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NSC

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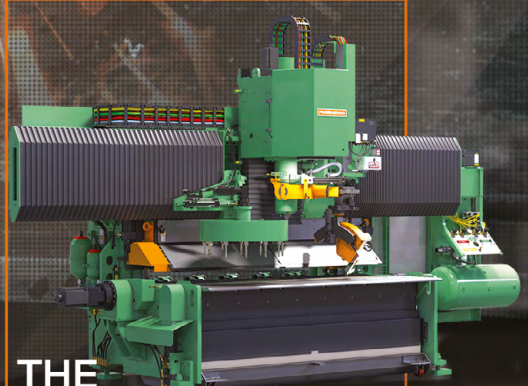

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NSC

MAY 2024
Vol 32 No 5

Cover Image
Ardgowan Distillery, Inverkip
Main client: Ardgowan Distillery Company
Architects: Hypostyle (Scotland) and Spitzbart and Partners (Austria)
Main contractor Muir Construction
Structural engineer: Blyth & Blyth
Steelwork contractor: Hescott Engineering
Steel tonnage: 260t

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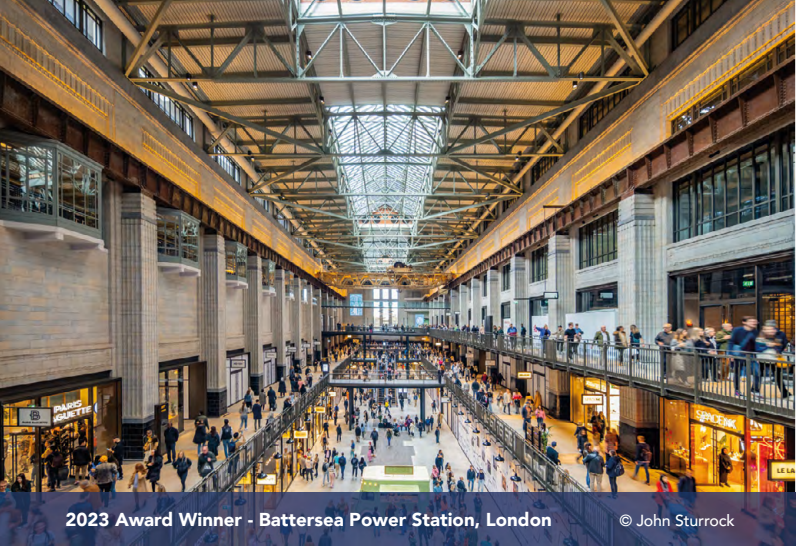

2023 Award Winner - Battersea Power Station, London © John Sturrock

2023 Award Winner - Copr Bay Bridge, Swansea © Hufton and Crow

Win two tickets to this years prestigious BCSA Structural Steel Design Awards

2023 Award Winner - One Centenary Way, Birmingham © Greg Holmes

2023 Award Winner - Stockingfield Bridge, Glasgow

A lucky respondent to our New Steel Construction (NSC) Reader Survey can win two tickets to the Structural Steel Design Awards event in London on 26 September 2024.

Simply scan the QR code to take part in the NSC survey and share your views about what you think we are getting right, and how you think NSC could be improved.

The BCSA is exploring whether you would like to continue receiving the NSC by post or join other sustainability-conscious readers in accessing it digitally via email. Your feedback and new ideas are welcome.

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Steel stays in the fast lane towards net zero carbon

Nick Barrett - Editor

High interest rates, inflation, wars in Ukraine and the Middle East, and rising government debt - a familiar litany of our woes in the UK press, but these are issues being grappled with across the world, not just here. The long term impacts of these factors are hard to assess, but in the short term, many investment and other plans are being upset or at least reconsidered. American bank JP Morgan recently warned that it was time for a 'reality check' on plans to move from fossil fuels to renewable energy and that it may take generations to reach net zero targets.

The Scottish government has already scrapped its plan to cut carbon emissions by 75% by 2030 on the grounds that the target was unachievable anyway. Major companies have also announced a scaling back of earlier commitments regarding climate targets. Debate on what pace to adopt in the climate change battle looks like it's heating up and we can only await developments.

Regardless of that background, the constructional steelwork sector remains committed to supporting the government's net zero ambitions and to implementing the strategies in its own net zero Roadmap. Steel manufacturers are pursuing well publicised carbon reducing investments, and BCSA member steelwork contractors are always looking to use efficient design and waste elimination techniques to minimise the amount of steel, and hence the embodied carbon, of all structures.

Away from global worries about the energy transition, and whatever the future holds, steelwork is proving its value in providing efficiently designed and constructed buildings, and other structures our future will need. In NSC this month we see projects up and down the UK and the Republic of Ireland supporting tomorrow's world.

The UK is suffering from a shortage of high quality laboratory space and, as well as providing new build spaces, several steel framed buildings have been or are being converted from offices and other commercial use to provide laboratories near where staff can be found or attracted to. In Manchester we visit a new addition to Europe's largest clinical academic campus, built to a high standard demanded by the international medicine and health innovation sectors. Steel's flexibility and speed came into their own here.

Elsewhere in this issue we bring news of a 36 storey City commercial development aiming at a BREEAM 'Outstanding' rating, a diagnostic centre at Newcastle's Metrocentre, three schools, an automotive R&D cluster in Warwickshire, two leisure and sports facilities, a world class, state of the art 'Multiversity' campus in Blackpool, a state of the art community hub in Stockport, a major refurbishment of the Tame Valley Viaduct, a logistics park in Hemel Hempstead, and a distillery near Greenock, all benefitting hugely from the constructional capabilities of steel.

As well as all that, we have an article on something you might not have read about elsewhere, three steel framed artificial nesting structures designed to house Kittiwakes off the Suffolk coast, said to be the first of their kind.

With this spread of geography and project types structural steelwork obviously will have a large part to play in creating the net zero carbon world, whatever speed we adopt to get there. BCSA will also play a major role in helping ensure that steelwork contractors will be available who are well up to the job. And how that will happen can be read about in our profile of new BCSA CEO Jonathan Clemens.

Billington launches into bridge market

Following a record financial year performance, structural steelwork contractor Billington is launching into the bridge market.

Billington Chief Executive Mark Smith said the company had recruited a skilled team of workers from S H Structures, a bridgeworks specialist that recently went into administration.

Among those moving over from S H Structures is the company's former managing director David Perry.

Mr Smith said, Billington would use the acquisition of the North Yorkshire firm's specialist skills to take its existing Tubecon business into the bridge market for the first time.

He said: "There are some opportunities to explore through S H Structures people, and after that we are going to see how far this goes.

"With our steel plate processing skills at Shafton Steel Services and protective coatings capability following the acquisition of Orrmac Coatings, we have the capability to take on large and complex bridge structures.

"This expansion marks an exciting chapter in our journey and reflects our commitment to innovation, growth and excellence as part of our comprehensive offering to our clients."

Billington has also announced a record financial performance for last year, with revenue up just over 50% to £133M and pre-tax profit more than doubled to £13.4M.

Mr Smith added, the group performance was driven by increased market share and efficiency improvements, enabling increased capacity and higher margins.

Steel frame up for plant machinery HQ in Suffolk

Construction work for a new UK headquarters for Avant Tecno, a Finnish manufacturer of wheeled loads, has reached a milestone with the completion of the steel frame.

The 2,900m² development in Bury St Edmunds, Suffolk is being led by Churchmanor Estates and built by SHE French.

AC Bacon Engineering has fabricated, supplied and erected 230t of steelwork for the project.

Due for completion later this year, the site will be home to Avant Tecno's UK operations. Facilities will include dealer training areas, offices, warehouse and a workshop.

The new development will allow the company to move from its current base near Thetford, where it has been located since it began operating the in the UK in 1994.

Raimo Ala-Korpi, Managing Director of Avant Tecno UK, commented: "We have enjoyed a sustained period of growth in recent years and, as a consequence, we have outgrown our existing warehouse and office facilities. Our new purpose-built UK headquarters represents a significant investment and is a commitment to the future for our dealers and end user customers."

Matt Cloke, Development Director at Churchmanor, added: "Avant are the UK market leader in small and medium sized wheeled loading machines, and their arrival in Bury St. Edmunds will help to cement and grow the town's position in the agricultural technology sector."

Groundbreaking heralds the transformation of former Rolls Royce site in Liverpool

Following a groundbreaking event, Winvic Construction has begun work on the £35.8m project to design and build four warehouses at Atlantic Park in Bootle, Liverpool for Royal London Mutual Insurance Society Limited.

Atlantic Park covers 52-acres on the former site of the Rolls Royce Engineering Works Factory. Winvic will first be excavating existing concrete slabs and preparing the ground for construction. The four industrial warehouse units are 3,700m², 4,640m², 10,200m² and 11,600m² and each will include a two-storey office space.

The scheme has been designed in accordance with Royal London's Sustainability Strategy, which aims for new build property developments to achieve net zero by 2030.

Winvic said it will be delivering the project as net zero carbon in construction and employing its tried and tested Life Cycle Assessment (LCA) process, which is aligned with the UKGBC and LETI, and third-party verified.

Aiming for BREEAM 'Excellent' and an EPC A rating, the project will also deliver a 10 per cent biodiversity net gain; bird, bat and insect nest boxes will also be installed.

Caunton Engineering will be fabricating, supplying and erecting the steelwork for the four warehouses.

British Land appoints SRM and William Hare for next Broadgate project

Developer British Land, has appointed Sir Robert McAlpine (SRM) as main contractor and William Hare as steel contractor for 2 Finsbury Avenue (2FA), the next phase of the Broadgate redevelopment in the City of London.

The appointment follows work undertaken by SRM in delivering 100 Liverpool Street and 1 Broadgate, extending the longstanding partnership with British Land.

Reaching a height of 170m, and due to be completed in 2027, 2FA will be an iconic addition to the capital's skyline. The steel-framed building will boast a 21-storey West office tower and 36-storey East office tower, characterised by triangular patterns combining a solid and glazed sawtooth-shaped façade that supports double height spaces.

The towers will be linked by both a 12-storey podium and a single-story winter garden at level 13.

According to British Land, 2FA will raise the bar in its sustainability strategy. It will be all-electric, and a smart-enabled development ensuring leading carbon and energy efficiency in operation, as well as BREEAM 'Outstanding', WELL Platinum, WIRED Platinum, Nabers 5-star and EPC 'A' accreditations.

Simon Carter, CEO at British Land, said: "2FA is an incredibly exciting scheme that will transform the London skyline with a unique dual tower design. It will be delivered into a supply-constrained market in 2027, and this landmark pre-let is further proof of the strong demand for the modern, sustainable office space at our well-connected, amenity-rich London campuses. We look forward to welcoming Citadel and Citadel Securities to their new London home at 2FA."

Steel frame gets tops marks for New Malden school

Structural steelwork is nearing completion for a new, three-storey, teaching block and sports hall for Burlington Junior School in New Malden, south London.

Working on behalf of main contractor Morgan Sindall Construction, SDM Fabrication is fabricating, supplying and erecting 170t of steelwork for the project.

As well as the new build, the programme also includes the refurbishment of the school's Victorian building, the installation of two multi-use games areas (MUGA), landscaping and the demolition of an outdated 1970s block. The overall scheme is aiming to achieve a BREEAM 'Excellent' rating.

The new building's teaching spaces are arranged along the northern elevation, with the first and second floors overlooking a central 12m-wide atrium that runs the length of the block, from one core to the other.

Adding some architectural interest, the building steps back at first floor level along the southern elevation, forming a terrace, which will be landscaped to create an outdoor space. At first floor, a bridge, formed by two 12m-long beams, spans the atrium, linking the classrooms with the terrace.

Below the outdoor space, the southern elevation's ground floor accommodates offices, a plant room and changing facilities for the adjoining sports hall.

The new school building is due to be finished by the end of this year, in time for the school to use it for the first term of 2025. The remainder of the works will then be completed by May 2025.

Government hub planned for Darlington

The Government Property Agency (GPA) has submitted a planning application to Darlington Borough Council to build a four-storey government hub.

The government is investing £118M in the project and said this is a significant indication of its commitment to sparking economic growth in the town and wider region.

When completed, Brunswick Street will form part of a government campus of three buildings, including Feethams House and Bishopsgate House, all located within Darlington town centre.

Construction of the new hub is set to begin later this year and will be completed in early 2027. The building will increase the total number of Darlington-based civil servants to over 2,300, 1,450 of whom will be located in the Brunswick Street hub.

Clive Anderson, Director of Capital Projects at the GPA, said: "In submitting our planning application, we are a step closer to creating another highly sustainable new government hub which will boost the local economy and see a modern, inspirational and energy-efficient workplace for government departments and their staff attracted to a rewarding civil service career based in Darlington."

NEWS IN BRIEF

Severfield has released a trading update for the year ending 30 March 2024, with a record UK and European order book of £511M. The Group said it has made good progress and expects to deliver a full year result which is slightly above its previous expectations. It also announced the intention to commence a share buyback programme to return £10M to shareholders.

Morgan Sindall Construction has been appointed by the Department for Education (DfE) to build a new secondary school in Newcastle-upon-Tyne. The Callerton Academy will comprise a multi-use three-storey building, built around a central core that includes teaching facilities, a flexible space for dining, assemblies and theatre, and an administrative area.

Robertson Construction North East, working in conjunction with Gateshead Health NHS Foundation Trust and Newcastle Hospitals, will deliver a new community diagnostic centre at the Metrocentre retail and entertainment complex. It will provide imaging, and respiratory and cardiac investigations, with the centre designed to create capacity for 145,000 appointments per year.

Sisk has been appointed as construction manager for a major new pharmaceutical facility in Tralee, County Kerry in the Republic of Ireland. The €330m facility, for Astellas, will be constructed on a greenfield site at the Kerry Technology Park. The project, which will be completed in late 2027, will create 600 construction jobs over the course of the build programme.

Councillors from Hyndburn Borough Council, alongside Alliance Leisure and members of the **ISG** construction team, have celebrated work starting on the new, state-of-the-art, leisure and sports complex in Clayton-le-Moors, Lancashire. It will include a four-lane, 25m swimming pool, a fitness suite, sauna & steam room, group exercise studio, café, and changing facilities.

PRESIDENT'S COLUMN

In January of this year, the BCSA hosted the inaugural meeting of the Young Person's Working Group at Carrwood Park in Leeds, which was attended by over 20 representatives of our member companies. The inspiration to start this initiative came from the BCSA's Sustainability Manager, Dr Michael Sansom, who recognised the importance of involving our younger members to contribute to the growth and development of the Association over the coming years.

