FLOORS

FLOOR

Part of a building on which materials are stored and occupants move.

TYPES OF FLOORS

Ground Floor

- Floor constructed on ground

Upper Floor

- Floors constructed above ground floors

Basement Floor

- Floors constructed below ground level

GROUND FLOOR

Floor constructed immediately above ground level

COMPONENTS OF GROUND FLOOR

- **SUB-FLOOR OR BASE:**
  - Sand
  - Earth filling
  - Cement concrete base
- **FINISHINGS**
  - Stone slabs
  - Wooden blocks, sheeting
  - Bricks
  - Tiles
  - PVC tiles and sheets
  - Concrete

PROPERTIES OF A GOOD GROUND FLOOR

Durable	Good Appearance	Damp Proof	Fire Resistant
Resilient	Easy to Clean	Economical	Low Maintenance Cost

TYPES OF FLOORS

Mud or Moorum Flooring

Brick Flooring

Stone Flooring

Cement Concrete Flooring

Tiled Flooring

Terrazzo Flooring

Mosaic Flooring

Wooden Flooring

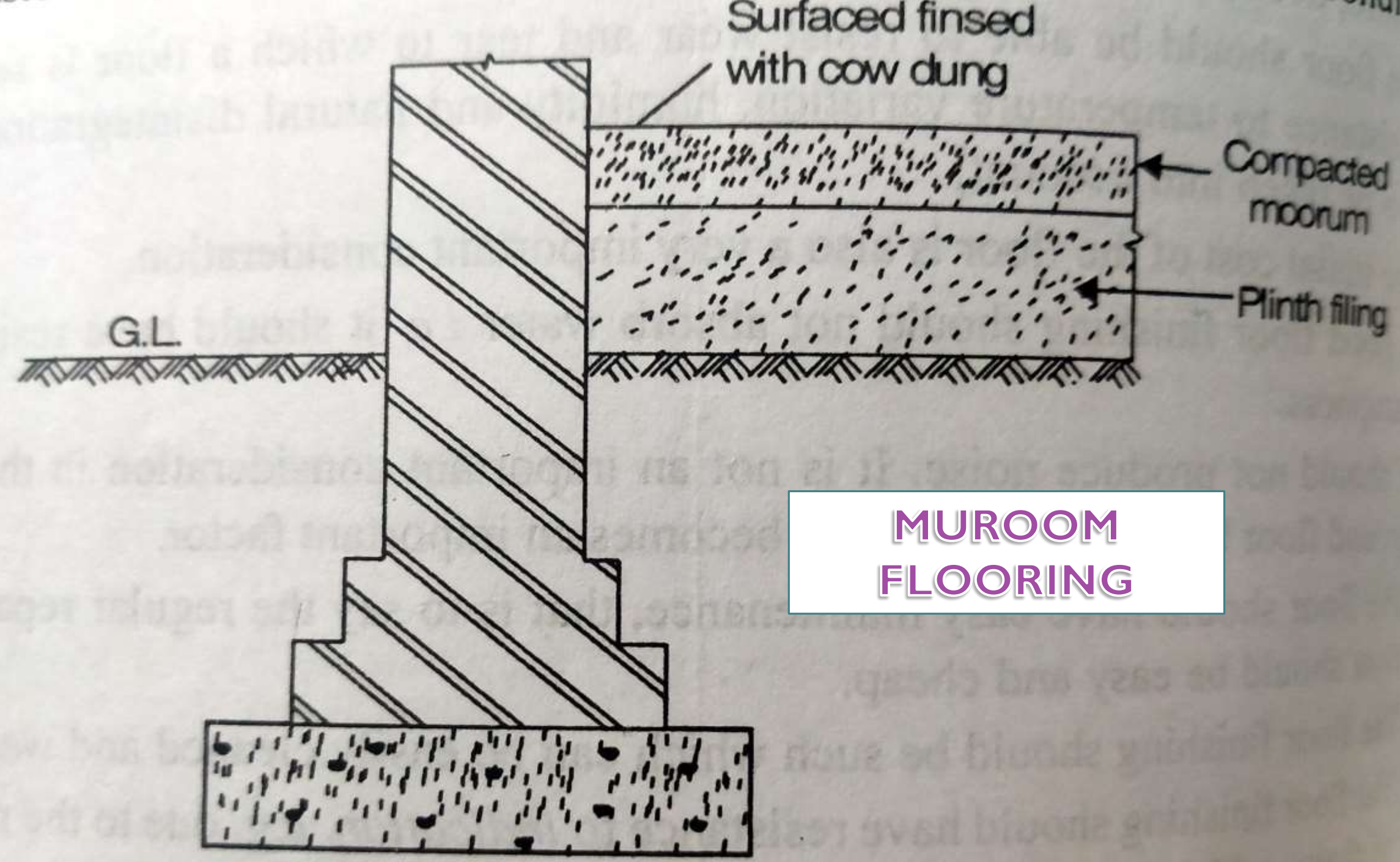
Granolithic Flooring

MUD OR MOORUM FLOORING

- Low cost dwellings
- Cheap, durable, hard, impervious, easy to construct and maintain
- Warm in winters, cool in summers
- Not hygienic, can crack with temperature variation

Method of construction of Mud Flooring

- Ordinary earth or sand is filled in the plinth nearly 15 cm below the proposed floor level. It is rammed and water is sprinkled
- Good quality earth or moorum is mixed with water and kneaded well. Chopped straw may also be added to prevent summer cracks in floor.
- This prepared earth is spread evenly over the base to a thickness of 25- 50 mm and consolidated by ramming without adding any water
- After compaction, whole surface is saturated with water and left for one day.
- Surface is coated with a paste of cow dung and water (1 part cement can also be added to 4 part cow dung)
- Surface is wiped cleaned after drying and cured for 2-3 days by water.



