

Sustainability in Practice

Passivhaus leaves home Public buildings in the UK are now winning the rigorous German standard, writes *Hattie Hartman*



Multi-use hub space in Oak Meadow Primary School, Wolverhampton by Architype

Two new primary schools in Wolverhampton by Architype and Bere Architects' Mayville Community Centre in London are among the first certified non-domestic Passivhaus projects to complete in the UK, indicating the growing traction of the radical German standard.

The schools were submitted to planning after just five months and delivered on budgets of approximately £2,000/m². The compressed design programme is apparent in some design details, but these are compensated by the quality of daylight and generosity of space achieved by the careful positioning of clerestories and the creation of cheerful hub teaching areas.

Architype has now adopted Passivhaus as its 'default' approach for all projects. Work in the pipeline includes another school in Wolverhampton, a number of one-off houses, housing schemes, an archive centre and other schools – all Passivhaus.

In the heart of the Mayville Estate in north London, Bere Architects has cloaked a graffiti-laden brick Victorian building in 300mm of external insulation and white render to achieve Passivhaus standard. Thoughtful detailing succeeds in making elements such as existing window openings and different existing mezzanine balustrades form part of a coherent whole, while glazed partitions which bring borrowed light into the main hall are a surprising intervention, and seem a risky proposition for a hard-wearing community facility.

Bere Architects will occupy the basement premises, and is currently funding a weekly yoga class in the main hall to offset against future rent. Alongside a number of residential projects, the practice is currently working with two housing associations to explore procurement routes for Passivhaus products.

ARCHITYPE

Community centre Bere Architects' retrofit stretched its tiny budget, winning funding for being the first non-domestic London Passivhaus

Originally a generating station for London's tram network when built in the 1890s, the almost derelict building was converted into a community centre for the Mayville Estate which surrounds it in the 1970s. Bere Architects reconfigured the space by excavating the south side to provide light (and solar gain) to the basement, and added a single-storey entrance pavilion which houses a reception and a future café.

All windows are triple-glazed units manufactured in Germany, fitted with external retractable



AJBuildingsLibrary.co.uk
Search 'bere' for more images, drawings and data



Venetian blinds where appropriate. Footings were excavated to the slab and insulated with 200mm polystyrene insulation – sealed with tape – over a parge coat. Above ground, 300mm of expanded polystyrene block was glued to the external brickwork and finished with external render. A new zinc roof with 400mm of insulation sits over existing steel trusses. Renewables include PVs and solar thermal, made possible through grant funding. Building performance is being monitored by the Technology Strategy Board.

Q+A

Justin Bere, director, Bere Architects

Why did you decide to go for Passivhaus?

Initially I was asked to look at the building to advise on putting in a biomass plant, but we started instead by looking at how to save energy. The basement was dark and unused, so we suggested excavating and adding south-facing windows, which would bring light in and generate heat for the building. There was no budget so it wasn't a matter of 'we can't afford that'. There was no money, full stop.

Did Passivhaus restrict your design options?

No. It shows you that if you waste energy in one place, you need to compensate for it somewhere else. You could put big windows on the north side but then you would have to add more insulation to the envelope.

I don't think we would have received permission from Homes for Islington to excavate and add all the windows overlooking the south garden if we hadn't been able to use Passive House Planning Package to demonstrate the long-term energy and comfort benefits.

This is London's first non-domestic Passivhaus, and all the funders liked that. We received about £260,000 from the council for renewables and the 90 per cent heat-recovery ventilation. The Carbon Trust, the Big Lottery Fund and the Community Builders Fund were also among those that helped fund the project.

Is the building more complicated to use and look after?

It's much simpler than a normal building. Typically a building this size would have a building management system, but we decided to keep controls really simple. Our controls



This image A new single-storey pavilion was added to house the entrance and a café. Opposite The main hall is illuminated by rooflights and borrowed light from south-facing offices through a glazed wall.

BERE ARCHITECTS/JEFFERSON SMITH

are no more complicated than a domestic thermostat. A ground-source heat pump supplies any heat needed to the radiators, which have simple thermostatic valves.

All lights are manually switched on and off. Presence detectors are used to switch lights off if they are forgotten. External retractable blinds (and insulation) help keep the building cool in the summer, and are adjustable so we get the light in but not the heat. These are very easy to operate.

What were the biggest successes of the project?

