



Project Description and Aims

The dwelling was originally constructed in the 1930's and the client wished to extend by adding two further floors of living accommodation to the property. This involved the complete removal of the existing roof. As the building was relatively old it was not considered cost effective or practical to build the extension in masonry and therefore the decision was taken to use a timber frame for the extension which would rest on the existing structural shell. The client required the extension to meet and exceed current building regulations and planning requirements dictated that the finish had to be visually acceptable and in keeping with other properties in the vicinity.



NBT role in project

NBT worked with the architect during the design phase of the project and co-ordinated the specification and ordering of the structural timber frame. NBT supplied the Diffutherm and Isolair insulation boards, Flax insulation for filling between the timber studs and trusses and the proprietary render finishes. NBT also provided technical and site support to the contractor as the project progressed.

Performance

The external elevation of the extension was constructed using a timber frame with 89mm studs faced with 60mm thick Diffutherm boards. The external rendered finish was achieved using a proprietary lime/cement render from Bayosan. The space between the timber studs was full filled using flax insulation. At the roof line Isolair boards were used as sarking to achieve a high performance warm roof design achieving a U-value of 0.2W/m2k. The elevations were designed to achieve a U-value of 0.25W/m2K. Both the walls and roof give a "breathing" construction which provides thermal performance and thermal storage, making the building warm in winter and cool in summer. The Diffutherm and Isolair boards also provide excellent acoustic insulation.



Bungalow Extension

-Princess Risborough Bucks.

Client: Private Client

Architect: Richard P James Associates

Contractor: Neil May Builders Ltd

Size of Contract: £65K

Timber Frame with Rendered Diffutherm Woodfibre Wall Insulation and Isolair Sarking / Insulation Woodfibre Board Over Rafters

Buildability

The timber frame offered a fast method of constructing the shell of the extension and the interlocking insulation boards complimented this in terms of speed of build. Once watertight the internal finishes were started while work continued outside. The dry construction meant that there was virtually no condensation or problems associated with the building “drying out” such as shrinkage and cracking.

Environmental

Diffutherm and Isolair woodfibre boards have an exceptional ecological profile and consist almost entirely of waste pine wood. The boards contain no artificial glue or resins, are extremely vapour open and have excellent moisture regulating properties. The proprietary Baumit-Bayosan renders used in conjunction with the Diffutherm boards are mineral based, vapour open and use sustainable resources. These products were complimented by the use of natural Flax insulation products which was used as the fill between the timber studs. All the products used in the construction of the walls and roof give off no emissions and require no special treatment on final disposal.

Design Issues

From architect: This method of construction was fast and efficient and allowed the performance criteria to be met with a lightweight structure that virtually eliminated the need for involved structural calculations or the cost involved in structural alterations.

Build Issues

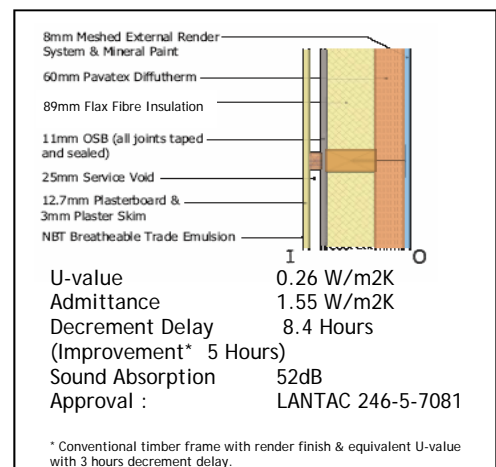
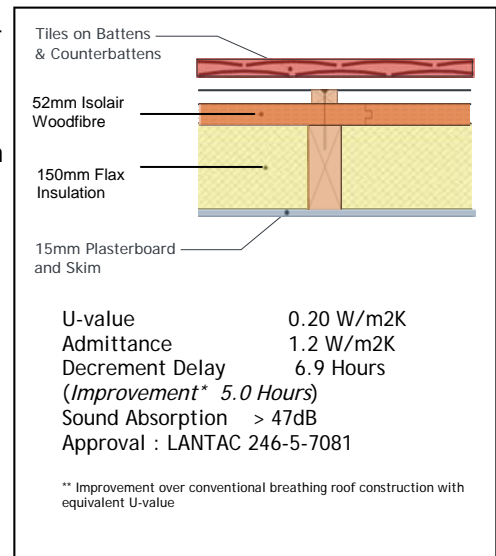
From main contractor: Progress in constructing the building shell was fast and straightforward but difficult site and weather conditions did cause some problems at the early stages of the project.

Cost

Commentary: The project was completed within time and budget and was cheaper to build than a masonry alternative due in part to the structural enhancement that would have had to be carried out to the existing building.

Performance Results

The extension to the building has now been in use from early in 2004 and the clients are very happy with the performance. They have kept records of their heating bills for the past 10 years, and even though the house has added an extra floor and 3 bedrooms without thermally upgrading the ground floor, the heating bill is reduced. Upstairs the radiators have been used only once or twice, in exceptionally cold weather. Furthermore the clients particularly noticed how cool the upstairs, including the new room in roof, were throughout the summer, in sharp contrast to their previous experience of the house and in contrast also to all their neighbours and friends with rooms in roofs. (Exact heating bill costs will be made available once the winter is over and we have a full year's bills.)



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