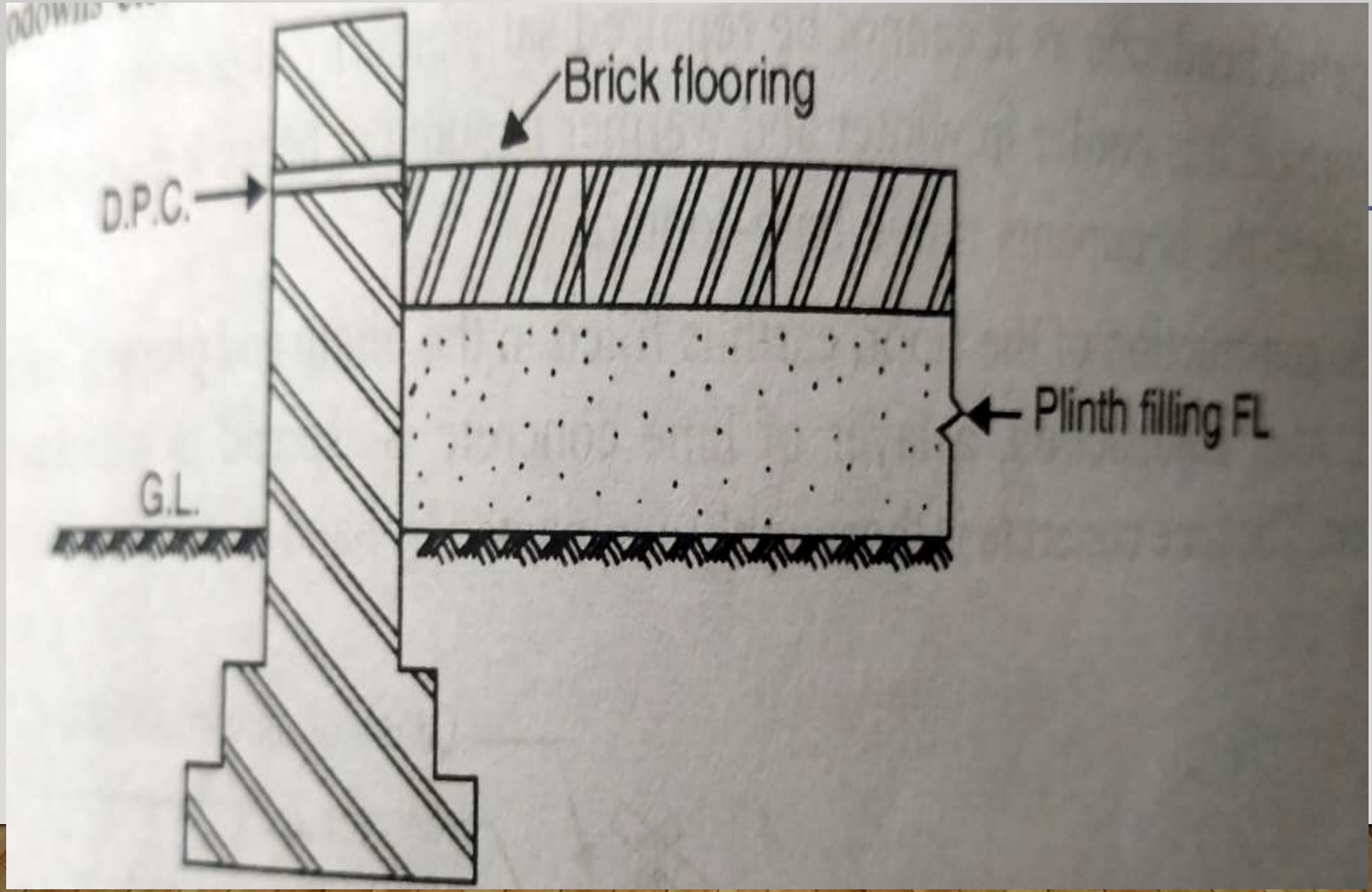
MUROOM FLOORING

BRICK FLOORING

- Courtyards, stores, godowns, garages and garden paths
- Durable, economic, easy to construct and repair, non-slippery, does not crack due to temperature variation
- Cannot be washed and cleaned easily, absorbent in nature

Method of construction of Brick Flooring

- Sand or earth is filled upto plinth level and consolidated well by adding water
- Base course of lean cement concrete 1:4:8 or 1:5:10 laid over entire floor area
- When base is sufficiently hard, 12 mm thick cement mortar (1:$ or 1:5) is spread over the base course and bricks are laid either flat or on edge according to the desired bond. Bricks must be soaked in water before laying
- Joints should be made flush and floor should be cured for 7 days


Brick flooring
D.P.C.
Plinth filling FL
G.L.

STONE SLAB FLOORING

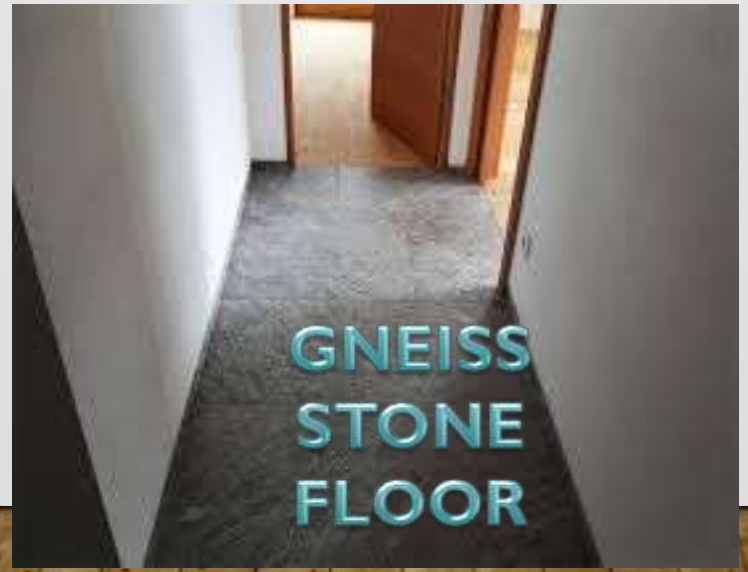
- Used in railway platforms, godown, warehouses, courtyards, marble stones used in kitchen, bath, entrance
- Slabs of stones having thickness 5 to 7 cm used
- Types of stones used: sandstone, gneiss, slate (slate thickness 2-3 cm), granite, marble
- Strong, durable, can take heavy loads
- Used only where stone is easily and cheaply available


