

## BEST PRACTICE PROGRAMME

# Good Practice Case Study

# 12

### The Cob Tenterden Kent McCarthy and Stone

#### Background

McCarthy and Stone are the country's largest builder of retirement homes and sheltered housing. The company has always adopted better insulation standards than the Building Regulations requirements, and their current standard specification includes double glazed uPVC windows and 70mm wide cavities filled with polystyrene beads.

At the Case Study site in Tenterden, however, the company have taken their commitment to low running costs a stage further by adopting the demanding Medallion 2000 insulation standards for the retirement cottages.

#### Design and construction

The majority of the 27 retirement homes at 'The Cob' are spacious 2 storey, 2 bedroom 'cottages', built in terraces. A particular feature of the cottages are the south-facing conservatories which form an extension to the living rooms.

Flats and 3 bedroom units are used over garages and at corners to create a sense of enclosure and

to provide added interest and variety to the scheme.

Construction is masonry cavity walls with beam and block suspended ground floors and trussed rafter roofs. External walls generally are finished in facing brick, with tile hanging to some upper floors.

Heating is by means of conventional off-peak storage radiators and panel heaters.

#### The energy efficiency package

- Brick cavity walls have a 70mm cavity filled with polystyrene beads, a 100mm thick Durox Supabloc inner leaf and dry lining (U value 0.31).
- Tile hanging is fixed to 215mm thick Durox Supablocs (U value 0.42).
- 160mm Mineral wool quilt as loft insulation (U value 0.23).
- Suspended ground floors are finished with 25mm EPS bonded to 15mm Sterling board (U value 0.36).
- uPVC windows with double glazing and weatherstripping.
- A Bahco ventilation and heat recovery system.

## ENERGY

## EFFICIENCY IN

## NEW HOUSING

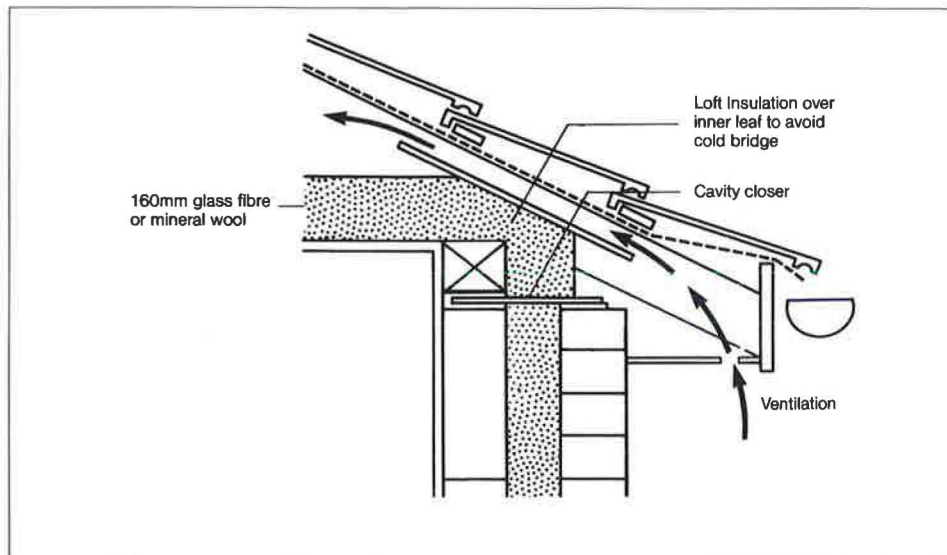


Artists impression of the retirement cottages

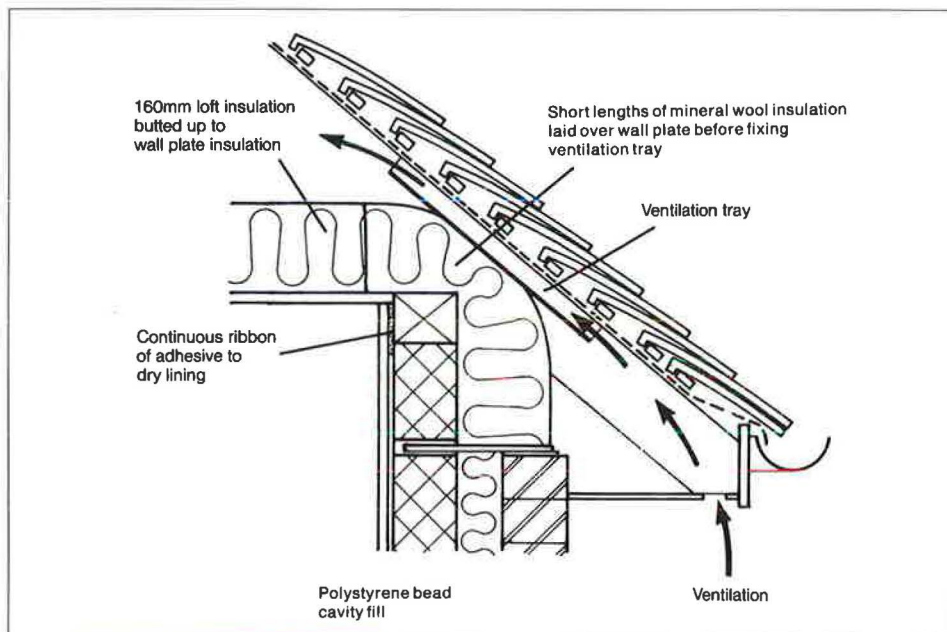


**Energy Efficiency Office**  
DEPARTMENT OF THE ENVIRONMENT

## THE COB, TENTERDEN KENT



Eaves detail from medallion 2000 Award 'Builder's Guide'



McCarthy & Stone eaves detail at Tenterden

The decision to adopt the Medallion 2000 standard at Tenterden followed a presentation by the South Eastern Electricity Board (SEEBOARD) and a trial at a Warden's flat at a McCarthy and Stone site in Maidstone.

