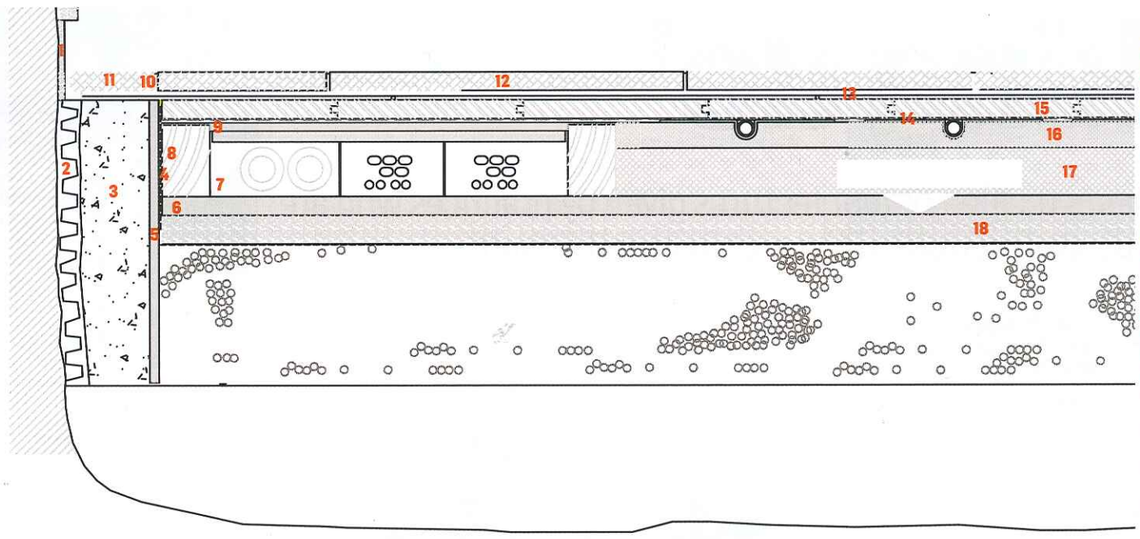
Project

St Mary's Church

Architect
Lee Evans Partnership
Dry flooring system
Jupiter Heating Systems
Location Broadwater, Worthing, West Sussex
Completed
July 2009



Floor construction details

1 Single coat of lime plaster
2 Newton 520 membrane
3 Lime concrete border
4 Visqueen 1200 gauge DPM
5 10mm Fermacell permanent shuttering against limecrete
6 20mm Fermacell with half lapped, screwed and glued joints
7 70mm x 335mm Pendock galv. steel floor duct with 12mm plywood cover
8 75mm x 50mm hardwood
9 9mm WBP plywood packing
10 Edge of Emperador stone lines
11 100mm x 20mm limestone Emperador by Keystone with grout
12 400mm x random x 20mm limestone Sienna by Keystone with grout.
13 Two-layer adhesive
14 Jupiter separating membrane
15 Jupiter 20mm terracotta T&G SRT tiles
16 30mm Jupiter EPS with aluminium diffusion plate and UF heating pipes
17 50mm Kingspan Styrozone H500 insulation
18 Min 30mm Jupiter crushed slate levelling material.

By Amanda Birch

One of the concerns Lee Evans Partnership had when commissioned to install underfloor heating into a medieval church was how they would do it without introducing wet trades.

"The grade I listed church had been dry for many years," says project architect John Minter. "So we were reluctant to bring in wet trades that would introduce huge amounts of moisture into the building."

The solution came in the form of a German-developed, dry-installed underfloor heating system by Jupiter Heating Systems. Another attraction of the product was its rapid installation time — it took only 12 days to install 180sq m of flooring, as opposed to the months it takes to install some screed heating systems.

Part of the brief was for the church to be ready for the summer wedding season. This gave the architects a limited window to implement the flooring works as well as other refurbishment works.

The flooring had to accommodate various sub-floor levels and provide a load-bearing surface suitable for large format limestone tiles. It also had to incorporate a hearing loop plus other cabling, together with the underfloor heating system.

The Jupiter System met all of these requirements, and Minter says that, six months on, the limestone-finished floor is wearing well with no cracking. The architects have been so impressed they have specified the system for two other church projects currently on site.

Eliminating the use of screed is the key innovation of the Jupiter product. The replacement material is a 20mm-thick terracotta tile called the Screed Replacement Tile. The 400mm x 180mm tongue and groove tiles are glued together and, after 24 hours, provide a very strong, ready-to-use floor in which the heating can immediately be switched on.

EPS Edge Zone panels were covered with a protective membrane (above), over which the heating system and Screed Replacement Tiles were laid. The final floor finish (right).

Before the tiles can be laid, it is essential the existing floor is level. At St Mary's Church the original medieval floor was far lower than the final floor finish, and so needed to be filled. Most of the void was filled using Foamglass recycled aggregate to a depth of about 600mm, supplied by Ty-Mawr Lime. In St Mary's Church, a damp-proof membrane was laid over the foamglass aggregate followed by a layer of crushed slate — a requirement for making the floor even. Then a 20mm-thick layer of Fermacell was laid, which provided a good load-bearing surface for the layer of high compressive-strength insulation that followed.

Jupiter manufactures two panel-based systems. The earlier Ideal system — first manufactured in 1996 — comprises 30mm-thick expanded polystyrene elements with integral aluminium heat diffusion plates on the surface. The Ideal Eco system was introduced in 2000 as a more ecological alternative, using recycled wood fibre elements, also 30mm thick, instead of EPS.

Both systems are available in 500mm x 1m size panels and arrive on site with preformed omega-shaped channels in place. The 16mm-diameter, multi-layer metal/polyethylene PE-RT pipe is then clipped into the channels. The Screed Replacement Tiles are laid on top and bonded together. They are not bonded to the underfloor heating system, so as to create a floating floor. The chosen final floor finish, whether marble or granite, is then laid.

Jupiter claims its system is around 14% more efficient than a screed underfloor heating system. A comparison test showed the dry-installed system operated similarly to a radiator, with the floor heating up and cooling down quickly, while the screed heating system had a much slower response time.

The Jupiter heating system costs around £38 per sq m.

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