



Rat Trap Bond Masonry

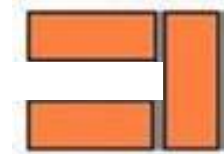


Technical Data

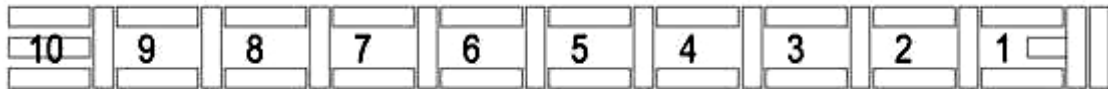
Building element	Wall
Size	9" thick wall
Bricks per sq. m	85
Cement per sq. m	8kg
Sand per sq. m	1.2 Cu. ft
Resistance to earthquake	Very good
Resistance to heat	Very good
Resistance to sound	Very good
Resistance to rain	Very good
Climatic suitability	Very good
Stages of experience	More than 100 years
Durability	Very strong

Short description

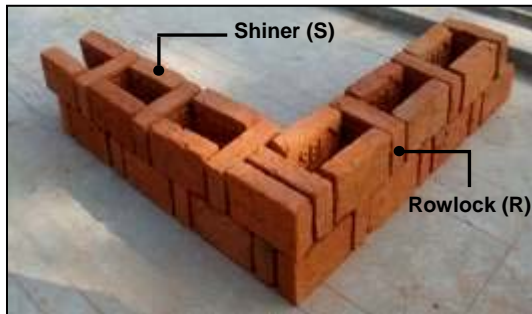
Rat Trap Bond is a brick wall construction technique in which bricks are laid on edge such that the shiner (S) and rowlock (R) are visible on the face of the masonry (brick cross) creating an internal cavity bridged by the rowlock.



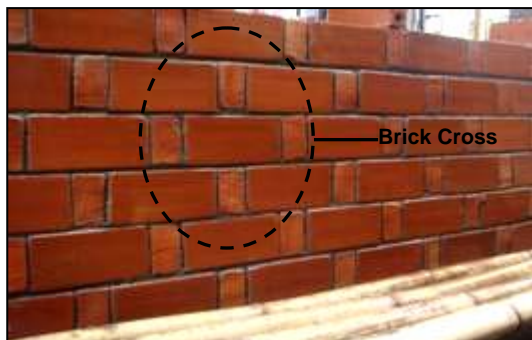
1 Rat Trap Bond Module



Wall of 10 Rat Trap Bond Modules



Alternate layers of Rat Trap Bond



Advantages

Environmental

- Uses 130 MJ/m² less energy than English Bond
- Saves 30 kg/m² less CO₂ than English Bond
- Reduces the green house gases
- A normal two and half story house with total floor area 150 m² has approx. 241m² wall area. Using VSBK brick in Rat Trap Bond masonry, it saves 1.56 Ton CO₂ compared to English Bond

Technical

- I.O.E Pulchowk Campus lab test report confirms the load bearing capacity of Rat Trap Bond for H₂ mortar is 10.52 kg/cm²
- Cavity provides good thermal and sound insulation
- Modular masonry reduces wastage of bricks
- Cavity can be filled with steel bars and concrete for earthquake resistance
- Reduces approx. 40% dead weight of wall as compared to English Bond, hence the building can be designed to save steel and concrete

Economical

- Cost of masonry is reduced by 25-30% as this technique uses approximately 35% less bricks and 50% less cement mortar compared to English Bond
- Construction Speed of Rat Trap Bond masonry is equal to that of English Bond
- Concealed concreting, bands or beams for earthquake resistance, is possible in the Rat Trap Band masonry without shuttering
- Through cavities concealed plumbing and electrical layout is possible; avoiding and reducing the cost of masonry cutting

Specification for its application

- ❑ **Brick Size**
 - Length = 230mm, Width = 110mm, Thickness = 55-65mm (most suitable)
 - Rat Trap Bond is possible with different brick sizes as per regional practice, ensuring that the shape and size of bricks are uniform
- ❑ **Mortar (Cement: Sand)**
 - For a single stories building – 1:6
 - For a double stories building – 1:4 for Ground floor, 1:6 for the upper floor
- ❑ **Earthquake resistance**
 - Reinforced concrete bands to be provided at sill, lintel and roof level. Corners, sides of openings, T-junctions of load bearing masonry to be reinforced with 12mm steel bars grouted in M₂₀ concrete filled in cavity
- ❑ Skilled mason required
- ❑ Architects / Engineers have to calculate the modular length and height of the wall
- ❑ Requires exact planning: Size (length, breadth, height) of a room, and even the size and position of the opening has to be according to the Rat Trap Bond Module size
- ❑ Vertical mortar joints must be applied directly to the brick before placing it
- ❑ “Brick Cross” pattern must be maintained at all the time for a proper Rat Trap Bond masonry

Construction Detail



Corner



Reinforced corner



Cross- Junction



Reinforced Cross- Junction



T-Junction



Reinforced Sill or Lintel Band

Limits of application

- ❑ Load bearing structure up to 2 stories is possible with Rat Trap Bond masonry, there is no limitation if used as in-fill masonry in framed structures
- ❑ Thickness of the wall is approximately 9". No half brick (4") or one and half brick (14") thick wall is possible in Rat Trap Bond Masonry

Application



Community Building at Butwal



Residence at Butwal



Residence at Baneshwor