LowCarb4Real; Workshop collection: Airtightness - Design & Construction 1

19 June 2008 - Topic C - Airtightness; design & construction

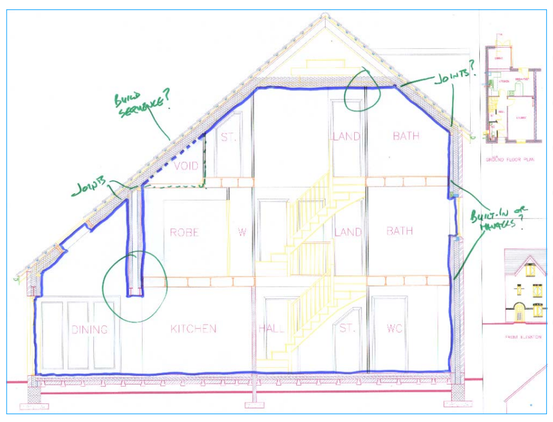
This session used a short presentation and video clip of a dwelling pressurisation test and leakage detection to lead into the main question: *Why does it appear to be so difficult to design and construct an airtight dwelling?*

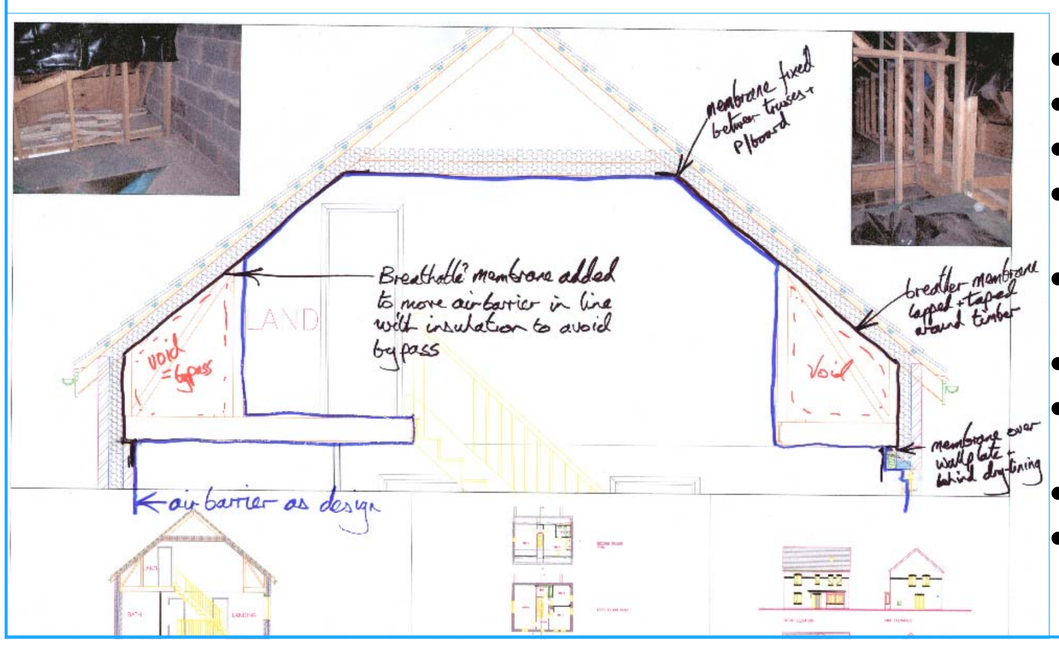
- In session 1 participants used a range of sample products and design details to look at some of the technical difficulties of designing and constructing an airtight dwelling whilst still ensuring adequate ventilation.
- In session 2 the discussion moved to the wider implications of issues arising from session 1; including policy, inspection, communication and process issues.

Breakout Session 1- Technical Issues

Task - pen-on-section test:

Workshop participants were provided with section drawings of actual dwellings and asked to conduct a pen-on-section test - drawing a line around the dwelling at the primary air barrier to illustrated its continuity, and then discuss the issues that arose.





