



**LOCATION: CHESHAM,
BUCKINGHAMSHIRE**

Your insulation team
Superglass

The project

Highfield is a new ultra-low carbon detached rural dwelling. The previous property was highly inefficient with solid walls, no insulation and a 30-year-old boiler achieving a SAP rating of <30 (Band F). This 180sqm 3-bed dormer bungalow property incurred high annual energy costs, which led the consumer to seek a more efficient and cost effective ultra-low carbon solution.

Owner, Richard Hurd had a genuine interest in building a house that used the latest low carbon technology to minimise energy usage. The aim was to build a home that looked like a traditional house from the outside, but was modern and contemporary inside and did not cost any more than a normal build.

PROPERTY:

ULTRA-LOW CARBON

PREVIOUS FUEL :

**MANUAL ELECTRIC NIGHT STORAGE HEATERS
AND OPEN FIRE**

TECHNOLOGIES USED:

- MINERAL WOOL INSULATION ✓
- MVHR ✓
- EARTH DUCT ✓
- SOLAR THERMAL PANELS ✓
- WOOD BURNER ✓
- ECONOMY 7 IMMERSION HEATER ✓

Specification

The design solution involves a mixture of efficient integrated heating and insulation solutions to negate the need for traditional boilers for space heating. A fabric first approach was taken, minimising the cost and complexity of the energy systems. Extremely low design U-values were achieved in the walls and ceilings due to the innovative twin-wall construction and Superglass mineral wool batt insulation combination.

Solar thermal panels and a wood burner charge a heat store in the summer and winter respectively, topped up overnight by an Economy 7 immersion heater to maintain optimum operating conditions and sufficient heat in the store for both hot water and space heating. The system is further optimised using a highly efficient mechanical ventilation and heat recovery (MVHR) system linked to a passive Earth Duct, which pre-warms (winter) & pre-cools (summer) the property's incoming supply air.

Benefits

Incurring costs of £3,500 in oil to heat and over £1,000 in electricity per annum, the previous property was expensive to heat. Highfield is a larger property; it has 4 bedrooms, 3 floors, and covers 330sqm. Despite the increase in size, electricity usage totals approximately £925 per annum and £560 in wood logs – that's a saving of over £3,000 per annum on energy costs.

The property scored an Environmental Impact rating of 95 (A) and an Energy Efficiency rating of 84 (B) compared to the previous property's rating of less than 30. Coventry University have undertaken a 3-year study as part of a Government funded project to monitor the property and consider how the property performed against design attributes. The study showed that performance U-values were above design values. Data is available on request regarding the heat production, electricity use, MVHR and Earth Duct performance, water consumption and internal conditions.

“The home meets our family's needs, it is efficient, looks great externally & internally, feels fresh at all times, has no draughts, and has a pretty constant temperature throughout the year. Also, it is very cheap to run.” Richard Hurd, Owner Highfield