

**SECTION - VII
PLASTERING WORK**

1.0 GENERAL

1.1 INDIAN STANDARDS

Indian and other international standards followed for this section shall be as listed below. In case any discrepancies or ambiguities noticed it shall be brought to notice of the Architect and clarification/confirmation sought. His decision shall be final. However as general rule more stringent specifications shall be followed.

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| 1. | IS 383 | Specification for coarse and fine aggregates for natural sources for concrete. |
| 2. | IS 412 | Specifications for expanded metal steel sheets for general purposes. |
| 3. | IS 1489 | Specification for Portland pozzolana cement. |
| 4. | IS 1542 | Specifications for sand for plaster. |
| 5. | IS 1661 | Code of practice for application of cement and cement-lime plaster finishes. |
| 6. | IS 2402 | Code of practice for external rendered finishes. |
| 7. | IS 2645 | Specifications for integral cement water proofing compound. |
| 8. | IS 6452 | Beads for internal plastering and dry lining specification for galvanized steel beads. |
| 9. | IS 8112 | Specification for 43 grade ordinary Portland Cement. |

1.2 Quality Assurance

1.2.1 All materials used shall be tested as per standards and samples approved by Architect.

1.2.2 GI beads shall be of approved quality.

1.2.3 Metal reinforcement used shall be as specified and conforming to IS.

1.3.0 Submittal

1.3.1 The Contractor shall submit product literature with samples for the approval of the Architect.

1.3.2 Samples

Samples of following products shall be submitted for approval samples shall be minimum 300 mm long and 300 mm square. Minimum 3 nos. of each samples shall be given.

1. GI beads
2. GI Chicken mesh.
3. GI metal reinforcement.

1.4 Mockups

Prior to start of work contractor shall prepare panels for each type of finish and application required to verify samples submitted and to observe / test aesthetic effects, quality of material and workmanship.

Mockup shall comply with

- a) Demonstrate the proposed range of aesthetic effect and workmanship.
- b) Erect mockup of full size and thickness including joints, supporting system if any, using proposed material.
- c) Notify the Architect 7 days in advance of date of mock to be ready.

Retain mockup till ordered to be removed by the Architect.

2.0 MATERIALS

2.1 Cement

2.1.1 Cement shall be ordinary Portland Cement conforming to IS and shall be of grade 43 or Portland pozzolana cement as approved by the Architect.

It shall be received in bags of 50 kg and each batch shall be accompanied with a test certificate of the factory. Also it shall be tested before use to ascertain its strength, setting time, etc. In case cement has been stored for over 2 months or for any reasons the stored cement shows signs of deterioration or contamination, it shall be tested as per the direction of the Architect prior to use in the works.

2.1.2 Cement shall be stored in such locations so as to prevent deterioration due to moisture dampness. A dry and waterproof shed shall be best suited for this. Bags shall be stacked on rigid waterproof platforms about 15 to 20 cm clear above the floors and 25 to 35 cm clear or away from the surrounding walls. A maximum high stack of 12 bags is permitted. Stacks shall be so arranged that the first batches are used first, and (FIFO) that they permit easy access for inspection and handling.

2.2 Water

2.2.1 Water used for mixing and curing shall be clean, reasonably clear and free from objectionable quantities of silt, oils, alkalies, acids, salts so as not to weaken mortar. It shall conform to IS 456.

2.2.2 Water tested shall be in accordance with IS 3025. Maximum permissible limits of deleterious materials in water as given in IS 456 Table 1 "Permissible Limits for Solids (in water)".

2.3 Coloured cement may be either ready-mixed material or may be obtained by mixing pigments and cement at site. The pigments to be mixed with cement shall conform to Appendix "A" of IS 2114 code of practice for laying in-situ Terrazzo Floor Finish.