MARBLE
FLOOR


KOTA
STONE
FLOOR


SLATE
FLOOR

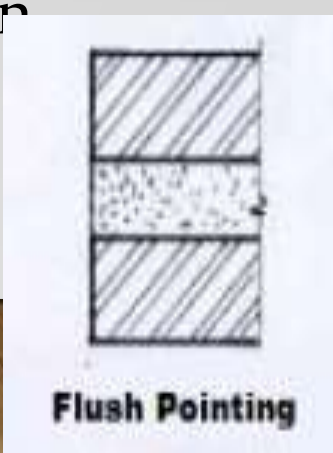

SANDSTONE
FLOOR


GNEISS
STONE
FLOOR

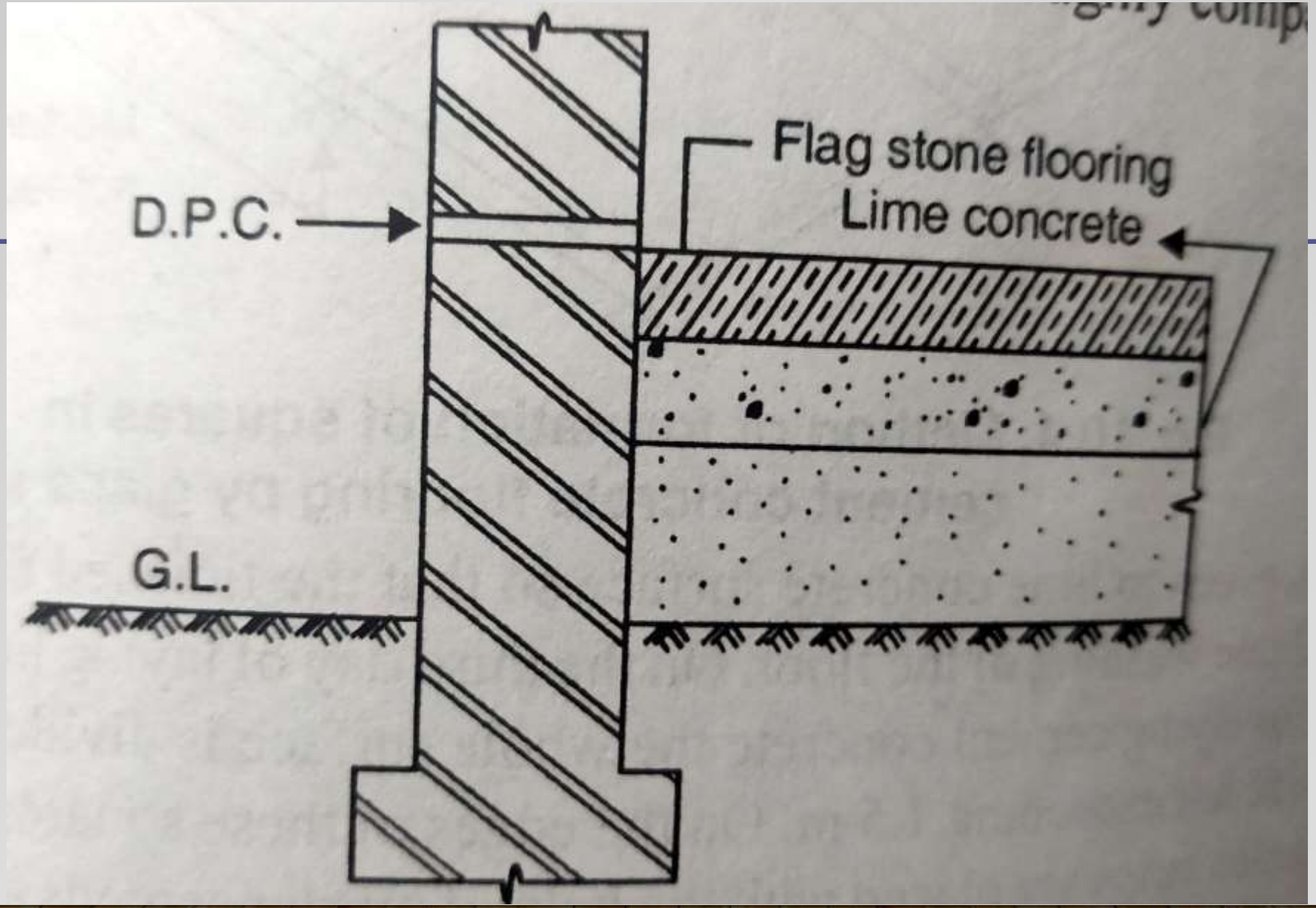

KADAPPA
STONE
FLOOR

Method of construction of Stone Flooring

- A layer of 10-15 cm thick lime concrete is placed over compacted earth surface. Lime concrete layer is given proper slope.
- Over this, a layer of cement mortar 20 mm is spread
- Stone slabs are placed over the mortar and tapped gently with a wooden mallet
- Stone slabs are packed together
- When all stone slabs are laid, joints are flush pointed. Joints should be very thin
- Surface cured for 7 days



Flush Pointing

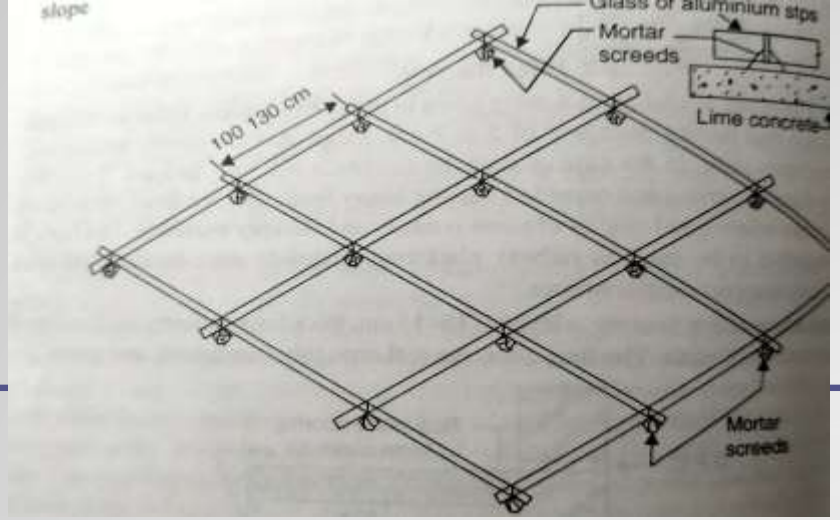

Flag stone flooring
Lime concrete
D.P.C.
G.L.

CEMENT CONCRETE FLOORING

- Best suited for all types of rooms
- Non-absorbent, durable, smooth, pleasing in appearance, good wear resistance, economical
- Cannot be repaired satisfactorily
- Cooler in winters, warmer in summers

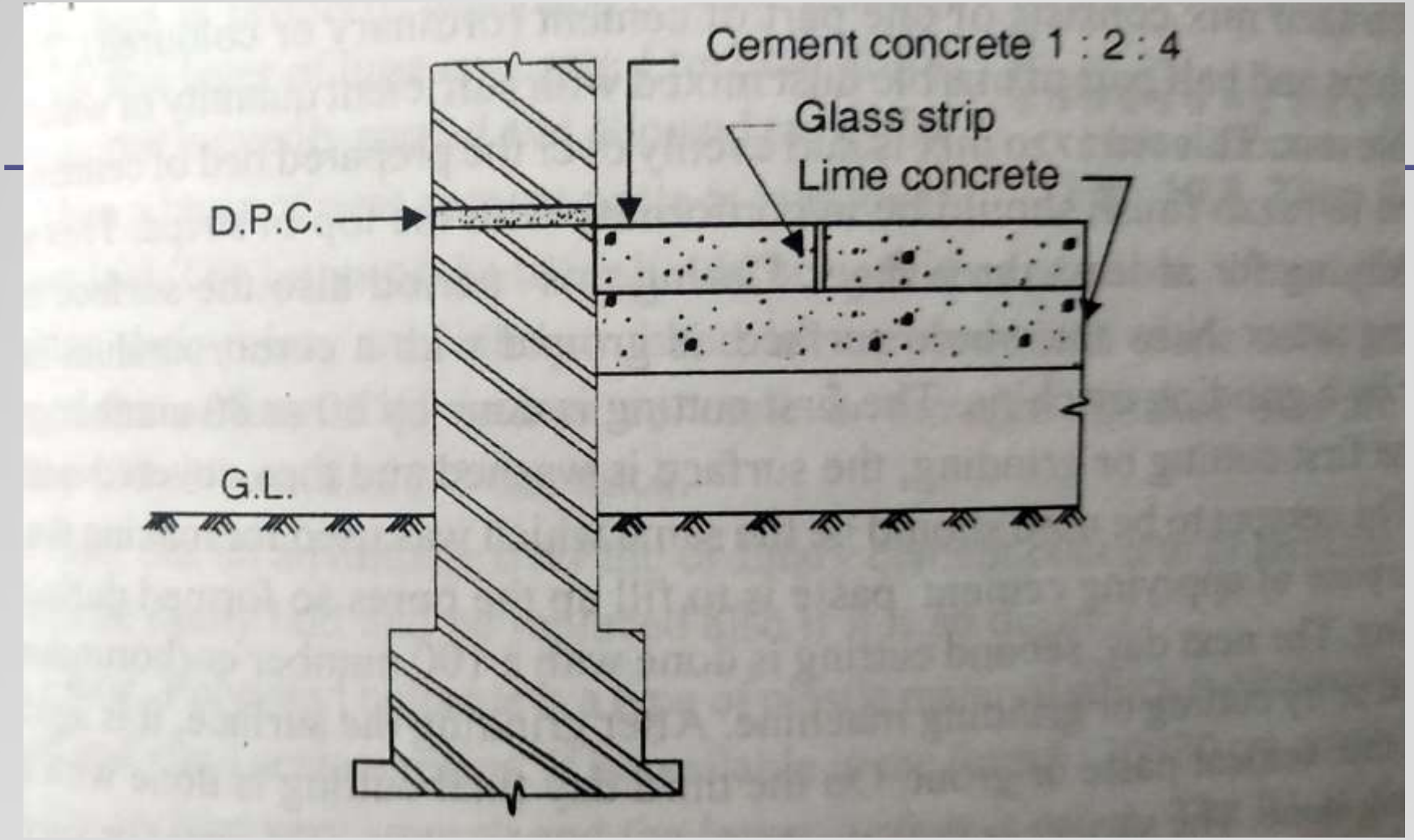
Method of construction of Cement Concrete Flooring

- Earth is filled in plinth, properly compacted and watered
- After compaction, a layer of lime concrete is spread 10-15 cm thick. Lime concrete is compacted by hand rammers to a convenient slope.
- On the third day of laying of lime concrete, cement concrete (1:2:4) is laid. Whole surface is divided into small squares or rectangles of side not exceeding 1.5 m. On the edges of these squares or rectangle, glass, aluminum or wooden strips (3mm) are placed with the help of mortar screeds.



