MODULE: MASWP301 WALL PLASTERING

COMPETENCE: MASWP301 PERFORM WALL PLASTERING

CLASS: LEVELIII MASONRY

RTQF LEVEL: 3

CREDITS: 8 Learning hours: 80

SECTOR: construction

Sub-sector: Masonry

Learning assumed to be in place

Masonry basic drawing

Building set out

Elevation

Concrete technology

INTRODUCTION TO WALL PLASTERING

0.1 Definition

Plastering is the process of covering rough surfaces (of walls, columns, ceiling, and other components of the building) with a thin coat of plastic or mortar to form a smooth and durable surface.

Plastering done on external exposed surface of the building is known as "**external rendering"**

0.2 OBJECTIVE OF PLASTERING

Why do we have to plaster?

Plastering is done to achieve the following objectives:

- **i.** To protect the external surfaces against penetration of rainwater and other atmospheric agencies.
- **ii.** To impart (give) a smooth surface in which dust and dirt cannot lodge.
- **iii.** To give decorative effects.
- **iv.** To protect the surfaces of the walls against vermit.
- **v.** To increase the durability of the structure.
- **vi.** To hide some defects of workmanship or to conceal inferior materials

0.3 Requirements of good plaster

A good plaster, well done, should fulfill the following requirements**:**

Fresh plaster should have the following properties:

1. **Adhesion**

The capability of mortar to stick to the surface which is developed in the plaster by the combination of materials and application technique. Adhesion is influenced by aggregate, water-cement ratio, and the absorptive characteristics of the base. This property should remain

in all variations seasons.

2. Cohesion

The ability of plaster to stick itself which is affected by the portland cement type; shape and gradation; and quantity of aggregate and water used in mortar preparation.

3. Workability

Workability of plaster is the ease with which the plaster is placed, shaped, floated, and troweled. Workability involves adhesion, cohesion and spreadability. To give the best workability, all materials should be proportioned properly during mixing. Plaster with poor workability requires greater effort to apply.

Finished, hardened plaster should have the following characteristics:

1. Weather resistance

The ability of plaster to withstand weathering includes resistance to wind and rain penetration, resistance to freezing and resistance to thermal and moisture changes. Resistance to aggressive chemicals in the atmosphere, such as acid rain, is also of concern.

2. Sulfate resistance

In aggressive sulfate environments, additional resistance to sulfate may be obtained with the use of portland cement Type II or Type V. Additional precautions may include application of a water-resistant surface coating.

3. Hardness and durability

Hardness of plaster is the ability of plaster to withstand scratching. Proper curing of a well-proportioned and well applied plaster is critical to obtaining optimum hard plaster.

Apart from the fresh and hardened plaster, the plaster should be cheap.

0.4 The factors affecting the selection of the various types of plaster are

a) Availability of binding materials
b) Durability requirement
c) Finishing requirement
d) Atmospheric conditions and variations in weather
e) Location of surface(i.e. exposed surface or interior surfaces)

0.5 TERMINOLOGY USED IN PLASTERING WORKS

1. **Background:** it is the surface to which the first coat of plaster is applied.
2. **Blistering:** this is the development of local swellings on the finished plastered surface, due to residual unslaked lime nodules.
3. **Cracking:** this is the development of one or more fissures in the plaster due to movements in the background or surrounding structure.
4. **Crazing:** this is the development of hair cracks, usually in an irregular pattern, over the finished surface.
5. **Dado:** this is the lower part of the plastered wall. It has to be well treated to give better resistance against the attack of water flowing on the floor.
6. **Dots:** these are small projections of plaster, laid on the background, for fixing the screeds. They are reference points for plastering. Their size may be 15cm×15cm.
7. **Dubbing coat:** it is a coat applied to the background to fill up hollow spaces in the solid background, before applying the main body of the plaster.
8. **Under-coat:** they are the coats of plaster applied under the finishing coat.
9. **Finishing coat:** it is the final coat of plaster. Such a coat is also known as **setting coat** or skimming coat
10. **Flaking:** the process of removing the patches plaster of previous coat, due to the lack of adhesion with under coat.
11. **Gauging:** it is the process of measuring various constituents of plaster.
12. **Grinning:** is the reflection or appearance on the surface of plaster or the pattern of joints or similar patterns in the background.
13. **Hacking:** it is the process of roughening the background to provide suitable bond or key for plastering.
14. **Grounds:** these are the wooden strips fixed to the background to provide suitable bond or key for plastering.
15. **Keys:** they are openings or corrugations on the background or surfaces of the under coats, to which plaster will form mechanical bond.
16. **Laitance**: this occurs when a fresh mortar is subjected to excessive trowelling and a screen consisting of thin layer of fine cement particle is formed. This layer is known as laitance.
17. **Peeling**: this is the term applied to the dislodgement of plaster work from the background.

