



RETROFITWORKS
BUILDING EFFICIENCY TOGETHER

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**Planning Advice and Information Service
London Borough of Camden
2nd Floor, 5 Pancras Square c/o Town Hall
Judd Street
London
WC1H 9JE**

7th May 2015

Dear Sir/Madam,

Planning Application: 73 Chester Road London, N19 5DH
External Wall Insulation Technical Clarification

I am writing in my capacity as Director of RetrofitWorks Limited but also drawing on my background as Managing Director of Parity Projects Limited, award winning specialists in the deep eco-renovation of existing buildings (www.parityprojects.com).

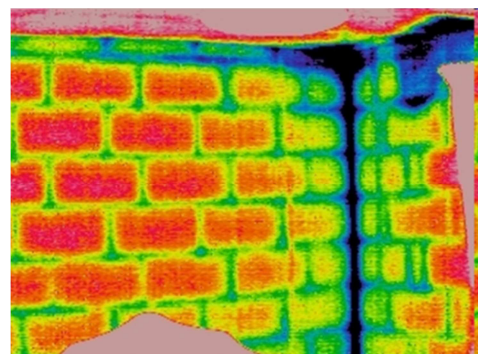
RetrofitWorks is assisting Ms Harrison in the administration needed towards grant assistance for External Wall Insulation (EWI) application to her homes' flank wall, but also in a technical capacity regarding the appropriateness of the installation.

Solid Wall Insulation (SWI) is in general the one measure in a pre-1919 property that can have the biggest impact on energy bills. This of course depends on the proportion of walled external surface area that a building has relative to roofs or floors, but this is a rule that holds true in 95% of cases in our experience.

SWI can be applied in two ways; internally (IWI) and externally (EWI). The Planning Application made for the above property is for EWI based on our advice as EWI has many technical advantages over and above IWI. Please see these categorised below:

- **A thermally efficient building envelope:** EWI will cover the outside of the building and all of its structural imperfections, nuances and joins. This helps to minimise any gaps in the insulation, called 'thermal bridging' which is inherent in IWI can cause two things:

1. **Additional heat loss:** whilst relatively small in isolation, a gap due to the presence of a structural member for instance will cause a heat loss adjacent to the insulation, and if added to all of the other gaps, denudes the overall performance of the insulation. As demonstrated in

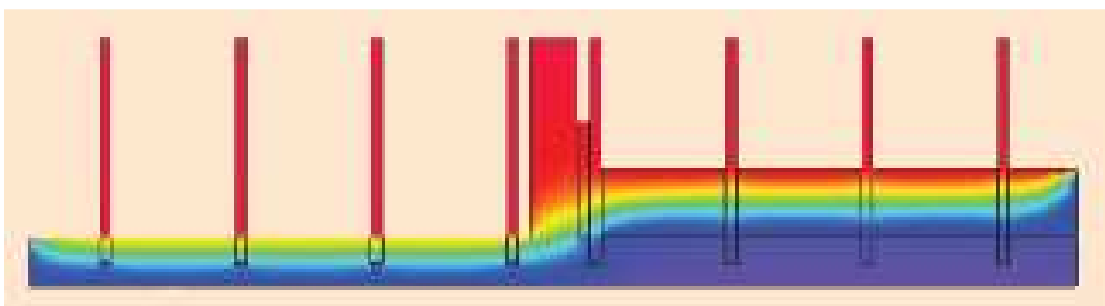


this thermal image opposite, even mortars carry a different heat capacity than the bricks or blocks that they hold together, so the phenomenon is not insignificant.

2. **Attraction of condensation:** more concerning than the heat loss is the presence of such cold spots and their ability to attract condensation. These are extremely common in buildings and continual attraction of condensation breeds mould and causes respiratory diseases. This phenomenon is extremely likely in instances of IWI but receded considerably through EWI. In the interests of balance, provided that IWI methods are combined with careful consideration of improved ventilation to remove excess water vapour, this can be controlled – but such ventilation is a further expense and can be turned off or blocked by the occupant or future occupants.
- **Controlling internal moisture:** Victorian buildings were originally designed to perform in equilibrium with their surroundings. Not all rooms were heated, washing was not dried in every room, they were well ventilated due to imperfections in the building structure and apertures. Over time, this has changed as we have made our buildings more airtight, all rooms are heated and the relative humidity of the internal conditions has risen. i.e. more water vapour is held in the air and this raises the prospect of condensation on any surface that falls to seven degrees centigrade or below.

This phenomenon is less well known in instances when thermal bridges or cold spots are 'buried'. If IWI were applied, the external wall would still be cold and as such if water vapour was allowed to pass through or around the insulation uncontrolled, so called 'interstitial condensation' is formed. It can linger and can cause long term structural problems as clay bricks deteriorate.

Then consider the presence of timber and other structural members in external walls. The thermograph below demonstrates the modelled temperatures of two external walls. They are both views of an external wall at the intermediate floor level, with, as usual, the floor joists are buried half in the wall. – the one on the left is uninsulated between the floor boards and the ceiling, the one on the right, insulated.



Please notice that the uninsulated instance slows the floor joists to remain at the same temperature as the wall thereby not attracting condensation in a greater fashion than the wall. On the right, the insulation allows the timber joists to become colder, further into the room. Given that the insulation will be

vapour permeable, and that the embedded joist locations have high potential for draughts, moisture will be drawn to cold timbers and condense. This is a serious condition and can be replicated in other instances of IWI.

- **Controlling water ingress:** EWI acts cleverly to prevent rain from passing through the render whilst allowing any moisture in the structure to leave. This will add many years to the serviceable life of the building.
- **Retaining thermal mass:** by in effect trapping the brickwork inside the insulation, we have created a very useful ability to control the temperature of the house, increasing comfort for the occupant and making it less necessary for the heating system to do 'work', using less energy. Moreover, this thermal mass keeps a building cooler in the summer as it absorbs heat during the day and lets it leave at night. It also prevents the walls from being heated from the outside. This in particular is massive advantage for Greater London as for the first time in 2014 our city used more energy in the Summer than it did in the Winter purely down to cooling loads on the grid.

Appearance: The colour of the proposed render can be selected from a range of around 1000 colours, so there is no technical limitation to matching the render to a colour that suits both Ms Harrison and any Planning requirements. It is currently not technically possible to reproduce the external appearance of the Victorian brickwork on top of the insulation.

There are some instances where IWI is the only option. In the instance of 73 Chester Road, it there is a choice. If we are considering the long term strategic interests of the building stock and the health of current and future occupants, where EWI is possible, it would be technically more responsible to allow it.

Yours faithfully,

Russell Smith
Director of RetrofitWorks Ltd

