



Passivhaus

Construction detailing

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The Tooley & Foster Partnership



Detailing the Building: *Construction Methods*

Any construction can be used

Timber frame – various types

Cross Laminated Timber

Masonry

Insulated concrete formwork

Structural insulated panels

Issues to consider

- Speed of erection
- Low embodied energy
- Off site construction
- Ecological construction
- Contractor familiarity (related to contract type)



Detailing the Building: *shape*

KISS – Keep it simple – not like this pre-Passivhaus low energy development

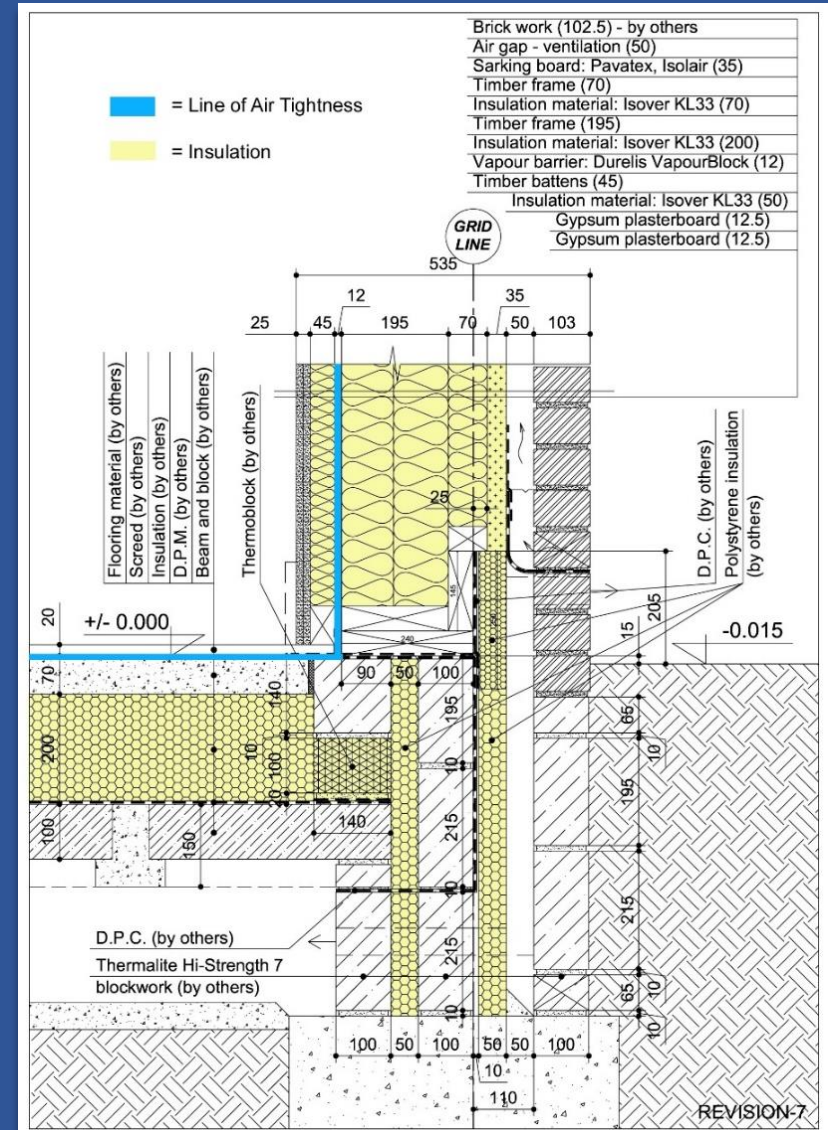
Non-sensible Shapes:

