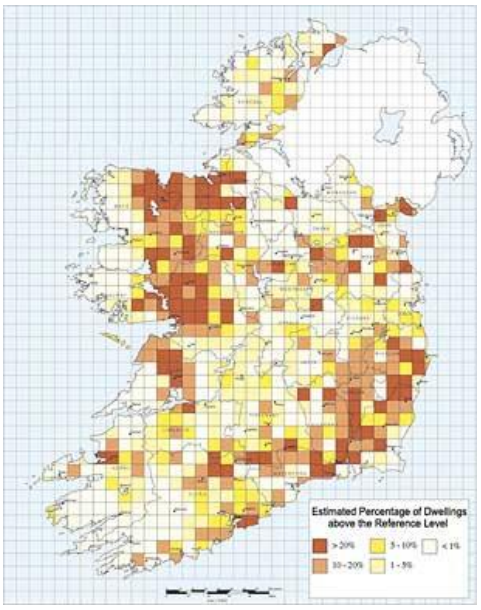
Floors and Radon Barriers

Radon

- *Tasteless*
- *Colourless*
- *Odourless*
- *Radioactive gas*
- *Given off by the decay of radioactive material*

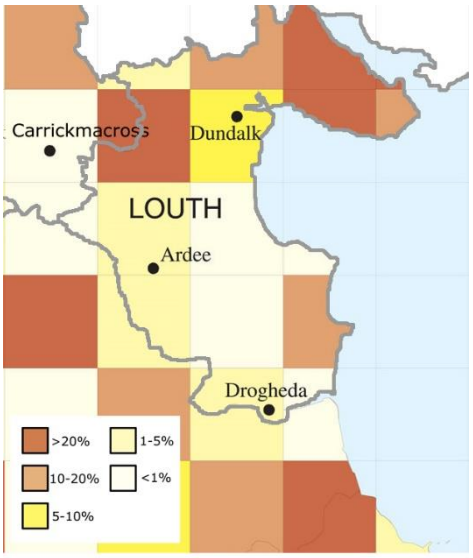
Radon enters a building :

- *Cracks through the walls and floors*
- *Gaps in floors and around services*
- *Junctions between floors and walls*



Example of a Radon Map

The darker the area the greater the number of homes above the reference level for radon



Radon System: Passive

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Passive system

- A radon-proof membrane is laid down on top and is sealed at all junctions.

Result

- Radon given off under the house cannot pass above the layer of radon membrane.

Radon System: Active

Active system

- A void is created in the hardcore with a pipe leading to the exterior of the building.
- A radon-proof membrane is laid over the foundations similar to the passive system.
- A fan may also be attached to the pipe from the sump to aid ventilation.

Result

- Radon will find its way into the void from the hardcore and then filter out to the exterior along the pipe.

