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NSC

Newport Transporter Bridge swings back

October 2010
Vol 18 No. 9

Silverstone on track for Grand Prix

Flexible schools for Nottingham

College gets rotunda

Scottish rail link

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New Steel Construction keeps designers and contractors abreast of all major steel construction related developments and provides detailed technical information on key issues such as the introduction of the Eurocodes. NSC will be the first place most people hear about advances made by the extensive research and development efforts of the steel construction partners – Tata Steel, the British Constructional Steelwork Association, and the Steel Construction Institute, as well as other researchers.

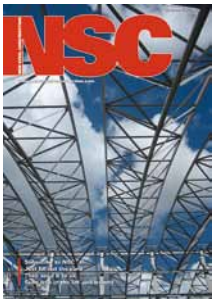
Each issue of NSC is a blend of project reports and more in depth technical material. Taking up our free subscription offer is a guarantee that you will be alerted to significant developments in a sector that retains a commitment to continuous development in knowledge and techniques for timely delivery of cost effective, quality projects across all sectors of construction.

Each issue of NSC is typically 44 pages and contains five pages of news, developments related to Eurocodes, cutting edge project reports from site, and the latest technical updates from the Steel Construction Institute in its Advisory Desk Note series. Popular features are 50 Years Ago and 20 Years Ago, looking at key projects of the past by revisiting the pages of 'Building With Steel' and 'Steel Construction'.

A recent development has been the introduction of Steel Industry Guidance Notes, SIGNS, with each issue of NSC, a loose leaf insert series aimed at students and designers new to steel construction. SIGNS provide essential introductory explanations of basic steel related design topics and point the way towards where more detailed, free, support can be accessed in the steel sector.

NSC is available free of charge each month to subscribers living in the UK or Ireland by simply filling in the reply paid card bound into this issue, or by contacting us by email, post or fax as described on the card.

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Cover Image
Silverstone Pit and Paddock complex
Client: Silverstone Holdings
Architect: Populous
Steelwork contractor: Barrett Steel Buildings
Steel tonnage: 1,200t

These and other steelwork articles can be downloaded from the New Steel Construction Website at *www.new-steel-construction.com*

October 2010 Vol 18 No 9

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Energy savings for sheds

Nick Barrett - Editor

Release of the first BCSA/Corus Target Zero report, on schools, earlier this year certainly made them sit up even at the back of the class with its myth slaying revelations about the illusory thermal mass performance of heavyweight concrete building frames. It also showed how using structural steelwork could make a sustainability impact that would shave £165M from the UK's annual schools heating bill. That is just the sort of easily achieved saving that the new public sector cost conscious government needs to hear about.

News just as good for operators of warehouses is to be found in the latest report in the Target Zero series, on warehouses, with savings of almost £2.5M in energy costs possible over a 25-year term from just one warehouse. What does that add up to nationally? The warehouse in the Target Zero study is some 382,000 sq ft. The 650 members of the UK Warehousing Association alone operate some 10M sq m of warehouses. So something over £2,000M is the least that could be expected to be saved by just 650 warehouse operators.

That will be music to the ears of companies in just about every industry, retailers and wholesalers particularly, but also to any user of single storey industrial buildings – where steel has an overwhelmingly dominant share of the market for already very good reasons.

This research places UK designers in a strong position along the road map towards meeting ambitious government carbon reduction targets that is represented by Part L of the new Building Regulations. Further emissions and energy saving guidance is still to come in reports for offices, supermarkets and mixed use developments. Steel is proving again and again to be the sensible business choice for our low or zero carbon sustainable future.

New look NSC

There is a new look to NSC from this issue, following a redesign by our in house graphic designers. The aim was to freshen up a five year old design, making it even easier to read and allowing layouts to have more visual impact without losing any of the magazine's authority.

The layout is now more flexible and more compact typefaces allow more space to be given to photographs. The dominant colour you will notice is now a more attention grabbing red.

Captions are now in white boxes on the photographs that they refer to, so readers no longer have to search to match a caption to a photo. The start of each article is signposted by a "drop cap" at the start of the first paragraph.

Technical articles at the back will now be laid out in a two-column format with the minimum of artifice: pure information for engineers. Navigation through these articles is now as simple as possible, with adequate space allowed for diagrams, tables and equations to appear in line with the text.

NSC is a magazine full of informative features to read, as well as a tool full of useful reference material and technical articles. We hope you find that the redesign helps us fulfill both its functions better.

NSC

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The British Constructional Steelwork Association Ltd

SCI

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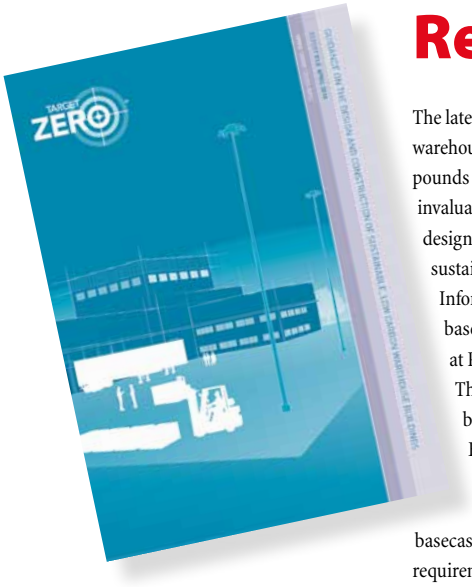


Report targets energy savings

The latest Target Zero guide can help warehouse operators save millions of pounds in energy costs as well as providing invaluable guidance and information for designers on how to design and construct sustainable warehouses.

Information in this Target Zero guide is based on a recently completed building at ProLogis Park near Stoke-on-Trent. The chosen warehouse has achieved both BREEAM "Excellent' and an EPC 'A' rating.

The Target Zero methodology is to modify and define a basecase that just meets the 2006 Part L requirements. The basecase building, along with Target Zero's recommendations for similar projects provide a set of best practice guidelines.

The report demonstrates how it is possible to implement a package of compatible, cost effective energy efficiency measures to yield an impressive 54% reduction in regulated emissions. By applying the Target Zero package a 25-year net present value saving of approximately £2.5M is possible.

The studied warehouse is a four span steel portal frame structure, featuring 24 dock levellers, 12m haunch height and rainwater harvesting. A similar precast concrete and glulam framed warehouse was found to have a 14% higher embodied carbon impact.

The full Target Zero warehouse guide is available for download in pdf format at *www.targetzero.info*

TARGET ZERO®

Seagull's home on target for May

The steelwork package, which has included more than 4,000t of the material, has been completed on Brighton & Hove Albion's new stadium at Falmer.

Working on behalf of main contractor Buckingham, Watson Steel Structures completed steel erection during August. Its work included the installation of two 170m-long trusses, which form the roofs over the two main East and West Stands. Because of their length, both trusses were brought to site 'piece small' and assembled into three liftable sections on the pitch.

Cladding of the external facades and the roof has now begun, with the project due to be completed during May 2011. Brighton & Hove Albion plans to kick off the 2011/12 season in its new 22,500 seater stadium.

Steelwork completed at Salford hospital

More than 3,000t of structural steelwork has been erected for the new Hope Hospital project in Salford.

The project consists of a new 222 bed acute hospital, including both outpatient and inpatient facilities as well as a new emergency and critical centre. Additional steel framed buildings include a new education centre with lecture theatres, a library, 30 seminar/training rooms and a number of interview rooms.

Severfield-Reeve Structures designed, fabricated and erected all steelwork for the project and installed 34,000m^2 of metal decking.

The new buildings will replace outdated Victorian wards and provide Salford with a better coordinated hospital site with facilities specially designed for modern healthcare.

Consort Healthcare (Salford), has been awarded a 30-year concession for the £135M project to design, build, finance and operate the new hospital which is due to open in 2012.

Main contractor for the project is a joint venture between Balfour Beatty Construction and Balfour Beatty Engineering Services.

Tata Steel - a new name for Corus

As from 27th September the Corus name has been officially changed to Tata Steel, with the new logo appearing on documentation, products, locations and vehicles. In order to avoid any unnecessary disruption to its many customers, the company says the transition will be done in a gradual process.

In 2007, the Corus Group became part of Tata Steel, creating one of the world's largest steelmakers, with a major presence around the globe.

Like Corus and its predecessors, Tata Steel has a long and successful history, having pioneered the first integrated steelworks in Asia more than a century ago.

Over the last three years, the two companies have been working to integrate their respective strengths in technology, manufacturing and marketing.

Cricket ground gets capacity boost

Work currently being undertaken at Edgbaston cricket ground will increase the stadium's overall capacity to 25,000, in time for next summer's Test match with India.

A new stand with a capacity to seat 8,250 spectators is being erected; the structure will also house conference facilities and offices.

Working on behalf of main contractor Galliford Try, D A Green & Sons will ultimately erect approximately 1,700t of steel for the project. The company is also carrying out connections to the concrete cores, installing metal decking and applying the steelwork's fire protection off-site as the structure is being erected close to a busy road.

Advantage for steel on world class technology centre

With the backing of some of the UK's largest manufacturers and a major investment by Advantage West Midlands, the Manufacturing Technology Centre (MTC) near Coventry is rapidly taking shape.

Requiring approximately 1,000t of structural steelwork, supplied by Caunton Engineering, the building comprises of three large portal frames separated by two storey areas containing offices, plant zones and viewing galleries. Linking the whole structure, the front of the building will feature a glazed 'street' accommodating the entrance hall, meeting rooms and exhibition space.

The concept for the MTC is to provide a facility where leading manufacturers, research institutes and universities can develop and instigate new manufacturing techniques to aid industrial competitiveness.

"We have some very large steel sections in this structure," said Caunton Engineering Project Designer Gavin Christie. "Each of the three portals contains an overhead crane which requires large beams to run on, while some of the supporting columns for the structure are not restrained lower down, because of the open plan design, and are consequently larger sections than we'd normally use."

Steelwork for the project will be completed during October and main contractor Morgan Sindall expects to complete the job by summer 2011.

AROUND THE PRESS

New Civil Engineer
2 September 2010
Northern verve
(Wigan Life Centre) One of the project's most challenging aspects is along the eastern facade where a 37m-long by 7m deep king truss has been erected to help create the area for the main pool.

New Civil Engineer
9 September 2010
Blackfriars: Spanning the Thames
Around 8,000t of scrap is being craned out to be taken away by river barge, and 14,000t of new material is delivered in the same way, an environmental benefit saving the congestion of 2,000 lorry journeys in the busy local City streets. New steel is being fabricated by Watson Steel and barge loaded downstream at Greenwich.

Construction News
9 September 2010
Cricket club gambles on a fast delivery
(Edgbaston) The proximity to the road means the contractor has looked into preparing elements offsite. For instance, standard practice would be to fire protect the steel frame by coating it with an intumescent spray once on site. Instead, all the steel is delivered pre-sprayed, taking out the risk of spraying near the main road.

Construction News
2 September 2010
Steel chief warns of tough market
(Severfield-Rowen Chief Executive Tom Haughey) "The key market sectors of power, energy and waste, London commercial offices and infrastructure present good opportunities in 2011 and beyond."

The Structural Engineer
3 August 2010
Kenneth Severn Award
Suppliers are working on making steel less damaging to the environment through process improvements - making materials less energy and carbon intensive - and increases in their recycled content. Structural engineers need to be aware of the potential impact of careful specification and support supplies in their efforts.

EDF reiterates nuclear opportunities

A new nuclear power station at Hinkley Point should be up and running by 2018 with construction work beginning in 2013, EDF Energy confirmed at its recent Suppliers Day Event held at The Queen Elizabeth II Conference Centre in London.

Vicent de Rivaz, EDF Energy CEO said: "Our programme is on track to meet this ambitious programme. The UK government has a united and clear purpose to deliver a low carbon economy supported by nuclear energy."

To support this strategy EDF Energy has initial plans for two new nuclear power stations at Hinkley Point and Sizewell, both with two reactors each.

There will be opportunities for UK steel contractors as each power station will require approximately 20,000t of structural steelwork.

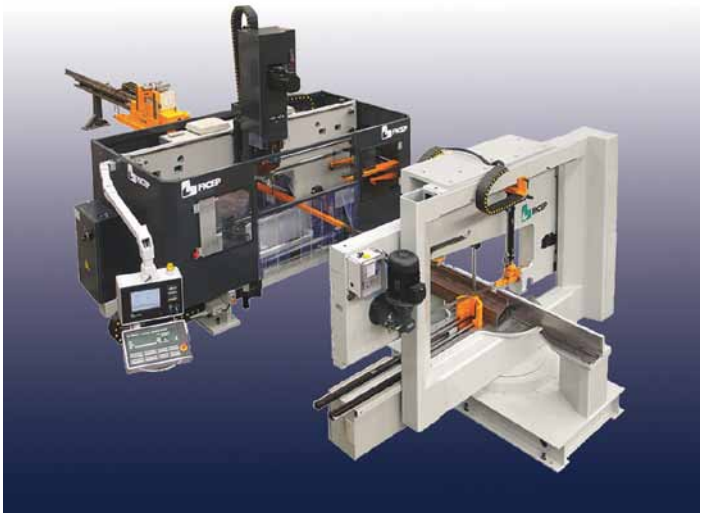
Mr de Rivaz confirmed that there will be between 150 to 175 major contracts, with 130 of these already let.

Speaking at the same event, Business Secretary Vince Cable repeated the Government's support for nuclear power, but also stressed that it will not provide any public finance for the projects as they must be built and run with private money.

Structures and components for the nuclear projects will be classified as either non-nuclear safety critical or nuclear safety critical. For non-nuclear critical structures, such as offices, turbine halls, electrical platforms – the buildings likely to be built using steel – the design and construction will be based on BS and European Standards.

Hinkley Point. *Photo: Richard Baker*

Orient achieves high expectations



One of the UK's leading specialist manufacturers of bespoke feature staircases has installed a FICEP Orient 10 drilling and sawing line, along with a FICEP P51 for plate punching, at its South East facility.

The machinery was installed to help the company increase productivity and output. The FICEP units, the company said, have enabled it to quote faster lead times as well as cut the cost of fabrication time in half while optimising floor space.

The Orient 10 is one of a new range of high performance, small footprint CNC machines from FICEP in which a drilling line is combined with a band sawing unit to carry out automatic drilling and sawing operations at variable mitring angles.

FICEP said the machine can produce very small parts which are drilled, scribed, sawn and unloaded automatically.

Guide to refurbishment solutions

Tata Steel, formerly Corus, has published a technical paper – 'Refurbishment solutions for non-domestic dwellings' – taking an in-depth look at the latest refurbishment solutions, and providing building designers and specifiers with practical guidance on the solutions available for pre-finished steel cladding systems.

Increasing financial pressures and the move towards a low carbon economy, is determining a real step change in attitudes towards building performance and construction practices. The UK's ambitious targets to reduce carbon emission and the knowledge that buildings account for almost half of all energy used globally, has lead to a growing realisation that refurbishment solutions make economic as well as environmental sense.

Carlton Jones, Technical Development Manager UK Construction, Tata Steel said: "The purpose of this technical paper is to highlight the need for designers and building owners to consider improving existing structures, rather than simply demolishing and rebuilding. There is a range of pre-finished steel refurbishment solutions available, from over painting for aesthetic purposes, or cladding durability reasons, through to a complete re-sheet or over cladding.

The paper has been developed in conjunction with the SCI and Tata Steel's supply chain partners to provide guidance and advice on the comprehensive range of refurbishment solutions using pre-finished cladding available to enable designers and building owners to meet both the technical and aesthetic requirements of a refurbishment programme.

