

An intelligent approach

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Stewart Dalgarno outlines why offsite construction is becoming the first choice in delivering high-quality housing

Offsite construction is an established, high-value manufacture and construction method that delivers guaranteed quality, precision-engineered components to meet a variety of standards. A mainstream and intelligent way to build, it presents cost-effectiveness, speed and energy-efficiency advantages from inception to construction, while removing practices that could invite error or inconsistencies.

For residential surveyors, offsite construction offers significant on-site benefits, cost certainty, and outstanding durability and robustness. Based on certified products manufactured in controlled factory environments, it uses modern technologies to minimise construction risk and simplify design.

The construction process at the on-site stage is vastly reduced, making installation easier, reducing the need for trades, removing opportunities for error and enhancing the long-term performance of the projects.

In the UK, timber frame is the largest offsite construction sector; 70% of houses in Scotland are built by this method, which is also on the increase in England and Wales. Given its many advantages, timber-frame offsite construction can deliver home units quickly while maintaining profit margins and equity interests for constructors and investors.

Timber frame also enjoys an unlimited, sustainable material supply chain, giving the potential to manufacture 10,000 homes or units a year, with considerably shorter call-off periods than traditional build methods.

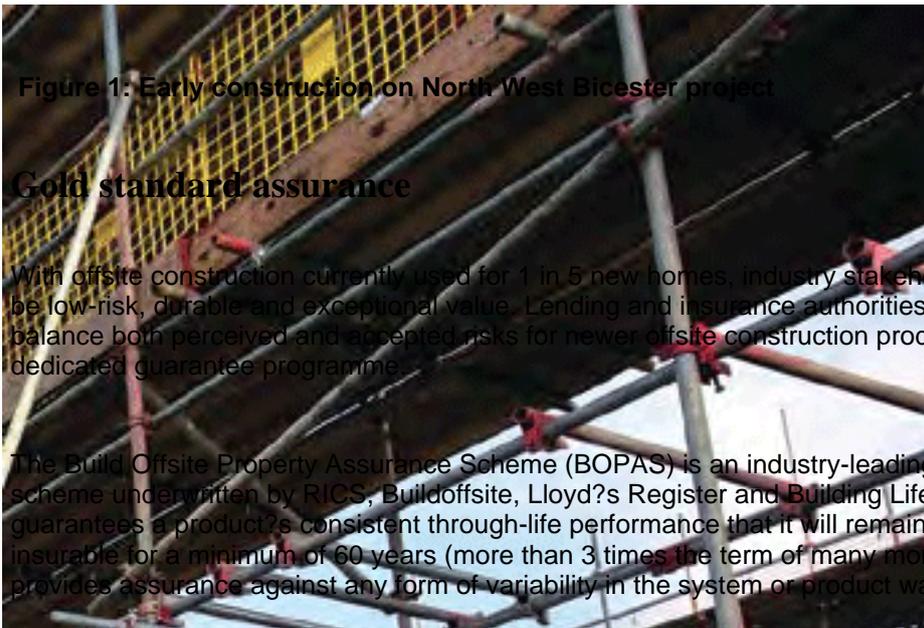


Figure 1: Early construction on North West Bicester project

Gold standard assurance

With offsite construction currently used for 1 in 5 new homes, industry stakeholders know it to be low-risk, durable and exceptional value. Lending and insurance authorities can now balance both perceived and accepted risks for newer offsite construction products through a dedicated guarantee programme.

The Build Offsite Property Assurance Scheme (BOPAS) is an industry-leading accreditation scheme underwritten by RICS, Buildoffsite, Lloyd's Register and Building LifePlans. It guarantees a product's consistent through-life performance that it will remain saleable and insurable for a minimum of 60 years (more than 3 times the term of many mortgages) and provides assurance against any form of variability in the system or product warranted.



Figure 2: Artist's impression of North West Bicester community street

Developed in consultation with the Council of Mortgage Lenders and the Building Societies Association, BOPAS presents the gold standard for novel offsite construction techniques. It comprises:

- an appraisal of durability and maintenance;
- process accreditation;

- an online database of assessed building methodologies, registered sites and warranted properties.

