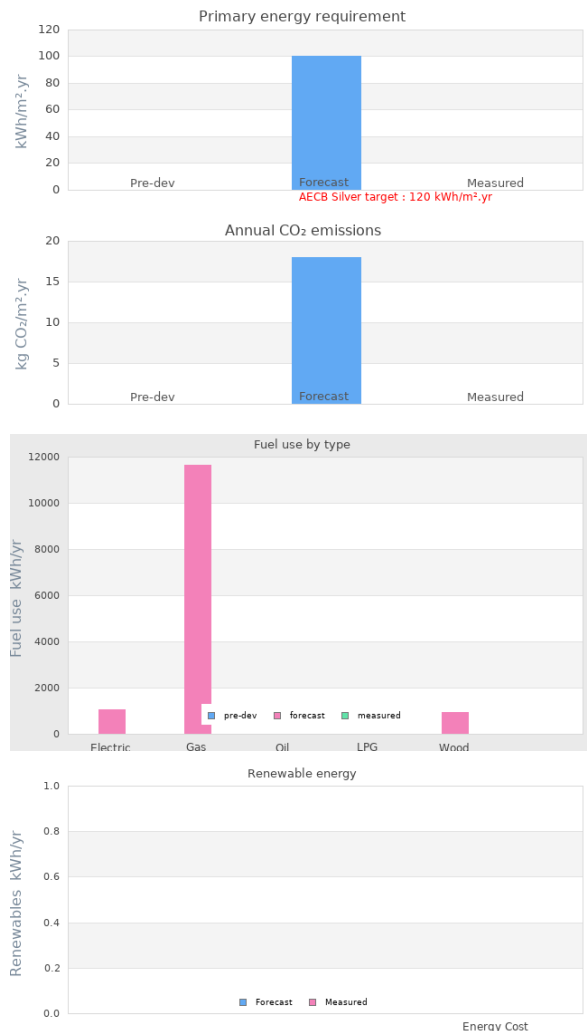


Project name Church Lane

Project summary A private residential new build to AECB building Standard in masonry cavity wall construction.



Project Description

Projected build start date	14 Nov 2017
Projected date of occupation	30 Sep 2018
Project stage	Occupied
Project location	Leeds, West Yorkshire, England
Energy target	AECB Silver
Build type	New build
Building sector	Private Residential
Property type	Detached
Existing external wall construction	Masonry Cavity
Existing external wall additional information	383mm block work cavity wall, 150mm cavity with 120mm Kingspan
Existing party wall construction	

Floor area	170 m ²
Floor area calculation method	PHPP

Project team

Organisation	Leeds Environmental Design Associates
Project lead	Leeds Environmental Design Associates
Client	Private Client
Architect	Leeds Environmental Design Associates
Mechanical & electrical consultant(s)	Leeds Environmental Design Associates
Energy consultant(s)	Leeds Environmental Design Associates
Structural engineer	Melia, Smith & Jones
Quantity surveyor	
Other consultant	Green Building Store
Contractor	Ashfield Building Group

Design strategies

Planned occupancy	Three People, working during week days.
Space heating strategy	Heating from mains gas fired systems boiler feeding radiators and underfloor on ground level; wood burning stove; MVHR.
Water heating strategy	Water heated by systems boiler stored in cylinder with backup electric immersion heater.
Fuel strategy	Mains gas, mains electricity.
Renewable energy generation strategy	N/A
Passive solar strategy	Home situated to benefit from southern solar gains with optimised window proportions using PHPP and orientated to maximises solar benefit.
Space cooling strategy	Natural ventilation for most of the cooling season. Daytime use of MVHR with night purging during heat waves. Cross ventilation possible.
Daylighting strategy	All rooms to achieve daylight factor of 1.5% with kitchen living space up to 2%
Ventilation strategy	Comfort ventilation with heat recovery (winter); Openable windows (summer).

Airtightness strategy

All junctions between walls, ceilings and floors sealed by wet plaster and tape with sealant; Tapes used used round perimeter abutments, windows and openings using plywood linings to enable two taped joints; all services penetrations and joints to be made air tight with airtight ness tape and sealant. First floor carried on bearer bolted to wall with parge coat behind to continue airtight plaster layer. FF ceiling sealed by using tape and plaster skim combination with continuity over top of studs and at edge abutments using tape.

