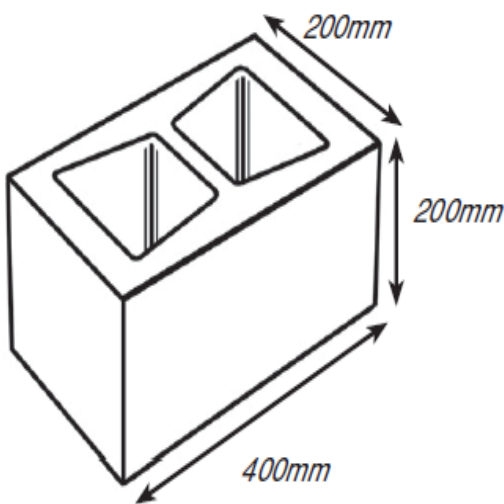


CONCRETE BLOCKS

Buildings are constructed with various sizes and kinds of concrete blocks that can be hollow or solid. The different types of blocks are made with heavyweight or lightweight materials and are normally referred to as such.

Actual and Nominal Sizes.

Most standard blocks are 400 mm long and 200mm high



The most common width is also 200mm — but blocks that are 150mm and 250mm wide are sometimes made.

Typical Sizes and Shapes.

Blocks come in both heavyweight and lightweight materials with full- and half-length sizes. The three-core block can also be obtained as two-core blocks. Figure 1, illustrates some of the typical sizes and shapes of concrete blocks.