Copies of the Colorcoat® Technical Paper are available to download from *www.colorcoat-online.com.* Alternatively email *colorcoat.connection@tatasteel.com* or call 01244 892434 to request a copy.

Seminars to boost steel construction awareness

The second Steel Essentials seminar - a series of events aimed at keeping construction professionals aware of the latest developments in steel construction - will be held this month in Cardiff.

Topics covered in the seminars include Sustainability, Target Zero, Steel: the Material of Choice, Eurocodes and Design for Fire.

The Sustainability presentation demonstrates the case for steel in sustainable construction, including the factors a designer should consider, and steel's sustainable credentials throughout a building's lifecycle.

Target Zero - the project which provides guidance on the design and construction of sustainable, low and zero carbon buildings is also fully explained. The focus will primarily be on schools and warehouses, the two building types of five for which guidance booklets have already been published.

Steel: the Material of Choice will review the cost effectiveness of steel construction; a Eurocodes presentation will give an overview of steel design to EC3; while Design for Fire considers the functional requirements of Building Regulations.

The forthcoming seminars are:

Barcelo Cardiff Angel Hotel,	14 October
Dublin,	9 November
Edinburgh,	23 November
Leeds,	7 December

To register email: *stephanie.hughes @steelconstruction.org*

ParkerSteel to go fully automated with new Kaltenbach line

Steel stockholder ParkerSteel has placed an order with Kaltenbach, for what is said to be one of the UK's first fully automated structural steel processing lines.

The installation for ParkerSteel's Canterbury facility comprises of a KBS 1051 mitre cutting bandsaw with an AS1000 auto-sorter system; a KDXS1015 drilling system; a four-axis contour marking unit; automated hard stamping, and an automatic material crossway and conveyor handling system.

Guy Parker, Managing Director, ParkerSteel, said: "Parkers have always been a progressive company, with continuous investment in the very best and most advanced leading-edge equipment, in order to ensure our cutting services remain firmly at the forefront of steel processing technology".

Portal frame for abandoned animals

Work is nearing completion on the Raystede Animal Centre in Lewes, East Sussex. The predominantly steel project features two elements; a traditional portal frame structure accommodating a new equine centre and bespoke architectural dog runs.

The £2M lottery funded extension to the specialist animal welfare centre has been designed by Waterside Architects with A & F Pilbeam as the main contractor. Some 90t of steel is required for the job, of which Albion Sections has provided the cold rolled steel to the equine centre and tensioning tie wire system for the dog runs.

Tom Hughes, Albion Sections Technical Development Manager commented: "The nature of this design has required us to work closely with the steelwork contractor.

The unusual bespoke diagonal tie wire system for the dog run consists of 30m security tension wire lengths, installed horizontally in rows of five above fencing enclosing the dog run."

The additional facilities within the Raystede Animal Centre will aid the charity to house the 1,500 unwanted and abandoned animals that arrive at the centre annually.

NEWS IN BRIEF

The **Steel Construction Certification Scheme** (SCCS) has obtained UKAS accreditation to National Highway Sector Scheme 20 for the execution of steelwork in transportation infrastructure assets.

Approximately 110t of cold rolled Multibeam purlins and rails, as well as 17,000m² of Multideck 60-V2 and associated products from **Kingspan** Structural Products have been specified for Silverstone's iconic new pit and paddock complex (see page 22).

Hilti has made a global investment of £7M for the development of its new Global Contact Centre. The system allows Hilti to segment its customer service departments into dedicated teams covering all market sectors including steel construction mechanical.

Over 50 on-line advisory questions and answers have now been published on SCI's **Steelbiz** website. All SCI members have free access to the site's answers - usually alerted by an automatic email giving links to the new additions. Members can choose to receive the weekly alerts via the 'preferences' link on the site's home page.

Work on the Medical Research Council's new Laboratory of Molecular Biology in Cambridge topped out during the early part of September. The building's steelwork programme is being carried out by **Fisher Engineering**.

Last month's (*NSC Sept 2010*) **20 Years Ago** article unfortunately contained an erroneous picture. The article's accompanying picture was not Stansted's passenger terminal, but was in fact one of the airport's main hangars.

New processing systems to debut at EuroBlech 2010

Dutch machinery manufacturer Voortman will present two new processing systems at the EuroBlech exhibition, which takes place in Hannover, Germany from 26-30 October.

Pride of place will go to the company's new CNC controlled V808M beam coping system, which can apply layout lines and information to all four sides of a profile. This is said to provide cost savings of at least one man hour per tonne of steel.

Another debuting machine is the VB1050 profile bandsaw which features a servo controlled spindle drive. This feature is said to improve accuracy and also allows the use of carbide saw blades which can increase capacity and production speed.

Voortman will be exhibiting at Hall 12 booth F47 and Hall 16 booth D25.

Exporting accolade for bolt manufacturer

Steve Jones (right) Operations Director at Tension Control Bolts (TCB) receives the Best International Trade of the Year award from Anthony Randall, President of Shropshire Chamber of Commerce. The business awards are now in their tenth year, and TCB were competing against more than 500 other Midlands based companies.

Sculpture stands guard over Cumbernauld

A 10m-high steel sculpture of a female form has been erected on a hill overlooking the Scottish new town of Cumbernauld.

Named Arria, after Arria Fadilla the mother of Roman Emperor Antoninus on whose orders the nearby Antonine Roman wall and fortifications where built, stands adjacent to the A80 truck road.

Its proximity to the highway means more than 70,000 commuters will see the sculpture every day.

International public artist Andy Scott took nearly a year to make the iconic sculpture. Prior to the erection and unveiling, the sculpture was split into 15 sections to allow it to be galvanized.

Mr Scott said: "Galvanizing was the last off-site fabrication stage and finalised the aesthetic appearance. As well as the obvious protective purpose, it also brings the sculpture to life."

Diary

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

5, 12 & 19 October 2010
NEW On-line Steel Building Design to EC3 Part 3 Internet

5 October 2010
Light Gauge Steel Design
Sheffield

12 October 2010
E4 Composite Design
Leicester

14 October 2010
Steel Essentials
Barceló Cardiff Angel Hotel

14 October 2010
Portal Frame Design
Northampton

19 & 20 October 2010
Essential Steelwork Design
Leeds

26 October 2010
Steel Building Design to EC3
Birmingham

2 November 2010
Stability of Steel Framed Buildings
Gloucester

9 November 2010
Steel Essentials
Dublin

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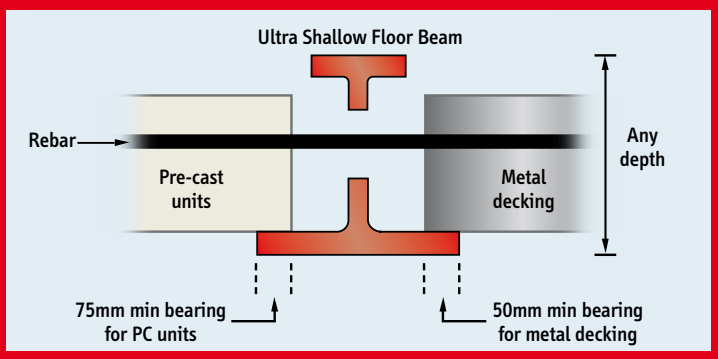

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The centrepiece of the project is a 15m high fin housing a viewing gallery

Steel's power of sustainability

An educational facility at a South Wales power station is making use of a number of sustainable features including a steel frame.

FACT FILE
Aberthaw Power Station, Centre for Energy and Education, South Wales
Main client: RWE npower
Architect: Loyn & Co
Main contractor: Jones Bros. Ruthin (Civil Engineering)
Structural engineer: Mott MacDonald
Steelwork contractor: EvadX
Steel tonnage: 60t

An example of sustainability in construction, and a destination for children and adults to learn about energy's environmental impact is under construction in South Wales. Known as the Aberthaw Centre for Energy and Education, it will open later this year and provide an important new resource for local schools and community groups.

Affording views over the adjacent Bristol Channel, the completed Centre's viewing gallery will also allow visitors clear views into the power station to observe how it is minimising the impact of electricity generation on the environment.

"We have always encouraged educational visits to the power station and we believe this centre will improve the quality of those visits," says Aberthaw Power Station Manager Phil Allen.

The initial design for the Centre was based around a concrete framed structure with three-storey high fins, however after some value engineering a smaller single storey building was decided on.

"The design needed to keep an industrial feel because of its location – so much of the steelwork is exposed – while we also wanted to reduce costs," says Tobias Stiel, Mott MacDonald Project Designer. "Steel allowed us to achieve these aims and offered a quicker construction programme."

Steelwork for the structure is based around a 15m tall fin; an architectural feature as well as an area to house energy saving heat pumps. The roof of the fin also accommodates a viewing gallery, accessed via a 9.5m long footbridge from an adjacent embankment.

Either side of the fin the structure extends in two directions, 30m for the west wing and 24m for the east wing. The west wing will house large classrooms, while the smaller east wing will contain a training room and an office. Taking advantage of the Centre's coastal location, the south elevations of both wings will be fully glazed, opening up the structure to sea views.

Structurally imposing and central to the project, the fin is structurally integral to the scheme, as the building derives much of its stability from this architectural feature.

The fin is actually formed from two fins, positioned approximately 5.8m apart and tied together via moment connections. One fin is a double fin, 1.25m wide and braced together, while the other connected fin, which forms the overall fin structure, is a single steel structure.

According to Mr Stiel some of the design challenges associated with the project, and especially the fins, included the control of high uplift forces at the base of the double fin, controlling deflection of the single fin, and designing a visually acceptable connection which would remain exposed.

For steelwork contractor EvadX, the double fin was the first part of the structure to be erected.

"This was a tricky procedure as the shape of the fin means it naturally wants to topple over," says Andrew Roberts, EvadX Project Manager. "To stop this every member had to be braced back to the adjacent member."

Aside from the steel frame, which has a

The fin is both architectural and structurally integral to the project

Providing the power

Aberthaw is a coal-fired power station and began full operation in 1971. It is located to the west of Cardiff, in the Vale of Glamorgan, on the north bank of the Bristol Channel.

Aberthaw can generate 1,500MW of electricity for the National Grid System, and this is estimated to be enough to meet the needs of some 1.5M people - equivalent to the total population of five cities the size of Cardiff.

The power station was designed to burn semi-anthracitic, low volatile coal. A high percentage of this coal is locally sourced and transported to the site by rail.

As part of its commitment to investing in lower carbon technologies Aberthaw has invested £9.5M to enable the co-firing of carbon neutral biomass fuels such as sawdust, palm kernel expeller and wood chips in 55MW of existing generating plant replacing some of the coal.

Once constructed the building will be insulated with material made from recycled glass bottles.

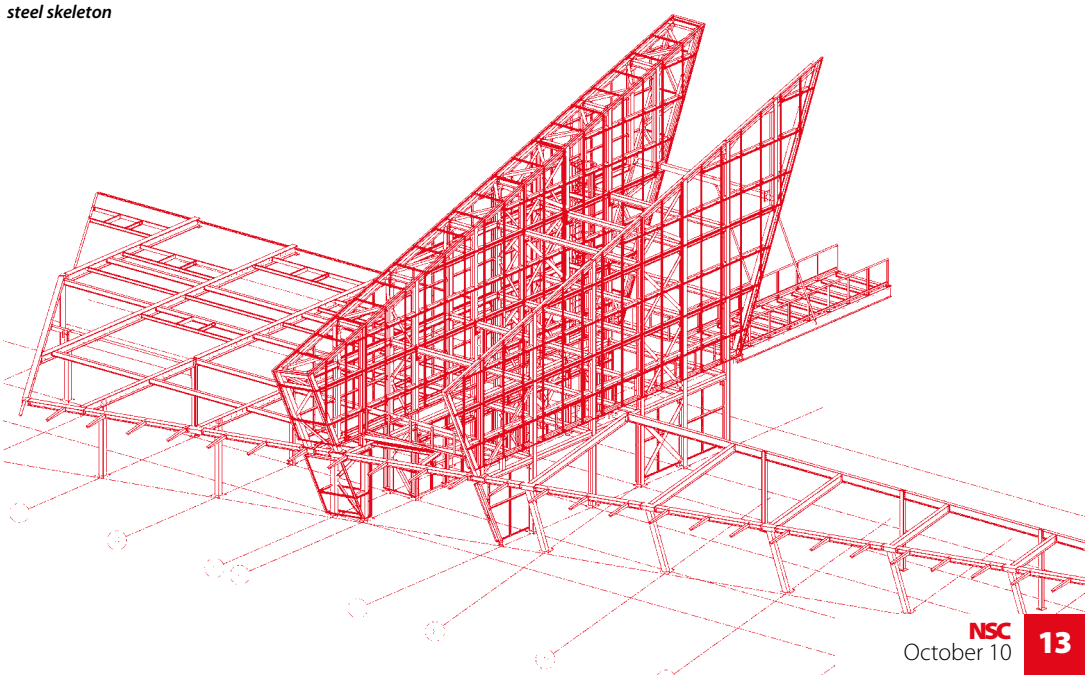
The Centre overlooks both the power station and the Bristol Channel

number of inherent sustainable attributes, the project is awash with environmentally friendly features. These include using by-products from the power station in the construction programme. Pulverised fuel ash has been used for foundations and furnace bottom ash will be used to construct the centre's car park.

Once constructed the building will be insulated with material made from recycled glass bottles; heated by the pumps in the fin and cooled by ducts on the roof designed to catch the wind, while rainwater will be collected for use in the toilets.

Summing up, Mr Stiel says the design concept is energy and environment. "The Centre offers views of the sea, while the gallery on the fin affords unobstructed views of the power station's chimney, in this way we have achieved the concept."

The project's steel skeleton



Building schools with steel

Steel's cost effective and programme benefits have come to the fore on three new schools under construction in Nottingham.

Speed of construction was a key factor in choosing steel for NUSA

Nottingham University Samworth Academy (NUSA)

Nottingham City Council is working in partnership with *inspiredspaces* to develop and build a new Academy in Bilborough called Nottingham University Samworth Academy (NUSA) which will cater for 950 pupils aged between 11 and 18. *inspiredspaces* is a joint venture company set up by Carillion and its partners to deliver educational transformation through the Government's Building Schools for the Future (BSF) programme.

The decision to use steel for the framing material for this project was predominantly contractor led as main contractor Carillion wanted the main frame erected as quickly as possible to fit into the overall tight construction programme.

To this end NUSA is a steel framed two and three storey complex divided into five distinctive blocks which are all interlinked. These have been designated as a main teaching block, science block, lecture/drama block, dining block and sports hall.

Chris Pembridge, Regional Director for Atkins, says: "Although the individual blocks are linked, structurally the project was isolated where possible with three major moment joints."

Steelwork contractor Caunton Engineering completed the majority of the steelwork for this project from April to August last year. Adrian Downing, Caunton Contracts Manager, says: "We erected the three level teaching block first as this is the largest block and it allowed follow-on trades to get started on the most time-consuming part of the project."

The teaching block is based around an irregular grid pattern which accommodates different classroom sizes. "This was another reason why steel was used for this and with many school projects," adds Mr Pembridge. "Steel framed teaching blocks lend themselves to reconfiguration if needed in the future."

Stability for this block, and in fact for all of the project, is derived from bracing located in stair cores and in bays where there are no windows. Precast concrete lift shafts and stairs were also installed by Caunton.

Once the steelwork for the teaching block was up Caunton worked its way up the sloping site and erected the other blocks which are all two-storey zones, with the exception of the sports hall. The portalised sports hall features the project's longest spans of 18.5m which were formed with a series of cellular beams, utilised for their inherent economy.

