

# Cre8 Barn, Stirley Community Farm Yorkshire Wildlife Trust, Huddersfield

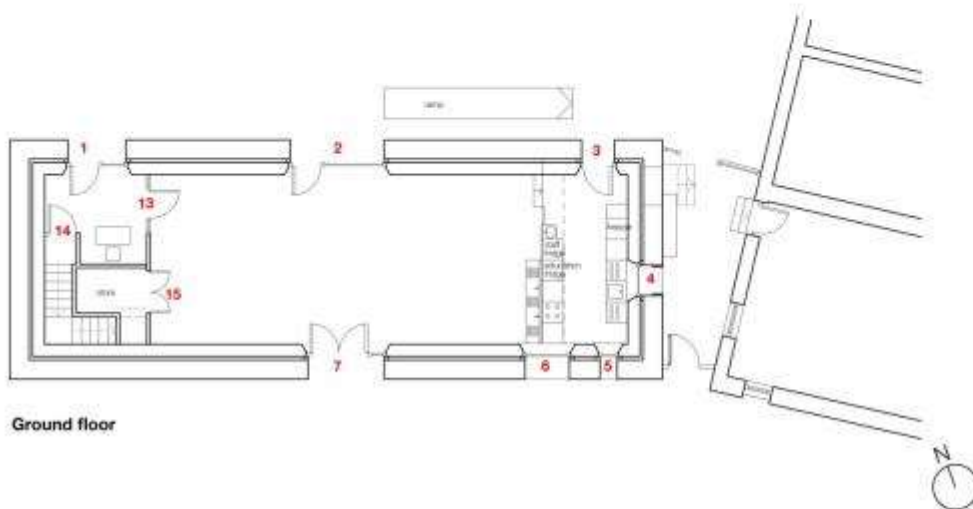
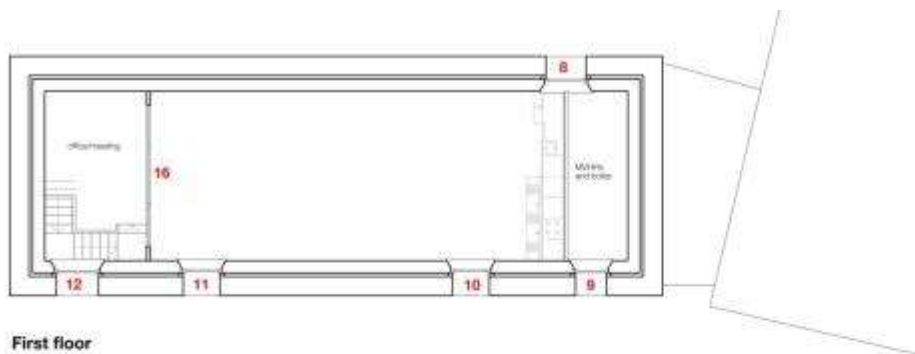


Bill Butcher, Certified Passive House Consultant  
Director Green Building Store & Green Building Company

- The conversion of a 19<sup>th</sup> century barn to a multi purpose educational centre
- To meet the PassivHaus EnerPHit standard for retrofit
- ‘Box within a box’, internal timber frame structure for structural stability, thermal performance, and air tightness
- Major underpinning of foundations and partial rebuild of masonry walls