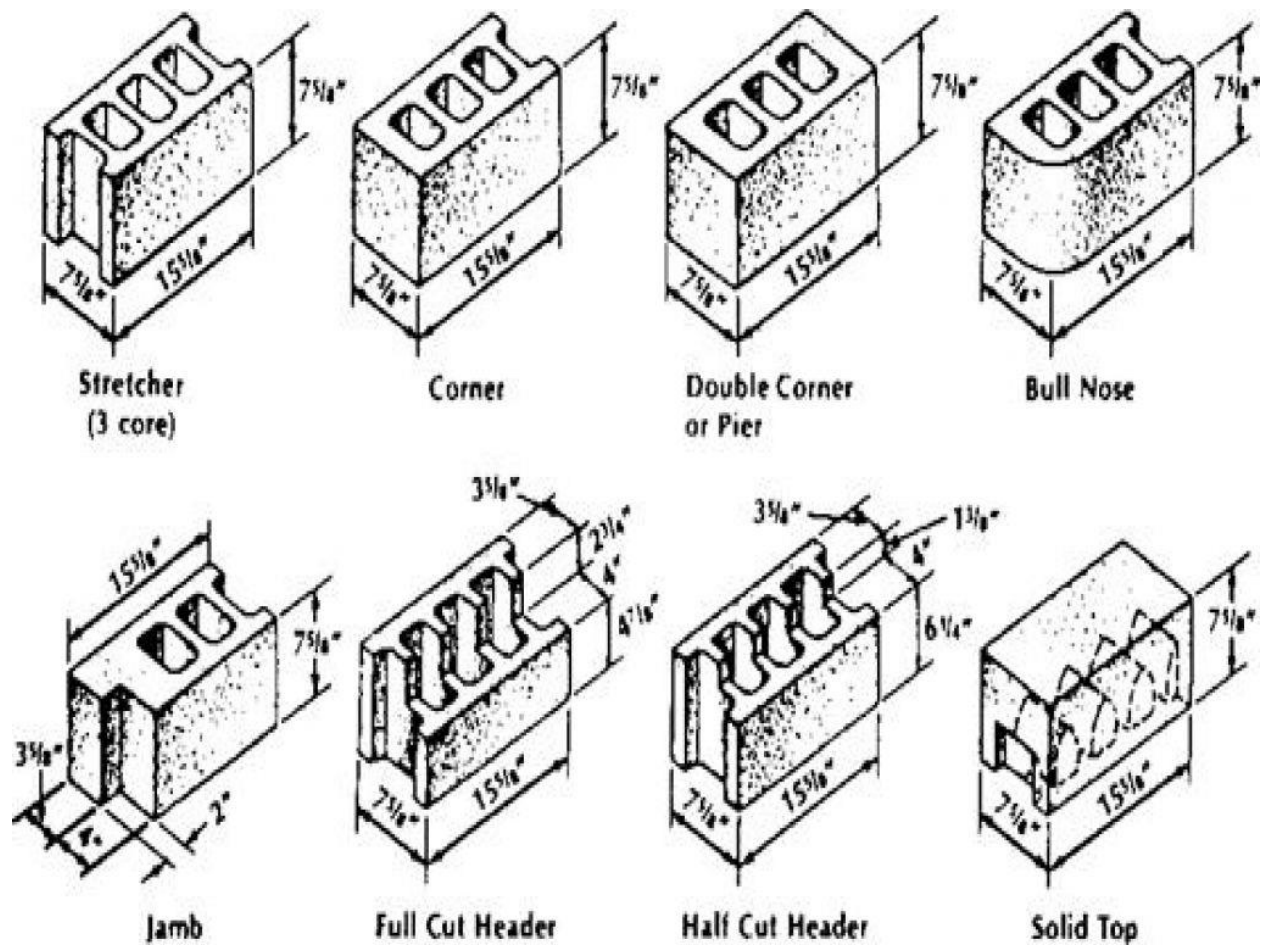


Fig: 1 Typical Size and Shape of Block

Types.

Concrete blocks come in several different types.

- a. Stretcher.** A stretcher block is the most commonly used block in construction. It is laid with its length parallel to the face of the wall.
- b. Corner.** A corner block is used for corners at simple window and door openings.
- c. Double Corner or Pier.** A double-corner or pier block is used for constructing piers pilasters or for any other purpose where both ends of the block would be visible.
- d. Bull Nose.** A bull-nose block serves the same purpose as a corner block, but it is used where round corners are desired.
- e. Jamb.** Used for window opening.

f. Most Common Block. The most common concrete block is the hollow, load-bearing stretcher block, which is 8 by 8 by 16 inches nominal size, but 7 5/8 by 7 5/8 by 15 5/8 inches actual size. The heavyweight load-bearing stretcher block weighs from 40 to 50 pounds.

Advantages

- Readily available product
- Good thermal and sound resistance
- High fire resistance
- Can be reinforced to increase lateral resistance against earthquakes and typhoons
- 20+ years lifespan
- Not attacked by rot and insect

Disadvantages

- Blocks are heavy
- Costly

Tiles

Tiles are thin slabs used for covering roofs, for flooring or for making drains and may be formed of:

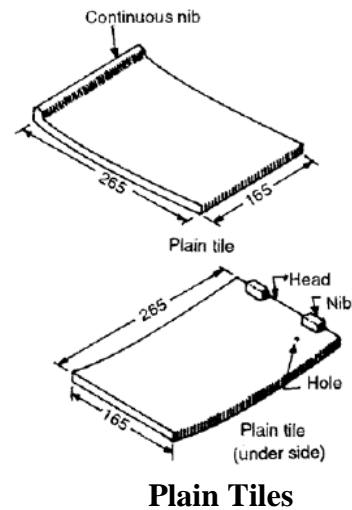
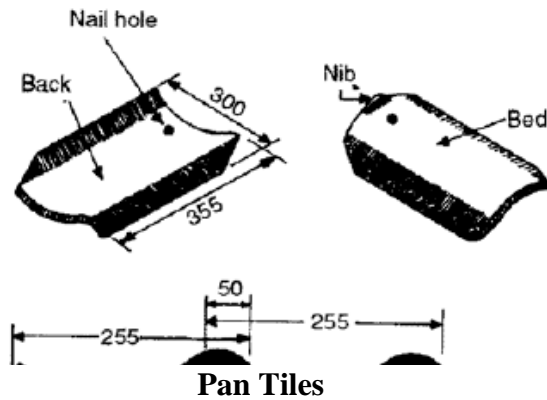
- (a) Brick earth burnt in kilns, and
- (b) Concrete.

