Eco-redevelopment for city-centre church: CB2

Property overview

Property age: 1891
Type: City-centre Church and Halls
Wall type: Solid walls (800mm)
Floor area: Church 422m², Halls 483m²
Project Timescale: 2019-2021
Cost of Build: £3,418,657
Members: Approx. 180
Blog: downingplaceurc.org/redevelopment-blog/

Meet your host: Margaret

The congregations of St Columba's URC and Emmanuel URC merged recently and as a result the Emmanuel URC building was sold. This gave us a rare opportunity to consider the future of the building and create a vibrant, inclusive and reflective space with people at its heart. We went down the route of an eco-retrofit after a chance remark by the church minister to the building committee advocating sustainability when preparing to interview architects. This was taken extremely seriously by me!

I have been an architect since 1983, specialising in low carbon since 1999 and, most recently, have been a Retrofit Coordinator since training in Autumn 2020. I have been a climate change activist for years (actually since age 17), and I had also been involved peripherally with the very successful redevelopment in 1991 of one of our two churches. So I was keen to offer my experience to shape this huge project, and to see what scope there might be for low-carbon design.

Financing, Design and Construction

Financing for this project was critical and we considered the work to be a significant investment with the aim of repurposing and future-proofing the entire building complex until 2050. We tried to find dual benefits for all the eco-measures – e.g., secondary glazing is also good sound-proofing. We were incredibly pleased that both the church and the denomination (United Reformed Church) agreed to back the idea of making the church a flagship renovation which enabled us to use more than half of the Emmanuel URC sale funds (£5m).

Originally, we hoped to build a new middle part of the site which would link the hall to the church, but this was prohibitively expensive, and an adaptive eco-retrofit proved to be better value. The strategy of the retrofit was completely based on inserting the maximum low-carbon measures into a standard renovation. None of the professionals were particularly familiar with low-carbon issues or techniques or selected on that basis. At the design stage I was essentially the only one specialising in low-carbon retrofit techniques. Once church members approved the design, Archangel took on a certified PassivHaus designer.

This was a huge team effort by the church committees, who spent nearly three years planning the renovation before starting the work on site in Sep 2019. We installed eco measures in both the church and halls, insulating where we could. In the smaller rooms we installed Mechanical Ventilation with Heat Recovery (MVHR) and max efficiency condensing boilers for the halls and church. The rooflights were triple glazed with external solar screens and we added secondary glazing on all stained-glass windows. 5kW of solar PV was installed on the roofs and there is LED lighting throughout.

Performance

It is early days yet and we are working through some teething issues getting used to using new technologies. Apart from this the retrofit has been brilliant and the congregation and general public are pleased with what has been achieved. As a result of this project, 'sustainability' has now been welcomed by the congregation - the contractor is now also interested in further eco-retrofit training. We are seeing changes to lifestyles and greater eco-awareness of the whole congregation and wider public as a result of the work.

Photo: DPURC website

We have completely transformed the church site to be used by both the congregation and the wider community. This includes a 'community hub' supporting vulnerable groups, 'Open Table' services for LGBT+ people and their allies and we now have larger more private spaces where an NHS Group Therapy Centre and help groups can run.

If we were to have done anything differently, we would have insisted on a feasibility study for heat pumps. With hindsight we would have got a quote for more solar PV, but we did not know then that the project would come out on budget.

Future plans

The church has now voted unanimously to become an Eco Church and we will be working towards Silver. In terms of the retrofit: we have allowed inverter wiring and a space for a battery which may be needed for the solar panels in the future; we could put more solar PVs on the main church roof with planning permission; and we are continuing to investigate whether to install a heat pump.

Information and Advice

It is likely that rebuilding existing premises is likely to be better value and have lower embodied energy than demolition and building new. I would also encourage others to publicise your eco-retrofit to have the maximum effect on the community.

Key contacts and products

Energy Advisor: Margaret Reynolds RIBA
Architects: ArchAngel
Quantity Surveyor: Bremner Partnership
Structural Engineers/Construction & Design Management/ Party Wall Surveyor: Andrew Firebrace Partnership
Joiners: Howdens Joinery, Coulson Building Group Joinery
Rooflights with solar shading: Velux

Key specifications

Insulation & Glazing

Church

- Ceiling insulation – 300mm blown Warmcel.
- Secondary glazing on stained-glass windows.

Halls

- Roof insulation.
- Internal wall insulation.
- rooflights triple glazed with external solar screens (72% heat reduction).
- Windows mostly double glazing.

Heating and Energy

- LED lighting throughout.
- Condensing boilers.
- Natural ventilation.
- MVHR to smaller rooms.
- 5kW solar PV, wiring and space for battery.

Water

- Rainwater harvesting for garden.

Sustainable/low-embodied carbon materials

- Lime plaster (church).
- Reused timbers in roofs.
- Reused wood parquet floor where possible.
- Warmcel insulation – recycled newspapers.

Garden and natural systems

- Bird table & baths.
- Compost bin.

Lifestyle changes

- Church now a registered Eco Church.