The idea was further reinforced following a visit to one of our long-serving members, BD Structures, who are based in the North West of England, where I met with the next generation of a family-owned business who clearly demonstrated their enthusiasm and desire to improve and modernise steelwork fabrication and construction.

The second group meeting in late April was hosted at the William Hare manufacturing plant in Scarborough, where the group was able to see a demonstration of the robotic assembly and welding machine, that is now an integrated part of the daily manufacturing output of that plant.

This new working group is a significant addition to BCSA's traditional approach to seek member involvement and opinion across the important and topical issues relevant to our industry. As the industry is now faced with different working practices, by means of communication and extensive social media activity, I believe that it's important to listen to the views of our younger generation of steel industry executives to ensure that the BCSA is in a position to manage the changes anticipated by new and developing technologies such as AI and Automated Manufacturing. The group will, of course, determine its own level of input and feed any proposals back to the BCSA Council for consideration and appropriate action.

David Thomas, the Group Representative from William Hare stated: "The BCSA Young Members Group aims to empower the next generation within the steelwork industry by providing them with a platform to voice their opinions, address current issues, and actively shape the future direction of the BCSA and the wider industry."

We are currently working on a calendar of events that will include social, educational and practical learning through which, the group can demonstrate their visions and achievements to the wider BCSA membership. Further information on this will be made available shortly.

I trust that we would all recognise the importance of this new Young Members Group and, if you or your company aren't already involved, I would encourage you to support this initiative and enquire about representation and ongoing involvement.

Information is available on the BCSA's website, and regular updates will be published in *New Steel Construction* magazine.

On a separate matter, may I take this opportunity to welcome our new CEO, Jonathan Clemens, who succeeded Dr David Moore in March 2024. David, who successfully led the Association through the turbulent times of Brexit, Covid and the start of the Ukraine war, has now taken up a new position of Deputy CEO to assist Jonathan during the transition period.

Although David will still provide a major input into BCSA committees and working groups, I think it is appropriate at this time to register our appreciation for his outstanding contribution to the Association over the past two decades, including the last five years as the BCSA CEO.

Gary Simmons
BCSA President

Steelwork creating Outstanding south London leisure centre

Aiming to achieve a BREEAM 'Outstanding' rating, the steel frame for the Woolwich Leisure Centre, which will be one of the UK's largest urban leisure facilities, is taking shape.

Working on behalf of Morgan Sindall Construction, Elland Steel Structures is fabricating, supplying and erecting 1,650t of steel for the project.

Because of the town centre location, space is at a premium on this job and so a stacked design has been chosen. In this way, the steel-framed 12,800m² centre is able to accommodate three floors of facilities within a relatively confined area.

The leisure centre's array of facilities will include a 25m, eight lane swimming pool, leisure pool with flumes and splash pad, a teaching/training pool, a spa, a six-court sports hall, a five-a-side football pitch, a two-level gymnasium, dance and spinning studios, and two squash courts.

The centre will also feature flexible and accessible community spaces, along with a commercial café, creche, and soft play area, as well as two studios that will be linked to the neighbouring Tramshed theatre and community arts hub.

With a number of different long-span areas to accommodate, a steel frame supporting precast flooring planks has been chosen as the best method to create these spaces, and dampen any potential vibration issues between the various areas of the building.

The Woolwich Leisure Centre is due to open in October 2025.

Contractor named for Hemel Hempstead logistics park

VolkerFitzpatrick has been selected by leading logistics investor, owner and developer, Prologis UK, to design and build five new distribution units at Prologis Park, Hemel Hempstead.

Set within the Maylands Business Park, the project is scheduled to complete in early 2025, with enabling works having recently commenced.

The units, which will range in size from 1,765m² to 6,960m², have been designed with customer needs and sustainability in mind. They will feature terraces, outdoor amenity areas and easy walking and cycling access for local communities. The units will all include rooftop solar panels, target EPC A+ and BREEAM 'Outstanding' ratings, and will align with the UKGBC zero carbon in construction framework.

Stuart Deverill, Managing Director of VolkerFitzpatrick's Building Division, said: "I am delighted that we have been chosen to deliver this significant expansion. We have been working with Prologis for many years and our strong, collaborative approach has enabled us to deliver innovative and sustainable projects whilst setting new standards for workplace wellbeing."

Stockport to get state-of-the-art community hub

Willmott Dixon is helping Stockport Council to develop a state-of-the-art Community Hub supported by a £20M grant from the Levelling Up Fund.

The council has submitted a planning application for the scheme in Marple, which will deliver a two-storey building with a five-lane swimming pool, a ground floor library with a small cafe, a 60-station fitness suite, shared community spaces, and the relocated Marple clinic.

Councillor Colin MacAlister, Stockport Council Cabinet Member for Economy, Regeneration and Housing, said: "We have listened to what the people of Marple have said and this fantastic new facility reflects what local people have wanted in their area for a long time.

"I am delighted that we continue to move this forward. If planning is granted, this hub is going to make a huge, positive impact on the prosperity, health and wellbeing of the residents of Marple and the borough.

Anthony Dillon, Managing Director for Willmott Dixon in the North, added: "We're proud to be working in partnership with Stockport Council once again, and to be playing our part in creating a vibrant and innovative community hub for the people of Marple."

A decision on the development is expected in June 2024.

Green light for Blackpool educational campus

Blackpool Council has received planning approval for a Multiversity campus for Blackpool and the Fylde College.

The five-storey, £65M development would allow the college to relocate from out of town facilities into a world-class state-of-the-art campus as part of the £350M Talbot Gateway regeneration (see NSC March 2023) of the area around Blackpool North train station.

The Multiversity would be built by Blackpool Council, then leased to the College, offering more than 70 individual courses and enhancing its existing higher education provision which is directly linked to local employment needs.

The proposed development would include two phases, starting with an education campus on the corner of Cookson Street and George Street, followed by future development across the southern end of the site by Milbourne Street and Grosvenor Street.

The plans would deliver up to 32,600m² of education and commercial space across several phases, starting with the new Multiversity building.

Blackpool Council Leader, Councillor Lynn Williams, said: "The Multiversity will be a game changing addition to the town centre, bringing thousands of workers and students into the area.

"It will also help improve the town's skills base so that local people can learn work-ready skills and gain university level qualifications without leaving Blackpool."

Brakes off for automotive research cluster expansion

GMI Construction Group has been awarded the £16M contract to deliver the next units on Europe's largest automotive research and development cluster.

It forms part of the major masterplan expansion of MIRA Technology Park (MTP), near Nuneaton, Warwickshire, by HORIBA MIRA and Evans Randall Investors, with the project delivery managed by Swanvale Developments.

A groundbreaking ceremony has been held to mark commencement of Plot 9, which is divided into two large units, each providing 3,344m² of high-quality office and technical space.

The growth in the MIRA cluster is being fuelled by advances in low-carbon automotive technology, including electric vehicle development, cleantech fuels - such as hydrogen, and emerging autonomous and connected car technologies.

The Plot 9 units will be steel framed using cladding that compliments the rest of the MTP development. They will consist of open plan workshop space, offices, service yards, and parking, and will be completed to CAT A fit out standard.

Andy Macdonald, Managing Director of Swanvale Developments, said: "The construction of this next phase of facilities is another major landmark for MTP, building on the infrastructure investment."

Plans approved for Landsec's latest City office scheme

The City of London Corporation Planning Applications Sub-Committee has approved a new office scheme at 1 Little New Street.

To be developed by Landsec, and designed by lead architect Apt, the 20-storey scheme will deliver over 57,000m² of Grade A office space to accommodate around 3,000 employees.

The Hill House proposals are said to contribute to the continued resurgence of the Fleet Street area, providing a unique design with cascading stepped green landscaped terraces.

Along with the much-needed new office space, the development will incorporate the existing Shoe Lane library, alongside flexible and affordable workplaces. In addition, there will be a top floor amenity space and a rooftop suitable for community events, offering outstanding views of the City.

Coupled with the building's green terraces, are plans to plant 28 new trees along adjacent streets and a larger public realm space, altogether delivering a 500% biodiversity net gain for the area.

Deputy Chairman of the City of London Corporation's Planning and Transportation Committee, Graham Packham, said: "Through the City Corporation's Destination City programme, together with developments like Hill House, we are creating a unique and diverse offer for local workers, residents and visitors, to make the Square Mile a world-leading destination for all to enjoy."

Diary

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

Tuesday 21 May and Thursday 23 May 2024
Vibrations and floor dynamics
On-line Course
This two part course delves into the fundamental principles of vibration theory, exploring its application in structural design. Participants will gain insights into the mechanics of vibrations in structures, particularly in the context of floor dynamics and response. The course will also present the practical aspects of vibration analysis, providing participants with the knowledge and skills to utilise both finite element methods and simple hand calculations for assessing footfall induced vibrations.

Tuesday 4, Thursday 6, Monday 10, Wednesday 12, Friday 14 May 2024
Steel Building Design to EC3
On-line Course
As the experts in steel design, the SCI have prepared this course as an overview of the Eurocode provisions for steel building design. The course focuses on orthodox construction, covering the primary design issues for practicing engineers. The course follows the process of determining actions, considering combinations of actions, frame analysis and the assessment of second order effects. The course will then demonstrate how the resistance of members are calculated, but also how they can be extracted immediately from resources such as the 'Blue Book'.

Tuesday 4 June 2024
Open section truss joints
Webinar
Major trusses with significant internal forces are often fabricated from UC sections. This webinar will consider the design of the joints using simple calculations of the component resistances.

Jonathan Clemens: " We have to develop new ways to create opportunity from challenges."

New BCSA head aims to create opportunity from challenges

A more outward looking BCSA is likely to be the product of leadership from new Chief Executive Officer Jonathan Clemens, who has an established track record in organisational transformation and modernisation as well as proven business acumen. Nick Barrett hears something of his plans for BCSA's future.

Jonathan will already be well known to many clients of the constructional steelwork sector as well as to steelwork contractors after a working lifetime in the industry. The 58 year old building graduate has specialised in marketing steel products in a career spanning some 37 years, mostly with Corus and then Tata Steel.

He has an MBA in Engineering Management, which proved its worth as he rose from curtain wall and other aluminium architectural product manufacturer Kawneer in 1987 where he spent seven years in various commercial roles as well as becoming a Total Quality Management facilitator before joining the steel lintel and access cover manufacturer Caradon Jones in 1994.

By 1997 he was Commercial Manager of industry household name Catnic, until being offered the post of Managing Director of another industry household name Kalzip Limited, and Chief Executive Officer of Kalzip Inc, a post he occupied for 12 years until 2012. While at Kalzip he also gained overseas experience, managing businesses in the Middle East and the Americas for a time. "The manufacturing was predominantly roll forming and fabrication with a strong focus on project sales rather than sales to stock, which involved high levels of specification and engagement with clients and engineers for residential, schools, hospitals and retail."

Jonathan's next move was in 2012 to a strategic marketing role at Tata Steel Europe as Head of Marketing Industry Sectors. "This was to help determine how Tata Steel Europe (TSE) would address the competitive marketplace for steel within targeted geographic areas," said Jonathan. "The role formed the link between the Operational hubs and the functional centres of excellence in Marketing, Supply Chain and Sales."

From there he became Head of Marketing Construction & Infrastructure at TSE, a post held for six years until 2019. This brought full marketing responsibility for construction sales of TSE. "I managed a team and associated processes covering 14 businesses in Europe and Middle East with over 4,500 direct customers and more than £1 billion revenue. We established Sustainability management, created new digital offerings including BIM and a new website plus developed our customer relationship management (CRM) systems, as well as bringing new and innovative products to market. During this period, we also introduced structured customer satisfaction analysis and a five year strategy for the construction sector.

"This was a totally new department within the organisation and therefore having established the team we needed to develop the strategy, plan and processes from scratch. It was to support the creation of the new Construction sector within Tata Steel and was assembled to include the correct mix of skills and locations across Europe with the team resident in over six countries.

"In that job I spent time with the UK Government, the department of Business, Energy and Industrial Strategy (BEIS) in particular, a number of trade associations, universities and other bodies such as the World Steel. All of that will be relevant to working for BCSA, although the job will be about much more than just networking."

For the four years until he left Tata Steel last year Jonathan was back at Catnic, this time as Managing Director, where he successfully undertook a business turnaround and cultural transformation. "Supporting a premium brand position in terms of service and product quality has been key in maintaining market share within the UK, Germany and France as well as returning some of the best

"Some companies still ask whether they can afford BCSA membership. The question they should be asking is whether they can afford not to be members. One of my key aims is to convince them that they can't."

margins in Tata Steel UK," says Jonathan. Digital solutions were deployed across the business and lean manufacturing techniques were also implemented." Last year he was named one of the top 100 Supplier Influencers by the Builders Merchant Federation.

"I had full profit and loss accountability for the first time at Kalzip, a role that I enjoyed and learned so much from. Catnic provided fresh challenges along with profit and loss accountability, including modernising the company culture. A lot of that experience is relevant to the BCSA as it moves to adopt a more businesslike approach.

"BCSA has always provided an excellent service to members but we are in a rapidly changing world and what clients expect from steelwork contractors is changing while the regulatory and economic background is also producing new challenges and pressures. That brings opportunity and there is a lot of opportunity out there for BCSA and its members. We have to develop new ways to create opportunity from challenges.

"One thing I have learned from marketing is that the voice of the customer must be heard, that is paramount. Having full profit and loss accountability also gave me insight into the pressures being felt by BCSA members in their day to day businesses. I fully understand why they must be focused on cash and profit as well as continuing excellence in their product, which is world leading."

Turning Kalzip into a profit making organisation was a career highlight for Jonathan, and he intends to make his BCSA role as much of a success. "I'll redouble on efforts that have been made over the years to convince non BCSA members that they will see benefits from membership. Non members benefit a lot from the work paid for by members, but there is a wider range of advantages from BCSA membership that the industry needs to be educated in.

"BCSA is providing a good service to members and a lot will be done to make sure that service continues and develops. We will have to become a bit more commercial in how we operate, keeping pace with developments in areas like IT and artificial intelligence. We need to explain our relevance to members, making sure we deliver services relevant to their needs.

"We will liaise increasingly with other organisations, sometimes piggy-backing on efforts they are making in areas of joint interest. There are mutually rewarding opportunities to be pursued with the academic world, for example, where we can help each other.

"We also need to press home to clients that there are clear benefits to them from insisting that their steelwork contractors are BCSA members. It is the best assurance of quality and compliance with the constantly tightening regulatory requirements, like proving the sustainability of your supply chain, that they can have.