"Top hat" seal around services passing through the radon barrier

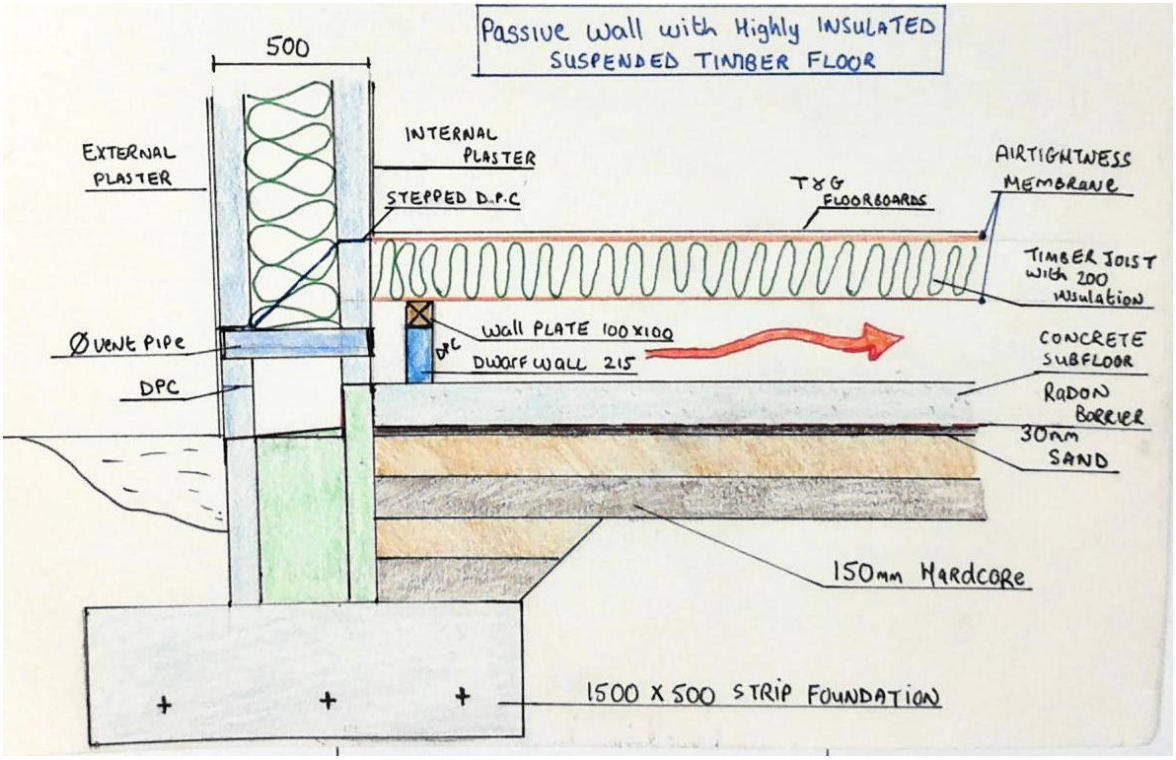
Similar Components in all Ground Floors:

Solid floor

- Hardcore
- Blinding
- Radon barrier/DPM & DPC
- Insulation
- Sub floor

Main Floor Types:

