

CPD 2

SUSTAINABLE STEELWORK PROCUREMENT

This CPD, sponsored by Steel for Life, examines the central role sustainability plays in procurement strategies and explains the key recommendations for procuring sustainable structural steelwork



Services can easily be accommodated in the structure itself

Sustainable procurement is set to become an increasingly important part of the drive towards net zero carbon within the construction industry. This will mean that sustainability considerations are given due weight alongside cost, quality and service when decisions are being made.

The sustainable procurement strategies of the future will force entire supply chains and users of buildings and other infrastructure to focus on reducing embodied carbon, as well as carbon emissions in both construction and in operation.

The steel sector has been focused on sustainability for many years, educating the market on the numerous environmental benefits of steel, and has made a positive start to its own zero carbon journey.

The aim of this CPD is to highlight the varied initiatives under way in the steel sector that support sustainable procurement, alongside nine key recommendations for specifying and procuring sustainable structural steelwork.

Objectives

- Understand the importance of sustainability in procurement
- Learn about the environmental benefits of steel
- Explore the initiatives under way in the steel construction sector to support sustainable procurement
- Gain awareness of the nine key recommendations for specifying and procuring sustainable structural steelwork

Steel confident

The steel construction supply chain has good reasons to feel confident about its future in a world where sustainability considerations are given their proper place in procurement decision-making.

Steel is, by a considerable margin, the most popular framing material for multistorey buildings in the UK and has a track record of delivering high-quality and cost-effective structures.

The British Construction Steelwork Association (BCSA) has gone to considerable lengths over the years to showcase the numerous environmental advantages of steel in a range of studies and publications.

Offsite manufacturing processes means on-site working is minimised and waste reduced, with »

» workforces operating safely in factory conditions and returning home at regular hours each workday. Steel is typically brought to site as and when needed for fast and safe assembly, minimising impacts on local communities.

Modern mechanical and electrical equipment for services like ventilation and heating can be more easily accommodated in a steel-framed building by being incorporated in the structure itself through the use of cellular beams. Retrofitting is also easier for the same reason.

In a world where the uses for buildings could change often, the ability of steel-framed buildings to be more easily reconfigured needs to be fully appreciated. Sustainable procurement will also recognise that the potential for reuse and recycling of steel after structures reach the end of their useful lives is another major advantage.

A detailed roadmap

The UK steel sector detailed its commitment to a sustainable future in the 2050 Roadmap in 2021, which shows how it intends to achieve net zero carbon by 2050, in support of the Climate Change Act. The roadmap shows how significant investments are already being made in new technologies that will reduce carbon emissions along the steel supply chain. The aim is to produce a genuine circular and sustainable net zero carbon structural steel sector by the government's target date of 2050.

The roadmap strategy uses six "levers" to show exactly where carbon savings can be made, with significant contributions coming from improvements in design efficiency, as well as an even greater emphasis on recycling and reuse. It also focuses on reducing emissions in direct steelmaking, decarbonisation of the national electricity grid, carbon capture, use and storage, and further improvements in how constructional steelwork is fabricated, transported to site and erected.