"Some companies still ask whether they can afford BCSA membership. The question they should be asking is whether they can afford not to be members. One of my key aims is to convince them that they can't." ■

"The voice of the customer must be heard, that is paramount."

Steel provides flexible lab solution

"Steel frame construction enabled a shorter construction programme, which was important for the developer."

Europe's largest clinical academic campus is set to receive a major boost with the delivery of the £35M Citylabs 4.0 development.

The new building will occupy a prominent position within the existing campus.

Structural steelwork's numerous attributes have come to the fore on the construction of the Citylabs 4.0 scheme in Manchester.

A seven-storey steel-framed block, represents the third phase of the wider Citylabs masterplan, which is located on the Manchester University NHS Campus. Already home to a number of major international medicine and health innovation organisations, this latest building will provide 11,600m² of additional specialist lab space.

With the UK said to be in the midst of a significant shortage of lab space needed to support the demand and burgeoning growth of the life sciences sector, the overall Citylabs development offers world-leading lab space for companies working in precision medicine, including those in diagnostics, genomics, biotech, medtech and digital health.

"Steel frame construction enabled the structural design of Citylabs 4.0 to minimise the number of internal columns within the floorplates, and therefore increase the flexibility and spatial arrangements for the building," explains Arup Senior Structural Engineer James Thorneycroft.

"It also enabled a shorter construction programme, which was important for the developer."

Alongside the use of structural steelwork, a sustainable approach was adopted for the project's design. The building is expected to achieve net zero carbon in construction and operation, while its shared spaces will be 100% electric.

As a highly energy efficient building, it is targeting a BREEAM 'Excellent' and EPC A ratings and it will include 208m² of solar panels, which is enough to charge an average electric car approximately 1,235 times. The sustainable design extends to the exterior of the building, as a cladding system made from 75% recycled end-of-life aluminium (post-consumer scrap) will be used.

The seven-storey development incorporates infrastructure to accommodate CL2 labs and specialist equipment, including increased floor loading, enhanced cooling systems and ventilation provisions, and a large platform lift. Businesses that locate here will also benefit from 100GB superfast connectivity, shared breakout spaces, an internally secure cycle storage with showers and kit drying room, and have access to the campus' 150-person event space, multiple meeting rooms, cafes and supermarket.

Commenting on the project, Dr Kath Mackay, Director of Life Sciences at Bruntwood SciTech, said: "There has never been a greater opportunity for the UK and Manchester to support the life science sector as there is currently, by investing in the much-needed specialist lab space and infrastructure companies need to scale and collaborate.

"As the Citylabs campus approaches its 10th anniversary, we're excited to get underway with Citylabs 4.0 and look forward to welcoming new businesses to this community and world-leading hub for health innovation. We will continue to enhance the city's knowledge economy and private, academic and clinical collaboration opportunities."

Prior to the construction programme commencing, the site had been used as a surface car park for more than 20 years, while a few two-storey temporary structures, associated with nearby Manchester Royal Infirmary diabetes centre were also located on the plot.

Once the site was made ready for the new build, main contractor GMI Construction installed a series of 15m-long 500mm-diameter continuous flight auger (CFA) piles. Supporting the steel framed building, there are typically three piles for each column.

Starting at ground floor level, as there is no basement on this project, the steelwork is based around an approximate 13.5m × 7.5m column grid pattern for the entire building.

Spanning between the columns, 600mm deep ribbon cut Westok cellular beams at 3.75m centres have been used. Each beam has a series of 400mm-diameter openings, through their webs at 620mm centres that enable the numerous building services within the building to distribute around the floor plate.

Westok worked in close collaboration with the project team to optimise the design of the floor plate. The company's Design Team Manager, John Callanan comments: "Following an initial interest in a plate girder option, the demands of the scheme were satisfied with a lean, lightweight Westok cellbeam design solution. We worked closely with Arup and the wider team to ensure the service and vibration requirements were achieved."

The cellular beams also support metal decking and a concrete topping to form a composite flooring solution.

During the early design stages, a variety of different structural framing options were considered, including an in-situ concrete frame, and precast concrete slabs. Following

Two-storey high CHS columns add some architectural interest around the lower levels of the building.

FACT FILE
Citylabs 4.0, Manchester
Main client: **Bruntwood SciTech**
Architect: **Sheppard Robson**
Main contractor: **GMI Construction**
Structural engineer: **Arup**
Steelwork contractor: **Leach Structural Steelwork**
Steel tonnage: **1,000t**

The completed project will add valuable extra lab space for the expanding campus.

an optioneering study, it was decided that a steel frame with composite metal decking offered the best solution for the project brief, which was to provide a lightweight lab space akin to a commercial office.

Leach Structural Steelwork Preconstruction Director Karl Hunter, adds: "The final design solution allowed for a much higher use of Electric Arc Furnace (EAF) produced steelwork on the scheme, thereby reducing the embodied carbon, while maintaining the same dimensions and floor to floor."

Stability for the frame is provided by braced bays with diagonal vertical flat cross-bracing members (transferring tension loads only), located around the central circulation core (steel-framed stair and lift shafts). These were chosen over larger single diagonal braces (that need to transfer both tension and compression loads) as they help minimise the core wall build-up and thereby lessens the impact on the all-important lab floorplates.

Adding some architectural verve to the scheme, the ground floor of the building has a higher floor-to-ceiling height than the upper levels. Providing the main entrance lobby with a double-height external space, the first-floor slab is set inwards in this location.

A further architectural highlight is a row of circular hollow section (CHS) columns along the main northern façade. Extending from ground level to the underside of the second floor, the columns will be left exposed in the completed scheme and so CHS members were chosen for their preferred aesthetic appeal.

Summing up, Bruntwood SciTech Managing Director Tom Renn, says: "Manchester's life science sector continues to thrive and continues to make a statement in being the place to be for start-ups and international companies in the sector to cluster together.

"This new building can facilitate direct collaboration with the NHS and the ability for companies to accelerate getting their product or service into the healthcare market faster, something truly unique to our city."

The Citylabs 4.0 building is due to complete in 2025. ■

Top marks for steel design

Steel construction is playing a leading role in the delivery of a major upgrade that will increase a south London school's capacity and provide new and modern educational facilities.

Helping to meet the growing demand for pupil places in the Royal Borough of Kingston upon Thames, a construction programme consisting of new build and refurbishment elements, is underway at the Burlington Junior School in New Malden.

Main contractor Morgan Sindall Construction is delivering a new three-storey steel-framed building that features 15 high specification teaching rooms alongside a sports hall.

The company's contracted works also include the refurbishment of the school's Victorian building, the installation of two multi-use games areas (MUGA), landscaping and the demolition of an outdated 1970s block. The overall scheme is aiming to achieve a BREEAM 'Excellent' rating.

Once the demolition work is complete, a landscaped garden and a staff car park will be created on the plot. This will replace the school's old car park that was located on the site of the new building.

Robert Shankland, Project Manager at Royal Borough of Kingston upon Thames, says: "Delivering high quality education and supporting opportunities for children and young people across the borough is one of our top priorities as we look to create a fairer Kingston.

"Providing the best facilities for that to take place is very important, and we are pleased to have experts like Morgan Sindall on board to help us create sustainable spaces that can help more of our children and young people flourish."

Work on the project began with the new building in July 2023, as Morgan Sindall Site Manager Christopher Cox, explains: "Prior to the steel frame being erected, our early works included the installation of piled foundations and casting the ground floor slab.

"Having the slab installed gave the steel erection team a clean flat surface for their MEWPs, which helped keep the programme on schedule.

"We also installed the two concrete cores, in preparation for the steelwork, as they provide the stability to the main frame."

The cores are positioned at either end of the teaching block and provide lift and stair access to the building's first and second floors.

The new building's teaching spaces are arranged along the northern elevation, with the first and second floors overlooking a central 12m-wide atrium that runs the length of the block, from one core to the other.

A landscaped terrace will be located at first floor level.

"Because of the required spans, the sports hall was always going to be a steel-frame, while the roof of the teaching block has a complex geometry that also lends itself to a steel solution."

A series of pyramid-shaped lanterns adorn the roof of the teaching block.

FACT FILE
Burlington Junior School, New Malden, London
Main Client: **Royal Borough of Kingston upon Thames**
Architect: **TPM Studio**
Main contractor: **Morgan Sindall Construction**
Structural engineer: **Shockledge Structural and Civil Engineers**
Steelwork contractor: **SDM Fabrication**
Steel tonnage: **170t**

The teaching block was completed, prior to the adjoining sports hall being installed.

A first-floor steel bridge spans the teaching block's central atrium.

Adding some architectural interest, the building steps back at first floor level along the southern elevation, forming a terrace, which will be landscaped to create an outdoor space. At first floor, a bridge, formed by two 12m-long beams, spans the atrium, linking the classrooms with the terrace.

Below the outdoor space, the southern elevation's ground floor accommodates offices, a plant room and changing facilities for the adjoining sports hall.

Throughout the teaching block, the steel frame supports precast flooring units, weighing up to 3t each, which form the first and second floors as well as the terrace.

The decision to design the new building in this way was made after considering a number of framing options.

"As the project is a local authority primary school, we always knew the budget would be restrictive, so we were always looking for ways to save on costs within our design," explains TPM Studio Director Glen Moorley.

"As such, we decided to pursue a design approach that would allow us to expose as much of the superstructure and building fabric as possible, without the need for linings or boxing.

"The use of precast planks for the floor structure worked well for the spans we required, allowing each classroom to sit within a structural bay with columns located within dividing walls. In-line with our design approach, the precast planks also presented a fair-finish to the soffit, providing a suitable ceiling finish."

Leaving the soffits exposed will also allow the building to benefit from the thermal mass they provide, assisting in cooling classroom spaces during summer months to prevent overheating.

Starting with the steelwork around the eastern core, the entire steelwork package was erected using a single 50t-capacity mobile crane.

As well as fabricating, supplying and erecting the steelwork, SDM Fabrication was also responsible for installing the precast stairs and placing the precast flooring units, which were lifted into position along with the steelwork.

The stairs were delivered to site in units, weighing up to 7t each. They had to be placed inside of the cores, and this lifting operation required a much larger 230t-capacity mobile crane.

The sports hall adjoins the teaching block alongside the western core. It was the final element of the steel frame to be erected by SDM Fabrication.

Topping the sports hall, four 17m-long trusses span the structure at roof level and create the required column-free space. The trusses were delivered to site as fully-assembled sections, weighing 1.7t each.

"Because of the required spans, the sports hall was always going to be a steel-frame, while the roof of the teaching block has a complex geometry that also lends itself to a steel solution," says Shockledge Director Barry Magee.

The complex design consists of nine pyramid-shaped lanterns, measuring 8m-wide and 1.5m-tall. They will each support a vent (wind catcher) helping to cool the building and aiding the overall thermal strategy, in conjunction with the flooring units.

The steelwork for the lanterns was delivered to site in sections, which were then assembled on a temporary trestle. Once complete, the lanterns, each weighing 2t, were then lifted into place.

The new school building is due to be finished by the end of this year, in time for the school to use it for the first term of 2025. The remainder of the works will then be completed by May 2025. ■

Steel extends viaduct's lifespan

FACT FILE
A38(M) Tame Valley Viaduct, Birmingham
Main client: **Birmingham City Council**
Main contractor: **VolkerFitzpatrick**
Structural engineer: **Jacobs Realis**
Steelwork contractor: **Taziker Industrial**
Steel tonnage: **180t**

Temporary access platforms allow all of the work to be carried out from beneath the viaduct.

The A38(M) Tame Valley Viaduct, a critical piece of transportation infrastructure that links the M6 with Birmingham city centre, is being strengthened and refurbished to preserve its longevity and minimise the need for future work.

Carrying approximately 80,000 vehicles a day, the Tame Valley Viaduct forms the northern end of the A38(M) Aston Expressway, one of the Midlands' most important highways, linking the UK's second city with 'Spaghetti Junction' and the wider motorway network.

Built in the early 1970s, the steel composite structure was not designed for modern-day traffic volumes and due to its advanced age, it has begun to show signs of deterioration.

To alleviate this problem and extend the lifespan of the viaduct, main contractor VolkerFitzpatrick is undertaking a four-and-a-half-year programme to strengthen and refurbish the steel superstructure.

Due to its importance and to minimise traffic disruption, the viaduct has to remain open throughout the works. To enable this, VolkerFitzpatrick has erected a series of high-level access platforms, which span from pier to pier and allow all of the work to be carried out from beneath the roadway.

To strengthen the viaduct, the programme includes the installation of new steelwork stiffeners to the inside of the viaduct's 3m-wide × 1.9m-deep box girders, via welded and bolted connections. Alongside this work, all of the original welds are being tested and repaired where necessary.

The busy viaduct is one of the Midlands' most important transport assets.

Overall, the viaduct is 640m long and 26m-wide with a total of 22 spans. There are four box girders supporting the structure along the majority of its length. The exception being the two slightly wider northern most spans that link to Spaghetti Junction, which have five supporting girders.

"In order to make the initial phase of the work as efficient and quick as possible, we have two steelwork contractors repairing the defective welds and adding new steelwork to strengthen the viaduct," says VolkerFitzpatrick Senior Project Manager David Landeryou.

"Taziker Industrial are working from the northern end of the viaduct and will complete 11 spans, while another contractor is undertaking the same work on the southern section."

Both steelwork contractors are scheduled to complete their strengthening works and meet in the middle of the structure in mid-2025. As well as this work, Taziker is also contracted to grit blast and repaint the entire superstructure with a new anti-corrosion coating. This part of the programme, which is due to complete in 2026, consists of 49,000m² of internal paintwork and 38,000m² of external paintwork.

Taziker Industrial Project Manager David Shrader, says: "The work is progressing really well, the grit blasting programme is ahead of schedule and the strengthening works are set to complete as planned.

"Two spans of the viaduct are over railway lines and these sections will be completed in two blockades, which we're expecting to take place during summer."

Adding to the complexity of the scheme, the viaduct also crosses the River Tame, a number of local roads and also spans over numerous business premises.

The access platforms are sufficiently shrouded to prevent any items from falling onto any of the assets below, while a steelwork strengthening trial, undertaken by the project team three years ago has helped with the current programme.

"As we've progressed through the project, the insight and knowledge we gained from completing a trial on the viaduct prior to our award of the full structural works has been invaluable," adds Mr Shrader.

"It's a huge structure and we've been able to get to grips with the task at hand much quicker due to knowing exactly what we're dealing with."

Another significant challenge of the project is the fact that all of the strengthening and testing work is being carried out inside of the box girders and their connecting cross boxes.

