

BOROUGH GROVE RETROFIT, HAMPSHIRE



Retrofit

A CASE STUDY



Refurbishment Case Study

This project was part funded by the European Regional Development Fund, secured via the South East England Development Agency.

The upgrade of the buildings included low energy and sustainability measures that would result in reducing carbon emissions by 77% in seven of the buildings and by 86% in the other six. The total budget for all refurbishment work undertaken on the properties was £1.2million, an average of £92k per dwelling. The buildings were constructed using precast reinforced concrete and were built after World War Two, when there was a need to build quickly due to housing shortages.

The properties were all 'E' rated, with residents' energy bills typically ranging between £1000-£1500 per year, and many failing to achieve thermal comfort. Carbon emissions for space heating, hot water & lighting were typically 6tCO₂/yr or 7.2tCO₂/yr in total, including appliance based electricity use (Based on Standard Assessment Procedure (SAP) and Code for Sustainable Homes methodology for electricity).

The properties had hollow precast concrete walls, solid concrete floors and concrete ceilings, with pitched roofs clad in concrete tiles. They had approximately 100mm loft insulation, no floor or wall insulation, double-glazing installed in the mid-90s, and gas boilers in need of replacement.

The properties were refurbished internally and externally, and this included new kitchens and bathrooms, re-wiring, re-plastering and re-roofing.

Some of the sustainability features added include:

- External wall insulation was added comprising of 100mm Kingspan Kooltherm phenolic insulation with a Wetherby K-silicon wet render finish. This reduced the wall U value from 2.34W/m²K to below 0.3W/m²K, cutting heat loss by a factor of nearly ten. Insulation was returned around corners to meet door and window frames to a thickness of 25mm. New windows and doors were also fitted with A or B rated alternatives.
- Around the concrete floor slab 'edge' insulation, in the form of 50mm extruded polystyrene board, has been applied to a depth of 300mm below the first floor level, covered with weatherproof Trespa cladding panels. This has reduced the floor U value from its original level of 0.68 W/m²K to 0.58 and 0.30 W/m²K respectively.
- Original loft insulation was removed due to age, as well as to enable re-wiring, and replaced with a depth of 300mm mineral wool laid between and across joists. All properties were also re-roofed and fitted with solar photovoltaics.

The seven East facing homes achieved a high 'B' rating, while the six remaining South East facing homes, with extra PV and solar water heating, achieved an 'A' rating.