



The construction director, who also called in his RSL co-ordinator, headed the team. The plan was to develop a design manual and a range of standard dwelling types, that would combine all the benefits of a fully integrated design solution." It was determined that this solution would include a foundation system, panellised timber frame construction, and pods for the kitchen and bathroom. Steve Cook continues: "All construction would be to the highest sustainability criteria and would maximise quality. Having examined the European and UK markets we selected two timber frame, two pod and one window partner. The outcome was a model of MMC efficiency."

Jarvis and its partners actually progressed to Stage Two of the ODPM's Design for Manufacture competition and demonstrated that it could deliver a habitable dwelling within the magic £60 K price cap.

Knowing full well that few sites these days offer good ground conditions, the foundation strategy is to use concrete pads where possible, and piles where the bearing conditions deteriorate.

Collaborating with PRC Structural Engineers, the team devised an arrangement of concrete ground beams (for side, gable and party wall positions) that then carry fully insulated timber floor cassettes.

Steve Cook explains: "We have cut the service penetrations right down so there is one drain beneath the central core, with the water supply coming in at the same position. We install the beams for the back wall and two side walls, then once the drainage trench is through, we place the front ground beam. The number of floor cassettes varies depending on the dwelling type, but typically there will be three sitting directly on the concrete."

The wall panels come from either Frame UK or Advanced Building Systems, with both suppliers working to the same design specification. This uses a Tyvek reflective or similar membrane over 9 mm OSB that offers the racking strength to the 140 mm studwork. The void is then filled with Rockwool or Crown mineral wool insulation and covered on the inside face by a vapour barrier. Finally, 25 mm battens create a service space

where conduits are positioned ready to receive the wiring.

The thickness of plasterboard lining is dependant on the position within the property, with the party walls receiving a double layer to combat sound transmission; while the pods sit within the main structural frame.

The party walls feature twin 89 mm stud walls separated by a 72 mm cavity. As with the sound separating floors for the three-storey flats that Jarvis has built, pre-completion testing is being passed by a considerable margin. The airtightness figures achieved to date are also exemplary with rates of between 5.0 and 7.5 cubic metres per hour being typical.

By keeping the twin objectives of speed and economy in sight from the start, Jarvis has been able to cut waste and transport costs while standardising pod and panel sizes, with the end result that a dry shell can be erected in just two working days. Then, the fact that all of the major plumbing and heating work has been undertaken in a controlled factory environment means that the number of operations needing to be

COVERING ALL THE BASES

Editor Bruce Meechan reports on a holistic building solution conceived by a leading contractor.



One of the phrases that you will regularly hear presenters use on motoring programmes, such as Top Gear, is for them to describe some model they like as being "a driver's car." Well it would be reasonable, then, to describe the Jarvis Group's prefabricated hybrid housing solution as "a contractor's system."

Compared to a lot of its competitors which have been conceived mainly by manufacturers – aided and abetted in most instances by personnel poached from the automobile industry – Jarvis' offering has come from within.

Back in 2005, the Jarvis Board decided to respond to the £60 K competition challenge by investing in the development of a comprehensive construction system; aiming to increase productivity and respond to the needs of the RSL sector which already accounted for 40 per cent of its business.

Steve Cook, Managing Director for Jarvis, states: "The company approached other members of the Jarvis Group in order to create a multi-disciplinary team. From the development company we took project management and design, and then from M&E Services we took designers with NHER experience.



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: Pods are positioned against the party walls, rather than being part of the construction, to ensure acoustic targets are met.

completed out on site is greatly reduced.

The team claims to have cut trades processes by half and achieved a 55% increase in speed of installation compared to traditional building techniques. The amount of excavated material going to landfill is also cut by an average of 40 per cent.

Internal audits indicate that the unit price for the basic property has risen to £68 K, with an extra £5 K for attaining Level 3 of the Code for Sustainable Homes. This rises substantially to an extra £30 K to attain level 5, though the falling cost of renewables will help mitigate the pain to a degree.

Steve concludes: "This system enables us to offer a complete package to our clients, though we do other types of construction and may well mix and match the system with traditional on some sites."