Strategy for minimising thermal bridges

Careful detailing and use of thermal transmittance breaks work to reduce thermal bridges. Refer to detail drawings of key junctions for roof walls and floors and perimeter of openings.

Modelling strategy

Whole house modelling was undertaken in PHPP.

Insulation strategy

Continuous insulation layer with all joins and junctions filled and taped; cavity wall insulation of 120mm phenolic foam insulation; floor insulation of 150 mm PIR with all joints taped and sealed including to masonry at perimeters. Bobtail truss use to maximise insulation to 400mm of mineral wool.

Other relevant retrofit strategies

Other information (constraints or opportunities influencing project design or outcomes)

Clients remained living onsite in old property during the construction with demolition of house and garage taken place in a phased approach.

Energy use

Fuel use by type (kWh/yr)

Fuel	previous	forecast	measured
Electric		1064.9758	
Gas		11627.968	
Oil			
LPG			
Wood		945.84	

Primary energy requirement & CO2 emissions

	previous	forecast	measured
Annual CO2 emissions (kg CO2/m².yr)	-	18	-

	previous	forecast	measured
Primary energy requirement (kWh/m ² .yr)	-	100	-

Renewable energy (kWh/yr)

Renewables technology	forecast	measured
-		
-		
Energy consumed by generation		

Airtightness (m³/m².hr @ 50 Pascals)

	Date of test	Test result
Pre-development airtightness	-	-
Final airtightness	31 Aug 2018	0.94

Annual space heat demand (kWh/m².yr)

	Pre-development	forecast	measured
Space heat demand	-	30	-

Whole house energy calculation method

PHPP

Other energy calculation method

Predicted heating load

16 W/m² (demand)

Other energy target(s)

Building services

Occupancy	Three adults, working during the week
Space heating	Heating provided by Ideal Logic 24 system A rated boiler with radiators and Dik Geurts Ivar 5 High A+ rated wood burner. Zehnder ComfoAir Q350 MVHR system to reclaim heat from exhaust ventilation air.
Hot water	Ideal Logic 24 system A rated boiler feeding an indirect Gledhill Unvented 210 slimline cylinder.
Ventilation	Zehnder ComfoAir Q350 PHI certified MVHR system with efficiency of up to 96%, to serve 5 wet rooms and one kitchen.
Controls	Zone control for UF heating and thermostat, MVHR with variable settings.
Cooking	Gas hob and electric fan oven
Lighting	100% low energy lighting throughout building
Appliances	A+ rated fridge freezer, condensing drier and washing machine
Renewables	

Strategy for minimising thermal bridges	Careful detailing to aim for thermal bridge free design. Key junctions and penetrations noted and addressed in detailing, with advice from structural engineers.
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Building construction

Storeys	2
Volume	596.9m ³
Thermal fabric area	56059m ²
Roof description	Roof trusses as bobtail design to fit 400mm mineral wool insulation mineral wool insulation. Colourcoat urban standing seam roof Klover Permo; light breathable membrane on 18mm OSB-3 boards with joints taped.
Roof U-value	0.11W/m ² K
Walls description	Block work cavity wall with 150mm partial fill cavity. external block work (thermal conductivity of 0.42w/mk) to be rendered or clad, with 30mm air cavity, 120mm of Kingspan k108 Kooltherm cavity insulation, with med weight inner leaf concrete block, plasterboard with all joints taped and skim plaster.
Walls U-value	0.13W/m ² K
Party walls description	N/A
Party walls U-value	0.00W/m ² K
Floor description	75mm screed on separating layer, on 140mm Kingspan Kooltherm, on 1200g dpm, on suspended beam and block floor with 150mm void below.
Floor U-value	0.12W/m ² K
Glazed doors description	All doors and windows supplied by the Green Building Store as per their Performance range
Glazed doors U-value	1.00W/m ² K installed
Opaque doors description	All doors and windows supplied by the Green Building Store as per their Performance range
Opaque doors U-value	1.00W/m ² K installed
Windows description	All doors and windows supplied by the Green Building Store as per their Performance range
Windows U-value	1.06W/m ² K installed
Windows energy transmittance (G-value)	0.53%
Windows light transmittance	0.52%
Rooflights description	Velux GGL MK08 triple glazed unit
Rooflights light transmittance	0.5%
Rooflights U-value	1.30W/m ² K installed

Project images