The redeveloped centre has helped lift the surrounding area; its white and grey render transforms the estate; its gardens are now actively used by the community. Users of all ages are excited by how their building is

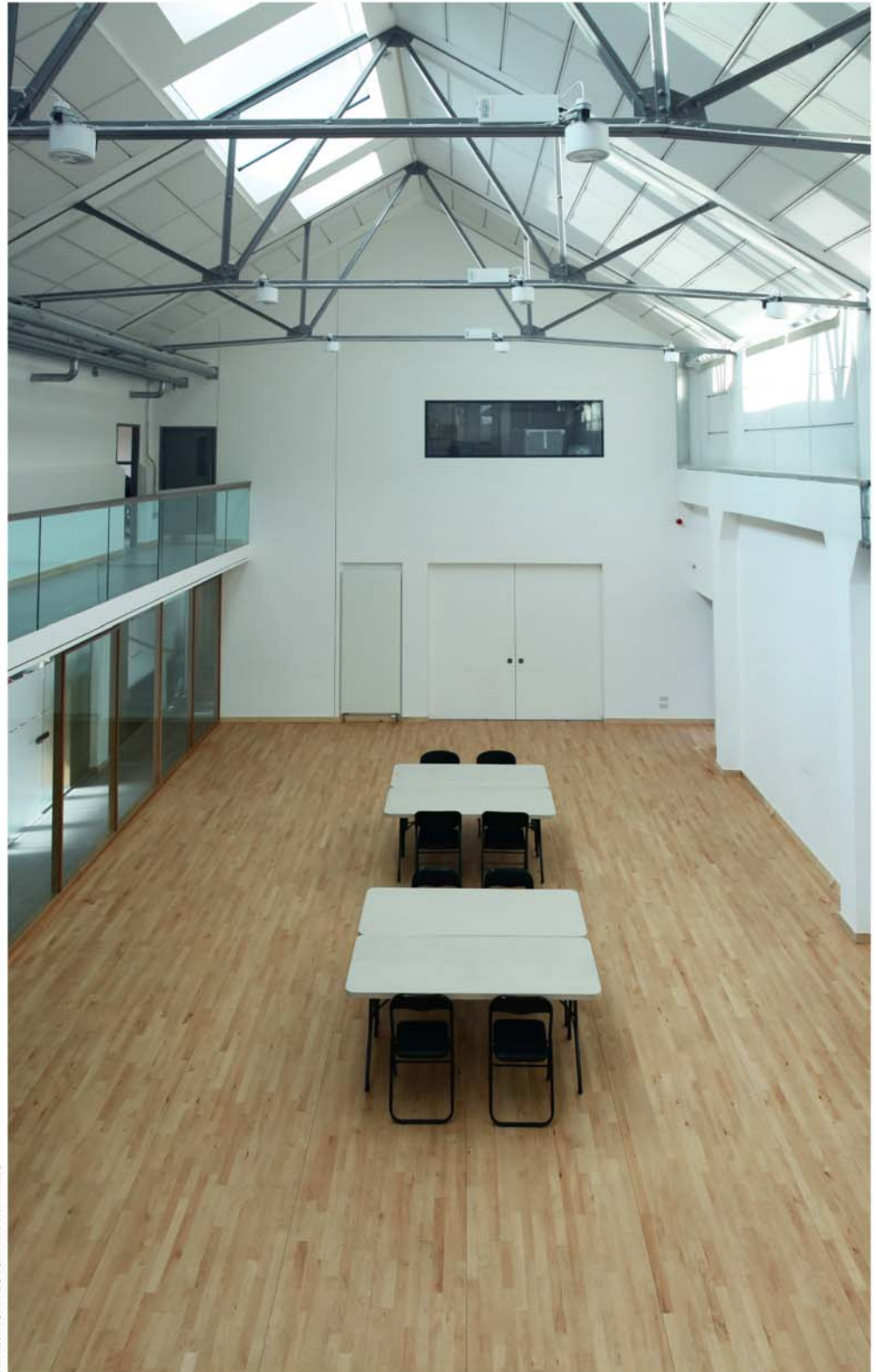
Users are excited by how their building is heated mostly by the sun

heated mostly by the sun.

The airtightness at 0.43ach-1 at 50Pa was a triumph on any project – especially a retrofit – and provides QA on the fabric, allowing the services to be sized and operated in accordance with the design model.

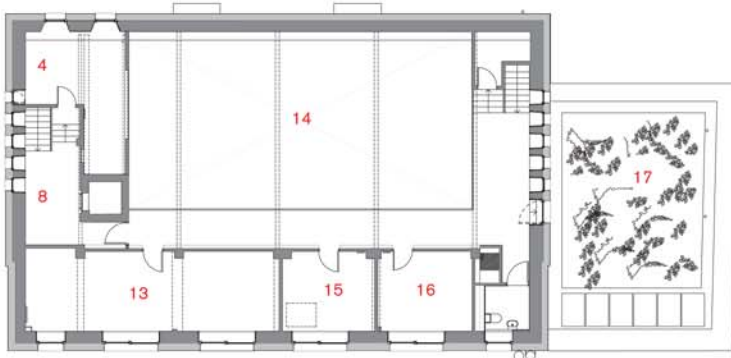
This is an all-electric building and by fabric-first measures and sensible controls, I think we will keep electrical and primary energy consumption so low that the PV will provide about half the energy requirements of the building.