- Dormer windows
- Exposed floors



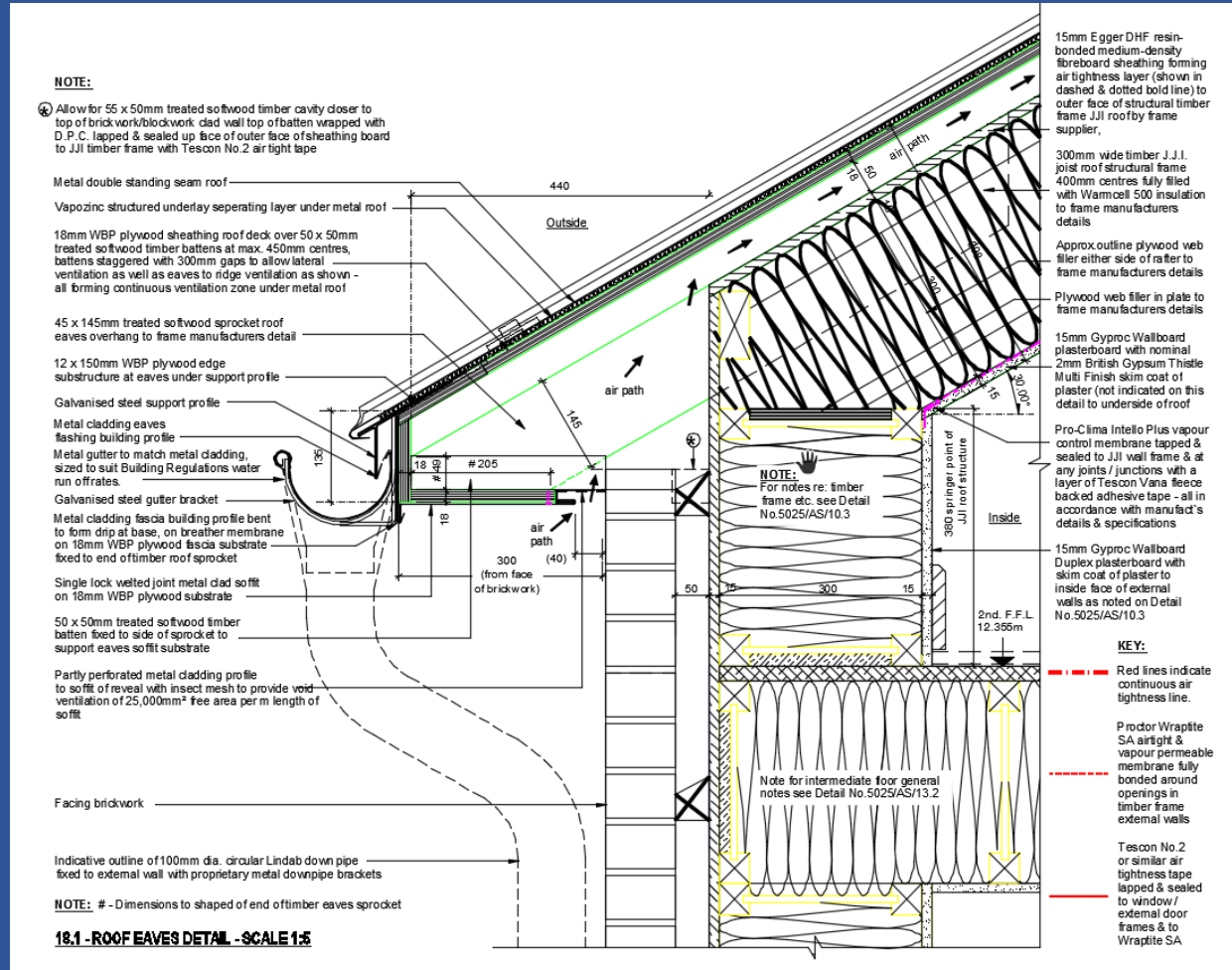
Timber frame panel

- Timber frame, insulated, boarded – fast to erect, high timber content
- Insulated service zone
- Thermalite block below inner leaves
- Marmox structural insulation
- NHBC require 150mm between internal and external ground level (not for this project)
- Additional drainage on this site



Timber frame panel – roof eaves

- Original frame type
- I section studs
- Lower timber content
- External air tightness layer – taped sheathing board
- Duplex plasterboard for vapour control
- No service zone



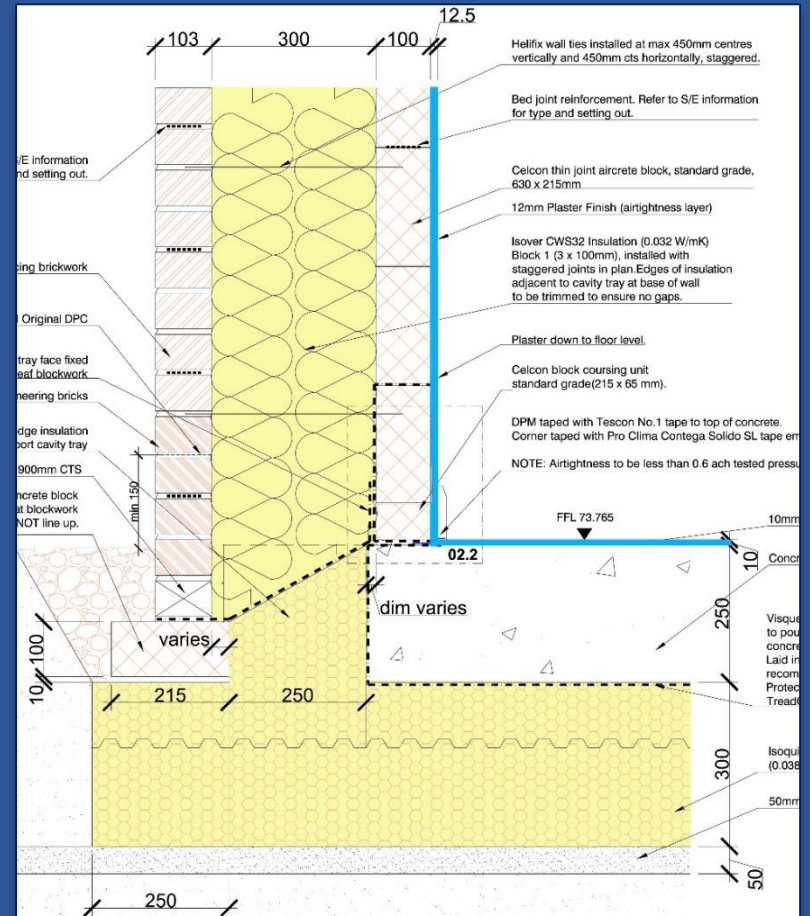
Timber frame panel and brickwork



Northbrook Road, Ilford – awaiting certification 2019

Masonry and raft foundation

- Thin joint blockwork construction
- Plaster air tightness layer
- Teplo wall ties
- Load bearing floor insulation
- RC floor slab
- Thermal bridge free
- No load bearing insulation



