

AECB Conference 2014 - Bristol

This year marks the 25th birthday of the AECB and once again a merry band of professionals, self builders and other members gathered for its conference. The event was held at the University of Bristol on the 11th and 12th July 2014. Once again the AECB conference team worked their magic to create the foundations for a hugely successful event. As always the evening meal (and drinks) provided a great chance for a social where members could blow off steam, pontificate and catch up with one another. Mark Siddall reports...

This year's sell out AECB Annual Conference and AGM was held in the University of Bristol's Wills Hall Campus. While the campus had no particular environmental features it was a wonderful venue with something of a Hogwarts' vibe.

The main themes for this year's event were retrofit (including the launch of the AECB's CarbonLite Retrofit programme) and timber. This mix seemed to work well and we may look at a similar format next year.

As well as the usual range of activities we also managed to squeeze in a coach trip out to the wonderful Ashley Vale self-build scheme. Those that went on the trip were treated to a very warm welcome and a chance to meet some of the group and poke around in their homes. Their generosity and honesty was wonderful and we thank them.

'The big picture'

To kick the event off, AECB's Vice Chair, Fran Bradshaw*, gave an introduction and set the scene for the occasion. The major topics that provided focus for the two days were 'the big picture', retrofit, timber frame construction, self-build and the panel debate. I have used these themes to structure this review.

'The big picture' was set in two parts. It began with the keen cyclist, renowned architect, Mayor of Bristol and long-standing AECB member, George Ferguson, explaining that Bristol has been voted European Green Capital 2014. Bristol is the first ever UK city to be named European Green Capital. Ferguson emphasised that it pays to think creatively about how a city can be transformed into a flourishing champion of sustainable living. Local politics does not have to conform to standard methods. In fact he said that a step change is required in order make cities cleaner and healthier. Alliances with Sustrans and the Soil Association are being used to help transform the city further, as is a proposed district energy scheme which, it was suggested, should

power 50% of Bristol by 2020.

Aubrey Meyer from the Global Commons Institute led us through a sobering systems' engineering model that examined interfaces and feedback loops between the economy, climate change and pollution growth. We learned that at the level of European and international policy the issue of integration was being poorly addressed – if not completely and deliberately avoided. Making an analogy to music Meyer explained that, just as an orchestra needs to be play in tune and in tempo, measures to address climate change need to be proportionate and timely. You can't

Below: Fran Bradshaw, AECB's Vice Chair; renowned Bristol architect and Bristol Mayor George Ferguson; and Aubrey Meyer (top, right), from the Global Commons Institute, headed up the opening session of the conference, outlining 'the big picture'.





finish late, the whole orchestra is condemned. "We have to do enough soon enough - otherwise we risk crashing the economy", she said.

Once the plenary introductions were over, the attendees then broke off into smaller groups and attended the sessions of their choice which are all listed below.

- How to do really good buildings in wood - Jon Broome
- Large and small retrofits using timber - Bill Butcher and Mark Elton
- Heating low energy buildings - Alan Clarke
- Building biology: a new UK Network - Tomas Gartner and David Gale
- Briefing for designers; the floods - Cath Hassell
- Architype's 30 years of radical timber construction - Jonathan Hines
- The latest UN climate change report and global justice - Aubrey Mayer
- Launch of the AECB's new CarbonLite Retrofit programme - Andy Simmonds
- Monitoring moisture in historic building - a retrofit to the

AECB's Silver standard - Harry Paticas

- Planting trees to make more buildings - Bernard Plantrose
- Does natural ventilation work? - Kate de Selincourt
- Exemplar retrofits - what role can 'open homes' events play? - Kate Watson
- 2 new and different Passivhaus timber frame buildings Parts 1 and 2) - Mike Whitfield and Fran Bradshaw
- Site visit to the Ashley Vale self-build project in Bristol

Below I'll outline my experiences of those presentations that I attended personally. There are summaries of most of the presentations now available on the AECB website: www.aecb.net/featured/aecb-conference-2014

Retrofit

Andy Simmonds began his discussion about the new AECB Retrofit Standards by driving home why retrofit is such an important measure when seeking to address climate change. It was clear that there is no easy path towards decarbonisation and that frank discussion about all technologies and solutions is warranted. The 'Less is More' report explores the AECB's stance on these options (to access your free online copy visit: www.aecb.net/publications/less-is-more-energy-security-after-oil).

