PARTICULAR SPECIFICATION

PLASTERING WORK

(For Building & Area Development Work)

1.0 INDIAN STANDARDS :

1.1 Work shall be carried out to Indian Standards and Code of Practices. In absence, International Standards shall be followed. These shall be latest issue. List given hereunder is not to be considered as conclusive and is for reference and guidance only. Any discrepancies / conflict noticed shall be directed to the EIC for his direction/approval. However, as a general rule more stringent specification shall take precedence.

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<tr>
<td>1</td>
<td>IS 383</td>
<td>Specification for coarse and fine aggregates for natural sources for concrete.</td>
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<tr>
<td>2</td>
<td>IS 1542</td>
<td>Specifications for sand for plaster</td>
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<tr>
<td>3</td>
<td>IS 2645</td>
<td>Specifications for integral cement water proofing compound</td>
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<td>4</td>
<td>IS 8112</td>
<td>Specification for 43 grade OPC</td>
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<td>5</td>
<td>IS 269</td>
<td>Specification for 33 grade OPC</td>
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<tr>
<td>6</td>
<td>IS 1489</td>
<td>Specification for Portland Pozzolana cement</td>
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2.0 MATERIALS:

2.1 Cement:

The cement shall be ordinary Portland Cement conforming to IS. Approved blended cement shall be used for internal plaster, masonry, flooring, waterproofing and plumbing works. For all RCC and PCC works, approved by fly ash shall be used. For external plaster approved fly ash as per specification of item shall be used.

It shall be received in bags of 50 kg (or in bulk carriers in case of storage in silos) and each batch shall be accompanied with 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 6 months from date of manufacturer or for any reasons the stored cement shows signs of deterioration or contamination, it shall be tested as per the direction of the Engineer-in-charge prior to use in the works.

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, alkalis, acids, salts so as not to weaken mortar.

2.2.2 Water tested shall be in accordance with IS 3025. Maximum permissible limits of deleterious materials in water as given in IS 456-2000.
2.3  Sand shall conform to IS 1542 specification for sand for plaster.

2.4  Integral water proofing compound shall conform to IS 2645 (Specification for integral waterproofing compound)

2.5  Neeru shall be obtained by mixing lime putty and sand in equal proportions and chopped jute @ 4 kg/cum of mortar and ground to fine paste in the chemical grinder to give fine butter-like paste. Approved ready made neeru available may be permitted if desired by the contractor after testing at site.

2.6  **GI Chicken Mesh / Plaster mesh**:
GI Chicken mesh of 20 gauge as approved shall be used over junctions of concrete and masonry or two dissimilar materials about 150mm wide fixed with GI wire nails. Etc. as directed by the EIC. (it is not recommended for external plaster).

2.7  **Bonding agent**:
Chemical bonding adhesive of approved chemical admixture manufacturer’s shall be used as per recommendations of manufacturer over concrete surface.

3.0  **MORTAR**:
3.0.1  Mortars shall be prepared by mixing fine graded aggregate with cement, in the proportion specified for respective items of work as detailed in the BOQ and drawings. Mixing of mortars shall be done by mechanical PAN mixers or by hand mixing.
3.0.2 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 cu.m. 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.

3.1 **Cement mortar**

3.1.1 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.

4.0 **WORKMANSHIP**

4.1 **Preparation of mortar mix**:

4.1.1 The material used in preparation of plastering mixes shall be measured by volume using gauge boxes or by weight.

4.1.2 When cement is measured by weight, 1440 kg. of material shall be taken equivalent to one cubic meter.
4.2 **Mixing:**

4.2.1 Mixing shall be done mechanically using PAN mixer only. Each mortar batch shall be used within half an hour. The mixing operation shall be continued with addition of necessary quantity of water until a uniform appearance and consistency of mortar is obtained.

4.2.2 Cement and sand shall be mixed dry in required proportion to obtain a uniform colour and water shall then be added to get the required consistency for the plaster. Polypropylene fibres of approved make shall be added to the plaster mortar as specified by the manufacturer.

4.3 **Method of plastering:**

4.3.1 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.

4.3.2 Raking out of joints is expected to be carried out along with masonry but it should be hacked thoroughly so as to receive good key. Bonding agent of approved make and quality shall be applied to the surfaces ready for plastering but prior to the application of plaster.