Via the platforms, the project's workers gain entry into the girders through access points, measuring approximately 530mm x 530mm, which

All of the strengthening work is being carried out inside of the box girders.

are located intermittently along the entire length of the superstructure.

This working environment is classified as a confined space and so all of the workers hold medium to high risk confined space training. Safety and worker welfare is paramount and so each team member has a gas monitor and escape kit with an attached digital tracking device, which allows the site office to see exactly where everyone is within each girder. If anyone is taken ill, their location is already known and VolkerFitzpatrick's first aid rescue team, who are on permanent standby, would quickly proceed to evacuate the worker.

The confined nature of the workspace has also had a bearing on the project's steelwork as all materials and equipment must be able to fit through the girder access points.

In total 1,900 steel stiffeners are being installed within the viaduct's girders. Providing the superstructure with the required extra load capacity, these steel members are fabricated plates, which are up to 30mm-thick. The majority of the plates vary in size from 300mm × 300mm × 15mm up to 600mm × 450mm × 20 and weigh up to 100kg.

The steelwork elements are lifted up to the access points by hoist, before being manoeuvred into the girder. The steelwork is then installed with either a bolted or welded connection.

As well as the new steelwork being installed, more than 5,000 welded connections are being repaired, following an exhaustive testing process. Keeping this work on schedule, there are currently up to 14 welding teams onsite.

Engaging with the community is also a key element of this project. The team has provided employment opportunities for local people and run a number of recruitment days in partnership with neighbourhood groups.

As well as working with its supply chain contractors from the surrounding area, VolkerFitzpatrick says it is continually engaging with nearby secondary schools, colleges and youth charities, while also being committed to providing a minimum of seven apprenticeship placements during the scheme's lifetime.

Summing up, West Midlands Mayor Andy Street, says: "The project is important as the viaduct would have needed weight and width restrictions within a few years and one day could have been closed down completely.

"The 80,000 vehicles a day it carries is far more than what it was designed for when it opened and so I am delighted that, we are pressing on and getting this essential maintenance work done.

"We are making a huge effort to encourage people to use public transport across the West Midlands, but people who rely on the car cannot be ignored and roads such as the Aston Expressway remain a critical part of our region's infrastructure." ■

A new stiffener plate is bolted into position within a girder.

One of the original welded connections is repaired by the Taziker team.

FACT FILE
Ardgowan Distillery, Inverkip
Architect: **Ardgowan Distillery Company**
Architects: **Hypostyle (Scotland) and Spitzbart and Partners (Austria)**
Main contractor: **Muir Construction**
Structural engineer: **Blyth & Blyth**
Steelwork contractor: **Hescott Engineering**
Steel tonnage: **260t**

Raising the roof

Steelwork's flexibility and ease of construction have come to the fore for a new distillery featuring a steep and sloping pitched roof.

Having experienced a number of fluctuations over the past couple of centuries, whisky production in Scotland is currently experiencing a high point. It might even be described as a boom, as more than 30 new distilleries have opened in the past decade, representing a 30% growth in the industry.

The upsurge in demand is partly driven by increased sales to Asia and North America, but it also seems more drinkers in the UK are acquiring the taste for whisky and are partaking in a dram or two.

Tapping into the buoyant market for high-quality malt whisky, a landmark distillery and visitor centre is under construction on the Ardgowan Estate, near Greenock, 30 miles east of Glasgow.

Housed in an eye-catching steel-framed structure with a steep and sloping pitched roof, the Ardgowan Distillery will have the potential to eventually produce up to two million litres of whisky a year.

The building's tall roof design creates a light-filled environment for the facility, while also forming a structure that easily spans over and accommodates the process equipment, which includes a five-tonne mash tun, fermenters and copper stills.

The production equipment will help make this distillery state-of-the-art, as it will use extensive heat recovery at each stage of the production process and CO_2 captured from fermentation in order to eventually achieve carbon negative distillation.

There will be a closed-loop cooling tower to minimise the consumption of water and eliminate the discharge of hot water into the nearby Kip River.

Distillery CEO Martin McAdam, says: 'This project will be a major boost to the local economy – both during construction and in operation.

"Our goal is to build a world-class facility, which will attract tourists and bring economic and social benefits to Inverclyde."

Forming the distillery building's steel frame, the perimeter columns are fabricated trusses, 7.3m-tall × 1.35m-deep. Providing the necessary rigidity for the roof, the trusses were chosen instead of traditional columns as they are perceived to be more aesthetically-pleasing.

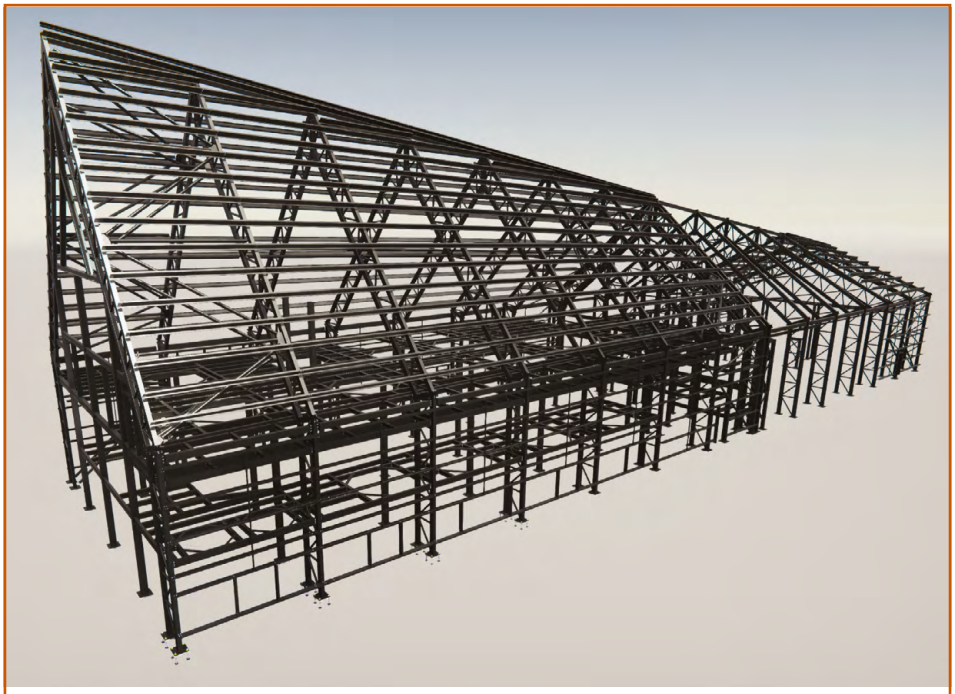
All of the project's steelwork, including the trusses, will be left exposed within the completed scheme and consequently all steel sections are fully galvanized.

On the top of each column truss, there is a crank point, which connects to a 1.35m-deep rafter truss member that forms the pitched roof. This feature element that tops the distillery building also slopes from one end of the structure to the other. Creating the slope, the rafters are 16.5m at the highest end of the building and 10m-high at the lowest.

Both the column and rafter trusses were brought to site as fully-welded elements, ready to be erected.

Approximately 60m-long, the steel structure has been designed as a portal frame. It will be divided into two halves, with area housed within

The steel frame will be fully exposed within the completed building.



Cost-effective roof solution

A redesign was undertaken to the roof steelwork in order to achieve the architectural vision of a smooth seamless structure that slopes in two directions.

"In order to have a faceted roof, we replaced all of the existing roof support hot rolled steelwork, which were circular hollow section (CHS) members, with conventional purlins," says Hescott Engineering Director Chris Scott.

"By connecting these to correctly positioned cleats that are all minutely different, and using the torsionally flexible purlin to take up the rotation, we were able to realign the roof to match the architect's model."

All of the necessary calculations were provided by an independent engineer, as no software package was available to check the rails with the required twist.

"This was a successful engineering accomplishment that saved the client money and provided a more elegant and efficient design," says Mr Scott. ■

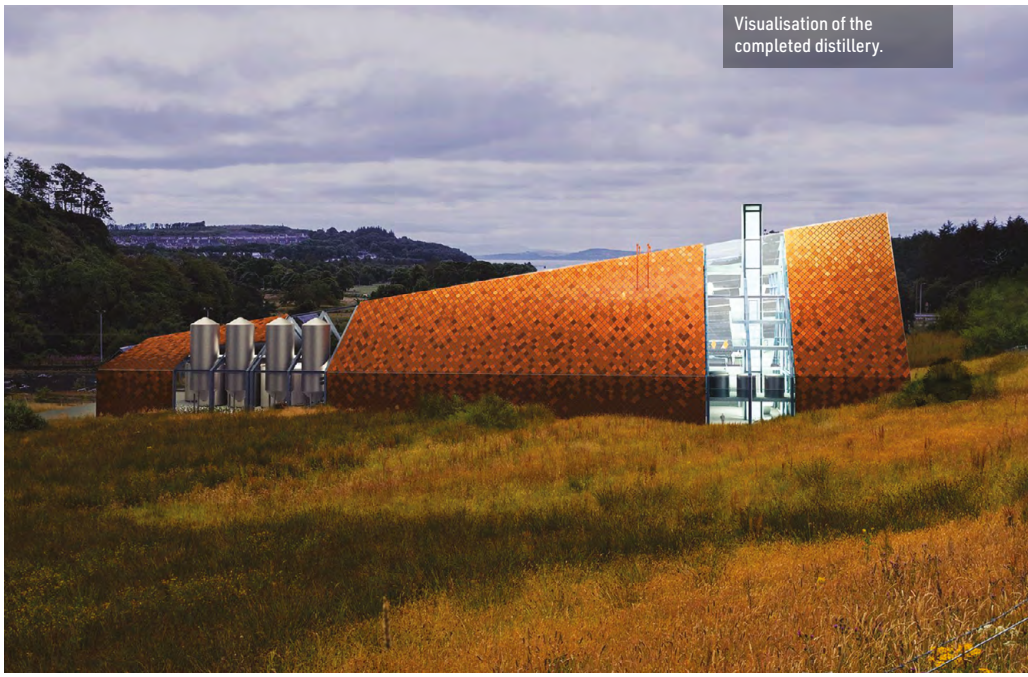
the highest part accommodating the milling, mash house and still production areas, and the opposite end housing tanks and silos.

The main silos are positioned within two bays of the structure that will not be roofed over. Open to the elements, this part of the building will be covered by a netting fabric, which will maintain the roof profile to match the structure either side.

Working on behalf of main contractor Muir Construction, Hescott Engineering completed the erection of the main frame during March. All of the steelwork was installed using a single 60t-capacity mobile crane.

Prior to the steelwork erection programme commencing, the construction team had completed the demolition of a saw mill that had previously occupied the site. Pad foundations and base plates were then installed, to support the steel truss columns.

Following on from the main frame, Hescott Engineering then installed the building's internal steelwork. This consists of two floors, an intermediate 3m-high level that surrounds ▸20



Visualisation of the completed distillery.

"As tanks and vessels are installed, the steelwork will be erected around them."

▸19 the processing tanks, and a main production floor, which is 6m above ground level and covers approximately half of the building's footprint.

"Including a number of walkways, all of the internal steelwork erection had to be coordinated around the installation of the processing equipment," explains Ardgowan Distillery Construction Project Manager Stephen Caughey.

"Hescott will have to work hand-in-glove with the process equipment installers. As tanks and vessels are installed, the steelwork will be erected around them."

Certain vessels and tanks will have to be replaced every ten to fifteen years and to facilitate their removal, demountable apertures have been left within the steel-framed floors. This lifting operation will be performed by a gantry crane, installed within the building, and supported from the main steel frame.

A second phase of the project is planned for the near future. This will consist of a steel-framed visitor centre that will sit adjacent to and abut the highest end of the distillery.

Once open to the public, visitors will have little trouble finding Ardgowan Distillery, as the tall church-like building, which has been described as a cathedral to whisky, will be easy to spot. Surrounded by hillside woods, but sat in a valley clearing, the building will have a copper/red and bronze cladding system, matching the autumn hues of its countryside location and creating stunning addition to the surrounding Ardgowan Estate. ■

All of the steel trusses were delivered to site as fully-welded sections.

The completed steel frame has a church-like appearance.

Galvanized trusses

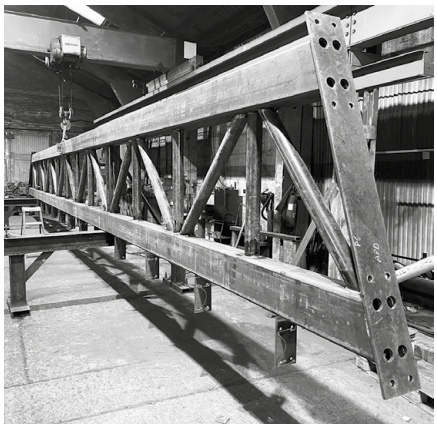
The Ardgowan Distillery departs from the common portal frame solution for enclosing space. David Brown of the SCI comments on the use of galvanized trusses for the frame members.

While orthodox portal frames from rolled sections may be the de facto choice for many commercial, manufacturing or industrial facilities, the Ardgowan Distillery bucks that trend and adopts a portal frame constructed from trusses. The design principles for the frame are exactly the same as orthodox construction – the eaves will carry the largest bending moment, although this will be manifest as axial forces in the truss members. In just the same way that designers should be used to providing restraints to the inner compression flange of an orthodox rafter, the compression chords of the trusses will need out of plane restraint. Instead of rafter stays, it is more common to provide longitudinal members between the compression chords connecting to bracing at the ends of the building. This is the usual solution when designing a trussed roof for uplift – the bottom chords experience compression and must be restrained.

Although the Ardgowan Distillery is a portal formed from trusses, there is no reason that the normal frame stability checks should be ignored. It would be expected that the in-plane stability of a frame of this form would not be a problem, since both chords of each column are connected to the foundation, but developing the habit of always checking in-plane stability is recommended. A second recommended habit is for the structural designer to verify the resistance of the welded nodes, so that expensive reinforcement is not required.

The second unusual feature of the Ardgowan Distillery is the galvanized trusses, which are fabricated from hollow sections. The internal members are circular hollow sections (CHS) and the chords are rectangular hollow sections (RHS). Special rules must be followed when galvanizing items of this type. The entirety of the internal volume must be vented, to avoid the risk of explosions when placed in the galvanizing bath. The truss end plates have large vent holes for this reason and to allow any molten zinc to run out. The internal CHS members were also vented for the same reason.