2.4 Sand shall conform to IS 1542 specification for sand for plaster. For white or coloured renderings, only quartz or silica sand shall be used. For textured finishes produced by treatment of freshly applied final or finishing coat with a tool, coarser particles used shall be screened through 3.35 mm IS sieve or 2.36 mm IS sieve. For torn texture a slightly larger portion of material coarser than 4.75 mm IS sieve shall be used.

2.5 Aggregate shall conform to IS 383.

- 2.6 Integral water proofing compound shall conform to IS 2645 (specification for integral water proofing compound).
- 2.7 Fibrous materials
Certain natural fibers, such as flax, sisal, manila, jute hemp, and coconut fibers may be used for incorporation in the mortar. They shall be clean, dry and free from oil.
- 2.8 Expanded metal
Expanded metal used as background for rendering shall comply with requirements of IS 412.
- 2.9 GI Chicken Mesh
Chicken mesh of 20 G with opening of 25 x 25 mm hot dipped galvanized shall be provided over junctions of two dissimilar material about 150 mm wide as directed by the Architect.
- 2.10 Beads
- 2.10.1 Zinc coated steel for exterior work shall be used. Nominal size to be provided are 5 mm bead with 60 mm minimum expanded metal wings as manufactured by M/s Expamet bead ref. no. 558 or Rakesh & Associates, Andheri (W), Mumbai. Tel no.6341284 or equal approved.
- 2.10.2 Casing beads
Zinc coated steel for exterior work shall be used. Nominal size shall be 5 mm return square edged bead with 75 mm wide expanded metal wing, depth to suit plaster thickness. Gauge and size shall be as recommended by the approved manufacturer. M/s Expamet plaster stop ref. no. 561 and 566 Rakesh & Associates, Andheri (W), Mumbai. Tel no.6341284 or equivalent shall be used.
- 2.10.3 Expansion joint beads
Zinc coated steel for exterior quality with adjustable openings size as shown in drawings and manufactured by expamet or equivalent approved shall be used. Gauge and size shall be as per recommendations of manufacturer.
- 2.10.4 Special Beads
Zinc coated steel beads of sizes and shape as shown in drawings to suit site conditions shall be used. Gauge thickness and other details shall be as per recommendations of approved manufacturer.
- 2.11 Bonding Agent
Chemical bonding adhesive of approved chemical admixture manufactures shall be used as per recommendations of manufacturer over concrete surface.
- 2.12 Binder
Fiberglass fibers free of dirt, oil, grease, diterious material or other impurities about 12 to 50 mm long of approved manufacturer in proportion as recommended by manufacturer shall be used to achieve dense mix as per instruction of the Architect.
- 2.13 Gypsum plaster
It is ready made proprietary Gypsum plaster mix of M/s. Gyproc or equivalent and shall be as per IS 2547 Part-II. It is consisting of Gypsum

hemihydrate formulated with specially additives to control working and setting characteristics. It contains lightweight exfoliated aggregates to improve workability, coverage and application. It shall have initial setting time of 15-20 minutes and final setting time of 20-25 minutes. Material shall be procured from approved manufacturer.

3.0 SCOPE OF WORK

- 3.1 Plastering work scope shall include preparing surfaces, applying plaster, providing reinforcement such as beads, chicken mesh, scaffolding, curing to correct line, level and plumb within acceptable tolerances. Work may be in single coat or multiple coats as specified.
- 3.2 Finish shall be as specified and approved by Architect.
- 3.3 Finishing of grooves, jams, cills, pattas, motifs, grooves, etc. shall be part of the work.
- 3.4 Work shall include required material and at all locations with required leads, lift and height.
- ☐ Internal wall surfaces of toilets and ducts with single coat cement sand mortar plaster minimum 12 mm thick including waterproofing compound.
 - ☐ Internal Gypsum wall plaster single coat minimum 13 mm thick.
 - ☐ White cement-based wall putty to ceilings
 - ☐ External double coat cement sand plaster minimum 25 mm thick including waterproofing compound.