LEARNING UNIT 1: PERFORM PRELIMINARY PLASTERING WORK

1.1 Select tools and equipment

- The commonly used tools for plastering works are:

1) **Trowel**: this trowel is used for gauging small quantities of materials and for applying mortar to moldings, corners, etc. the end of this trowel may be either pointed or bull-nosed.
2) **Float**: A float is used for applying and spreading mortar on the surface. It is made of either metal or wood. Metal float is known as **laying trowel.** It is used for trowelling, to get desired finish. The wooden float is commonly known as **skimming float.** It is used for finishing coat of plaster. Its size is 10cm×30cm to 11cm×33cm.
3) **Floating rule**: It is used for checking the level of the plastered surfaces between screeds.
4) Utility knife:
5) Gauging box: This is a box made from timber boards or metal sheet having the dimension of 300 mm x 300 mm x 375 mm which holds 0.035 m^3 of material. It used in measuring or Spade:
6) Mortar pan: Use for transporting mortar on small site
7) **Miscellaneous tools:** these include plumb bob, Set Square, straight edges, stiff wire brush, scratching tools, tape measure, sponge, sprit level, building line, hawk etc.
   - **i)** Plumb bob: Used for checking the verticality of dots forming the screeds.
   - **ii)** Set Square or builder's square: Use for checking the right angle in the corners of the building.
   - **iii)** Stiff wire brush: Used to remove the dirt, grease and laitance appeared on the surface to be plastered.
   - **iv)** Scratching tools: Used for roughening the surface to be plastered in order to provide a good bond between the surfaces and plaster coat applied.
   - **v)** Tape measure: Used for taking measurement
   - **vi)** Sprit level: used for checking the horizontal and vertical level.
   - **vii)** Building line

- **Equipment**

1. **Wheelbarrow:** This is used for transporting materials on the site
2. **Concrete mixer:** This used for mixing concrete ingredients or mortar ingredients

1.2 Select ingredients

Materials used in plastering: The mostly common materials used in plastering are:

1. Cement and lime generally known as binding materials
2. Sand
3. Water
4. Additives/ admixtures

The commonly types of mortar used for plastering are:

1. Cement mortar.
2. Lime mortar.
3. Lime-cement mortar.

1. Cement mortar

It is the best mortar for external plastering works; since it is practically non absorbent. It is also preferable in both climates. Cement mortar is stronger rather than the other types of mortar. The mixing proportion (cement, sand) may vary from 1:4 to 1:6.

The sand used for plastering should be clean and well graded. Before water is added; dry mixing of sand and cement is done. Once water is added, the mortar should be used within 30 minutes after the mixing. It means the mortar must be consumed before setting takes place.

2. Lime mortar

The lime used for plastering may be either fat lime or hydraulic lime. However fat lime is most preferred since it yields good putty after slaking. The mix proportion (i.e. lime: sand) varies from 1:3 to 1:4 for fat lime and 1:2 for hydraulic lime.

3. Lime-cement mortar

Lime-cement mortar contains properties of both lime mortar, as well as cement mortar. Cement mortar does not possess sufficient plasticity. The addition of lime to the cement imparts plasticity, resulting in smooth plastered surfaces. Generally; mixing proportions used are 1:1:6(cement: lime: sand)

GRADATION AND BULKING OF SAND

1. **GRADATION OF SAND**

The term gradation means particle *size distribution* of an aggregate which determined by sieve analysis. Gradation is determined by passing the material through a series of sieves stacked

with progressively smaller openings from top to bottom and weighing the material retained on each sieve.

If all the particles of an aggregate are of uniform size, the compacted mass will contain more voids whereas aggregate comprising particles of various sizes will give a mass with lesser voids.

The particle size distribution of a mass of aggregate should be such that the smaller particles fill the voids between the larger particles. The proper grading of an aggregate produces dense concrete and needs less quantity of fine aggregate and cement waste, therefore, it is essential that coarse and fine aggregates be well graded to produce quality concrete.

Well graded sand is sand that contains particles of a various sizes range. Well graded gravel is classified as GW while well graded sand is classified as SW.

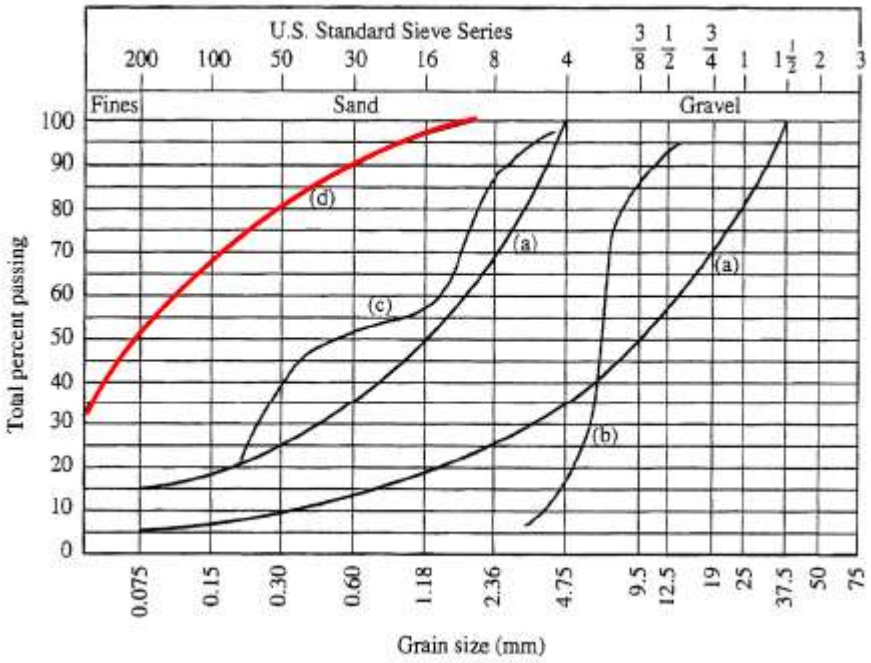
Poorly graded sand is sand that does not have a good representation of all sizes of particles distribution. Poorly graded gravel is classified as GP while poorly graded sand is classified as SP.