A completely prefabricated truss is generally too large to be immersed into a galvanizing bath in one



operation. One end is dipped and then the other, commonly known as "double-dipping". This means that one end of the truss is at the temperature of the galvanizing bath (around 450°C) whilst the other end is at room temperature. This can cause issues for highly restrained welded fabrications, so taking advice is recommended. ■

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 will become 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**

Nature calling

As part of innovative plans to compensate for potential impacts of a nearby windfarm, three steel-framed artificial nesting structures have been installed along the Suffolk coastline to house a vulnerable species of seabird.

Described as a first of its kind, Ørsted (a global leader in offshore wind), has commissioned three steel-framed artificial nesting structures (ANS) specially-designed to house kittiwake.

The structures are located approximately 1km offshore - with one close to the Minsmere Nature Reserve and the other two located near South Beach, Lowestoft. These nearshore locations place the structures close to existing, thriving kittiwake colonies, while minimising disturbance to local residents and business owners. The scheme is also part of innovative plans to compensate for potential impacts of the Hornsea 3 windfarm on the species.

Despite a lack of suitable natural nesting sites, such cliffs in Suffolk, black-legged Kittiwake have colonised the area and populations are expanding, highlighting its ecological suitability. This makes east Suffolk one of the most likely places for artificial structures to be colonised quickly and for the compensation measures to have the highest chance of success.

Each ANS comprises of an octagonal topside, measuring 7m-high and 9.5m-wide, founded on a 1.6m-diameter monopile. The piles protrude above the waterline and have an embedded depth of 30m below the seabed.

Working on behalf of main contractor Red7Marine, Four-Tees Engineers fabricated, supplied and helped install each of the three topside ANS elements.

"The topsides each weigh approximately 65t and are fabricated from a variety of sections and plate," explains Four-Tees Managing Director Tim Stedman.

Designed around a circular sleeve that connects to a monopile, the topside's frame includes a series of RHS 450mm x 250mm x 8mm members that radiate outwards from a central point. These sections connect to eight similar rectangular hollow sections (RHS) that form the outer octagonal shape. This part of the steel frame also supports a steel panel flooring system.

Eight columns support the ANS walls and are topped by an outer ring of CHS members that in turn connect to 300mm x 200mm x 6.3 RHS sections that form the roof and rake towards a central node.

Within the eight sides of the structure, seven have steel panels containing alternating rows of fully

Prefabricated steelwork has proven to be the ideal solution for the installation of the offshore Artificial Nesting Structures.

FACT FILE
Artificial Nesting Structures (ANS), Lowestoft
Main client: **Ørsted**
Main contractor: **Red7Marine**
Structural engineer: **Royal Haskoning**
Steelwork contractor: **Four-Tees Engineers**
Steel tonnage: **195t**

partitioned, open, and semi-partitioned ledges with a capacity for 500 breeding pairs of kittiwake. This experimental design will provide valuable insight on the nesting preferences of kittiwake and help inform future compensation projects for the industry.

The artificial nesting structures were designed by a team of ecologists, architects, and engineers to ensure they are attractive to kittiwake and fit in with the landscape. For example, they have narrow ledges and vertical sides to replicate the cliffs where kittiwake would naturally nest.

Individual nesting spaces are fitted with a sliding perspex panel, which will allow researchers to view the kittiwake from inside the structures without the birds being able to see them, as well as allowing for safe handling for monitoring purposes.

Allowing researchers access into the structure, the eighth side of the topside is fitted with a set of double doors, a platform and a ladder.

"We did a trial erection and fit-out of each ANS at our facility, before the steelwork was painted white and delivered to a dockside assembly site in Lowestoft," adds Mr Stedman. "It was important to make sure everything fitted together correctly before the ANS were installed. The project brief was to minimise the work that needed to be done out at sea."

Once in Lowestoft, the steel-framed topside structures, along with all of the associated elements, were re-assembled on temporary trestles, before the completed structures were lifted on to a jack-up barge.

Once the barge was in the correct maritime location, the construction sequence for each of the three ANS could commence. The first task was to install each supporting monopole and driving it to the required depth.

Following this, the topside fixtures were grouted into position and the topside structures lifted and bolted onto the structure. Navigation lights and systems were also installed.

The nesting structures will be monitored every year to count the number of birds, occupied nests, and their productivity. In addition, monitoring systems are in place for the existing kittiwake colonies in north east England and east Suffolk and the results will all be shared with local groups such as the Lowestoft Kittiwake Partnership.

Kristen Branford, Managing Director at Red7Marine comments: "We are delighted to announce the successful completion of the project involving the installation of three artificial nesting structures.

"These structures will play a crucial role in supporting an important and vulnerable species, whilst enabling the generation of clean, green electricity for the Hornsea 3 project. This project is the first of its kind and required meticulous planning and consideration, and we are proud to have achieved this significant milestone.

Our success in delivering this project was greatly attributed to effective supply chain management. With multiple interfaces involved, we recognised the importance of coordination and collaboration to meet project timelines."

Eleni Antoniou, Environmental Manager at Ørsted, says: "Kittiwake are listed as at risk from extinction and with climate change as a key driver to their decline, a move towards a green energy system could help considerably in the long-term conservation of the species. In the meantime, the provision of these structures will provide a safe, nesting space to enable future generations to raise young away from predators and out of town centres." ■

One of the bases for an ANS is assembled at the fabrication yard.

"We did a trial erection and fit-out of each ANS at our facility, before the steelwork was painted white and delivered to a dockside assembly site in Lowestoft."

An assembled topside unit is lifted on to the barge.

Once the pile was installed, the steel-framed ANS topside unit was lifted into position from the jack-up barge.

Design of steel beams with large web openings

BS EN 1993-1-13: Beams with large web openings has been published by BSI. It deals with the design of steel beams with circular, hexagonal, rectangular, elongated circular and sinusoidal openings and is a sister-document to the design of composite beams with large web openings that is being worked on currently under EN 1994-1-1. Mark Lawson of the SCI, who was a member of the Project Team, explains some of the technical aspects of this new Part.

To a UK audience, Eurocode 3 Part 1–13 *Beams with Large Web Openings* follows the SCI publication P-355 relatively closely and it includes the following information:

- Application for steel grades up to S460.
- Rules for different opening shapes.
- Beams with relative slender webs depths, $h_w \leq 121\ t_w\ \varepsilon$, where t_w is the web thickness.
- Limits on web opening sizes for both unstiffened and stiffened openings.
- Two methods for Vierendeel bending checks at circular openings, which are a simplified equivalent rectangle method and a radial stress method.
- Web-post buckling rules, now using buckling curve 'a' to BS EN 1993-1-1 and extended to include hexagonal openings.
- Rules for the buckling resistance of the compressed top Tee at long openings.
- Rules for end-post buckling based on an adaptation of the web-post buckling rules.
- Rules for asymmetric steel sections taking account of an in-plane web-post moment required for re-distribution of shear forces between the Tees.
- Simplified rules for the additional deflection due to large web-openings.
- Lateral torsional buckling verifications based on the section properties at the centre-line of the openings.

This article covers the principles of design of large web openings in steel beams and a second article will summarise the rules for end-posts based on recent tests at City, University of London.

The limits on maximum opening sizes for unstiffened openings are presented in Table 1, below. These are Nationally Determined Parameters so could be modified for use in the UK. In this table, the effective opening length of elongated circular openings is taken as $a_{eff} = a_o - 0.3h_o$, where a_o is the opening length. The corresponding limiting dimensions for longitudinally stiffened openings are given in a further table.

Verifications at large web openings

The verifications that should be made at large web openings in steel beams are:

- Pure shear check based on the reduced depth of the web
- Bending resistance at the centre-line of the opening
- Vierendeel bending of the web-flange Tees due to transfer of shear across the opening
- Web buckling next to isolated openings
- Web-post shear and buckling between closely spaced openings
- End-post shear and buckling next to the connections
- Combined compression and bending of slender top Tees in regions of high moment
- Calculations of the relative deflection across large web openings, where this impairs the serviceability performannce

The resistance to Vierendeel bending of the Tees at large rectangular openings can be increased by welding horizontal stiffeners on one or both sides of the beam that project at least 150mm past the ends of the opening to act as an 'anchorage length'.

For Vierendeel bending at circular, elongated circular and hexagonal openings, the equivalent rectangular opening width, a_{eq}, defines the double curvature moment that is developed in the web-flange Tees. The critical angle for Vierendeel bending around a circular opening is at approximately 26° to the vertical and so the equivalent rectangular opening width for this verification is given as $a_{eq} = 0.45\ h_o$, where h_o is the opening diameter.

Web-post buckling between openings

For closely spaced openings, web-post buckling may occur due to the transfer of horizontal shear which leads to 'strut and tie' action in the web-post. The method for web -post buckling uses an effective length of the equivalent strut, which is illustrated in Figure 1 (over page) for adjacent circular openings. The buckling strength is obtained using buckling curve 'a' to EN 1993-1-1, which is justified by correlation with tests and by the additional restraints to plate buckling in comparison to an equivalent strut.

For this verification, the compressive force acting on the web-post, $N_{wp,Ed}$ should be taken equal to the horizontal shear force in the web-post and it is required that the buckling resistance of the web-post exceeds this force.

The non-dimensional slenderness of the web-post is defined as follows for ▸26

Table 1: Limiting dimensions for different shapes of unstiffened openings

Shape of opening	Maximum opening height, h_o	Maximum opening length, a_o	Minimum edge to edge spacing, s_o	Minimum depth of Tee	
				Tee in compression	Tee in tension
Circular	0.8 h	-	0.1 h_o	Max($t_f + r + 10$mm; $t_f + 30$mm)	Max($t_f + r + 10$mm; $t_f + 30$mm)
Hexagonal	0.75 h	1.5 h_o	0.25 h_o		
Rectangular	0.75 h	2.5 h_o	Max($0.5a_o$;h_o)	Max(a_o / 12; 0.1h)	0.1h
Elongated	0.8 h	3 h_o	Max($0.25a_{eff}$;$0.5h_o$)	a_{eff} / 12	Max($t_f + r + 10$mm; $t_f + 30$mm)
Sinusoidal	0.8 h	5 h_o	0.25 h_o	a_{eff} / 12	

a_{eff} = effective opening length; h = beam depth; t_f = flange thickness; r = root radius

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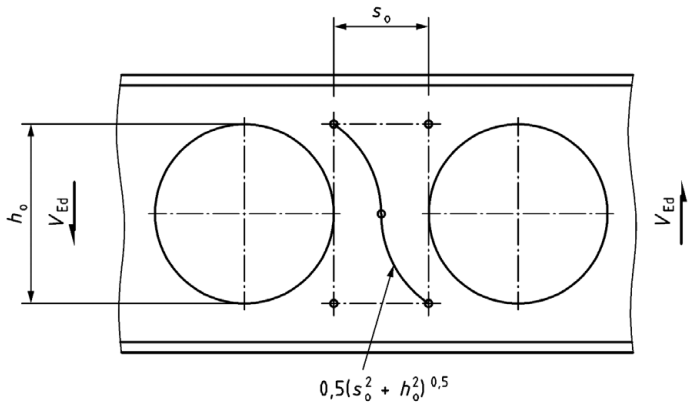

Figure 1 - Illustration of the effective length due to web-post buckling between circular openings

the different opening shapes, where so is the edge to edge spacing of the openings.

For circular openings and elongated circular openings:

$$\bar{\lambda}_{wp} = \frac{1.75\sqrt{s_o^2 + h_o^2}}{t_w}\frac{1}{\lambda_1} \text{ but } \bar{\lambda}_{wp} \le \frac{2.4\, h_o^2}{t_w}\frac{1}{\lambda_1}$$

For cellular beams with unequal web thickness in the two parts, t_w may be taken as the average web thickness in this formula.

For rectangular openings:

$$\bar{\lambda}_{wp} = \frac{2.5\sqrt{s_o^2 + h_o^2}}{t_w}\frac{1}{\lambda_1} \text{ but } \bar{\lambda}_{wp} \le \frac{3.5\, h_o^2}{t_w}\frac{1}{\lambda_1}$$

The web-post buckling resistance should be taken as:

$N_{wp,Rd} = \chi_{wp}\, s_o \min\{t_{w,rT} f_{y,rT}\,;\, t_{w,bT} f_{y,bT}\} / \gamma_{M1}$

Where χ_{wp} is determined to buckling curve 'a' using λ_{wp}

$t_{w,rT} f_{y,rT}$ and $t_{w,bT} f_{y,bT}$ are the multiples of the top or bottom web thickness and the steel strengths for these parts.

γ_{M1} is taken as 1.0.

Buckling Resistance of a Compressed Top Tee at a Large Rectangular Opening

A new method is presented for the stability of slender Tees at long web openings. The definition of a 'long opening' is given in clause 8.3.2 (1). The combination of compression, Vierendeel bending and bending from local applied loads acting on a slender is determined as follows:

$$\frac{N_{T,Ed}}{N_{b,Rd}} + \frac{0.4M_{T,Ed} + M_{add,Ed}}{M_{T,Rd}} \le 1.0$$

where

$$M_{T,Ed} = \frac{V_{Ed} a_{eff}}{4} + N_{T,Ed} w_{vier,add}$$

where

$N_{T,Ed}$ is the compression force in the top Tee resulting from global bending

$N_{b,Rd}$ is the buckling resistance of the top Tee

$M_{T,Ed}$ is the moment in the Tees due to Vierendeel bending combined with an eccentricity due to the relative deflection across the opening

$M_{T,Rd}$ is the bending resistance of the Tee

$M_{add,Ed}$ is the moment due to the loading applied over the opening

$w_{vier,add}$ is the relative deflection across the opening in Vierendeel bending, which is calculated at serviceability. In the limit, $w_{vier,add} \le a_o/200$.

Note: It is assumed that under factored loads, the relative deflection across the opening is $2w_{vier,add}$ and so the additional eccentric moment acting on each Tee due to the relative deflection across the opening is, $N_{T,.Ed}\, 2w_{vier,add} / 2 = N_{T,.Ed} w_{vier,add}$.

