

Built at a factory near you

21 June 2016

Kim Vernau argues the need for off-site manufacture

For the UK to overcome the chronic housing supply shortage, the industry needs to look beyond traditional forms of construction. The requirement to fill the supply and demand gap of more than 100,000 homes a year has to be met with housing that is both sustainable and of the highest quality. A solution can be found if the industry embraces off-site or non-traditional forms of construction.

Non-traditional construction systems are also known as off-site manufacturing (OSM) or modern methods of construction (MMC). They essentially refer to any non-traditional form of construction methodology. Prefabrication in a factory setting is by no means a new concept and the benefits are clear:

- speed of construction;
- reliability of materials and manufacture;
- improved performance; and
- potential reduction in construction costs (if units can be delivered at scale and to repeatable design).

According to [Constructions skills shortages a result of 30 years of failure](#), a report from the [Union of Construction, Allied Trade and Technicians](#), the UK is facing its biggest skills shortage for a generation, with estimates showing that the construction industry needs 35,000 new entrants just to stand still. With a huge shortage of skilled workers in the UK, building firms have been forced to double the wages for tradespeople from abroad, increasing the cost of traditionally built homes. Of course, some OSM systems will not be immune from these issues, particularly where there are elements of on-site works such as brick claddings.

To overcome the chronic housing supply shortage, the industry needs to look beyond traditional forms of construction

Conventional housebuilders know what their customers want and are unlikely to move fully to non-traditional forms of construction, although a number are trialling various off-site solutions. While they may engage with the concept on the periphery, the real growth area for off-site methods will be the burgeoning private rented sector (PRS). At a seminar hosted by [BLP Insurance](#) and the [British Property Federation](#) in February 2015, and reported in [Could the private rented sector be the solution to the country's housing shortage?](#), Brian Kilroy, BLP Business Insurance Development Manager, said:

'A quarter of Londoners are already living in the PRS and this figure is expected to overtake the owner-occupied sector in the next decade.'

Most of these PRS developments coming to market can be replicated and this model is suited to the off-site industry. Furthermore, funding in this sector will come predominantly from institutional investors looking to invest in secure large-scale developments, where the economic benefits will be matched by the consistency and sustainability that OSM provides.

Concerns

One of the main advantages of OSM is quality. The article [Britain facing a construction industry skills shortage](#) in the January 2016 issue of *Planning and building control today* confirms that buildings in the UK currently fall short by up to 30% in terms of how they were originally designed to perform, while properties built in a factory will have a higher level of quality control compared with a construction site, improving the performance of the building over time. This improved performance from off-site techniques should translate into reduced energy and maintenance costs.

While the benefits of MMC and OSM are clear, they do not come without challenges. Concerns about systematic failure, fire spread and water ingress have been raised around the use of off-site techniques, both during and after construction. These concerns are being addressed by the [Buildoffsite Property Assurance Scheme \(BOPAS\)](#), which provides long-term assurance to mortgage lenders, valuers, funders, landlords and homeowners that properties built using non-traditional forms of construction will be durable for at least 60 years, without the need for disproportionate maintenance.

BOPAS, which was launched in March 2013, was developed by [Buildoffsite](#), [Lloyd's Register](#) and [BLP Insurance](#) with [RICS](#), the [Council of Mortgage Lenders](#) and the [Building Societies Association](#). The BOPAS process gives an independent assessment of quality and reassurance from inception through to construction for investors, developers and owners.

Case studies

We are now seeing schemes being built using off-site systems that have been through the BOPAS accreditation process. One built by [Regal Homes](#) and completed in 2015 provides 51 new homes, including many for the [Islington and Shoreditch Housing Association](#). It uses the BOPAS-accredited B&K cross-laminated timber solution (figure 1) and benefits from a BLP Insurance 10-year structural warranty.

