTES:

1. Intermediate values may be obtained by interpolation.
2. For buildings fitted with an automatic sprinkler system, see paragraph 13.22.
3. For open-sided car parks in purpose group 7(b), the distances set out in column (1) may be used instead of those in column (2).
4. The total percentage of unprotected area is found by dividing the total unprotected area by the area of a rectangle that encloses all the unprotected areas, and multiplying the result by 100.

Figure 3: Method 2 from Approved Document B

given boundary distance, with separate columns for different purpose groups. For industrial buildings, the permitted unprotected percentage ranges from 4% at 1m boundary distance up to 100% at 25m. Clause 13.21 of Approved Document B requires that "each side of the building should meet the limits in Table 13.1". Read casually, this could be taken to mean that the unprotected percentage is calculated over the full area of the building side.

Note 4 to Table 13.1 states: "the total percentage of unprotected area is found by dividing the total unprotected area by the area of a rectangle that encloses all the unprotected areas, and multiplying the result by 100". Therefore, the enclosing rectangle is not necessarily the same as the entire building side, and for a façade with openings concentrated in one area, the enclosing rectangle may be considerably smaller, resulting in a higher percentage of unprotected area. To those familiar with BRE 187, this distinction may be clear, though users who are not familiar with the underlying concept may be forgiven for overlooking it.

A further omission in the Approved Document B method is the assumption in BRE 187 that "unprotected areas are uniformly distributed over the enclosing rectangle". BRE 187 notes that if the unprotected areas are not uniformly distributed, "there may be hot spots which should be treated independently". Again, for those familiar with the basis for the external wall requirements, this will make intuitive sense – a concentrated area of openings will result in a high level of radiation in the event of a fire and require a corresponding large distance to the relevant boundary. This fact would be unchanged if the opening was part of a large protected façade.

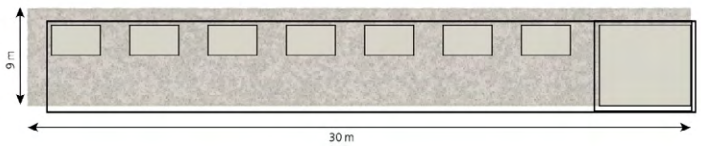


Figure 4: Elevation with non-uniform distribution of unprotected areas (taken from BRE 187)

A brief history of "Table 13.1"

Up until the 1985 edition of Approved Document B, the guidance reproduced the BRE 187 method and tables directly. The width of the enclosing rectangle was an important parameter: a wider opening required a greater boundary distance, even for the same percentage of unprotected area.

In the 1992 edition of Approved Document B, the simplified Method 2 was introduced. The width of the enclosing rectangle no longer features as an input parameter, and rather than extracting numbers of the earlier BRE 187 tables, it appears to depart entirely from the analytical approach; inspection of Table 13.1 reveals that the allowable unprotected percentage for industrial use is simply four times the boundary distance (in metres). For residential, the multiple happens to be eight. This relationship clearly has no direct basis in the radiation calculations.

There is no question that the BRE method can be complex, particularly when applied outside of the textbook worked examples; for small and regularly compartmentalised buildings this simplification is pragmatic and will produce acceptable results. However, for large uncompartmentalised buildings such as industrial sheds the distinction between the simplified Approved Document B method and the full BRE 187 calculation becomes significant. It is understandable that designers would want to rely solely on the Approved Document, but for large buildings it is recommended that the BRE 187 method be used instead.

Examples

To demonstrate the use of the BRE 187 method, first consider a building 40m long and 9m high, classified as industrial use with the long elevation situated 10m from the relevant boundary.

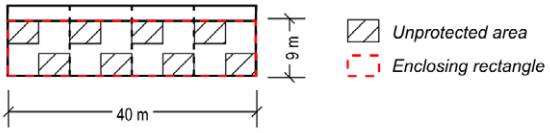


Figure 5: Example 1

From Approved Document B Table 13.1, this building side may be 40% unprotected – equivalent to an unprotected area of 144m² on a 360 m² façade. When measured against the requirements of BRE 187 Table C (over page), we see that the minimum boundary distance for a 40m wide, 40% unprotected area is 9.5m, therefore less than the 10m required by Approved Document B. So far, so good.