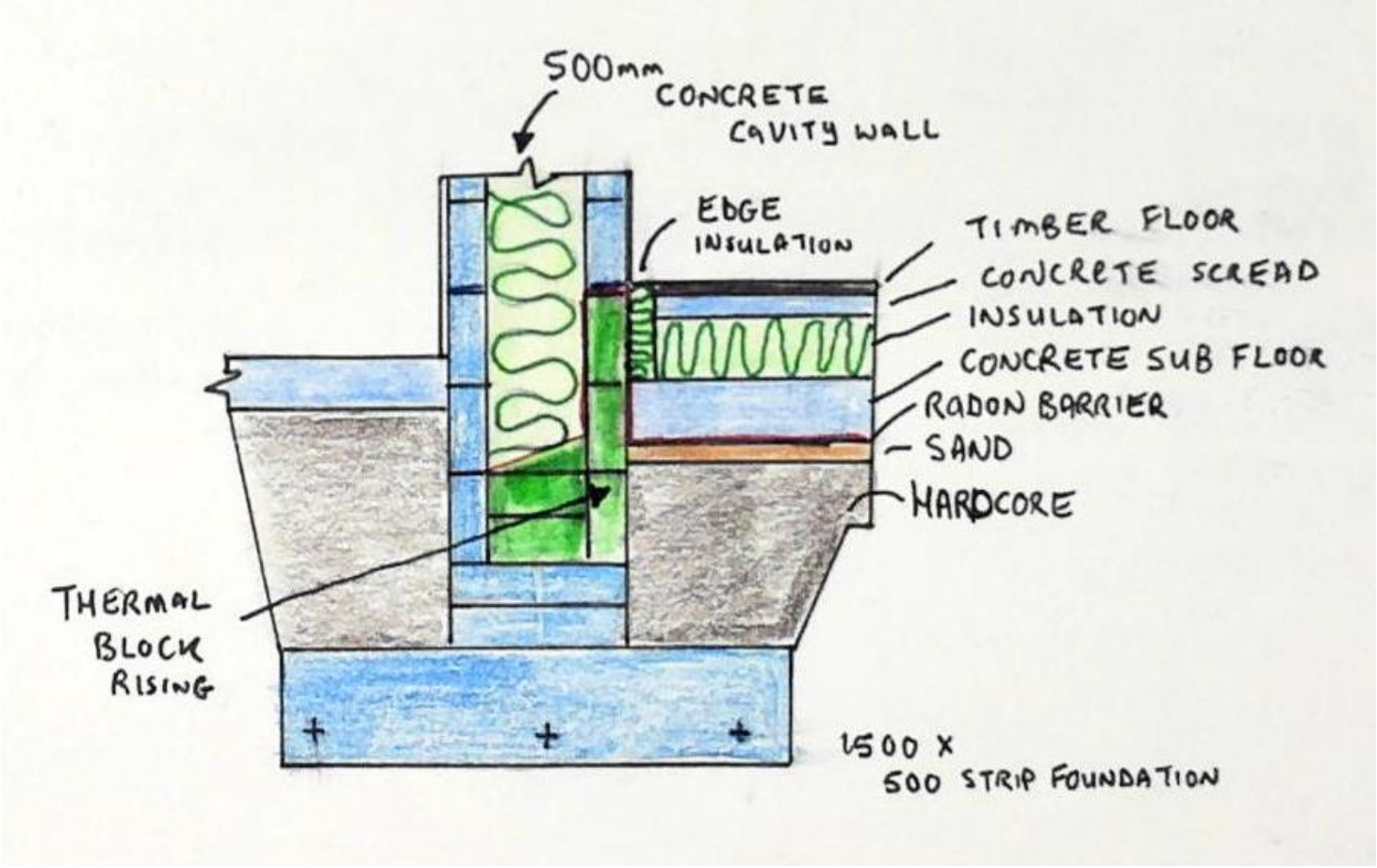
Suspended Timber Floor



Above is a sketch of a Suspended Timber Floor.

- The main materials used in the type of floor is Concrete and Timber.
- Since timber is being used, rot can become a major issue.
- To counteract this issue ventilation is needed under the suspended timber floor.
- A vent pipe is placed inside the Concrete Cavity wall to allow ventilation to flow underneath.
- The floor is raised of the ground with a Dwarf/Tassel Wall and the floor is fixed to a timber wall plate 100 x 100mm.
- DPC is placed between the Tassel Wall and Wall plate to stop any moisture passing through the concrete block
- The sketch is upgraded to improve its U Value to meet the NZEB standards
- The Timber joist is heavily insulated with 200 mm of Quilted insulation
- It is then sealed with an Airtightness membrane on top and the bottom of the Joist
- Stepped DPC is placed from floor level to the top of the Vent Pipe

Suspended Concrete Floor



Above is a sketch of Suspended Concrete Floor

- The main materials needed for this type of floor is insulation and Concrete
- Since there is no timber being used, no vent pipe is needed in the Concrete Cavity wall
- The sketch is upgraded to improve the U value to meet the NZEB standards
- Thermal Blocks rising from the Passive Strip Foundation is crucial to further eliminate cold bridging from forming between cold materials
- More Edge Insulation is placed between the Wall and Concrete Screed
- Over 200mm of insulation is placed underneath the Screed to improve the U value and to stop further cold bridging
- DPC is placed in the wall at Floor level
- Hardcore is compacted in 150 layers

