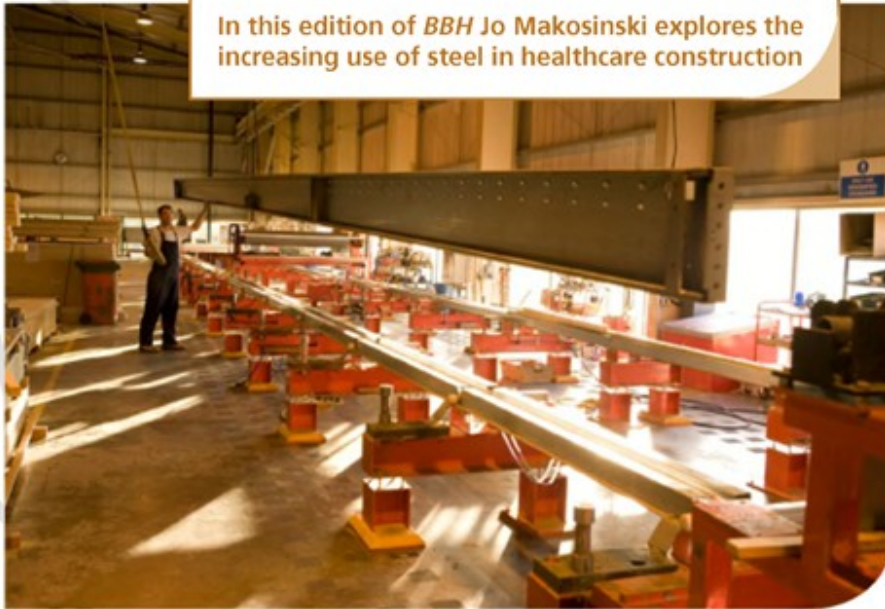




Steel yourself

In this edition of *BBH* Jo Makosinski explores the increasing use of steel in healthcare construction



Modular building specialist, Yorkon, uses steel for its sustainability and adaptability

When developing new, modern healthcare facilities one of the key aims, particularly where hospitals are concerned, is to make the buildings as flexible as possible to meet future, as well as current, needs.

But, with many building techniques requiring the use of load-bearing internal walls, this adaptability is often hard to achieve in practice.

One of the exceptions to the general rule is steel, which is currently enjoying a 70% share of the non-residential, multi-storey buildings market and is seeing huge growths in the healthcare and education sectors in particular.

"This popularity is down to the flexibility that can be achieved using long span options, which minimise the need for load-bearing walls and internal columns

that break up usable space," explained Dr Graham Couchman, director of the Steel Construction Institute.

"Recent developments in understanding and design have enabled it to be demonstrated that so-called 'light weight' steel floor solutions can, and indeed do, work. Lots of steel floor solutions facilitate service integration with the structural system and this is particularly important in highly-serviced healthcare buildings. There are also health and safety and logistical benefits as steel is less labour intensive on site."

Sustainable developments

But one of steel's most-attractive benefits is its sustainability, which is a key consideration as the NHS strives to lower its carbon footprint and become more environmentally-friendly.

Dr Couchman said: "Growing awareness of sustainability is advantageous as with steel there is greater flexibility for future adaptations, rather than knocking down and building again.

"Steel construction also has a negligible impact in terms of pollution, both on-site and in-service, as pre-fabricated components are produced in factory-controlled conditions using energy-saving and pollution-reducing technologies. Pre-fabrication of building components in this way means waste on site is greatly reduced."

Other sustainability benefits include:

- Rapid 'dry' construction with high accuracy
- Steel is lightweight meaning building can take place on poor ground
- High levels of thermal insulation
- Reduced storage of materials in comparison to brickwork, for example
- Galvanised steel is free from deterioration, rot and shrinkage
- Worker safety is improved due to the speed of construction and the need for fewer on-site staff
- Steel is easy to dismantle, re-use or recycle

Healthcare construction also tends to be subject to strict timescales and tight budgets, another advantage of using steel.

"Steel construction has good performance characteristics in comparison to traditional building materials"

"This type of construction achieves high levels of productivity and therefore labour costs are reduced in comparison to site-based construction," explained Dr Couchman. "It is a high-quality material produced to exacting standards and components are dimensionally accurate when manufactured and installed. This leads to improved accuracy and long-term reliability and less time on site making changes."

Light steel can be used for infill walling, both externally and for facades, and the material is also useful for internal products such as bathroom pods, which can be made off-site and brought in when needed.

But the most-popular use is for traditional steel framing where, by producing a firm steel shell, you can effectively shore up the external walls and avoid the need for load-bearing interior divisions.

With this approach office space could just as easily become a new ward if healthcare needs change over time.

Adaptability

Offering advice to developers and architects looking to find the right approach to their developments, Dr Couchman said: "Steel construction has good performance characteristics in comparison to traditional building materials. It is manufactured accurately and has guaranteed material properties that are unaffected over time. It's a very strong material with a strength-to-weight ratio which means longer spans can be achieved to provide a more adaptable space."

Additional benefits over other popular techniques include:

- Steel offers excellent acoustic insulation and even higher levels of thermal insulation, leading to reduced heating costs





- Unlike timber, no cracking or long-term movement occurs due to shrinkage which, in turn, reduces maintenance costs
- Steel does not decay if properly protected and can offer a high level of fire resistance
- Construction programmes can be reduced by 30% to 70% compared to traditional methods and connections and attachments can be made relatively easily in the future

Dr Couchman said: "Often architects are concerned about the building appearance that can be achieved using steel, thinking they may be limited in their options, but a variety of high-quality cladding and external finishes are available so there is great flexibility."

Steel has also become a firm favourite in the modular building sector as it can help to further speed up construction projects.

A spokeswoman for modular build specialist, Yorkon, told BBH: "The strength of the steel-framed construction of our modular buildings allows clear internal spans of up to 12m and internal walls are non-loadbearing. This is important for buildings to be future-proof, allowing internal spaces to be reconfigured to meet changing local needs and new healthcare strategies."

"For the healthcare construction industry, sustainability is also a major challenge and more than 40% of the world's production of 'new' steel is actually made from recycled steel with no compromise on quality. Steel itself is 100% recyclable, which appeals to many developers, particularly in this marketplace."

www.yorkon.co.uk
www.steel-sci.org



Steel is becoming increasingly popular in healthcare builds as it does not need as many alternations, is not liable to shrinkage or expansion like other materials, is quick to put up and needs fewer on-site workers



Steel can also be used for aesthetic purposes, where it can be left exposed as part of the architectural design of a building