Now consider an otherwise identical building 100m long. Again, from Approved Document B Table 13.1, this building side may be 40% unprotected – equivalent to an unprotected area of 360m² on a 900m² façade.

If that 360m² is evenly distributed across the full length of the elevation, the enclosing rectangle would be 100m wide with unprotected area of 40%. BRE 187 would now require a distance of 11.5m to the boundary. A moderate increase, and slightly greater than the 10 m required by Approved Document B.

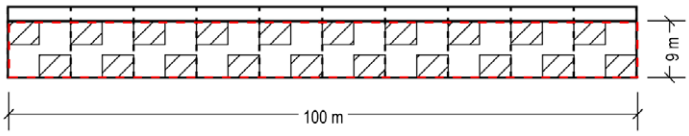


Figure 6: Example 2a

If, however, the same unprotected area is grouped at one end, a 40m wide section would be entirely unprotected. A 40m wide, 100% unprotected area, assessed using BRE 187 Table C would require a minimum boundary distance of 18m, far greater than 10m, and clearly demonstrating the importance of Note 4 requiring the use of an enclosing rectangle rather than the entire building side.

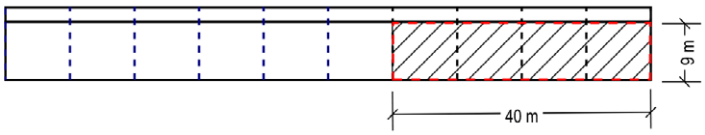


Figure 7: Example 2b

Alternatively, consider a perhaps unlikely arrangement of two 20m × 9m unprotected areas. This time the arrangement of openings meets the requirements of Table 13.1, Note 4 as a single 100m rectangle would be required to enclose both areas. Considered as a whole, the minimum acceptable boundary distance would be the same as that of Example 2a, however, considered as individual openings (i.e. 20m wide, 100% unprotected), BRE 187 Table C would require a minimum boundary distance of 13.5m, 35% greater than the 10m required by Approved Document B.

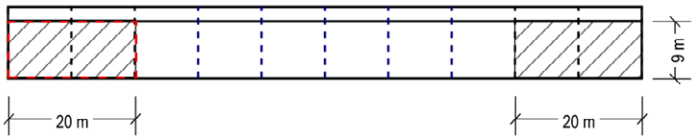


Figure 8: Example 2c

▸28

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Table C: Enclosing rectangle 9 m high