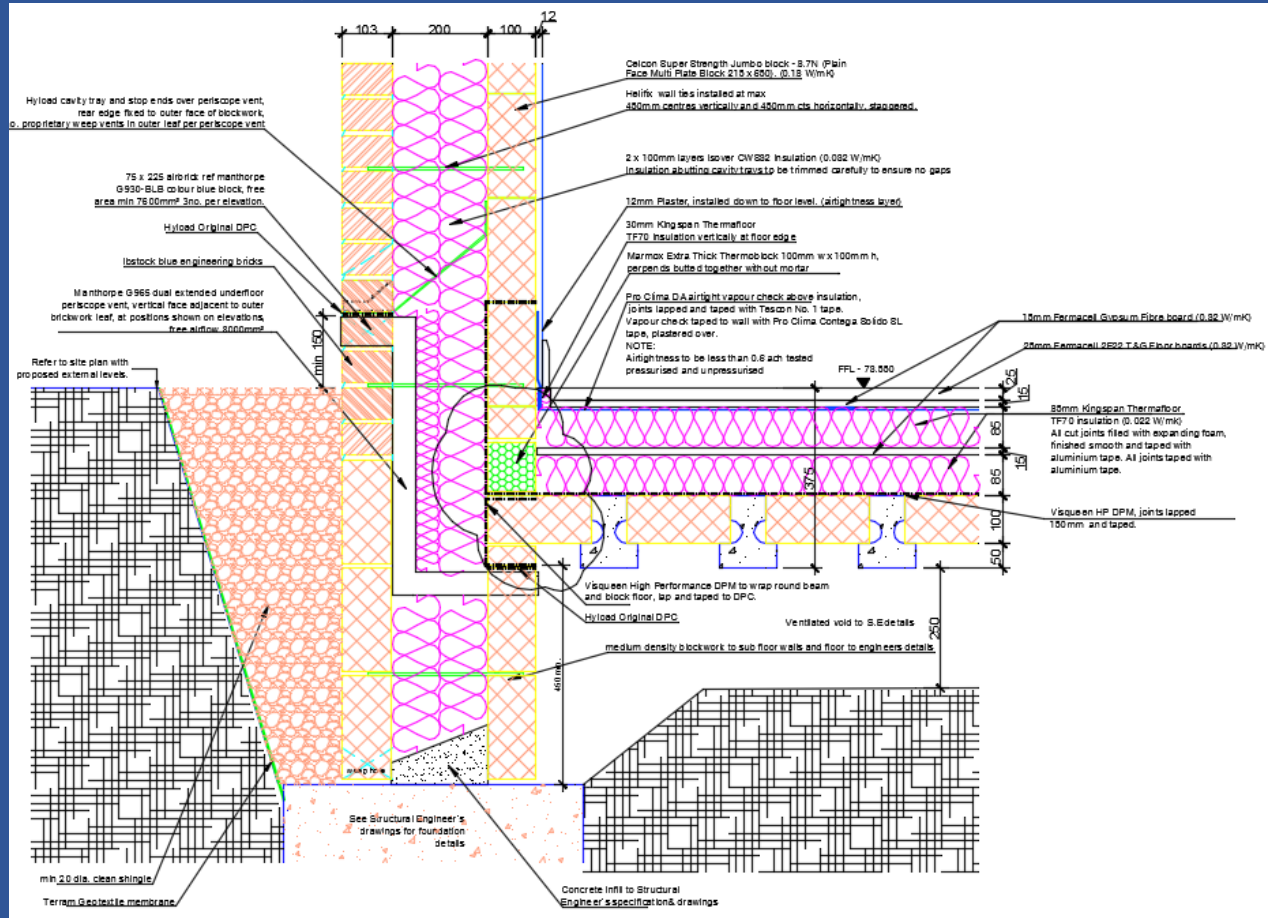
Masonry and raft foundation



Gales Place, Crawley – certified 2017

Masonry and suspended floor

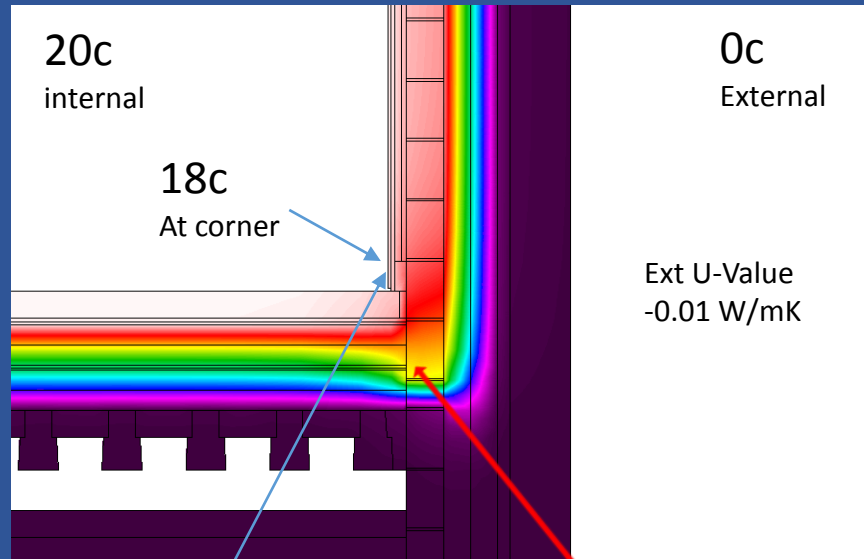
- Where a raft foundation is not possible
- Thermal bridge to be calculated
- Dry floor with screedboard
- Load bearing insulation - Marmox



Masonry and suspended floor

Overcoming Thermal Bridges :

- Continuous thermal envelope
- Even internal surface temperatures
- Reduced energy use