GRADATION ANALYSIS

As we described above the gradation of aggregate is taken as a screening process in which coarse fractions of soil are separated by means of series of sieves. Particle sizes larger than 0.075 mm (U.S. No. 200 sieve) are usually analyzed by means of sieving whereas Soil materials finer than 0.075 mm (-200 material) are analyzed by means of sedimentation.

Grading curves

The results from the particle size determination tests are plotted as grading curves. These show the particle size plotted against the percentage of the sample by weight that is finer than that size. The results are presented on a semi-logarithmic plot as shown in figure below.



Produced grading curve for the sample, determining the values of the critical particle sizes, **D60**, **D30** and **D10** that correspond to 60, 30 and 10 % passing, calculating the values of the coefficients of uniformity(**Cu)** and curvature(**Cc)** and finally comparing these values to critical ranges to determine whether the material is well graded or poorly graded. These coefficients are calculated as shown below:

$$C_u = \frac{D_{60}}{D_{10}} \qquad C_c = \frac{(D_{30})^2}{D_{60} D_{10}}$$

If more than half of the material is coarser than the 75 □m sieve, the aggregate is classified as coarse. The following steps are then followed to determine the appropriate 2 letter symbol

1. Determine the prefix (1st letter of the symbol)

If more than half of the coarse fraction is sand then use prefix S

If more than half of the coarse fraction is gravel then use prefix G

2. Determine the suffix (2nd letter of symbol)

First determine the percentage of fines that is the % of material passing the 75μm sieve.

Then if % fines is < 5% use W or P as suffix> 12% use M or C as suffix between 5% and 12% use dual symbols. Use the prefix from above with first one of W or P and then with one of M or C.

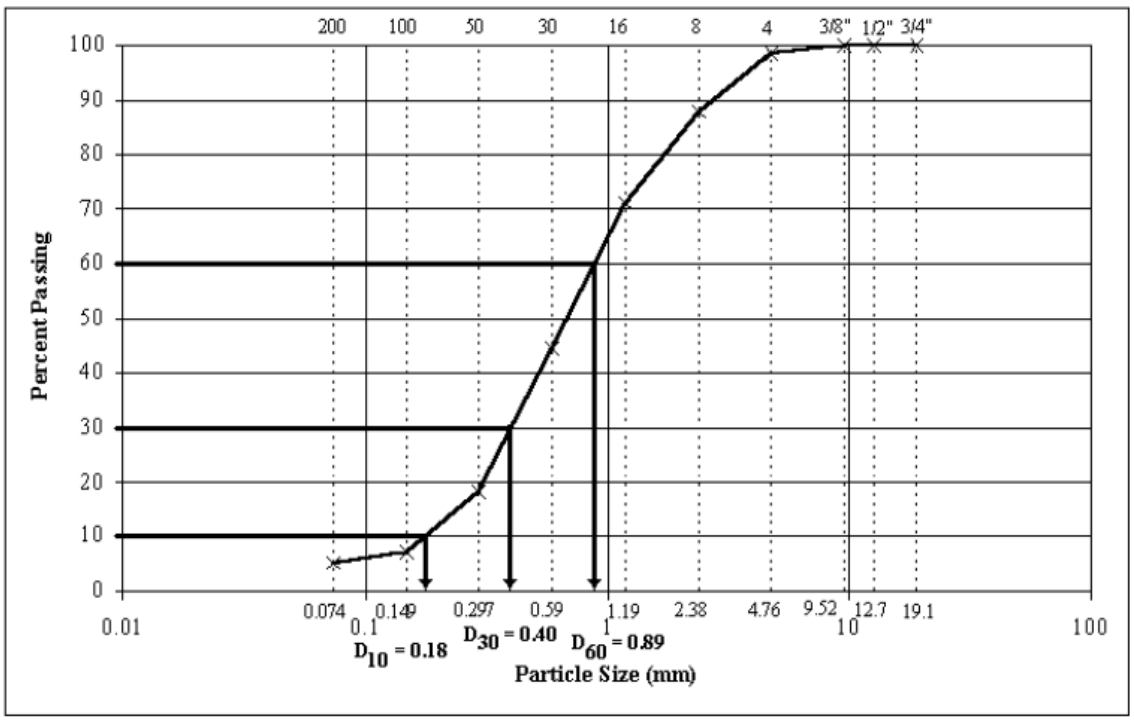
If prefix is G then suffix is W if Cu > 4 and Cc is between 1 and 3 otherwise use P

If prefix is S then suffix is W if Cu > 6 and Cc is between 1 and 3 otherwise use P

Example1. Sieve Analysis Data for Fine Aggregate

SIEVE		%
Designation	Size (mm)	PASSING
3/4"	19.1	100.0
1/2"	12.7	100.0
3/8"	9.52	100.0
No. 4	4.75	98.6
No. 8	2.38	87.9
No. 16	1.19	71.1
No. 30	0.59	44.5
No. 50	0.297	18.1
No. 100	0.149	7.2
No. 200	0.074	5.3

The gradation curve for the sample data above is presented in Figure 2.