Width	Distance from relevant boundary for unprotected percentage not exceeding								
	20%	30%	40%	50%	60%	70%	80%	90%	100%
Minimum boundary distance (m)	Figures in brackets for residential, office and assembly uses								
3.0	1.5 (1.0)	2.5 (1.0)	3.0 (1.5)	3.5 (2.0)	3.5 (2.5)	4.0 (2.5)	4.5 (3.0)	4.5 (3.0)	5.0 (3.5)
6.0	2.5 (1.0)	3.5 (2.0)	4.5 (2.5)	5.0 (3.0)	5.5 (3.5)	6.0 (4.0)	6.5 (4.5)	7.0 (4.5)	7.5 (5.0)
9.0	3.5 (1.5)	4.5 (2.5)	5.5 (3.0)	6.0 (4.0)	6.5 (4.5)	7.5 (5.0)	8.0 (5.5)	8.5 (5.5)	9.0 (6.0)
12.0	3.5 (1.5)	5.0 (3.0)	6.0 (3.5)	7.0 (4.5)	7.5 (5.0)	8.5 (5.5)	9.0 (6.0)	9.5 (6.5)	10.5 (7.0)
15.0	4.0 (1.5)	5.5 (3.0)	6.5 (4.0)	7.5 (5.0)	8.5 (5.5)	9.5 (6.0)	10.0 (6.5)	11.0 (7.0)	11.5 (7.5)
18.0	4.5 (2.0)	6.0 (3.5)	7.5 (4.5)	8.5 (5.0)	9.5 (6.0)	10.0 (6.5)	11.0 (7.0)	12.0 (8.0)	12.5 (8.5)
21.0	4.5 (2.0)	6.5 (3.5)	7.5 (4.5)	9.0 (5.5)	10.0 (6.5)	11.0 (7.0)	12.0 (7.5)	12.5 (8.5)	13.5 (9.0)
24.0	5.0 (2.0)	6.5 (3.5)	8.0 (4.5)	9.5 (6.0)	10.5 (6.5)	11.5 (7.5)	12.5 (8.0)	13.5 (9.0)	14.5 (9.5)
27.0	5.0 (2.0)	7.0 (3.5)	8.5 (5.0)	10.0 (6.0)	11.0 (7.0)	12.0 (7.5)	13.0 (8.5)	14.0 (9.0)	15.0 (10.0)
30.0	5.0 (2.0)	7.0 (3.5)	9.0 (5.0)	10.5 (6.0)	11.5 (7.0)	12.5 (8.0)	14.0 (9.0)	15.0 (9.5)	15.5 (10.5)
40.0	5.5 (2.0)	7.5 (4.0)	9.5 (5.0)	11.5 (6.5)	13.0 (7.5)	14.5 (8.5)	15.5 (9.5)	16.5 (10.5)	18.0 (11.5)
50.0	5.5 (2.0)	8.0 (4.0)	10.5 (5.5)	12.0 (6.5)	14.0 (8.0)	15.5 (9.0)	17.0 (10.0)	18.0 (11.0)	19.5 (12.0)
60.0	5.5 (2.0)	8.0 (4.0)	10.5 (5.5)	13.0 (7.0)	14.5 (8.0)	16.5 (9.5)	18.0 (10.5)	19.5 (11.5)	21.0 (13.0)
80.0	5.5 (2.0)	8.5 (4.0)	11.0 (5.5)	13.5 (7.0)	16.0 (8.5)	18.0 (10.0)	19.5 (11.0)	21.5 (12.5)	23.0 (13.5)
100.0	5.5 (2.0)	8.5 (4.0)	11.5 (5.5)	14.0 (7.0)	16.5 (8.5)	18.5 (10.0)	21.0 (11.5)	23.0 (12.5)	24.5 (14.0)
120.0	5.5 (2.0)	8.5 (4.0)	11.5 (5.5)	14.5 (7.0)	17.0 (8.5)	19.5 (10.0)	21.5 (11.5)	24.0 (13.0)	26.0 (14.5)
130.0	5.5 (2.0)	8.5 (4.0)	11.5 (5.5)	14.5 (7.0)	17.0 (8.5)	19.5 (10.0)	22.0 (11.5)	24.0 (13.0)	26.5 (14.5)

Notes

Figure 9: BRE 187 Table C, example values

Clause 2.2 of P313

The query that prompted the writing of this article concerns the application of Clause 2.2 of SCI Publication 313. Clause 2.2 states:

"These recommendations apply to columns supporting protected areas of external walls. Columns supporting protected areas will require fire protection up to eaves level, regardless of the extent of the protected area. Therefore, when less than 100% of the wall is required to have fire resistance it is preferable to arrange the protected area so that it covers as few columns as possible thereby minimising the requirements for fire protection and moment resisting bases."

Read in isolation, this advice encourages the designer to consolidate the protected area into as few bays as possible, and, by extension, concentrate the unprotected area over the rest of the building side. But as the preceding example demonstrates, it is unlikely to be possible to arrange the unprotected areas in such a concentrated manner and still satisfy an assessment to BRE 187.

Where the relevant boundary is skewed relative to the building, it would perhaps be possible, but the structural engineer would need to demonstrate that unprotected structural elements would not compromise the stability of the protected elements. In practice, this means demonstrating that the collapse of unprotected columns and rafters in the fire-affected zone would not pull down the protected columns and the wall they support. In the past, a designer may not have felt it necessary to provide formal justification for this; but in the post-Grenfell regulatory atmosphere, that is unlikely to remain the case, where designers are increasingly expected to demonstrate the robustness of their fire design through analysis rather than precedent alone.