Towards the top of the sloping site the school's blocks form an internal courtyard which is roofed with ETFE. Two steel bridges span this internal space, both formed with 12m long beams supported on universal columns.

FACT FILE

Nottingham schools

Main client: Nottingham's Local Education Partnership (LEP) - A public private partnership between Nottingham City Council, *inspiredspaces* and Building Schools for the Future Investments
Architect: Atkins; Franklin Ellis
Construction Delivery Partner: Carillion Building
Structural engineer: Atkins; Price & Myers
Steelwork contractor: Caunton Engineering
Steel tonnage: 2,695t

Nottingham Academy will be the country's largest school

The Bulwell Academy

The Bulwell Academy, another entirely framed in steel school project, is divided into eight blocks which form an E-shape in plan. The project comprises a 13m × 23m main hall, a 35m × 18m sports hall, a library, a dining area, with the remaining blocks consisting of classrooms on two levels, connected at first floor by outside walkways.

Chris Pembridge, Regional Director for Atkins, says the decision to use steel was again contractor driven and based on the need for a quick construction. "Steel framed buildings are erected quickly and efficiently and this is important when the overall programme is tight."

Atkins designed the project's steelwork while Caunton designed the connections and erected the steelwork during the Spring of 2009. "All of our steel erection had to be coordinated around other on-site trades," comments Adrian Downing, Caunton Contracts Manager.

The structures consist of a mix of traditional beam and column, and portal frames for the main hall and sports hall. All of the school's eight blocks are linked with a number of moment joints isolating individual zones.

"Using portalised steel frames also provided us with the desired longer spans for the halls," comments Mr Pembridge.

Stability is provided by bracing positioned in corridor walls and windowless bays.

The majority of the blocks have pitched roofs with the classroom blocks' roofs covered with sedum to prevent excessive rainwater run-off and adding a green sustainable benefit to the project's design. Some of the school's plant areas have also been conveniently secreted into the structure's pitched roofs.

Nottingham Academy

Having successfully completed the steelwork for other academies, Caunton were subsequently awarded the contract to erect structural steelwork for a third project, a unique institution which is set to be the largest school in the UK, with more than 3,500 pupils.

Sponsored by the Greenwood Dale Foundation Trust, Nottingham Academy will cater for pupils aged 3 to 19 years old.

The overall project consists of three main zones housing secondary, primary and nursery schools. The main secondary school consists of a two-storey faceted circular structure with an open central courtyard.

Harry Stock, Associate at Price & Myers, says: "This sector is roughly doughnut-shaped. Because of this shape and the large amount of angles the grid is very irregular and for stability the structure required numerous moment frames as there are a lot of open areas."

Cross bracing has also been used and predominantly located in corridor walls, while external bracing has been placed in blockwork areas.

Attached to the circular structure is a long rectangular block which curves inwards by 45 degrees halfway along its length. Housing the primary and infant schools, this section is mostly single storey.

The project features a number of sustainable features such as rainwater harvesting, a green roof over some of the single-storey elements, and a biomass boiler.

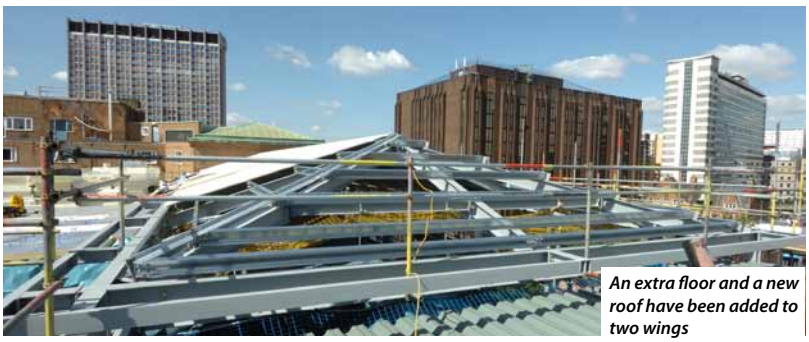
To find out more about the Nottingham LEP visit *www.nottinghambsf.co.uk*

Impression of the completed Bulwell Academy

Bulwell Academy consists of eight steel framed blocks

Sustainability and speed of erection both played key roles in the decision to specify steel for Nottingham Academy

The rotunda features an atrium spanned by bridges linking into the existing building



An extra floor and a new roof have been added to two wings

College remodelling

A new entrance hall housed within a glazed rotunda and extra floors added to two existing buildings are just part of the extensive work being undertaken at a south London college.

FACT FILE
Croydon College, Surrey
Client: Croydon College
Architect: Nightingale Associates
Main contractor: ISG
Structural engineer: Hambleton Partnership
Steelwork contractor: D A Green & Sons
Steel tonnage: 450t
Project value: £12M

Croydon College, one of south London's largest vocational colleges, is currently in the midst of a large remodelling project, a scheme that will keep the establishment at the forefront of training and education, while making widespread use of structural steelwork.

The college currently has two sites - Fairfield Road and Barclay Road - and it is at the former that the work is being undertaken. Consisting of both new build and refurbishment, at the heart of the project is a six-storey glazed rotunda, which will incorporate the new entrance to the College.

The predominantly steel framed rotunda includes a double-height space below ground level, which will house drama studios and music practice rooms. The ground floor will house the entrance hall, while the upper levels will provide light and spacious offices with circulation areas and glazed walkways (linking into the existing adjacent building).

The double-height basement zone is concrete framed and above it there is a concrete transfer structure supporting the steel frame for the upper parts of the rotunda. The perimeter curvature of the rotunda structure was one of the main reasons for choosing a steel frame. Much of the steelwork will remain exposed and consequently aesthetically pleasing CHS sections have been used throughout its semi-circular shape.

"We weren't allowed to splice these large 406mm diameter CHS columns, as they will remain in full view," explains Sean Clark, Contract Manager for D A Green & Sons. "So we had to procure them in complete lengths and the majority of them are nearly 20m long."

Bringing such large steel sections to site was a delivery and manoeuvring challenge, as the site is surrounded by busy roads, and the rotunda's access is severely restricted by the college's existing buildings.

Once the steel was on site, the CHS columns and the tight site, dictated the build programme for steelwork contractor D A Green. As the perimeter columns were immediately erected to full height (using temporary restraints), the rest of the rotunda's steelwork was erected around these sections.

"Once the CHS columns were up our access machines were restricted on the small tight site and could only reach to level three," adds Mr Burchnall. The basement slab also had a weight restriction which also limited the size of machine that could work on it.

"This meant we had to erect the internal steelwork to third floor level and then allow the concrete contractor to cast the concrete floors," he adds.

The final two floors were then erected with lightweight cherrypickers working off of the completed concrete slabs.

The rotunda actually features three rows of CHS columns, with the perimeter members being slightly shorter and ending at the fifth level, while the remaining two internal rows extend upwards the full 19.8m to form the top floor and roof. The perimeter columns are shorter as the uppermost part of the structure steps back to form a balcony.

Because of the amount of exposed CHS steelwork and the fact that the perimeter will be fully glazed, the project engineers had to figure out where to put the stability-giving bracing. The perimeter façade was

1

2

3

The completed rotunda (1) will house a new entrance hall (2) and the structure features CHS columns (3) which will remain exposed

The rotunda takes shape

obviously ruled out as cross bracing would have obscured the glazed elevations, while internally there was no space.

"All beam to column connections are moment connections in two directions, and these are all secreted within the floor zone," explains Chris Lyons, Hambleton Partnership Project Engineer. "This was the only solution, so as not to spoil the exposed columns with welded or bolted connections."

Along the back elevation of the rotunda, which abuts the existing building, there is a full height atrium containing two scenic lifts. At each floor level a bridge spans the atrium connecting the rotunda to the rest of the college. The lift shafts are constructed from 200 × 200 box sections, and these members tie-back into the existing building.

"The rotunda is basically an independent structure, with its own stability - via the moment connections. The lift shafts are the only point where the new steel connects back into the existing building's steelwork," explains Mr Lyons.

As well as the rotunda, steelwork has played a major role in another aspect of the college's redevelopment; the adding of an extra floor to two teaching wings. Both of these wings are identical and situated either side of the college's library. Initially the work consisted of the old copper roofs being taken off which then allowed steelwork, to form a new storey, to be erected. This was then completed with the portal frame roof which was clad in copper to match the surrounding college rooftops.

Before this a thorough survey of the existing buildings was undertaken and subsequently it was decided that the new floors had to be as light as possible. Using steel was the answer as connecting new steelwork to the original steel was a relatively straightforward procedure. However the old steel was concrete encased and some of this was stripped away making the old columns lighter, prior to the new frame being added.

"It was necessary to remove some of the concrete encasement to save weight, while the steel frame and portal roof were both of a lightweight design," adds Mr Lyons.

A timber decking has been used instead of a more traditional concrete floor, again this has minimised the loads being transferred down to the original foundations.

The project is scheduled for completion in February 2011.

The old steel was concrete encased and some of this was stripped away making the old columns lighter, prior to the new frame being added


The top floor of the rotunda steps back to form a balcony

Stations on track

Off-site construction has played a key role in the erection of steel structures at two new stations along Scotland's newest railway line. Martin Cooper reports.

Steelwork was erected around train services at Airdrie station

FACT FILE
Airdrie and Bathgate stations
Client: Network Rail
Main contractor: BAM Nuttall
Structural engineer/ designer: Scott Wilson
Steelwork contractor: Cairnhill Structures
Steel tonnage: 100t

The size of the UK's railway network has shrunk considerably since its heyday at the beginning of the 20th Century. Numerous cost saving measures, including the infamous report by Dr Richard Beeching in the 1960s, resulted in branch lines and stations being closed.

Over the last decade this trend has begun to be reserved with stations reopening and lines being reinstated, such as the East London Line extension (see NSC January 2007). Railways and light rail systems are now seen as a viable alternative to road transport and a number of projects are in the offing.

The Airdrie - Bathgate Railway Link is an example of this trend. It will soon reopen, connecting Edinburgh and Glasgow to give Scotland's two largest cities their third direct rail link.

The route already exists, but has been closed for more than 50 years. The last passenger train ran in 1956, while freight trains continued along the line until 1982. After this trains continued between Airdrie and Glasgow, and Bathgate and Edinburgh (see map), but sadly, the middle section between Airdrie and Bathgate was completely closed and the tracks removed.

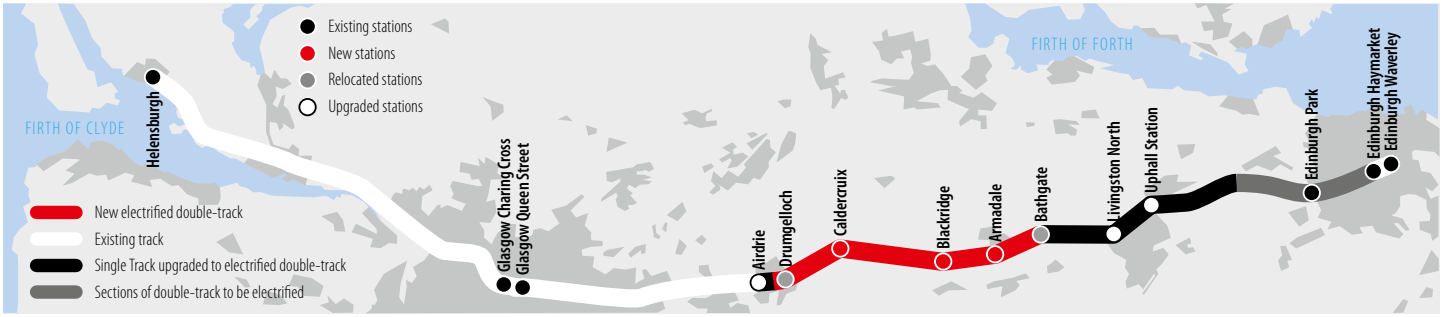
In 2004, the Scottish Government decided to reopen the line on the recommendations of the Central Scotland Transport Corridor Study. It stated the line would encourage the use of public transport and ease the nearby motorway and road networks. The project received Royal Assent in May 2007, and Network Rail and its team of contractors got the works underway in 2008.

The main works have been divided into four main contracts with Balfour Beatty responsible for new tracks between Airdrie and Bathgate, and also electrifying the whole route between Glasgow and Edinburgh.

During April 2009, Network Rail awarded three further contracts to Carillion, BAM Nuttall and Spencer respectively. Carillion is building the four new stations at Armadale, Blackridge, Caldercruix and Drumgelloch (between Airdrie and Bathgate), as well as carrying out certain ground treatment and filling activities. The new station at Bathgate and the renovated station at Airdrie, as well as bridge and earthworks are to be delivered by BAM Nuttall. Spencer was responsible for developing the light maintenance depot at Bathgate (see box story).

Working on behalf of BAM Nuttall, Cairnhill Structures has been responsible for fabrication and erection of structural steelwork for both Airdrie and Bathgate stations. At Bathgate this has consisted of a footbridge with stairs and lifts, linking the two new platforms. Under a separate contract a 25m x 6m steel framed station building, housing a ticket office and waiting area, has also been erected.

Bathgate's new station is only 400m east of the existing single platform station. The proximity of a 'live' station to the



construction site has meant the steelwork was all erected during overnight possessions.

"The footbridge was erected during five separate Saturday night rail possessions," explains Graham Paterson, BAM Nuttall Site Agent. "Saturday nights are the most popular as we get a longer possession, Midnight until 6am as opposed to Midnight to 5am on other nights."

This extra hour was particularly important for the lifting of the bridge deck, which was erected in one possession using a 200t capacity mobile crane.

"It took an hour to rig up the crane, and then a further hour to de-rig it," adds Mr Paterson. "This only left us four hours to get the entire deck into place… which we did." Cairnhill delivered the completed 18m-long steel footbridge deck to site in one assembled unit. The aluminium cladding was pre-installed in Carnhill's fabrication yard, while electrical conduits were also fitted. This meant little or no work was necessary on the deck once it was installed over the 'live' rail lines.

The other four possessions were used to install the lift shafts and the stairs which are connected to the bridge deck's supporting trestles. Again Cairnhill delivered the stairs/trestles as pre-assembled units, speeding up the erection process as well as minimising the required on-site work. The lift shafts were delivered in two sections and bolted together on site.

A similar steelwork package has also been completed at Airdrie, where again Cairnhill has erected a footbridge with lifts shafts and stairs. The only difference being this structure is slightly smaller with a span of 15m.

"It took an hour to rig up the crane, and then a further hour to de-rig it. This only left us four hours to get the entire deck in place… which we did."

"Again we used the same methodology," says Ian Taylor, Cairnhill Estimating Manager. "The steelwork was delivered to site in pre-assembled sections, which minimised the number of rail possessions needed and the amount of on-site work, which was critical as Airdrie is a 'live' station."

Both Airdrie and Bathgate stations are nearing completion and the line is scheduled to open this December.

The station at Bathgate with its new footbridge in the foreground and new station building behind it to the left

A light maintenance depot - including a steel framed 1,250m^2 office, amenity and stores building - has been constructed at Bathgate to serve the new railway line. Completed one month ahead of schedule, by main contractor Spencer, the project was 'Highly Commended' in the Best Project - Medium category, at the recent Network Rail Partnership Awards.

The depot provides facilities to First ScotRail, to enable it to clean trains, discharge toilets, fill water storage tanks and also carry out minor repairs.

A number of sustainable elements were included in the scheme, as the job involved 10,000t of excavation works. All of this material was recycled and transferred as fill to the adjacent station project. Over 3,000t of excavated tarmac was crushed and recycled for use in constructing the depot's new access road.

Choosing a steel frame for the depot's office building also proved to be the correct decision as the building was also erected and completed ahead of schedule.

