Introduction to Infrastructural Engineering

Building Structure

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Chapter Description

- What is concrete?

  -Concrete is a composite material composed of water, coarse granular material (the fine and coarse aggregate or filler) embedded in a hard matrix of material (the cement or binder) that fills the space among the aggregate particles and glues them together.

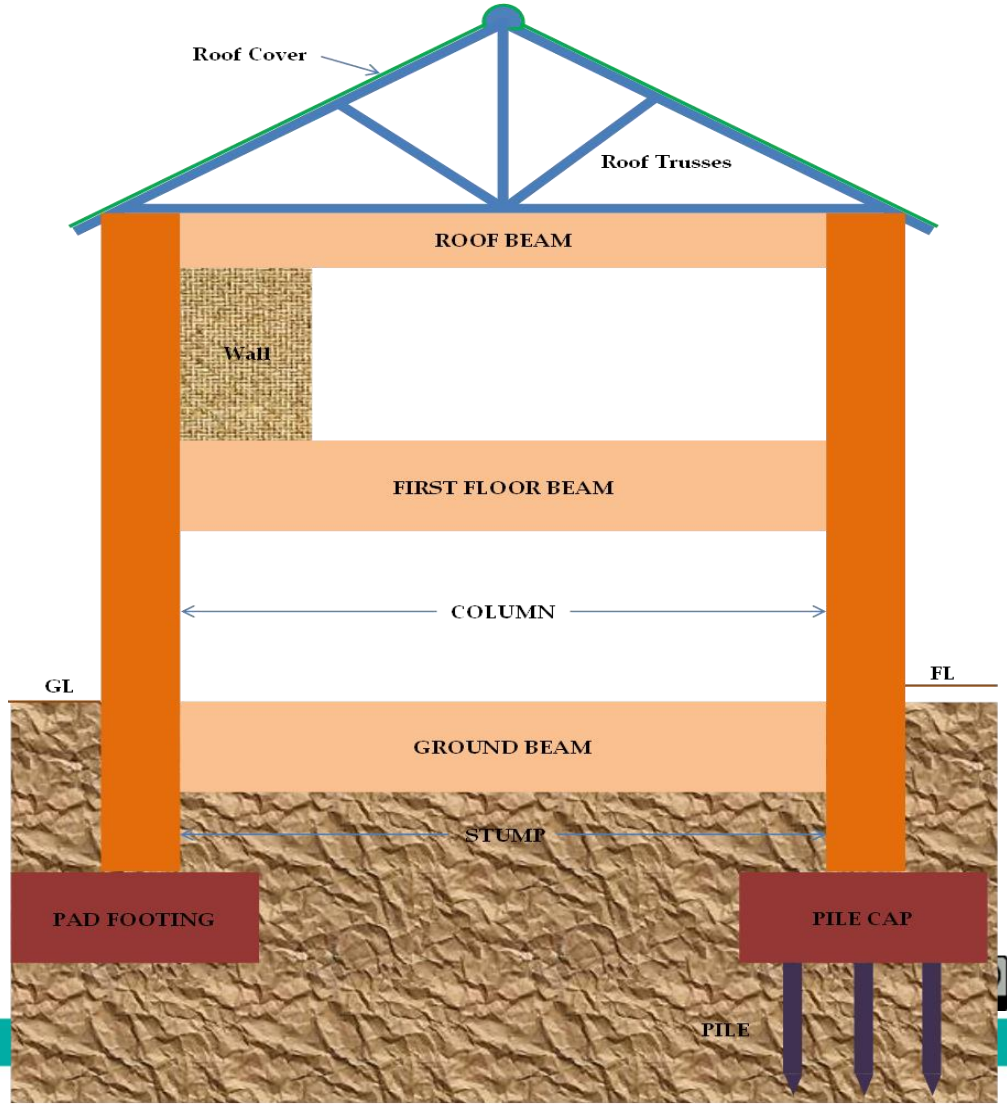
- What is Reinforced Concrete?

  -concrete in which metal bars or wire is embedded to increase its tensile strength

Reinforced Concrete

1. Cement
   - Ordinary Portland Cement
   - Rapid Hardening Portland Cement
   - Sulphate Resisting Portland Cement
   - Portland Pulverized-Fuel Ash Cement
   - Portland Slag Cement

Typical RC Building Structure



Reinforced Concrete

2. Aggregates
   - Naturally occurring sand, granite or limestone.

   i. Course Aggregates
      - Comply with MS 29.
      - Work below ground level, only crushed granite shall be used.

Reinforced Concrete

ii. Fine Aggregates

- the term of ‘sand’ is used to mean ‘fine aggregate’.

3. Water

- Clean and free from materials deleterious to concrete in plastic and hardened state.

Classification of Concrete Mixes

1. Requirements for Concrete

   i. Workability

   - The workability of the fresh concrete shall be judged by its suitability for the condition of handling and placing so that after compaction, it surrounds all reinforcement, tendons and ducts, and completely fills the formwork.

Classification of Concrete Mixes

- Methods
- Slump Test
- 75 ± 25mm or ± one third of the ‘designed workability’, whichever is greater.

- Compacting Factor
- ± 0.03 where the ‘designed workability ≥ 0.9
- ± 0.04 where the ‘designed workability between 0.8 and 0.9
- ± 0.05 where the ‘designed workability ≤ 0.8