Example for a Slender Tee

As an example of the use of this check for combined actions on the compressed Tee, consider a large rectangular opening in a 13m long beam at x = 5m from one support for the following data:

a_o = 1000mm (a_o/h_o = 2.22 < 2.5)

h_o = 450mm and h = 650mm (h_o/h = 0.69 < 0.75)

A_f = 220mm × 20mm and t_w =10mm

Q_{Ed} = 30 kN/m; M_{Ed} = 619 kNm and V_{Ed} =45 kN and at x = 5m

Cross-sectional area of Tee, A_T= 220 × 20 + 80 × 10 = 5200mm²

Depth of elastic neutral axis from top of section, z_e = 18mm

Axial resistance of the Tee (for f_y=345 N/mm²) = 5200 × 345 × 10^{-6} = 1794 kN

Bending resistance at the opening, $M_{o,Rd}$ = 1794 × (650 − 2 × 18) × 10^{-3} = 1102 kNm > 619 kNm

Compression force in top Tee, $M_{T,Ed} = \frac{619 \times 10^3}{650 - 2 \times 18} = 1008$ kN

Inertia of Tee in vertical direction, I_T = 2265 × 10^3mm⁴

Radius of gyration of Tee, $i_{zz} = \left(\frac{2265 \times 10^3}{5200}\right)^{0.5} = 20.9$mm

Slenderness of Tee, $\lambda_T = \frac{0.5 \times 1000}{20.9} = 24$

Non-dimensional slenderness, $\bar{\lambda}_t$ = 24/77 = 0.31

For buckling curve (c) considering the Tee as a strut, its buckling resistance is obtained as χ_T= 0.93.

Buckling resistance of Tee, $N_{b,Rd}$ = 0.93 × 1794 × 10^{-3} = 1668 kN > 1008 kN

Vierendeel bending moment acting on a Tee, $M_{T,Ed}$ = 45 x 1.0/4 = 11.3 kNm

Plastic bending resistance of Tee, $M_{T,Rd}$= 21.1 kNm

Additional end moment due to local load on Tee, $M_{add,Ed}$ = 30 × 1.0²/12 = 2.5 kNm

Eccentricity of the axial force due to the deflection across the opening for V_{ser} = 31.6 kN:

$$w_{vier,add} = \frac{31.6 \times 1.0^3 \times 10^9}{24 \times 210 \times 2265 \times 10^3} = 2.8\text{mm}\ (=a_0 / 355)$$

This satisfies the deflection limit of a_o/200 across the opening at serviceability.

The additional eccentric moment due to the relative deflection across the opening is,

$N_{T,.Ed}\ w_{Vier,add}$ = 1008 × 2.8 × 10^{-3} = 2.8 kNm

Verification of the combined buckling and bending resistance of the top Tee:

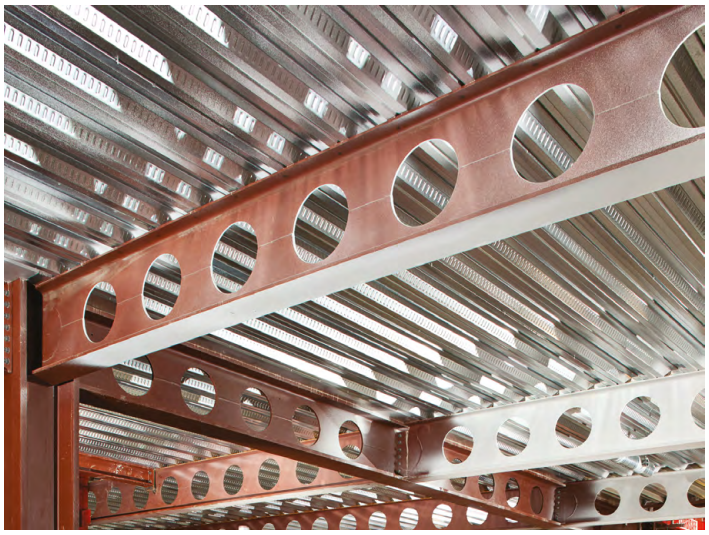

Figure 2 - Typical slender bean with infills (courtesy of Kloeckner UK Metals Westok)

$$\frac{1008}{1668} + \frac{0.4 \times (11.3 + 2.8) + 2.5}{21.1} = 0.60 + 0.39 = 0.99 < 1.0 \text{ just OK}$$

This shows that the 100mm deep top Tee is stable under combined loads for a 1m long opening.

Checks on End-Posts

The design of end -posts next to connections is an aspect not properly covered by SCI P355 and is now addressed in BS EN 1993-1-13. This will be covered in a subsequent article in *New Steel Construction*, based on tests on cellular beams at City University of London. The minimum width of an end-post in a cellular beam with circular openings is given as 0.25 h_o, and for rectangular openings, the minimum width increases to 0.5 a_o. ■

AD 528:
Lateral restraint forces for beams

SCI's Advisory Desk has received queries from designers as to what restraint forces should be used to restrain the compression flange of a beam. This AD Note compares the lateral restraint force requirements for BS EN 1993-1-1[1] and BS 5950-1[2].

To use a steel beam economically, the compression flange needs to be restrained laterally against buckling and two requirements may be identified for all restraint systems[3,4]:

1. The restraint should have sufficient stiffness to increase the buckling load of the restrained member to the desired level by limiting the buckling deformations.
2. The restraint should have sufficient strength to resist the loads transmitted as a result of restricting the buckling deformations.

The relationship between stiffness and strength is such that the greater the stiffness of the restraint, the smaller its required strength. Despite the importance of both strength and stiffness, many structural design codes provide only strength requirements (e.g. BS 5950-1) and it is assumed that a member of such strength will also possess sufficient stiffness. Long span structures will develop large restraint forces and additional checks may be required.

In BS 5950-1, the restraint force required is straightforward, in BS EN 1993-1-1, the approach is more detailed.

BS EN 1993-1-1

In BS EN 1993-1-1, restraint is dealt with by assuming an initial geometric imperfection. The initial geometric imperfection may be replaced by an equivalent stabilising force q_d, defined by Equation 5.13 of BS EN 1993-1-1, which is applied as a uniformly distributed load on the member to be resisted by a bracing system.

The equivalent stabilising force q_d is defined in clause 5.3.3(2) of BS EN 1993-1-1 as:

$$q_d = \sum N_{Ed} 8 \frac{e_0 + \delta_q}{L^2}$$

Where:

N_{Ed} is the axial force in the compression flange of the beam, taken as:

$$N_{Ed} = \frac{M_{Ed}}{h}$$

M_{Ed} is the maximum moment in the beam

h is the overall beam height

Where a beam is subjected to external compression N_{Ed}, it should include the part of the compression force carried by the flange.

e_0 is the member imperfection defined by Equation 5.12 of BS EN 1993-1-1 as:

$e_0 = \alpha_m L/500$

α_m is a reduction factor when multiple beams are being restrained by a bracing system, given in clause 5.3.3(1) of BS EN 1993-1-1 as:

$$\alpha_m = 0.5\left(1 + \frac{1}{m}\right)$$

m is the number of members to be restrained

L is the length of the beam

δ_q is the inplane deflection of the bracing system under q_d plus any external loads. The in-plane deflection of the bracing system could have a significant impact on the stabilising force. SCI's P360 suggests that the deflections of typical bracing systems in buildings are unlikely to exceed $L/2000$ and a useful approach is to assume initially (and subsequently confirm) that the deflection of the bracing system δ_q will be less than this conservative value. The total resulting equivalent stabilising force ($q_d L$) is then 2% of N_{Ed}.

Where two or more intermediate lateral restraints are provided, P360 suggests that each restraint should be capable of resisting a force of not less than $5q_dL/8$. Provided that the actual deflection of the bracing system δ_q is less than the L/2000, the restraint force equals 1.25% of N_{Ed}.

The restraints should also be capable of resisting any additional forces due to external actions and it must be ensured that sum of the restraint forces for the individual beams are transferred to some 'stiff' point in the structure, for example, to in-plane bracing or concrete core walls.

BS 5950-1

BS 5950-1, clause 4.2.2 says that full lateral restraint may be assumed to exist if the frictional or positive connection of a floor (or other) construction to the compression flange of the member is capable of resisting a lateral force of not less than 2.5% of the maximum force in the compression flange of the member.

Similarly, clause 4.3.2.2 says that where intermediate lateral restraint is required at intervals within the length of a beam, the intermediate lateral restraints should be capable of resisting a total force of not less than 2.5% of the maximum value of the factored force in the compression flange within the relevant span, divided between the intermediate lateral restraints in proportion to their spacing.

Where three or more intermediate lateral restraints are provided, each intermediate lateral restraint should be capable of resisting a force of not less than 1% of the maximum value of the factored force in the compression flange within the relevant span.

The intermediate lateral restraints should either be connected to an appropriate system of bracing capable of transferring the restraint forces to the effective points of support of the member, or else connected to an independent robust part of the structure capable of fulfilling a similar function.

The bracing system should be capable of resisting each of the following alternatives:

a) the 1% restraint force considered as acting at only one point at a time and
b) the 2.5% restraint force divided between the intermediate lateral restraints in proportion to their spacing

Clause 4.3.2.2.3 requires that bracing systems that supply intermediate lateral restraint to more than one member should be designed to resist the sum of the lateral restraint forces from each member that they restrain, reduced by the factor k_r obtained from:

$k_r = (0.2 + 1/N_r)^{0.5}$

N_r is the number of parallel members restrained.

Conclusion

Both BS EN 1993-1-1 and BS 5950-1 result in similar lateral restraint forces, for full lateral restraint a force equal to 2% and 2.5% of the axial force in the compression flange respectively and for intermediate lateral restraints a force equal to 1.25% and 1% of the axial force in the compression flange respectively. However, in BS EN 1993-1-1 the determination of restraint forces is an iterative process, due to the dependence of the forces on the level of deflection of the bracing system.

Both approaches include a reduction factor on the restraint forces to bracing systems when multiple beams are being restrained.

Long span structures will develop large restraint forces and additional checks may be required.

1 BS EN 1993-1-1:2005
Eurocode 3 - Design of steel structures - General rules and rules for buildings, BSI

2 BS 5950-1:2000
Structural use of steelwork in building. Code of practice for design. Rolled and welded sections

3 Nethercot, D.A. and Lawson, R.M.
Lateral stability of steel beams and columns (P093),
SCI, 1992

4 Gardner, L.
Stability of steel beams and columns (P360),
SCI, 2011

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New and revised codes and standards

From BSI Updates April 2024

BRITISH STANDARDS WITHDRAWN

PD CEN/TR 15941:2010
Sustainability of construction works. Environmental product declarations. Methodology for selection and use of generic data.

BS EN ISO 9692-2:1998
Welding and allied processes. Joint preparation. Submerged arc welding of steels.
superceded by BS EN ISO 9692-2:2024

PD CEN ISO/TR 3834-6:2007
Quality requirements for fusion welding of metallic materials. Guidelines on implementing ISO 3834.
superceded by BS EN ISO 3834-6:2024

BS EN PUBLICATIONS

BS EN 15941:2024
Sustainability of construction works. Data quality for environmental assessment of products and construction work. Selection and use of data.
supersedes PD CEN/TR 15941:2010

BS EN ISO 3834-6:2024
Quality requirements for fusion welding of metallic materials. Guidelines on implementing the ISO 3834 series.
supersedes PD CEN ISO/TR 3834-6:2007

BS EN ISO 9692-2:2024
Welding and allied processes. Joint preparation. Submerged arc welding of steels.
supersedes BS EN ISO 9692-2:1998

CEN EUROPEAN STANDARDS

EN ISO 3834-6:2024
Quality requirements for fusion welding of metallic materials. Guidelines on implementing ISO 3834 series.

EN ISO 9692-2:2024
Welding and allied processes. Joint preparation. Submerged arc welding of steels.

EN ISO 15610:2024
Specification and qualification of welding procedures for metallic materials. Qualification based on tested welding consumables.

DRAFT BRITISH STANDARDS FOR PUBLIC COMMENT

24/30397912 DC
BS EN 1993-2 Eurocode 3. Design of steel structures. Steel Bridges.
Comments for the above document are required by 04 June, 2024

24/30397918 DC
EN 1993-1-11 Eurocode 3. Design of steel structures. Tension components.
Comments for the above document are required by 04 June, 2024

24/30443599 DC
EN 1993-3 Eurocode 3. Design of steel structures. Towers, masts and chimneys.
Comments for the above document are required by 04 June, 2024

24/30457258 DC
EN 1994-2 Eurocode 4. Design of composite steel and concrete structures. Bridges.
Comments for the above document are required by 04 June, 2024

24/30457261 DC
EN 1994-1-1 Eurocode 4. Design of composite steel and concrete structures. General rules and rules for buildings.
Comments for the above document are required by 04 June, 2024

24/30460220 DC
EN 1994-1-2 Eurocode 4. Design of composite steel and concrete structures. Structural fire design.
Comments for the above document are required by 04 June, 2024

24/30459398 DC
BS EN ISO 15630-3 Steel for the reinforcement and prestressing of concrete. Test methods. Prestressing steel.
Comments for the above document are required by 20 April, 2024

24/30467111 DC
BS EN ISO 16834 Welding consumables. Wire electrodes, wires, rods and deposits for gas shielded arc welding of high strength steels. Classification.
Comments for the above document are required by 22 April, 2024

24/30472172 DC
BS EN ISO 636 Welding consumables. Rods, wires and deposits for tungsten inert gas welding of non-alloy and fine-grain steels. Classification.
Comments for the above document are required by 13 April, 2024

24/30482392 DC
BS EN ISO 17633 Welding consumables. Tubular cored electrodes and rods for gas shielded and non-gas shielded metal arc welding of stainless and heat-resisting steels. Classification.
Comments for the above document are required by 17 April, 2024

24/30483365 DC
BS EN 10379. Steel sheet piles. Test methods.
Comments for the above document are required by 30 April, 2024

NEW WORK STARTED

ISO 19998
Structural bolting coordination. Tasks and responsibilities.

EN ISO 19443
Quality management systems. Specific requirements for the application of ISO 9001:2015 by organisations in the supply chain of the nuclear energy sector supplying products and services important to nuclear safety (ITNS).

EN WI EC103137
Steels for structural use. General requirements.

ISO 45008
Occupational health and safety management. Guidelines for remote working.

BRITISH STANDARDS REVIEWED AND CONFIRMED

BS EN 14399-7:2018
High-strength structural bolting assemblies for preloading. System HR. Countersunk head bolt and nut assemblies.

BS EN 14399-8:2018
High-strength structural bolting assemblies for preloading. System HV. Hexagon fit bolt and nut assemblies.

ISO PUBLICATIONS

ISO 3834-6:2024
Quality requirements for fusion welding of metallic materials. Guidelines on implementing the ISO 3834 series.

ISO 9692-2:2024
Welding and allied processes. Joint preparation. Submerged arc welding of steels.

ISO 19443:2018/A1:2024
Quality management systems. Specific requirements for the application of ISO 9001:2015 by organisations in the supply chain of the nuclear energy sector supplying products and services important to nuclear safety (ITNS).

ISO 9001:2015/A1:2024
Quality management systems.

