UK PASSIVHAUS AWARDS 2015

CRE8 BARN

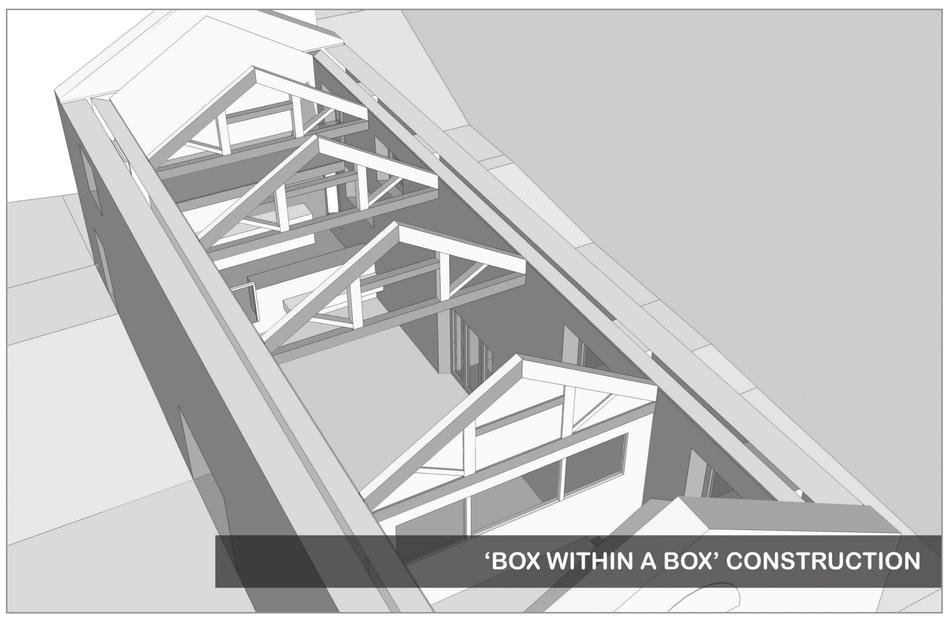
GREEN BUILDING STORE

Passivhaus Trust Awards 2015

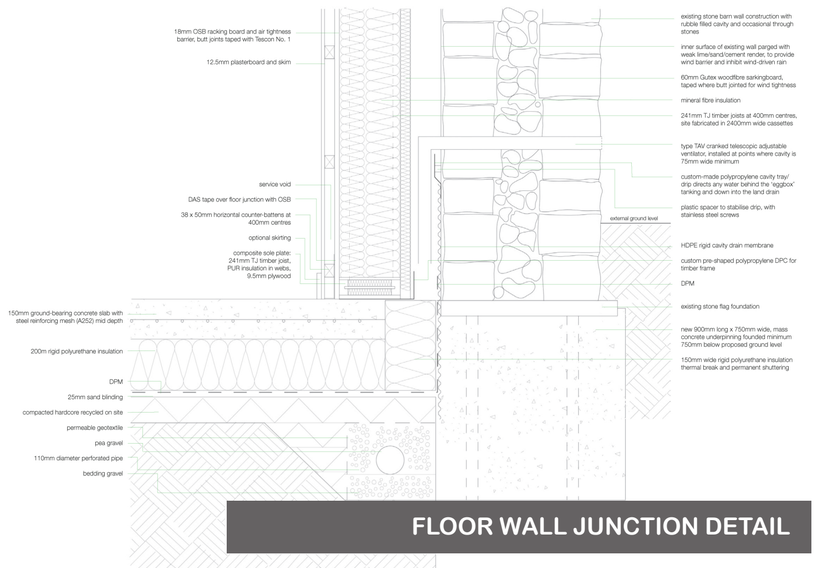
CRE8 BARN, STIRLEY COMMUNITY FARM

The Cre8 Barn project is an innovative barn conversion to the EnerPHit standard, featuring a 'box within a box' structure (inner timber frame within outer masonry barn). The timber frame construction not only ensures thermal performance, but also helps provide structural stability to the outer masonry walls. An innovative thermal bridge-free wall connector technique utilised low thermal conductivity wall connectors between the inner timber wall and outer masonry wall. The risk of moisture build up within the cavity was extensively addressed at the design stage and is now being monitored.