- prevents surface condensation related issues such as mould
- fRsi in Building Regulations stricter than Passivhaus



Min fRsi of
15 deg C
BRE/Part L



Masonry with suspended floor



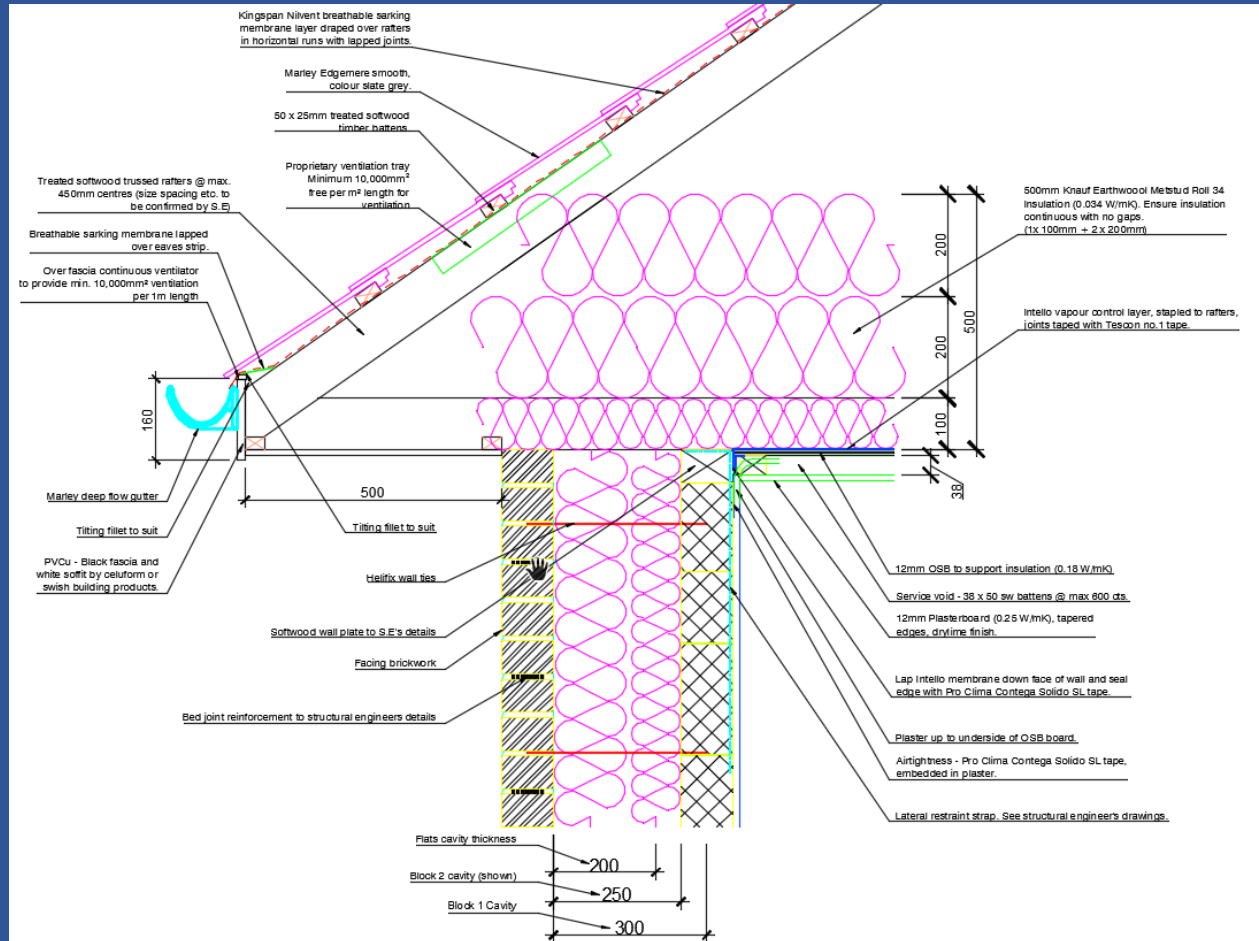
Dobbins Place, Crawley – Certified 2019

Masonry – roof eaves

Airtightness:
Wet plaster to walls
Membrane to underside of trussed rafters - replaced with airtight OSB on later projects

Thermal bridge free due to overlap of full thickness of loft insulation with wall insulation.

