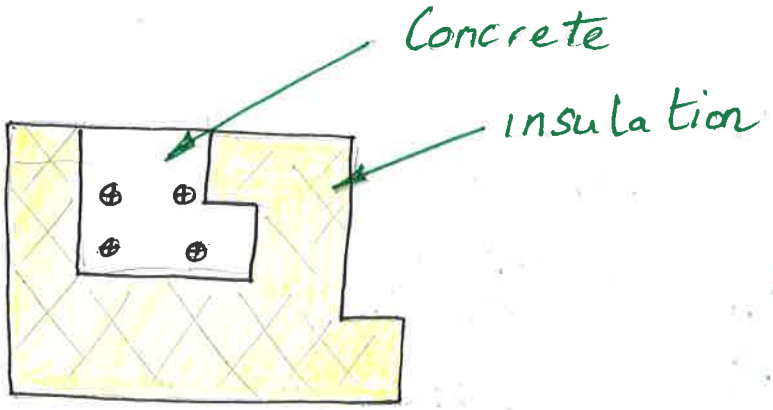
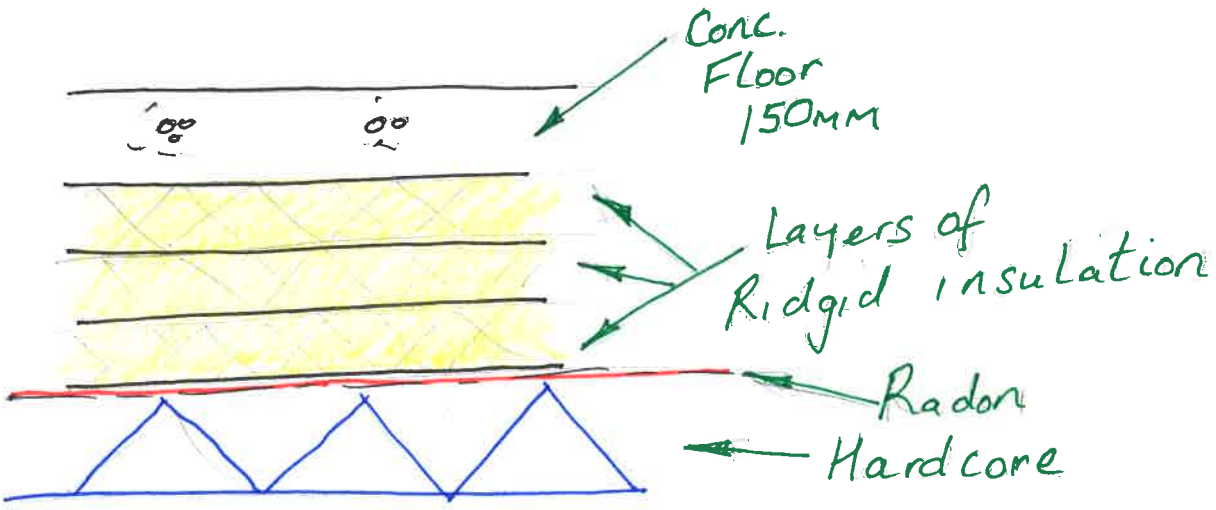
10(a) Foundations



For most passive house the foundation is wrapped in insulation. The insulation acts as a mould for the concrete. This ~~the~~ insulation creates a thermal break between ground and concrete to stop cold entering and heat escaping