4.0 WORKMANSHIP

- 4.1 Mortar
- 4.1.1 Mortars shall be prepared by mixing fine graded aggregate with cement, the lime or a combination of these in the proportion specified for respective items of work as detailed in the BOQ. Mixing of mortars shall be done by mechanical mixers only.
- 4.1.2 Mortars shall be specified by proportion only and not by strength. Volumetric mixing shall be based on dry volumes of each ingredient. For convenience, measurement shall correspond to volume of one cement bag i.e. 0.035 cum. Boxes shall be of size 40 x 35 x 25 cm. These shall be marked as mortar mixing boxes by red paint and shall be used throughout the contract. Mechanical mixing proportions shall be done with the use of these boxes.
- 4.1.3 Cement mortar
- Cement mortar shall be prepared by mixing cement and sand in specified proportions. Proportioning shall be carried out as detailed above. Sand shall be added suitably to allow for bulkage if required. Bulkage shall be determined as specified in IS 2386 Part III. Cement and sand added to mixer shall be thoroughly mixed and water shall be added to it gradually. After addition of water the mixer shall run for a minimum of 3 minutes. The mortar mixed shall be consumed within 30 minutes of its mixing.
- 4.2 Application
- 4.2.1 Preparation of surfaces
- a) Surfaces to be plastered must be clean and free from dust, loose

material, oil, grease, mortar droppings, sticking of foreign matter, traces of algae, etc. It is very important to ensure that there should not be any chance of the plaster getting debonded due to presence of materials harmful for bonding.

- b) Raking out of joints is expected to be carried out along with masonry but it should be checked thoroughly so as to receive good key.
- c) Joints shall be raked and grouted / pointed with square crushed aggregates.
- d) Apply rust removal to metal surfaces which are in contact with plaster.
- e) Actual plastering shall be undertaken only on the approval of the Architect. Plaster work should follow the steps mentioned below :
 - ☐ Surface must be thoroughly cleaned, hacked and applied with approved chemical adhesive over concrete surface to receive scratch coat. Joints shall be raked and grouted / pointed with square crushed aggregates.
 - ☐ Plaster area must be provided with level dabs or spots allowing working and checking with 2-3 m straight edge. Depth of plaster must not be less than 20 mm at any point.
 - ☐ Fix corner / stop / special beads at locations shown in drawing or required by Architect or suggested by bead manufacturer.
 - ☐ Corner beads to true vertical plumb, level and of longest length to minimize joint shall be set at all external corners.
 - ☐ Plaster stops shall be fixed to correct line, level and plumb where plaster terminates or abuts with other surfaces.
 - ☐ Expansion joint beads shall be provided to correct line, level and location and shall be of specified size only. It shall be set exactly as detailed in drawing.
 - ☐ Required concealing services must be completed and tested.
 - ☐ No further cutting of masonry must be required.
 - ☐ Repairs carried out to masonry or concealing work must be cured and dry.
 - ☐ Surface must be sufficiently damp.
 - ☐ Plaster dabs are checked for plumb and level by the Architect or his representative.
 - ☐ Joints, concealing and repairing areas must be covered with GI mesh as per the Architect's instruction.
- e) Walls should be sufficiently damp prior to plastering. Water from plastering mortar must not be absorbed by masonry under any condition.
- f) Any unavoidable projections in masonry and concrete surfaces shall be chiseled back. Care shall be taken that surrounding surfaces are not damaged and reinforcement is not exposed.