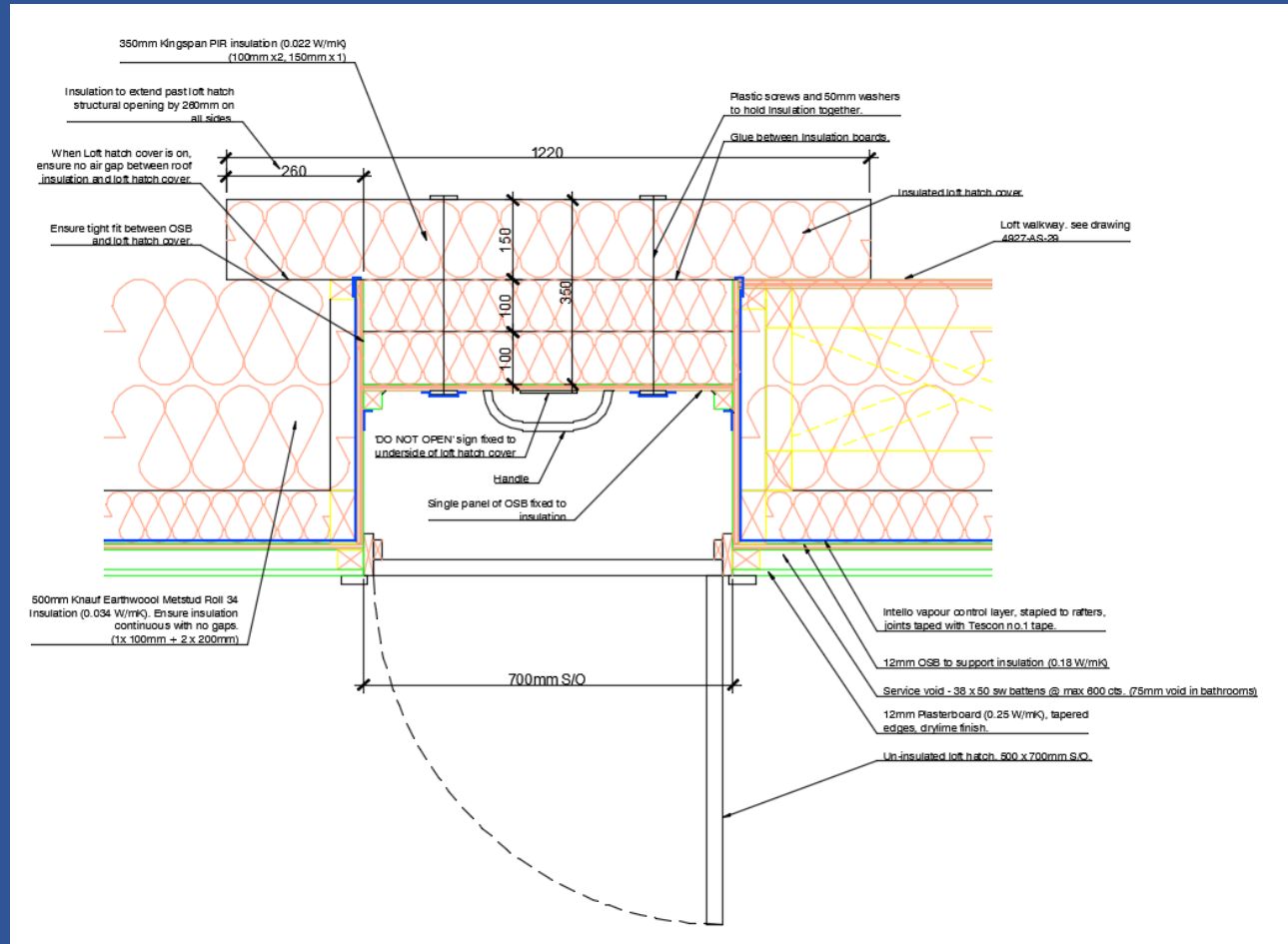
Service void in ceiling



Loft hatch

Local authority client required loft access for maintenance, but not for tenant use.