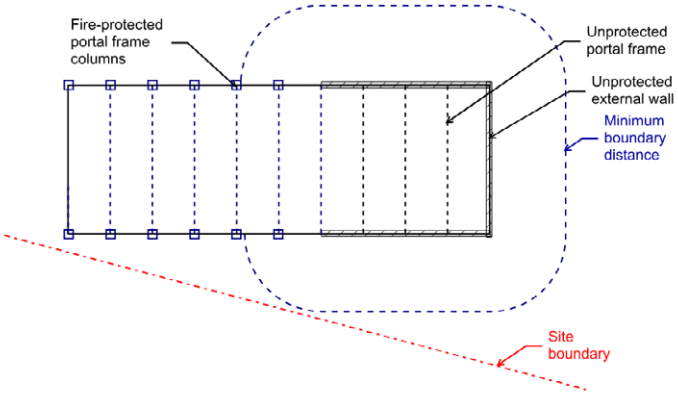


Figure 10: Plan of building with skewed boundary

Conclusions

The simplified table in Approved Document B Table 13.1 is a useful tool for small buildings, but it should not be applied uncritically to large uncompartmentalised buildings. For large building, BRE 187 should be used to verify that the proposed arrangement of unprotected areas is acceptable.

The intent of the guidance in P313 to minimise the number of columns requiring fire protection by concentrating the protected area is understandable, but designers should recognise that the resulting concentration of unprotected area may require a greater boundary distance than Table 13.1 from Approved Document B would suggest. ■

AD 557: Robustness and fire

SCI's Advisory Desk has become aware of some requests to apply the "robustness" rules found in BS 5950 and BS EN 1991 in the fire limit state. This AD clarifies the requirements.

The requirement to verify a structure in the fire limit state is entirely separate to the avoidance of disproportionate collapse (the "robustness" rules).

Fire design (e.g. provision of fire protection) is intended to ensure that elements of structure do not lose their ability to support design loads for the duration of the specified fire period. The possibility of fire is a "known" accidental situation and must be designed for, as required under the "Basic requirements" of BS EN 1990 clause 2.1(3).

Robustness rules are there to ensure the structure does not suffer disproportionate collapse if an accidental action causes an element of structure to lose its ability to support design loads. BS EN 1990 clause 2.1(4) covers the necessity to avoid disproportionate collapse. In contrast to the specified actions in the fire limit state, the actions potentially leading to disproportionate collapse are unidentified.

To apply the robustness rules in the fire limit state is the equivalent of assuming that during one accidental situation (fire) there is a second, unidentified accidental event. Two accidental situations are not assumed to be concurrent.

However, while this approach is appropriate for typical buildings, there may be cases, possibly for higher-risk buildings, where collaboration between the structural engineer, fire engineer and other relevant parties is necessary to determine whether the risk of disproportionate collapse in fire warrants further assessment.

Contact: **David Brown**
Telephone: **01344 636555**
Email: **advisory@steel-sci.com**

Module fabrication building

for Highlands Fabricators Ltd, Nigg

Originally published in **BCSA NEWS** June 1986

W. H. Mackay & Sons Ltd of Fearn have completed the European offshore industry's largest fabrication facility in less than a year. Here they tell the story of its construction.

Main Contractor was Messrs Wimpey Construction and our contract was on a design and construct basis covering the supply and erection of 3,500 tonnes of structural steelwork. 48,000 sq m of single skin profiled steel cladding and 28 No. sliding door leaves

The building is constructed in three bays which have the following dimensions:

Bays 1 and 2
Each 50 metres wide centre-to centre of crane rails and 25 metres clear height under the crane hook.

Bay3
80 metres wide centre-to-centre of crane rails and 35 metres clear height under the crane hook.

The building is 117 metres long centre-to-centre of end frames and supports E.O.T. cranes of 120 tonnes, 50 tonnes and 20 tonnes capacity.

Full width doors are provided in each gable, so arranged to provide clear openings 50 metres wide x 25 metres high in Bays 1 and 2, and 80 metres wide x 35 metres high in Bay 3.