Determine % of different particle size fractions:

- % fines from the grading curve(Silt and Clay)= 5,3%
- Gravel= 100-98.6=1.4%
- Sand= 98.6-5,3= 93.3%

Cu=$\frac{0.89}{0.18}$ = 4.94, **Cc=$\frac{0.4^2}{0.89*0.18}$=0.99≈ 1** and hence Suffix$_1$ = p

Of the coarse fraction about 93.3% is sand, hence Prefix is S

BUILKING OF SAND

Bulking in sand occurs when dry sand interacts with the atmospheric moisture. Presence of moisture content forms a thin layer around sand particles. This layer generates the force which makes particles to move a side each other. This results in the increase of the volume of sand. Extremely fine sand particularly the manufactured fine aggregate bulks as much as about 40%.

WHAT CAUSES BULKING OF AGGREGATE?

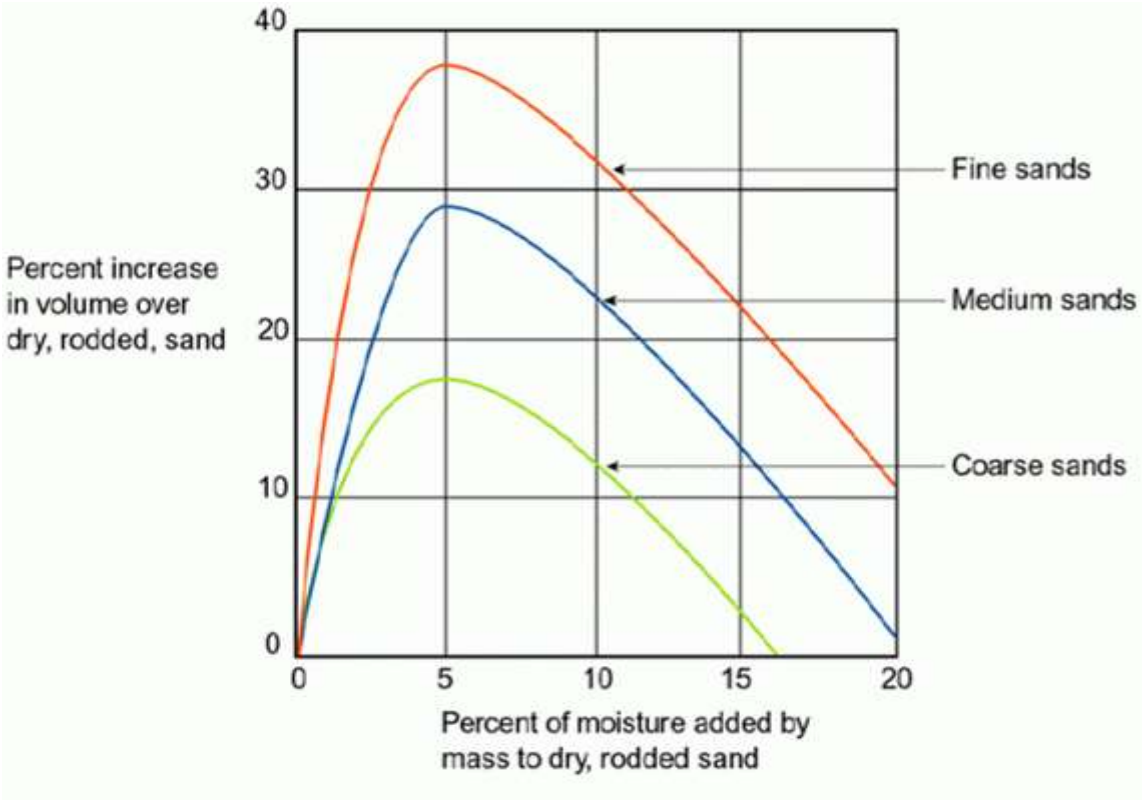
The moisture present in aggregate forms a film around each particle. These films of moisture exert a force, known as **surface tension,** on each particle. Due to this surface tension each particles gets away from each other. Because of this no direct contact is possible among individual particles and this causes bulking of the volume.

Bulking of aggregate is dependent upon two factors,

1. Percentage of moisture content
2. Particle size of fine aggregate

Bulking increases with increase in moisture content up to a certain limit and beyond that the further increase in moisture content results in decrease in volume. When the fine aggregate is completely saturated it does not show any bulking. Fine sand bulks more as compared to coarse sand, i.e. percentage of bulking in indirectly proportional to the size of particle.

The figure below shows percentage of bulking of sand with moisture content



WHY TO DETERMINE PERCENTAGE OF BULKING?

