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Your reference
Our reference BRE112/6/2

Dear Mr Brown,

**COST EFFECTIVENESS OF DRAUGHT-PROOFING.**

Further to your FAX dated 16 August and your meeting with me at BRE on 11 September. I have determined the cost effectiveness of draught-proofing a hypothetical building which is much larger than Building 26 at BRE which was draught-proofed by Quattro Seal.

The office type building used in this analysis has a volume of 5,500 $m^3$, an envelope surface area of 2,000 $m^2$, insulation to the current Building Regulations standard and has an average airtightness value (i.e. leakage index) of 10 $m^3/h$ per $m^2$ of envelope area at a pressure differential of 25 Pa. This is the average leakage index of UK non-domestic buildings. The reduction in air leakage through the windows and doors following the installation of draught proofing is the same as Building 26 at BRE, i.e. 53% reduction at a pressure differential of 25 Pa.

We have estimated the savings that could be obtained to be 267 GJ (74,026 kWh) per annum which is 27% of the total space conditioning load of 984 GJ. If we take 1.123p per kWh as the mean cost of a unit of gas this amounts to a saving of £831. With the cost of draught proofing the building estimated to be of the order of £2,000 this would give a simple payback period of 2.4 years. If the same building was heated by electricity, at a cost of 5p per kWh, the savings would then be £3,700 with a payback period of 0.6 years.

If the thermostats inside the building were lowered by 1°C following the installation of the draught proofing there would be energy savings obtained from a reduction in the heat loss through the building fabric and ventilation heat losses. It has been estimated that this reduction in thermostat setting could produce up to 10% savings in energy use.

In reply to the final request in your FAX concerning additional benefits of draught-proofing. One such benefit is the additional sound insulation of draught-proofed windows. In a BRE

Information Paper IP 6/94 'The sound insulation provided by windows' there are results of measurements of sound reduction in fitting foam draught-proofing strip to a wooden framed window. A greater sound reduction index (averaging approximately 4dB) occured with the draught-proofed window with frequencies above 500 Hz. The paper also concludes that the sound insulation of windows is very dependent on the quality of sealing. This implies that it should be continuous around the opening light. Also, the paper states that for continued sound reduction the durability of the seal must be considered. Obviously when the integrity of the draught-proofing deteriorates with time its sound insulating properties will be reduced. Therefore, any type of draught-proofing material which has a long effective life will maintain its sound insulation capabilities.

There are likely to be additional benefits of draught-proofing buildings, e.g. reduction in cold draughts close to windows. This will effectively increase the working areas in the building by allowing desks to be positioned closer to windows without draughts causing discomfort to the occupants. Also, there will be a reduction in particulate matter entering the building. This will reduce the amount of cleaning necessary in the offices.

I hope the information contained in this letter is satisfactory. If you are planning to use any of the information contained either in the report TCR 105/96 'Pressure testing building 26, BRE, before and after draught-proofing' or in this letter can you please allow us to see it before publication.

Yours sincerely

Brian C. Webb

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