Report of Draught-Proofing Survey conducted at the Countess of Huntingdon's Chapel (Building of Bath Collection), Wednesday 5th February 2014.

Bill Martin, Jon McChesney and Jan Watterson (of Transition Bath Energy Group and the Centre for Sustainable Energy) attended and inspected the areas suggested by Jill Hunter, taking some thermal imaging photographs.

Thermal imaging photographs are an excellent visual aid used to demonstrate how and where buildings lose heat. The camera is able to discern differing temperatures within any given section of a building, and taking images with the camera enables the user to identify where potential energy efficiency improvements can be made.

The camera uses colours to differentiate between the different temperatures present – the orange/yellow colours indicate 'warmth', and the purple/black sections indicate 'cold'. Generally speaking, any 'cold' sections on the images show where heat is being lost to the outside. The scale to the right of each image indicates the extent of the temperature difference, and the level of heat loss that the building is suffering.

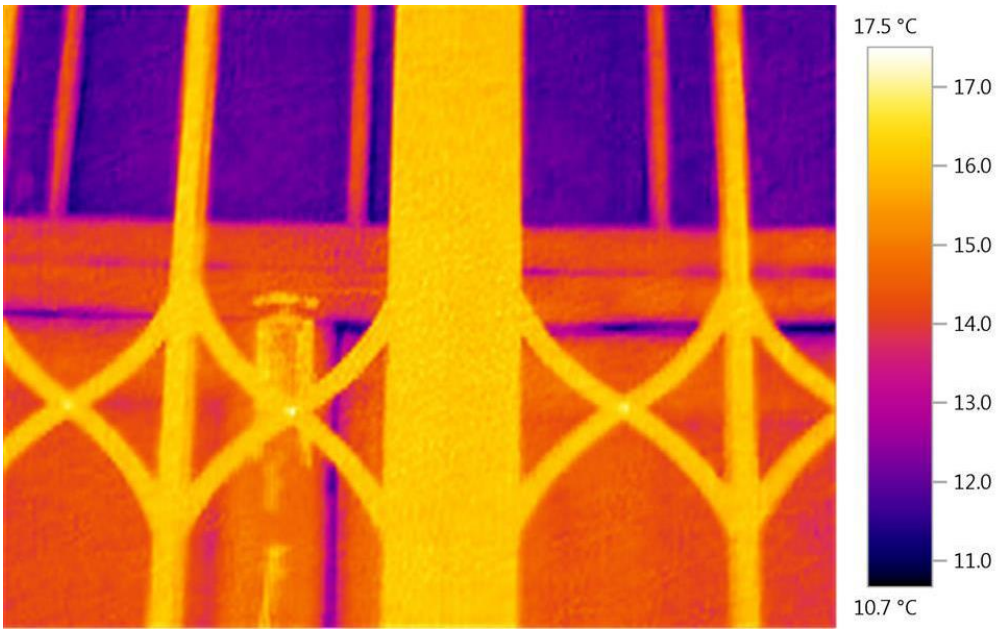
Introduction

Much as Jill had indicated to us, the biggest problem area is around the external doors. This was confirmed through the use of the thermal imaging camera. Draught was also observed around some internal doors but our initial proposal will centre on addressing shortcomings in external openings, which should have a 'knock-on' effect throughout the building. The camera was also used to check loft hatches and windows. There were two windows identified as needing some draught proofing (shown below).