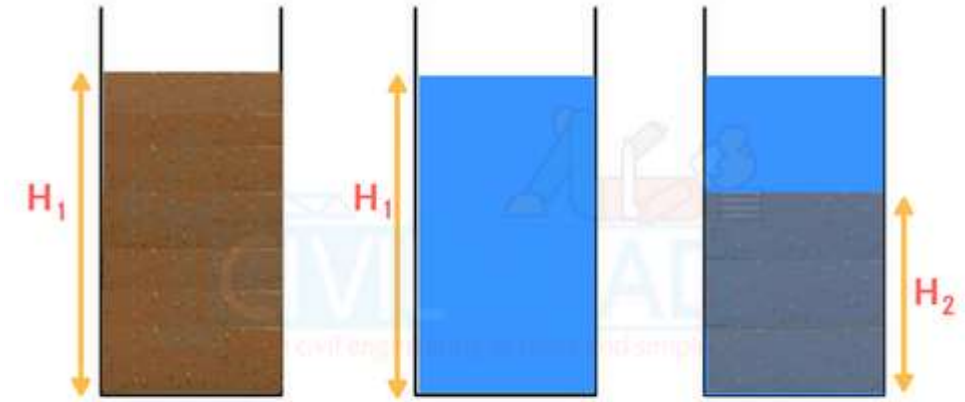
Due to bulking, fine aggregate shows completely unrealistic volume. Therefore, it is absolutely necessary that consideration must be given to the effect of bulking in proportioning the concrete by volume. If care is not given to the effect of bulking, in the case of volume batching, the resulting concrete is likely to be under sanded and harsh. It will also affect the yield of concrete for a given cement content.

HOW TO DETERMINE PERCENTAGE OF BULKING?

The extent of bulking can be estimated by a simple field test.

1. Take a simple container and add 2/3 part of sand in it.
2. Measure the exact height of sand using the scale and note it down. (H1)
3. Now fill the container upto 2/3 part with water. (Same height of Sand)
4. Now add the measured sand to the container and wait for some time to settle down.
5. Now calculate the height of Sand in water. (H2)

$$\% \text{ of Bulking of sand} = \frac{H_1 - H_2}{H_2} \times 100$$



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BULKING IN SAND

LEARNING UNIT 2: APPLY PLASTER COAT

1.1 Identify the types of plaster finishes

Plastered surfaces can be finished in the following varieties:

1. **Smooth cast finish**

To obtain smooth cast finish, mortar used should be in the ratio 1: 3 [cement: sand]. Fine Sand should be taken to prepare the mortar. For spreading the mortar, skimming float or wood float is best suitable tool. Hence, smooth and levelled surface is obtained finally.

2. **Sand faced finish**

It is obtained by plastering in two coats. The first coat is applied in 1:4 (cement: sand) mortar for about 12mm thick. It is provided with zigzag lines. It will be cured for 7days; then the second coat is applied in the thickness of 8mm. The mortar for second coat is prepared from cement sand mix ratio of 1:1.

The sand of this coat is perfectly screened so that uniform size is obtained. Sponge is used in the second coat when it is still wet. Finally take some sand and screened it to obtain uniform grain size. The screened sand is applied on the second coat using skimming float or wooden float. Finally, sand faced finish with uniform grain size of sand is obtained.

3. **Rough cast finish or spatter dash finish.**

The mortar for the final coat contains fine sand as well as coarse aggregates. It is mixed in the ratio of 1:1.5:3(cement: sand: aggregates).

The coarse aggregates may vary from 3mm to 12mm in size. The mortar is dashed against the prepared plastered surface. The surface is then roughly finished using a wooden float

4. **Pebble dash or dry dash finish.**

Pebble dash finish requires mortar layer of 12mm thickness with cement and sand in the ratio of 1: 3. After plastering, pebbles of size 10mm to 20mm are dashed on to the plastered surface. Then press them into the plastered surface using wooden float slowly. After hardening they provide aesthetic appearance to the structure.

5. **Depeter finish.**

This is similar to pebble dash finish in which the 12mm coat is applied and while it is still wet, the pieces of gravel or flint are pressed with hand on the surface. Flints of different colours may be used to obtain beautiful patterns

6. **Scrapped finish**

In this, final coat of 6 to 12mm thick is applied and after it has stiffened for few hours, the surface is scrapped in patterns for a depth of 3mm. for scrapped, steel straight edge, old saw blade or such other tool may be such scrapped surface is less liable to cracks.

7. **Tyrolean finish rendering**

This type of plaster is produced by machine that throws a 1:1 cement and sand mixture on the wall for a deeply texture finish. Cement can be coloured to produce a permanent coloured surface.

8. **Textured plaster**

This is used with **stucco plastering.** Ornamental patterns or textured surfaces are made on the final coat of stucco plastering, by working with suitable tools.

Note: The above types of plastering are known as the external render, where they are classified as follow:

i. Smooth render

ii. Rough cast render

iii. Scraped render

iv. Pebble dash render

v. Tylorean render finish

The term “external rendering” is the process of applying a cement and sand plaster coat to outside walls of building.

You apply external render to:

a) Improve the appearance of concrete block walls

b) Provide a waterproof finish to porous faced wall.

c) Provide a base for a colour finish.