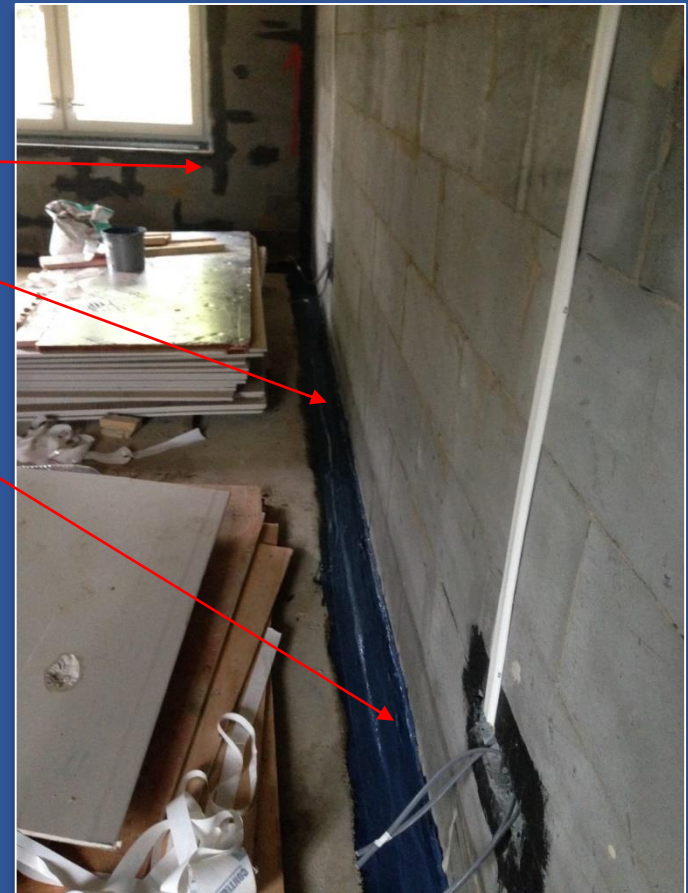
Semi permanent roof hatch



Low air leakage - masonry

Before wet plaster goes on:

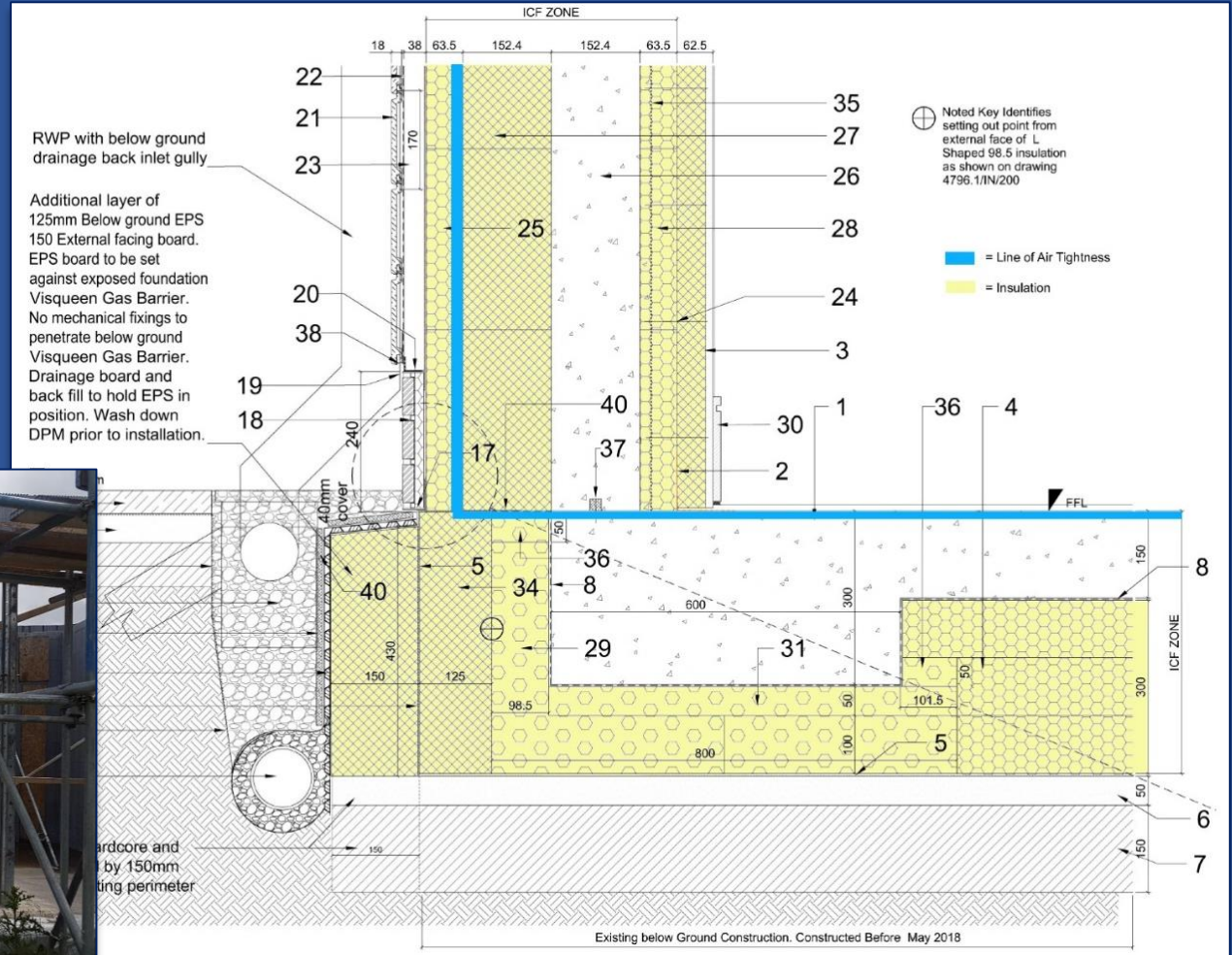
- Taping of window
- Liquid airtightness to wall floor joint
- Liquid airtightness to first fix
- Airtight grommets to pipes
- Airtight sheet to ceiling



