12

Ground Floors

12·1. GENERAL

The floor of a building immediately above ground is known as ground floor. In case, part of the building has basement, the floor is termed as basement floor.

There are various types of floors which are commonly adopted in residential or public buildings these days. Each type of floor has its own merits and there is not a single type that could be suitably provided under all circumstances. The different types of floors which are commonly used for ground floor construction are given below :

(1) *Mud flooring*
(2) *Muram flooring*
(3) *Brick flooring*
(4) *Flag stone flooring*
(5) *Tiled flooring*
(6) *Cement concrete flooring*
(7) *Granolithic flooring*
(8) *Terrazzo flooring*
(9) *Mosaic flooring*
(10) *Marble flooring*
(11) *Timber flooring*
(12) *Asphalt flooring*
(13) *Rubber flooring*
(14) *Linoleum flooring*
(15) *Acid proof flooring*

The selection of the type of floor often poses a problem and as such the following points are carefully considered before making final choice:

(*a*) It should be durable.
(*b*) It should be easy to clean.
(*c*) As far as possible it should be noiseless.
(*d*) It should have a good appearance.
(*e*) It should be free from dampness.
(*f*) It should be fire-resistant.
(*g*) It should have low maintenance cost.
(*f*) It should not be very costly.

The description of various types of floors is given below :

12·2. MUD FLOORING

In a tropical country like India, mud floors are commonly constructed in villages. They are cheap, hard, fairly impervious, easy in construction and easy in maintenance. They remain warm in winter and cold in summer and hence are most suitable for places where the temperature is extreme during these seasons. The method of its construction is very simple. Upon the prepared bed, a 25 cm thick layer of selected moist earth is evenly spread out and is rammed well so as to get a consolidated thickness of about 15 cm.

It is important to note that no water is used during the process of ramming. In order to prevent the formation of cracks after drying, chopped straw in small quantity is mixed with the moist earth before ramming. The floor is maintained by giving a thin cement cow-dung wash (1:2 to 1:3) once or twice a week.

12·3. MURAM FLOORING

Any disintegrated rock is called muram. Muram floors are constructed in villages in India and have the same advantages as that of mud-floors. Unlike mud floors, they are constructed with great care. Upon the prepared sub-grade a 15 cm. thick layer of muram is laid. A 25 mm. thick layer of powder muram is spread over the already laid muram layer and water is sprinkled over the entire surface. The surface is then rammed well. After ramming the surface is saturated with water, so that a thin layer is formed on the top of the rammed surface. Then the surface is trampled well till the cream of muram rises to the top. The surface is left in this state for about a day and then it is rammed again with wooden rammers called thapies for about three days. The dry hard surface thus formed is then smeared with a thick coat of cow dung and rammed once again for two days in the morning. Finally the surface is finished with a cement cow-dung plaster 1:4 (1 cement : 4 cow dung). To maintain the floor in good condition, it is given a wash of cement cow-dung plaster once a week and the surface is wiped clean immediately.

The merits and demerits of mud or muram flooring may be summarised below :

Merits :

(*i*) It is cheap

(*ii*) It has smooth, hard and fairly impervious surface.

(*iii*) It is easy in construction.

(*iv*) It has sufficiently long life if properly maintained.

(*v*) It maintains comfortable temperature in all seasons.

Demerits : For perfect maintenance of the surface it has to be given cement cow-dung wash once or twice a week. This may be objectionable from sanitary consideration.

12·4. BRICK FLOORING

This type of flooring is commonly provided in warehouses, stores and godowns or in places where heavy articles are stored. The flooring may be done with brick laid flat or on edge arranged in herring bone fashion or set at right angle to the walls.

The earth filling under floor is well compacted first and thereafter 10 to 15 cm. thick layer of cement or lime concrete is laid over the entire area of floor. This layer is known as subgrade. The floor is laid directly over the subgrade. The slope required to be given to the floor to take care of floor washing etc. is provided in subgrade itself. Prior to use, the bricks should be properly soaked and wetted in water.

The bricks are laid on edge on 12 mm. thick mortar bed in such a manner that all the joints are full of mortar. Where the floor has to be plastered or painted, all the face joints should be raked to a depth of about 15 mm. during the progress of work (when the mortar is green). This is necessary to ensure adequate bond between the flooring and the mortar of pointing or plastering. In case, however, pointing or plastering is not needed, the joints need not be raked and instead rendered flush and finished during laying of bricks.

The flooring should be cured for a minimum period of seven days before use.

Merits :

(*i*) It is durable and sufficiently hard.

(*ii*) It is cheaper than cement concrete, wooden or mosaic flooring.

(*iii*) It is non-slippery.

(*iv*) It is easily repairable.

Demerits :

It is absorbent.

12·5. FLAG-STONE FLOORING

Any laminiscated sandstone available in uniform thickness is called flag stone. The stone slab for flooring may be square or rectangular with width not less than 38 cm. and thickness varying from 20 to 40 mm. The sub-grade is prepared by laying a 10 to 15 cm. thick layer of lime concrete over a bed of well consolidated earth. On this sub-grade well-wetted flag stones are laid on 20 to 25 mm. thick layer of bed mortar. When the stone slabs are properly set, mortar in the joints is raked out to a depth of about 20 mm. and flush pointed with cement mortar (1:3). A slope of 1 to 40 is necessary to be given in flag stone flooring for proper drainage.