Specifying sustainability

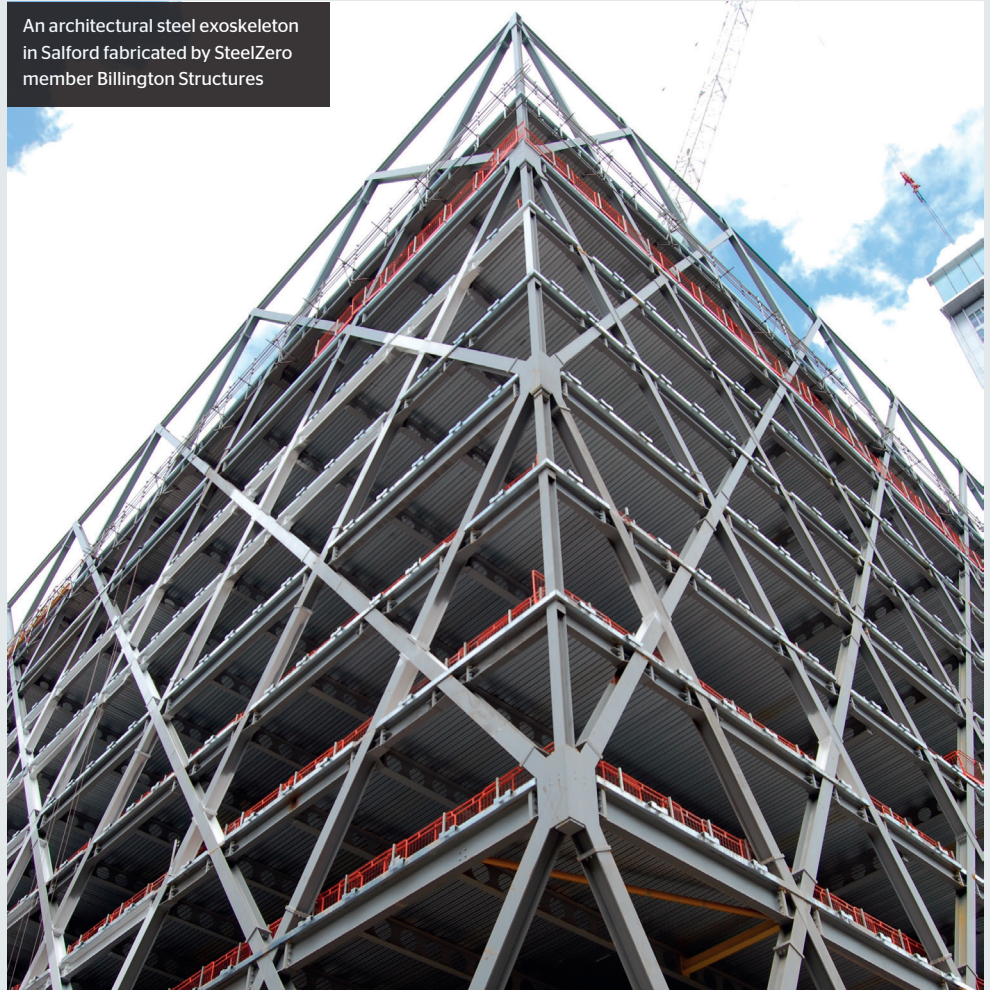
Published by the BCSA in 2022, a new Sustainability Specification for Structural Steelwork provides general requirements and practices for achieving environmentally sustainable steel building construction.

The Sustainability Specification will constitute a new Annex J to the National Structural Steelwork Specification for Building Construction (NSSS) when it is revised for its eighth edition.

Annex J supplements the requirements of Clauses 1 to 11 of the NSSS and includes guidance on both the sustainable design and sustainable fabrication of structural steelwork. The annex also covers topics including steel procurement, project specification requirements in terms of sustainability, and reusing structural steel.

Specifiers are encouraged to adopt the NSSS

An architectural steel exoskeleton in Salford fabricated by SteelZero member Billington Structures



as the default specification for all steel building structures. The scope covers the requirements in BS EN 1090-2 for orthodox building structures, but provision is included for modifications to suit any "unorthodox" construction.

■ **Sustainable design** It is important to consider the structural adequacy; safety during fabrication, transportation, handling, and erection; and temporary stability of the structural steel frame.

Project specification may include requirements for the employer to appoint key contractors as early as possible to ensure teams are fully co-ordinated.

Design for material efficiency is key, with due regard to the practicality and cost of fabrication and for longevity. It is important to ensure that the upfront embodied carbon associated with the structure leads to extended building lifetimes and yields reusable structural elements.

Using materials efficiently and minimising quantities can be done in a number of ways, including: avoiding overspecification of design loads; optimising spans and grids; minimising complex load paths; making sure structural

deflection and vibration criteria are appropriate; and avoiding excessive material use.

The design should also facilitate building flexibility and adaptability and ensure that where complex connections are being considered to reduce material usage, the full fabrication and installation implications have been considered, and any additional waste is considered in material usage and environmental impact assessments.

■ **Sustainable fabrication** All structural steel should be procured based on the principles of responsible sourcing as defined in BES 6001, with the supplier required to have an environmental management system that follows the principles of BS EN ISO 14001.

Structural steel should be sourced from steel producers that have defined and are implementing a strategy to reduce greenhouse gas emissions and have made a public commitment to decarbonise in line with national or international carbon reduction targets.

The steelwork contractor should consider ordering directly from mills to minimise offcuts. Alternatively, if stock lengths are ordered, these

should be used efficiently in order to minimise waste. All steel fabrication waste should be either reused or recycled, with the former being prioritised over the latter.

The records of the as-erected structure should contain all relevant information to allow the origin and properties of the completed components to be identified, facilitating their reuse in the future.

Sources of reassurance

The BCSA took an international lead in 2005 with the introduction of its Sustainability Charter, making it the first steelwork contractor representative body to allow its members to adopt formal sustainability commitments, as well as the first UK representative organisation of any sort to do so.