Drawing upon 'Less is More' Andy suggested there is little need for expensive R&D, the technology we need already exists at an affordable cost, all that we need to do is to deploy it effectively. The solar thermal farms in Denmark were given as one example. Denmark is on a similar latitude to the UK, in fact the Danish island of Marstal is at 55 degrees north the same as Newcastle. It is there that they are capable of pumping decarbonised energy to homes for as little as 3.5p/kWh; the same as natural gas.

Over the last year or so Andy and his team have been working to develop the AECB's very own retrofit training course as part of the new CarbonLite Retrofit programme. It



A record turnout for the 2014 AECB conference at Bristol University.

is almost complete and the pilot phase is due to commence shortly. Once rolled out the course will be run online and will allow AECB members to gain a deeper appreciation of the practical considerations that will impact upon the retrofit of homes. It will also offer a qualification so that members can self-certify their own retrofit projects. Importantly, to help prevent abuse, it will be people, not companies, that will carry the qualification.

Andy also mentioned that the Low Energy Buildings Database (www.lowenergybuildings.org.uk) now features over 200 projects and that the powerful search features allow searches for critical data about building performance.

Harry Paticas, from Arboreal Architecture, presented his experience with retrofitting a 170 year old, 4 storey, end of terrace home. Prior to intervention the house had received a render finish to one elevation. Wall thicknesses varied from floor to floor. Initially the aspirations were to retrofit the home to the Passivhaus standard for retrofit; known as EnerPHit. However, discussions with the conservation officer determined that external insulation would not be permitted, so this meant that EnerPHit could not be easily achieved.

As the desire to maintain Passivhaus standards of quality assurance remained the AECB's Silver standard was adopted. This standard requires that the specific heat demand is below 40kWh/m².yr and that the primary energy demand is below 120kWh/m².yr.

In total nine different types of insulation were installed around the home after consideration of factors including orientation, thermal performance, presence of historic timber and plasterwork, vapour permeability, cost and buildability. There were also 14 different thermal bridging calculations that were undertaken. Where cornices remained, the gypsum-faced lime plaster was removed and a customized depth of aerogel backed magnesium silicate boards were applied over the original profile of the wall between the floor level and the cornice.

The existing home suffered from the ingress of moisture. An extensive amount of effort was undertaken in order to address these challenges. One notable example was where cementitious render had been applied to the gable. Over time it has split away from the existing wall to form a 3mm wide gap at the top. This small opening directed rainwater in towards the home, soaked the masonry and caused damage to internal finishes. During the course of the retrofit this was remediated. The ends of existing timber joists that were within external walls were treated with boron wood preservatives. There is now a monitoring process that is taking place using the HygroTrac moisture monitoring equipment from the AECB.

The air barrier was formed using lime plaster and taped joints. The measured airtightness of the home fell from



9.6ac/h@50pa down to 1.8ac/h@50pa, and careful attention to the design of the thermal performance, meant that the Silver standard was achieved.

As we move towards retrofitting existing homes, greater and greater attention will need to be paid towards understanding how we tackle moisture related risks. Valentina Marincioni from UCL presented her research into moisture in buildings. One of the primary takeaways was the hierarchy of moisture risks:

- Water ingress
- Air movement
- Diffusion

Time and time again in the UK we find that attention is given to water ingress and diffusion but rarely do designers (and builders) appreciate the impact that air movement can have upon building performance. Convective loops that lead behind insulation, on to the cold side, can be responsible for considerable moisture damage and mould growth.

