

# Achieving lower 'U's

**Changes to the Building Regulations should give architects more flexibility. \* Geoff Hickson describes three ways in which they may want to approach the challenges of meeting the new requirements.**

**N**ew thermal insulation regulations will take effect on April 1, 1990, allowing architects a more flexible means of selecting the most appropriate risk-free design option. There are three approaches to meeting the new requirements—elemental, simple alternative and by calculation. For the first time, ground floors and other floors exposed directly to external air may need to be insulated.

For the elemental approach each element of the building will have to

When using the simple alternative approach in dwellings, full double glazing allows the specifier to retain the existing U-values for both the walls—0.6 and the roof—0.35. There is no need to insulate the floor. There are other "simple alternatives" that allow trade-offs between the elemental requirements. These can allow the designers to increase window area for example, or improve floor insulation to reduce loft insulation.

The calculation procedures will allow specifiers to vary individual elements within a permitted rate of heat loss for the whole building. The first calculation procedure can be used to show that the rate of heat loss through the fabric of a proposed building, where U-values differ to those stated in the elemental approach, is no greater than that of a notional building, designed to comply fully with the elemental requirements.

Procedure two allows a completely free design of the building using any valid conservation measure. The calculated energy use of the proposed

wall design options. Any 90 or 100mm aerated concrete block inner leaf, for example the Durox aircrete, combined with cavity fill will meet 0.45. With most other types of concrete block the cavity will have to be significantly increased. A 50mm clear cavity solution that only marginally increases the wall width is achieved using a 115mm aircrete inner leaf by simply substituting the internal dry lining system with a urethane laminate insulation board.

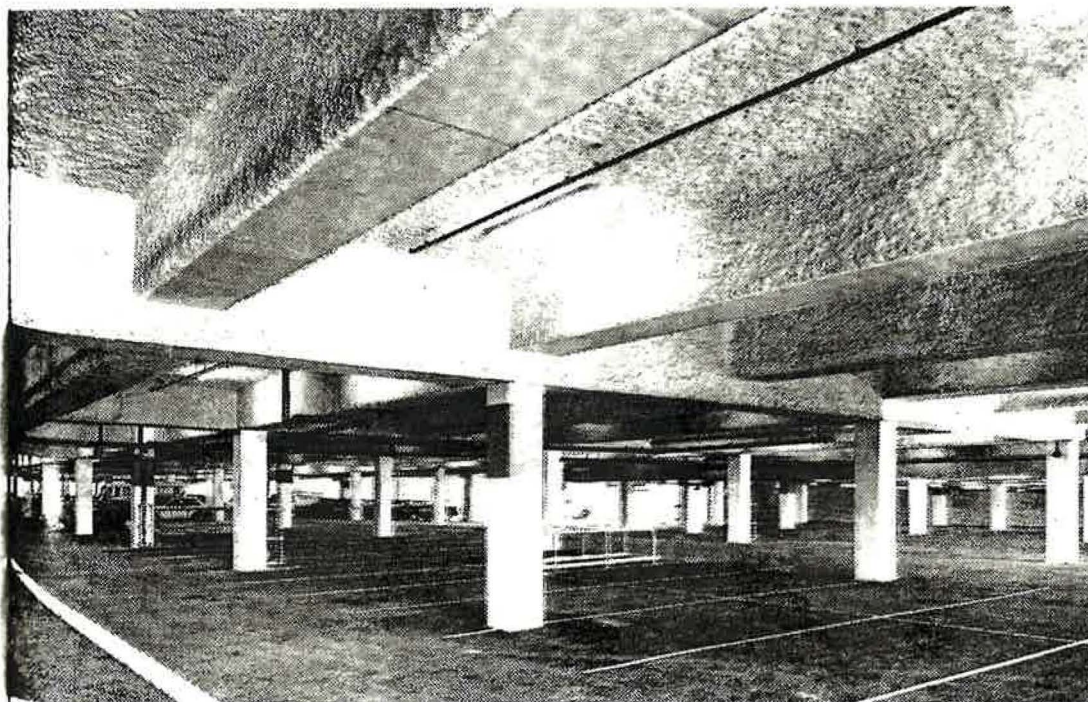
Alternatively, many will turn to the simple alternative option. Those who specify double glazing, recognise the tangible benefit it offers to house buyers, which may help to offset the costs of meeting the new regulations. Equally, many specifiers will prefer to retain tried and tested 0.6 clear cavity wall design methods.

The tightened regulations present new opportunities for the design of floors and the use of aircrete products below the damp-proof course. Aircrete blocks for in situ, suspended ground and intermediate floors offer a cost-effective choice—reduced deadweight equalling less expensive foundation design. The use of 7N/mm<sup>2</sup> aircrete blocks is expected to increase. Weighing just one-third of a dense block equivalent product, they meet the new requirements without increasing the overall wall width. Recent developments in this product area include the introduction of a 7N/mm<sup>2</sup> coursing brick—Supabloc 7—to partner the Durox Supabloc 7. To eliminate cold bridging around openings, a combination of aircrete reveals coursing bricks at sills and used with Durox Supalintels provide a homogeneous structure with built-in insulation. This in turn allows flexibility when specifying window sizes—cold bridges can be deducted from the glazing area.

Technical issues become more significant as buildings are better insulated. For example, there is a greater risk of condensation and changes to traditional forms of construction could lead to damp penetration. For this reason, the BRE has issued design guide lines to accompany the new regulations.

The building regulations have been long awaited and will take some time to digest. The intention of the DOE was to provide flexible means to achieve considerable energy savings whilst minimising risk. It is clear the three approaches will allow a greater degree of flexibility for architects to select the most appropriate design solution.

*\* Geoff Hickson is technical manager of Durox Building Products Ltd.*  
**More information circle 250**



**Rockspray used on the soffits at the Merton Savacentre**

meet an up-rated insulation level. The new U-values are 0.45 for exposed walls, 0.25 for roofs (0.45 in commercial and industrial buildings) and 0.45 for floors. Single glazing in homes should not exceed 15% of the total floor area. More glazing is permitted in buildings other than dwellings. Roof lights can be up to 20% of roof area and windows, as a proportion of exposed wall area, can be 25% (other residential), 35% (factories, offices and shops) and 15% (industrial and storage).

building should not exceed the estimated annual energy loss of a similar building designed to comply with the elemental requirements. Specifiers will have to meet "energy targets".

As often happens when new rules are laid down, interesting and profitable solutions present themselves. In particular, products with inherent insulating properties are expected to be the main beneficiaries.

Those who opt for the elemental approach will consider many cavity