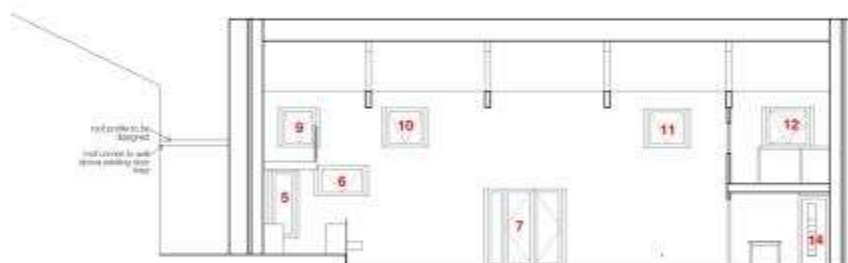
Section GG



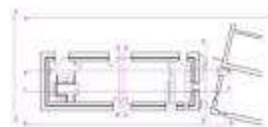
Section FF



Section HH

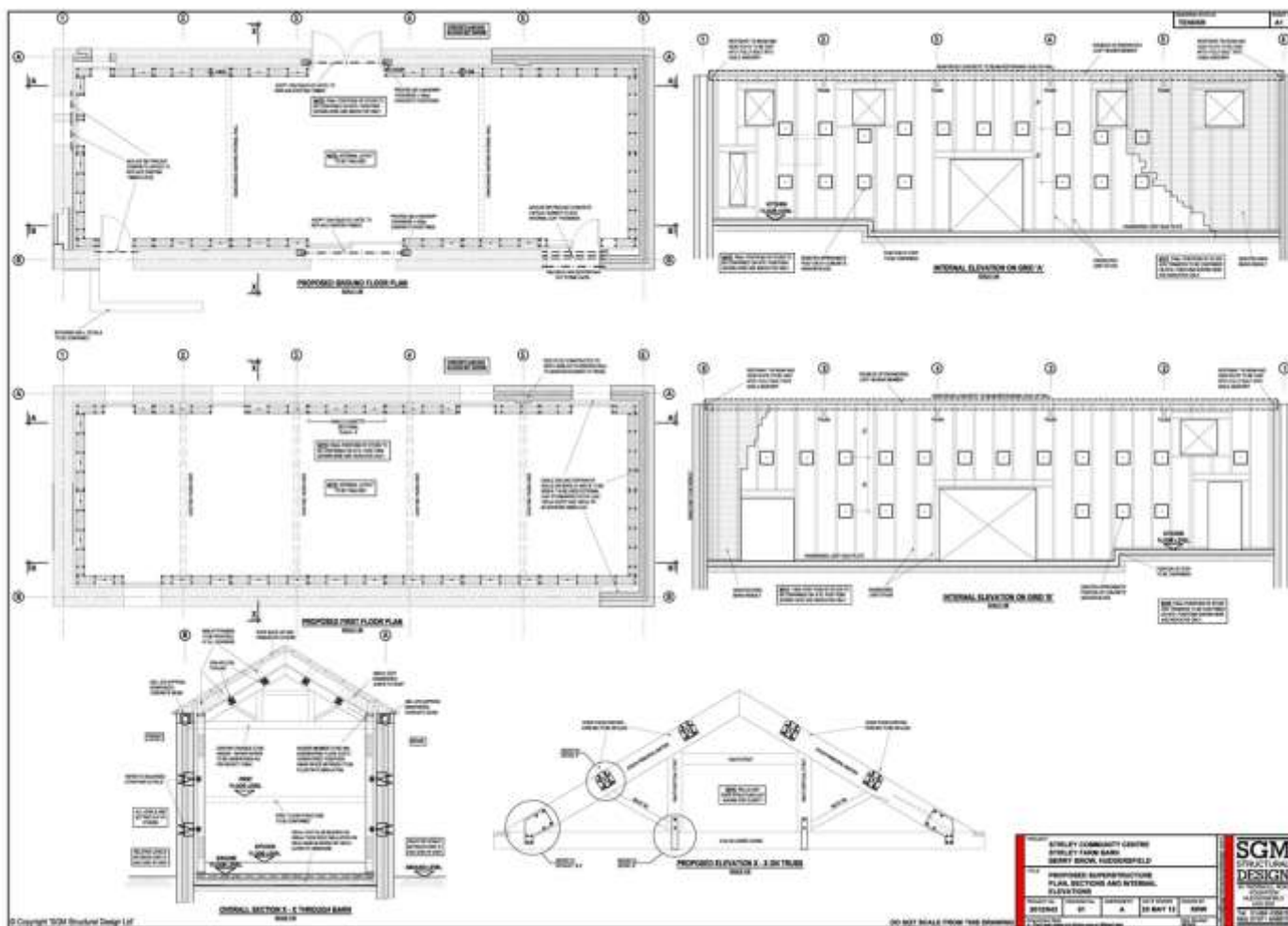


Section EE



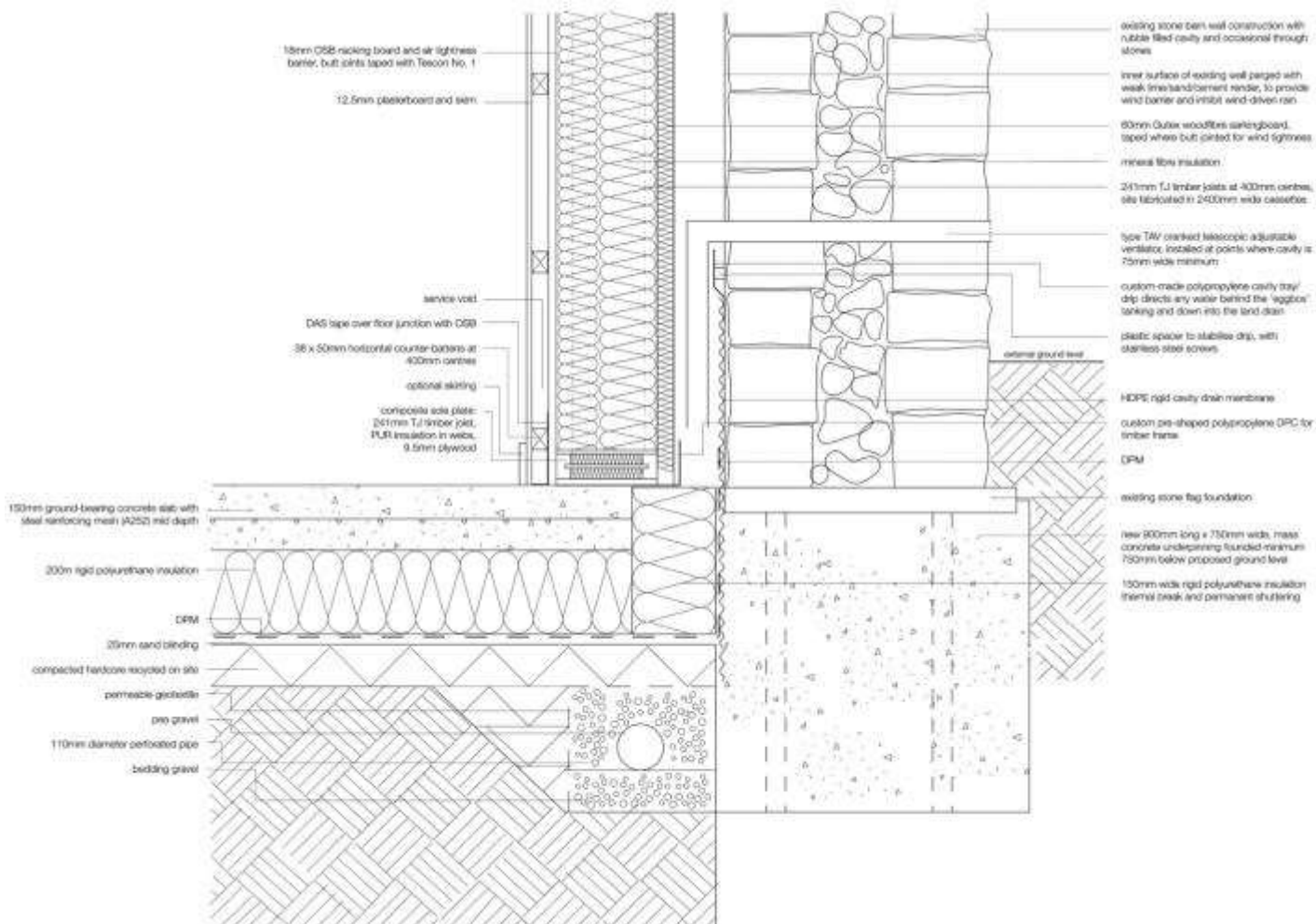
Key to section lines





# Internal wall insulation considerations

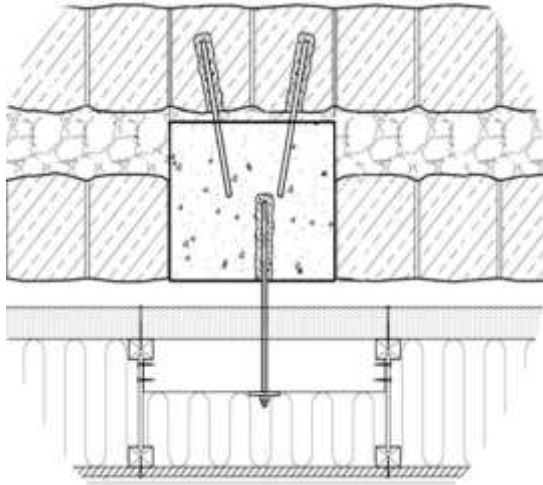
- Thermal performance
- Structural stability
- Airtightness
- Wind tightness
- Elimination of any interstitial moisture risk
- Integration of tanking
- Draining the cavity of any rain ingress
- Ventilation of cavity to eliminate risk of solar driven moisture



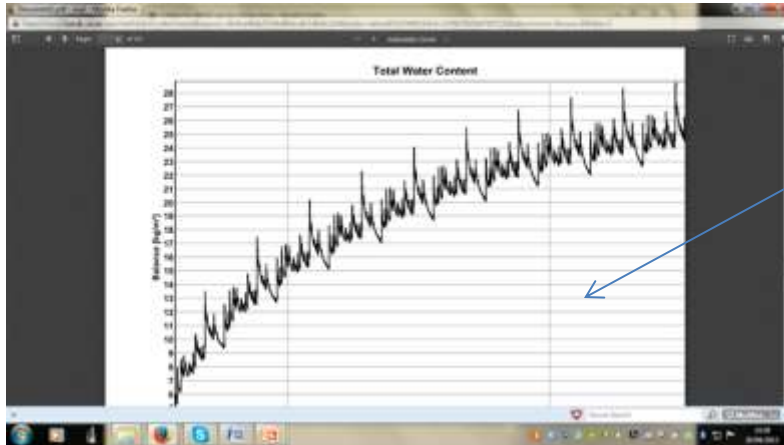






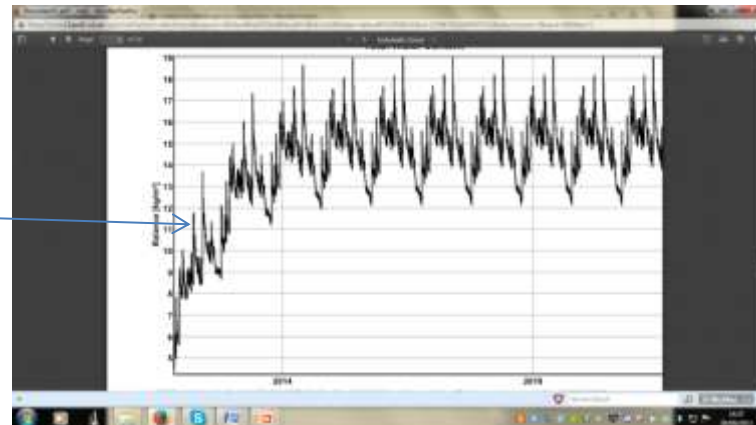


# Risks of moisture within the wall cavity, WUFI analysis



Unventilated cavity

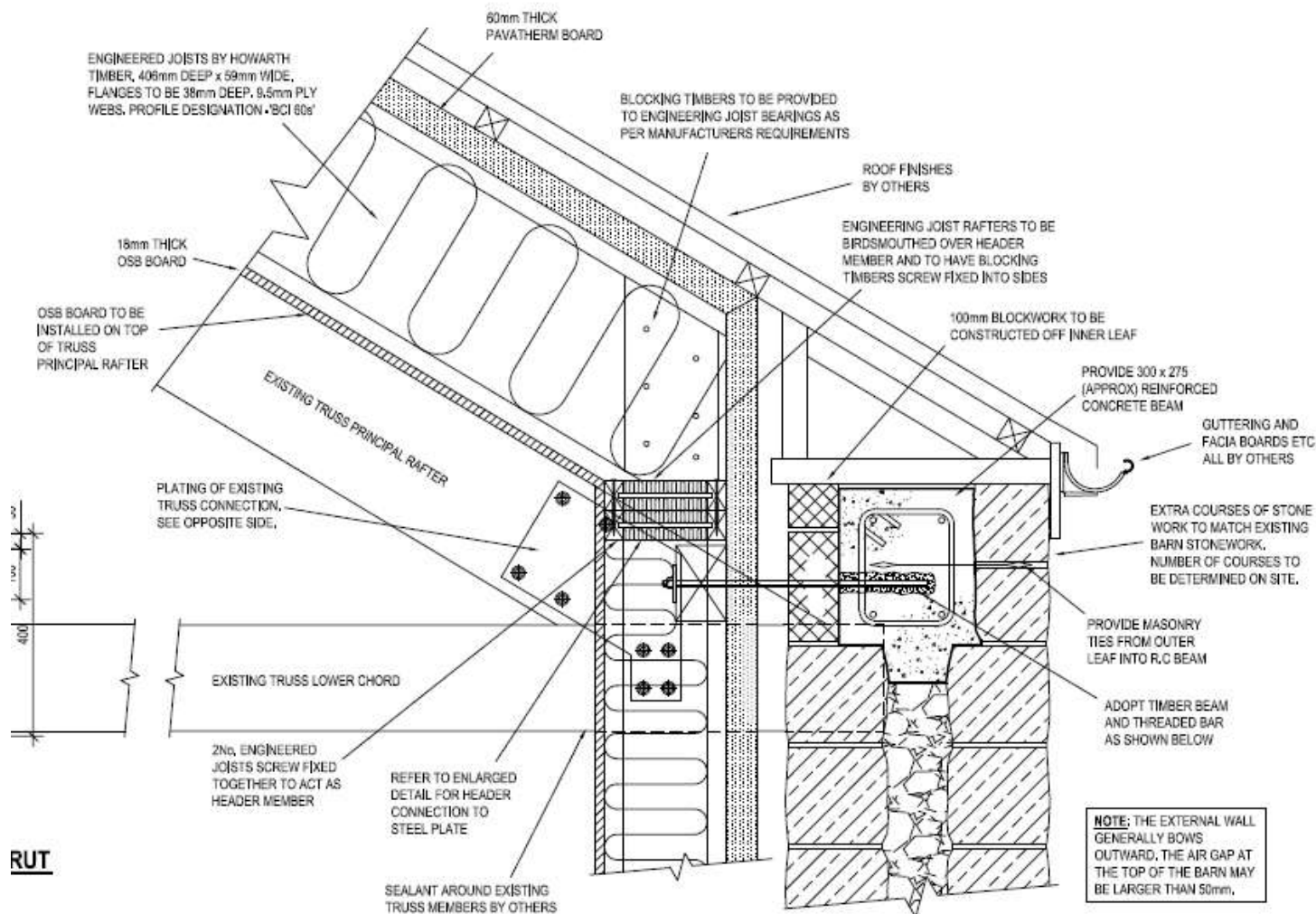
Ventilated cavity



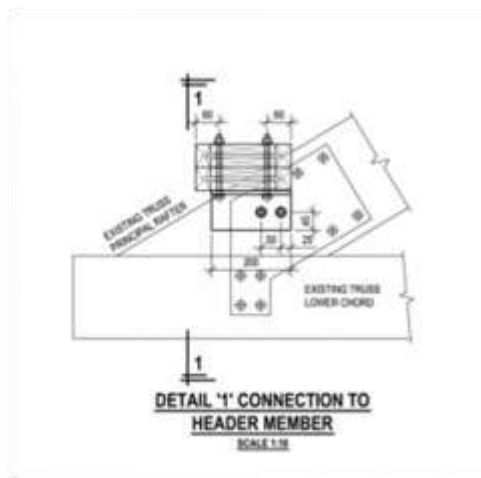




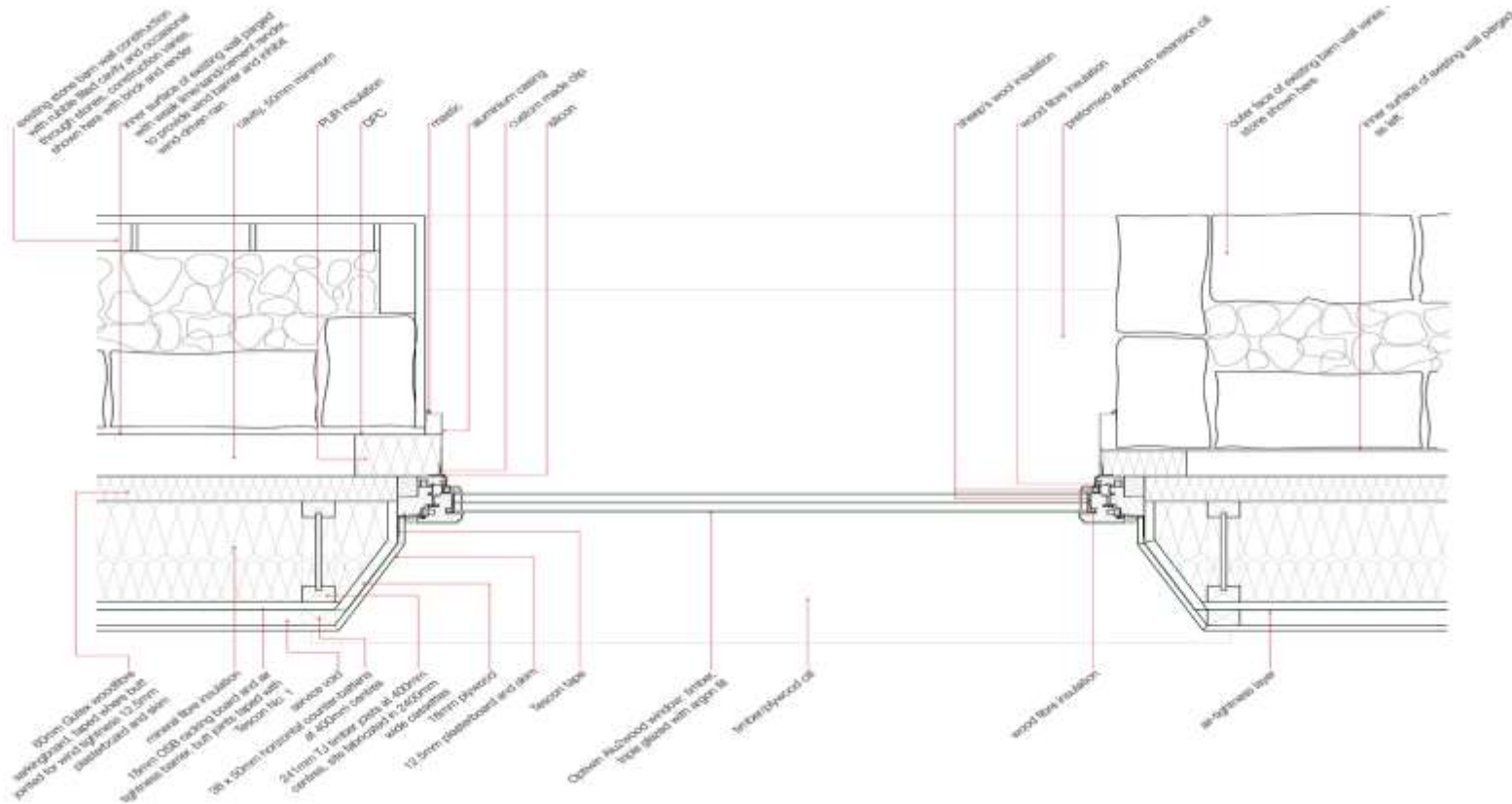




