

# OFF-SITE SHAPES UP ON EFFICIENCY AND PERFORMANCE

The speed and efficiency of off-site construction represents one of the ways the UK can address the nationwide housing crisis and go some way to curbing the impact of climate change. Our need to build more homes, coupled with a skills shortage has meant housebuilders will need to embrace newer and faster methods of construction, to comply with more stringent energy efficiency demands and help the UK meet its net zero targets.

Off-site construction has come a long way since the post-war prefabs of the late 1940s which had famously poor insulation and were meant to have a lifespan of just 10 to 15 years. The negative image of these temporary homes is long gone, with present day off-site manufacturing producing buildings, modules and systems designed to exacting specification and because they are pre-insulated, with a marked increase in thermal performance.

In a bid to encourage greater working: Off-site manufacture

efficiency and higher productivity, the construction industry is seeing an increased use of off-site fabrication and systems such as structural insulated panels (SIPs), modular buildings and pre-engineered insulated roof systems. These modular solutions can also give a much needed boost to the UK housing supply capacity and ensure that the regulatory targets for energy efficiency are met or even exceeded.

Rethinking the way we design, engineer and construct buildings will help deliver higher quality projects faster, and with a greater degree of precision. Building better with these modern methods of construction can also play a part in plugging the skills gap by reducing on-site labour whilst at the same time addressing the high demand for new buildings. In recent years the UK has fallen behind its European neighbours by depending on skilled trades at the expense of any mechanised processes or components that reduce site

can provide better working conditions for workers, reduced site times, and improve environmental performance in the construction process.

There is a number of ways in which off-site construction can help to ensure that the in-use energy performance of a building meets the as-designed performance and the insulation industry is constantly looking at innovative ways to ensure that buildings meet the ever more stringent energy performance requirements.

Off-site solutions can reduce the detrimental impact of bad weather on build times, whilst faster weatherproofing of structures will reduce delays for follow on trades.

Structural Insulated Panels (SIPs) are perfect for off-site construction and can offer several clear benefits over more traditional methods. They reduce reliance on wet trades, and provide a fast track construction programme, as well as maximise space and re-

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duce site waste. The inherently high thermal performance of SIPs also reduces reliance on renewables, which can be expensive to install and maintain.

In a further bid to address the challenges faced by housebuilders, an innovative pre-



fabricated roof system by Recticel enables the installation of a fully insulated pitched roof in just a matter of hours. The self-supporting system enables a safe, fast method of creating a watertight structure as used recently for a two-storey property in Burley, Hampshire. This provided a prefabricated system with superb thermal performance that quickly waterproofed the partially-built home and helped to speed-up the construction process. Such was the ease of application, the construction of the pitched roof

was completed in just seven hours.

The innovative, lightweight and cost-effective modular roofing panels are designed to offer U-values of between 0.13 and 0.19 W/m<sup>2</sup>K. The panels comprise breather membrane, counter battens and integral structural timber along with high performance PIR insulation.

Another example of the benefits of off-site construction is the addition of a first-floor extension to the Sainsbury's store in Brentwood. The extension was constructed from 42 pre-insulated steel-framed modules which were manufactured by Portakabin off-site at its manufacturing facility in York and then installed in just six days. The insulation core exhibits substantial strength, is lightweight and gives a high thermal performance with an initial thermal conductivity of 0.021 W/mK and a declared value of 0.024W/mK. This ensures U-values which significantly improve upon the current Building Regulations.

Whether or not developers and buildings will adopt offsite construction on a larger scale remains to be seen, but as an alternative to traditional building techniques off-site solutions are expanding rapidly and will play an increasingly important role in the future of UK construction and meeting our climate change targets.