- Before pouring concrete, lime concrete is properly wetted and dry cement sprinkled.
- Cement concrete is filled in alternate or diagonal opposite square or rectangular bays. Pouring of concrete started from one corner and is evenly spread, rammed with trowel or wooden thappies and are finished smoothed by steel floats.
- Cement concrete laid in two layers. Thickness of concrete varies from 2 to 3 cm.
- After finished diagonally opposite bays, remaining bays are filled after one or two days.
- After laying, surface should be kept wet with gunny bags for 24 hours.
- Curing is done for 7-10 days


shutterstock


Cement concrete 1 : 2 : 4
Glass strip
Lime concrete
D.P.C.
G.L.

TILED FLOORING

- Best suited for all types of rooms
- Elegant in appearance, easy to clean, non-absorbent, durable, easily repairable
- High cost, slippery when wet

TYPES OF TILED FLOORING

- Depending on type of tile used, tiled flooring are subdivided into:

GLAZED TILE FLOORING

TERAZZO TILE FLOORING

PVC TILE FLOORING

GLAZED TILE FLOORING

- Ceramic glazed tiles in various designs and shades are used for interior decoration

Method of construction of Ceramic Glazed Tile Flooring

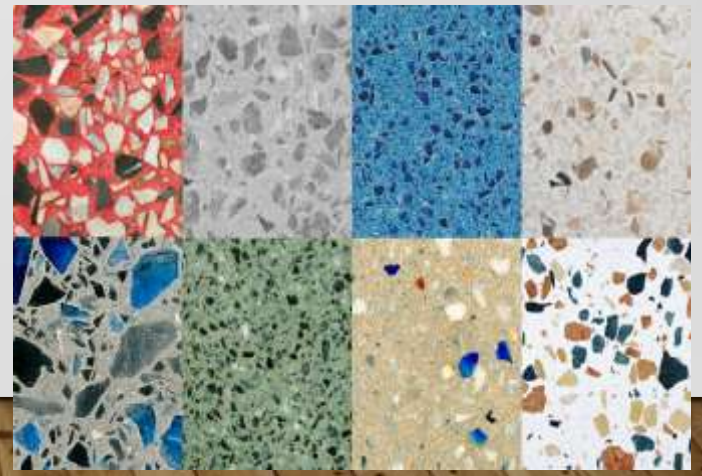
- Sub-base of cement concrete laid and allowed to harden.
- Surface of cement concrete scratched for providing better bonding
- Cement mortar 1:3 laid over the sub base of a thickness of 10-12 mm and hardened for one day
- Cement slurry spread over the mortar. Tile is placed and tapped gently with the help of a wooden mallet. Joints should be as thin as possible
- . They are raked to a depth of 3 mm. cement slurry of color same as tile is applied and the surface is wiped clean
- Curing should be done for 7 days.

The slope should be checked in tiling work at various locations, which may vary from 1:48 to 1:60 or as specified in the drawing. The slope should run in the direction of water outlet sleeves or towards floor gully trap

In the case of the bathroom,
the bathroom accessories should be located at the junction of tiles

TERRAZZO TILE FLOORING

- Available in market in standard sizes 30 x 30 cm and 2-3 cm thick
- Tile is composed on cement mortar 1:3 layer and 5 to 6mm thick wearing layer of cement, marble chips mixture

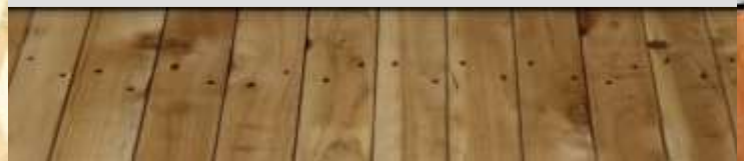


Method of construction of Terrazzo Tile Flooring

- Sub-base of cement concrete laid and allowed to harden.
- Surface of cement concrete scratched for providing better bonding
- 30 mm thick layer of lime mortar 1:3 is spread and allowed to dry for a day
- Next day cement slurry spread and tiles are fixed.
- Joints are raked to a depth of 4 mm with wire mesh and again grouted with fresh slurry having color same as tile
- Floor is kept wet for 7 days and there after should be ground with grinding machine
- After obtaining a glossy finish the entire surface is washed with soap water and oxalic acid water

PVC TILE FLOORING

- Polyvinyl chloride (PVC) tiles are a commonly used floor finish made from polyvinyl chloride (plastic material)
- The tiles are made of a composite of PVC and fibre, producing a thin and fairly hard tile
- Elegant, non absorbent, easy to clean, tough, resilient, quick in construction, Light in weight, any damage can soon be repaired by replacing individual tiles
- Suitable for bedrooms, dining rooms, living rooms but not for wet areas
- The glues used on the tiles sometimes give way, causing edges to lift and get broken by foot traffic
- PVC tiles are not fire resistant



Method of construction of PVC Tile Flooring

- Base(RCC or Wooden) cleaned well
- Adhesive applied on the base
- Adhesive is allowed to set slightly and PVC tiles are fixed in the desired pattern.
- Surface is rolled lightly with wooden rollers and excess adhesive wiped clean
- Floor left to set
- When surface is dry, area washed with soap water
- PVC sheets are also used


House-Improvements.com

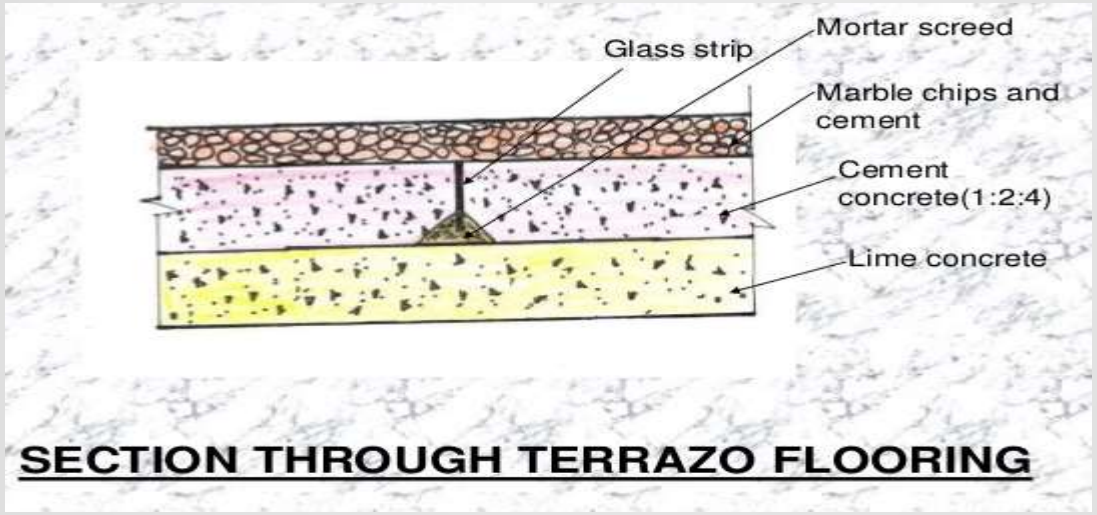
TERRAZZO FLOORING

- Used in offices, hospitals, bedrooms, drawing rooms, halls etc.
- It is a concrete surface with special type of marble chips or aggregates
- Terrazzo mix consists of 1 part of cement (ordinary or colored) and 2.5 to 3 parts od marble chips and half parts of marble dust mixed with water
- Durable, smooth, good in appearance, non-absorbent, can easily be washed and cleaned.