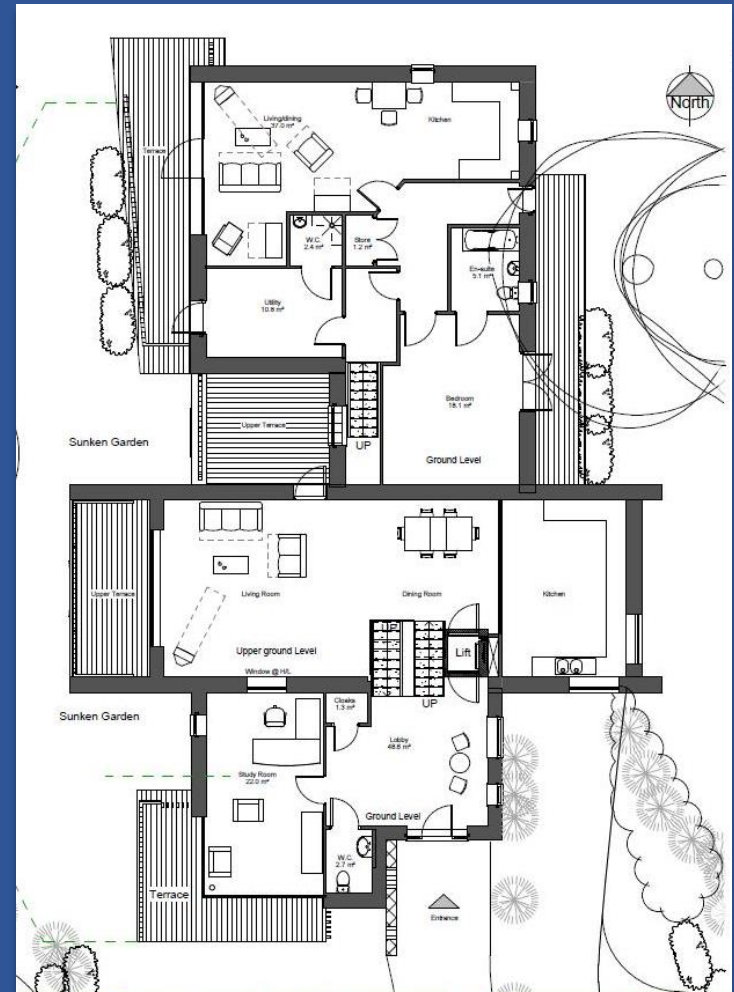
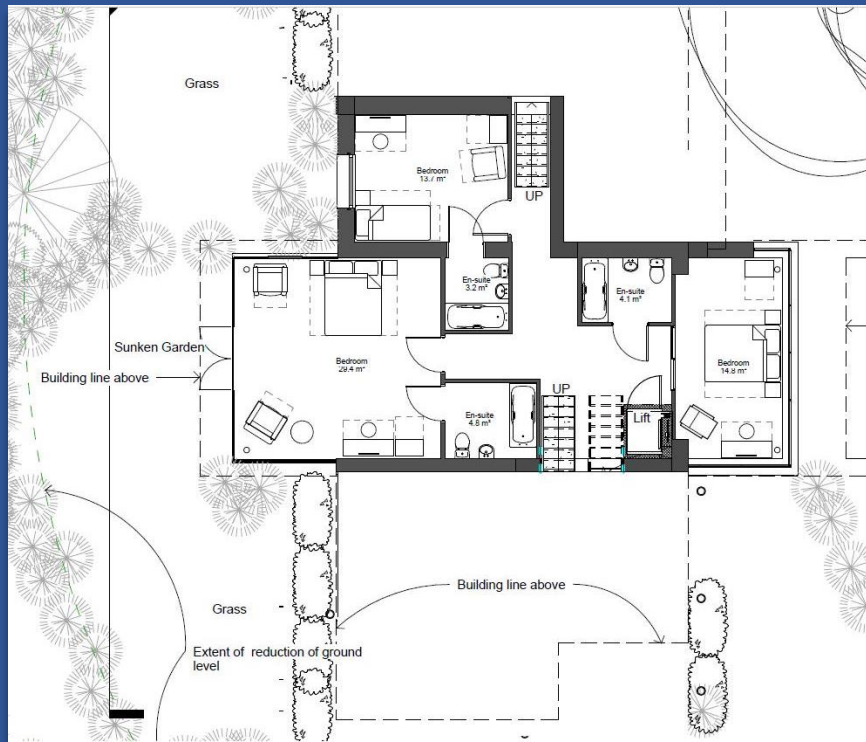
Achieved air leakage of 0.54 air changes per hour