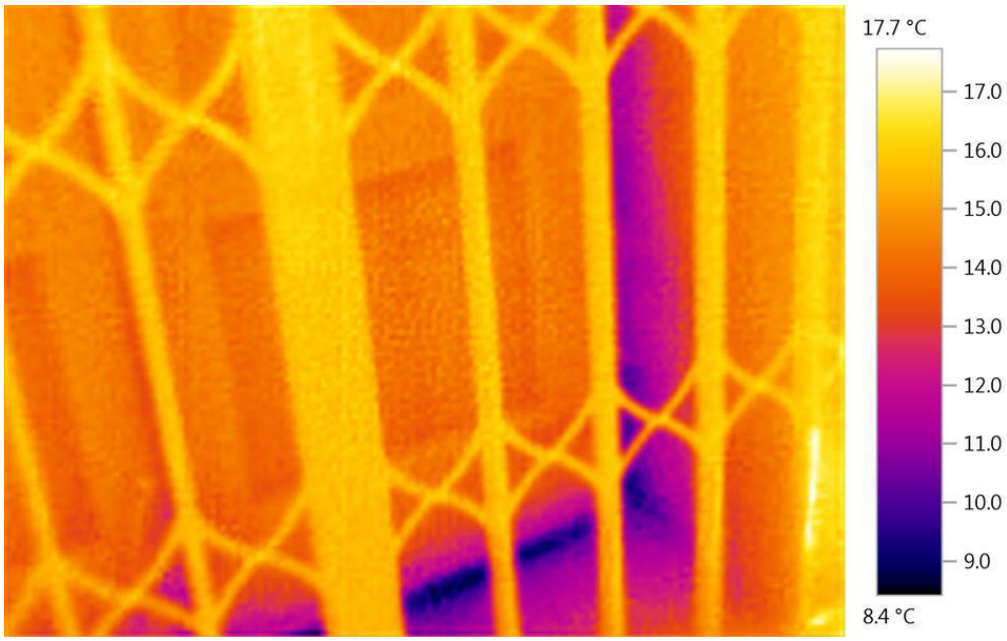
The external temperature on the day was 7 degrees Celcius.

Some detail of the survey findings

1.External door, Chapel south side.

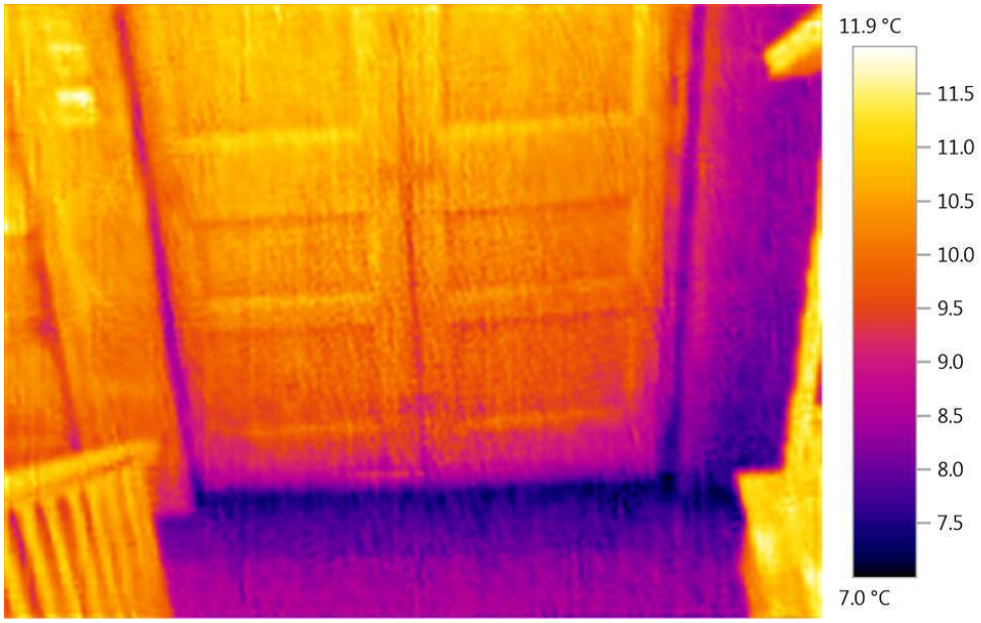


Showing the heat loss from the windows above the door and the draught around the edges of the door.