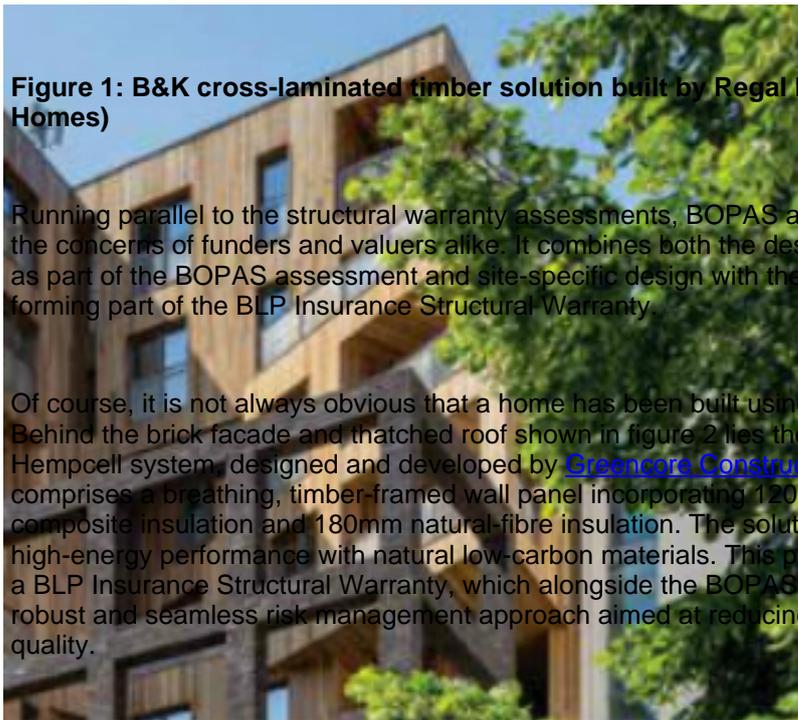


Figure 1: B&K cross-laminated timber solution built by Regal Homes (? Regal Homes)

Running parallel to the structural warranty assessments, BOPAS accreditation addresses the concerns of funders and valuers alike. It combines both the design checks undertaken as part of the BOPAS assessment and site-specific design with the workmanship checks forming part of the BLP Insurance Structural Warranty.

Of course, it is not always obvious that a home has been built using off-site techniques. Behind the brick facade and thatched roof shown in figure 2 lies the BOPAS-accredited Hempcell system, designed and developed by [Greencore Construction](#). This system comprises a breathing, timber-framed wall panel incorporating 120mm of Hemp-Lime Bio composite insulation and 180mm natural-fibre insulation. The solution combines high-energy performance with natural low-carbon materials. This property also benefits from a BLP Insurance Structural Warranty, which alongside the BOPAS accreditation provides a robust and seamless risk management approach aimed at reducing defects and improving quality.



Figure 2: Hempcell system designed and developed by Greencore Construction (? Greencore Construction)

Volumetric approach

This is much more familiar in terms of off-site fabrication. The SIG Insushell volumetric system (figure 3) has been through the BOPAS process and comprises factory-completed modules that are transported to site and stacked on site-constructed foundations. These are site-specific and may typically comprise concrete pads or pile-and-ground beams, depending on ground conditions. The whole is structurally interconnected to provide composite action to comply with the UK codes and is specifically designed for each structure. A drained-cavity external-cladding system is added on site to complete the building.



Figure 3: SIG Insushell volumetric system developed by [Urban Splash](#) (? Urban Splash)

Given the reassurance that BOPAS provides, OSM systems and other innovative construction methods can provide a sustainable, cost-effective solution to the increasing shortage of housing supply and there is currently a surge in interest from manufacturers seeking accreditation.

Government support for OSM is essential in keeping the momentum going, and in its [Residential policy paper](#), RICS urges ministers to support non-traditional construction and endorses BOPAS as an independent assessment process to ensure that such systems are durable for at least 60 years.

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Further information

This feature is taken from the RICS *Property journal* (May/June 2016)