Sustainability
in Steel Construction

The route to sustainable construction

The BCSA was the first representative organisation in the UK to launch a sustainability charter, the objective of which is to develop steel as a sustainable form of construction in terms of economic viability, social progress and environmental responsibility.

Launched in 2005, the British Constructional Steelwork Association's (BCSA) Steel Construction Sustainability Charter (SCSC) currently has 40 members which is proof that sustainability is high on the agenda for the majority of construction companies, and they need to focus on responsible practice across all activities including the supply chain.

It is this responsible approach, that is today a common thread throughout the constructional steelwork supply chain, and one that also sees steelwork as an increasingly sustainable material of choice for clients and designers.

Signing up to the SCSC is one initiative that offers steelwork contractors and component, material and product suppliers a way of demonstrating that they are addressing sustainability at a time when clients are wanting to employ firms that can show they are monitoring progress and continually making improvements.

The SCSC was set up to promote the development of steel as a sustainable form of construction in terms of economic viability, social progress and environmental responsibility. Steelwork contractors demonstrate their commitment to operating in a sustainable and responsible way by signing up to the charter.

A steelwork contractor that is a charter member can offer a specifier or contractor the following:

- Commitment to sustainable ideals
- Capability to deliver on those ideals
- Information on sustainable steel construction
- Responsible sourcing for steel materials
- Information on operational carbon footprint

Charter Members that agree to be bound by the charter have to make a formal declaration of their commitment to a set of sustainable principles, and to be assessed and monitored against a range of environmental, social and economic criteria. Charter Members formally declare that they will adhere to the following aims and objectives:

- Operate their businesses to the highest ethical standards in efficient and financially sustainable ways, in order to undertake contracts that satisfy clients and add value for stakeholders
- Work to assess and minimise the effect of manufacturing and construction activities on the eco-efficiency of steel construction through its life cycle
- Work towards increasing the efficiency of use of resources and energy in steel construction by promoting the recovery, reuse and recycling of steel
- Foster the health and safety of employees and others in the steel construction industry, and operate generally in a healthy, safe and environmentally sound manner
- Demonstrate social responsibility by promoting values and initiatives that show respect for people and communities associated with steel construction and with other organisations in the supply chain.

The SCSC was set up to promote the development of steel as a sustainable form of construction in terms of economic viability, social progress and environmental responsibility

Charter Members adhere to sustainable construction methods

The SCSC has been used to help improve understanding of sustainability among steel construction companies, as well as providing them with a tool to help them manage their businesses in more sustainable ways. Charter Members also agree to provide data which is used to calculate sustainability Key Performance Indicators (KPIs) and benchmark their performance.

A second objective of the Charter takes the BCSA's sustainability initiative beyond individual companies and requires the sector to engage directly with building specifiers and bridge procurement agencies. The aim is to develop suitable "green" specifications for steel construction that draw on the established capabilities of BCSA Charter Members in the supply chain.

Charter Member companies are assessed against the criteria listed below; to obtain Charter Membership companies must achieve at least six of the requirements; for Silver a minimum of nine requirements must be met and for Gold all requirements must be met:

1. A published sustainability policy (mandatory)
2. Monitoring of progress towards sustainability using specific management targets
3. A programme of involvement with their local community on social issues and with the steel construction community generally
4. An accredited H&SMS to OHSAS 18001 or H&S management as an integral part of a QMS accredited to BS EN ISO 9001
5. IIP accreditation or a structured programme for personnel training, development and communication
6. A published equal opportunities policy
7. A published ethical trading policy
8. An accredited EMS to BS EN ISO 14001
9. Use of environmental impact assessment for process improvement
10. A policy to manage energy and vehicle fuel usage in the business
11. A policy to question whether suppliers have published sustainability policies
12. An accredited QMS to BS EN ISO 9001

Of the 40 members of the scheme, 17 have Gold and 14 have silver status.

An up to date list of all Charter Member companies can be found at: *http://www.steelconstruction.org/directories/sustainability.html*

Factory based steelmaking and fabrication supports a stable local workforce, benefiting family life and building stable communities

The new pit and paddock takes shape between Club Corner and Abbey

Taking the chequered flag

A pit and paddock complex, containing race team garages and hospitality suites, will be open in time for next year's British Grand Prix. Martin Cooper reports from Silverstone's dynamic new structure.

FACT FILE
Silverstone Pit and Paddock complex
Client: Silverstone Holdings
Architect: Populous
Main contractor: Buckingham Group
Structural engineer: Mott MacDonald
Steelwork contractor: Barrett Steel Buildings
Steel tonnage: 1,200t
Project value: £28M

Silverstone is one of the UK's most iconic sporting venues and one which evokes thoughts of high speed racing, chequered flags and the occasional home winner, as last happened in 2008 when Lewis Hamilton won the British Grand Prix.

The former WWII RAF airfield has been synonymous with F1 racing since 1948 when Silverstone held its first British Grand Prix, an event it has hosted every year since 1987.

The circuit has continually evolved over the years with alterations to the track's configuration as well as spectator and competitor facilities being improved. This process must continue as it is seen as vital to Silverstone keeping its position in the top tier of world motor racing circuits.

Block one contains mezzanine levels which can be used as VIP areas

Part of this on-going programme is the construction of a new pit lane and paddock complex currently going up between Club Corner and Abbey (two of the circuits famous corners). Once complete the starting grid and finishing line will be moved, from their current position on the other side of the track, to the front of the new structure.

Housing 41 team garages along the ground floor, the 360m-long steel framed structure will also accommodate a media centre, hospitality suites - with a capacity of 4,000 - and a race control box.

Taking into account the many functions the building will perform, the design concept called for flexibility, while architecturally a strong impression of velocity and sleekness was required.

"The roof form takes its lead from modern cars with sleek lines and a blade at one end," says John Rhodes, Associate Principal at Populous. "It depicts excitement, and the blade also acts as a feature or signpost to the building."

To create the illusion of speed and excitement the paddock's roof is dynamic in form as it rises, falls and flares to mimic movement. The roof is also monolithic, with no joints, gaining its sleek seamless appearance from a liquid applied roofing material.

The dips and troughs culminate at the blade, which is a non-habitable 16.5m long fin-like structure jutting forth at 40 degrees from one end of the building. It has been constructed from four main steel trusses, each one assembled on the ground and erected with two 50t capacity cranes. One crane lifted the truss and held it in position, while the other crane erected the smaller in-filling sections. The trusses are all 16.5m long and at their widest point they are 2.18m deep. Overall more than 300 individual hot rolled steel pieces were used to construct the fin.

Built on a greenfield site and founded on pad foundations, the paddock is structurally divided into four sectors, all separated by circulation cores containing stairs and lifts. Block one, nearest the blade, has three levels,

The paddock will be open for next year's British Grand Prix

while the rest of the structure has two floors.

Race team garages (high enough to accept truck racing vehicles) are spread along the ground floor of the paddock, above level one is mostly open-plan with two mezzanine floors, giving it the required flexible design for a multitude of functions.

"One of the main reasons for choosing a steel frame was that it gives us this flexibility," adds Mr Rhodes. "Using a fairly large open plan grid, the hospitality areas can either be partitioned into separate boxes or the whole floor can be open plan for exhibitions. The mezzanines allow us to create VIP areas, separate from the rest of the floor level."

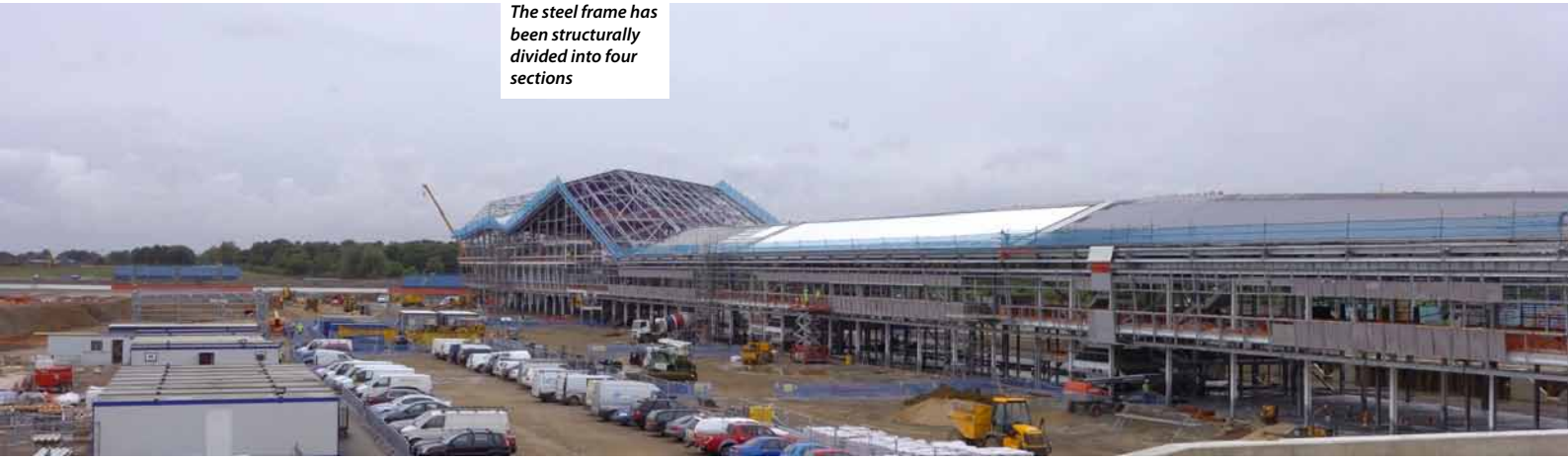
In block one, a media centre has been sandwiched in between the ground floor garages and the hospitality level. Just below the blade, block one also contains the racing control centre overlooking the new pit entry point.

Barrett Steel Buildings has undertaken a design and build contract for the project's →

"The roof form takes its lead from modern cars, with sleek lines and a blade at one end."

Ground floor garages are high enough to house most types of racing vehicle

The steel frame has been structurally divided into four sections



Working around the Grand Prix

One of the more out of the ordinary elements associated with the project is the fact that Silverstone has not closed for business during the construction programme, and this year's British Grand Prix went ahead as planned in July.

"There was a two week window before the Grand Prix weekend when we had to completely decamp from site, take down all hoardings, remove all plant equipment and basically hand the project area over to the client," explains Buckingham Project Manager Clive Bailie. "However, the Monday after the event we moved back in and as everything went like clockwork we were back working as normal on the Tuesday."

The whole decamping procedure was planned well in advance and was written into Buckingham's contract as nothing could be allowed to prevent the Grand Prix taking place. Planning in advance helped with this unusual element, while client and contractor have also had to work closely together to get most materials and equipment to site. As the paddock is inside the circuit, deliveries have to cross the track (which is in use most days) and this often requires 48 hours notice being given to the track officials.

The structure's design mimics movement with its peaks and troughs

steelwork. It has been on site since May and erected approximately two-thirds of its 1,200t steelwork package prior to this year's Grand Prix, when the site was closed down (see left).

Block one was the first section to be erected along with its adjacent core, the largest of the structure's cores. "We started at this end because this core will have all of the services for the media centre as well as hospitality zones," says Stuart Bew, Senior Site Manager for Barrett Steel Buildings. "As there are more follow-on trades in this area it was important to get the steel up as early as possible."

The largest of the cores also took time to erect because of its complex configuration, as one side as three levels (block one) and the other only two, with a sloping roof above. To accommodate the varying floor levels Barrett has installed a number of column trees, with as many as seven beams connected to them.

Steelwork then continued down the structure with block two being erected, followed by block four. After the Grand Prix hiatus, block three was subsequently erected by in-filling between the previously erected steelwork.

"Again block four is slightly more complex as it has a bridge connecting the first floor with ground floor and it made sense to erect it early," explains Mr Bew.

The overall paddock steelwork programme, including a small adjacent steel framed energy centre was completed during September. The project is on schedule for its 2011 completion date, with the paddock and pit complex due to be used first for next Spring's Moto GP, followed by the big unveiling for the British Grand Prix in July.

The fin structure will act as a signpost for the new paddock

Bridges provide road and rail solutions

Using steel allowed all work to be undertaken from the riverbanks

When it comes to building bridges two transportation projects in the Republic of Ireland have highlighted steel's flexibility and ease of construction.

Ireland's recently opened M3 motorway provides a much needed improvement to one of the country's busiest commuter routes. By connecting the towns of Kells, Navan and Dunshaughlin to the M50 Dublin ring road, the 66km-long highway has alleviated town centre congestion, while simultaneously making the life of driving commuters less stressful.

Just north of Dunshauglin the M3 crosses the River Boyne, the widest obstacle along the highway's route and one which required the largest structure.

A steel composite solution was chosen for the bridge (known as S19) as this was deemed the best way of avoiding any work being undertaken in the river.

The bridge consists of three arched spans supported on concrete piers; two outer 37m spans and a central span of 56m. The middle section spans the River Boyne, while the outer two allow local - predominantly farm vehicles - access along the riverbank.

Steelwork contractor SIAC Butlers Steel fabricated and brought the bridge's girders to site in fully braced pairs. "This minimised the amount of on-site work needed," explains Tony Callanan, SIAC Butlers' Construction Director. "And also meant we could lift fully assembled girders into place across the river from the bank."

Initially the 56m-long central span was erected with the aid of a 1,000t capacity crane positioned on the riverbank. These girders were too long to be transported by road as complete sections so they were delivered in two parts and then spliced together on site before being lifted into place. Because of their extra length, the central span's girders are 3.8m deep, while the outer spans are 2.2m deep.

"Once the mid section was in place, the outer spans were then lifted using a 400t capacity mobile crane," adds Mr Callanan. "As these spans were smaller, we were able to fabricate and deliver the girders to site in complete 37m lengths."

Aesthetics have played a key role in the design of this structure, with landscaped areas placed around the supporting piers and the client specifying a brilliant blue polyurethane paint for the steelwork, which was applied in SIAC Butlers' fabrication facility.

"Most of the connections on the bridge are bolted, but for aesthetic reasons the outermost girders were site butt welded," adds Mr Callanan.

As well as completing Structure S19, SIAC Butlers also fabricated, delivered and erected the 46 sign gantries along the M3 and toll booths at either end of the motorway.

Summing up the work, Pat Egan, SIAC Butlers' Deputy Managing Director, says: "Bridge projects will continue to be a key area of growth for the company in the future. As a fully certified member of the BCSA RQSC Bridgeworks Scheme we've built up a proven capability in the fabrication and installation of road and rail bridges."

". . . we could lift fully assembled girders into place across the river from the bank."

FACT FILE
Structure S19, M3 Motorway, County Meath, Ireland
Main client: National Roads Authority
Main contractor: M3 Motorway JV
Structural engineer: Roughan O'Donovan
Steelwork contractor: SIAC Butlers Steel
Steel tonnage: 650t

The 56m long central span consists of twelve girders brought to site in six pairs

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The canal bridge was designed to look like the other older bridges along the route

New commuter railway

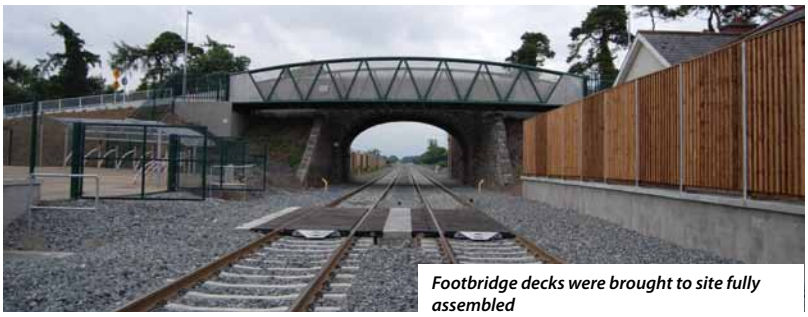
FACT FILE
Dublin - Navan railway line
Main client: Irish Rail
Main contractor: SIAC Construction
Structural engineer: Capita Symonds
Steelwork contractor: SIAC Butlers Steel
Steel tonnage: 250t

Currently under construction, the Dublin to Navan railway project was also proposed to address growing traffic problems in County Meath. Similar to the M3 motorway, the new railway will provide an alternative transportation route in and out of Dublin.