4.2.2 Application of Plaster

- a) All concrete surfaces shall be applied with 5 mm thick skim coat by 1st applying bonding agent as recommended by the manufacturer. Surface shall be cured for 3 days. Joints shall be racked and grouted / pointed with square crushed aggregates.
- b) The method of application is also important and hence it is recommended that the mix be thrown on the surface rather than stuck with trowel. This increases the adhesion.
Apply 12-15 mm thick full depth coat material over skim / scratch coat with pressure to form full grip
- c) Plaster shall be leveled and lined by aluminium hollow section, 2-3 m long. (This will give even and leveled surface). There shall not be more than 2 mm difference in level when checked with 3 m straight edge. It is important that enough pressing and beating is done to achieve compact filling of joints and that the area is fully compacted.
- d) Corners, external or internal, shall be finished along with final coat. It is advisable to have rounded corners.
- e) Finishing of plaster may be carried out with wooden float (randhas) or trowel led smooth with sheet metal trowels as specified. Care shall be taken to avoid excessive troweling and overworking of the wooden float.
- f) All corners, internal or external, shall be truly vertical or horizontal. These shall be finished with a proper template to achieve best workmanship for rounding and chamfering as specified or directed.

4.2.3 Plaster shall be cut to correct horizontal or vertical line at the end of the day or if work requires to be suspended for any reason.

4.2.4 It is advisable to limit the area of plaster to 15 sq m to avoid cracks due to thermal movements of dissimilar material in contact, it is advisable to provide joints treated with groove or any other detail as suggested by the Architect. These joints if not specified shall be treated with 150 mm wide reinforcing chicken mesh (approved by the Architect) fixed over joints by GI nails and the area plastered.

4.2.5 Plaster shall be cured for 14 days by wet curing except in neeru finish plaster. During this period plaster shall be protected from exposure to extremes of temperature and weather.

4.2.6 Scaffolding should be rigid, allowing free and safe movement on the platform and it should be at sufficient distance or height from the working areas. Scaffolding with railing gives more confidence to workers and improves the quality of work.

4.3 12 mm thick internal plaster

Single coat cement-sand plaster with cement-sand mix in proportion of 1:4 shall be carried out over the entire area as detailed above. This shall be finished just with wooden float to give the best smooth surface possible. This may be for internal or external areas. Thickness may be from 10 to 15 mm maximum or as specified in the item or drawing.

- 4.4 18 to 25 mm ordinary cement sand plaster
This is the same as for the 12mm thick single coat plaster except that this shall be carried out in two coats. Maximum thickness of the undercoat shall be 12 mm and balance in the second finishing coat. All operations remain the same and are as detailed in Clause 3.0 of this section.
- 4.5 Cement finished plaster
This shall be carried out in the same manner as in Clause 4.3 and 4.4 of this section for specified thickness in single or double coat. Then it shall be finished uniformly over the entire area with a paste of neat cement when the plaster has just hardened and finished smooth with a steel trowel. It shall be worked over again to achieve a smooth leveled surface. Quantity of cement applied shall be about 1 kg/sqm.
- 4.6 Gypsum Plaster
- 4.6.1 M/s. Gyproc or other readymade Gypsum plaster mix shall be as per IS 2547 Part-II. Approved brand shall be used.
- 4.6.2 The background to be plastered should be thoroughly brushed with broom to be free from all loose particles and dust. Wash and clean traces of mould oil.
- 4.6.3 Recommend usage of Gyproc® BOND IT, a high-performance bonding agent to eliminate hacking.
- 4.6.4 It is recommended to pre-wet the surface before application so as to achieve more spread and higher coverage.
- 4.6.5 Mix gypsum plaster to water (not vice versa), use a mixing rod to mix the paste thoroughly.
- 4.6.6 Water to plaster ratio (1 part of water : 1.5 part of plaster) should be maintained to have good cohesive workable mix.
- 4.6.7 Prepare plaster mix as much as required depending upon the immediate scope of work.
- 4.6.8 Once the mix has begun to set, additional dry material should not be added, as performance properties of plaster will get altered, thus affecting workability, cohesiveness, adhesion and strength.
- 4.6.9 Avoid using a wet brush on to the finished surface, as that would leave permanent brush marks and spoil the surface.
- 4.6.10 A single coat should not exceed 13 mm in thickness. If at all thickness required is more than 13 mm, plaster should be applied in multiple coats.
- 4.6.11 After complete drying (which takes usually 72 hrs depending on the thickness and weather conditions), the plain smooth leveled surface is ready for painting.
- 4.6.12 It is also recommended to use Gyproc® Champion Putty on a plastered surface which smooth finish and prevent the paint from flaking.
- 4.7 External Cement Plaster
- 4.7.1 This shall generally be carried out on the outside face and exposed area of masonry work and concrete work. It shall be of minimum 25 mm thickness and shall be in two coats. The coat shall be CM 1:4 (1 cement: 4 sand) mixed

with water-proofing compound 2% by weight of cement and applied as usual and surface shall be keyed.

