

Cihan University Sulaymaniya
Faculty of Engineering
Architectural Engineering Department



Building Materials

Chapter Seven

(Floor Finishes)

1st Grade- Spring Semester 2022-2023

Instructor: Diyari B. Hussein

Chapter Seven

Floor Finishes

7.1 Introduction

Flooring is the process of providing clean, smooth, durable and impervious levelled surface to the occupants of the house and the said surface is called Floor.

A floor in building construction is a leveled surface which can support the objects, passengers etc. Different flooring types are there based on different factors.

There are various types of flooring materials used in building construction and their selection depends on the choice of user, aesthetics, and the applications that provides the most satisfying results for objective, either it may be economically or durability wise.

Chapter Seven

Floor Finishes



Cement Concrete Floor



Tile Floor



Brick Floor



Tile Floor



Terrazzo Floor



Timber Floor



Jack Arch Floor



Timber Upper Floor



Flagstone Floor

Chapter Seven

Floor Finishes

7.1.1 Essential Requirements of the Floors

- Adequate strength and stability
- Adequate fire resistance
- Sound insulation
- Damp resistance
- Thermal insulation

Chapter Seven

Floor Finishes

7.2 Types of Floor finishes

a. **Hard Flooring** (*durable, noisy, more expensive*)

- ✓ Cement or lime concrete
- ✓ Stone (Slate, marble, flagstone, terazzo, granite)
- ✓ Brick
- ✓ Ceramic Tile
- ✓ Wood
- ✓ Glass

Chapter Seven

Floor Finishes

7.2 Types of Floor finishes

b. Resilient Flooring (*durable, good acoustics, easy to maintain*)

- ✓ Sheet Vinyl (plastic)
- ✓ Cork
- ✓ Rubber
- ✓ Linoleum
- ✓ Mud

c. Soft Flooring – (*warm, quite, difficult to maintain, allergens*)

- ✓ Carpets

Following are the different types of flooring materials generally used in building construction works and their application:

Chapter Seven

Floor Finishes

7.2.1 Cement Concrete Flooring Material in Buildings

Concrete is most commonly used flooring material. It is suitable for any type of construction and is cheaper than others and durable, see Figure in the next slide.

Cement Concrete mix of 1:3:6 to 1:5:10 or lime concrete with 40% (1:2 lime sand mortar) and 60% coarse aggregate, is used as base course (base layer). After hardening, 1:2:4 cement concrete mixes with 40 mm thick layer is laid as topping. The concrete is cured for 10 days.

In industrial buildings, granolithic finish is provided to obtain hard wearing surface. Granolithic finish can be obtained from rich concrete with tough quality coarse aggregate mix (like fine granite chipping or crushed granite).

Properties: are Non- absorbent, smooth surface, pleasing Appearance, Economical, Easily cleaned, hard, durable, and fire resistance.

Chapter Seven

Floor Finishes



Chapter Seven

Floor Finishes

7.2.2 Bricks Flooring Material in Buildings

Bricks can also be used for flooring purposes, but they are not suitable floor materials for residential or public buildings. Brick floorings are generally used in unimportant rooms. For this, well burnt bricks are preferable and bricks should be in uniform size and have same color.

In brick flooring, bricks are used as toppings of floor and well compacted earth filling is done under the floor. 10cm to 15cm thick layer of cement or lime concrete is laid over entire floor area for bonding are called sub- grade. Bricks laid on edge are on 12mm thick mortar bed such that all joints are full of mortar. If plastering is to be done, 12mm thickness can be provided after raking out the face joints.

This type of floor do not have smooth surface. They are hard and durable, Non-slippery, cheaper and easily repairable. They are commonly provided in go downs, warehouses, stores or in places where heavy articles are stored.

Chapter Seven

Floor Finishes



Chapter Seven

Floor Finishes

7.2.3 Flagstones Flooring Material in Buildings

Flagstone is a type of sedimentary rock which is obtained by splitting along bed planes. It consists of silica, calcite and iron oxide. Flag stone is used to manufacture tiles of different sizes in different shapes, as shown in Figure below.

For construction, earth surface is leveled, rammed and watered.

In Flagstone flooring stone slabs are used as toppings in floor, thin slabs of lime- stones laid on concrete bedding. Layers of lime concrete of 10cm to 15cm thickness is laid and rammed properly.

Well dressed flagstones are laid and fixed with mortar.

They are used in go downs, stores, pavements etc.

Slope of 1 in 40 is provided for drainage.



Chapter Seven

Floor Finishes

7.2.4 Marble Flooring Material in Buildings

Marble is a type of metamorphic rock and is used widely for floorings in commercial buildings, kitchens, bathrooms etc. they are stain proof and easily cleanable.

Hence, they are used where extra cleanliness is required especially in bathrooms. They are also available in different colors and designs.



Chapter Seven

Floor Finishes

7.2.5 Artificial hard floor finishes (Terrazzo)

This is a composite material made up of cement and marble aggregate; it is then mixed and poured in situ onto a concrete base, then ground waxed and polished. It is available in slabs or tiles. It is very hard wearing, if it is polished or wet it is very slippery. It is very useful in commercial situations i.e. malls and shopping centers as it is very durable and easy to clean.

