

**BRICK**

# Types of Brick

- Mainly of **two** types:
  - Pressed:** have a deep frog in one bedding surface and a shallow frog in the other.



- Wire-cut:** 3 or 4 holes through them constituting up to 25% of the total volume of the brick.



# Brick dimensions

- General Dimension: 10''x5''x3'' (With mortar)
- Nominal size: 9.5''x4.5''x2.75'' (Without mortar)

# Quality of good bricks

- Sound, hard and well burnt with uniform size, shape and color.
- No cracks/flaws.
- No mark should be made when scratched by finger nails.
- When stuck together should produce metallic ringing sound.
- Should not break when dropped from a height of 90-120 cm.
- Should not absorb more than 20% of their dry weight when immersed in water for 24 hours.

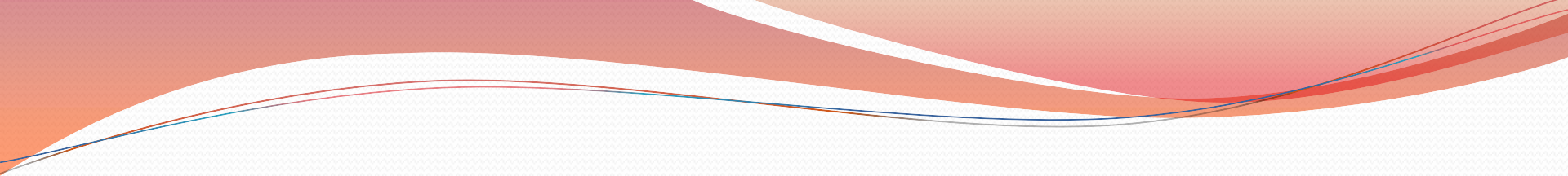
# General Principle to be observed in Brick masonry construction

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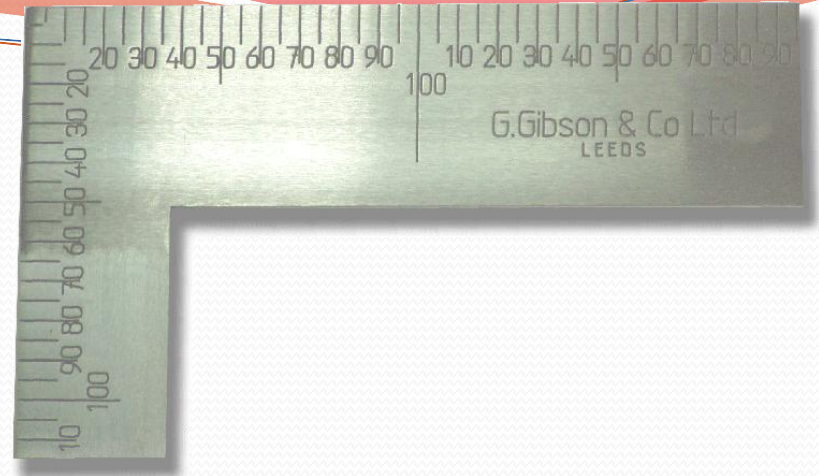
Building Construction by Sushil Kumar

- Should be thoroughly soaked in clear water before use for suitable period.
- Should be laid on a full bed of mortar. Should be slightly pressed into the bed mortar (proper adhesion).
- Unless otherwise specified, bricks must be laid with their frog marks pointing upward.
- All the joints should be properly flushed and filled with mortar (no cavity).

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- All the courses should be truly horizontal and all the vertical joints should be truly vertical.
  - No brick-bats should be used except when it is absolutely necessary for obtaining specified bond.
  - Thickness of joints should not exceed 13 mm.
  - Plastering should be done after 28 days of completion.
  - Finished masonry wall should be kept wet for at least 7 days.