ISO 45001:2018/A1:2024
Occupational health and safety management systems. Requirements with guidance for use.

ISO 45004:2024
Occupational health and safety management. Guidelines on performance evaluation.

Wagon Loading Station

In some ways these structures are not buildings, being essentially large plants with weatherproof covers. Nonetheless, they are very interesting and are described by Mr R. Wigley, Manager of the Projects Department of Butterley Engineering Co. Ltd. Three plants have been built but the emphasis is given to that at Redcar.

During 1973 Redcar and Immingham Ore Terminals were brought on stream as part of BSC's expansion programme and work was begun on a third terminal at Port Talbot. While this article deals mainly with Redcar the function of all three is very similar.

They are designed to handle large quantities of imported ore for stocking and inward transportation to inland steelworks. A complete installation includes port facilities, ship unloaders, conveyor systems to adjacent stockyards, stocking and reclaiming facilities and provision for onward movement of ore. These notes feature the train-loading facilities which have been designed to provide rapid loading of large tonnages of ore into merry-go-round train systems.

The purpose of the system is to control the flow rate of gravity-activated ore from storage bunkers into weigh hoppers, arranged to provide accurate repetitive weighing, and then into rail wagons. Differences in the types of ore handled at the three sites require variations in the equipment but they are broadly similar.

REDCAR TRAIN LOADING STATION

Specification

This called for the capacity to load complete trains in under 30 minutes where each train could consist of 15-21 rigid coupled 100T bogie wagons or 24-36 loose coupled 26T SVB wagons in rakes of 3 and 6 wagons respectively. The ore to be handled would range from fines, concentrates and pellets to 8in rubble ore. The moisture content could be up to 15 per cent and bulk densities could be between 110lb/cu.ft and 190lb/cu.ft.

The design

Holding bunkers

There are two lines of bunkers each with a capacity of 5000T based on ore at 190lb/cu.ft. They are fabricated from mild steel and are built into a portal frame structure which spans the twin sets of rail tracks and each line includes six bunkers. These are filled from a conveyor system with shuttles which traverse them in either automatic or manual modes. Ore levels are monitored and the central control system automatically adjusts the shuttle traverse to obtain uniform filling of the bunkers. Three levels are specifically monitored. At the low level the operation of the vibrating feeders is inhibited. The minimum contents level is chosen to ensure that whole trains can be loaded without interruption and is set to allow for the rate of input while outloading is taking place. High level stops the reclaim system before full bunker level is reached. This prevents 'hunting' of the system and minimizes the effects of the reclaim system starting under full load conditions.

Discharge control is effected by a pair of hydraulically operated doors which regulate the flow of material on to twin vibratory feeders. The central control system determines the size of door opening depending on the characteristics of the ore being handled. Six weigh hoppers are freely suspended on tension load cells below each line of bunkers and they operate either in pairs or singly discharging 76 tonnes into bogie wagons or 38 tonnes in AVBs.

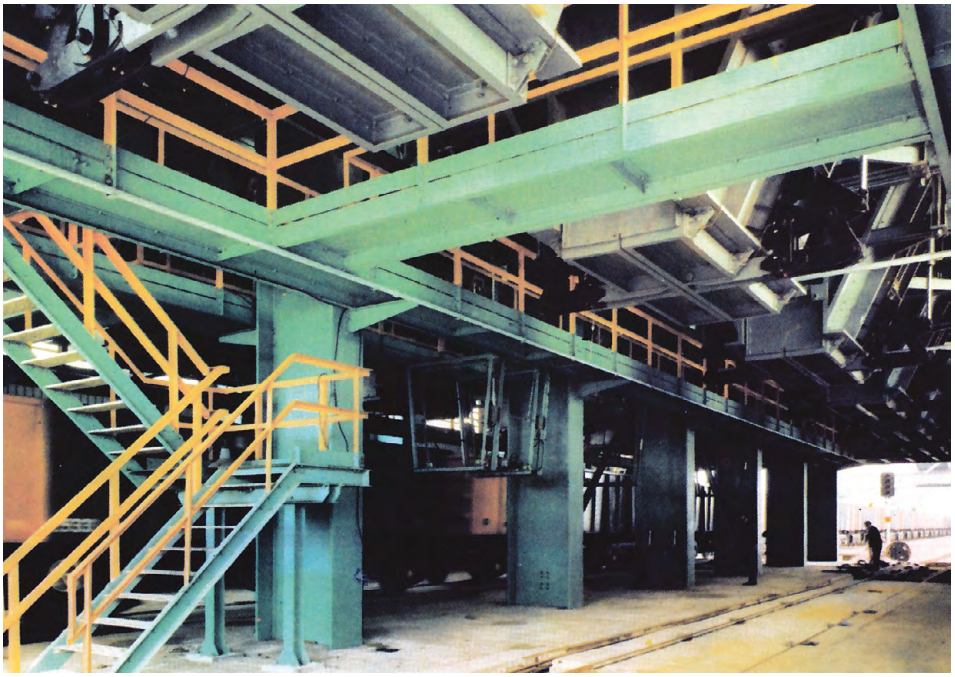
Should there be a power failure the weigh hopper bottom doors are automatically locked shut by an over centre self-locking linkage. The hydraulic equipment for the doors includes three interchangeable sets of pumping and accumulator systems. The nitrogen-charged accumulators have sufficient capacity to carry out one full cycle of operation in the case of an electrical power failure. Site welding was eliminated on all major connections by the use of high strength friction grip bolts. Each main column was designed to carry 950 tonnes and altogether 2,000 tonnes of structural steelwork have been used in the building and equipment.

Conveyors

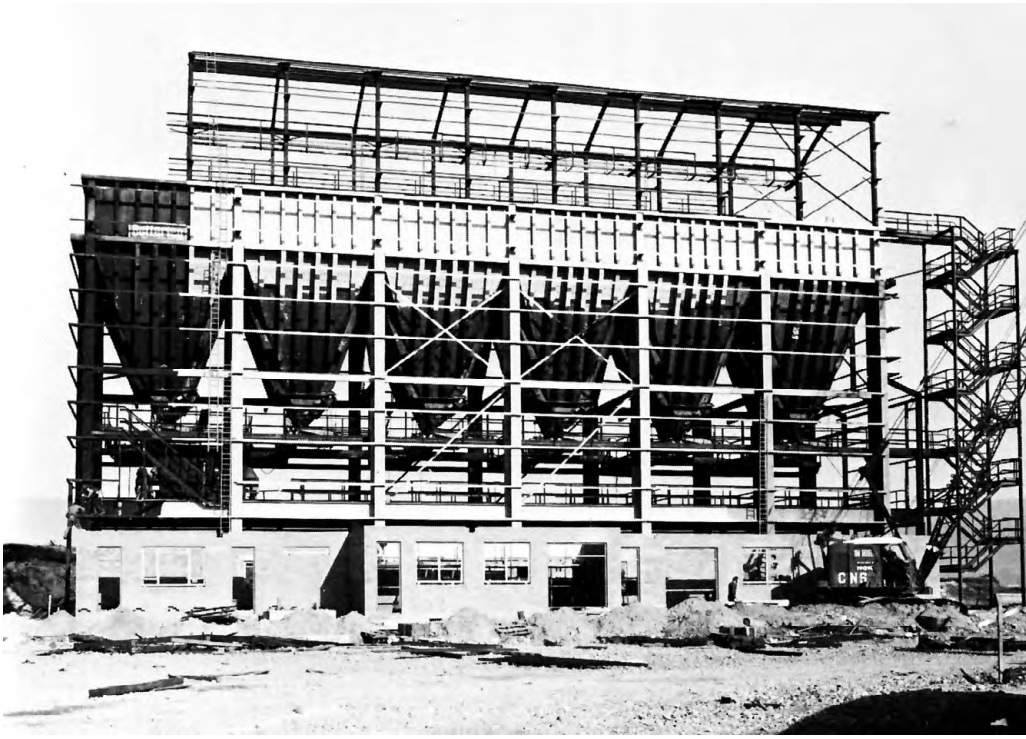
A dual conveyor system is provided, 1,200mm wide, which runs at 2·25m/sec with each conveyor rated at 2,000T/hr. Two belt weighers are fitted in the conveyor system to monitor the feed rate to the bunkers.

Railway signalling and wagon positioning

The control equipment is designed to handle three types of train, the two described above and one consisting of 25½ tonne 2-axle ironstone hopper wagons, used half coupled and made up in lengths between 24 and 36 wagons. All three types are. headed by one three-axle locomotive. Loco-driver instruction is given by four aspect signals and these together with wheel sensers position the wagons.



A train being loaded at Redcar



This view at Port Talbot clearly shows the hopper arrangement.

The sensers detect the type of wagons being handled and their spotted positions relative to the weigh hoppers. At each end of the loading area are air-operated retarders which apply external braking forces to the wagons to assist in obtaining a positioning accuracy of ± 6in, particularly with respect to the loose coupled wagons.

Weighing

Two independent sets of weighing equipment are installed. One controls batch weighing from the bunkers into the weigh hoppers while the other provides weighing in-motion of the wagons. The latter system feeds the control system with tare and gross individual wagon weights, the axle weights and whether 2- or 4-axle wagons are entering the system. Axle weights are monitored to determine the load distribution within the wagons and ensure that they are safely loaded. Weigh hopper batch requirements are programmed by determining the number of axles.

Dust suppression

Water spray systems under automatic control are provided at material transfer points. Furthermore the top surface of the ore within the wagons is sprayed to minimize ore losses during transportation.

Control system

While each of the main components of the plant has its own control system the various functions are co-ordinated through a central control logic system with control desk and mimic panel.

Loading procedure

Filling the bunker is an independent function and is not interlocked with the wagon loading except for the minimum contents level as described earlier.

To be filled a train enters the reception sidings where it waits until all is clear when the operator presses a train 'accept' button on the control desk. This changes the four aspect signalling from red to green. The train then moves into the loading area where, after receiving an amber light warning of 'spotting' position imminent, the driver stops it on the red light signal with the aid of the retarders. Any overshoot is indicated by a flashing red light when the train is backed up.

Once the wagons are correctly spotted and after a short delay for proving time the vibrators begin feeding the weigh hoppers. When the correct amount of ore has nearly been reached in the weigh hoppers the vibrators are switched to trickle feed for topping-up and the contents are printed out. When this is complete the ore is discharged into the wagons.

After a delay to prove the hoppers are empty the doors are closed, the signal is changed to green, the train moves off and the vibrators are restarted for another cycle. This procedure continues until the last rake is spotted and the number of wagons ascertained. Only the required weigh hoppers are then activated and the wagons filled. The train then leaves after it has been given clearance and its total weigh is recorded at the gross weighbridge on the way.

Interlocks

The system is fully interlocked and the three main locks prevent loading until the bunker contents are at a predetermined· level, stop the vibrators running while the weigh hopper doors are operating and vice versa and prevent any discharge from the weigh hoppers until the wagons are in position and proved.

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

Steelwork contractors for buildings

BCSA

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

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

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

FPC Factory Production Control certification to BS EN 1090-1
1 – Execution Class 1 2 – Execution Class 2
3 – Execution Class 3 4 – Execution Class 4