The overall project consists of two phases; Phase one includes the construction of a 7.5km double track railway line between Clonsilla near Dublin and the M3 Interchange at Pace, just north of Dunboyne in County Meath. This part of the project is scheduled for completion this year, while a second phase extending the line a further 34km north towards Navan is due to be ready by 2015.

Near Dunboyne the railway crosses the Royal Canal and this obstacle required SIAC Butlers Steel to erect a single span box girder bridge, requiring 120t of steel. The largest steel structure along the railway line, the company fabricated and delivered the six arched girders - 31m long - to the site and then assembled them into braced pairs using 36mm diameter stainless steel bolts. The three assembled pairs were then erected in one full day lifting operation, using a 350t capacity mobile crane.

"This is a compression arch bridge," explains Mr Callanan. "The steelwork is quite heavy-duty for a small bridge, but it has to be to carry a railway."



Footbridge decks were brought to site fully assembled

Each of the girders is fabricated from 400 × 400 × 25 plated box sections, while the end pin connections are 110mm diameter.

"We also chose this design so it would mimic the other bridges along the canal," explains Aidan McAdam, Project Manager for Irish Rail. "To get the required design and do it cost effectively we had to go with the steel option."

SIAC Butlers has also been contracted to provide steel structures for three new stations along the Phase one route. Station buildings including a ticket office have been erected at Dunboyne and Pace, while a slightly smaller station building was erected at Hansfield.

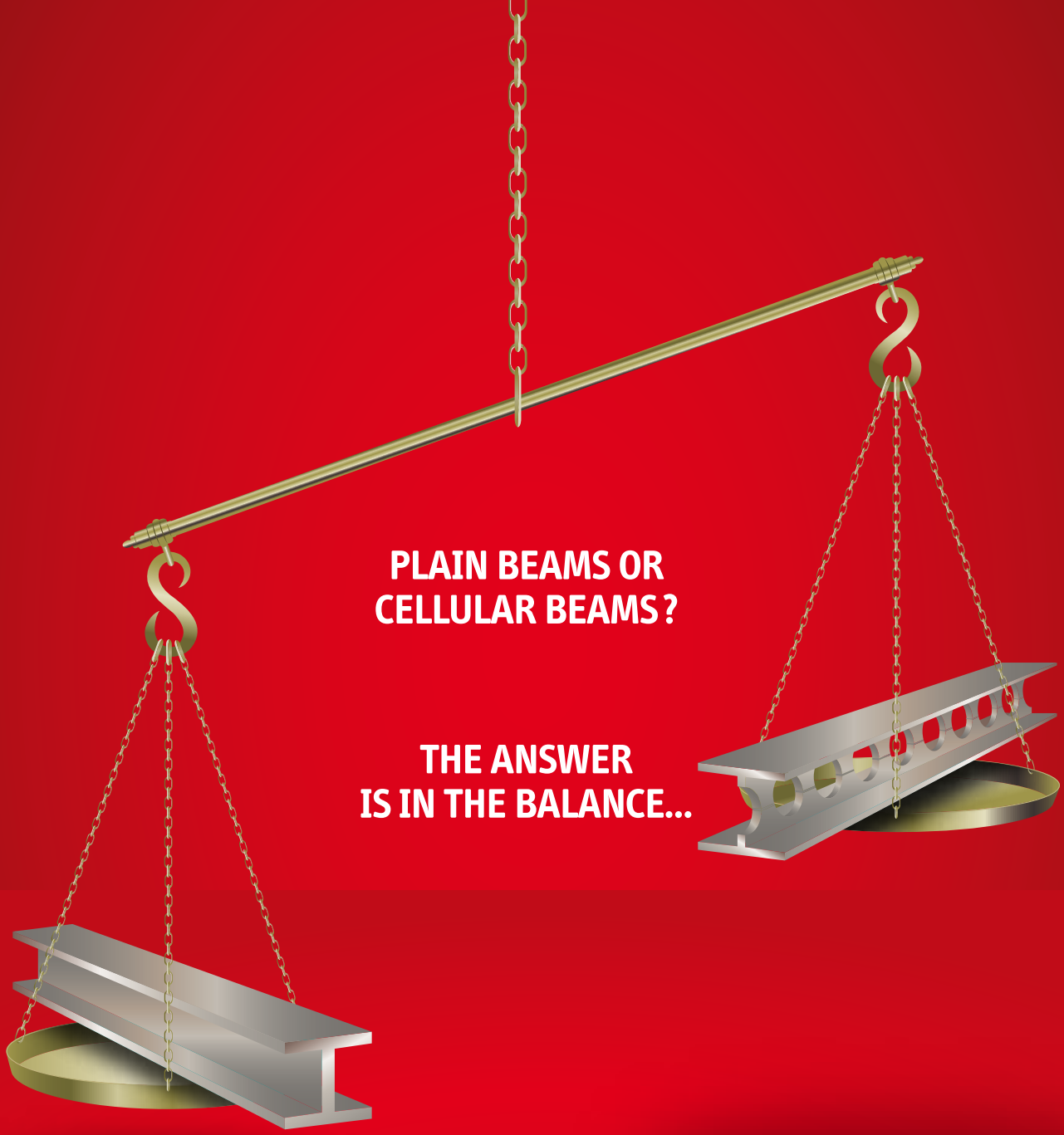
The station buildings are small portal frame structures, quick to erect and chosen for their cost effectiveness and sustainability credentials.

"Steel's flexibility, which gives us the possible option of extending or enlarging the station buildings was one of the main reasons for using steel frames," says McAdam.

SIAC Butlers has also installed steel footbridges at Dunboyne and Pace stations. Each weighing 25t and measuring 18m long, both decks for these structures were brought to site fully assembled and lifted into position in one operation.

"This is one of the benefits of steel bridges," explains Mr Callanan. "We needed to do minimal site work as the whole footbridge was fabricated and assembled in our facility, and then brought to site in one piece. This also meant we didn't interfere with other on-site trades."

A new road bridge has been installed across the River Brick, Ballingar, County Kerry by SIAC Butlers Steel working on behalf of main contractor BAM Construction. The 36m-long single span warren truss structure was transported to site by road, from SIAC's Portarlington fabrication facility, in full length sections. Weighing 90t in total, the entire bridge was erected in a single day using one 450t capacity mobile crane.



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A suspended gondola carries vehicles and passengers across the River Usk

Swinging back into action

One of only eight transporter bridges in the world, Newport's historic steel landmark recently reopened to the public following a major refurbishment. Martin Cooper reports.

For more than one hundred years Newport's Transporter Bridge has stood over the River Usk as a steel landmark to British engineering and construction expertise. Now, following a major £1.2M refurbishment programme, the bridge has officially reopened to the public, having been closed for more than two years.

Originally opened in 1906, the Grade I listed structure carries passengers and vehicles across the Usk on a gondola suspended from a trolley. Spanning between two 74m-high towers, the trolley is propelled by a continuous cable that winds onto a drum driven by an electric motor.

The gondola travels 197m between the two riverbank towers, which makes it the longest spanning transporter bridge in the world. Eighty passengers and up to six vehicles can be carried each trip, and for the more adventurous there is also a high level walkway at the top of the towers offering great views of the Newport area.

The bridge's refurbishment is one of the legacies of The Ryder Cup, which Newport is hosting this month, with funding from the Welsh Assembly Government, Newport City Council and Cadw. The project took six months, during which time 12 abseiling painters were dangling from the towers on a typical day to repaint approximately four miles of steel.

"The steel structure is in excellent condition for its age," comments Brian Kemp, Head of Engineering & Construction for Newport City Council. "During the refurbishment works we only had to replace a few cross bracing beams, as well as installing a new high level track for the cabling."

All new steel sections for the bridge are bespoke pieces, specifically tailored for the project. However, new and replacement sections have had to be ordered in metric and not in the original imperial sizes. "The switch to metric is probably the only change we've made to the original design," says Mr Kemp.

So well preserved is the bridge and its equipment that the motor for the gondola's trolley has never needed to be changed or overhauled. According to Mr Kemp, the original designers purchased two motors, with the spare one still in its box to this day.

Designed in France Made in Britain

The original concept for the iconic transporter bridge is generally credited to French engineer/designer Ferdinand Arnodin. During the 1890s he designed transporter bridges in France, Spain and North Africa. When Newport's City Councillors decided to build a new crossing of the River Usk, to service the newly opened Orb Steelworks, Mr Arnodin was duly summoned.

A transporter bridge was the only sensible option for the Usk crossing. A ferry was ruled out as low tide would have hindered services, while conventional bridges would not have allowed large ships to pass under them on their way to the City Docks.

Mr Arnodin, working in conjunction with Borough Engineer Mr R Haynes, designed the world's longest transporter and employed contractor Alfred Thorne of Westminster to erect it. Approximately 850t of structural steelwork, mostly sourced from Frodingham near Scunthorpe (above), was needed for the project, with the bridge finally costing the princely sum of £80,000.

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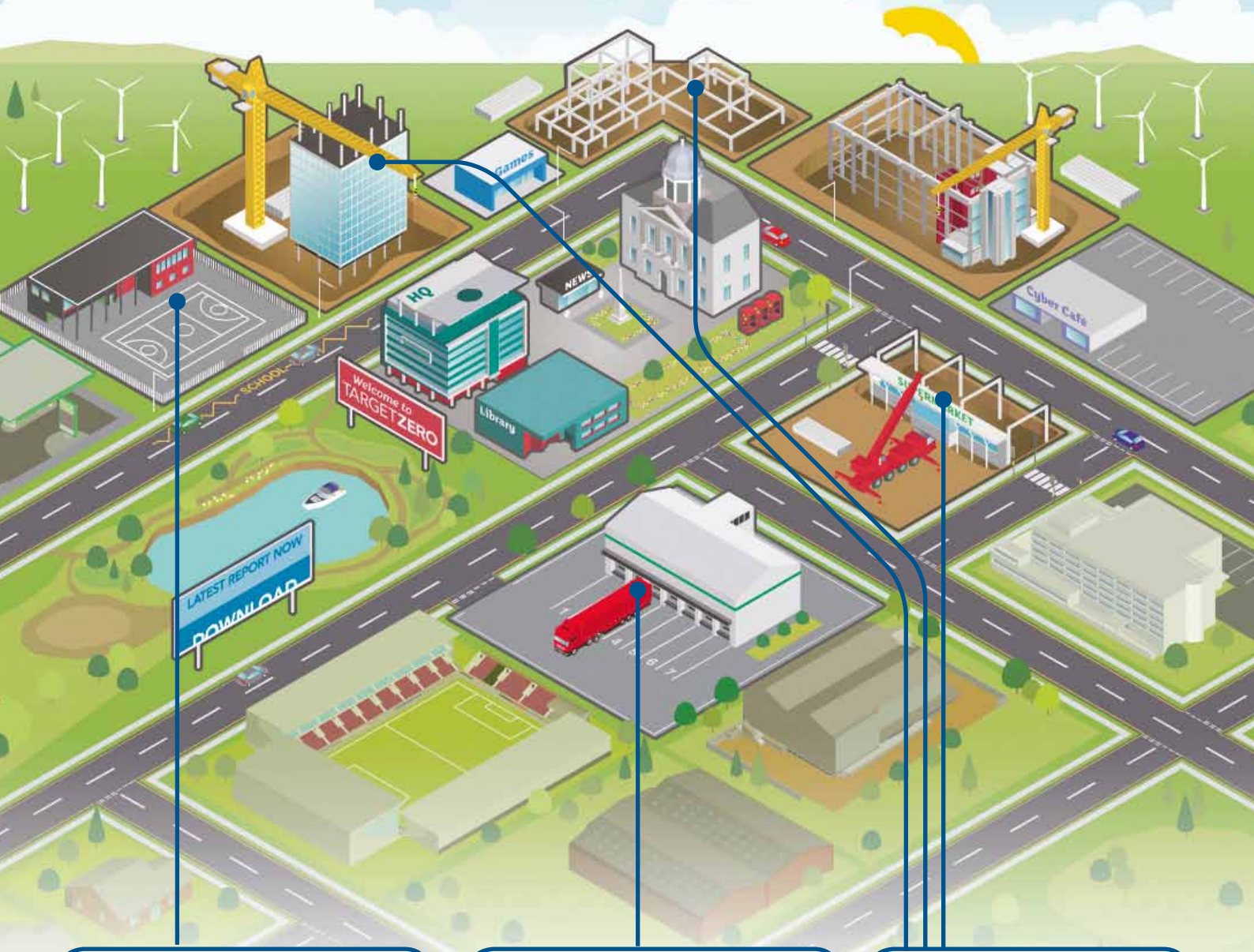

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Blowing - our way

The second part of a review of the impact of Eurocode wind action on the UK, in comparison with BS6399-2, by Alastair Hughes of the SCI. Part One appeared in the September issue

Part Two: Interaction of wind and building

Introduction

EN1991-1-4's velocity pressure q_p, based on its new wind map and the factors discussed in Part One, is practically identical to dynamic pressure q of BS6399-2. Though calculated for a height, and perhaps for directional sectors, to suit the building, it is an attribute of the incident wind. Effects on the building will also depend on its own size, shape and dynamic character. As in BS6399-2, factors apply to q_p to account for size and dynamism, so new $q_p c_s c_d$ substitutes directly for old $q_s C_a (1 + C_r)$. Overall forces are calculated either directly using force coefficients or indirectly (as in BS6399-2) using pressure coefficients together with a lack-of-correlation factor.

Separate size and dynamic factors are used in the UK. Combining them into a 'structural' factor $c_s c_d$, though not ruled out, is discouraged. Dynamic factors apply to overall effects on the building; surface pressures for (*e.g.*) roof uplift or cladding design would be calculated without them. However size (of the area whose wind contributes to the effect being designed against) is always an influence.

Lack-of-correlation factor now varies with the slenderness of the building. The traditional 0.85 only applies up to $h/d = 1$. Unhelpfully, upwards of $h/d = 5$ the factor is 1 (linear interpolation intermediately). These values, given in a NOTE, do not have normative status (nor a symbol, though c_{loc} could serve) but are endorsed by the UKNA.

Size effect

Table NA.3 gives the size factor, varying with size (expressed not as a diagonal dimension but as $[b + h]$ for the building or portion in question) and also with height (above displacement level) and zone. There are three zones A, B or C, as in BS6399-2, but now assigned in Figures NA.7/8.

The base Code has a separate localized allowance for size effect, wherever different pressure coefficients are presented for loaded areas of 10 and 1 m^2 respectively. The higher 1 m^2 values are only relevant to cladding design, if that, because the NA declares the 10 m^2 values valid for any loaded area in excess of 1 m^2. One of the reasons given for this bold simplification is that the UK cladding and glazing industry preferred it, which seems refreshing.

Dynamic effect

The NA includes graphs for dynamic factor, depending on height, aspect ratio and assumed damping. Table F.2 of the Code informs us that damping values, expressed as logarithmic decrement, may be approximated as 0.05 for steel buildings and 0.08 for 'mixed structures concrete + steel', which could be interpreted to mean either composite construction or steel frame with concrete core. Unfortunately no graph is provided for 0.08. Damping values are, in a sense, anybody's guess, but Table F.2's recommendations look distinctly cautious compared to traditional assumptions.