At the design stage the building was planned basically around bolted construction so that the large lattice columns and trusses could be manufactured piece small to permit shotblasting and painting within our Workshops without handling difflculties.

Units were then sub-assembled by separate crews on site prior to erection.

An analysis of the programme requirements indicated a commencement of erection on-site shortly before Christmas 1984, with a large proportion of erection and cladding work being undertaken during the worst period of Winter weather.

The height of the building and consequently the time involved In making adequate provision for Operators safety concerned us and after considerable discussion we adopted the Erection Method indicated In the accompanying photograph. This entailed splicing roof shaft column Just below main tie level and assembling at ground level a roof section 9 metres long x 56 metres wide In the case of Phase 1, and 86 metres wide in the case of Phase 2.

Roof cladding, rainwater goods, safety lines and scaffolding were fitted and the sections then lifted into position using dual Manitowac 4100 cranes In the case of the 56 metre span sections and dual 'Skyhorse' cranes In the case of the 86 metre section. Average lifting time per section was less than one hour and programme dates were achieved.

The design took recognition of the dual 11ft requirement and special lifting beams were incorporated into the structure and left In position as a permanent feature as it was not cost effective to remove them after erection.

Doors are a unique feature of the building as the gable of each span can be opened over its entire width enabling completed Modules to be skidded out without hinderance.

Highlands Fabricators Ltd claim that the building Is now the largest indoor fabrication facility In the European Off-Shore Construction Industry.

Cavern Walks – Liverpool

Originally published in **BCSA NEWS** Autumn 1985

Cavern Walks occupies the site of the original Cavern Club where many of the Liverpool pop groups of the Sixties began their careers, the most famous being the Beatles.

As part of the scheme a replica of the Cavern Club has been created in the basement using the original bricks. A system of steel and concrete beams had to be provided to withstand the thrusts from the replica brick barrel vaults.

Royal Life Insurance, upon agreeing to fund the new project, put together the professional team, all of whom are Merseyside based, and decided to invite tenders for the works, interviewing a number of contractors. Finally, however, it was decided to negotiate the contract with Tysons (Contractors) pie, who had worked with Royal Life Insurance for a number of years, and had built their Liverpool headquarters.

It was essential for the opening of the project to coincide with the opening of the International Garden Festival in May 1984.

Work began on site at the beginning ot October 1982, with a completion date of the beginning of May 1984. To achieve this very tight programme the choice of building frame was crucial. A steel frame with pre-cast concrete floor units was selected, which permitted the desired rate of progress to be achieved.

A severe additional complication was caused by the very restricted nature of the site, and the neighbouring roads. The building covers the site to all four boundaries. Deliveries to it were exceptionally difficult, and a far greater than normal degree of co-ordination was required. A magnificent job was done by the site agent, and the team from Tysons.

The combination of programme and the complex shape of the building led to the decision to use a steel frame, keeping any concrete casing to a minimum and utilising dry fire protection wherever possible. As the building has more than five storeys it has been designed to comply with progressive collapse regulations.

Horizontal continuity is provided by the frame whilst pre-cast floor units provide resistance to debris loading.

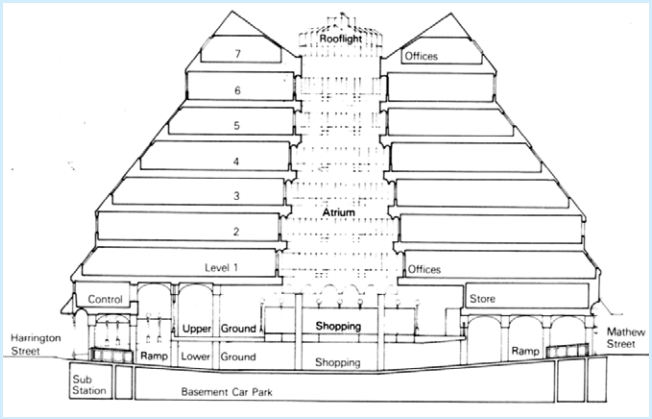
960 tonnes of steelwork are used in the frame, about half being high yield steel, to save weight and floor depth. Architectural requirements limit the structural floor zone to under 600mm. The frame grid is 7.6 metres. For economy the bays were split into three by high yield steel secondary beams. Some end connections were designed to provide small fixed end moments which enabled beam weights to be reduced.

