

Case Study No.11

Embedded Solar Sunspaces, High Insulation

Perthshire Housing Association, Nelson Street, Perth

Type: New build, solid masonry, 3 and 4 storey flatted
 Number of units: 27

SAP rating: 92
 U-values: 0.18 Wm²C roof
 0.25 Wm²C walls
 Fuel costs: £3-6.23 pw (predicted)

Works costs: £1,215,589
 Unit cost: £45,000

Completion date: August 1997

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	Architect:	Milton Studios, Glamis	James F. Stephen	01307 840254
	Builder:	Taycon Construction Ltd, Dundee	R J Cowan	01382 622321

This development of two and four person flats has been designed to achieve high levels of energy efficiency within a traditional solid masonry structure. The intention of the client was to address an increase in the incidence of fuel poverty triggered by the addition of VAT to fuel bills. The scheme is also high density (117 dph) and built on a brownfield site. It is situated in the centre of Perth and is within easy walking distances of local amenities. It is also well served by public transport and has an exceptionally low level of car-parking (6 off-street car spaces only).



Figure 11.1 Solar sunspaces are embedded into this scheme, maximising efficiency

Key Features

Energy Use

High insulation, sunspaces

High energy efficiency is achieved through:

- south-facing sunspaces supplying warm air to the rest of the dwelling
- sun shades to prevent overheating of the sunspaces when the sun is strongest
- increased insulation (walls 80mm styrofoam, roof 200mm mineral fibre, floor 35mm styrofoam)
- low energy windows (low emissivity, argon-filled giving U-value of 1.24).

The sunspaces are embedded into the buildings' structure rather than added on like conservatories and ventilate into the bedroom and living room spaces. Kitchen and bathroom are internal and have no external windows, although a window from the kitchen faces into the sunspace.

The whole building acts as a passive thermal store because it is made of solid masonry. Wet plaster was used on the walls to maximise the efficiency of thermal storage.

Since the development has been occupied there are indications that the combination of extra insulation and sunspaces has increased energy efficiency to such an extent that boilers could have been smaller and central heating may not have been necessary. Radiators were installed in order to address tenants' perceptions of heating requirements rather than the actual heating requirement. This development also demonstrates that the attractiveness of sunspaces can lead occupants to annex them as additional living space with fitted carpets etc which can compromise their effectiveness. This highlights a need for educating the occupier in relation to energy efficiency.

Other Relevant Aspects

Costs and Maintenance

Costs, although within an agreed budget with Scottish Homes, are approximately £10,000 per unit over standard costs. The high cost is attributable more to difficult ground conditions and the need for flood protection than to the higher environmental specification.

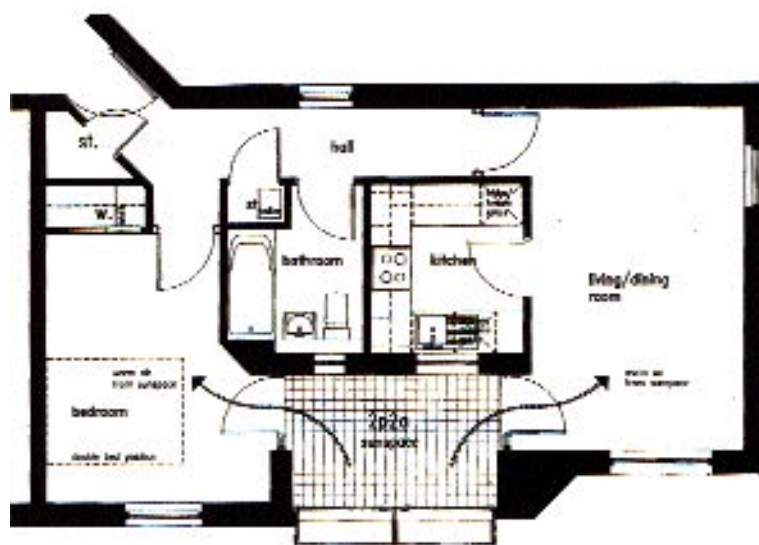


Figure 11.2 The floor plan shows how the sunspace pre-warms the living spaces.