Method of construction of Terrazzo Flooring

- Earth filled in plinth and thoroughly compacted
- A layer of lime concrete (10-15 cm) is laid over the earth with a slope of 1 in 100 to 1 in 120. it is compacted with hand rammers.
- After the lime concrete base is prepared, whole surface is divided into squares or rectangle bays (as in cement concrete floor)
- Aluminum or glass strips having 35 mm width and thickness 1-2 mm are placed on the edges of these squares or rectangles with the help of mortar screeds
- Cement concrete 1:2:4 is laid in these bays in a thickness of nearly 25 mm. surface is left rough by booming and is left for drying.

- After 3-4 days of laying cement concrete, terrazzo finish is laid in a thickness of 10 mm as follows:
  - Terrazzo mix (cement, marble chips, marble dust, eater) is laid evenly over the prepared bed of cement concrete. This is left for drying for a period of 3 days atleast. Surface is kept wet by sprinkling water on it.



- Whole surface is ground with a corborundum stone by hand or grinding machine

- After first grinding or cutting by 60-80 number stones, surface is washed and then covered with neat cement paste to fill up the pores formed during grinding (cement same as used in terrazzo mix)
- The next day second cutting is done with 100 number corborundum stones by hand or grinding machine.
- After grinding, surface again coated with a neat thin cement paste.
- On the third day final cutting is done with 120 number stones.
- Surface is washed with soap or dilute oxalic acid
- Finally floor polished with wax polish or saw dust soaked in kerosene oil.

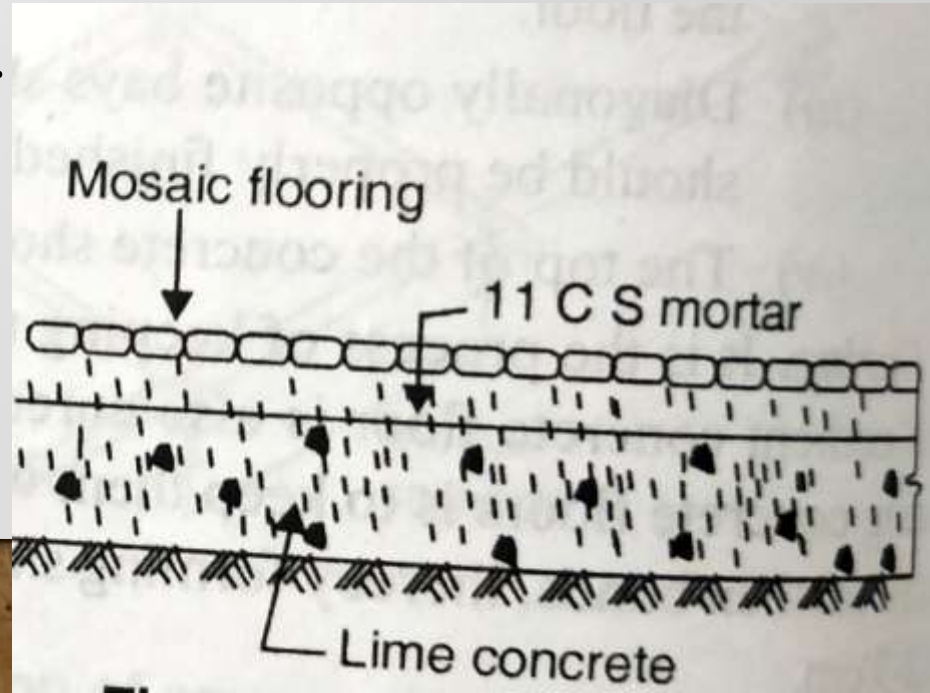
MOSAIC FLOORING

- Mosaic means assembling of small pieces of colored glass, stone, or other material
- Outdated technique
- Mosaics are made of small, flat, roughly square, pieces of stone or glass of different colors
- Durable, easy to maintain, form beautiful decorative floors, resistant to chemicals, flexible in designs and patterns
- small size makes them fragile, become slippery if used in wet areas (non-slip sealer to be applied)

Method of construction of Mosaic Flooring

- Earth filled in plinth and thoroughly compacted
- A layer of lime concrete (10-15 cm) is laid over the earth with a slope of 1 in 100 to 1 in 120. it is compacted with hand rammers. It is properly leveled
- On a small portion of floor, rich cement mortar layer (1:1) containing white sand is evenly laid in a thickess of 1 cm.
- Broken tiles, pieces of crockery, or marble chips wedge shaped, stones, etc are laid with hand and set properly in the desires pattern.

- Dry cement (ordinary or colored) is sprinkled and pressed in joints.
- Process is continues for the whole floor.
- Water is sprinkled periodically y for setting of cement.
- Joints are rubbed with corborundum stone



WOODEN/TIMBER FLOORING

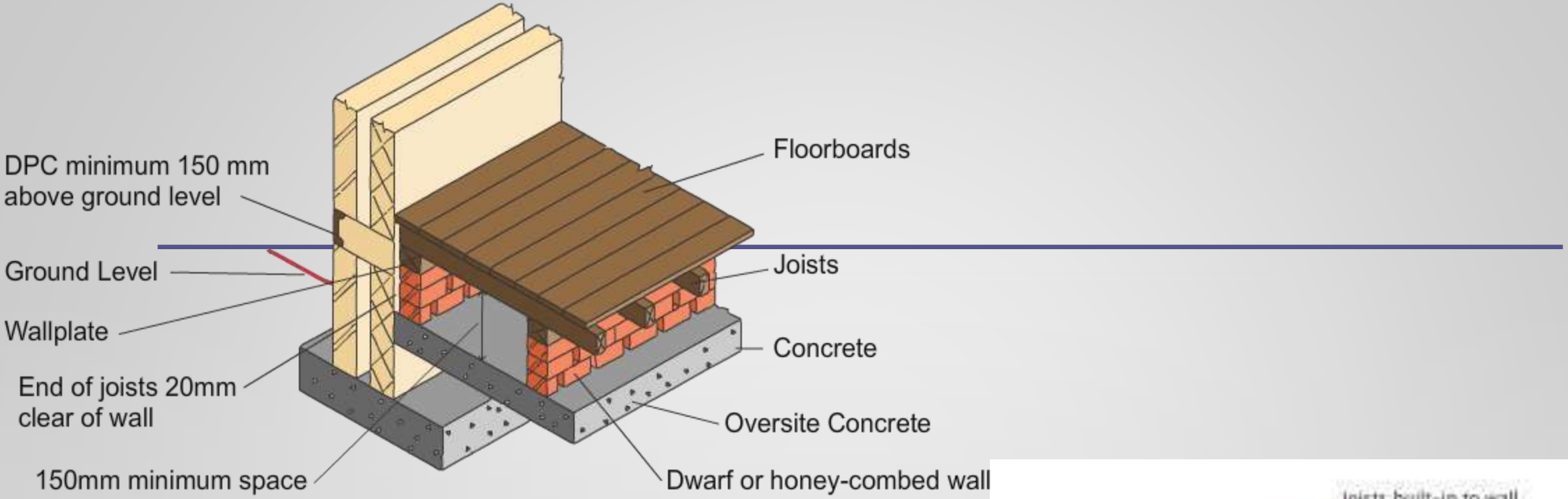
- Used in hilly places
- Used in auditorium, dance halls, badminton courts, stages etc. apart from drawing rooms, bed rooms etc.
- High quality look, strong, durable, easy to clean, great variety (patterns and shaded), no hollow sound vibrations, healthy indoor quality
- Not fire resistant, care for dampness has to be taken, not suitable for wet areas,
-