Merits :

(*i*) It is hard, durable and resistant to wear and tear and as such is used in workshops, garages and godowns.

(*ii*) It is easily repairable.

(*iii*) It is easy in construction.

(*iv*) In stone districts, it can be used with economy.

Demerits :

(*i*) It does not give a pleasing appearance and hence it is not suitable to be provided in places like residential building or important public buildings.

(*ii*) Its usage is not comfortable.

12·6. TILED FLOORING

Depending upon the type of material used tiled flooring can be broadly divided into the following categories.

(1) Terrazzo flooring

(2) Chequered tile flooring

(3) Glazed tile flooring

(4) PVC. tile flooring.

1. Terrazo Tile Flooring

Terrazo tiles manufactured under hydraulic pressure are available in following three standard sizes.

(*i*) 200 x 200 x 20 mm.

(*ii*) 250 x 250 x 22 mm.

(*iii*) 300 x 300 x 25 mm

The total thickness of the tile comprises of two layers *i.e.*, the upper layer and the backing. The thickness of the upper layer (also

known as wearing layer) varies from 5 mm. to 6 mm. and it consists of mix of cement, marble chip aggregates and pigment (if required) taken in suitable proportions. The backing of the tile consists of leaner mix of cement and aggregates usually taken in proportion of 1:3.

The tiles are laid over reasonably hard sub-grade which may be of concrete or R.C.C. slab.

Prior to laying tiles, a 30 mm. thick layer of lime mortar 1:3 (1 lime putty : 3 surkhi or coarse sand) is spread over the sub-grade to serve as bedding. The bedding mortar is allowed to harden for a day. Immediately before laying, neat cement slurry is spread over the bedding mortar and the tiles are then fixed over the slurry grout. Each tile is gently tapped with a wooden mallet till it is properly bedded and levelled. The joints in the tile flooring should not exceed 15 mm. in thickness. Next day all the joints in the flooring are cleaned of loose mortar, dust etc. to the depth of about 5 mm. by use of wire brush. The joints are thereafter grouted with cement slurry of the same shade as that of tiles and the same slurry is applied over the flooring in the form of thin coat.

The flooring is cured for 7 days and thereafter the surface of the tiles is ground with grinding machine fitted with grinding stone No. 60. After grinding, the surface is washed and again covered with a thin coat of cement and cured second time. After curing, the surface is ground second time by using grinding stone No. 120. Day after the second grinding, the entire surface is finally ground using grinding stone No. 320.

The grinding of surface is also termed as polishing. Finally the surface of flooring is rendered clean by using oxalic acid water.

2. Chequered Tile Flooring

Chequered tiles are available in the following standard sizes.

(*i*) 200 x 200 x 22 mm.

(*ii*) 250 x 250 x 22 mm.

(*iii*) 300 x 300 x 22 mm.

The method of laying tile is identical to that of terrazzo tile flooring except that the polishing of the tile has to be done by hand.

3. Glazed Tile Flooring

Glazed tiles are available in the following standard sizes :

(*i*) 100 x 100 x 5 or 6 mm.

(*ii*) 150 x 150 x 5 or 6 mm.

The tiles have only top surface glazed. The tiles are laid over a reasonably hard sub-grade which may be of concrete or R.C.C. slab. Prior to laying, a 10 mm. thick layer of cement mortar 1: 3 is spread over

the sub-grade to serve as bedding. The mortar is allowed to harden so that it may permit the mason, to work over the surface without damage to bedding mortar. Immediately before laying tiles, neat cement slurry is spread over the bedding mortar and the tiles are then fixed over the slurry grout. Each tile is gently tapped with a wooden mallet till it is properly bedded and levelled. The joints in the tiles should be as thin as possible and should be in straight lines. After laying, the joints are cleaned off all dirt and mortar to a depth of 2 to 3 mm. with the help of wire brush or trowel and then flush pointed with white or coloured cement to suit the colour of the tiles. The flooring is cured for seven days and thereafter washed before use.

4. P.V.C. Tile Flooring

P.V.C. tiles are now manufactured in variety of shades and design and are being commonly used in residential as well as non-residential buildings. It gives a decorative floor finish which is resilient, smooth and can be cleaned easily. It can be laid over a prepared base which can be of concrete, timber etc.. Prior to laying the tiles, it is necessary to see that the base is perfectly dry and brought to the temperature at which it will be while in use. The layout of the P.V.C. tiles (to the required design/pattern) is marked on the base with the help of guide lines. Adhesive of specified make is thereafter applied on the base and the back of the P.V.C. tiles with the help of a notched trowel. Laying of tile commence when the adhesive has set sufficiently (say within half an hour). After laying, the tiles are pressed suitably with wooden rollers (weighting 5 kg.) to ensure intimate contact with the base. Extra adhesive that oozes out is wiped off and the flooring is finally cleaned with warm soap water before use.

Merits and demerits of tiled flooring.

Merits :

(*i*) It is non-absorbent.

(*ii*) It is easily repairable in patches.

(*iii*) It offers pleasant appearance.

(*iv*) It is durable.

(*v*) It permits quick laying of floor.

(*vi*) It is resistant to wear and has fairly good strength.

Demerits :

(*i*) This type of construction is very costly both in initial cost as well as in maintenance.

(*ii*) Terrazo tile and glazed tile flooring becomes slippery when wet.