DEEP RETROFIT OF 1930s END OF TERRACE HOUSE, OXFORD
External wall insulation installation

Existing wall construction:

Cavity wall construction with 50mm cavity with mineral wool insulation

Main external wall insulation options:

- EPS insulation
- Rockwool insulation
- Timber fibre insulation

Selection rationale:

Rockwool and timber fibre insulation are similar in price, while EPS is less costly. However, rockwool and timber fibre insulation have significantly lower embodied energy and lower negative environmental impacts. Timber fibre insulation is also considered a carbon sink as it locks carbon into a product that should last the lifetime of the building.

The house before the insulation was installed

Project description:

Deep retrofit including insulation to roof, walls, windows, floor and new services and renewable energy sources.

Project location:

50 Cornwallis Road, Oxford OX4 3NW

Completion: 2022

Client/ architect/ environmental designer:

Paola Sassi

1

The base of the external wall is at risk of damp from the ground and from rain. Therefore below the damp proof course the insulation used was extruded polystyrene (XPS) as it has low moisture absorption. A trench was dug at the base of the wall and the wall was waterproofed with a black liquid damp proof applied membrane.

2

100mm of XPS insulation is fixed with adhesive and mechanical fixings. The top of the XPS boards is also waterproofed.

3

Above the XPS two layers of 80mm of timber fibre insulation were fixed with adhesive and mechanical fixings to the wall.

The insulation was made to overlap the window frames by 50mm to insulate the window frames and minimise thermal bridges, which transfer heat through the building fabric. The external corners were strengthened with a plastic bead (metal is also available).

4

The insulation was finished with a lime render, a primer and a silicon top coat.

A plastic mesh was used to strengthen the finish.

The insulation below the damp proof course was finished with recycled slate.

5

The silicon wall finish was sprayed and all the windows etc. have to be protected. The silicon finish should be long-lasting and will not attract dirt.

Comments

A good result can be achieved without insulating below ground and with far less insulation. In this case the high levels of insulation allow the omission of a central heating system and direct electric heating will be used only when absolutely necessary.