



STEEL INDUSTRY
GUIDANCE NOTES

Sustainable steel construction

The requirement to move towards sustainable development is the most important challenge facing our planet. Environmental stress and depletion of finite resources require a different development paradigm. Steel's excellent sustainability credentials make it ideally suited to meet this challenge. Some of the benefits of using steel are highlighted below.

1. What is sustainable development?

At its simplest, sustainable development can be defined as development that meets our current needs without compromising the ability of future generations to do the same.

2. Drivers for sustainable construction

A raft of measures is already impacting the sustainability of UK construction and more are in the pipeline. Some recent measures have included:

- Directive on the energy performance of buildings and Part L of the Building Regulations
- Sustainable communities plan
- Secure and sustainable buildings bill
- Code for Sustainable Homes
- BRE AAM and EcoHomes and the Green Guide to Specification
- ISO, CEN and BSI work on the development of standards to assess the sustainability of buildings.

3. Steel recycling

Steel is 100% recyclable and can be recycled again and again with current technology, without any degradation in terms of properties or performance. This property sets steel apart from other common construction materials.

4. Structural efficiency of steel

Steel's inherent strength and high strength-to-weight ratio can be exploited in 'light', resource efficient structures and structures that have low overall environmental impacts. Such buildings often require fewer and lighter foundations than alternative methods of construction.

5. The steel construction supply chain and off-site manufacture

The steel construction supply chain is highly efficient. All steel construction products from standard structural sections to fully fitted-out steel modules are manufactured off-site and delivered to site pre-engineered to facilitate fast and easy assembly and erection.

6. Off-site manufacture

Off-site manufacture is more efficient, faster, leaner and safer than site construction. It also yields high quality products with fewer defects that require less 'snagging' on site, leading to savings in both time and money.

7. Waste

Steel construction has excellent, low waste credentials during all phases of the building's life cycle:

The by-products of steel production including sludges, slags and dust, are used by the construction industry for a range of products including roadstone, lightweight aggregate and as cementitious material used as a substitute for Portland cement. During fabrication computer controlled, automated production lines ensure that wastage of steel is minimised.

8. Flexible buildings

Good practice is to only specify the weld size actually. Steel's inherent strength and long-span capabilities enable the designer to create flexible, column-free spaces that can facilitate changes in use during the life of the building, maximising letting area, reducing refit costs and extending the life of the building.

Steel-framed buildings are inherently more adaptable than other forms of construction. Additional structural members can be connected to the existing frame with minimal disturbance and cost.

Often steel is the only viable solution for vertical extensions because of its relative lightness. Alternative, heavier options may require costly and disruptive foundation strengthening.

9. On the construction site

Steel construction minimises the impact on communities neighbouring the construction site. Steel construction is dry, dust-free, and relatively quiet and requires fewer deliveries to site than other forms of construction.

Steel construction is inherently safe.

10. Drivers for sustainable construction

There are two main cladding types; twin skin built up systems and composite or sandwich panels. Both systems are highly efficient and can easily achieve U-values that exceed the current Building Regulations. Furthermore, good air tightness is easily achievable using steel cladding systems.

11. Reducing cooling loads

Historically, buildings designed to take advantage of fabric energy storage (FES) were specifically designed to be 'heavy'. This is a myth. Optimum levels of FES can be achieved in relatively light, structurally efficient buildings that consume fewer resources. Steel-framed buildings with floor slabs of 75-100mm can be designed to take maximum advantage of FES.

12. Design for deconstruction and reuse

Steel buildings and steel construction products are inherently demountable. Provided that attention is paid to

deconstruction at the design stage, there is no reason why nearly all of the steel in the building stock should not be regarded as a vast 'warehouse of parts' for future use in new applications.

13. The industry's commitment

The steel industry recognises the importance of sustainability to both the wider community and the construction industry and has set up the Steel Construction Sector Sustainability Committee. This committee has developed a three-part sustainability strategy which embraces social, economic and environmental objectives. This strategy is set out in 'Sustainable Steel Construction – Building a Better Future' which can be found at www.steel-sci.co.uk. This strategy recognises the commitment the industry is making to sustainability and provides the basis for further progress.

14. Steel Construction Sustainability Charter

Whilst the above strategy seeks to produce sustainable buildings the industry also recognises that they need to be built by companies that operate sustainably themselves. Consequently the industry has developed a number of sustainability initiatives one of which is the BCSA's Steel Construction Sustainability Charter. Details of the charter can be found at www.steelconstruction.org. Companies who sign up to the charter are required to publish a sustainability policy and undergo an independent, sustainability audit.

Key Points

1. Construction has an important role to play in sustainable development
2. Steel is resource efficient and steel structures have low overall environmental impacts.
3. Off-site manufacture is more efficient, faster, leaner and safer than site construction. It has fewer defects that require less 'snagging' on site, leading to savings in both time and money.
4. Steel has excellent, low waste credentials during all phases of the building's life cycle
5. Steel-framed buildings are inherently more adaptable than other forms of construction.
6. Steel construction minimises the impact on communities neighbouring the construction site
7. Steel-framed buildings with floor slabs of 75-100mm can be designed to take maximum advantage of fabric energy storage.
8. Steel is 100% recyclable
9. The steel industry is committed to sustainability and has developed a number of initiatives including a Sector Sustainability Strategy and a Steel Construction Sustainability Charter

Further sources of Information

1. **Achieving Sustainable Construction, Guidance for clients and their professional advisers, BCSA, Corus, SCI and Sustainable Steel Construction, Building a Better Future, BCSA, Corus and SCI - are both available from www.steelconstruction.org and www.steel-sci.org**
2. **Further information about all aspects of sustainable steel construction can be found at www.sustainablesteelconstruction.com**