Wind on the structure is taken to foundation level by transferring the load from the cladding through the floors to the frame and cores. The pyramid shape is inherently stable as the raking steel members triangulate the structure. Hip rafters/stanchions span from the second to the sixth floor, and support the fourth, fifth and sixth floor steelwork. Welded tubular lattice girders span from first to fourth floor and are a feature of the solarium.

The atrium void extended from the lower ground floor to roof level, topped by a welded, vierendeel roof light. Throughout erection a tower crane was standing in the atrium. and the roof light had to be stored on site in pieces and erected after the removal of the crane. The pyramid shape of the building resulted in large areas of slate roofing, and a timber stressed skin solution was adopted. This was prefabricated off-site as much as possible. Once the steelwork was erected it was possible to work down from the top of the building which was vital in view of the condensed programme.

A. Long - BSC Sections and Commercial Steels

Section through Atrium and Ramps 2 & 3



Client
Royal Life Insurance plc
Architect
David Backhouse RIBA
Consultant Architect
Dominic Mccannon RIBA
Consulting Engineer
Bjngham Blades & Partners
Quantity Surveyor
Tweed Atkinson Lewis & Partners
Service Engineer
Kevin Gaskell Associates
General Contractor
Tysons (Contractors) plc
Steelwork Fabricator
John Booth & Sons (Bolton)

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BCSA

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- **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 £6,500,000
Atlasco Constructional Engineers Ltd	01782 564711			●	●	●	●			●	●			●	●	✔	2			Up to £1,200,000
BD Structures Ltd	01942 817770			●	●	●	●				●	●		●	●	✔	3	✔	●	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 £6,500,000
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 £2,400,000
D H Structures Ltd	01785 246269			●	●		●				●						2			Up to £600,000
Duggan Steel	00 353 29 70072		●	●	●	●	●	●			●					✔	4			Above £10,000,000
D Hughes Welding & Fabrication Ltd	01248 421104				●	●	●	●	●	●	●		●	●	●	✔	4			Up to £600,000
ECS Engineering Services Ltd	01773 860001	●		●	●	●	●	●	●	●	●			●	●	✔	4		●	Up to £3,400,000
Elland Steel Structures Ltd	01422 380262		●	●	●	●	●	●	●	●	●	●		●	●	✔	4	✔	●	Up to £10,000,000
Embrace Steel Group Ltd	01748 810598	●	●	●	●	●	●			●	●	●	●	●	●	✔	4			Up to £10,000,000
EvadX Ltd	01745 336413		●	●	●	●	●	●		●	●	●			●	✔	3		●	Up to £2,400,000
Four-Tees Engineers Ltd	01489 885899	●		●	●		●	●	●	●	●		●	●	●	✔	3		●	Up to £3,400,000
Fullpen Fabrications Ltd	0203 6335586	●		●	●	●	●			●	●				●		3			Up to £500,000
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)
G & L Environmental Ltd	01634 252288									●	●			●	●	✔	3			Up to £500,000
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
H Young Structures Ltd	01953 601881			●	●	●	●	●			●			●	●	✔	4	✔	●	Up to £5,000,000
Had Fab Ltd	01875 611711	●			●		●	●	●	●	●		●	●	●	✔	4			Up to £6,500,000
HBE Services Ltd	01525 854110				●	●				●				●	●	✔	3			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*
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 Fabrication Company Ltd	01506 858466				●			●	●	●	●			●	●		3			Up to £600,000
M Hasson & Sons Ltd	028 2957 1281			●	●	●	●	●	●	●	●			●	●	✔	4		●	Up to £1,400,000
M.J. Patch Engineering Ltd	01275472279				●					●	●			●	●	✔	3			Up to £600,000
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			●	●	●	●	●	●	●	●		●	●	●	✔	3			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
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
Steel & Roofing Systems	00 353 56 444 1855	●		●	●	●	●	●	●	●	●	●		●	●	✔	4			Up to £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 £6,500,000
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

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.

