PROVIDING A BALANCE TO CHANGES

The government has for some time had a strategy to achieve a zero carbon building programme for non-domestic buildings by 2019. This strategy has resulted in a series of step changes within Part L of the Building Regulations, the most recent of which was implemented during October 2010. To meet the 2019 target the Government has set in place further changes in 2013 and 2016.

The MCRMA which is recognised as the building envelope authority was actively involved within the 2010 consultation process when the construction industry was asked to provide input into the proposed regulatory change. Since May 2011 the consultation process has been working towards the 2013 step change and the MCRMA has again been influential in trying to ensure that any changes provide a balanced proposal to meet Government's wishes and demonstrate the industry's commitment.

For some time the Part L Building Regulations has taken a fabric first approach which has driven down U values and given an overall improvement in thermal performance of the building envelope. This approach has resulted in the specification of ever increasing thicknesses of insulation and the cumulative effect of deeper roofing and cladding systems.

System suppliers offer a full range of systems which can provide U values much lower than those generally regarded as practical for the application however, it must be recognised that specification of these low U value systems adds a further level of complexity and has an associated cost.

The adoption of deep non-domestic envelope solutions may also result in the need to incorporate uprated primary and secondary structures, which also has an associated cost premium for the completed building.

Both industry and academia have for some time recognised that the fabric first approach in the non-domestic sector has reached an optimum level and further changes in this sector need to focus on other means of achieving a reduction in carbon emissions.

Sophisticated lighting controls including lux monitoring, timers and motion sensors would play an important part in the reduction of carbon and the adoption of renewable energy measures would further enhance the savings. However, there are many non-domestic buildings which would not fully benefit from the introduction of these technologies and improved air permeability would offer a significant low cost CO2 saving.

Improving air permeability to achieve figures below that of the backstop figure of 10 m3/hr/m2 is dependent upon a number of factors. The overriding factors are quality design at the design stage and the on-site execution of the detail by skilled contractors who understand why the detail is so important and who can fabricate the detail to the exacting standards which are needed. This must also be linked with formal QA procedures to ensure that the site interpretation reflects the practical design process. Low air permeability figures can be a low cost option but they are not a no-cost option.

With the correct design assumptions and onsite practical skills and procedures air permeability figures approaching 1 m3/hr/m2 can be achieved. However, it must be recognised that not all non-industrial buildings can achieve air permeability figures as low as this and one of the overriding design factors is the size or footprint of the building. Large open plan buildings with a footprint of over 10,000 square metres are more likely to achieve low air permeability figures when compared with a 1,000 square metre footprint building whose air permeability figure is more likely to be approaching the 10 m3/hr/m2. Building with footprints within these two limits should generally be designed to air permeability figures suggested in the table below:

Floor Area m2	Air permeability m3/m2/hr
0 - 1000	10
1001 - 2500	8
2501 - 5000	7
5001 – 10000	5
10001 and over	3

As part of the Government's approach to reducing CO_2, buildings are designed to the National Calculation Method (NCM) using a simplified tool known as the Simplified Building Energy Model (SBEM). Within the SBEM software sits a building model which is known as the Notional Building (NB). The NB is formed from a set of figures which *offer* the architect, specifier, designer and services engineer a conceptual design which will meet Part L of the Building Regulations.

The conceptual design also includes figures for heating, lighting, hot water, operational use and many other factors. This conceptual design currently includes the design figures for the building envelope in the table below:

Element	Unit	2010 Notional Building
Roof	U value (W/m2.k)	0.18
Wall	U value (W/m2.k)	0.26
Floor	U value (W/m2.k)	0.22
Window	U value (W/m2.k)	1.8
Window	Light transmittance (%)	70
Air permeability	m3/m2/hr	5

It must be noted that the conceptual design in the NB is not a single solution for all building types or applications and the figures should be considered as one solution and not the only solution that will meet the Part L regulations. Designing the non-domestic building to other more appropriate design parameters will in many cases provide a more balanced, cost effective and sustainable solution.

Above: An example of air testing

System and component suppliers, together with the Consultants within the MCRMA, have a detailed working knowledge of Part L of the Building Regulations and can advise accordingly for individual projects. As the premier suppliers of metal roofing and cladding materials and services for the building envelope to the non-domestic sector, MCRMA members are recognised for their ability to speak with authority on building envelope design, have a full and unequalled knowledge of their business sector and offer complete reliability to their customers.

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