Running costs will be about £800 a year compared to £10,000 before (with no feed-in tariff). The building uses 90 per cent less energy than it did before, with less than 10 per cent of the running costs, and it's really warm in winter and cool in summer.

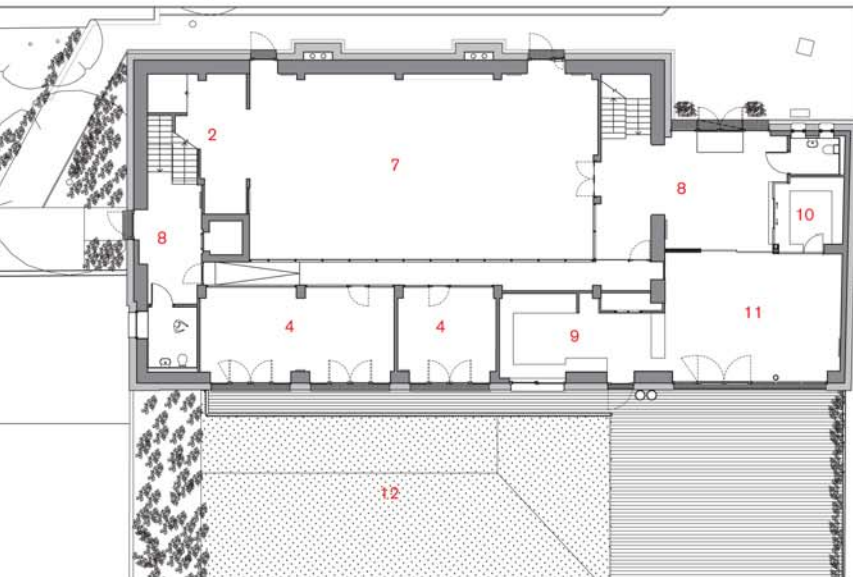


BERE ARCHITECTS/MARK MATINES

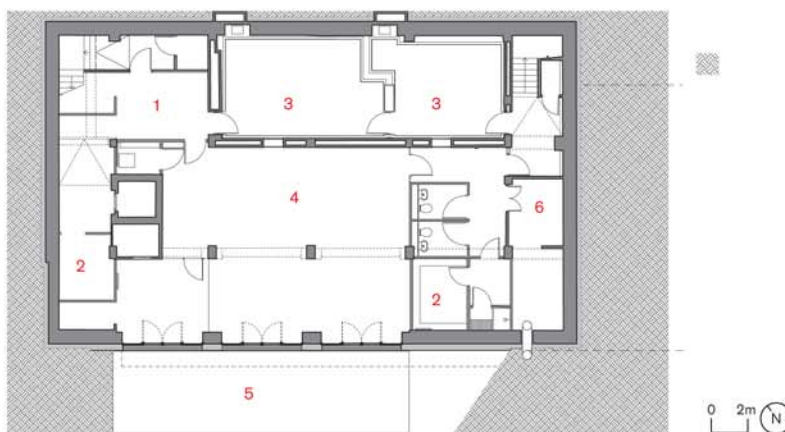
First floor plan



Ground floor plan



Basement floor plan



BERE ARCHITECTS/JEFFERSON SMITH



BERE ARCHITECTS

1. Meeting room
2. Store
3. Recording studio
4. Office
5. Lightwell
6. Plant
7. Hall
8. Lobby
9. Kitchen
10. Reception
11. Dining area
12. Turfed grass area
13. IT training room
14. Void
15. Therapy room
16. Conference room
17. Green roof

Project data

START ON SITE	May 2010
COMPLETION	August 2011
GROSS INTERNAL FLOOR AREA	800m ²
TYPE OF PROCUREMENT	JCT SBC/Q05 traditional
CONSTRUCTION COST	£1.6 million
COST PER SQUARE METRE	£2,000
ARCHITECT	Bere Architects
CLIENT	Mayville Community Partnership

Top Openings were kept to a minimum on the north side
 Above The building opens to the south, and the garden was excavated to recuperate use of the basement

ESTIMATED ANNUAL CO ₂ EMISSIONS	6kg/m ² a (excluding appliances)
ON-SITE RENEWABLE ENERGY GENERATION	PV panels, solar thermal panel, ground-source heat pump
ANNUAL MAINS WATER CONSUMPTION	4m ³ /occupant/year
AIRTIGHTNESS AT 50PA	0.43ach-1
SPECIFIC SPACE HEAT DEMAND	13kWh/m ² /year
OVERALL AREA-WEIGHTED U-VALUE	0.28W/m ² K