CONSTRUCTING A CONTEMPORARY PREFABRICATED TIMBER HOME

Timber House specialists Stommel Haus, explain the term 'Prefabricated' has a new definition; bespoke homes tailored to personal needs, budget and style

Pre-Fab vs Contemporary Off-Site Manufacturing

The term "prefabricated" still has a negative connotation with a lot of British consumers based on the experience with post–war prefabricated houses built in their thousands in Britain. According to the 1944 Housing (Temporary Accommodation) Act, the houses were designed to last only about 10 years. Naturally, the quality and standards were not very high.

But there is no reason for a bad reputation for prefabricated houses today. There are multiple manufacturers who produce homes in the sheltered environment of a dry factory with all the added benefits from a quick assembly on site to precision build. With their long standing tight energy efficiency requirements and a demand for high quality products, Germany pioneers prefab technology and there are quite a few German companies who offer their products on the British market.

Today pre-fabs, or let's call them "offsite manufactured" houses, can be bespoke homes tailored to personal needs, budget and style. Clients have complete freedom of design while enjoying the benefits of this method of build, namely: -speed of assembly, -fixed price and -on-time finish.

There is of course a difference in quality, construction and price between various manufacturers and the Premium Suppliers each use their own unique wall construction, different levels of kitting out the houses and specific ways to run the project.

How can a pre-fab be bespoke?

Let's take the example of the Premium German Manufacturer Stommel Haus who produce around 70 to 80 bespoke offsite manufactured timber houses per year. Each and every house manufactured in the factory in Germany is a bespoke design. Stommel Haus sales agents do a thorough briefing with their clients to determine the requirements for space, layout, the architecture and a target budget, then look at the plot and planning situation to create the bespoke design.

The specific design of the walls, ceilings and roof truss, the vast experience in timber construction, the CNC support in production allow the manufacturer to pre-construct almost any kind of architectural design.

Hand-made production supported by computer aided design and manufacturing

The very experienced staff take the bespoke design and translate it into meticulously prepared production plans – a process performed under tight quality control.

The plans are subsequently taken into the factory for production. Both precision design and production are supported by the latest computer technology, although the actual assembly of the walls and ceiling panels in the factory is all hand labour. Wall panels up to 13 metres in length can be produced – the length is actually limited by the transport facilities on articulated lorries. High quality, triple glazing windows are made to measure and set into the timber walls. The wall plates at the top of each storey are prepared with high precision dove tails which allow the ceilings to be slotted into place on site. With this method, no cutting of wood, or any kind of component alteration, is required on site.

Modernised DIN Standards for Construction and Quality of Timber Buildings

Stommel Haus are a very successful off-site manufacturer and build contemporary high quality bespoke homes which are made primarily of untreated wood.

The advantages of energy efficiency and the sustainability of wood over other building materials are unrivalled; however the health aspects of using untreated timber and non-toxic building materials, as well as the quality and longevity of timber buildings still have to be explained to British consumers. A long history of constructing with wood in Germany, supported by research and teaching of timber construction at various renowned German universities, led to modernised DIN standards which define the construction of timber buildings with unlimited lifespan and without the need for toxic wood preservatives. Germany also has independent quality assurance organisations (such as RAL) to monitor the adherence to these standards which gives clients great confidence in the quality of build. Premium Manufacturers such as Stommel Haus not only apply these standards and are subject to independent monitoring, but over the years have also participated, together with the technical authorities responsible, and along with others in the industry, in the development and updating of DIN standards for Construction and Quality of Timber Buildings (DIN 68800, DIN 1052 and others).

Unique Wall Construction

The design of the Stommel Haus wall is unique. Only the heartwood of polar spruce from FSC certified forests in Finland is used. The solid timber is kiln dried to a residual moisture of way below 20%. During this process the proteins in the wood are removed and thus it is no longer of interest for any wood eating insects. The quality, the way the timber is cut, the sheer thickness of the wood and the way it is constructively protected without using any chemicals ensures an unlimited life span for the building.

The Stommel Haus wall is a substantial 34.5 cm thick sandwich wall with a timber frame in the centre. With non-toxic thermal panels and solid polar spruce either side of the timber frame plus thick insulation made of recycled glass, the timber frame is never exposed to the weather. The client has the choice of an exterior wall either displaying the beauty of 50 mm thick polar spruce or render. A combination of both is also possible.

Breathability and Airtightness – A Contradiction?

British Building Regulations now require air-tight houses, the required values are outperformed by good quality manufacturers such as Stommel Haus. Air-tightness means that there are no gaps in joints or holes where valuable heat can escape to the outside – which of course also eliminates draughts inside.

At the same time, the Stommel house is built with breathable walls: All materials used in the wall are diffusion open and there is no membrane or panel in the wall which can collect any condensation. Furthermore, wood has the natural property to take up moisture when the air humidity in the house is high – after a long shower or bath for instance – and give up moisture when the air is dry. There is no need for mechanical ventilation, and neither trickle vents nor ventilators are installed in houses built in Germany (British Building Regulations, however, make this compulsory). Furthermore, wood has antibacterial properties and is able to process stale air – an advantage which our kipper-loving British clients really appreciate.

Construction on Site

The huge benefit gained with off-site manufactured houses can best be seen when watching the assembly on site. The wall panels with already installed windows and exterior doors are lifted by a mobile crane from the lorry straight onto the concrete slab. Wall after wall is installed until all the exterior walls of the ground floor are in place, typically by lunchtime of the first day. After the installation of the partition walls, the ceiling panels are lifted onto the ground floor and let down into the dove tails at the top of the ground floor walls. Normally, the ground floor is finished by the end of day one.

The first floor is installed the same way on day two and typically in the evening of the second day, the massive polar spruce purlins holding the roof are lifted and slot into the grooves of the top floor. This is a very emotional moment and several clients have been seen watching this moment with tears in their eyes.

The roof truss construction is pretty traditional, i.e. rafter after rafter is slot into the dove tails of the wall plates and ridge purlin. The roof truss and roof under-construction are normally finished on day four and five and the house is wind and watertight and lockable within that first week.

It is during this first week when there is the most traffic on site. Lorry after lorry – typically 3 to 5 – is unloaded and returns home. After the first week the main traffic and noise is finished and the kitting out process can start.

Top Quality, Precision and Excellent Craftsmanship

In order to manufacture a house off-site, meticulous planning is required. At the same time, this planning allows the manufacturer to calculate the exact cost and to build the house in budget.

Building houses far away from the factory demands careful planning of all the trades involved as well as the transport of materials and the teams of craftsmen. Stommel Haus are doing this at the rate of 70+ houses per year and this requires working like clockwork, with the benefit for the clients that each and every build finishes on time.

This level of precision and quality control requires motivated and well trained staff. The people building the houses are qualified craftsmen with an apprenticeship of at least 3 years and many years of experience in the company which – being a family business – has very low fluctuation of staff.

Pre-Fabulous

Anyone who watched an off-site manufactured Stommel house go up reports with enthusiasm on the speed of build and cooperation of the skilled teams. Anyone who lives in such a fabulous high quality bespoke house would probably agree to describe the experience as simply pre-fabulous!

FOR MORE INFORMATION, VISIT:
Stommel
www.stommel-haus.co.uk