

BEYOND BRICKS AND MORTAR



With the retail sector becoming more environmentally conscious, the spotlight is turning onto the stores themselves and their performance from cradle to grave. With it, we're seeing a new trend emerging for large retailers building with timber. Dave Hopkins, head of external affairs at Wood for Good, the timber industry's sustainability campaign, discusses why some retailers are choosing timber as the building material of choice to help make them sustainable



Modern retailers are under pressure to adhere to the highest ethical and sustainable business practices through their corporate social responsibility commitments, with a large part of this focused on reducing carbon emissions and minimising waste.

The negative impact a building has on the environment – both in the construction phase and once it is fully operational – can no longer be ignored, which means environmentally-conscious retailers are having to re-evaluate both the premises in which their businesses are housed and their on-going operational effects.

For developers of supermarkets and large, out-of-town stores, this is filtering through to their choice of construction materials. More and more we're seeing sustainably-harvested timber recognised as a way to achieve affordable, sustainable designs. Household names such as M&S and Sainsbury's are already stipulating that timber is used in their new build stores. So, why is timber coming back into fashion?

The sustainability argument

From an environmental perspective, wood is the most sustainable building material at our disposal. From the moment the first seeds are planted, trees start producing oxygen and actively absorbing CO₂ through photosynthesis. Even after a tree is cut down it continues to store sequestered carbon and stops it from re-entering the atmosphere, with each cubic metre sequestering about one tonne of carbon.

While the idea that chopping down trees can be good for the environment may sound counterintuitive, sustainably-managed forests actually help manage the carbon cycle.

Much like people are more physically fit in their youth, younger trees are more adept at emitting oxygen and absorbing carbon than older ones. Sustainable forestry sees trees harvested at the peak of their growth, with every tree felled then replaced with three younger, more efficient saplings. This process is repeated in a cycle of planting, growth, carbon sequestration, and harvesting so there is no net loss of resource.

The positive effects are felt during production too. Wood requires only sunlight and rainfall to grow, with other building materials relying on carbon-intensive extraction processes and using far more energy – a tonne of brick, for example, requires four times the amount of energy to produce as sawn softwood, concrete five times, glass six times, steel 24 times and aluminium 126 times.

It's rare that we're presented with an opportunity to create more bio-diverse habitats and drive positive environmental change, but that's exactly what the increased appetite for timber represents.

Estimates put that, if we were to increase our forest cover by just 4% – from 12-16% – by 2050 we could abate up to 10% of the country's carbon emissions. In the UK, where 83% of timber used comes from commercially-managed, sustainable sources, this means we're fuelling the demand for a robust timber supply chain and thereby augmenting the need for more green areas.

Small wonder then that retailers are turning to timber in buildings to reduce their carbon footprint and lessen the impact of climate change.

Building the case for wood

For retailers looking to transform their operations through new builds and refurbishments, there are numerous benefits of using wood as a primary construction material. The beauty of timber structures is that they can be prefabricated at specialist facilities off-site and brought to a location ready for assembly.

These structures can then be erected quickly, and made weather tight and water resistant far more rapidly than traditional build processes, thereby allowing for wiring and other interior work to be carried out almost immediately, and keeping the risk of labour programme delays through adverse weather conditions to a minimum. As well as offering significant cost savings this results in quicker turnaround times, with retailers being able to occupy a site and begin trading more quickly too.

Prefabrication also awards a heightened level of precision. This has two benefits: firstly, made-to-measure products mean minimal waste; secondly, being made within very strict, predefined measurements,

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construction becomes almost an exact science. Panels can be slotted together exactly to offer enhanced air tightness, meeting or exceeding Part L Building Regulations by conserving the loss of heat through the walls.

Wood also has the best thermal properties of any mainstream construction material, insulating five times better than concrete and 350 times better than steel. In fact, its thermal ability is so good that it can often be used on its own without additional insulation, helping to cut down on material costs. In the long-term, the better thermal performance means savings on the heating bill, and a more comfortable thermal environment for shoppers and staff.

The design case

The benefits of adopting widespread use of timber in the retail sector go far beyond its environmental credentials.

Aesthetics are an integral part of any building, and a particular concern for retailers looking to attract new customers and encourage sales. Modern methods of construction mean wood products are now enormously versatile and can be used to create all manner of striking designs, from slick lines through to sweeping curves. There's added flexibility too, with the option of a range of textures and finishes. The result is stylish, flexible stores that are able to accommodate the contemporary consumer.

CASE STUDY

M&S sticks to Plan A

The challenge

Retail giant M&S first engaged the services of architects, Aukett Fitzroy Robinson in 2005 to design what would become its biggest outlet in the UK to date at Cheshire Oaks near Chester.

In keeping with M&S's environmental scheme Plan A, an assessment was made of the building materials that would provide an environmentally friendly, fit-for-purpose store that would also meet the company's aesthetic ideals.

The execution

The most noticeable feature of the new store is the roof, which comprises 1,400m² of curved glulam beams. This creates a unique façade, so that externally the roof is distinctive and immediately recognisable on approach, while internally the high quality of the glulam beams means they can be left exposed, creating both a pleasing aesthetic and eliminating the need for additional costly materials.

By selecting lightweight timber frame for the roof, the developers have been able to reduce the structure's dead weight by 20%.

For the external walls, 2,600m² of Hemclad panels were fitted with hemp fibre, an innovative wall panel system that absorbs and stores carbon. This has provided excellent insulation, giving a U-value of 0.12W/ m².K and saving around 360T of CO₂ emissions and helping to reduce the running costs of the building.

The good thermal insulation has been complemented by a biomass boiler, which will be used to heat the store and will



run on natural waste, to provide 70% of the building's heating requirement.

Finally, continuing the green theme outside, 228 new trees have been planted in the site's grounds and enhancements made to existing hedgerows to generate greater biodiversity, provide a habitat for wildlife and offer an attractive setting for M&S customers.

The results

Using timber throughout the design has seen the building receive a BREEAM rating of 74.56%, giving it an 'Excellent' score, the highest and most widely used environmental assessment method.

It's commitment to using only Forestry Stewardship Council (FSC) timber has seen the site awarded the honour of being the first retail building in the UK to achieve an entirely FSC structural frame, with the premises receiving full FSC project certification (TT-PRO-003615:2012). It is also the first retail store to have a 100% FSC-certified glulam roof.

The end result is a unit which is 30% more energy efficient than its other M&S sites.