Brick earth used for manufacturing brick tiles is more pure and is prepared more thoroughly than the one used for manufacturing bricks. Tiles, being thinner require careful burning.

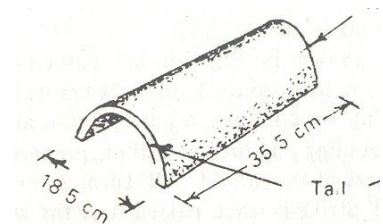
Roofing Tiles. These may be flat or may be made to different shapes.

Plain Tiles. These measure about 25 cm x 15 cm to 28 cm x 18 cm and from 10 mm to 17 mm thick. These may have a continuous projection at one end or two small projecting nibs.

Pan Tiles. The tiles are curved in section. These are 33 cm to 38 cm long and 23 cm to 28 cm wide.



Pot Tiles. These are semi-circular in section and taper along the length. Diameter at larger end is about 23 cm and at the smaller end it is about 20 cm. Rows of these tiles are laid with the concave side up. Then rows of same tiles with convex sides up are laid to cover the adjoining edges of every pair of the previously laid tiles.



Concrete Tiles. Tiles of any shape, size or color could be made with cement concrete. These are more strong, durable and weather resistant.

Flooring Tiles or Paving Tiles. These are usually thicker than roofing tiles and vary from 15 mm to 30 mm in thickness. Their shapes are square, hexagonal or of any other geometrical pattern and maybe colored, if desired.

Drain Tiles. These are curved tiles made in various shapes and sizes to suit the work in which they are to be used. Tiles to be used in the construction of sewage carrying drains should be glazed.



Drain tile

Properties of good tiles.

- i. It should be of a regular shape and size.
- ii. It should be free from twists, cracks or flaws.
- iii. It should be well burnt and have uniform colour.
- iv. It should give a clear ringing sound when struck.
- v. It should be sound and hard.
- vi. Its broken surface should show an even and compact structure.

Manufacturing of tiles

Tiles are made in the same manner as bricks, but are thinner and lighter, so require greater care.

These are manufactured from a clay mass with or without admixtures of coloring impurities by moulding and subsequent burning until baked, up to about 1300 °C. The clay should be highly plastic with lean admixtures and fusing agents to lower the melting point. These are moulded in machines and are commonly burned in continuous kilns.

FIRE CLAY OR REFRACTORY CLAY

Fire-clay is a term, loosely applied, to include those sedimentary or residual clays which vitrify (Convert into glass like substance) at a very high temperature and which, when so burnt, possess great resistance to heat. These are pure hydrated silicates of alumina and contain a large proportion of silica 55–75%, alumina 20–35%, iron oxide 2–5% with about 1 per cent of lime, magnesia and alkalis. The greater the percentage of alumina, the more refractory the clay will be.

Fire clays are capable of resisting very high temperatures up to 1700°C without melting or softening and resist spalling.

The presence of a small percentage of lime and magnesia and alkalis help to melt the clay particles more firmly, whereas a large percentage of lime and magnesia tend to melt the clay at low temperatures. Iron oxide or other alkalis reduce refractory qualities of fire clay. The fire clay is used for manufacturing fire bricks used in furnace linings, hollow tiles, and crucibles.

FIRE CLAY BRICKS OR REFRACTORY BRICKS

Fire-clay bricks are made from fire-clay. The process of manufacturing is as of an ordinary brick, burnt at very high temperatures in special kilns (Hoffman's kiln). The raw materials used for the manufacture of fire bricks consist of flint clay and grog (burnt fire clay) as non-plastic materials and soft fire clay as plastic material. Fire clay mortar is used to clay refractory bricks.

Properties

- The colour is whitish yellow or light brown.
- The water absorption of fire-clay bricks varies from 4–10%
- The minimum average compressive strength of the bricks should be 3.5 N/mm².

Uses

- These are used for lining blast furnaces, ovens, kilns, boilers and chimneys.