Project Overview

Client:	Mr & Mrs Napper
Status:	Complete
Date:	December 2011
Frame:	icarus
Render:	NYRS
Roof:	G D Roofing

Single storey extension under ‘Permitted Development’

The structure is a single storey light gauge steel structure erected under ‘Permitted Development’ rules, or a “House Holder Planning Check”, meaning no planning permission was required. Build was completed in three weeks - from a cleared drive way to an in habited building. A fourth week was required due to weather limitation for the render to be applied. The structure is less than the permitted three metre permissible width from the side to give access to rear of the property and rear of the existing property and less than three metres high as is closer than two metres to the side boundary, thus no planning permission was required.

As the structure is made from Light Gauge Steel clad with insulation and render and a light weight membrane roof, the structure is very light and this meant that the foundations are also very small. Foundation loads are so small that the foundation is made from a one hundred millimetre slab cast onto a cleared and hard cored drive way covered with insulation. This meant that there was no spoil to be taken away from the site, thus reducing mess, vehicle movements and risk associated with deep trenches. Time and ‘mess’ were a factor in the construction as Mr & Mrs Napper had three children between two and seven living at the property at the time of the build.

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Light steel framing uses galvanized cold form steel sections which were used as the main structural component. Wall panels and roof trusses were prefabricated in a factory and later combined on site. Through wall construction was plasterboard with mineral wool infill, cement board, polystyrene insulation and directly applied acrylic render for a maintenance free external finish. The roof is covered with an membrane roof membrane to give a low maintenance, yet aesthetic finish. This form construction allowed the first fix plumbing and electrics to be installed in less than half a day using the pre punched service holes. This also meant that secondary fixers knew exactly where the wires and pipes were so there was no risk of accidental damage.

Floor cassettes were not needed due to ground slab detail employed for foundations, and roof is designed to span between external load bearing wall panels on z hangers to enable ease of levelling of the finished building. If planning permission was granted to permit future upward extension the ‘roof’, ground floor walls and foundations are all engineered to carry a second floor. Roof joists were clad with twenty two millimetre floor boards to give a solid feel as a floor.

The panels are connected to each other on site using conventional techniques, i.e. self-drilling screws. Wall panels are fixed onto previously installed concrete floor using a combination of bolts and screws to meet holding down and shear requirements. The individual framing components are fully tied together to form inter-connecting panels, which together with the sheathing resistance of the lining boards, ensures the whole framed structure acts as a single mass. This also applied to the progressive collapse requirements and checks – EN 1991-1-7 and BS 5950-5 along with Part A of the UK Building regulations.

The structural system is designed and erected in accordance with the guidance of Steel Construction Institute for Light Gauge Steel Framing in Residential Construction, P301. A design life of over 200 years can be achieved in a ‘warm frame’ construction highlighting that this is a permanent construction. This project highlights that Light steel framing can be used on sites with restricted access, party wall issues and is a clean, quick and sustainable solution to today’s requirement for additional space for families with limited budgets. The build time and clean safe site means that families put off by the ‘building site experience’ have less concern and it feeds the requirement for local tradesmen and builders in the form of foundations, joinery, electrics, plumbing, etc. Overall the project benefited from adopting light steel framing solution which combines the benefits of a reliable quality controlled product with speed of construction on site and the ability to create existing structural solution.

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