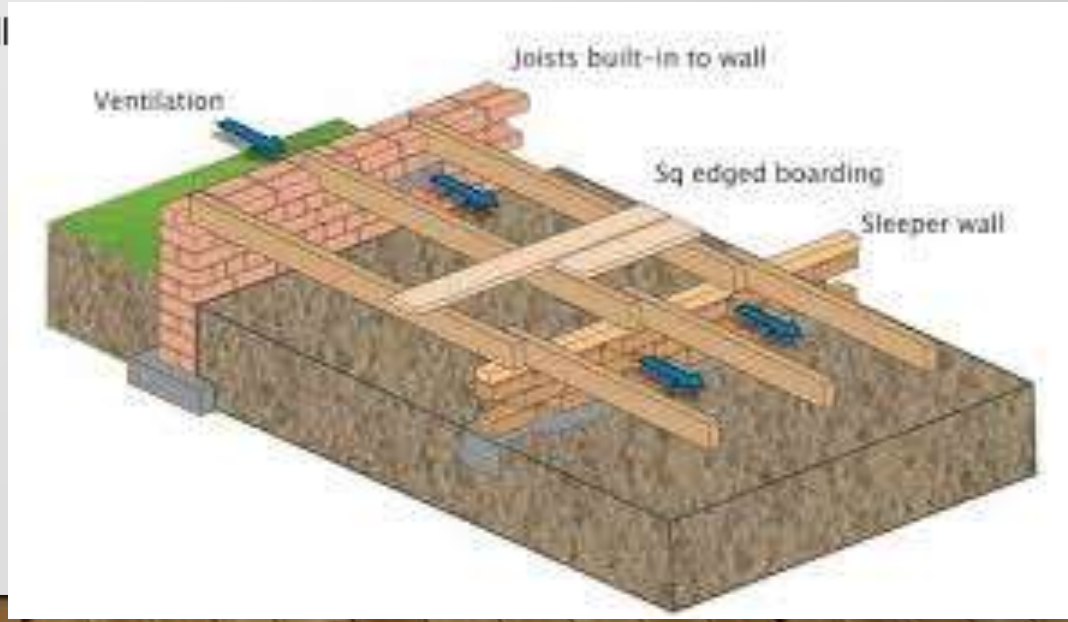
Method of Construction of Wooden Flooring (Method I)

- Ground is leveled and compacted
- On the compacted surface, layer of lime concrete 10-15 cm thick laid and compacted
- Small walls called **dwarf walls** , 10 cm thick are constructed over the concrete bed at a distance of nearly 1.5 – 2 m, which are honeycombed. Honeycombing helps in preventing dampness and decay of timber.
- timber beams called **sleepers** or needles, 8x10 cm in size are laid over the dwarf walls. Sleepers are connected with cross-beams called **bridging joists**. Bridging joists 6 x 8 cm or 4 x 6 cm are placed 1 m c/c.
- Wooden boards, 2-3 cm thick are fixed to the bridging joists in the desired pattern

Method of Construction of Wooden Flooring (Method II)

- In alternate type of construction, asphalt layer about 6 mm thick is laid over lime or cement concrete base. Asphalt acts as damp-proof layer and binding layer
- Over this base timber joists are laid dividing the floor area in square or rectangles
- Timer planks 3-4 cm thick are fixed over joists.


DPC minimum 150 mm above ground level
Ground Level
Wallplate
End of joists 20mm clear of wall
150mm minimum space
Floorboards
Joists
Concrete
Oversite Concrete
Dwarf or honey-combed wall


Joists built-in to wall
Ventilation
Sq edged boarding
Sleeper wall

shows this type of floor

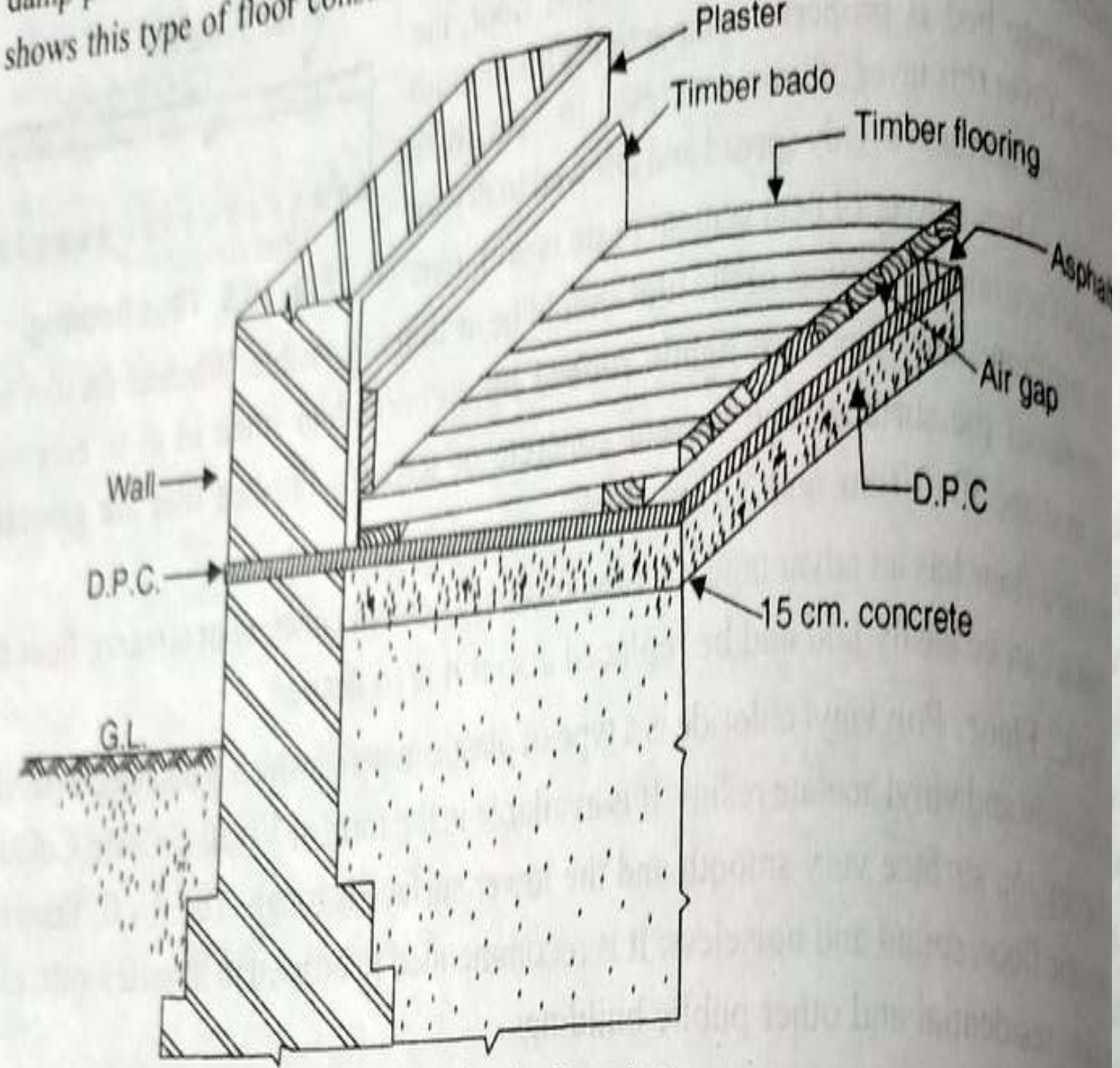


Fig. 10.9. (a). Timber planks flooring.

