

SERVE Conference and Site Visits

Case Study: Site 91 – Hemp/Lime Build – Detached House

Summary

Site 91 is a 2 Storey Detached House with a pitched roof. The dwelling has 4 bedrooms and a total floor area of 170m².

It is constructed using a ground floor insulated strip foundation, Hemp Lime external walls, pitched roof with unoccupied attic space and with flat roof timber frame single storey annex.

The Building Energy Rating (BER) = A3 (Primary Energy 67.25 kWh/m²/yr)

The house has been designed where the main living areas and bedrooms are all south facing.

Over 50% of the glazing area is on the south face with only 10% of glazing on the north face.

The house is a 2 storey construction with a pitched roof.

Key Elements

Foundation.

The house has a traditional strip foundation built up with concrete blocks with hardcore filling between the strips and a sand base to support the poured concrete floor slab. 150mm of Quinnterm High Density Insulation is installed under the floor slab.

Timberframe

A timberframe shell to provide the full structural support for the house was designed so that a solid hemp lime wall could be cast around it. All external walls on the inside were sheathed with Multi Pro Manganese Silicate boards, which when combined with the frame provide the structural and racking strength.

Hemp Lime Walls

The external walls of the house were cast from a hemp lime mix that is fully tested and certified. The walls were cast using lightweight plastic shuttering and to form 300mm thick walls. It took 2 weeks to complete the walls.

Roof Construction

The roof has a shallow pitched roof of 25m². The main attic has been insulated at ceiling level with 400mm of Cellulose achieving a U value of 0.13 W/m²K. The flat roof has been insulated between the 225 mm studs with cellulose to achieve a U value of 0.2 W/m²K.

	W/m ² K
U-Value of Floor	0.13
U-Value of Wall	0.22
U-Value of Roof	0.13

Windows

All windows fitted are timber frame triple glazed with argon filled low emissivity glass. The doors are high specification sealed timber doors.

SERVE Conference and Site Visits

Case Study: Site 91 – Hemp/Lime Build – Detached House

Heating

Low temperature aluminium radiators have been installed to meet the heating requirements of the house. There will be 2 heating zones installed to control the temperature on each floor of the house with a weather compensator to regulate flow water temperature to the radiators.

Hot Water

Hot Water will be controlled by a separate zone to provide time and temperature control.

Ventilation

The house has a heat recovery ventilation system installed to provide a constant supply of fresh air. For this system to work effectively the house has to be very air tight. An Air Tightness Test on the House achieved a value of 1.12m³(m².hr)

Result

Plot Number	BER	Area m ²	Primary Energy KW/hrs/m ² /yr	Delivered Energy KW/hrs/m ² /yr (SERVE Target < 70 KWh/m ² /yr)	Air Tightness (SERVE Target < 3 m ³ (m ² .hr)	Heating Controls (SERVE Target minimum of 1 zone space heating & 1 zone hot water)
91	A3	170	67.25	41.5	1.12	2 Heating/ 1DHW

Energy Data:

Mean energy for space heating from 18/03 to 08/04 was 26.04 kWh/ day

The SERVE Project

The SERVE Project aims to create a sustainable energy region in North Tipperary which achieves significant energy consumption reduction and increases the use of renewable energy. The project involves the upgrade of 400 existing buildings in terms of energy efficiency and renewable energy and the construction of the eco-village in Cloughjordan.

E-mail: info@servecommunity.ie



CONCERTO is co-funded by the European Commission