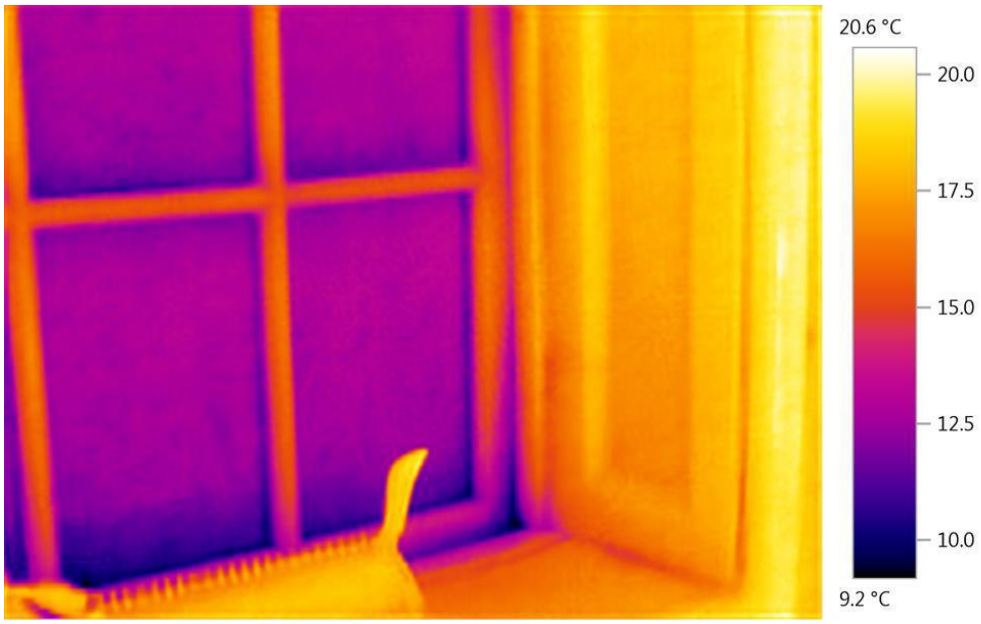
This (RHS at base of door) shows the ingress of cold air.

2. Double door in passage between chapel and reception.



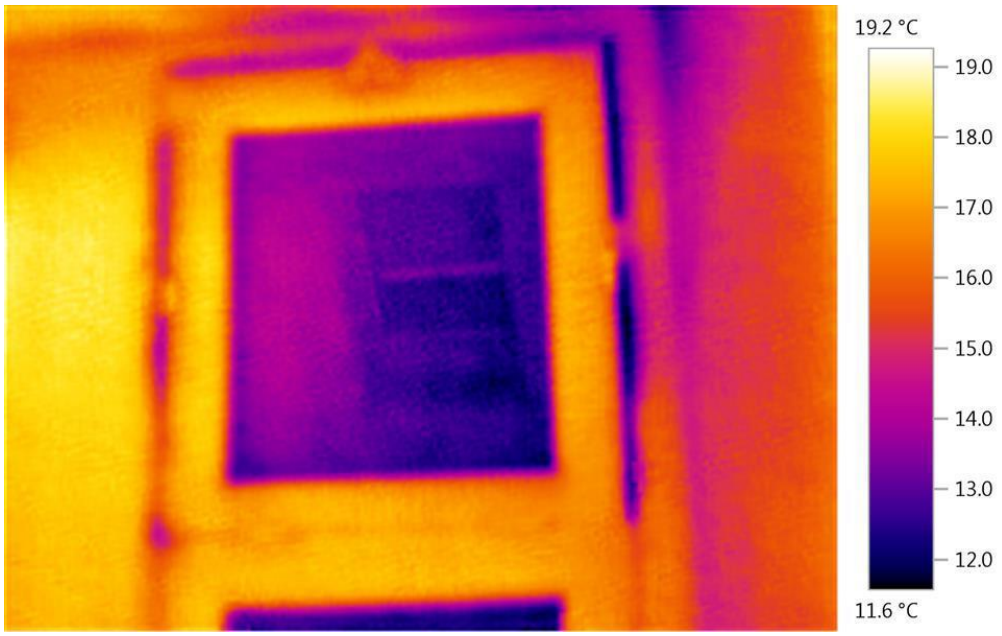
Considerable ingress of cold air is seen at the base of the door and around the sides.

3. Sash window outside CMG Architect's office



The above sash window shows draught at base, right. Draught was also evident elsewhere around this window.

4. Schoolhouse window showing draught at right.



The photos above clearly show a number of areas where the building is effectively 'leaking'. The effect of this is twofold – firstly this will have a large impact on the heating requirements of the Museum, as warm heated air will rush out of the gaps to the cold of the outside. This air will need to be replaced, so the boiler will have to work longer, harder, and more inefficiently, therefore resulting in higher fuel costs.