Smooth Cast Plaster Finish

Rough Cast Plaster Finish

Sand Faced Plaster Finish

Pebble Dash Plaster Finish

2.2 APPLY THE PLASTER

2.1 Number of coats of plaster

The background over which plaster is to be done, depend upon the type of wall construction (such as random rubble masonry, brick masonry, cement block work, etc.)

Different thicknesses of plaster are required for different types of backgrounds. Plastering is therefore applied in **one, two,** or **three coats.** Plaster in one coat is applied only for inferior works. Generally, lime plaster is applied in three coats while Cement plaster is applied either in two or three coats.

The table below indicates the recommended number of plaster coats required depends up on the type of background.

BACKGROUND	**NUMBER OF COATS**
Stone works	2 coats or three coats
Brick works	2 coats or three coats
Concrete cast in situ	2 coats or one coat
Concrete blocks	2 coats or three coats
Slab 2 coats or one coat	2 Coats or one coat.

These various coats are applied successively in the following sequence:

1) **Rendering coat (under-coat):** This is the first coat of plaster which provides the means of straightening or leveling an uneven surface.

2) **Floating coat:** It is the second coat applied. Before it is applied; the surface of the rendering coat is watered. The average thickness of rendering coat and floating coat may be 10mm to 15

mm and 6 to 9mm respectively. The main purpose of this coat is to bring the plaster to an even surface.

3) **Setting coat or finishing coat:** It is the final coat to provide smooth surface. The thickness may be 2 to 3mm. If the plaster is applied in single coat, its thickness should not greater than 12mm and not less than 6mm.

2.2 Techniques of plastering

2.2.2 Application of two coats of plaster

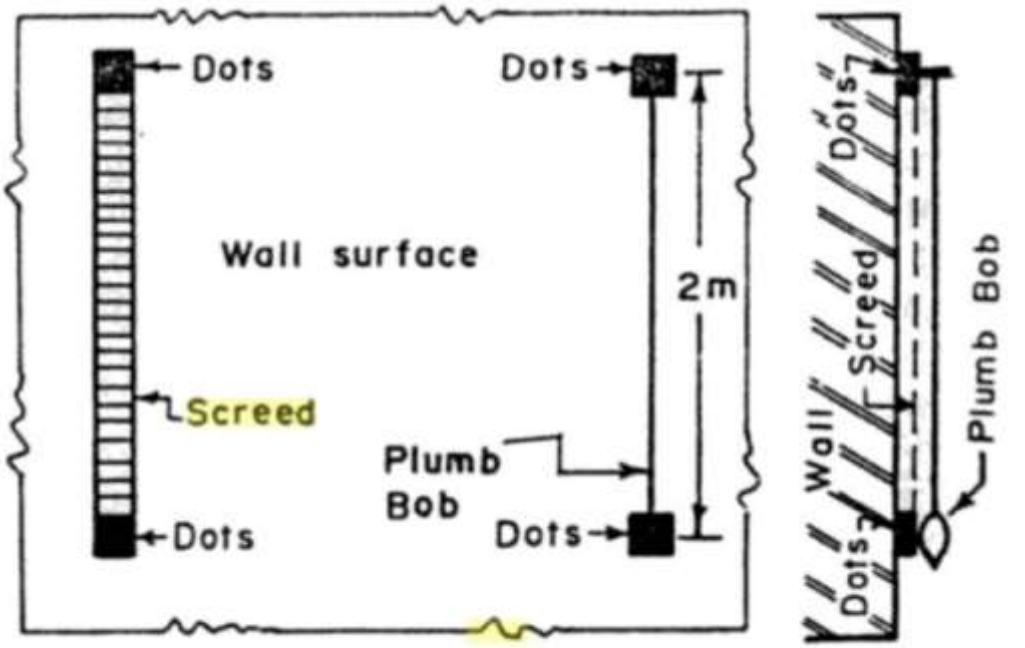
The process of applying a double coat cement plaster on wall surface consists of the following steps.

(i) Preparation of background

1. Keep all the mortar joints of wall rough, so as to give a good bonding to hold plaster.
2. Roughen the entire wall to be plastered.
3. If the surface to be plastered present some oil or grease, clean the surface with a wire brush
4. If the projection on the wall surface is more than 12 mm, then knock it off, so as to obtain a uniform surface of wall. This will reduce the consumption of plaster.
5. If there is any cavities or holes on the surface, then fill it in advance with appropriate material.
6. Cleaned off all dirt, dust and humidify the entire wall to be plastered, and keep it wet for at least 6 hours before applying cement plaster.

STEP-2 (GROUND WORK FOR PLASTER)

1. In order to get uniform thickness of plastering throughout the wall surface, first fix *dots* on the wall. A dot is small projections of plaster of size 15 mm * 15 mm and having thickness of about 9 to10 mm.
2. Dots are fixed on the wall first horizontally and then vertically at a distance of about 2 meters covering the entire wall surface.
3. Check the verticality of dots, one over the other, by means of plumb-bob.
4. After fixing dots, the vertical strips of plaster, known as *screeds*, are formed in between the dots. These screeds serve as the gauges for maintaining even thickness of plastering being applied.



DOTS AND SCREEDS.