The NA's treatment is presented as a simplification. The Code's more elaborate one, 6.3.1 in conjunction with Annex B, is not overruled and 'should be more accurate'. However its Annex C (in lieu of Annex B) and Annex D (bundling together size and dynamic factor) are rejected by the NA.

Force coefficients

Force coefficients experience a resurgence. The 'net pressure' coefficients given in Table NA.4 (for rectangular buildings up to $5d$ in height) can readily be transformed into force coefficients by application of the lack-of-correlation factor. The overall wind force calculated this way ($q_p c_f \times$ shadow area) will generally be lower than that from summation of pressures. A more slender building must, and a less slender one may, use force coefficients from Code clause 7.6 (not forgetting that the NA substitutes Table 7.16).

There is no mention in EN1991-1-4 of the 'enclosing rectangle' concept for irregular shaped buildings, but it is as valid as ever and short of a wind tunnel there is no practical alternative. Not all architects are content to design shoeboxes to suit the Code! For circular and polygonal shapes force coefficients are available.

External pressure coefficients

Pressure coefficients, in principle the same as before, are surprisingly controversial. At the eleventh hour (April 2010), the EN has been amended to allow national determination of roof pressure coefficients. Consequently the revised NA will replace Recommended Values with coefficients almost (not quite) identical to those of BS6399-2. Designers are rescued from legal limbo (an 'advisory note' at the back of the original NA recommends continued adherence to BS6399-2), but disharmony remains.

NDP status allows the NA to set 1 m^2 values for roof pressure coefficients equal to 10 m^2 values, an indirect abolition. [The slate could have been wiped clean by doing likewise for walls, but it seems that Table 7.1's values for 1 m^2 are to remain.]

Zones A, B, C into which side faces are subdivided are not to be confused with the similarly labelled zones for size factor in Table NA.3. The PD includes advice for zoning of some building shapes not in the Code.

Calculation of lateral force by vectorial summation of surface pressures will still be called for where roofs are not flat (unless a force coefficient is applied to an enclosing cuboid). The NA clarifies that the lack-of-correlation factor may be applied to all of the lateral force, not just the component from the walls.

Another candidate for the pressure summation approach is a building subdivided by movement joints between front and rear faces, with apportionment of wind force dependent on internal pressure.

'Division by parts' is permitted, but for windward face only, which limits its appeal.

Internal pressure

For virtually all buildings, computation of internal pressure is necessary for cladding design. For some, it will also influence structural design. The new regime has little new to say on the subject; its declaration that the internal pressure coefficient can be taken as the more onerous of +0.2 and –0.3 (in the absence of a dominant opening) echoes that of BRS Digest 119 in 1970, and designers of portal frames will look in vain for the relief offered by BS6399-2.

Funnelling hasn't gone away

Locally increased side face suctions where wind is funnelled between adjacent buildings receive scant attention in the Code, but the NA corrects this deficiency with notes under (but rather unrelated to) Table NA.4.

Comparison of design wind forces

A taxpayer-funded calibration study commissioned by CLG is freely downloadable at *http://www.communities.gov.uk/publications/planningandbuilding/calibrationeurocodewind*

Conclusions are that the new regime will generate slightly lower design wind forces than BS6399-2 for low rise buildings, but that high buildings

will suffer an increase, in some cases 30% or more. This is largely due to the tapering (to the point of withdrawal at ***h/d*** = 5) of the 0.85 factor for lack-of-correlation, which BS6399-2 applied irrespective of height or slenderness.

Partial Factors

Arguably the most serious impact on our structures, of any height, will be made not by EN1991-1-4 but by EN1990. This dictates a partial factor of 1.5 where wind action is the leading variable action, as in lateral design or an uplift situation. This is an increase from the factor of 1.4 previously applied. Wind is now taken just as seriously as any other variable action when it is 'leading'. A vestige of its traditional underassertiveness remains in the relatively low combination factor applied when wind is an 'accompanying' variable action. This is cold comfort because situations in which wind governs are commonly those in which it is the **only** variable action, countered by unfactored permanent (dead) load alone. Note that equivalent horizontal force represents an inclination of the gravity action and is factored as such. It is not an independent variable action.

Implications for future design

By comparison with a pre-Eurocode design, it seems likely that lateral forces will increase, at least for the higher buildings in which they matter most. Impact on member sizes will vary from building to building, and from member to member, but clearly lateral forces will be more demanding of attention. There will be consequences, not least for connection design, in moment-resisting frames. In braced buildings, columns under tension gain a little relief from enhanced holding down power of reinforced concrete floor slabs whose density is taken as 25 not 24 kN/m^3. On the compression side increased factors on wind will tend to be compensated by the reduced factors on gravity (though combination-factored wind will contribute to ultimate design compression, which is tedious). Any member resisting wind alone, such as a diagonal, is in line for a meaningful increase in design force.

Conclusion

Updated UK wind code or harmonized Eurocode? Perhaps it should be conceded that this new regime is neither fish nor fowl. Europhiles and traditionalists alike may find its presentation unappetizing. Yet after a little effort with the knife and fork, and some chewing over, its digestibility may surprise us all.

Would it be far-fetched to suggest that despite appearances this might be the best wind code yet? We need a good one, as EN1990 partial factors make future structures work harder against wind.

Contemporary Factory Design — some notable examples

H. J. HEINZ COMPANY'S KITT GREEN FACTORY NEAR WIGAN LANCASHIRE

This is the Commonwealth's largest food processing plant covering an area of 130 acres and with a total floor space of 833,600 sq. ft. Designed and built for the H. J. Heinz Co. Ltd., who have been manufacturing food products in England since 1905, it was completed last year (1959) and when operating at full capacity employs 3,000 personnel.

The architects, J. Douglass Mathews & Partners of London, designed a factory notable for its flexibility. This attribute was quite essential, due primarily to the fact that so many different varieties of food are produced in the factory with varying outputs. Consideration had to be given to the possibility of changing certain features in the factory both during and after erection. The full effect of this naturally could not be foreseen but alterations in design were obliged to be carried out during the time of erection and the foresight shown by the architects meant that these changes could be effected with a minimum of trouble and inconvenience.

These is little doubt that the choice of steel as the structural medium assisted in achieving this flexibility of action. Some 8,000 tons were used in the factory structure. It is interesting to note that the factory was originally designed as a reinforced concrete building, but the steelwork contractors were able to put in a better price for the work.

The architects recommended two-storey construction as being advantageous from many points of view, though the Production Building shows a variation from this in that a mezzanine floor was introduced: into this floor were canalised all the administrative and service functions so leaving large areas of uninterrupted floor space on the upper and lower floors.

Right: Raw materials store. Note the extensive use of castellated beams.

Column spacing of 48 ft. by 16 ft. was adopted in the lower production floor and steel plate girders having a depth of about 4 ft. were used to span in the 48-ft. direction, the top flanges being used to support the decking of the mezzanine floor, the lower flanges supporting the ceiling of the lower floor. One hundred and eighty such girders were used, a feature of them being the 2 ft. 9 in. diameter holes through the webs to allow easy access for ducts to pass through.

The storage section of the main building is of two storeys with a flat roof. Height of ground floor storey is 27 ft.: the flat roof is of metal decking on a steel framework: Castella beams were used for the highly loaded large spans.

Working in association with J. Douglass Mathews & Partners were Skidmore, Owings and Merill of New York. Consulting Structural Engineers were R. T. James & Partners.

FORD MOTOR COMPANY LTD PAINT TRIM & ASSEMBLY PLANT, DAGENHAM

This building cost £10,000,000 and formed the last major part of an expansion programme launched by the Ford Company in 1954. The complete programme cost £75,000,000, contributed an additional 3,000,000 sq. ft. of floor space and almost trebled the company's fixed assets. It has been anticipated that this year will see the labour force exceed 50,000 and the 1954 capacity doubled.

The new paint, trim and assembly building provides 1,402,000 sq. ft. of floor area and was in fact the hardest single project in the expansion programme. Car bodies are received in this building by means of an overhead conveyor bridge. After painting and furnishing they pass to the final assembly area to meet engines, transmissions and other components from the main plant. It is of two storeys with the paint shop on the first floor and the trim and assembly shop on the second floor.

This was clearly a project where first class team work would be the deciding factor in getting the building finished and working in the shortest possible time. So it turned out and structural steelwork made its customary notable contribution to this speed in erection.

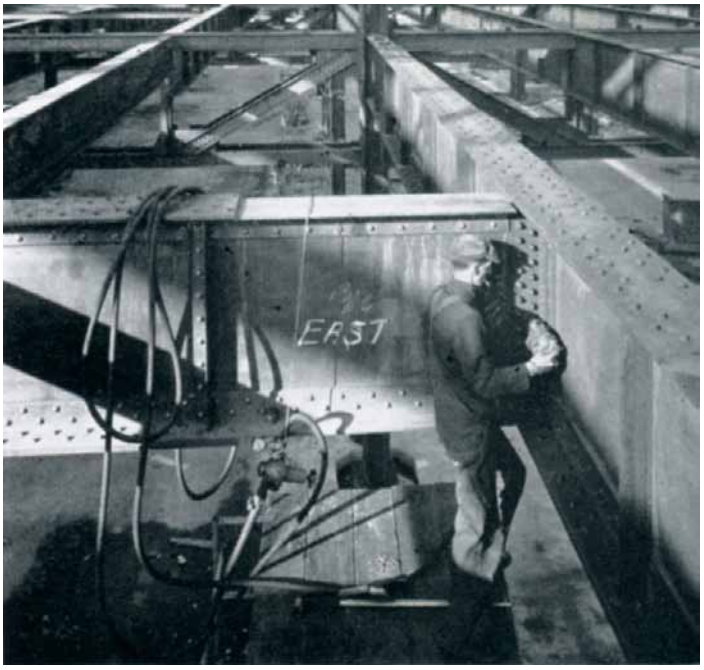
The formidable task of erecting 15,000 tons of steelwork for the main building, together with ancillary structures, was completed in ten months – six weeks ahead of schedule. Within four months of commencing the steelwork there were on site 2,500 tons of fabricated beams, lattice girders and stanchions ready to be lifted into position.

Six 10-ton, 110-ft. jib, bogie-mounted electric Scotch derricks were built in two lines three abreast, facing each other accross the width of the building. In erecting the steelwork one line moved east from the centre point, the other west, on steel bridging girders supported on the stanchion pile capped foundations. The bolting gang used 250,000 bolts to secure the connections and tightened them to a predetermined torque by pneumatic powered wrenches. Two 7-ton 75-ft. jib, diesel-engined mobile cranes erected the

Above: The new Heinz factory at Kitt Green, Lancs, showing the employee's service building on the left and the main production building in the foreground.

Below: The Ford Factory. Bolting gang member impact wrenching one of the quarter million bolts securing the connections on 15,000 tons of steelwork.

Bottom: Final assembly area at Ford Motor Co.'s new Paint Trim and Assembly plant.



1,500 tons of steelwork for the annexe and ancillary building and also acted as feeder cranes to the six main derricks.

The main steel for the first floor was double lattice girders carries on double plated joist stanchions. Secondary beams were of both welded and riveted construction.

The normal main roof, not requiring double girders, was constructed mainly of steel plate girders according to load requirements. The conveyor bridge was constructed from steel lattice girders.

Mr Martin Hutchinson, L.R.I.B.A., was the architect and Posford, Pavry & Partners the consulting engineers for this important project.

The Pavilions – Uxbridge Town Centre

For Prudential Assurance Co Ltd

The original Town Centre Development was completed in 1973 and comprised of over 50,000m² of retail space, open precincts, offices, flats and car parking. The shopping centre at street level was arranged ariound two parrallel open malls leading from the high street to open squares linked with covered walkways. A basement below had service roads and loading bays for the shops.

By the early 1980s the shop units were considered to be too small and the environment of windy spaces and stained concrete increasingly unpopular. It was becoming clear that the retail facilities would have to be improved of the centre was to compete with other projects in the area and a major refurbishment project was comissioned in 1984. The main construction began in 1986, phased to allow market trading to continue throughout the contract period, and largely completed in 1988. The formal opening was in September 1989.

The work covers all the public areas and includes new formal entrances from the High Street, glazed canopies over the malls and squares, new fascias to the shops, lighting, toilets, and many of the shops enlarged by extending forwards yo to 4m. Open spaces are retiled in patterns of white and black terrazzo and the squares decorated with ornamental trees. A new tower in the Market Square painted in trompe d'oeil houses a smoke extract shaft and lifts to ligh level bridges linking to a multi-storey car park.

Simple forms were chosen for the geometry of the new roofs, pitched along the entrances and malls, and pyramids over the squares. The coverings are predominantly double glazing with an inner layer of translucent insulation, relieved at the top with areas of clear glass and spaces for smoke vents. General ventilation is natural, only in the food court is there limited mechanical recycling of air. The effect is of a bright, spacious and temperate environment.

The elegance of the roof was always an important and integral part of the new design concept. This coupled with the constraints of the load carrying capacity of the original building, economy, erectability and least disruption to trading below led to the choice of steel for the new roof structures.

The critical detail at the interface between the new roofs and the original buildings has to support the roof, allowing for relative movements, and collection of rainwater. Internal columns in the square relieve the perimeter loads. Their location rather far from the sides is governed by the arrangement of service roads in the basement, but their effectiveness is enhanced by the umbrella-like form of the roofs.

Canopies to the malls were analysed using simple plane frame methods. Three dimensional analyses were adopted for the entrances and squares in order to assess the in-plane forces generated and in particular to find the correct distribution of reaction forces.

The malls and entrances have conventional aluminium mullions spanning on to steel lattice purlins, in turn supported by rafter frames. The two squares have light aluminium mullions bearing through insulation pads on to steel sub frames supported by a system of steel lattice purlins and rafters. The steel sub frames in the squares have two functions; visually they form comparatively slender supports to the glazing (with due allowance for relative thermal movement), they also provide lateral restraint to the purlins.

The main components of the roofs were designed to be transported and erected as single pieces and all the joints pinned or bolted. The only exceptions were the long hip rafters and the relatively heavy bridge beams where site welded joints were introduced.

The pleasant new spaces created bear little resemblance to what had become a drab and unattractive place. The centre is popular with the public and from a commercial point of view it is very successful. The scheme is submitted as an example of how steelwork has contributed to this effect.

Judge's comments

Structural Steelwork has made a major contribution to the rehabilitation of an outdated town centre scheme constructed in the 1960s. The careful incorporation of environmental services has enabled the new roofs over the squares and pedestrian malls to present a strikingly clean and effective appearance. Great care has been taken over the design and fabrication, and the erection was acrried out while the premises continued in use.

This is a worthy example of how effectively steelwork can contribute to a growing need for updating such developments which need a new lease of life.