4.3.3 Walls should be sufficiently damp prior to plastering. Water from plastering mortar must not be absorbed by masonry under any condition.
4.3.4 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.

4.3.5 Thickness of one coat should not be more than 15mm and less than 8mm for single coat finished plaster.

4.3.6 Undercoats shall be scratched or roughened before they are fully hardened to form a mechanical key.

4.3.7 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.

4.3.8 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 shall be with proper railings.

4.3.9 Actual plastering shall be undertaken only on the approval of the Engineer. Plaster work should only follow the steps mentioned below:

a) Surface must be thoroughly cleaned.

b) 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 8mm at any point.
c) Required concealing services must be completed and tested.
d) No further cutting of masonry must be required.
e) Repairs carried out to masonry or concealing work must be cured and dry.
f) Surface must be sufficiently damp.
g) Plaster dabs are checked for plumb and level by the EIC or his representative.
h) Joints shall be racked and grouted/pointed with square crushed aggregates.
i) Joints, concealing and repairing areas must be covered with 20 gauge GI chicken mesh as per the EIC’s instruction (Chicken mesh shall be applicable for internal and duct/boxing plaster only.)

4.3.10 Corners, external or internal shall be finished along with final coat. It is advisable to have rounded corners.

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

4.3.12 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 2mm difference in level when checked with 3m 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.
4.3.13 Finishing of plaster may be carried out with wooden float (randhas) or trowelled smooth with sheet metal trowels as specified. Care shall be taken to avoid excessive trowelling and overworking of the wooden float.

4.3.14 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.

4.3.15 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.

4.3.16 It is advisable to limit the area of plaster to 15 sq.mt. 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 150mm wide reinforcing chicken mesh (approved by the EIC) fixed over joints by GI nails and the area plastered.

5.0 TYPE OF PLASTER :

5.1 6 mm thick cement sand plaster

Single coat cement-sand plaster with cement-sand mix in proportion of 1:4 shall be carried out over the concrete surfaces. Plastering operations as specified clause No. 4.3 of this. This shall be finished just with wooden float to give the best smooth surface possible. This may be for internal or external areas.
5.2 **12 mm thick ordinary cement sand 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.

5.3 **23 mm thick sand face plaster**

23 mm thick sand faced plaster in two coats over one bond coat shall be provided to entire external surface of sub-station, watchmen’s cabin, society office & pump house. The first coat shall be of 8 mm thick in cement sand mix proportion of 1:4 and admixtures as detailed subsequently, second coat of 15 mm thick cement sand mix proportion of 1:4 with necessary admixtures enumerated in subsequent clauses.

5.4 **23mm thick sand faced plaster in three coats to all external surfaces of the buildings**

5.4.1 Material for external plaster:


2) Sand: Clean and screened River sand. (only washed sand to be used).

3) Water: Potable water from CIDCO.
4) Admixture:
   i) Hack Aid Plast (Special) as bonding agent, Sunplex as shrinkage compensating plasticizing and waterproofing compound both manufactured by M/s. Sunanda Speciality Coating Pvt. Ltd.
   ii) Polypropylene Fibre manufactured by M/s. Dolphine Foats.
   iii) Polyalk EP

5.4.2 Process
I) Preparation for Surface
   1) Surface should be thoroughly checked and cleaned from dust, oil, mortar dropping, sticking of foreign matter etc.

   2) Joints between RCC members and block masonry shall be raked out at least 10 mm deep. This separation gaps are sealed by cement mortar mix with Polyalk EP chemicals in proportion of 2:5:15 (2 parts chemical + 5 parts PP cement + 15 pars sand) and metal. Also holes in the concrete for the sleeves etc. shall be properly sealed.

   3) Any projection and irregularities in the plumb line shall be corrected by chipping or leveling coat with bonding agent.
   4) Moisten the surface properly with water before application of bonding agent.
II) Preparation of Mortar

Mix PP cement and sand in the proportion 1:4. Add Sunplex and Polypropylene fibre as per following proportion for different type of coat. Required quality of water is added for getting cohesive mortar.

This mixing is to be done in mechanical concrete mixer 10/7 type only.