SEEBOARD produce a very helpful and informative 'Builders Guide' to the Medallion 2000 Award. The guide not only stresses the need for high insulation levels, but also the importance of small detailing points such as draughtstripping the loft hatch and fixing plasterboard drylining using ribbons of adhesive rather than dabs. This attention to detailing is necessary to minimise heat loss from air leakage and to ensure the efficient operation of the mechanical ventilation and heat recovery system.

The Medallion 2000 Award requires pressure testing of every property. Air leakage should be less than the 7 air changes an hour when the pressure difference between inside and outside is 50Pa.

On the Tenterden site, the guide was being used as a checklist by the site supervisors to ensure that the energy efficient detailing was being properly

constructed. Correct construction is important if the anticipated savings are to be realised in practice.

### Buildability

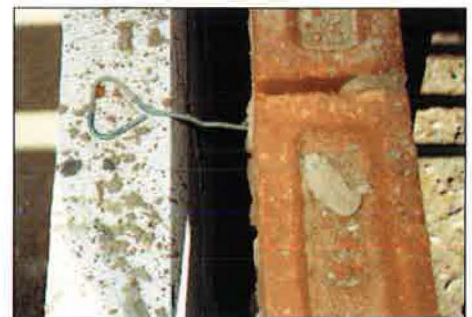
The Project Manager, Ray Williams, mentioned two areas where particular care was being taken to avoid cold bridging.

The present practice is to fill the lintels with mineral wool quilt. This has the advantage that a visible check can be made that the lintel is completely filled with insulation, using the holes that provide the plaster key, before the lintel is placed in position.

The eaves was the second area where the emphasis on avoiding a cold bridge had resulted in a change in normal practice.

The first of these was at the Catnic lintels. In earlier schemes reliance was placed on the polystyrene beads finding their way into the open ends of the box lintel. However, the long narrow shape of the box lintels meant that it was not always easy to ensure there were no unfilled voids.

The Project Manager had doubts about the effectiveness of installing 160mm thick mineral wool quilt over the wall plate from inside the loft, once the roof had been tiled. The solution was to instruct the roofer to place small lengths of mineral wool quilt over the wall plate immediately before fixing the proprietary eaves ventilation tray and roof sarking. The protruding lengths of mineral wool made it easy for the supervisors to check that the insulation had been correctly installed to avoid the cold bridge. When the main loft insulation was installed, this was simply butted up to the insulation over the wall plate.



A clear cavity to be filled later with polystyrene beads.

### Marketing

The majority of customers for retirement homes have limited budgets and many lived on fixed incomes. As McCarthy and Stone manage their completed schemes, they are well aware of the importance of low outgoings for their customers. It is important, therefore, to demonstrate that their properties were well insulated and had low running costs.

The adoption of the Medallion 2000 standard was a natural development of the current high levels of insulation included in the company's standard specification (the standard specification is already better than the new 1990 thermal insulation requirements).

It was planned that the additional cost of energy savings features would be fully recoverable in the selling price and that, in addition they would enhance sales and generate interest and goodwill amongst potential customers.

### Building costs

The extra cost of the energy efficiency package for a mid terrace cottage was estimated by Davis Langdon and Everest to be about £2600 compared to the same property built to 1989 standards and £316 more compared to 1990 standards. The selling prices have not yet been fixed, but the extra cost of the energy package would be about 2% of the selling price. Of the £2600, £2300 was attributable to the double glazing and the ventilation and heat recovery system. The cost of these two items is recoverable in the sale place.

### Energy and Cost Savings

The BRE Domestic Energy Model (BREDEM) was used to estimate the difference in energy use between an 88m<sup>2</sup> mid terrace cottage and the same property assumed to be built to the 1982 Building Regulations thermal standards. The calculations showed that the energy saving package can produce annual savings in space heating of up to 63% compared to 1982 standards, 55% compared to 1990 standards and 40% compared to the McCarthy & Stone standard specification. Compared to the 1982 thermal standards, the estimated saving would be in the order of £160-175 per annum.

### Assumptions

#### Estimates of annual fuel consumption for space heating, using BREDEM.

Annual average external temperature:

- South East = 9.75°C
- Midlands (UK average) = 9.54°C

Whole house demand temperature = 21°C

Efficiency of storage radiators = 100%

The proportion of electricity used for space heating is assumed to be 90% off-peak: 10% on-peak.

#### Estimates of costs and savings from energy efficiency measures

Estimates of extra capital cost are based on the Architects and Builders Price book, edited by DL&E, and published by E&FN Spon. Costs have been adjusted for Southern England (location factor from the Building Cost Information Service of the RICS). The insulated ground floor with no floor finish applied.

Fuel cost savings are based on electricity prices of 2.1p/kWh for off-peak and 5.8p/kWh for on-peak.

### Acknowledgements

The study described was carried out by NBA Tectonics on behalf of BRECSU, and funded by the Energy Efficiency Office of the Department of Energy, but the views expressed are not necessarily those of that Department.