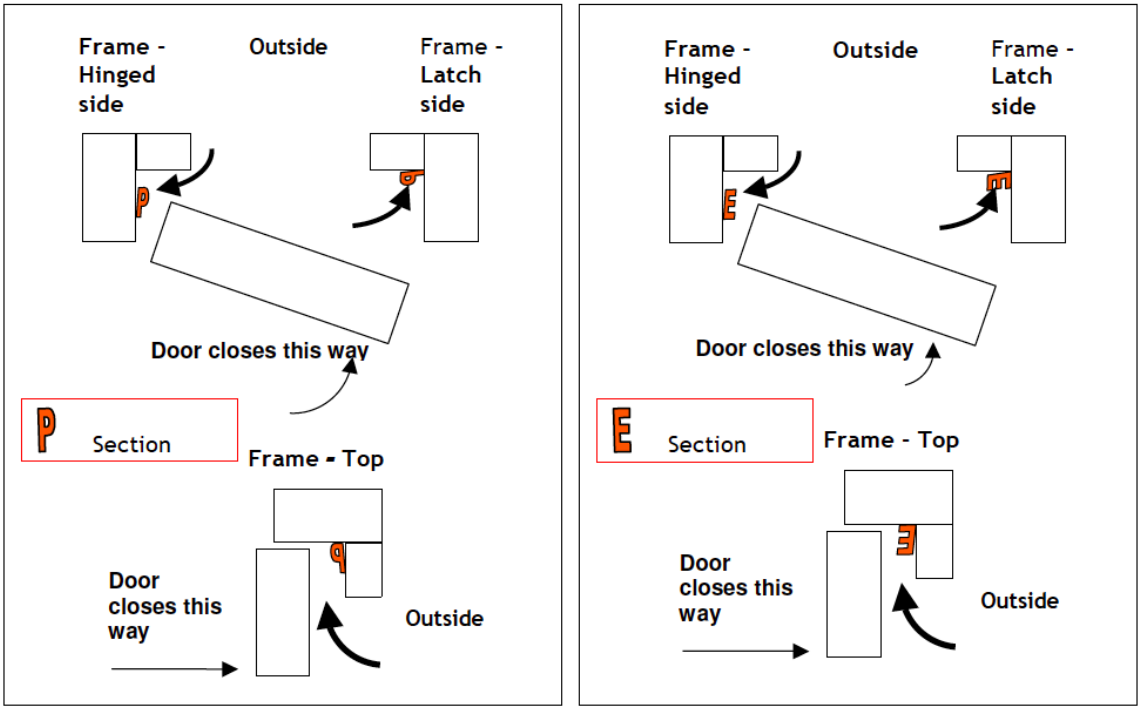
Secondly, the comfort of the occupants within the building is being significantly affected. The gaps within the building fabric enable cold air from the outside to enter, resulting in uncomfortable draughts for the occupants as the cold air interacts with the existing warm air. This can cause occupants to feel cold, unhappy, and potentially even result in health problems further down the line.

Thankfully, these problems can be easily remedied!

Proposals

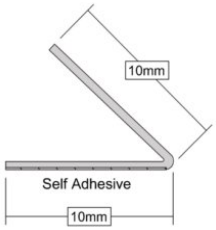
We are conscious of the Listed Building status of the Countess of Huntingdon's Chapel and our proposals are made keeping this closely in mind.

We believe some significant improvements can be achieved with these external doors by the careful application of a combination of self-adhesive "P" & "E" section EPDM rubber draught excluder around the frames (see diagrams below). E section is for gaps 1.5-3mm and P section for 3-5mm. Fitting of brush strip draught excluder to the internal base of the doors should minimise draught from below.



It would be interesting to know if any of these external doors are either generally redundant or seldom used as the measures employed could differ from 'in use' doors. In these cases, the draught proofing could be supplemented by discreet masking tape around frames and at closing stiles and neat, removable packing (Celotex or Kingspan) under the door bottom rails.

In addition, some draught proofing will be possible with the sash windows we observed in our survey. This would be done by fixing self-adhesive V strip (see below) in the gaps, as demonstrated at the museum recently. The opening deficiency we observed in one window would have to be remedied professionally.



The self-adhesive materials are easily removable at a later date and are fitted discreetly – not visible when doors are closed and minimally so when the doors are open. Similar treatment at the closing stiles of double doors is also recommended.

Brush stripping is normally fitted by screwing it to the door surface.

It was observed that some masonry adjacent to the doorframes had deteriorated, leaving large gaps (for which our draught-proofing would not really be suitable). These areas would benefit from professional repair.

Conclusion

We have the materials and skills to carry out the draught-proofing works as described above at no cost to the Trust and would be happy to set about this at a time to suit our mutual convenience. This may be best during your 'closed hours'.

If you engage with us and are satisfied with our efforts, we would like to continue our association with you, advising upon and, where possible, participating in energy saving initiatives. It would also be useful to take further thermal images of the treated areas to show 'before and after'.