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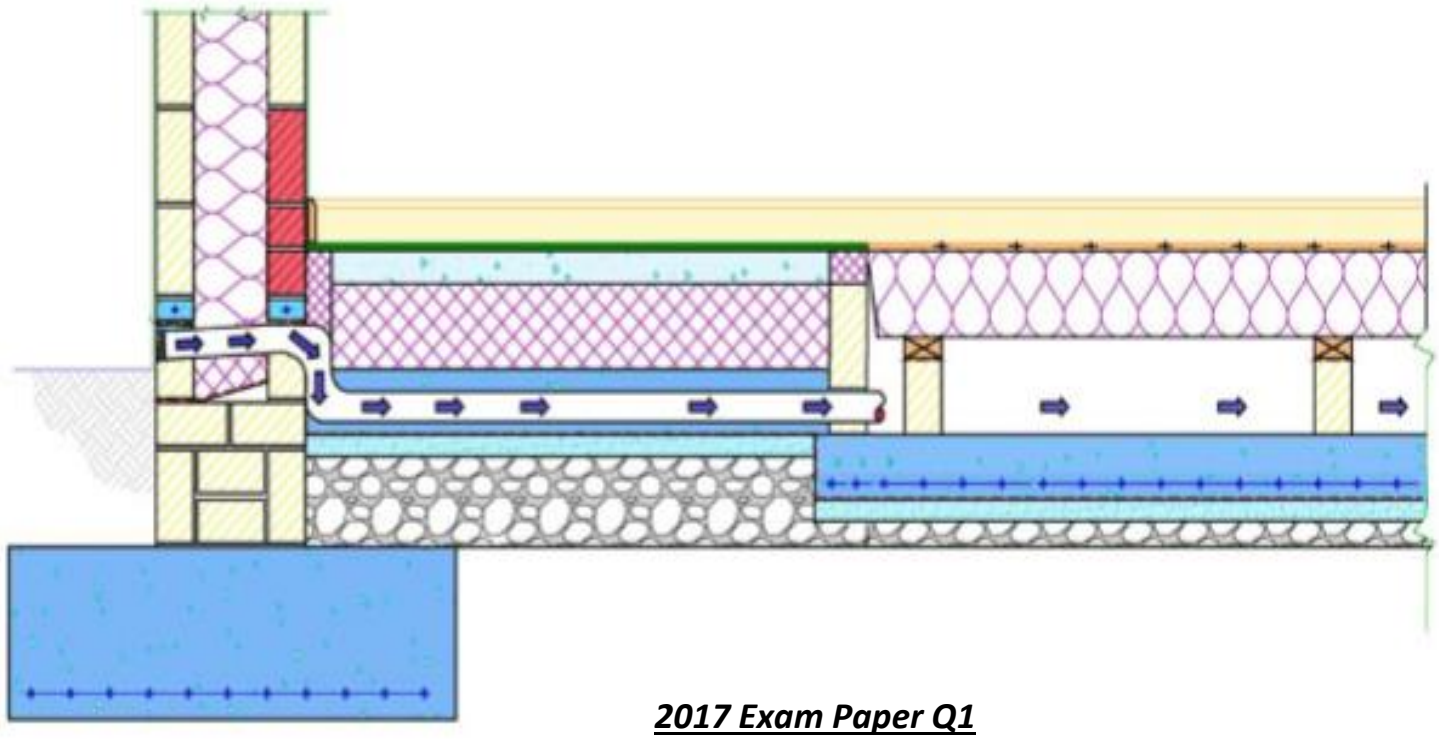
Linked Concrete to Suspended Timber Floor



2017 Exam Paper Q1

Above is a drawing of a Linked Concrete Floor and Suspended Timber Floor

- This drawing is from the Marking Scheme of the 2017 Construction Paper Q1 (SEC)
- It is a combination of the previous two floors
- The main components are almost exactly the same
- The key difference is the vent pipe
- The vent pipe has to be a lot longer as it has to go through the Concrete Subfloor until it reaches the timber floor.
- This is necessary as without the ventilation from the vent pipe, there will be a build-up of moisture and air.
- These conditions will affect the timber material
- The main thing with this drawing is that both floors should end up at the exact same level

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