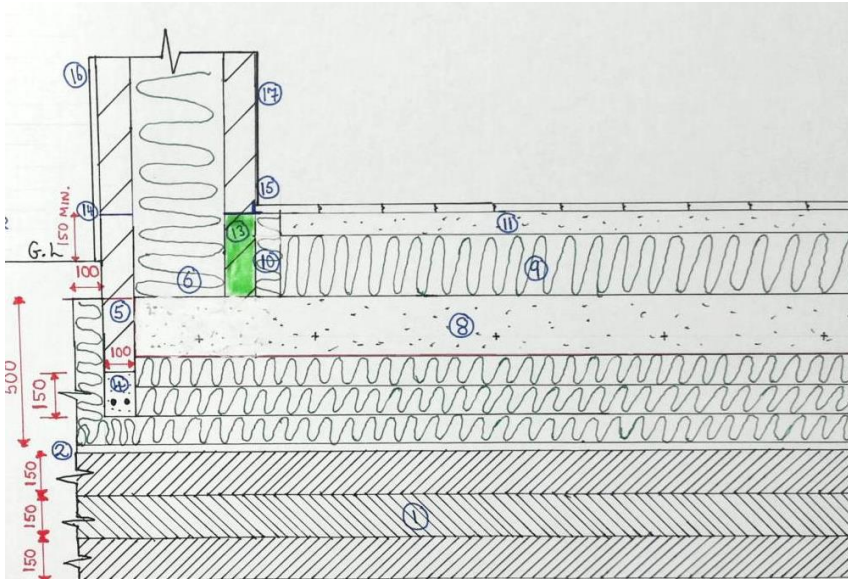




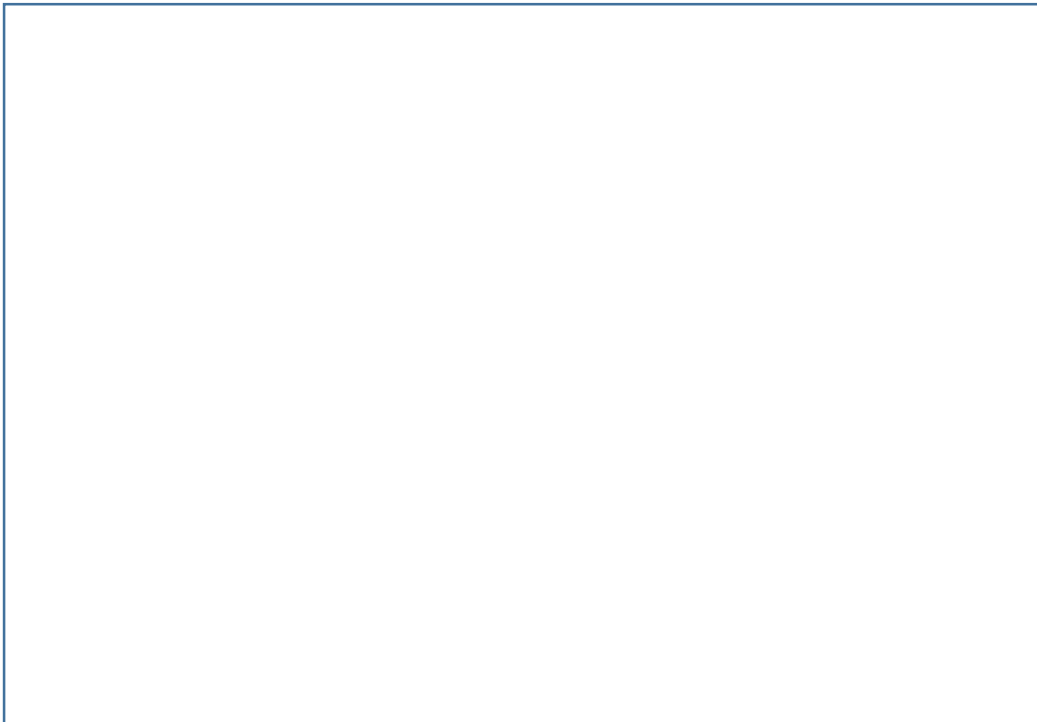
## Raft Foundation

- A raft foundation is a large concrete slab covering the whole building area.
- All loads are transmitted through the raft to the soil
- Rafts are suitable for low load bearing soils, such as soft natural ground or made-up ground.
- Rafts consists of a reinforced concrete slab up to 300mm thick, with the slab thicker under load bearing walls