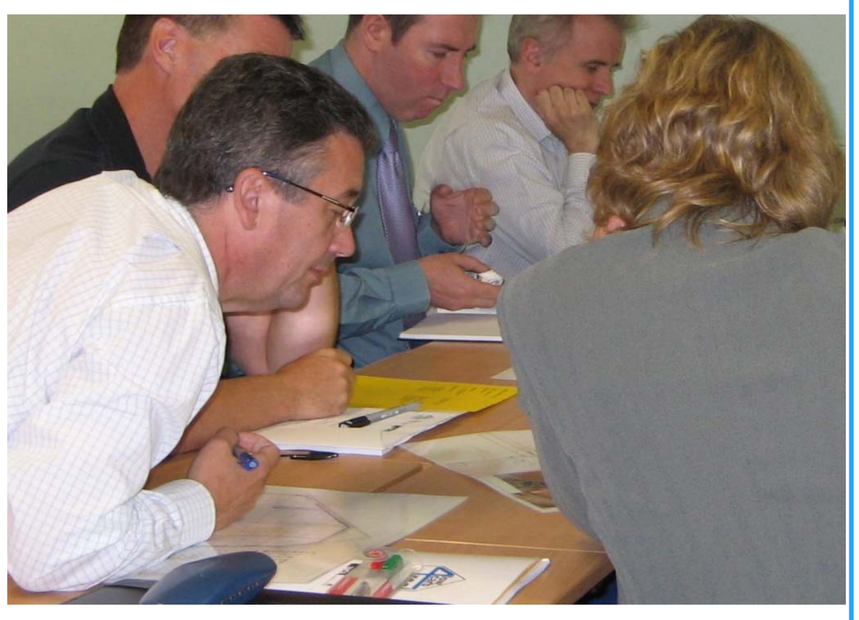
Issues arising relating to the airtightness task:

- Air barriers are seldom marked on drawings
- Design complexity rarely considers airtightness
- Build sequence can inhibit air barrier continuity
- Designers are not fully knowledgeable regarding standard site practices
- Value engineering often has an impact on designed performance
- Lack of detail design available on site – particularly for subcontractors
- Questions of culpability and responsibility - both on site and in the design process
- Role of accredited construction details
- Communication between manufacturers, specifiers and tradesmen
- Cost of design alterations is often hugely underestimated
- Airtightness and ventilation is often an “after-thought” in the design process
- Some trades seem oblivious to many design characteristics not related to their own field
- It is hard to check areas which are hidden from view
- If the site operatives don’t have all the necessary details, why are they expected to build it correctly?
- How can 2D designs be translated to 3D structures more easily?
- Higher-spec products are readily available but rarely used due to the envisaged extra cost

Additional Topics Discussed

Following on from the pen-on-section task, a number of discussion topics not directly related to airtightness ensued:

- What is “deemed to satisfy”, and who offers guidance to, takes responsibility over and polices the entire construction process rather than just individual sections?
- Product manufacturers research and development is often dismissed as sales and marketing and under utilised. Training of specifiers and operatives could be undertaken better through manufacturers, to ensure that their products get specified correctly and used correctly to gain maximum benefit.
- If extra policing is required who is qualified to perform it, and who will pay for it?
- All adaptations to standard house designs need assessment which is not always considered in terms of time and cost, and often not considered until the design goes into production - by which time the original designer is often no longer included in the chain
- How much can be learnt regarding process issues from looking at how other industries cope with stratified production processes?
- The possibility of manufacturers integrating their designs to come up with effective system designs; rather than leaving it to architects and other agents to combine individual details into a “patchwork-quilt” of a house design.
- The “quality” of workmanship and the trades’ skill levels appear to have decreased significantly over the last 30 years



Airtightness Breakout Session 1 - Summary

- There is a general lack of understanding throughout all sectors of the industry regarding airtightness and ventilation.
- There are severe breaks in communication, especially between designers/specifiers and site staff. Many problems could be averted by better and quicker information transfer and feedback.
- Pattern book approach has changed the mass-housing design mindset from one of first principles to one of “detail-shopping”.
- No one is an expert in every field, but there is often a general reluctance within the industry for people to seek professional advice and instead adopt a “that should do” approach.

UrbanBuzz Project - Developing Low Carbon Housing: Lessons from the Field - LowCarb4Real

Lead Organisations: Leeds Metropolitan University & University College London Project Partners: Good Homes Alliance, National Trust, Taylor Wimpey, Redrow, University of Leeds
Contacts: Malcolm Bell, Leeds Metropolitan University (m.bell@leedsmet.ac.uk), Prof. Bob Lowe, UCL (robert.lowe@ucl.ac.uk), Jon Bootland, GHA (info@goodhomes.org.uk)