Insulated concrete formwork & raft

Deceptively simple
External airtightness
added



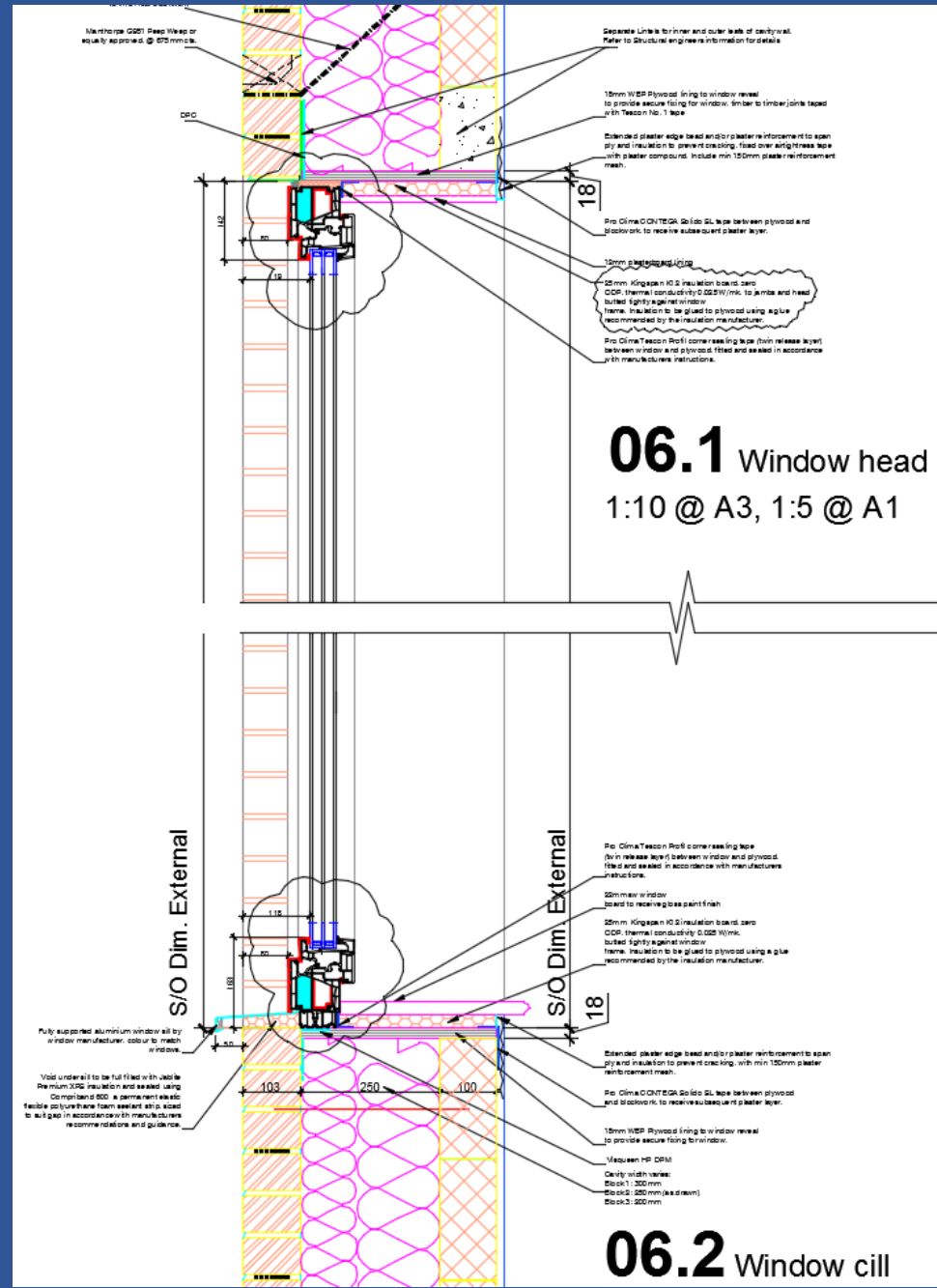
rural site



Windows

Less radical detailing than some:

- Metal clad windows for durability
- Less suitable for external insulated frames
- Detailing more conventional
- Standard allowance in PHPP for installation thermal bridge used
- Planners & clients often like brick finish



Accredited Passivhaus Design – part of Tooley & Foster

- Based in Buckhurst Hill
- Architects and Interior Designers
- Passivhaus Designers
- Accredited Passivhaus Design
- ISO 9001 and 14001 certified
- Multi Award Winning

- Housing
- Care and Extra Care with dementia specialism
- Education
- Health
- Sustainable and Low Energy Design

- Established 1892