The charter commits members to a range of environmentally sound behaviours, and an audit process checks that steelwork contractors are fulfilling their commitments. It is designed to help improve understanding of sustainability among steel construction companies and to help them manage their businesses in more sustainable ways, promoting carbon reduction, reuse of steel, fabrication efficiency, economic viability, social progress and environmental responsibility.

The charter has four levels of membership - Certificate, Bronze, Silver and Gold - which reflect the progress being made by individual steelwork contractors on their sustainability journey.

Updated in 2021 in response to the growing recognition of the climate emergency, members are now encouraged to:

- Measure, report and reduce the company carbon footprint
- Have a responsible sourcing policy
- Procure at least 50% (by weight) of steel sections and plate from steel producers with a published decarbonisation roadmap
- Contribute to efficient and optimised structural designs, taking into account greenhouse gas emissions and the reusability of the steel structure, and to communicate options to clients
- Demonstrate innovation towards sustainable steel construction.

Initiatives under way

Alongside Annex J and BCSA's Sustainability Charter, there are varied initiatives under way in the steel sector that support sustainable procurement, including BES 6001, ResponsibleSteel, SteelZero and CO₂nstructZero.

BES 6001 is a framework standard, developed by BRE Global, for responsible sourcing within the construction industry. The standard is used alongside an independent, third-party certification scheme that allows manufacturers to have their products independently certified as being responsibly sourced.

The framework lays down requirements for an organisation to manage the supply of construction products in accordance with a set of agreed principles relating to:

- Organisational management requirements
- Supply chain management
- Management of sustainable development.

Certification to BES 6001 has been obtained by most of the major steel producers supplying the UK construction market.

Within BREEAM, the "broken chain" approach allows for companies that only fabricate steel products to obtain responsible sourcing credits on projects as long as they use steel produced by a company certified to BES 6001.

ResponsibleSteel is the steel industry's first global, multi-stakeholder standard and certification initiative. It was established in 2016 with the aim of enhancing the responsible sourcing, production, use and recycling of steel.

The standard applies to operational steel sites and to related sites that process raw materials for steelmaking, or that produce steel products. It is structured on 13 environmental, social and governance (ESG) principles with 370 associated requirements.

SteelZero is a global initiative, developed by the Climate Group in partnership with ResponsibleSteel, for companies that use, specify and procure steel products.

Companies that join SteelZero are using their purchasing power and influence to send a powerful

demand signal to steel producers, investors and policymakers to speed up wide scale production of low and net zero carbon steel.

Organisations who join SteelZero are required to make a public commitment to transition to 100% Net Zero Steel by 2050.

CO₂nstructZERO The BCSA is now a partner of CO₂nstructZero, joining more than 100 other construction organisations.

"CO₂nstructZero is a new, industry-wide initiative led by the Construction Leadership Council (CLC). Its role is not to develop new solutions, but to bring people and organisations together to consolidate collective actions and plans for the sector," said BCSA sustainability manager Michael Sansom.

To measure progress, CO₂nstructZero has published a performance framework that sets out the headline commitments and the metrics for measurement progress.

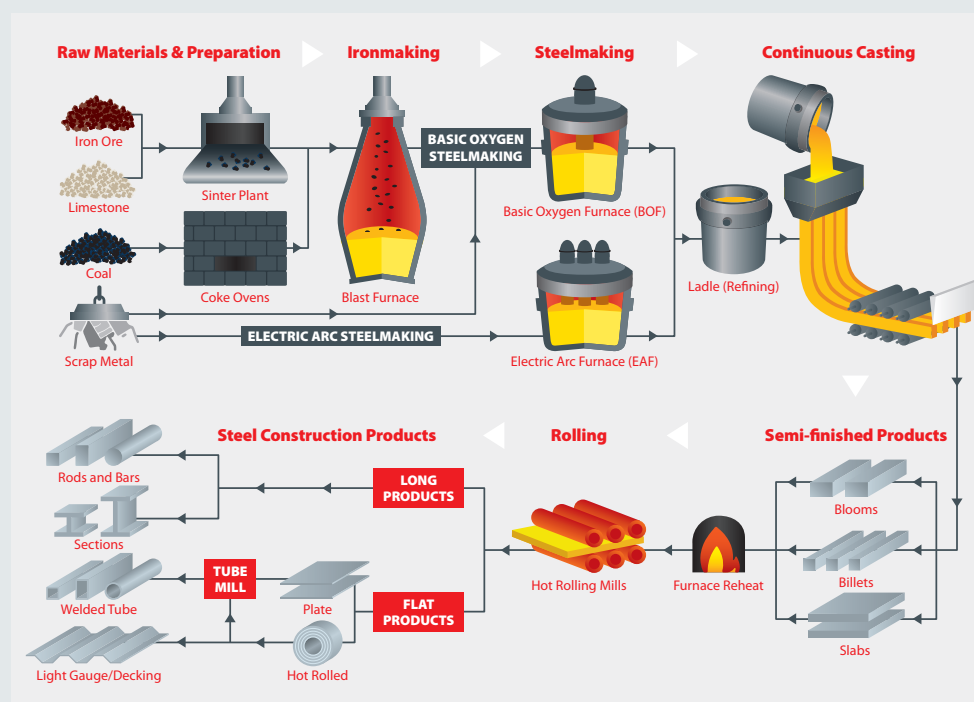
BCSA is also encouraging its members to become business champions and to provide tangible evidence of the steps they are taking to respond to the net zero climate challenge in relation to the nine CO₂nstructZero priorities most relevant to their business.