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Structural Engineers:
Michael Barclay Partnerships
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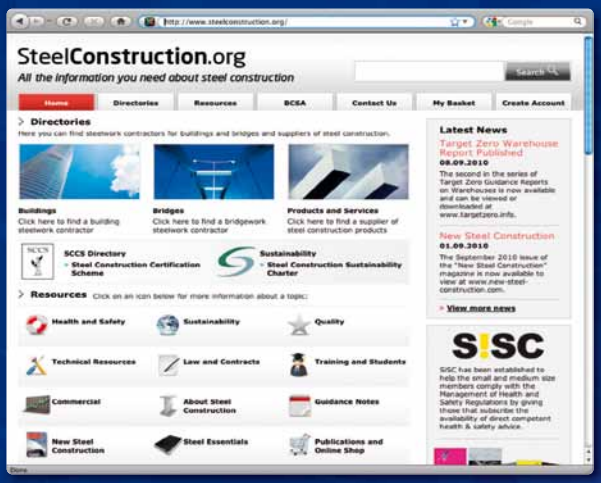

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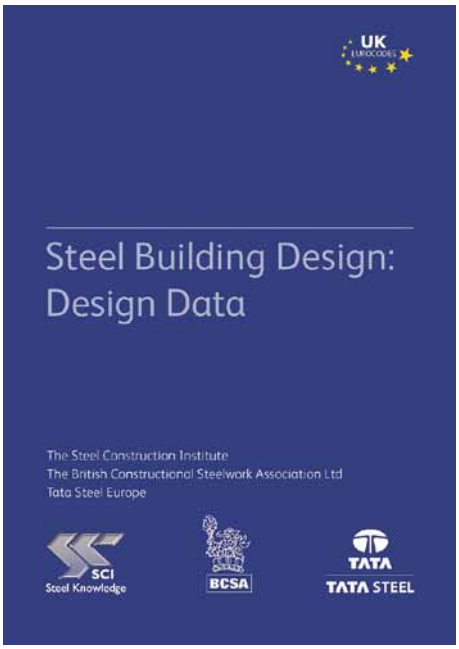
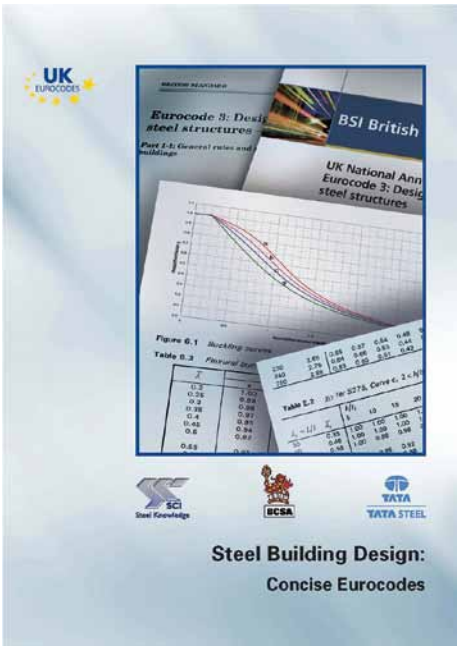
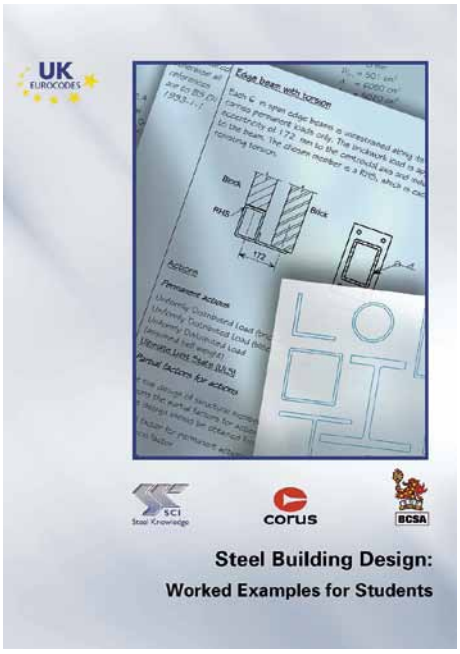
Essential reading for your Steel Design to the Eurocodes

As part of your essential support of Steel Design to the Eurocodes, your library of information wouldn't be complete without the following three publications. In their own right each publication stands alone as providing good in-depth technical guidance, together they form a comprehensive information base for your eurocode design requirements.







P363
Steel Building Design; Design Data (SCI/BCSA Eurocode Blue Book)
The "Blue Book" is the essential aid for the design of steelwork. Section property tables and comprehensive tables of member resistances are given for grades S275 and S355. This edition provides resistances in accordance with the relevant UK National Annexes.
(Normal price: £80 for Non SCI or BCSA Members, £60 for SCI or BCSA Members)

P362
Steel Building Design: Concise Eurocodes
This guide cuts through the apparent complexity of the Eurocodes for steel design and provides the designer with a digestible approach to common tasks. Guidance is presented on design routes, with references to Eurocode clauses. Formulae are converted into look-up tables and design tips are highlighted. The compilation includes the related provisions in the UK National Annex.
(Normal price: £50 for Non SCI or BCSA Members, £25 for SCI or BCSA Members)

P387
Steel Building Design: Worked Examples for Students (UK Version)
Although prepared with students in mind, this guide is a very valuable reference for practicing engineers as it provides 12 worked examples of common design situations and includes the influence of the UK National Annex.
(Normal price: £30 Non SCI or BCSA Member Price, £15 SCI or BCSA Member Price)

Until Nov 5th these three valuable publications are offered at an exclusive package offer price of £130 for Non SCI or BCSA Members, £75 for SCI or BCSA Members.

For SCI Publications please contact Publication Sales
Tel: Direct 01344 636505 Fax: 01344 636570
Email: publications@steel-sci.com
Website: www.shop.steelbiz.org

The Steel Construction Institute
Silwood Park
Ascot SL5 7QN

New and revised codes & standards

From BSI Updates September 2010

BS EN PUBLICATIONS

BS EN ISO 9444-2:2010
Continuously hot-rolled stainless steel. Tolerances on dimension and form. Wide strip and sheet/plate
No current standard is superseded

BS EN ISO 18286:2010
Hot-rolled stainless steel plates. Tolerances on dimensions and shape
No current standard is superseded

EDUCATION PUBLICATIONS

BIP 2200 PP 1990 Pack of 5
Structural Eurocodes: Extracts from the Structural Eurocodes for Students of Structural Design (PP 1990)
Supersedes BIP PP 1990:2007 Pack of 5

BIP 2200 PP 1990 Single Copy
Structural Eurocodes: Extracts from the Structural Eurocodes for Students of Structural Design (PP 1990)
Supersedes BIP PP 1990:2007 Book (single copy)

SPECIALIST BOOKS FROM BSI

BIP 2199
Concise Eurocodes. Loadings on Structures BS EN 1991. Eurocode 1
No current standard is superseded

CORRIGENDA TO BRITISH STANDARDS

BS EN 1990:2002+A1:2005
Eurocode. Basis of structural design
CORRIGENDUM 2
Also incorporates Amendment 1 & Corrigendum 1

NEW WORK STARTED

BS EN 1998-2:2005/Amendment 2
Eurocode 8. Design of structures for earthquake resistance. Bridges

BS EN ISO 3506-1:2009/Amendment 1
Mechanical properties of corrosion-resistant stainless steel fasteners. Bolts, screws and studs

BS EN ISO 3506-2:2009/Amendment 1
Mechanical properties of corrosion-resistant stainless steel fasteners. Nuts

BS ISO 16834 (Revision)
Welding consumables. Wire electrodes, wires, rods and deposits for gas-shielded arc welding of high strength steels. Classification
Will supersede BS EN ISO 16834:2007

DRAFT BRITISH STANDARDS FOR PUBLIC COMMENT – NATIONAL BRITISH STANDARDS

10/30232884 DC
NA to BS EN 1991-1-4 UK National Annex to Eurocode 1. Actions on structures.
Part 1-4: General actions. Wind Actions.

DRAFT BRITISH STANDARDS FOR PUBLIC COMMENT – ADOPTIONS

10/30230952 DC
BS EN ISO 14341 Welding consumables. Wire electrodes and deposits for gas shielded metal arc welding of non alloy and fine grain steels. Classification

AD 349
Shear resistance of Parallel Flange Channels in the Eurocode Blue Book

An error has been found in the values of shear resistance of Parallel Flange Channels that are quoted in SCI publication *P363 Steel building design: Design data* (the Eurocode Blue Book). The design shear resistance values are given in the tables for Web Bearing and Buckling. The pages affected are C-128, C-129, D-128 and D-129. The values of the design resistance of the unstiffened web are correctly given in these tables.

Table 1 gives the correct shear resistances for Parallel Flange Channels in grade S275 and S355.

The resistance tables in Steelbiz have been corrected and now show the above values. A set of the four corrected pages is also available on Steelbiz – they will appear as an appendix of this AD Note. The electronic Blue Book will be updated shortly, as will be the version in IHS. Sticky labels are available from the SCI that fit the original tables in the publication. Those interested in obtaining these labels should contact the SCI on *publications@steel-sci.com* or by phoning the publications team on 01344 636505.

Contact: **Edurne Nunez Moreno**
Tel: **01344 636525**
Email: **advisory@steel-sci.com**

Section Designation	Design Shear Resistance $V_{c,Rd}$ (kN)	
	S275 / Advance275	S355 / Advance355
430×100×64	750	977
380×100×54	581	757
300×100×46	443	577
300×90×41	445	575
260×90×35	349	451
260×75×28	308	397
230×90×32	294	380
230×75×26	258	333
200×90×30	244	315
200×75×23	213	275
180×90×26	207	267
180×75×20	191	247
150×90×24	175	226
150×75×18	152	196
125×65×15	129	166
100×50×10	90.3	117

Table 1: Shear resistance of Parallel Flange Channels for S275 and S355 steel in accordance with BS EN 1993-1-1

Steelwork contractors for buildings

BCSA is the national organisation for the steel construction industry.
Membership of BCSA is open to any Steelwork Contractor who has a fabrication facility within the United Kingdom or Republic of Ireland.
Details of BCSA membership and services can be obtained from
Gillian Mitchell MBE, Deputy Directory General, BCSA, 4 Whitehall Court, London SW1A 2ES
Tel: 020 7839 8566 Email: *gillian.mitchell@steelconstruction.org*

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

- **C** Heavy industrial platework for plant structures, bunkers, hoppers, silos etc
- **D** High rise buildings (offices etc over 15 storeys)
- **E** Large span portals (over 30m)
- **F** Medium/small span portals (up to 30m) and low rise buildings (up to 4 storeys)
- **G** Medium rise buildings (from 5 to 15 storeys)
- **H** Large span trusswork (over 20m)
- **J** Tubular steelwork where tubular construction forms a major part of the structure
- **K** Towers and masts
- **L** Architectural steelwork for staircases, balconies, canopies etc
- **M** Frames for machinery, supports for plant and conveyors
- **N** Large grandstands and stadia (over 5000 persons)
- **Q** Specialist fabrication services (eg bending, cellular/castellated beams, plate girders)
- **R** Refurbishment
- **S** Lighter fabrications including fire escapes, ladders and catwalks
- **QM** Quality management certification to ISO 9001

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

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

Company name	Tel	C	D	E	F	G	H	J	K	L	M	N	Q	R	S	QM	Contract Value (1)
A C Bacon Engineering Ltd	01953 850611			●	●		●										Up to £2,000,000
ACL Structures Ltd	01258 456051			●	●	●	●				●				●		Up to £3,000,000
Adey Steel Ltd	01509 556677				●	●	●	●		●	●			●	●		Up to £3,000,000
Adstone Construction Ltd	01905 794561			●	●	●											Up to £4,000,000
Advanced Fabrications Poyle Ltd	01753 531116				●		●	●	●	●	●				●	✓	Up to £400,000
Angle Ring Company Ltd	0121 557 7241												●				Up to £1,400,000
Apex Steel Structures Ltd	01268 660828				●		●			●	●						Up to £800,000
Arromax Structures Ltd	01623 747466	●		●	●	●	●	●	●		●	●					Up to £800,000
ASA Steel Structures Ltd	01782 566366			●	●	●	●			●	●			●	●		Up to £800,000*
ASD Westok Ltd	01924 264121												●				Up to £6,000,000
ASME Engineering Ltd	020 8966 7150				●					●	●			●	●	✓	Up to £1,400,000*
Atlas Ward Structures Ltd	01944 710421		●	●	●	●	●	●	●	●	●	●		●	●	✓	Above £6,000,000
Atlasco Constructional Engineers Ltd	01782 564711			●	●		●							●			Up to £2,000,000
B D Structures Ltd	01942 817770			●	●	●	●				●			●			Up to £1,400,000
Ballykine Structural Engineers Ltd	028 9756 2560			●	●	●	●	●				●				✓	Up to £2,000,000
Barnshaw Section Benders Ltd	01902 880848												●			✓	Up to £800,000
Barrett Steel Buildings Ltd	01274 266800			●	●	●	●									✓	Up to £6,000,000
Barretts of Aspley Ltd	01525 280136			●	●	●				●	●			●	●		Up to £3,000,000
BHC Ltd	01555 840006	●	●	●	●	●	●							●			Above £6,000,000
Billington Structures Ltd	01226 340666		●	●	●	●	●	●	●	●	●	●		●		✓	Above £6,000,000
Border Steelwork Structures Ltd	01228 548744			●	●	●	●			●	●				●		Up to £3,000,000
Bourne Construction Engineering Ltd	01202 746666		●	●	●	●	●	●	●	●	●	●	●	●		✓	Above £6,000,000
Browne Structures Ltd	01283 212720				●			●							●		Up to £400,000
Cairnhill Structures Ltd	01236 449393				●	●	●	●		●	●			●	●	✓	Up to £2,000,000
Caunton Engineering Ltd	01773 531111	●	●	●	●	●	●	●	●	●	●	●		●	●	✓	Up to £6,000,000
Cleveland Bridge UK Ltd	01325 502277	●	●	●	●	●	●	●	●	●	●	●		●		✓	Above £6,000,000
CMF Ltd	020 8844 0940				●		●	●		●	●				●		Up to £6,000,000
Cordell Group Ltd	01642 452406	●			●	●	●	●	●	●	●					✓	Up to £3,000,000
Cougar Steel Stairs Ltd	01274 266800									●					●	✓	Up to £6,000,000*
Coventry Construction Ltd	024 7646 4484			●	●	●	●		●	●	●			●	●		Up to £1,400,000
Crown Structural Engineering Ltd	01623 490555			●	●	●	●		●		●			●		✓	Up to £800,000
D A Green & Sons Ltd	01406 370585		●	●	●	●	●	●	●	●	●	●		●	●	✓	Up to £6,000,000
D H Structures Ltd	01785 246269				●						●						Up to £40,000
Deconsys Technology Ltd	01274 521700				●					●				●	●		Up to £100,000
Discain Project Services Ltd	01604 787276				●					●	●				●	✓	Up to £1,400,000
Duggan Steel Ltd	00 353 29 70072		●	●	●	●	●	●			●					✓	Up to £6,000,000
Elland Steel Structures Ltd	01422 380262		●	●	●	●	●	●	●	●	●	●		●		✓	Up to £6,000,000
Emmett Fabrications Ltd	01274 597484			●	●	●	●							●			Up to £1,400,000
EvadX Ltd	01745 336413			●	●	●	●	●	●	●	●	●				✓	Up to £3,000,000
F J Booth & Partners Ltd	01642 241581			●	●		●				●				●	✓	Up to £4,000,000
Fisher Engineering Ltd	028 6638 8521		●	●	●	●	●	●	●	●	●	●				✓	Above £6,000,000
Fox Bros Engineering Ltd	00 353 53 942 1677			●	●	●	●	●			●						Up to £3,000,000
GME Structures Ltd	01939 233023			●	●		●	●		●	●			●	●		Up to £400,000
Gorge Fabrications Ltd	0121 522 5770				●	●	●	●		●				●			Up to £800,000
Graham Wood Structural Ltd	01903 755991		●	●	●	●	●	●	●	●	●	●		●			Up to £6,000,000
Grays Engineering (Contracts) Ltd	01375 372411				●			●		●	●				●		Up to £100,000
Gregg & Patterson (Engineers) Ltd	028 9061 8131			●	●	●	●	●				●				✓	Up to £4,000,000
H Young Structures Ltd	01953 601881			●	●	●	●	●			●						Up to £2,000,000
Had Fab Ltd	01875 611711								●		●				●	✓	Up to £2,000,000
Hambleton Steel Ltd	01748 810598		●	●	●	●	●	●				●		●		✓	Up to £6,000,000
Harry Marsh (Engineers) Ltd	0191 510 9797			●	●	●	●				●	●					Up to £2,000,000
Company name	**Tel**	**C**	**D**	**E**	**F**	**G**	**H**	**J**	**K**	**L**	**M**	**N**	**Q**	**R**	**S**	**QM**	**Contract Value (1)**