Chapter Seven

Floor Finishes

7.2.5 Artificial hard floor finishes (Terrazzo)



Chapter Seven

Floor Finishes

7.2.6 Glass Flooring Material in Buildings

Glass is used as flooring material for special conditions like to transmit light from upper floor to lower floor etc. They are available in tiles which are fixed in closely spaced frames. Even though it is very costly, it provides beautiful appearance, as shown in Figure below.

Chapter Seven

Floor Finishes



Chapter Seven

Floor Finishes

7.2.7 Ceramic Flooring Material in Buildings

Ceramic tiles are famous floor covering materials. Ceramic is inorganic material and it possess properties like good compressive resistance, brittleness and hardness etc.



Chapter Seven

Floor Finishes

7.2.8 Wood Flooring Material

Wood or timber is one of the most common methods of flooring. It is preferred when the timber is cheaply available. Many different species of wood are fabricated into wood flooring. The two major forms are plank and parquet. Hardwoods are more durable than softwoods.

Wooden floors are most suitable for auditoriums, saloons etc. Damp proof course below the flooring is necessary for wooden floors. see Figure in the next slide.

Chapter Seven

Floor Finishes



Chapter Seven

Floor Finishes

7.2.9 Plastic Flooring Material in Buildings

Plastic tiles or poly vinyl chloride (PVC) tiles are widely used nowadays which are laid on concrete base. These tiles are available in different shapes, sizes and colors, as shown in Figure below. Plastic tiles are of slippery nature and can get easily damaged by fire.

Chapter Seven

Floor Finishes



Chapter Seven

Floor Finishes

7.2.10 Laminate Flooring

Laminate flooring is a multilayered synthetic product fused together with a lamination process.

Laminate can be used to cover the floor or most spaces, except for those with a lot of moisture or those exposed to severe abuse



Chapter Seven

Floor Finishes

7.2.10.1 Advantages of Laminate Flooring

- It is extremely easy to install.
- The surface is quite durable compared to wood covering.
- You don't have to worry about any bad pieces. Unlike real wood that comes with some imperfect pieces.
- Easy to clean. Mop with a damp mop.
- Relatively warmer when walking on it even without under floor heating.

Chapter Seven

Floor Finishes

7.2.10.2 Disadvantages of Laminate Flooring

- It isn't real wood.
- It has a lower resale value. Compared to hardwood.
- You cannot refinish or sand it.
- It is hard to replace a damaged unit.

Chapter Seven

Floor Finishes

7.2.11 Mud Flooring

Mud is nothing but moist earth which is being used as flooring material in since olden days. It has good thermal insulation property. Chopped straw is added to mud to prevent it from the cracking. These types of floors are used in low cost construction and are easy in construction and maintenance.



Chapter Seven

Floor Finishes

7.2.12 Cork Flooring

Cork is obtained from the cork oak tree. It is used as flooring material in the form of carpets. These carpets are noiseless and are required mainly in libraries, theaters etc. Cork tiles are also available which are made from high graded cork bar using compression in moldings, see Figure below.



Chapter Seven

Floor Finishes

7.2.13 Linoleum Flooring

Linoleum is the product obtained by oxidizing linseed oil in gum, resins, pigments, cork dust etc. It is available in sheets which are generally used as covering for concrete or wooden flooring. The sheets may be plain or design printed, as shown in Figure below.



Chapter Seven

Floor Finishes

7.2.14 Asphalt Flooring Material

Asphalt is highly viscous liquid form of petroleum. Asphalt is used as flooring material in different ways, see Figure in the next slide.

If asphalt and sand are mixed in 1:2 proportions then it is called asphalt mastic which is poured on concrete base as flooring cover. If sand is replaced by marble chips then it is called as asphalt mosaic. Asphalt tiles are also available which are prepared from the asphalt fibers, inert materials and mineral pigments.

Chapter Seven

Floor Finishes



Chapter Seven

Floor Finishes

7.2.15 Rubber Flooring Material

Rubber tiles or sheets are also available in market for flooring purposes. They are made from pure rubber which is mixed with cotton fibers or asbestos fiber. Suitable adhesives are used to fix the rubber tiles with concrete or wooden base, as shown in below. Rubber flooring is noiseless and provided in libraries, gyms, offices etc.

Chapter Seven

Floor Finishes



Chapter Seven

Floor Finishes

7.2.16 Plush Carpets

There are different types of carpets used for floor finishing like:-Smooth, Texture, Twist, and Shag, as shown in the Figure below



Chapter Seven

Floor Finishes

7.3 Factors Affecting Selection of Flooring Material

The selection of flooring material is done based on the following factors:

- **Initial cost**
- **Durability**
- **Hardness**
- **Smoothness**
- **Cleanliness**
- **Appearance**
- **Sound insulation**
- **Thermal insulation**
- **Damp proof**
- **Fire resistance**
- **Maintenance**

End of Chapter Seven

Thank You