BCSA

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 £6,500,000
BHC Ltd	01555 840006	●	●	●	●	●	●	●	●			●	✓	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 £600,000
ECS Engineering Services Ltd	01773 860001	●		●	●	●	●		●			●	✓	4					Up to £500,000
Four-Tees Engineers Ltd	01489 885899	●	●	●	●	●	●		●	●	●	●	✓	3			✓	●	Up to £3,400,000
Fullpen Fabrications	0203 6335586	●	●	●	●	●	●					●	✓	3			✓		Up to £600,000
Jamestown Manufacturing Ltd	00 353 45 434 288	●	●	●	●	●	●					●	✓	4			✓		Up to £10,000,000
Kiernan Structural Steel Ltd	00 353 43 334 1445	●		●	●	●			●			●	✓	4	✓		✓	●	Up to £1,200,000
M&S Engineering Ltd	01461 40111	●		●		●	●	●		●	●	●	✓	3					Up to £2,400,000
M Hasson & Sons Ltd	028 2957 1281	●	●	●	●	●	●	●	●	●	●	●	✓	4			✓	●	Up to £2,400,000
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 £3,400,000
Severfield plc	01845 577896	●	●	●	●	●	●	●	●	●	●	●	✓	4	✓	✓	✓	●	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
AMCO Giffen	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
Harrisons Engineering (Lancashire) Ltd	01254 823993	●	●	●	●	●	●	●	●	●	●	●	✓	3		✓	✓		Up to £3,400,000
Hollandia Infra BV	+31 (0) 180 519956	●	●	●	●	●	●	●	●	●	●	●	✓	4					Above £10,000,000
HS Carlsteel Engineering Ltd	020 8312 1879									●	●	●	✓	3			✓		Up to £2,400,000
In-Spec Manufacturing Ltd	01642 210716			●						●	●	●	✓	4		✓	✓		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	01698 264271	●	●	●	●	●	●	●	●	●	●	●	✓	4		✓	✓	●	Up to £5,000,000
Taziker Industrial Ltd	01204 468080	●	●	●	●	●	●	●	●	●	●	●	✓	3		✓	✓	●	Above £10,000,000
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
Griffiths & Armour	0151 236 5656
MMCEngineer Ltd	01423 855939
National Highways	0300 123 5000

Company name	Tel
Paul Hulme Engineering Ltd	07801 216858
Sandberg LLP	020 7565 7000
Solent Commercial Management Limited	07852 309104

Company name	Tel
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	Barrett Steel Limited	Steel producers and stockholders	01274 474314	✓	M	4	3B		https://www.barrettsteel.com	sales@barrettconstructional.com
Gold	Cleveland Steel & Tubes Ltd	Steel producers and stockholders	01845 577789	✓	M	3	3B		https://www.cleveland-steel.com	sales@cleveland-steel.com
Gold	National Tube Stockholders Ltd	Steel producers and stockholders	01845 577440	✓	D/I	4	3B		https://nationaltube.co.uk	sales@nationaltube.co.uk
Gold	voestalpine Metsec plc	Manufacturing and structural services	0121 601 6000	✓	M	4		●	https://www.metsec.com	metsec.plc@voestalpine.com
Gold	Wedge Group Galvanizing Ltd	Protective Coatings	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	Behringer Ltd (Vernet Behringer)	Manufacturing and structural services	01296 668259		N/A				https://www.behringerltd.co.uk	info@behringerltd.co.uk
Silver	FICEP UK Ltd	Manufacturing and structural services	01924 223530		N/A				https://www.ficep.co.uk	info@ficep.co.uk
Silver	Hempel	Protective Coatings	01633 874024	✓	N/A				https://www.hempel.com	sales.uk@hempel.com
Silver	Joseph Ash Galvanizing	Protective Coatings	01246 854650	✓	N/A				https://www.josephash.co.uk	sales@josephash.co.uk
Silver	Sherwin Williams Ltd	Protective Coatings	01204 521771	✓	N/A				http://www.sherwin-williams.com	enquiries@sherwin.com
Silver	Voortman UK Ltd	Manufacturing and structural services	+31 (0)548 536 373		N/A				https://www.voortman.net/en	info@voortman.net