Self-build (site visit)

Making the decision about which event to attend during the afternoon wasn't easy. I could hear Jono Hines from Architype give a history of experience with self-build and timber frame construction; or I could visit the Ashley Vale self-build project in Bristol. In the end I plumped for the site visit.

Before embarking on the tour, we were given a presentation about the scheme. We learned that the Ashley Vale Action Group (AVAG) was the vehicle that was used to advance the project's development. The group came together in 1999



Above and right: one of the breakout groups visited a unique inner-city eco self-build project by the Ashley Vale Action Group. (Green Building magazine first featured this project in 2005 (Vol 15, No 1, Summer 2005).

to buy the land and block a developer from building on the site. After some too-ing and fro-ing masterplan was finally conceived late in 2001. It consists of 20 self-build plots and 6 sheltered housing units. A culvert that ran through the site influenced the site layout, as did the retention of a large concrete slab.

Upon purchase, to avoid capital gains tax, there was an instantaneous transfer of land ownership to self-builders. Plots were bought as self-build plots with the intention that they should be completed within 2 years of gaining planning permission. The planning application itself was coordinated by the AVAG. Negotiations with the local planning authority allowed the AVAG a reasonable degree of latitude with the design. As a consequence they elected not to employ an architect throughout the entire project. They were used simply to coordinate the planning application and to do minor amendments as and when they arose. Key elements of the project include:

- 20 self-build plots
- 6 self-finish bungalows
- 6 self-finish flats
- Three work units
- A community room
- A communal garden
- A home zone
- Communal recycling

In terms of personal contributions to constructing the



homes, there was no requirement for a number of dedicated hours per week. To keep costs as low as possible many people lived in caravans on site while they were building their homes. This worked well in the long term as it also helped to forge the community.

The majority of homes have been constructed from timber frame. In some cases they are prefabricated timber kit, in others they are home made. To help reduce the impact of thermal bridging homes generally had a layer of insulation over the studs (sometimes on the inside face, other times on the outside face). The main lessons learned included:

- Sharing caravans which helped to forge a sense of community
- Meeting and getting to know each other for two years before the build also helped to build community spirit and allowed for better planning
- If the project was to be repeated then a re-selling clause should be included. This is to reduce the risk of plots being exploited by commercially savvy small builders
- The deposit required to buy a plot was 5-10% of the value of the plot. More recently, to assist other self builder projects to get underway, the community has set up Eco Motive¹

Timber frame construction

Part 1

Fran Bradshaw presented the design and construction of her own hybrid straw bale/timber frame home. Fran explained that the origins of the home began at Lordship Park where Anne Thorne Architects had built their first straw bale building.

When it came to designing the home the decision was made not to use the straw bales as a load bearing structure. Instead they were to be used as insulation. The structural timber frame is formed from UK grown Douglas fir. The bales are decoupled from the concrete floor and are sat on a layer of Foamglass insulation. Compak foam was used to support the door thresholds. Windows were manufactured by Optiwin.

From the perspective of heat loss, the surface area to volume ratio, by Fran's own admission, is not ideal due to the incorporation of a pitched, warm roof. However, this does create a large internal volume inside which really adds to the drama of the home.

The roof of the house is covered with Norfolk thatch. Airtightness was maintained by using a vapour permeable magnesium silicate board with taped joints. The air barrier of the straw bales has been formed externally using clay render. As external air barriers introduce building performance risks Fran is monitoring of the moisture content within the bales in order to assess long term performance. The air leakage of the home is a respectable 1ac/hr@50pa.

Part 2

The skill, care and workmanship of builder, Mike Whitfield, is such that I've heard some people say that they'd like to clone him. It was with this in mind it was a delight to hear Mike present his experiences about building a timber frame home that satisfies the Passivhaus Standard.