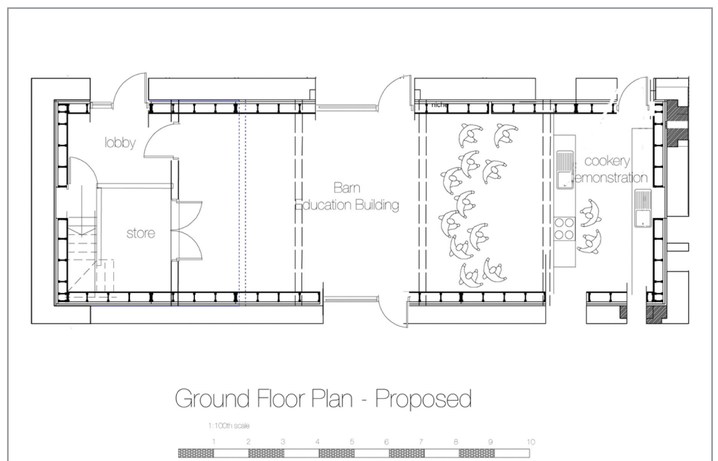
MVHR UNITS AND DUCTING



'BOX WITHIN A BOX' CONSTRUCTION



FLOOR WALL JUNCTION DETAIL

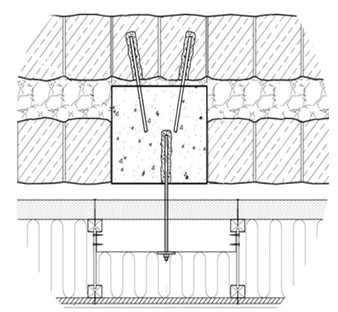


FLOOR PLAN

Project Overview
Name: Cre8 Barn, Stirley Community Farm
Location: Huddersfield, West Yorkshire
Building Type: Visitor and Education Centre
Construction type: Inner timber frame within outer masonry barn
Completed in: October 2013
Occupancy status: Occupied since October 2013
Construction Cost: £1930/sqm

Sustainability Features
Primary Energy Demand: 136 kWh/m²a
Space Heating Demand: 33 kWh/m²a
Heating and Cooling Load: 17 W/m²
Ventilation strategy: Two PAUL Novus 450 units running continually at a base level fan speed (fan speed 1) for 365 days a year. Unit 1 is solely for the main hall.
Unit 2, supplies the meeting room but also provides air to the reception area and the main hall using the 'cascade principle'.
Heating strategy: Mains gas central heating
Shading strategy: Not needed due to existing barn design
U values: Exterior wall 0.132 W/(m²k),
Roof 0.100 W/(m²k), Floor 0.108 W/(m²k),
Windows 0.78 W/(m²k)

Measured Performance
Analysis of actual energy use: 42.9 kWh/m²a (including gas consumption for heating, cooking and hot water)
TFA: 98m²
Actual running costs (including gas used in cooking and hot water): £180.50/year



DETAIL OF CONCRETE WALL CONNECTORS

Lessons learnt: The building performed as predicted in its first year of operation

Air pressure result: 0.35 air changes per hour @50Pa
TFA: 98m²

Quote:

Thanks to the Passivhaus strategies applied to the refurbishment, the Cre8 Barn uses very little energy to heat, offering a fantastic public example of how good design can be used to radically reduce energy use and improve comfort in even the most cold and draughty of buildings.

Rob Stoneman, Chief Executive at Yorkshire Wildlife Trust

TEAM CREDITS

Client: Yorkshire Wildlife Trust
Architect: Design & build project led by Green Building Store (with architect Derrie O'Sullivan)
Consultant: Green Building Store
Contractor: Green Building Store
Certifier: Pete Warm, WARM low energy practice
Other: Stuart McCormick, Structural Engineer; SGM structural engineers

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