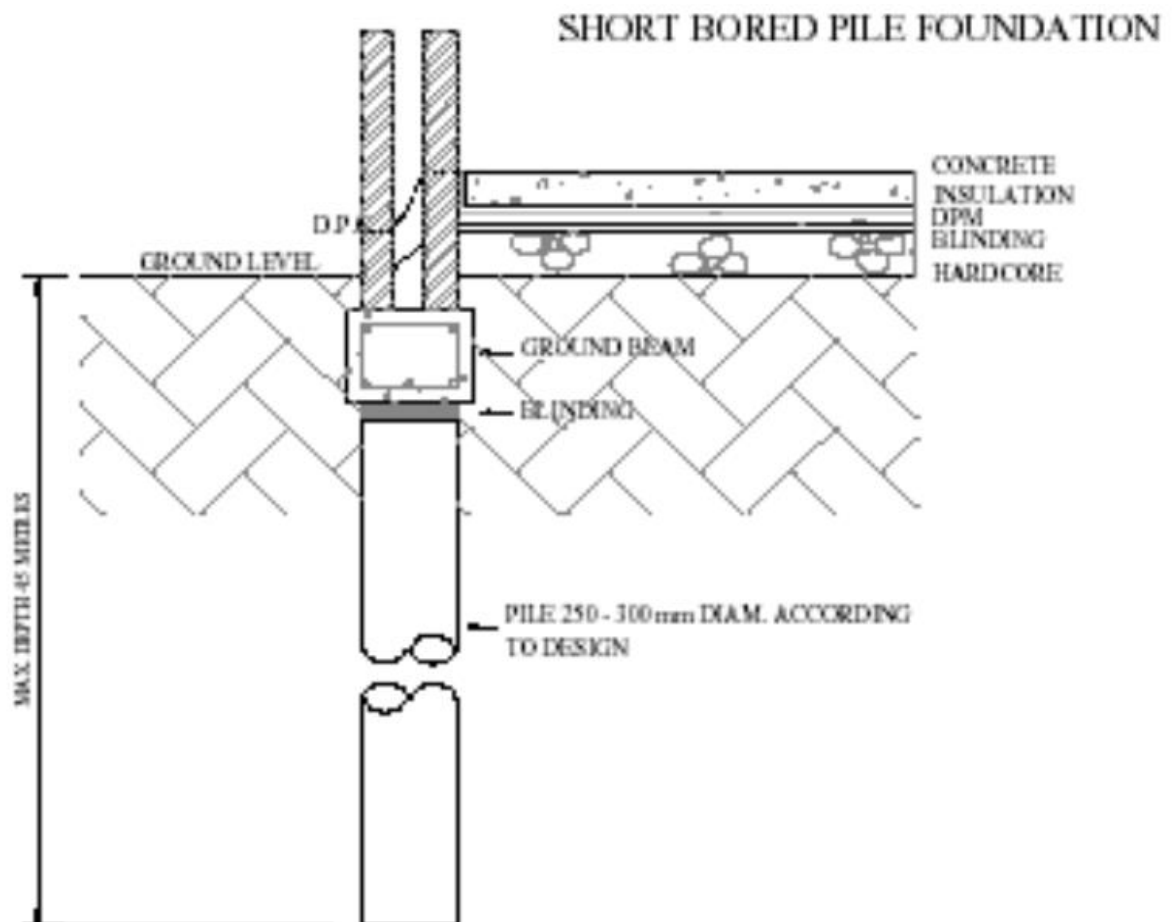
- Hardcore
- Concrete raft
- Steel mesh reinforcement
- Radon barrier
- Insulation
- DPC 150mm min. above Ground Level

My Sketch



## Short Bored Pile Foundation

- Avoid excessive excavation in subsoils of poor load bearing capacity.
- System of short concrete piles cast in holes bored in the ground and spanned by light reinforced concrete beams.
- Holes bored by mechanically operated auger to depth of 1.5-3.5m depending on ground conditions.
- Immediately filled with concrete
- Reinforcing bars placed into the top 600mm of concrete to connect the piles to the ground beams



### **Why choose a Strip Foundation?**

#### **Traditional strip foundation – reasons**

- Suitable for moderately firm clay sub soil
- Easily constructed, easily filled and levelled
- Economical in terms of materials, especially aggregate, cement and mild steel
- Economical in terms of labour

### **Why choose a Raft Foundation?**

#### **Raft foundations – reasons**

- Suitable for soils of poor load-bearing capacity
- Faster to set out and remove – saves on labour costs
- Reduction in settlement as the loads are spread evenly over the entire area of the house
- Mesh reinforcement reduces the risk of differential settlement
- Allows for a change of internal layout as load-bearing walls may be positioned anywhere on the raft.

### **How do you ensure maximum strength of concrete in you foundation?**

Correct site preparation. The bottom of the trench should be level and free of loose soil particles

- Use of good quality materials – clean aggregates correctly sized
- Correct batching of fine and coarse aggregates, batching by weight is the most accurate, correct water /cement ratio
- Correct placement of reinforcement - should be designed by structural engineer Reinforcement – minimum cover of 75 mm to prevent corrosion
- Concrete should be allowed cure before any blockwork is placed on the foundation (28 days recommended)
  - Concrete should be protected from extreme heat or cold during the curing process
  - Too high a water / cement ratio (ideal 0.6) - mix too wet - greatly weakens the concrete
- Use sulphate resisting cement where necessary
- Correct vibration/compaction of the concrete to ensure that there are no air voids in the foundation
- Avoid excessive vibration as this may lead to a segregation of the aggregates
- Placement of concrete – should not be dropped from a height.

## Homework: 2013 Exam Paper Q.8

8. (a) Discuss in detail, using notes and freehand sketches, **two** functional requirements of a foundation suitable for a dwelling house.
- (b) A trial hole, as shown in the sketch, indicates a moderately firm clay subsoil for the foundations of a dwelling house. The external wall of the house is a 350 mm solid concrete block wall with an insulated cavity. Consideration is being given at the design stage to using either:
- a traditional strip foundation *or*
  - a raft foundation.



Show, using notes and annotated freehand sketches, the typical design detailing for **each** type of foundation.

Recommend a preferred foundation for the house and give **two** reasons for your recommendation.

- (c) Discuss in detail **three** best practice guidelines that should be observed to ensure the maximum strength of concrete in a foundation.

Page 4 of 5

## Homework: 2017 Exam Paper Q.9

9. (a) A reinforced concrete strip foundation supports a 400 mm concrete block external wall with an insulated cavity, as shown. Using notes and freehand sketches, show the typical design detailing of the **foundation**. Indicate the position of the reinforcement in the foundation. Specify **three** typical dimensions and discuss the reasons for the dimensions you have specified.
- (b) Using notes and freehand sketches, discuss the importance of **each** of the following to ensure the maximum strength of concrete in the foundation:
- mixing
  - placing
  - compacting
  - curing.
- (c) Using notes and freehand sketches, describe **one** test that may be carried out to measure consistency in the quality of all concrete delivered to a site.