III) Proportions of Mortar

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Bond coat</th>
<th>First coat 8-10 mm</th>
<th>Second coat 10-12 mm</th>
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<tbody>
<tr>
<td>PP CEMENT (ACC Make)</td>
<td>1 Part</td>
<td>1 Part (1 Bag of 50 kg)</td>
<td>1 Part (1 Bag of 50 Kg)</td>
</tr>
<tr>
<td>Sand</td>
<td>Nil</td>
<td>4 Part (4 x 0.035 = 0.14 m³)</td>
<td>4 Part (4 x 0.035=0.14 m³)</td>
</tr>
<tr>
<td>Hack Aid Plast</td>
<td>0.5 Part</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>Sunplex-Waterproofing Compound</td>
<td>Nil</td>
<td>1 Pkg. of 330 gms</td>
<td>1 Pkt of 330 gms</td>
</tr>
<tr>
<td>Poly Propylene Fibres</td>
<td>Nil</td>
<td>125 Gm</td>
<td>125 Gm</td>
</tr>
<tr>
<td>Water</td>
<td>Nil</td>
<td>As required</td>
<td>As required</td>
</tr>
</tbody>
</table>
IV) Process of Plastering

1) Seal Joint: The joints between RCC members and masonry shall be racked out at least 10 mm deep. This gap shall be sealed by cement mortar mix with polyalk EP Chemical in proportion 2:5:15 (2 parts chemical + 5 parts PP Cement + 15 parts sand) and metal.

2) After surface preparation. Level dots are marked @ 1 mtr. Centre to centre both way in plumb and line on the surface. References are to be taken with respect to topmost point of the building irrespective of the location of actual plaster.

3) Hack aid plast and cement plast shall be mixed in (0.5:1) proportion by stirrer to obtain lump free consistent slurry. This slurry is applied on the prepared surface about 1 m thick by using brush or spray pump as a Bonding coat.

Care to be taken to avoid application of slurry on excess area reachable by the masons within 10 to 20 minutes. (i.e. before setting of the Bond coat)
(However it is to be informed that if first coat is applied after setting of Bond coat then separation layer may occur leading to peel off the plaster)
4) The prepared mortar shall be applied (8-10 mm thick) on bond coat within 10-20 minutes after applying bonding coat before it sets or dries. Proper leveling is done with wooden floats, Aluminium hollow sections etc. Rough finish is done.

5) Continuous curing is done by sprinkling of water manually after the first coat has set.

6) Second coat of 10-12 mm thick is to be applied above the First coat on next day. Proper leveling and finishing is done with wooden floats. Aluminium hollow section etc. Architrave grooves shall be marked and made properly in line, level and depth uniformly. Window mouldings shall be marked and made properly. Finished grooves, cornices shall be cleaned thoroughly from all deposits.

7) After the day work, plaster is to be cut in line and level. All mortar lying on the floor will be cleared off after day work.

8) Plaster will be cured by keeping the surface wet by manually sprinkling of water for min. 14 days to be started on same Day.

5.4.3 Quality Control Plan for External Plaster

1) Washed sand: a) Silt content, b) Bulkage, c) Gradation

2) Cement: a) Manufacturer test reports, b) Outside test as per approved frequency.

5.4.4 Additional Precautions:
1) Cleaning of window corners and proper finishing.
2) Drip moulds for windows, dry balcony drops.
3) Proper slopes on window niches.
4) Water spouts for decks, dry balcony etc.
5) Cleaning tops of cornices and proper roundings in corners.
6) Cleaning inside of rooms, walls and floors of the mortar.

6.0 ITEM INCLUDES

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 packing 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 EIC.

6.4 Trimming off the projections on masonry shall be part of the item.

6.5 Scaffolding and working platform shall be part of the item.

6.6 Materials as detailed and as required to complete the item as specified.

6.7 Curing of plaster by curing compound and water.

6.8 Cleaning of adjacent areas, windows, door frames, etc. including masonry surface in exposed masonry work.

6.9 Forming grooves for joints between beams/columns and masonry etc. any special treatment if detailed and specified in BOQ.
6.10 Providing and fixing plaster mesh (chicken mesh/expanded metal mesh internally) at junction of RCC, brick work, edges, corners, chiseled and repaired brick work prior to plaster over concealed conduit, etc. shall be as directed by the EIC. It shall be a part of item.

Signature of Tenderer
Date:

Additional Chief Engineer (I &NT)
Date: