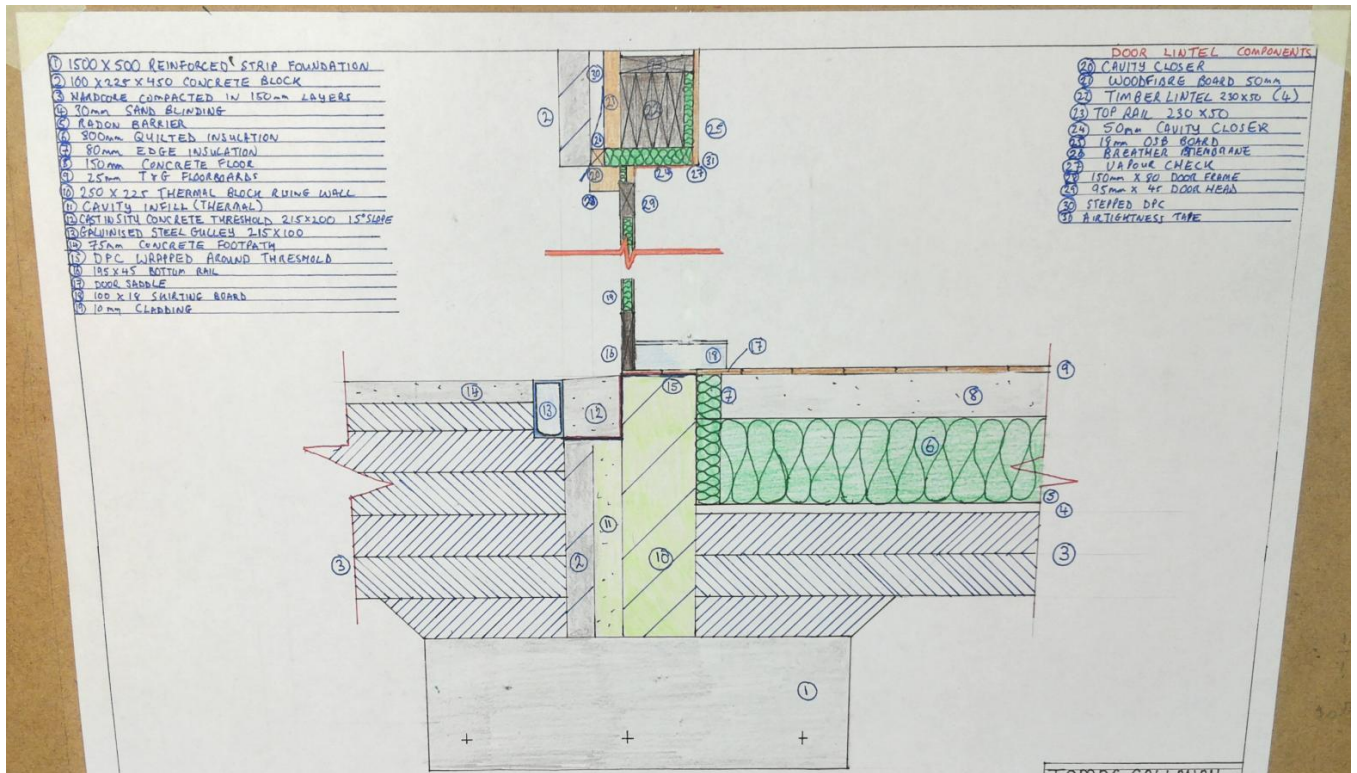
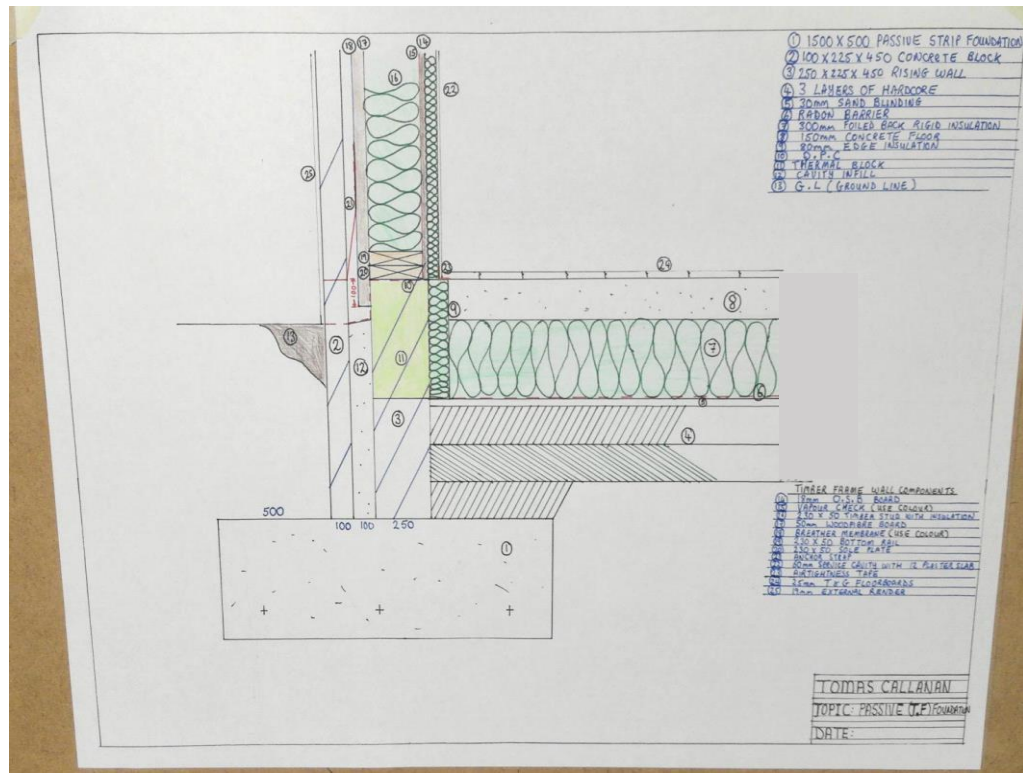
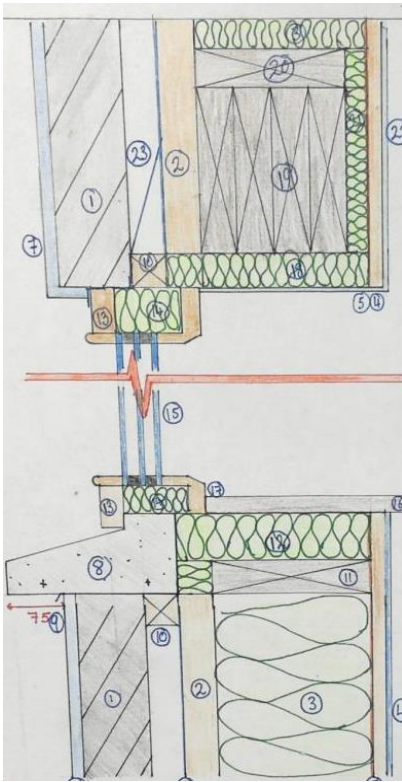


# Timber Frame Cavity Walls

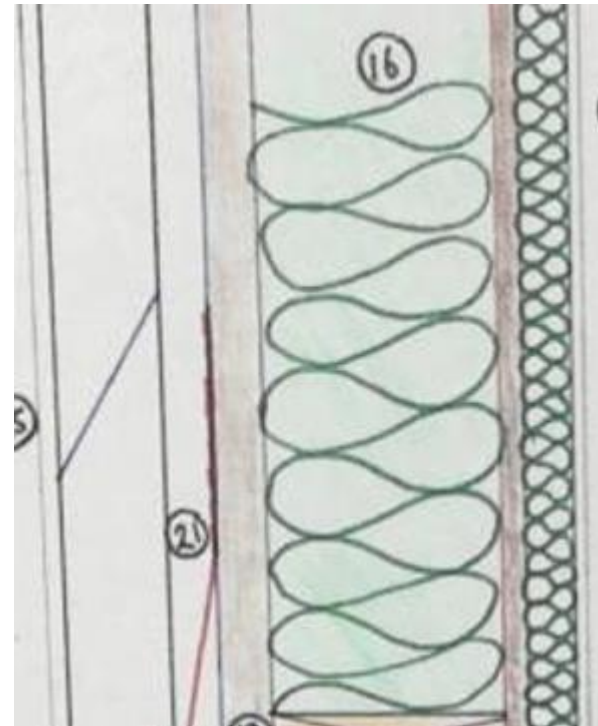


## Timber Frame Cavity Walls

- Similar to concrete cavity walls
- Principles and requirements of timber frame walls are the same as for concrete cavity walls
- Main difference is the inner leaf on timber frame houses is made from timber, the outer leaf remains masonry

## Construction of Cavity Wall

- The timber frame leaf consists of a stud framework sheathed with plywood or OSB board.
- This provides structural stability
- As well as providing a surface to fix the breather membrane.
- Panels are made in a factory and delivered to the site where a crane lifts them into place
- A DPC is fixed to the underside of the panel soleplate to prevent the timber absorbing any moisture from the concrete.
- Ground floor external panels and internal panels are fixed into place first. Then the upper floor panels are lowered and fixed into place. This type of construction is called **platform construction**
- **A wall tie is used to connect the inner leaf to the other masonry leaf. This are nailed to the studs of the timber panel and pulled outward to meet the masonry (where they are built into mortar joints)**



## Structural Stability

- Sheeting material applied to their outer surface
- This sheeting helps prevent racking (side wards collapse when load is applied to the panel)

## Breather Membrane

- External face of the sheeting must be covered with a breather membrane
- Its function is to provide a second line of defence against wind driven rain or moisture that may penetrate the cladding
- It must be water proof but permeable (allow water vapour passing through the inner leaf to enter the ventilated cavity, this will prevent condensation within the wall panel)

## Vapour Check

- Fitting a vapour check between the internal wall and the warm side of the insulation prevents the likelihood of condensation occurring in the cavity due to different internal and external temperature levels
- This stops or checks the progress of moisture which can be generated by cooking, showers and other steam-producing appliances

### **Fire Protection**

- Timber frame wall panels are protected from fire by applying plasterboard to their inner surface. This will protect the timber panels for the required thirty minutes in the event of fire
- To prevent the spread of fire within the wall, fire barrier strips are fixed to the inner leaf around openings, at eaves and verges, and at the junction of party walls and external walls.

### **Insulation**

- In timber frame houses the thermal insulation is placed within the timber panel inner leaf.
- Quilted insulation is placed between the studs of every external panel.

### **Ventilation**

- Unlike block built houses where you seal the cavity in order to trap the air within it. This trapped air acts as an insulator for the wall.
- In timber frame houses it is important to ventilate the cavity so that any moisture that might build up within it can be dried out.
- To achieve this, special ventilators called *perpend ventilators* are placed in vertical joints between the block work in the outer leaf.

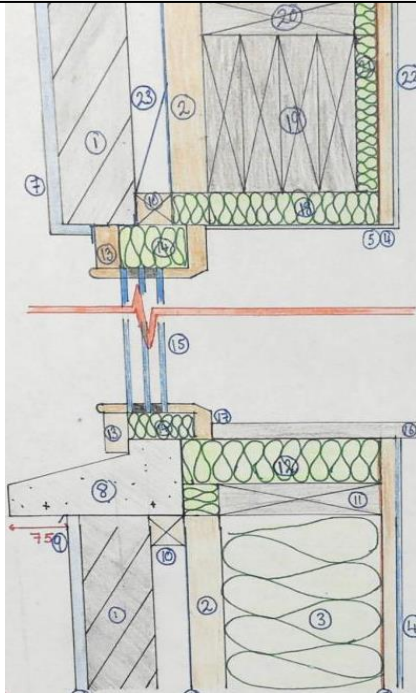
### **Shrinkage**

- When a timber frame house is constructed, a small amount of shrinkage in timbers is common. To accommodate this shrinkage, gaps must be left to allow for the downward movement of the timber structure.

### **Openings in timber-frame cavity walls**

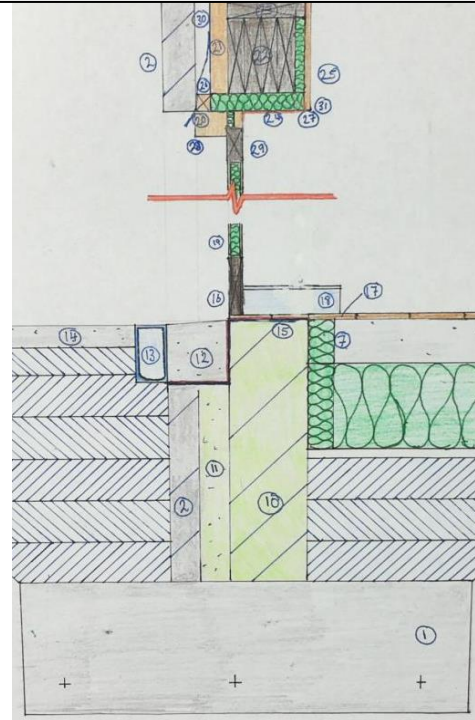
- Timber lintels are used to span openings in the inner leaf. To support this, extra studs are used called *cripple studs* to carry the additional loads.
- A pressure-treated timber batten called a cavity barrier is fixed to the outer surface of the timber panel to seal the cavity around the opening and provide fixing for door and window frames.
- Window cills are slightly smaller than in concrete cavity construction
- Supported by cavity barrier and two courses of DPC are used to prevent the penetration of moisture from either cill or outer leaf

Timber Frame Window Opening



Sketch Detail

Timber Frame Door Opening



Sketch Detail

**Advantages of Timber Frame Cavity**

- Quick to construct, reduced site labour, quickly weather proofed, recyclable, reduced waste during construction, energy efficient, low embodied energy, flexible design, accuracy because of being factory made

**Disadvantages of Timber Frame Cavity**

- Transportation and carriage access, decay if exposed to excessive moisture, exposed to weather before enclosed , hire of crane