Cihan University Sulaymaniya
Faculty of Engineering
Architectural Engineering Department

Building Materials

Chapter Six

(Tiling)

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Tiling

Introduction:

Tiles are thin slabs used for covering roofs, for flooring, for walls, or for making drains. Tiles may be formed of: (a) brick earth burnt in kiln and (b) concrete.

The process of manufacture is similar as to that of brick manufacturing. Since tiles are thinner than ordinary bricks and are more liable to breakage, however the clay must be more pure and stronger. Therefore, great care is needed in their manufacture. They should be dried in the shade, burnt and cooled gradually in specially made kilns. All the tiles must be well burnt throughout of regular shape and uniform size, sharp, even free from twists & bends. They may be red or any other types in colour & ring clearly when struck.

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Different kinds of tiles may be classified as under:

1. Flooring tiles or paving tiles

These tiles are usually thicker than roofing tiles and vary from 15 mm-30mm in thickness. They are flat and usually square or rectangular in shape. These can be made in any colour and of any geometrical shape. They should give ringing sound when struck with each other, and should not absorb water more than 24% by weight . The fracture surface of the tile should be clean, dense and sharp edges, and show maximum resistance to impact.

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2. Roofing tiles:

These tiles should be strong, durable and perfectly leak-proof, although they are expensive but they need less maintenance cost, the main types of roofing tiles are described below:

Flat tiles: are rectangular in shape and of various dimensions. They are laid in cement or lime mortar. Many types of flat tiles are discussed below:

(a) Slate tiles: the available size (60cm x 30 cm x 15 mm) and (50 cm x 25 cm x 10 mm) , these tiles should be reasonably straight, uniform in colour, good texture and free from veins, cracks, fissures and white patches. The water absorption after 24 hours immersion in cold water should be maximum 21% by weight.

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(b) Burnt clay flat terracing tiles: These tiles should be uniform in shape, size and should be free from irregularities like bends, twists, cracks. The water absorption should not exceed 20% by weight. The compressive strength should not be less than 7.5 N/mm2.

Pot or country tiles: these tiles are sometimes called pan tiles. They are hand moulded, first into flat tile then to the required shape on wooden pattern and burnt in a kiln after drying. These tiles are semi-circular in section, such tiles used either alone or with flat tiles. These tiles are less liable to be displaced by birds and may used as sole covering to the roof. These tiles are laid on sloped roofs along with the conecave side up and longer end towards the ridge. Then another row of same tiles with convex side up and small end towards the ridge is laid covering the adjoing edges of every pair of tiles below, such tiles commonly used in rural areas.

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Pot or country tiles

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Allahabad tiles: these tiles are of different shapes. They are generally laid side by side and joints are covered with half round tile. and they are used for making good and pleasing roofs, they should not absorb water more than 20% by weight.

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Corrugated tiles: these tiles have corrugation and when they are placed in position a side lap of one or two corrugation is formed. Placing such tiles on a roof give very good appearance of corrugated galvanized sheets, but they can be easily blown by violent winds.

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Manglore tiles: they are red colour and of double channeled basel mission manglor pattern, due to its projections they interlock with each other when placed in position, the life of these tiles is about 25 years with 5% replacement per year. About 16 tiles are required to cover one square meter of roof.

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Encaustic tiles: these tiles are employed for decorative purposes and are consist of three layers:

1- The face is a thin coat of pure clay of the required colour.

2- The body is of coarse clay.

3- The back is formed with thin layer of clay different from the body to prevent warping.

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3. Wall tiles

These are similar to the floor tiles except for their design and degree of burning. They are burnt at low temperature, glazed and burnt again at a low temperature, they can be made in different designs and colours and be built to any size. These tiles are used on face work , arches and architectural ceiling.

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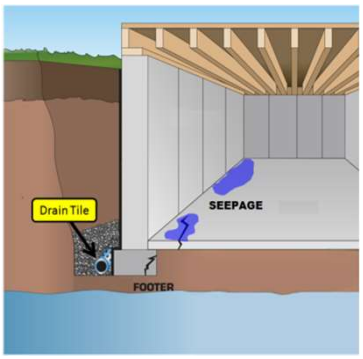
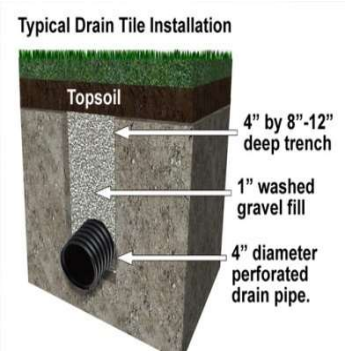
4. Drain tiles

Usually are long curved sections of various shapes and sizes such as semi-circular or circular . they are used for draining waste water and for arraying sewage glazed tiles should be used.





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4. Glazed earthenware tiles

Such tiles are of earthenware having top surface glazed and underside unglazed so the tile may be adhere properly to the base, these tiles are made in two sizes (14.9cmx14.9cm) and (99mmx99mm), having thickness 5mm, 6mm and 7mm, the joint thickness is 1mm. they should not absorb more than 18% of water , such tiles are used for finishing the surfaces of walls and floors of water closets, bathrooms, kitchens and hospitals (where cleanliness is important).

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Properties of building tiles

- **Quality:** building tiles should be made from good clay of even texture, they should be well burnt and uniform in size and shape and should be free from irregularities such as bends, twists and cracks.

- **Warpage test:** in case of flooring tiles warpage should not exceed 2% along the edge and (1.5)% along the diagonal. In case of terracing tiles should not exceed in any direction 1%.

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- Characteristics of good tiles: a good tiles should posses the following characteristics:

1. Should posses uniform colour.
2. Should be properly burnt.
3. Should be free from cracks, flaws or bends.
4. Should be hard and durable.
5. Should have proper shape and size.
6. When placed in position, it should fit well.
7. Its broken surface should exhibit even and compact structure.
8. It should give a clear ringing sound when struck with light hammer or with another tile.

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Manufacture of tiles

The manufacture of common tiles includes:

1. Preparation of clay
2. Moulding of tiles
3. Drying of tiles
4. Burning of tiles

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End of Chapter Six

Thank You

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