- 4.7.2 The second coat shall be applied after 7 to 10 days and shall be of CM 1:4 (1 cement: 4 sand). Mortar shall be mixed with slightly coarse sand. Mix shall be worked over with 3 m gauge or wooden float to achieve a uniform surface.

5.0 MEASUREMENT

- 5.1.1 Plaster work shall be measured in square meter to the second decimal place.
- 5.1.2 Thickness of plaster shall be the average depth of plaster as specified. But if extra thickness occurs due to bad quality of bricks, stones or blocks or due to bad workmanship, the repairs required to be carried out shall be at the cost of contractor.
- 5.1.3
- a) Grooves, pattas in continuation of large areas or plaster areas shall be considered as part of the plaster and not measured separately.
 - b) Isolated areas and width below 300 mm shall be specified and detailed separately in the BOQ and measured in running meter.
 - c) Ceiling plaster, including ribbed beam slab shall be measured in square meters.
 - d) Beams and columns in continuation of masonry shall be measured in square meter.
- 5.1.4 Jambs, sills, coves, cornices, etc. shall be a part of plaster and no separate payment shall be made towards these items.
- 5.1.5 Deduction
- a) Deduction for an opening in plaster shall not be for area less than 0.5 sq m.
 - b) In case the opening area is 0.5 sqm to 3.0 sqm, only 50% area shall be deducted from each face.
 - c) In case the width of door or window frames are equal to masonry, full area of opening shall be deducted.
 - d) In case of openings of area above 3 sqm each deduction shall be made for opening on each face and jambs, soffits, sills shall be measured.
- 5.1.6 Plaster to ceiling and walls shall be measured separately if specified in the BOQ.
- 5.2.1 Description of item in the BOQ, unless otherwise stated, includes, wherever necessary, conveyance and delivery handling, unloading, storing, fabrication, hoisting, all labour for finishing to required shape and size, setting, fitting and fixing in position, straight cutting and waste, return of packings and other incidental charges.
- 5.2.2 Levels and heights shall be as indicated in the BOQ.
- 5.2.3 Preparation of surface shall be as approved by the Architect.
- 5.2.4 Trimming off the projections on masonry shall be included in the price.
- 5.2.5 Scaffolding and working platform shall be included in the price.
- 5.2.6 Materials as detailed and as required to complete item as specified shall be included in the price.

- 5.2.7 Curing of plaster shall be included in the price.
- 5.2.8 Cleaning of adjacent areas, windows, door frames, etc. Including masonry surface in exposed masonry work, shall be included in the price.
- 5.2.9 Forming grooves for joints between beams/columns and masonry etc. shall be included in the price. Any special treatment if detailed shall be measured separately and billed in BOQ.
- 5.2.10 Providing and fixing chicken mesh at junction of R.C.C., brick work, edges, corners, chiseled and repaired brick work prior to plaster over concealed conduit, etc. shall be as directed by the Architect. It shall be considered as part of item and no separate charge will be payable.

6.0 RATE

- 6.1 Description of item in the BOQ, unless otherwise stated, includes, wherever necessary, conveyance and delivery handling, unloading, storing, fabrication, hoisting, all labour for finishing to required shape and size, setting, fitting and fixing in position, straight cutting and waste, return of packings and other incidental charges.
- 6.2 Levels and heights shall be as indicated in the BOQ.
- 6.3 Preparation of surface shall be as approved by the Architect.
- 6.4 Trimming off the projections on masonry shall be included in the price.
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