

① Lecture # 09 BCE

Surface Rendering

→ Also known as surface finishing and surface treatment, is the art of treating the masonry surface with a suitable covering material in order to make it

- weather resistant
- decorative
- Control acoustics

There are various type of Surface rendering of masonry wall.

- Plastering
- Painting
- white wash and color washing
- Distemping and painting
- Tiling
- Terrazzo work → chips work

Plastering :-

→ It is a wet mix of suitable material applied to masonry work as a finish to fill in any irregularities in the surface and to provide a smooth surface

Requirements of the good plastering is the following

- A good plaster should be such that it should firmly adhere to the surface
- It should not contract in volume while drying and setting

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- It should have good sound insulation
- It should have good fire resistance
- The plaster surface should be smooth non-absorbent and washable
- It should have good impact and abrasion resistant

TYPES OF Plaster

- Cement plaster
- Lime plaster
- Mud plaster
- Stucco plaster
- Moghul plaster
- Terrazzo plaster

Cement plaster

It is obtained by mixing fine aggregate (usually sand) with portland cement and water in the ratio ranging from 1:2 to 1:3 for Fine plastering and 1:5 to 1:8 for General plastering of walls.

- The Sand used in the plastering work shall be preferably coarse, free from Clay and Organic contents.
- Cement plaster is ideal for external finishing. It is also used for internal rendering of buildings. It is specially suited for damp condition i.e. bathroom, kitchen etc.

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Following are the steps followed in cement plaster work. Detail can be seen in 14.4.1 of Arora.

1. Surface Preparation
2. Succeed work $\rightarrow$ mixing of raw materials.
3. Mortar Mixing.
4. Plaster application.
5. Curing.

* Lime Plaster:-

In case of lime plaster the Fine aggregate may be Sand or Surkhi (brick powder)

$\rightarrow$ Hence, this plaster can be lime-sand plaster or lime-surkhi plaster.

$\rightarrow$ Lime plaster is rarely used in Pakistan. For historical buildings lime surkhi mortar is usually used.

$\rightarrow$ In case of lime sand plaster, the proportion is usually, 1 part of lime and 2 part of sand.

$\rightarrow$ Thickness of lime plaster varies from 20 to 25mm.

$\rightarrow$ Lime plaster may be applied in one two or three coats. Lime plaster in the final coat is made with richer mix than the first & second coats.

$\rightarrow$ Lime plastering

Lime plaster
for detail 14.4.2 of above

1. Surface Preparation
2. Application of first coat
3. Application of 2nd coat
4. Application of final/Finishing coat

Mud Plaster

Mud Plaster is prepared by mixing mud with water

Sand (usually 10%), cement (usually 10%) locally available straw and cow dung may be added to strengthen and stabilize the mortar against weathering actions.

Mud plaster is usually applied on adobe (sun dried brick masonry) wall surface in rural areas

In rural area mud plaster is usually applied hand without using trowels & floats

Following steps are followed in mud plaster work.

1. Surface Preparation

2. Mud mortar mixing

3. Application of mud plaster with wooden float

4. lapping after 24 hrs for compaction and filling of joints.

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After tamping, water is sprinkled and the surface is polished with steel float.

→ Finally the surface is given a mesh of fine earth, cow dung & cement usually 3:2:1

Pointing :-
Application of cement or lime mortar to the masonry joints on surface application of the wall is known as pointing.

- Pointing is usually applied on external surface of the wall.
- These joints are roughly filled during masonry work. These joints are after wards neatly finished off to make them water tight.
- Mortar used in pointing is richer than cement plaster mortar.

→ The purpose of pointing is to -
• Make masonry joint water resist.
• To improve the appearance of the wall.

→ Pointing is preferred over plastering when -
• Smooth and even surface is not essential.
• Natural beauty of the material is required.
• The wall material has enough weather resistance.

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the workmanship of the masonry wall is neat & good

Types of Pointing

1) weathered Pointing

In this type of pointing the mortar surface is made inclined by keeping the upper surface about 12mm inside the wall face while the bottom is kept flush with the wall.

this pointing easily throws rain water off of wall surface.

2) Struck pointing

this is similar to weather pointing but with a reverse slope, keeping the bottom surface inside the wall face while the upper is kept flush with the wall surface.

3) Flush Pointing is

In this type joints are filled with the wall surface. This is most common & simplest type of pointing which is economical & durable.

→ It does not afford a lodging place for dust.

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V-grooved Pointing

A V-shaped groove is made in the joint with special tool.

→ It has a good appearance which is generally recommended for brick in government buildings.

⑤ Keyed pointing :

In this type, the joint is first filled up flush and then a circular piece of a steel tool is pressed & rubbed in the middle of joint.

⑥ Recessed Pointing

In this type, the face of the mortar is pressed in the joint but keeping the surface of mortar vertical with in the joint.

• Suitable for good quality masonry work with straight edges & sharp corner.

⑦ Tuck Pointing

The joint is first filled up flush and then a square groove

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is formed immediately in the center of mortar joint.