Manufacturing and Structural Services

Company name	Tel	QM	CA	FPC	NHSS	SCM	SfL
Albion Sections Ltd	0121 553 1877	✓	M	4			
Behringer Ltd (Vernet Behringer)	01296 668259		N/A				
Cast Connex UK Ltd	01416 806 3521	✓	M				
Cellbeam Ltd	01937 840600	✓	M	4	20		
Construction Metal Forming Ltd	01495 761080	✓	M	3			
FICEP UK Ltd	01924 223530		N/A				
Farrat Isolevel	0161 924 1600	✓	N/A				
Hadley Industries Plc	0121 555 1342	✓	M	4		●	
Hi-Span Ltd	01953 603081	✓	M	4		●	
Kaltenbach Ltd	01234 213201		N/A				
Kingspan Limited	01944 712000	✓	M	4		●	
Lincoln Electric (UK) Ltd	0114 287 2401	✓	N/A				
Peddinghaus Corporation UK Ltd	01952 200377		N/A				
Tata Steel – ComFlor	01244 892199	✓	M	4			
Voestalpine Metsec	0121 601 6000	✓	M			●	✓
Voortman UK Ltd	+31 (0)548 536 373		N/A				✓

Software

Company name	Tel	QM	CA	FPC	NHSS	SCM	SfL
Autodesk Ltd	01252456600		N/A				
Fabsec Ltd	01937 840641		N/A				
IDEA StatiCa UK Ltd	02035 799397		N/A				✓
StruMIS Ltd	01332 545800		N/A				
Trimble UK Limited	0113 887 9790		N/A				

Site services and installation

Company name	Tel	QM	CA	FPC	NHSS	SCM	SfL
Composite Profiles UK Ltd	01202 659237		D/I				
Deconstruct UK Ltd	02035 799397	✓	N/A				
Easi-Edge Ltd	01777 870901	✓	N/A				
Keltbray Holdings Ltd	0207 643 1000	✓	N/A				
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				

Structural fasteners

Company name	Tel	QM	CA	FPC	NHSS	SCM	SfL
Advanced Bolting Solutions Limited	0116 251 2251	✓					
Andrews Fasteners Limited	0113 246 9992	✓	M		3		
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				
Tension Control Bolts Ltd	01978 661122	✓	M		3		

Steel producers and stockholders

Company name	Tel	QM	CA	FPC	NHSS	SCM	SfL
Arcelor Mittal Distribution - Scunthorpe	01724 810810	✓	D/I	4	3B		✓
ASD Metals UK	0113 254 0711	✓	D/I	4	3B	●	
Barrett Steel Limited	01274 474314	✓	M	4	3B		✓
British Steel Ltd	01724 404040	✓	M		3B		
Cleveland Steel & Tube Limited	01845 577789	✓	M	3	3B		✓
Daver Steels Ltd	0114 261 1999	✓	M	3	3B		
Dent Steel Services (Yorkshire) Ltd	01274 607070	✓	M	4	3B		
Murray Plate Group Ltd	0161 866 0266	✓	D/I	4	3B		
National Tube Stockholders Ltd	01845 577440	✓	D/I	4	3B		✓
Rainham Steel Co Ltd	01708 522311	✓	D/I	4	3B		
Tata Steel – Tubes	01536 402121	✓	M		3B		
The Alternative Steel Co Ltd	01942 826677	✓	D/I				

Protective coatings

Company name	Tel	QM	CA	FPC	NHSS	SCM	SfL
Forward Protective Coatings Ltd	01623 748323	✓	N/A				
Hempel	01633 874024	✓	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	●	
Joseph Ash Galvanizing	01246 854650	✓	N/A				✓
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				
Wedge Group Galvanizing Ltd	01902 601944	✓	N/A				✓

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