Having completed one of two Passivhaus projects already it was about 4 years ago Mike decided that his building company would specialise in Passivhaus. At the time he wasn't sure how consistent his workload was



Another view from the Ashley Vale site visit.

going to be so he bought a plot of land with the intention of building a Passivhaus home. In the end he found that he was so busy the plot sat vacant for much longer than intended. It had planning permission for a home, but Mike set about redesigning it in order to embed Passivhaus in a cost effective manner. In effect the design developed from his experience at the Wahroonga Passivhaus project in Ledbury; only he wanted this one to be smaller and simplified.

The floor was formed using an insulated raft design. The thoughtfulness and simplification of the construction sequence led to an elegant and efficient use of shuttering. The shell was then erected and then, once the air barrier was in place, the internal walls were set in place. The balloon framed Larson truss was insulated with cellulose fibre insulation. Mesh is placed along the joists so that the sprayed-in-place insulation can be installed at the appropriate pressure and with the required density. Smaller joints between the studs were pre-insulated. An additional 40mm of wood fibre insulation was boarded over the Larsson truss in order to minimise thermal bridging. Tongue and groove joints were sealed using a product called Buttyrub. The airtightness result was 0.24ac/hr@50pa.

When Mike discussed the construction of intermediate floors he explained that he had used posi-joists in the past, however, when coordinating their installation with ductwork for MVHR systems they can be particularly problematic. The reasons for this arise from two factors. Firstly, there is

the need to align all of the prefabricated holes. Secondly, due to the way the joists are fabricated, when there are changes in span – which there invariably are - it becomes almost impossible to align the holes. For this reason he prefers to use engineered timber 'I' beams. The simple, elegant lighting was designed by Colin Chetwood.

Conclusion

At the AGM we saw stalwarts Neill Lewis (the AECB's longest serving Committee member then Trustee) and Nick Grant both step down. This leaves some rather large shoes to be filled. In their place, as the only volunteers coming forward, Phil Newbold and I were elected to the board. I hope that we manage to honour their years of hard work and dedication to the AECB - I'm sure that we'll do our best.

It is clear that climate change is not something that we can stop, at least not in the short term. It is something that we will have to accommodate and adapt for. Challenging times lie ahead. In this context it strikes me that the AECB stands resolute, earnest and forward looking; its power comes from the willingness of its members to challenge themselves and each other. The more that we share our experiences, and the lessons that we learn from them, then the stronger the AECB becomes. It is with this in mind that I already find myself looking forward to the next year's conference.

Mark Siddall, with contributions from other AECB members.

Photo credits: Neill Lewis, Mark Siddall and Clare Nash:
[HTTP://CLARENASHARCHITECTURE.CO.UK/AECB-CONFERENCE/](http://clarenasharchitecture.co.uk/AECB-CONFERENCE/)

* Sadly AECB Chair, Peter Wilkinson, was unwell and unable to attend, so Fran Bradshaw and Chris Herring stepped in at the last moment.

Copies of the presentations are on the AECB web site. So if you were at the conference but missed a workshop you can pick it up and if you were not there you can see what you missed and write a note to yourself to book early for next year:

WWW.AECB.NET/FEATURED/AECB-CONFERENCE-2014

The AECB would like to thank all those who gave their time preparing and fronting workshops, panel discussions and presentations. We owe so much to these presenters who give their time freely to share their knowledge and experience, it is the quality of the information given that makes the conference so successful and genuinely informative. Also we would like to take this opportunity to thank everyone involved in the planning, organisation, hosting and running of this very successful event.

Refs:

1. Ecomotive is a social enterprise working to create more sustainable and affordable homes and communities by supporting and enabling self build and custom build group projects:

WWW.ECOMOTIVE.ORG

Mark is an AECB Trustee. He is also Northern England's leading Passivhaus architect. His practice, LEAP, offers architectural services and energy consultancy. Author of over 30 articles and papers on building performance, the practice provides educational tools, information and 'how to guides' for people building and renovating in the North of England. For free downloads of the papers visit WWW.LEAP4.IT or email MARK@LEAP4.IT



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