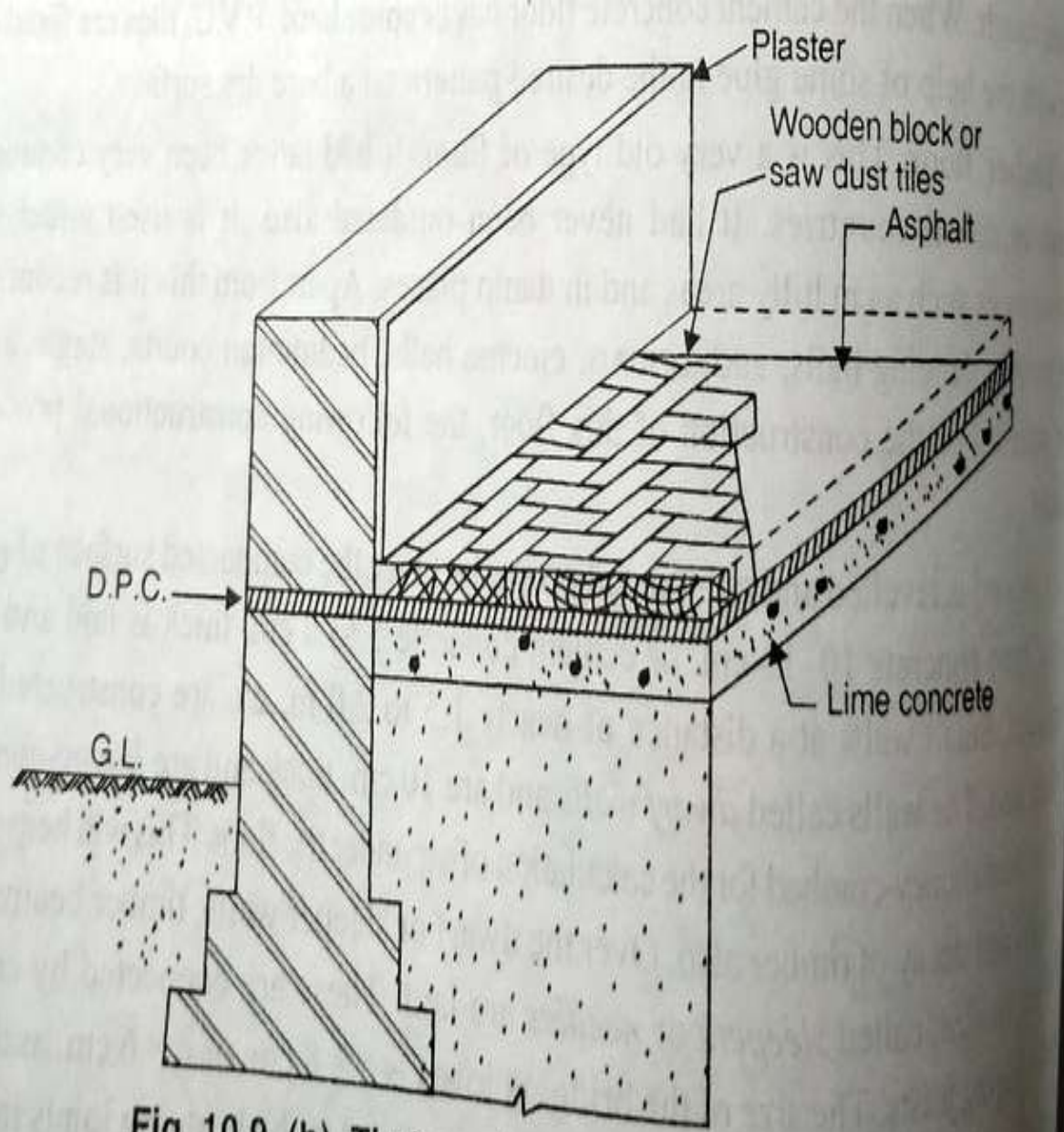


Fig. 10.9. (b). Timber pieces flooring

GRANOLITHIC FLOORING

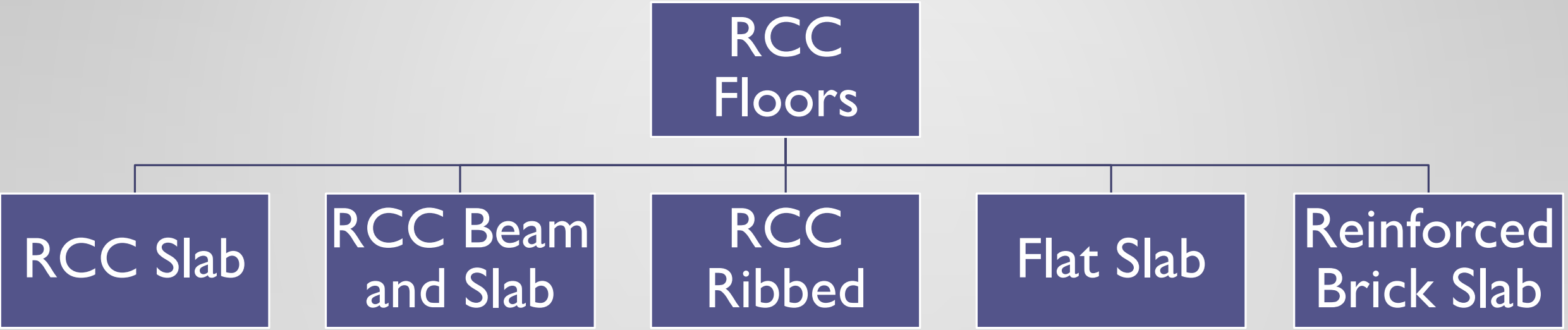
- Same as cement concrete floor
- Wearing surface mad with a mixture of cement and specially selected graded aggregates
- Mix proportion used is 1:1:2 and 1:1:3
- Aggregates of hard stones like granite, basalt, quartzite of size ranging from 12 mm 240 micron are generally used in the mix
- Surface is hard, tough and resistant to abrasion

UPPER FLOOR

Floor constructed other than ground floors

REINFORCED CEMENT CONCRETE FLOORING

- Strong, durable, fire resistant, easy to construct
- Cement concrete+ reinforcement
- Reinforcement is either mild steel, ribbed steel

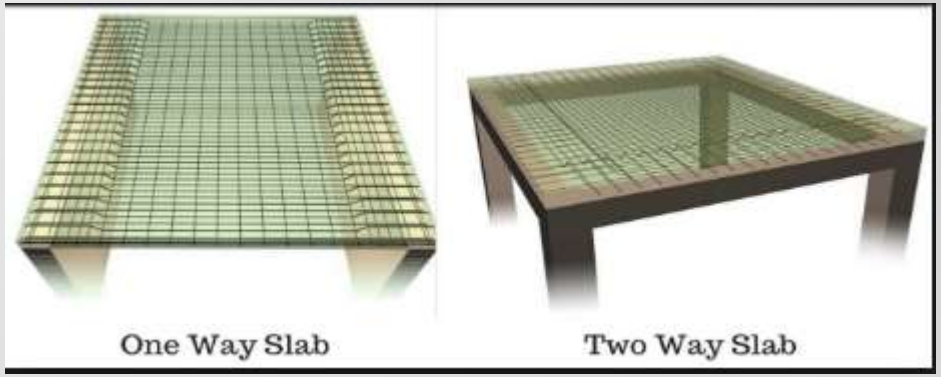

RCC Floors
RCC Slab
RCC Beam and Slab
RCC Ribbed
Flat Slab
Reinforced Brick Slab

RCC Slab flooring

- For spans upto 3.6 m for light loading
- Reinforcement in one or two directions:
  - One Way Slab (L/B >2)