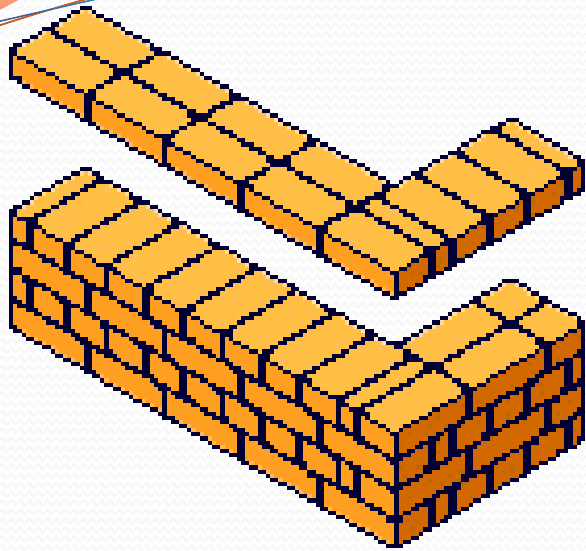
# Brick Laying Tools

- Hammer
- Brick Axe
- Line and pins
- Plumb rule
- Spirit level
- Mason's square
- Trowel

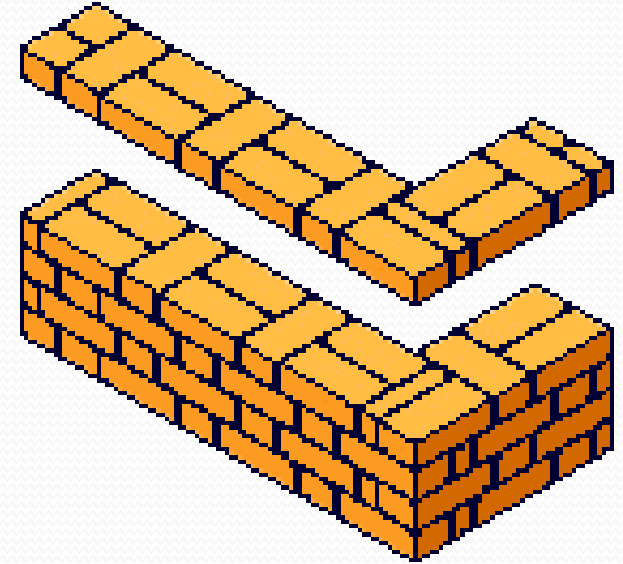


# Types of Bond

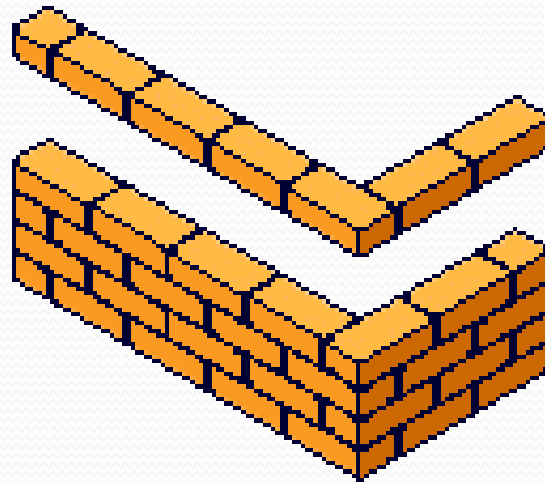
- **English bond:** Alternative courses of headers and stretchers
- **Flemish bond:** Alternate bricks are placed as header and stretcher in every course.
- **Stretcher Bond:** Originally used for single brick walls