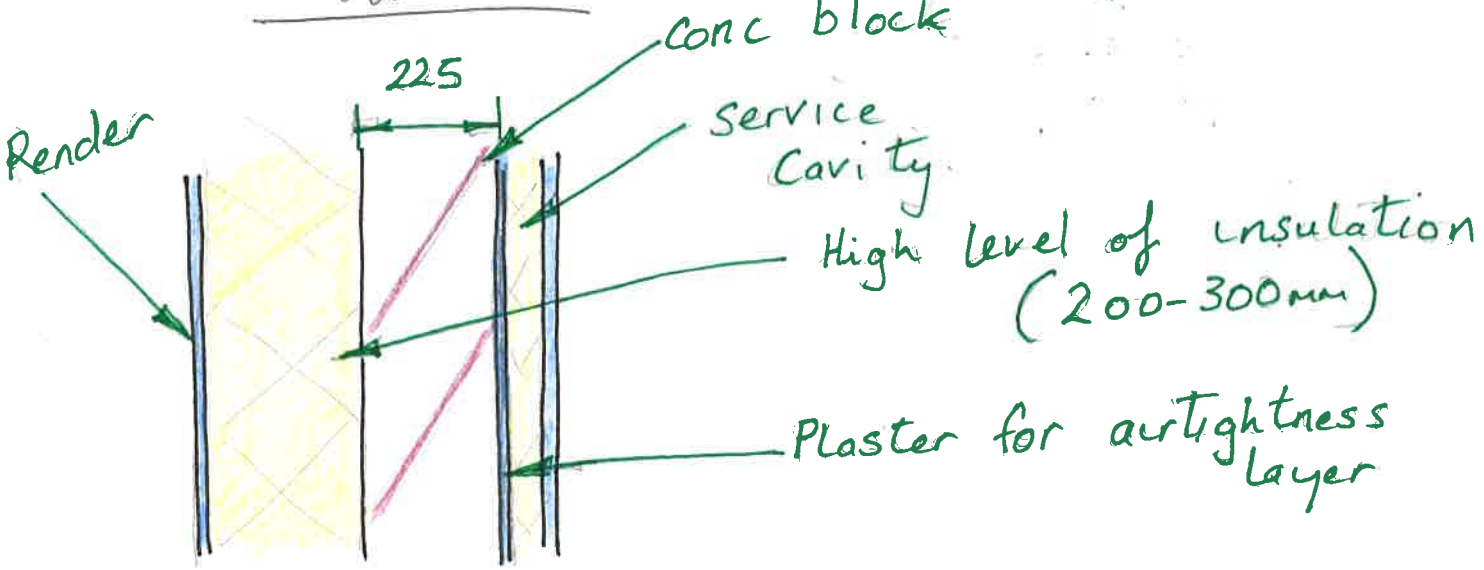
Ground Floor



Ground floors consist of concrete on top of a number of layers of insulation. Standard floors would usually have 150mm but a passive would have 300+ mm. This high level

of insulation will help retain heat inside house and stop thermal bridging. The concrete will act as a heat sink (thermal mass)

Walls

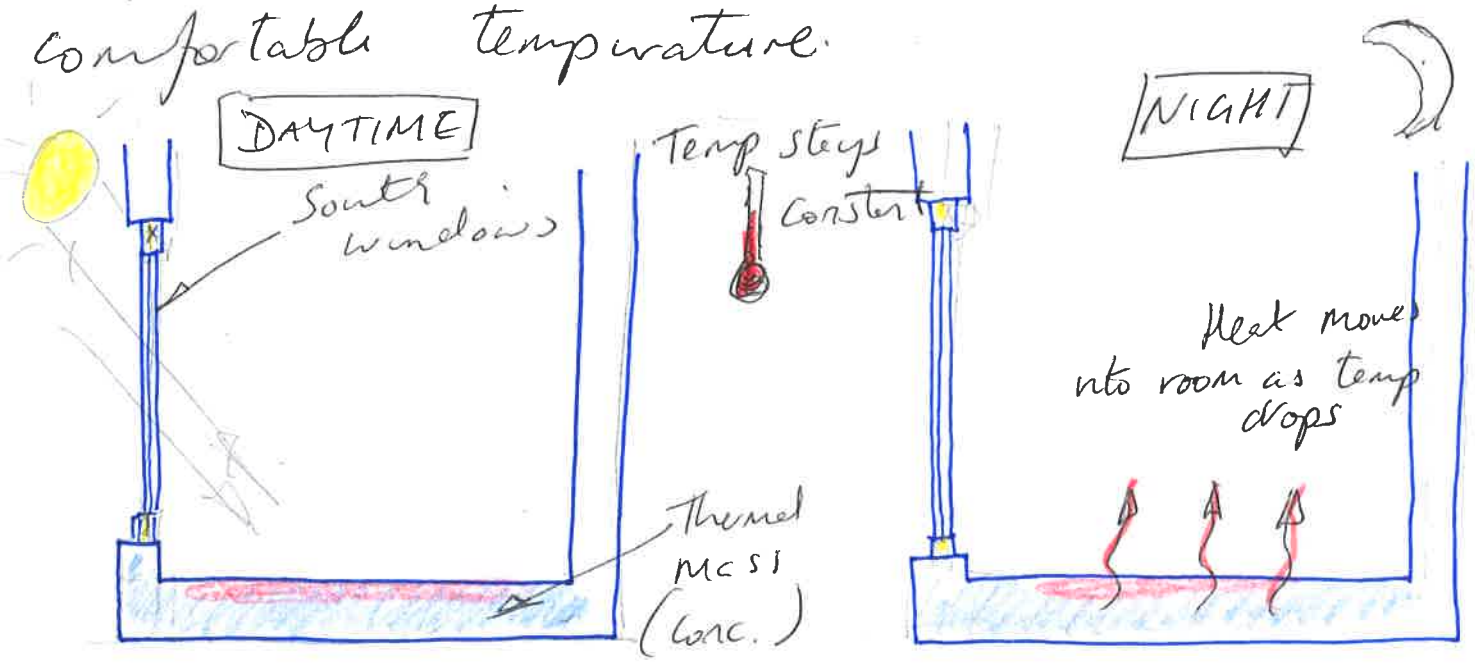


A Passive wall can be built in many ways. Passive is a 'Standard' not a method of building. All ways would show high levels of insulation and airtightness. The wall above has no cavity and is externally insulated with 200-300mm of insulation. It also has a service cavity for electric and plumbing. This way the services will not puncture the airtightness layer.

(b) Thermal Mass

Thermal Mass is the ability of a material to absorb and store heat. Concrete has a great thermal Mass. Thermal mass is essential in a passive house. Without it all sunlight coming through the large South facing windows would create a stuffy feel and overheat the house (i.e. nothing to absorb the heat).