Additionally, it is designed to evaluate the adoption of best practice by offsite constructors in competency, configuration, risk, and procurement management and process control.

Offsite construction is a high-value manufacture and construction method

Sigma II Build System

Stewart Milne Timber Systems? Sigma II system is the only advanced closed-panel timber-frame/offsite construction product to achieve BOPAS accreditation. Offering an integrated approach with guaranteed performance and cost-effectiveness, this closed-panel timber-build system is the result of 7 years? collaborative research and development.

It enables clients to tailor the amount of prefabrication required per project, and encompasses closed and insulated walls, pre-fitted windows and doors, and insulated pre-wrapped floor and roof cassettes. All this offers residential developers a fast build with vastly reduced trades interface and risk of error on site.

Sigma II?s fully integrated and comprehensive build system requires less supervision and construction risk. Following extensive testing, third-party assessment and technical compliance, Sigma II is BBA certified and backed by NHBC?s 10-year warranty.

North West Bicester

Stewart Milne Group is working with A2Dominion on its development in North West Bicester. This pioneering housing project will be the UK?s only true zero-carbon community and aims to deliver the highest standards of sustainable living to its residents. With its fabric-first design, precision-engineered, as-built performance and fully integrated offering, the Sigma II Build System was an ideal fit for the priorities of this ambitious task.

Stewart Milne Timber Systems designed, manufactured and installed the initial 93 Sigma II build systems for the first homes as part of the 393-home Exemplar phase of the project. With a 0.15 U-value, 3m³/hr/m² of air loss (in accordance with best practice as prescribed in Part L1A of the Approved Documents) and thermal bridging of 0.04, the properties will reach Code for Sustainable Homes Level 5 through excellent heat retention and airtightness.

Initial infrastructure work began in April 2014, and the first residents are expected to move in over the coming months.



Figure 3: Offsite construction in the Witney factory

Energy efficient and robust

When combined with a fabric-first approach, offsite construction adds even more value for clients and surveyors by delivering high-performance housing that requires little to no ongoing maintenance in terms of 'add-on' energy-efficiency technologies. Offsite construction reduces the building design versus as-built performance gap, through factory quality, simplified detailing and improved process controls on site.

Rising energy bills for consumers and impending carbon-emissions reduction targets for builders are a serious concern. Being able to build houses that do not require additional expensive 'eco bling' and are guaranteed to remain energy efficient for at least 60 years is an attractive assurance to investors and owners.

Stewart Milne's technical team works with clients from the concept and design stage to advise on appropriate specification, value-engineer the project from the start, and reduce waste and risk. This contributes to increased buildability, lessens construction costs, and incorporates robust and durable solutions to any project brief.

Lessons from Japan

Earlier this year, I was part of a delegation that visited Japan, whose highly successful offsite construction housebuilding sector is producing more homes annually than the entire UK housing market. By investing heavily in research and development, Japan is a world leader in advanced offsite construction, with large corporations and brands dominating its private housebuilding sector.

The country has developed a sophisticated approach that is delivering highly customisable and durable newbuild homes. With an overarching focus on quality and system assurance, the market in Japan has benefited from BOPAS-like principles to the point where offsite constructed newbuild homes are given preferential mortgage rates and insurance terms.

It is hoped that introducing BOPAS to the maturing offsite construction industry in the UK will begin the same shift towards a more joined-up, industrywide approach.

Stewart Milne Timber Systems is part of the Stewart Milne Group, one of the UK's leading independent housebuilding, construction and development companies. The 4 divisions share one aim: to use their expertise, innovation, quality and commitment to provide the best solutions for their clients.

The group celebrates its 40th anniversary this year. Over 4 decades, it has been delivering housing and commercial builds through offsite construction, which has been integral to its clients' continued business success and the satisfaction of its customers.

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Further information

- Related competencies include [Housing strategy and provision](#)
- This feature is taken from the RICS *Property journal* (December 2015/January 2016)