BIM BIM Level 2 assessed

QM Quality management certification to ISO 9001

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

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

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

BCSA steelwork contractor member	Tel	C	D	E	F	G	H	J	K	L	M	N	Q	R	S	QM	FPC	BIM	SCM	Guide Contract Value (1)
A C Bacon Engineering Ltd	01953 850611			●	●	●	●				●			●		✔	2			Up to £6,500,000
Adey Steel Ltd	01509 556677	●		●	●	●	●	●	●	●	●			●	●	✔	3		●	Up to £3,400,000
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
ASME Engineering Ltd	020 8966 7150	●		●	●	●		●	●	●	●		●	●	●	✔	4		●	Up to £5,000,000
Atlasco Constructional Engineers Ltd	01782 564711			●	●	●	●			●	●			●	●	✔	2			Up to £1,200,000
B D Structures Ltd	01942 817770			●	●	●	●				●	●		●	●	✔	2	✔	●	Up to £2,400,000
Ballykine Structural Engineers Ltd	028 9756 2560			●	●	●	●	●				●				✔	4	✔	●	Up to £2,400,000
Barnshaw Section Benders Ltd	0121 557 8261												●			✔	4			Up to £1,200,000
BHC Ltd	01555 840006	●	●	●	●	●	●	●	●	●	●	●		●	●	✔	4	✔	●	Above £10,000,000
Billington Structures Ltd	01226 340666		●	●	●	●	●	●		●		●	●	●		✔	4	✔	●	Above £10,000,000
Bourne Group Ltd	01202 746666		●	●	●	●	●	●	●	●	●	●	●	●	●	✔	4	✔	●	Above £10,000,000
Briton Fabricators Ltd	0115 963 2901	●		●	●	●	●	●	●	●	●		●	●	●	✔	4		●	Up to £10,000,000
Cairnhill Structures Ltd	01236 449393	●			●	●	●	●	●						●	✔	4		●	Up to £6,500,000
Caunton Engineering Ltd	01773 531111		●	●	●	●	●	●		●	●	●		●	●	✔	4	✔	●	Above £10,000,000
Cementation Fabrications	0300 105 0135	●	●	●	●	●	●	●	●	●	●	●	●	●	●	✔	3		●	Up to £10,000,000
CMF Ltd	020 8844 0940				●		●	●		●	●				●	✔	4			Up to £6,500,000
Coventry Construction Ltd	024 7646 4484			●	●	●	●		●	●	●			●	●	✔	4			Up to £1,200,000
D H Structures Ltd	01785 246269			●	●		●				●						2			Up to £500,000
Duggan Steel	00 353 29 70072	●	●	●	●	●	●	●	●		●				●	✔	4			Up to £10,000,000
D Hughes Welding & Fabrication Ltd	01248 421104				●	●	●	●	●	●	●		●	●	●	✔	4			Up to £1,200,000
ECS Engineering Services Ltd	01773 860001	●		●	●	●	●	●	●	●	●			●	●	✔	4		●	Up to £5,000,000
Elland Steel Structures Ltd	01422 380262		●	●	●	●	●	●	●	●	●	●		●	●	✔	4	✔	●	Up to £10,000,000
EvadX Ltd	01745 336413		●	●	●	●	●	●		●	●	●			●	✔	3		●	Up to £5,000,000
Four Bay Structures Ltd	01603 758141			●	●	●	●	●		●	●			●	●		2			Up to £1,200,000
Four-Tees Engineers Ltd	01489 885899	●		●	●		●	●	●	●	●		●	●	●	✔	3		●	Up to £2,400,000
G.R. Carr (Essex) Ltd	01286 535501	●		●	●			●			●			●	●	✔	4			Up to £1,200,000
H Young Structures Ltd	01953 601881			●	●	●	●	●			●			●	●	✔	4	✔	●	Up to £3,400,000
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)
Had Fab Ltd	01875 611711				●		●	●	●	●	●			●	●	✔	4			Up to £6,500,000
HBE Services Ltd	01525 854110				●	●				●				●	●	✔	2			Up to £1,200,000
Hescott Engineering Company Ltd	01324 556610			●	●	●	●			●				●	●	✔	2			Up to £3,400,000
Hillcrest Structural Steel Ltd	023 8064 1373			●	●	●	●	●		●	●			●	●	✔	3		●	Up to £3,400,000*
Integrated Water Services Ltd	01282 777739									●	●			●	●	✔	2			Up to £1,200,000
Intersteels Ltd	01322 337766	●			●	●	●	●	●				●	●	●	✔	3	✔		Up to £5,000,000
Jamestown Manufacturing Ltd	00 353 45 434 288		●	●	●	●	●	●	●	●		●	●			✔	4			Up to £10,000,000
Kiernan Structural Steel Ltd	00 353 43 334 1445			●	●	●	●	●		●	●	●	●	●	●	✔	4	✔	●	Above £10,000,000
Kloeckner Metals UK Westok	0113 205 5270												●			✔	4		●	Up to £6,500,000
Leach Structural Steelwork Ltd	01995 642000			●	●	●	●	●			●					✔	3		●	Up to £6,500,000
Legge Steel (Fabrications) Ltd	01592 205320			●	●					●	●			●	●		2			Up to £600,000
Littleton Steel Ltd	01934 311670			●	●	●				●	●			●	●	✔	3			Up to £1,200,000
Loaninghill Fabrications Ltd	01506 858466				●			●	●	●				●	●		3			Up to 600,000
M Hasson & Sons Ltd	028 2957 1281			●	●	●	●	●	●	●	●			●	●	✔	4		●	Up to £1,400,000
M&S Engineering Ltd	01461 40111				●				●	●	●				●	✔	3			Up to £2,400,000
Mackay Steelwork & Cladding Ltd	01862 843910			●	●		●			●	●			●	●	✔	4		●	Up to £2,400,000
Maldon Marine Ltd	01621 859000				●				●	●	●			●	●	✔	3			Up to £600,000
Midland Structures Limited	01384 411201				●	●	●	●	●	●	●		●	●	●		2			Up to £5,000,000
Murphy International Ltd	00 353 45 431384	●		●	●	●	●	●	●	●	●			●	●	✔	4			Up to £6,500,000
Nationwide Structures Ltd	01924365883			●	●	●	●				●					✔	4			Up to £10,000,000
Newbridge Engineering Ltd	01429 866722	●	●	●	●	●	●	●			●	●				✔	4		●	Up to £2,400,000
North Lincs Structures	01724 855512			●	●					●					●		2			Up to £600,000
Painter Brothers Ltd	01432 374400				●				●	●	●			●	●		3			Up to £5,000,000*
Peter Marshall (Steel Stairs) Ltd	0113 307 6730				●	●				●	●				●	✔	3			Up to £2,400,000*
PMS Fabrications Ltd	01228 599090			●	●	●	●		●	●	●			●	●		3			Up to £3,400,000
REIDsteel	01202 483333			●	●	●	●		●			●			●	✔	4		●	Up to £10,000,000
SAH Luton Ltd	01582 805741			●	●	●				●				●	●		2			Up to £600,000
SDM Fabrication Ltd	01354 660895	●	●	●	●	●	●			●	●			●	●	✔	4			Up to £3,400,000
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	01423 358001				●		●	●	●	●					●	✔	2			Up to £6,500,000
Steel & Roofing Systems	00 353 56 444 1855	●		●	●	●	●				●	●		●	●	✔	4			Up to £10,000,000
Taziker Industrial Ltd	01204 468080	●		●	●		●	●		●	●		●	●	●	✔	3		●	Above £10,000,000
Temple Mill Fabrications Ltd	01623 741720			●	●					●	●				●	✔	2			Up to £600,000
TSI Structures Ltd	01603 720031			●	●	●	●	●			●			●			2	✔		Up to £3,400,000
W I G Engineering Ltd	01869 320515				●					●	●			●	●	✔	2		●	Up to £600,000
Walter Watson Ltd	028 4377 8711			●	●	●	●	●				●				✔	4		●	Above £10,000,000
Westbury Park Engineering Ltd	01373 825500	●		●	●	●	●	●	●	●	●				●	✔	4		●	Up to £1,200,000
William Haley Engineering Ltd	01278 760591			●	●	●	●				●		●			✔	4			Up to £5,000,000
William Hare Ltd	0161 609 0000	●	●	●	●	●	●	●	●	●	●	●	●	●	●	✔	4	✔	●	Above £10,000,000

Non 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 member	Tel	C	D	E	F	G	H	J	K	L	M	N	Q	R	S	QM	FPC	BIM	SCM	Guide Contract Value (1)

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

Steelwork contractors for bridgeworks

BCSA

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

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

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

Notes

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

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

BCSA steelwork contractor member	Tel	FB	CF	SG	PG	TW	BA	CM	MB	SRF	FRF	AS	QM	FPC	BIM	NHSS 19A	NHSS 20	SCM	Guide Contract Value (1)
Adey Steel Ltd	01509 556677	●	●	●	●	●	●			●	●	●	✓	3			✓	●	Up to £3,400,000
AJ Engineering & Construction Services Ltd	01309 671919	●		●	●	●	●	●	●	●	●	●	✓	4				●	Up to £3,400,000
Beaver Bridges Ltd	01204 668773	●		●	●	●	●	●	●	●	●	●	✓	4					Up to £3,400,000
Billington Structures Ltd	01226 340666	●		●	●	●	●					●	✓	4	✓	✓	✓	●	Above £10,000,000
Bourne Group Ltd	01202 746666	●		●	●	●				●		●	✓	4	✓		✓	●	Above £10,000,000
Briton Fabricators Ltd	0115 963 2901	●	●	●	●	●	●	●	●	●	●	●	✓	4			✓	●	Up to £10,000,000
Cairnhill Structures Ltd	01236 449393	●	●	●	●	●	●	●		●	●	●	✓	4			✓	●	Up to £6,500,000
Cementation Fabrications	0300 105 0135	●	●	●	●	●	●	●	●	●	●	●	✓	3			✓	●	Up to £10,000,000
Centregreat Engineering Ltd	02920 226088	●		●	●	●	●	●	●	●	●	●	✓	4		✓			Up to £3,400,000
D Hughes Welding & Fabrication Ltd	01248 421104	●		●		●			●	●	●	●	✓	4			✓		Up to £1,200,000
ECS Engineering Services Ltd	01773 860001	●		●	●	●	●		●			●	✓	4				●	Up to £5,000,000
Four-Tees Engineers Ltd	01489 885899	●	●	●	●	●	●		●	●	●	●	✓	3			✓	●	Up to £2,400,000
Jamestown Manufacturing Ltd	00 353 45 434 288	●	●	●	●	●	●					●	✓	4			✓		Up to £10,000,000
Kiernan Structural Steel Ltd	00 353 43 334 1445	●		●	●	●						●	✓	4	✓		✓	●	Above £10,000,000
M&S Engineering Ltd	01461 40111	●		●		●	●	●		●	●	●	✓	3					Up to £2,400,000
M Hasson & Sons Ltd	028 2957 1281	●	●	●	●	●	●	●	●	●	●	●	✓	4			✓	●	Up to £1,400,000
Millar Callaghan Engineering Services Ltd	01294 217711	●	●	●	●	●	●	●	●	●	●	●	✓	4			✓		Up to £1,400,000
Murphy International Ltd	00 353 45 431384	●	●	●	●	●	●			●	●	●	✓	4			✓		Up to £6,500,000
Nusteel Structures Ltd	01303 268112	●	●	●	●	●	●	●	●	●	●	●	✓	4		✓	✓	●	Up to £6,500,000
REIDsteel	01202 483333	●			●	●	●		●			●	✓	4				●	Up to £10,000,000
Severfield plc	01845 577896	●	●	●	●	●	●	●	●	●	●	●	✓	4	✓	✓	✓	●	Above £10,000,000
Taziker Industrial Ltd	01204 468080	●	●	●	●	●	●	●	●	●	●	●	✓	3		✓	✓	●	Above £10,000,000
William Hare Ltd	0161 609 0000	●	●	●	●	●	●	●	●	●	●	●	✓	4	✓	✓	✓	●	Above £10,000,000
Non-BCSA member																			
Allerton Steel Ltd	01609 774471	●	●	●	●	●	●	●	●	●	●	●	✓	4	✓		✓	●	Up to £5,000,000
AmcoGiffen	01226 243413	●	●	●	●	●	●		●	●	●	●	✓	4			✓		Up to £1,200,000
Carver Engineering Services Ltd	01302 751900	●		●	●	●	●		●	●	●	●	✓	4			✓		Up to £5,000,000
Cimolai SpA	01223 836299	●	●	●	●	●	●	●	●	●	●	●	✓	4		✓	✓	●	Above £10,000,000
CTS Bridges Ltd	01484 606416	●	●	●	●	●	●	●	●		●	●	✓	4			✓		Up to £600,000
Donyal Engineering Ltd	01207 270909	●		●						●	●	●	✓	3		✓	✓		Up to £2,400,000
Eiffage Metal	07511 177815	●	●		●	●	●	●	●	●	●	●	✓	4			✓		Above £10,000,000
Harrisons Engineering (Lancashire) Ltd	01254 823993	●	●	●	●	●	●	●	●	●	●	●	✓	3		✓	✓		Up to £3,400,000
Hollandia Infra BV	00 31 180 540 540	●	●	●	●	●	●	●	●	●	●	●	✓	4					Above £10,000,000*
HS Carlsteel Engineering Ltd	020 8312 1879			●						●	●	●	✓	3			✓		Up to £1,200,000
J&D Pierce Contracts Ltd	01505 683724	●	●		●	●	●	●	●			●	✓	4			✓		Above £10,000,000
Kelly's Welders & Blacksmiths Ltd	01383 512 517											●	✓	2			✓		Up to £350,000
Lanarkshire Welding Company Limited	01698 264271	●	●	●	●	●	●	●	●	●	●	●	✓	4		✓	✓		Up to £5,000,000
North View Engineering Solutions Ltd	01325 464558											●	✓	3					Up to £1,200,000
Shaw Manufacturing Ltd	01642 210716			●						●	●	●	✓	4			✓		Up to £1,200,000
Smulders Projects UK Ltd	0191 295 8700	●	●	●	●	●	●	●	●	●	●	●	✓	4					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

Corporate Members

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

Company name	Tel
Bonham and Brook North Ltd	020 3523 9125
Gene Mathers	0115 974 7831
Griffiths & Armour	0151 236 5656
Highways England Company Ltd	0300 123 5000
Keiths Welding Limited	07791 432 078

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

Structural components

Company name	Tel	QM	CA	FPC	NHSS	SCM	SfL
Albion Sections Ltd	0121 553 1877	✓	M	4			
Cellbeam Ltd	01937 840600	✓	M	4	20		
Composite Profiles UK Ltd	01202 659237		D/I				
Construction Metal Forming Ltd	01495 761080	✓	M	3			
Daver Steels Ltd	0114 261 1999	✓	M	3			
Farrat Isolevel	0161 924 1600	✓	N/A				
Hadley Industries Plc	0121 555 1342	✓	M	4		●	
Hi-Span Ltd	01953 603081	✓	M	4		●	
Kingspan Structural Products	01944 712000	✓	M	4		●	
MSW UK Ltd	0115 946 2316		D/I				
Prodeck-Fixing Ltd	01278 780586	✓	D/I				
Structural Metal Decks Ltd	01202 718898	✓	M	4			
Stud-Deck Services Ltd	01335 390069		D/I				
Tata Steel – ComFlor	01244 892199	✓	M	4			
voestalpine Metsec plc	**0121 601 6000**	✓	**M**	4			**Gold**

Computer 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**				**Silver**
StruMIS Ltd	01332 545800		N/A				
Trimble UK Limited	0113 887 9790		N/A				

Steel producers

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

Manufacturing equipment

Company name	Tel	QM	CA	FPC	NHSS	SCM	SfL
Behringer Ltd	01296 668259		N/A				
Ficep (UK) Ltd	**01924 223530**		**N/A**				**Silver**
Kaltenbach Ltd	01234 213201		N/A				
Lincoln Electric (UK) Ltd	0114 287 2401	✓	N/A				
Peddinghaus Corporation UK Ltd	01952 200377		N/A				
Voortman (UK) Ltd	**+31 (0)548 536 373**		**N/A**				**Silver**

Membership services

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

Protective systems

Company name	Tel	QM	CA	FPC	NHSS	SCM	SfL
Forward Protective Coatings Ltd	01623 748323	✓	N/A				
Hempel UK Ltd	**01633 874024**	✓	**N/A**				**Silver**
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**				**Silver**
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**				**Gold**

Safety systems

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

Steel stockholders

Company name	Tel	QM	CA	FPC	NHSS	SCM	SfL
AJN Steelstock Ltd	01638 555500	✓	M	4			
Arcelor Mittal Distribution - Scunthorpe	**01724 810810**	✓	**D/I**	**4**	**3B**		**Headline**
Barrett Steel Services Limited	**01274 682281**	✓	**M**	**4**	**3B**		**Headline**
British Steel Distribution	01642 405040	✓	D/I	4	3B		
Cleveland Steel & Tubes Ltd	**01845 577789**	✓	**M**	**3**	**3B**		**Gold**
Dent Steel Services (Yorkshire) Ltd	01274 607070	✓	M	4	3B		
Dillinger Hutte U.K. Limited	01724 231176	✓	D/I	4		●	
Duggan Profiles & Steel Service Centre Ltd	00 353 567722485	✓	M	4			
European Metal Recycling Ltd	01925 715400	✓	N/A				
Kloeckner Metals UK	0113 254 0711	✓	D/I	4	3B	●	
Murray Plate Group Ltd	0161 866 0266	✓	D/I	4	3B		
NationalTube Stockholders Ltd	**01845 577440**	✓	**D/I**	**4**	**3B**		**Gold**
Rainham Steel Co Ltd	01708 522311	✓	D/I	4	3B		
The Alternative Steel Co Ltd	01942 826677	✓	D/I				

Structural fasteners

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

Welding equipment and consumables

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

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