**English bond**



**Flemish bond**



**Stretcher Bond**

# Defects in Brick Masonry

- Sulphate Attack
- Efflorescence
- Corrosion of steel
- Shrinkage on drying

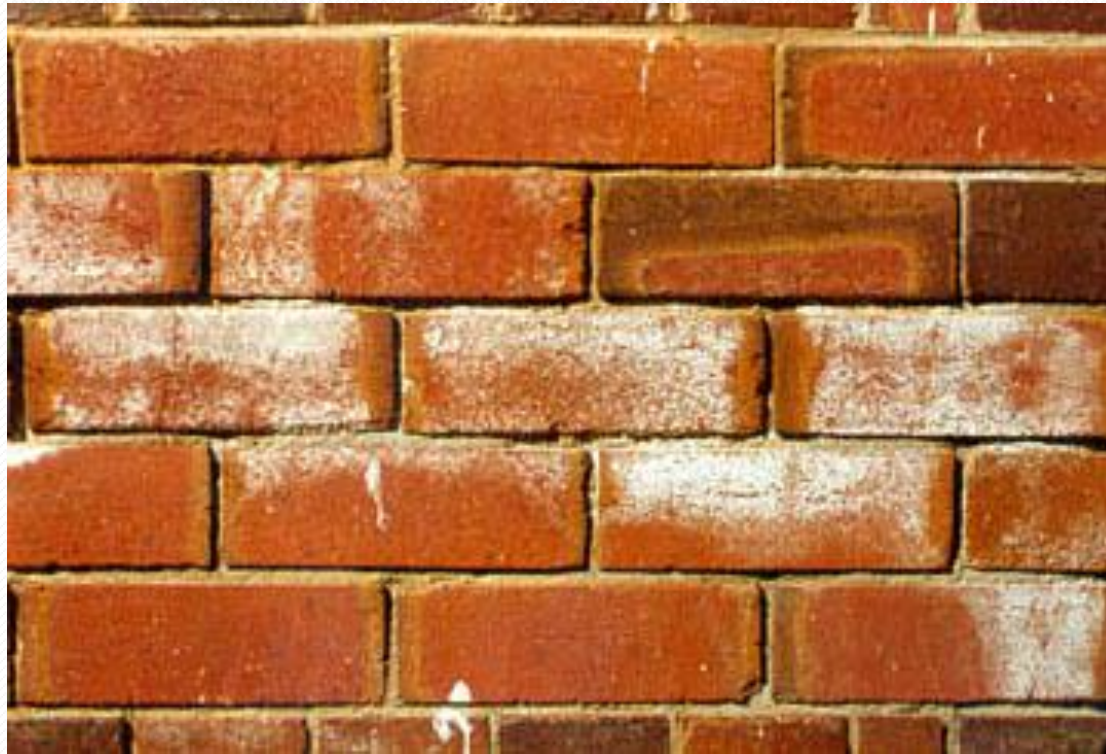
# Sulphate Attack

- Sulphate Salts (Brick) + Alumina (Cement)/ Hydraulic Lime (Lime mortar) → increase in volume
- Results: - chipping and spalling of bricks  
- formation of cracks
- Occurs in situations where brick work is exposed to weather/moisture.
- Remedies:
  - choosing suitable material
  - adopting suitable construction details that the entry of moisture into the body of bricks can be checked.



# Efflorescence

- Bricks containing excessive soluble salts
- When come in contact with water, the soluble salts get dissolved and appear in the form of form of fine whitish crystals on the surface.
- Results:
  - The surface of brick work gets disfigured and presents an ugly look.
- Remedies:
  - By brushing and washing the effected surface repeatedly.



# Corrosion of steel

- Steel gets corroded in the presence of dampness.
- Results:
  - Steel expands in volume and tends to crack the brick work.
- Remedies:
  - By encasing the reinforcement in dense cement mortar (15-25 mm)

# Shrinkage on drying

- Results:
  - Develops cracks in the masonry joints.
  - If mortar used is lean, the cracks are distributed over large number of joints.
- Remedies:
  - By protecting masonry from moisture penetration.



# Some Brick Structures

- Duplex Home



# Some Brick Structures (contd.)

- Mosque's Dome



# Some Brick Structures (contd.)

- Arches



# Some Brick Structures (contd.)

- Arch bridge



# Some Brick Structures (contd.)

- Pavement



# Structural limitations

- Good compressive strength (vertical loads) but is much lower in tensile strength unless reinforced.
- The tensile strength of masonry walls can be strengthened by thickening the wall. Where practical, steel reinforcements can be added.



**The End**