STEP-3 (APPLYING FIRST COAT OR UNDER COAT OR RENDERING COAT)

1. In case of brick masonry the thickness of first coat plaster is in general12 mm and in case of concrete masonry this thickness varies from 9 to 15 mm.
2. The ratio of cement and sand for first coat plaster varies from 1:3 to 1:6.
3. Apply the first coat of plaster between the spaces formed by the screeds on the wall surface. This is done by means of trowel.
4. Level the surface by means of wooden straight edges.
5. After leveling, left the first coat to set but not to dry and then roughen it with a scratching tool to form a key to the second coat of plaster.

STEP-4 (APPLYING SECOND COAT OR FINISHING COAT OR FINE COAT)

1. The thickness of second coat or finishing coat may vary between 2 to 3 mm.
2. The ratio of cement and sand for second coat plaster varies from 1:4 to 1:6.
3. Before applying the second coat, damp the first coat evenly.
4. Apply the finishing coat with wooden floats to a true even surface and using a steel trowel, give it a finishing touch.

5. As far as possible, the finishing coat should be applied starting from top towards bottom and completed in one operation to eliminate joining marks. And sand use for this coat is fine sand type.
6. Every coat of cement plaster applied should be well kept wetted or cured with water after its final setting during 2 or 3 days in order to obtain hard and durable plastered surface.

STEP-5 CURING OF PLASTERING WORKS

After completion of the plastering work, it is kept wet by sprinkling water for at least 7days in order to develop strength and hardness of plaster. Use of gunny bags or blanket to cover plastered surface is important to keep the surface wet for long period. Improper curing may lead to the formation of cracks and low strength plaster.

Note: Care to be taken after completion of plaster work

- ✓ Cleaning of door and window frame and floor area is necessary at the completion of the work
- ✓ Curing should be finished as soon as the plaster has hardened sufficiently with 7days and it should commence, 24 hours after the plaster is laid.

2.2.3 Application of one coat of plaster

The single coat plaster is only used in inferior quality work. It is applied similarly as two coat plaster except that the rendering coat, as applied for two coat plaster is finished off immediately after it has sufficiently stiffen .

2.2.4 Application of three coats of plaster

In three coat plasters, the first coat is known as rendering coat, second coat is known as floating coat and the third is known as setting or finishing coat as it was described above.

1. **Application of rendering coat**

In this system when the surface to be plastered is well prepared and mortar is ready. The mortar is forcibly applied with mason's trowel and pressed well into joints and over the surface. The thickness of coat should be such as to cover all inequalities of the surface. Normal thickness is 12 mm. This is allowed to slightly harden, and then criss-cross with the edge of trowel. The surface is cured by keeping it damp and then allowed to dry completely. This is done during 4 to 7 days

2. **Application of floating coat**

The rendering coat is cleaned off all dirt, dust and other loose mortar dropping. The strips of mortar called screeds of specified thickness (9mm) are formed over the old plaster surface and then mortar is applied between screeds to fill panels with mason's trowel. After, a straight edge is used to level the surface when mortar is still wet. This coat has to be applied after 4 to 7days after applying the first coat and then cure this coat of plaster within that range of period. Floating coat needs to be remaining rough to ensure the proper bond of next coat.

3. **Application of finishing coat**

The coat is applied after 4 to7 days the floating coat was applied, after cleaning the surface of all dirt, dust and mortar droppings and after fully wetting the surface of previous coat the finishing is applied and cured properly within 4 to 7days.

2.3 Skirting and Architraves

Skirts are narrow band or strip of 10 to 15cm depth and 1to1.2cm thick made around wall base at wall and floor intersection and manufactured strong enough to resist water entry. Skirting can be made into rich cement mortar, timber, metal and tile. Architraves are mold or forms which are used for decorative purposes installed around doors and windows. Skirting plays two important roles, to protect the lower part of wall from water entry and give good aesthetic to the wall.

2.4 THE DEFECTS FOUND IN PLASTER WORK

1. BLISTERING

Blistering is the phenomenon of small patches of plaster swelling out beyond the plastered surface.

CAUSES

- Due to improper slaking of lime particles in the plaster
- High moisture content and excessive trowelling before setting of the plaster
- Exposure of the plaster surface to severe heat

REMEDIES

- Use properly slaked lime for plastering
- Avoid plastering in extreme temperatures (>40^{O} C)
- Avoid excessive troweling while finishing the plaster

2 CRACKING

The development of one or more fissures appeared on the plastered/masonry surface. Some cracks visible in the plaster may result from cracking of the wall. This can be caused by differential movement of the foundations, moisture expansion or drying shrinkage of masonry units. Because these cracks originate in the wall and not in the plaster, repairing the plaster is ineffective. A specialist should be called in to establish the cause of the cracking and to recommend remedial measures.

Its causes:

- Imperfect preparation of back ground.
- Rapid drying of applied mortar.
- Excessive shrinkage due the application of thick coat of plaster.
- Faulty workmanship.
- Structural defects in building caused by:
    i. Differential settlement of foundation or wall masonry
    ii. Shrinkage of masonry units.

3. CRAZING

Crazing is a network of fine cracks, usually in a hexagonal pattern, which measures between 5 and 75 mm across each hexagon. Craze cracks are usually very fine and shallow and do not extend through the whole depth of the plaster.

Its Causes.