A house with good thermal mass will absorb the heat (either concrete floor or wall) during the day and release it slowly during the evening as the temperature drops. This helps the house maintain a constant comfortable temperature.



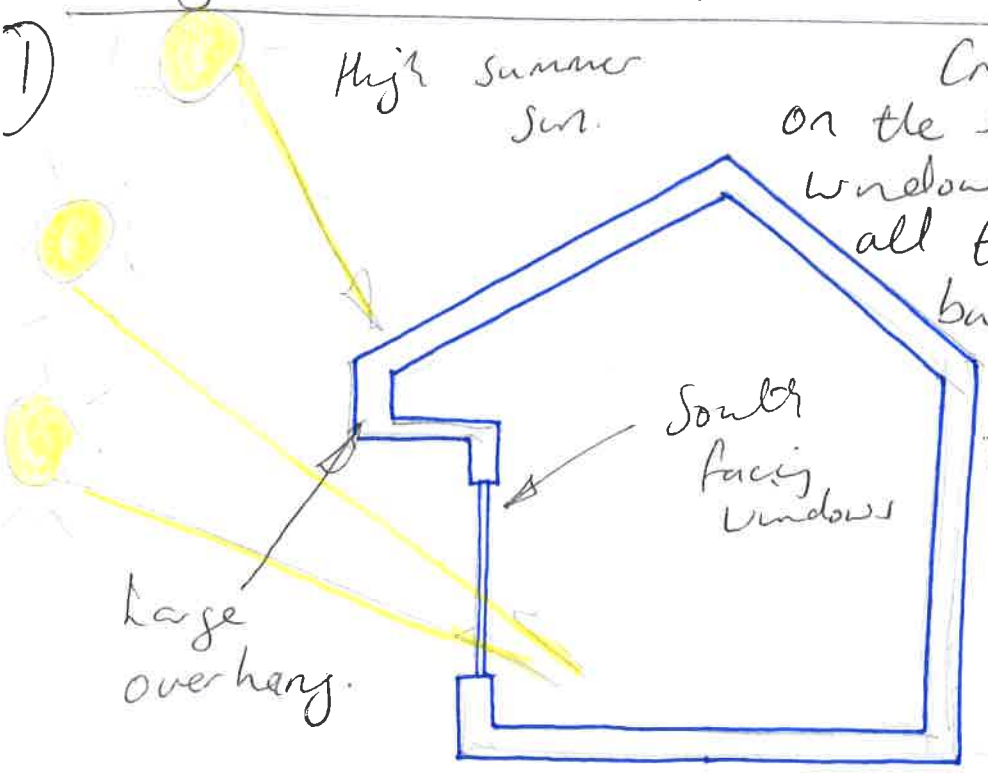
(C) Overheating can occur during Summer in a passive house for various reasons

- Not enough Thermal Mass
- Not enough Solar Shading on South facing windows
- MHRV not working correctly

- If there isn't enough thermal mass the heat generated wont be able to be absorbed leading to overheating.
- If there isn't any solar shading too much high summer sun could enter the building leading to overheating

Design detail to prevent overheating

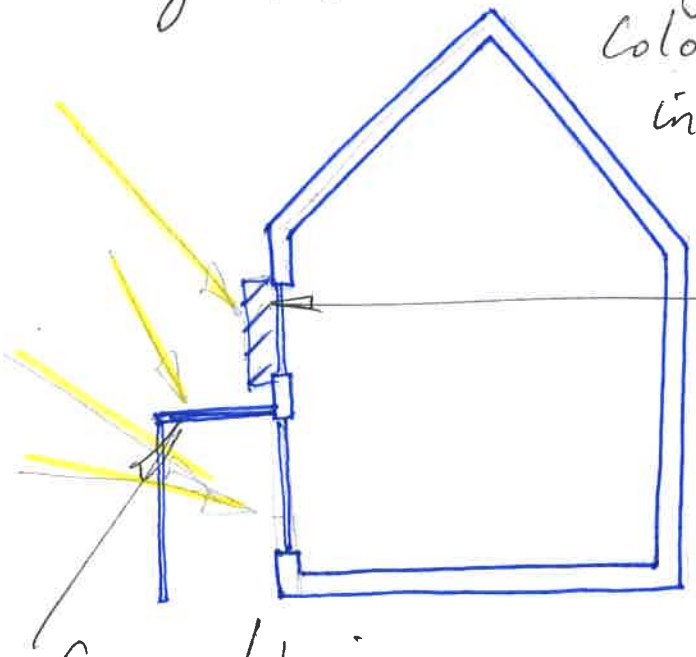
1)



Create a large overhang on the eaves of South facing windows. This will let in all the low winter sun but will block the high summer sun. That is when it is at its hottes

(2) brise soleil / canopy.

a brise soleil will shade the house from the interse high summer sun. This will reduce overheating during the summer. Many moden buildings have incorperated colourful or unusual designs into their brise soleil



Brise soleil — Anything which will shade the house from the high sun.