Company name	Tel	C	D	E	F	G	H	J	K	L	M	N	Q	R	S	QM	Contract Value (1)
Henry Smith (Constructional Engineers) Ltd	01606 592121			●	●	●	●	●									Up to £4,000,000
Hescott Engineering Company Ltd	01324 556610			●	●	●	●			●				●	●		Up to £4,000,000
Hills of Shoeburyness Ltd	01702 296321									●	●				●		Up to £1,400,000
J Robertson & Co Ltd	01255 672855									●	●				●		Up to £200,000
James Bros (Hamworthy) Ltd	01202 673815			●	●		●			●	●	●			●	✓	Up to £2,000,000
James Killelea & Co Ltd	01706 229411		●	●	●	●	●					●		●			Up to £6,000,000*
Leach Structural Steelwork Ltd	01995 640133			●	●	●	●	●			●						Up to £1,400,000
Lowe Engineering (Midland) Ltd	01889 563244									●	●			●	●	✓	Up to £400,000
M Hasson & Sons Ltd	028 2957 1281			●	●	●	●	●	●	●	●				●	✓	Up to £3,000,000
M&S Engineering Ltd	01461 40111				●				●	●	●			●	●		Up to £1,400,000
Mabey Bridge Ltd	01291 623801	●	●	●	●	●	●	●	●	●	●	●		●		✓	Above £6,000,000
Maldon Marine Ltd	01621 859000				●			●	●	●					●		Up to £1,400,000
Midland Steel Structures Ltd	024 7644 5584			●	●	●	●			●	●	●		●	●		Up to £2,000,000
Mifflin Construction Ltd	01568 613311		●	●	●	●	●				●						Up to £3,000,000
Milltown Engineering Ltd	00 353 59 972 7119			●	●	●	●	●									Up to £6,000,000
Newbridge Engineering Ltd	01429 866722			●	●	●	●								●	✓	Up to £1,400,000
Nusteel Structures Ltd	01303 268112						●	●	●	●						✓	Up to £4,000,000
On Site Services (Gravesend) Ltd	01474 321552				●		●	●		●	●				●		Up to £200,000
Overdale Construction Services Ltd	01656 729229			●	●		●	●			●				●		Up to £1,400,000
Paddy Wall & Sons	00 353 51 420 515			●	●	●	●	●	●	●	●					✓	Up to £6,000,000
Painter Brothers Ltd	01432 374400								●		●				●	✓	Up to £6,000,000
Pencro Structural Engineering Ltd	028 9335 2886			●	●		●	●			●				●	✓	Up to £2,000,000
Peter Marshall (Fire Escapes) Ltd	0113 307 6730									●					●		Up to £1,400,000
PMS Fabrications Ltd	01228 599090			●	●	●	●		●	●	●			●	●		Up to £1,400,000
REIDsteel	01202 483333		●	●	●	●	●	●	●	●	●	●		●			Up to £6,000,000*
Remnant Engineering Ltd	01564 841160				●		●	●	●	●	●			●	●	✓	Up to £400,000*
Rippin Ltd	01383 518610			●	●	●	●	●									Up to £1,400,000
Robinson Steel Structures	01332 574711		●	●	●	●	●		●	●	●	●		●	●	✓	Above £6,000,000
Rowecord Engineering Ltd	01633 250511	●	●	●	●	●	●	●	●	●	●	●	●	●	●	✓	Above £6,000,000
Rowen Structures Ltd	01773 860086		●	●	●	●	●	●	●	●	●	●		●			Above £6,000,000*
RSL (South West) Ltd	01460 67373			●	●		●				●						Up to £1,400,000
S H Structures Ltd	01977 681931						●	●	●	●							Up to £3,000,000
Severfield-Reeve Structures Ltd	01845 577896	●	●	●	●	●	●	●	●	●	●	●	●	●	●	✓	Above £6,000,000
Shipley Fabrications Ltd	01400 231115			●	●	●	●		●	●	●				●		Up to £200,000
SIAC Butlers Steel Ltd	00 353 57 862 3305		●	●	●	●	●	●	●		●	●				✓	Above £6,000,000
SIAC Tetbury Steel Ltd	01666 502792			●	●	●	●				●	●				✓	Up to £3,000,000
Snashall Steel Fabrications Co Ltd	01300 345588			●	●		●								●		Up to £2,000,000
South Durham Structures Ltd	01388 777350			●	●	●				●	●	●			●		Up to £800,000
Temple Mill Fabrications Ltd	01623 741720			●	●	●	●				●	●			●		Up to £200,000
Terence McCormack Ltd	028 3026 2261			●	●		●	●									Up to £800,000
The AA Group Ltd	01695 50123			●	●	●	●			●	●				●		Up to £4,000,000
Traditional Structures Ltd	01922 414172		●	●	●	●	●	●	●		●	●		●		✓	Up to £4,000,000*
W & H Steel & Roofing Systems Ltd	00 353 56 444 1855			●	●	●	●	●						●	●		Up to £4,000,000
W I G Engineering Ltd	01869 320515				●					●					●		Up to £400,000
Walter Watson Ltd	028 4377 8711			●	●	●	●	●				●				✓	Up to £6,000,000
Watson Steel Structures Ltd	01204 699999	●	●	●	●	●	●	●	●	●	●	●		●	●	✓	Above £6,000,000
Westbury Park Engineering Ltd	01373 825500	●			●			●	●	●	●				●	✓	Up to £800,000
William Haley Engineering Ltd	01278 760591			●	●	●			●	●	●					✓	Up to £2,000,000
William Hare Ltd	0161 609 0000	●	●	●	●	●	●	●	●	●	●	●		●		✓	Above £6,000,000
Company name	Tel	C	D	E	F	G	H	J	K	L	M	N	Q	R	S	QM	Contract Value (1)

Corporate Members

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

Company name	Tel
Balfour Beatty Utility Solutions Ltd	01332 661491
Griffiths & Armour	0151 236 5656

Company name	Tel
Roger Pope Associates	01752 263636
Highways Agency	08457 504030

Associate Members

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

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

Company name	Tel	1	2	3	4	5	6	7	8	9
AceCad Software Ltd	01332 545800		●							
Advanced Steel Services Ltd	01772 259822								●	
Albion Sections Ltd	0121 553 1877	●								
Andrews Fasteners Ltd	0113 246 9992									●
ArcelorMittal Distribution – Bristol	01454 311442								●	
ArcelorMittal Distribution – Mid Glamorgan	01443 812181								●	
ArcelorMittal Distribution – Birkenhead	0151 647 4221								●	
ArcelorMittal Distribution – Scunthorpe	01724 810810								●	
Arro-Cad Ltd	01283 558206			●						
ASD Interpipe UK Ltd	0845 226 7007								●	
ASD metal services - Biddulph	01782 515152								●	
ASD metal services - Bodmin	01208 77066								●	
ASD metal services - Cardiff	029 2046 0622								●	
ASD metal services - Carlisle	01228 674766								●	
ASD metal services - Daventry	01327 876021								●	
ASD metal services - Durham	0191 492 2322								●	
ASD metal services - Edinburgh	0131 459 3200								●	
ASD metal services - Exeter	01395 233366								●	
ASD metal services - Grimsby	01472 353851								●	

Company name	Tel	1	2	3	4	5	6	7	8	9
ASD metal services - Hull	01482 633360								●	
ASD metal services - London	020 7476 0444								●	
ASD metal services - Norfolk	01553 761431								●	
ASD metal services - Stalbridge	01963 362646								●	
ASD metal services - Tividale	0121 520 1231								●	
Austin Trumanns Steel Ltd	0161 866 0266								●	
Ayrshire Metal Products (Daventry) Ltd	01327 300990	●								
BAPP Group Ltd	01226 383824									●
Barnshaw Plate Bending Centre Ltd	0161 320 9696	●								
Barrett Steel Services Ltd	01274 682281								●	
Bentley Systems (UK) Ltd	0141 353 5168		●							
Cellbeam Ltd	01937 840600	●								
Cellshield Ltd	01937 840600							●		
CMC (UK) Ltd	029 2089 5260							●		
Composite Metal Flooring Ltd	01495 761080	●								
Composite Profiles UK Ltd	01202 659237	●								
Computer Services Consultants (UK) Ltd	0113 239 3000		●							
Cooper & Turner Ltd	0114 256 0057									●
Corus	01724 404040				●					

Steelwork contractors for bridgework

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

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

FG Footbridge and sign gantries
PG Bridges made principally from plate girders
TW Bridges made principally from trusswork
BA Bridges with stiffened complex platework (eg in decks, box girders or arch boxes)
CM Cable-supported bridges (eg cable-stayed or suspension) and other major structures (eg 100 metre span)
MB Moving bridges
RF Bridge refurbishment
AS Ancilliary structures in steel associated with bridges, footbridges or sign gantries (eg grillages, purpose-made temporary works)
QM Quality management certification to ISO 9001

Notes
(1) Contracts which are primarily steelwork but which may include associated works. The steelwork contract value for which a company is pre-qualified under the Scheme is intended to give guidance on the size of steelwork contract that can be undertaken; where a project lasts longer than a year, the value is the proportion of the steelwork contract to be undertaken within a 12 month period.
Where an asterisk (*) appears against any company's classification number, this indicates that the assets required for this classification level are those of the parent company.

Company name	Tel	FG	PG	TW	BA	CM	MB	RF	AS	QM	Contract Value (1)
'N' Class Fabrication & Installation	01733 558989	●	●	●	●			●		✓	Up to £800,000
A G Brown Ltd	01592 630003	●						●	●	✓	Up to £800,000
Briton Fabricators Ltd ◆	0115 963 2901	●	●	●	●	●	●	●	●	✓	Up to £3,000,000
Cairnhill Structures Ltd ◆	01236 449393	●	●		●			●	●	✓	Up to £2,000,000
Cimolai Spa	01223 350876	●	●	●	●	●	●			✓	Above £6,000,000
Cleveland Bridge UK Ltd ◆	01325 502277	●	●	●	●	●	●	●	●	✓	Above £6,000,000
Concrete & Timber Services Ltd	01484 606416	●	●	●		●	●		●	✓	Up to £800,000
Donyal Engineering Ltd	01207 270909	●						●	●	✓	Up to £800,000
Four-Tees Engineers Ltd	01489 885899	●	●	●	●		●	●	●	✓	Up to £2,000,000
Francis & Lewis International Ltd	01452 722200							●	●	✓	Up to £2,000,000
Harland & Wolff Heavy Industries Ltd	028 9045 8456	●	●	●	●	●		●	●	✓	Up to £6,000,000
Hollandia BV	00 31 180 540540	●	●	●	●	●	●	●	●	✓	Above £6,000,000
Interserve Project Services Ltd	0121 344 4888							●	●	✓	Above £6,000,000
Interserve Project Services Ltd	020 8311 5500	●	●	●	●		●	●	●	✓	Up to £400,000*
Mabey Bridge Ltd ◆	01291 623801	●	●	●	●	●	●	●	●	✓	Above £6,000,000
Millar Callaghan Engineering Services Ltd	01294 217711	●						●		✓	Up to £800,000
Nusteel Structures Ltd ◆	01303 268112	●	●	●	●	●		●	●	✓	Up to £4,000,000
Painter Brothers Ltd ◆	01432 374400	●		●					●	✓	Up to £6.000,000
P C Richardson & Co (Middlesbrough) Ltd	01642 714791	●						●	●	✓	Up to £3,000,000*
Remnant Engineering Ltd ◆	01564 841160	●							●	✓	Up to £400,000*
Rowecord Engineering Ltd ◆	01633 250511	●	●	●	●	●	●	●	●	✓	Above £6,000,000
SIAC Butlers Steel Ltd ◆	00 353 57 862 3305	●	●	●	●	●		●	●	✓	Above £6,000,000
TEMA Engineering Ltd ◆	029 2034 4556	●	●	●	●	●	●	●	●	✓	Up to £1,400,000*
Varley & Gulliver Ltd ◆	0121 773 2441	●						●	●	✓	Up to £4,000,000
Watson Steel Structures Ltd ◆	01204 699999	●	●	●	●	●	●	●	●	✓	Above £6,000,000

◆ Denotes Steelwork Contractor Membership of the BCSA

Company name	Tel	1	2	3	4	5	6	7	8	9
Corus Ireland Service Centre	028 9266 0747								●	
Corus Panels & Profiles	0845 308 8330	●								
Corus Service Centre Dublin	00 353 1 405 0300								●	
Corus Tubes	01536 402121				●					
Corus Wednesfield	01902 484100								●	
Daver Steels Ltd	0114 261 1999	●								
Development Design Detailing Services Ltd	01204 396606			●						
Easi-edge Ltd	01777 870901							●		
Fabsec Ltd	0845 094 2530	●								
FabTrol Systems UK Ltd	01274 590865		●							
Ficep (UK) Ltd	01924 223530					●				
FLI Structures	01452 722200	●								
Forward Protective Coatings Ltd	01623 748323						●			
GWS Engineering & Industrial Supplies Ltd	00 353 21 4875 878									●
Hadley Rolled Products Ltd	0121 555 1342	●								
Hempel UK Ltd	01633 874024						●			
Hi-Span Ltd	01953 603081	●								
Highland Metals Ltd	01343 548855						●			
Hilti (GB) Ltd	0800 886100									●
International Paint Ltd	0191 469 6111						●			
Jack Tighe Ltd	01302 880360						●			
Kaltenbach Ltd	01234 213201					●				
Kingspan Structural Products	01944 712000	●								
LaserTUBE Cutting	0121 601 5000								●	
Leighs Paints	01204 521771						●			

Company name	Tel	1	2	3	4	5	6	7	8	9
Lindapter International	01274 521444									●
Metsec plc	0121 601 6000	●								
MSW Structural Floor Systems	0115 946 2316	●								
National Tube Stockholders Ltd	01845 577440								●	
Northern Steel Decking Ltd	01909 550054	●								
John Parker & Sons Ltd	01227 783200								●	●
Peddinghaus Corporation UK Ltd	01952 200377					●				
Peddinghaus Corporation UK Ltd	00 353 87 2577 884					●				
PMR Fixers	01335 347629	●								
PP Protube Ltd	01744 818992	●								
PPG Performance Coatings UK Ltd	01773 837300						●			
Prodeck-Fixing Ltd	01278 780586	●								
Profast (Group) Ltd	00 353 1 456 6666									●
Rainham Steel Co Ltd	01708 522311								●	
Richard Lees Steel Decking Ltd	01335 300999	●								
Rösler UK	0151 482 0444					●				
Schöck Ltd	0845 241 3390	●								
Site Coat Services Ltd	01476 577473						●			
Steelstock (Burton-on-Trent) Ltd	01283 226161								●	
Structural Metal Decks Ltd	01202 718898	●								
Studwelders Ltd	01291 626048	●								
Tekla (UK) Ltd	0113 307 1200		●							
Tension Control Bolts Ltd	01948 667700									●
Voortman	00 31 548 536373					●				
Wedge Group Galvanizing Ltd	01909 486384						●			

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