The joint is then filled or tuckered with lime putty.

Beaded pointing

The joint is filled with the mortar projecting from the surface of wall.

The shape of beaded pointing may be V-shaped, circular or square. Square type beaded pointing is usually used for stone masonry.

* Assignment Photos of different pointings. then email it to Sir.

Washing

Washing is the application of lime water (ie quick lime mixed with water) on smooth plastered surface to give it a pleasant effect. Wash may be

- White wash (white adding color)

- colour wash (if color is added to lime)

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Wash Preparation :-

White wash is Prepared by mixing quick or fat lime in water

- The quick lime is put in a container.
- The sufficient water is then poured in the container.
- When slaked, more water is added and stirred to get a mixture of uniform consistency.
- The wash is then strained through coarse cloth or sieve in another container.
- Arylic glue or rice water may be added to enhance the binding power of wash.
- Colour pigments are added in case of colour wash.

* Surface Preparation :-

- Surface should be cleaned, brushed & dried.
- The surface should be made ^{smooth} rough by a sand paper in order to develop proper bond b/w surface & wash.
- Large hole if any shall be filled with lime putty.

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In case of rewashing, the old surface shall be cleaned, scraped to remove loose old wash & rubbed with a sand paper

Application of wash

Wash is applied in two or three coats with help of brush. In case of rewashing one coat may be sufficient

The coats are applied alternately with a vertical & horizontal strokes of brush

Each coat should be allowed to dry before the application of the next coat

In case of color wash on new surfaces the first coat is applied with white wash & other two coats with color wash.

Distempers

Distemper is water based paint consisting of powder chalk, coloring pigments & glue mixed in water.

Ready to use distempers are available in market nowadays only water is added to obtain a mix of required consistency

Distemper is commonly used for surface treatment of interior wall surface.

Surface Preparation

- The plaster surface on which distemper is to be applied shall dry.
- The surface is first cleaned & brush rubbed with sand paper.

A Primer coat is applied to the wall surface which may be consist of white wash mixed with glue or ready available prime coats.

- Readily available wall putty is applied on the wall surface in two or three thin coats. Each coat is rubbed with fine sand paper before application of next coat.

Application

After surface preparation, two or three coats of distemper are applied on the surface using a soft brush.

- Each coat shall be allowed to dry before

In each coat distemper shall be applied vertically & then immediately crossed off horizontally.

As far as possible distemper should not be used in wet weather.

Emulsion & plastic Emulsion

Emulsion is a water based washable paint. The main difference in distemper & emulsion is that the acrylic plastic emulsion is used for exterior surface having high weather resistance. Plastic emulsion is commonly known as weather shield.

Painting is

Oil Paint generally consist of 7 or 8 ingredients

- Pigments provides colour & opacity to the paint. It is in form of fine particles that are dispersed not soluble. Pigments are dangerous which included lead, chromates

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- Binder is what hold everything together. The binder is usually based oil which is frequently mixed with one or more other vegetable oil.

- Solvents keep their respective pigments and binder in solution and help them penetrate deeply into the surface being painted.

- Additive are some additional ingredients added to the paint to improve its properties, e.g. increase durability, reduce bubbles, control consistency.

- Oil paints may have glossy or matt texture.

Painting:-

Painting is the application of one or more coats of paint on wood, steel or plastered surface to protect the surface from decay, rust & other weathering actions.

Surface Preparation

- clean
- rubbed & smoothed with sandpaper
- shall be treated properly
- steel work & rust shall be removed

Application

Tiling

- Tiles have been known to maintain their integrity for many years
- Tiles are made from natural clay or manufactured from other ceramic materials, quarry stone or metal
- They are relatively thin in relation to their facial area
- can be textured, smooth, embossed, patterned, scripted or engraved
- are available glazed & unglazed
- they are available in many types, size & shape can be cut into nearly any configuration with tile cutters

Tiles are burnt in kilns at very high

Application - may be applied to the surface using

- ready to mix grouts or organic adhesives (known as thin set process)

- Thin layer cement-sand mortar; 1 to 2 inch for floor and $\frac{3}{4}$ to 1 inch for walls (known as thick set process)

- Before application of tiles, the surface should be made rough either at the time of plastering or at the time of tiling using mason hammer

- Care shall be taken to proper level & finish the tile work

Terrazzo work

Modern day terrazzo is a matrix of mostly marble or granite chips marble powder, Portland Cement & water or a synthetic resin.

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After this completely matrix is hardened but not
or Chemically cured the surface is ground
aggregate, then pecked to expose the
smooth finish polished to give a

Terrazzo Provides a dense extremely
durable, smooth surface controlled
by the size & binder & color of aggregate

- Terrazzo work is mainly applied on floors, in dado & skirting.
- Terrazzo can be
 - Washed terrazzo
 - Grinded terrazzo
 - Non washed - non grinded terrazzo

Mixing

As first steps cement is dry mixed thoroughly with marble powder in equal proportions.

Then marble chips are added

Application