Procuring steel

One of the most important considerations for sustainable steelwork procurement is where the materials come from and how the steel is produced.

The primary ore-based steelmaking process using a blast furnace and basic oxygen furnace

Major steelmaking processes



» (BF-BOF) and the 100% scrap-based steelmaking process using an electric arc furnace (EAF) together comprise a single global system of supply to meet the increasing worldwide demand.

The latest data from the World Steel Association shows that currently 70% of current global demand for steel is met by BF-BOF and 30% by EAF.

Used steel always has a value because it is an essential part of both production processes. Both BF-BOF and EAF require significant amounts of recycled content for their production, up to 30% for the former and up to 100% for the latter.

These proportions are predicted to change significantly in the coming years, with the drive towards low and zero carbon steelmaking coupled with increased availability of scrap driving new steelmaking capacity towards EAF.

Global demand for new steel currently exceeds the supply of scrap steel by a factor of around three. To meet the growing demand, new steel has to be produced from iron ore.

Supplies of ferrous scrap are growing globally, but are finite and exclusively specifying 100% scrapbased EAF steel will result in an increased demand for scrap that cannot be met. It is not only unsustainable but may also drive up scrap prices.

As such, the two production processes should be seen as complementary rather than rivals.

Where to start

The following are nine key recommendations for specifying and procuring sustainable structural steelwork:

- Use the NSSS and follow the sustainability guidance in Annex J.
- Select steelwork contractors that meet the requirements of the RQSC.

Select steelwork contractors that have the BCSA Sustainability Charter



- Select steelwork contractors that have the BCSA Sustainability Charter.
- Select steelwork contractors that are members of SteelZero and/or CO₂nstructZero.
- Select companies that have a certified environmental management system and a certified responsible sourcing policy.
- Select steel products with a product and/or company specific environmental product declaration (EPD).
- Select companies that measure and report their carbon emissions and have committed to carbon reduction targets.
- Select steel producers that have made a public commitment to decarbonise in line with

UK or international net zero targets and are ResponsibleSteel certified and/or have committed to a quantitative, science-based GHG emissions reduction target.

■ Set carbon intensity targets for structural steel, based on a performance banding that includes both BF-BOF and EAF steelmaking.

Procurement professionals and their engineering advisers have a responsibility to be aware of the full, circular economy carbon implications of the design and materials choices that they make.

The introduction of statutory embodied carbon targets might not be far away - and it would be a game-changer for many.

QUESTIONS

1. A new Sustainability Specification for structural steelwork was published by the BCSA in what year?

- a. 2019
- b. 2020
- c. 2021
- d. 2022
- e. 2023

2. What are the sustainable benefits of specifying structural steelwork?

- a. Steel can be recycled and reused continuously
- b. Offsite manufacture means on-site working is minimised and waste reduced
- c. Fast and safe assembly minimises impacts on local communities
- d. Modern mechanical and electrical equipment

can be more easily accommodated in the structure itself
e. All of the above

3. BCSA's Sustainability Charter has how many levels of membership?

- a. 1
- b. 2
- c. 3
- d. 4
- e. 5

4. All structural steel should be procured based on the principles of responsible sourcing as defined in ...

- a. BES 6001
- b. BS 8102: 2022
- c. Section 10 of Approved Document B

d. BS 7412: 2007
e. All of the above

5. According to the World Steel Association, what percentage of global demand for steel is met by BF-BOF and EAF respectively?

- a. 90% / 10%
- b. 70% / 30%
- c. 50% / 50%
- d. 30% / 70%
- e. 10% / 90%

To complete this CPD, read the module and then answer the questions online at www.building.co.uk/cpd
Closing date: 28 April 2023
CPD credits: 60 minutes