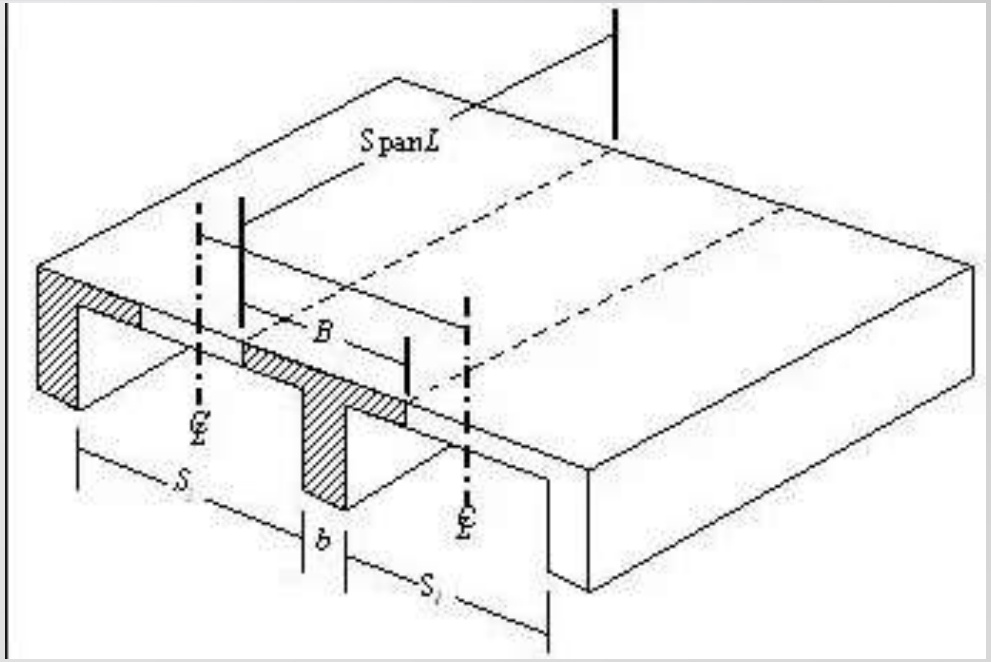
    - Main reinforcement provided in one direction
    - Slab is designed along width of the room and reinforcement provided along width (shorter direction)

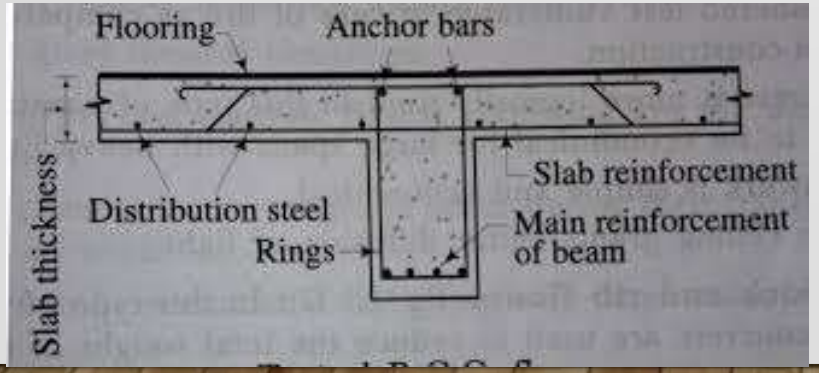
    Temperature reinforcement is provided along the length
  - Two Way Slabs (L/B <2)
    - Reinforcement provided in both directions.
    - Reinforcements calculated and provided along the width as well as length



RCC Beam and Slab flooring

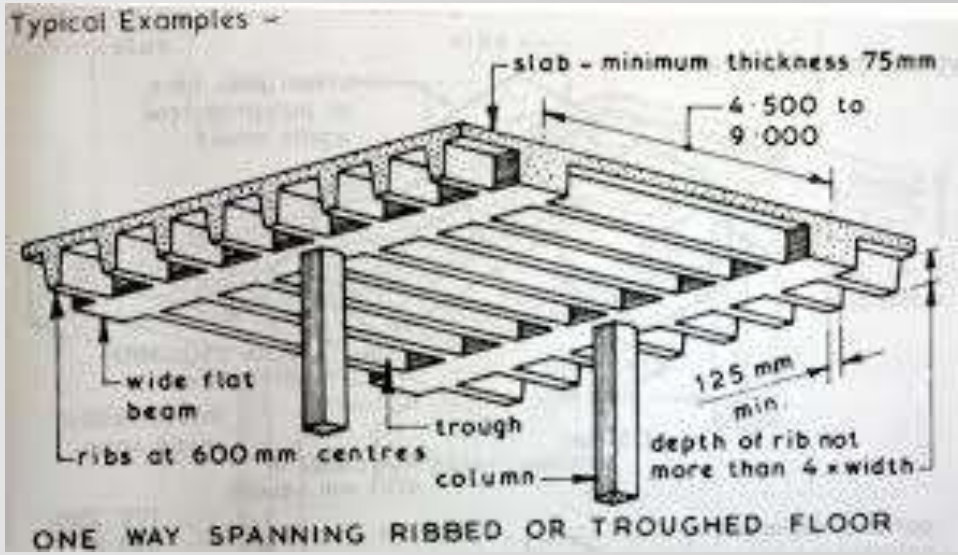
- Bigger size rooms
- Slabs supported with beams at intermediate points
- RCC beams cast monolithically with slabs





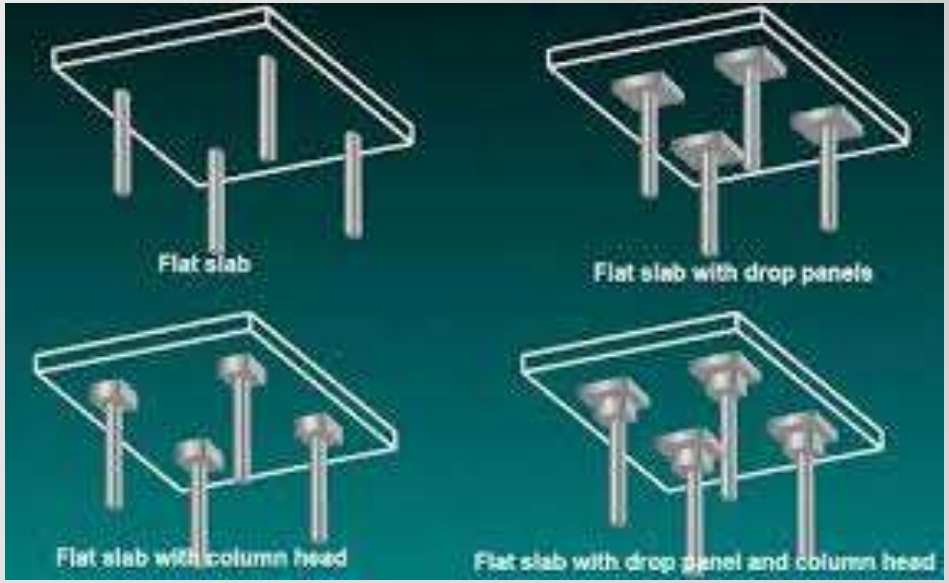
RCC Ribbed Flooring

- Same as RCC beam-slab flooring
- Beams are smaller in size
- Ribs can be precast or cast in situ
- Ribs are provided at 100-120 cm centre to centre



RCC Flat Slab Flooring

- RCC slab with or without drops provided on columns.
- No beams are provided under flat slabs



Reinforced Brick Slab Flooring

- Shuttering is erected and bricks are arranged at specified spacing
- Main reinforcement and distribution reinforcement is provided in between bricks
- Cement mortar poured in the joints
- Work is kept wet for 2 weeks and shuttering is withdrawn
- Entire work covered with rich cement plaster