- Over trowelling a rich mix (one with high cement content)
- Using sand containing excessive fines.
- Improper curing.
- High absorption of cement mortar water content.
- Excessive shrinkage due the application of thick coat of plaster.

4. EFFLORESCENCE

It is the formation of whitish crystalline substance on the surface of plaster/ masorny surface.

CAUSES

- Due to the presence of salts in building materials like burnt clay brick or blocks and cement based blocks or bricks likely to be in contact with water.

Remedies

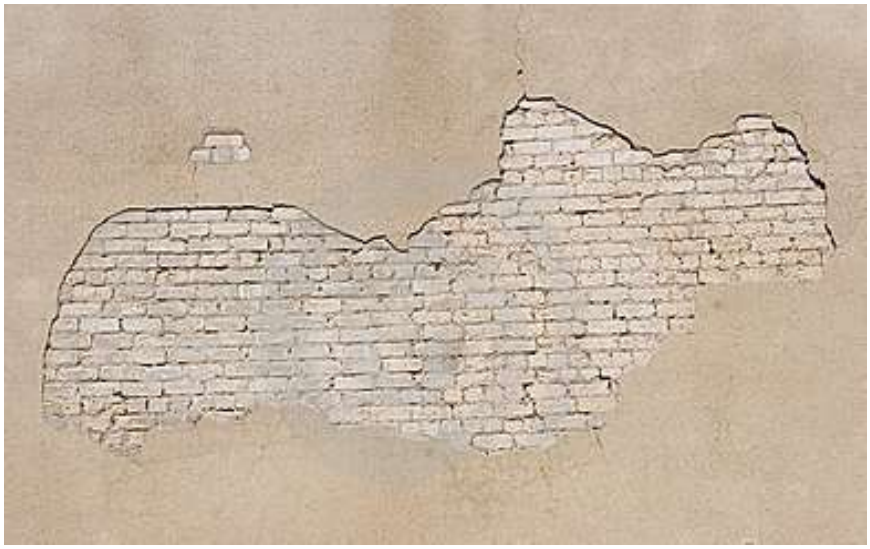
- Dry brush the affected surfaces as it appears, and do not wash with water as it may carry some of the salts back into the pores.
- Provide bitumen or Damp Proof Course (DPC) in the walls above the ground level to prevent the rising of salt solutions through capillary action from sub-soil.
- Apply a solution of one part of hydrochloric acid or sulphuric acid diluted with five parts of water on the surface with the scrubbing brush. Surface should be then thoroughly washed, cleaned and dried before.

5 FLAKING

It is the formation of very loose mass of plastered surface due to poor bond successive coats which create a gap between the coat of plaster and background.

Its causes

- Improper preparation of the surface to be plastered.
- Improper maintenance of thickness of successive coats of plaster.
- Improper (weak) proportion mix ratio in cement.



6. GRINNING

Grinning is the appearance of the patterns of mortar joints or similar patterns in the background on the surface of the plaster that are clearly visible through the plaster.

CAUSES

- Difference in suction between the masonry units and the mortar
- Raking out mortar joints deeply

PREVENTION

- Provide **two** coats of plaster on solid backgrounds
- Application of an undercoat or a spatter dash coat before plastering will help to avoid grinning

7. PEELING

It is a complete dislocation of some portion of plastered surface, resulting in the formation of a patch.

EXERCISE ON WALL PLASTERING

1. Define the term ‘plastering’ as used in wall plastering
2. What are six objectives of plastering on a surface?
3. Distinguish between wall and plaster in plastering
4. How do you call plastering applied on external exposed surface?
5. Enumerate the condition of a good support in plastering (at most 3)
6. Define the following terms as used in plastering
   (a) Background
   (b) Dots
   (c) Dubbing coat
   (d) Blistering
   (e) Gauging
   (f) Grounds
7. Give one function for each of the following tools used in plastering:
   (a) Floating rule
   (b) Building line
   (c) Spirit level
   (d) Plumb bob
   (e) Float

8. IPRC east wants rehabilitate by removing the old plaster and applying the new plaster in its classrooms. As a mason you are assigned to perform the work.
   Step by step, show how activities will be done from the starting till the end.
9. The owner of a house wants to plaster the wall of his house. He wants to use three coat cement mortar. Briefly name and discuss how these coats will be applied.
10. Mr. Mugenzi wants to do finishing work for his shop. Due to less money he has got he would like to make a single coat plaster.
    Slightly explain how the single coat plaster is done

11. Plastering work may be done in three, two or single coat for cement mortar. If you are hired to calculate the mortar to be applied internal and external.
    Explain how this mortar will be applied internal and external without too much wastage of money and material
12. Mr. Ruhashya has own a work of plastering a fence wall. He is wanted to make types of mortar in order to perform his task. The first he will apply cement mortar on the fence secondly he will apply tyrolean finish rendering.
    (a) Explain what is tryolean finish rendering in plastering
    (b) What is the ratio that this plaster is applied
    (c) Why is it preferable on external surfaces
    (d) Slightly talk about this type of mortar is applied
13. The room that has be elevated, now the step of applying the plaster of cement mortar is required. But here two coat plaster will be adopted. As a mason you are chosen to perform the work.
    Discuss the procedures adopted for two coat plaster.