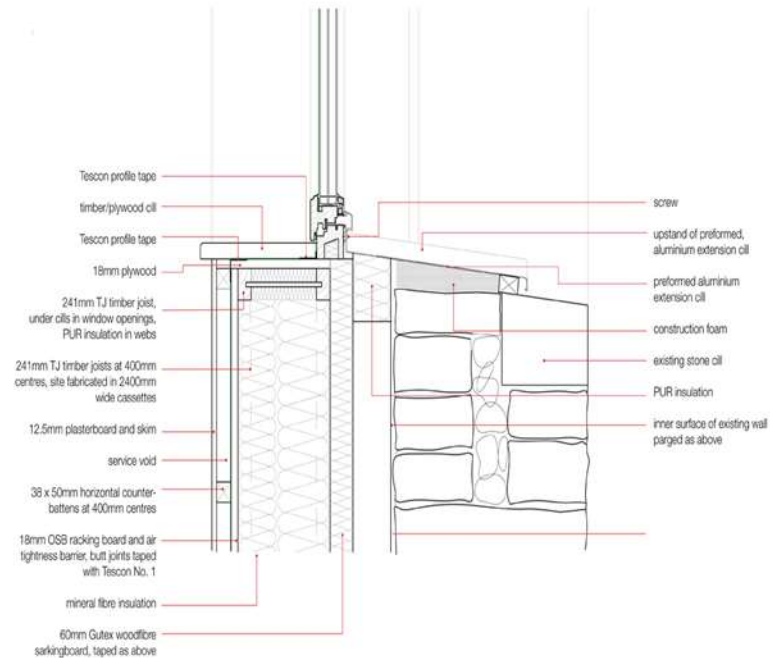
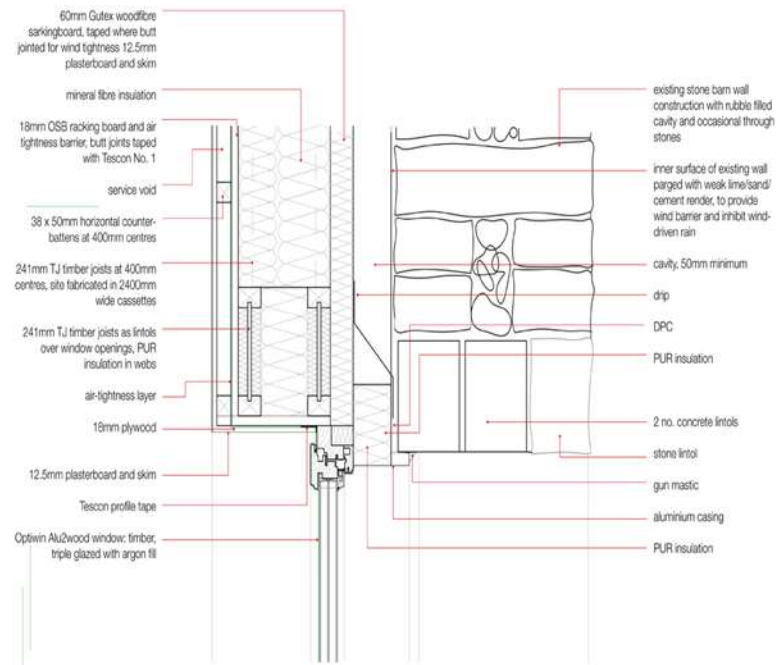
RUT



# Window & door installation



# Window & door installation









# MVHR strategy



# Certification: Elemental route

## 1) Building envelope

Exterior insulation:  $U \leq 0.15 \text{ W/(m}^2\text{K)}$

Interior insulation:  $U \leq 0.35 \text{ W/(m}^2\text{K)}$

## 2) Windows

$U_w, \text{ installed} \leq 0.85 \text{ W/(m}^2\text{K)}$

## 3) External doors

$U_D, \text{ installed} \leq 0.80 \text{ W/(m}^2\text{K)}$

## 4) Ventilation

Heat recovery efficiency  $\geq 75 \%$

More information and guidance on the EnerPHit 'Elemental method' is at:

[http://passiv.de/downloads/03\\_certification\\_criteria\\_enerphit\\_en.pdf](http://passiv.de/downloads/03_certification_criteria_enerphit_en.pdf)











# More information



Free resources on the project are available at:  
[www.greenbuildingstore.co.uk/enerphit](http://www.greenbuildingstore.co.uk/enerphit)