

SECTION – 6521

CEMENT PLASTER

1. SCOPE

The work under this section of the Specifications consists of furnishing all plant, labour, equipment, appliances, and materials and in performing all operations in any floor and at any height connection with providing and installation of cement plaster, and specified external rendering complete in strict accordance with this section of the Specifications and the applicable drawings and subject to the terms and conditions of the Contract.

2. APPLICABLE STANDARDS

Latest editions of following American Society of Testing and Materials, American National Standard Institute and Metal Lathing/Steel Framing Association are relevant to these Specifications wherever applicable.

2.1 ASTM - American Society for Testing and Materials

ASTM A 109 -	Specification for Steel, Carbon, Cold-Rolled Strip
ASTM A 570 -	Specification for Steel, Sheet and Strip, Carbon, Hot-Rolled, Structural Quality
ASTM C 28 -	Specification for Gypsum Plasters
ASTM C 29 -	Test Method for Unit Weight and Molds in Aggregate
ASTM C 35 -	Specification for Inorganic Aggregates for Use in Gypsum Plaster
ASTM C 61 -	Specification for Gypsum Keene's Cement
ASTM C 150 -	Specification for Portland Cement
ASTM C 206 -	Specification for Finishing Hydrated Lime
ASTM C 472 -	Test Method for Physical testing of Gypsum Plasters and Gypsum concrete
ASTM C 841 -	Specification for Installation of Interior Lathing and Furring
ASTM C 842 -	Specification for Application of Interior Gypsum Plaster
ASTM C 847 -	Specification for Metal Lath
ASTM C 926 -	Specification for Application of Portland Cement-Based Plaster

2.2 ANSI - American National Standards Institute Inc.

ANSI A42.1 -	Gypsum Plastering
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ANSI A42.3 - Lathing and Furring for Portland Cement and Portland Cement-line, Exterior (Stucco) and Interior

ANSI A42.4 - Specification for Interior Lathing and Furring

2.3 ML/SFA - Metal Lathing/Steel Framing Association

ML/SFA - Specification for metal lathing and furring

3. SUBMITTALS

3.1 Manufacturer's Certificates: Submit manufacturer's certificates showing compliance with the specified material requirements and installation and workmanship instructions.

3.2 Samples: Submit 300 mm long samples of the proposed accessories.

4. TRANSPORTATION, HANDLING AND STORAGE

4.1 Except for sand and water, deliver materials to the site in sealed containers or bags fully identified with manufacturer's name, brand, type and grade. Store materials in a dry, well-ventilated space, under cover, off the ground, and away from surface subject to dampness or condensation.

4.2 Deliver accessories in their original containers bearing the name of the manufacturer and item identification.

5. QUALITY ASSURANCE

5.1 Allowable Tolerance for Finished Work: For flat surfaces, do not exceed 3 mm in 3 meters for bow or warp of surface and for plumbness or level.

5.2 Mock-up Installation: Prior to installation of plaster work, provide sample mock-up panels using materials specified for final work. Build sample panels at site, of full thickness and approximately 1.2 x 1.2 m. Demonstrate the proposed range of color, texture and workmanship to be expected in the completed work, and submit to Engineer for review. Retain sample panels construction as a standard for judging completed plaster work. Do not alter, move or destroy sample panel until plastering work is completed. Provide a sample panel for interior and exterior Portland cement plaster and plaster on metal lath.

6. JOB CONDITIONS

6.1 Protection: Protect contiguous work from moisture deterioration and soiling, which may result from plastering operations. Provide temporary covering and whatever other provisions may be necessary to minimize harmful spattering of plaster on other work.

Finished door and window frames and other surfaces which do not receive a plaster finish shall be well protected during plaster application.

6.2 Environmental Conditions:

General: Protect plaster against uneven and excessive evaporation and from strong flows of dry air, both natural and artificial. Apply and cure plaster as required by climatic conditions to prevent rapid dry-out. Provide suitable coverings, moist curing, barriers to deflect sunlight and wind, or combination of these as required.

Ventilation: Provide adequate ventilation to properly dry interior plaster during and subsequent to its application.

7. GENERAL

7.1 Except as may be otherwise shown on surfaces specified, all plaster work, both internal and external shall be ordinary Portland Cement plaster of the required thickness as shown on the drawings.

7.2 Plastering shall not commence until all electric conduits, drainage and sanitary pipes, inlets to tanks, brackets, clamps, doors and window frames and all sorts of inserts and embedded items are fixed in position. It shall be the responsibility of the Contractor to make sure that all such work is carried out by other contractors before starting of plaster work. Chiseling and repairing of cement plaster shall not be permitted without the approval of the Engineer.

8. MATERIAL

8.1 PLASTER ACCESSORIES

8.1.1 Galvanized steel furring, lathing and other plaster accessories shall conform to the material provisions of ASTM C 841 and ANSI A42.3. Plaster accessories shall include but not limited to the following:

- a. Metal Corner Beads: Fabricated from galvanized sheet, 5 mm radius bead with 38 mm wide expanded type flanges.
 - b. Strip Reinforcement: Smooth edge strips of expanded metal lath fabricated from galvanized steel sheet, with uncoated steel painted after fabrication.
 - c. Casing Beads: Square-edged style, with short or expanded flanges to suit kinds of plaster bases galvanized steel.
 - d. Curved Casing Beads: Square-edged style, fabricated from
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aluminum coated with clear plastic, preformed into curve of radius indicated on the Drawings.

- e. Control Joints: Prefabricated, galvanized steel one-or two-piece type as required. Provide removable protective tape on plaster face of control joints.
 - f. Metal Corner Reinforcement: Expanded large mesh diamond lath fabricated from welded wire mesh from 1.2 mm diameter galvanized wire, specially formed to reinforce corners of Portland cement plaster where exposed while allowing full plaster encasement.
 - g. Expanded Metal Lath: Galvanized steel diamond mesh complying with ASTM C 847 and shall have a minimum weight of 1.85 kg/m².
- 8.1.2 Coordinate the depth of accessories with the thickness and number of plaster coats required in accordance with the manufacturer's recommendations and as directed by Engineer.

8.2 PORTLAND CEMENT PLASTER

- 8.2.1 Portland cement plaster shall have a minimum thickness of 20 mm in a double coat provided using but not limited to the following materials:
- a. Base Coat Cement: Portland cement, conforming to ASTM C 150, Type I.
 - b. Finish Coat Cement: Portland cement, conforming to ASTM C 150, Type I.
 - c. Factory-Prepared Finish Coat: Manufacturer's standard product requiring only the addition of water; white in color unless otherwise indicated.
 - d. Lime: Special hydrated lime for finishing purposes, conforming to ASTM C 206, Type S.
 - e. Sand Aggregate for Base Coat: Conform to the requirements of ASTM C 897.
 - f. Aggregate for Finish coat: Conform to ASTM C 897, manufactured or natural sand to match approved sample.
 - g. Water for Mixing and Finishing Plaster: Potable, free of substances, capable of affecting plaster set or of damaging plaster, lath or accessories.
 - h. Bonding Agents: Conform to ASTM C 932.
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8.2.2 Portland cement plaster mixes and compositions:

- a. General: Comply with ASTM C 926 for Portland cement plaster base and finish coat mixes as applicable to plaster bases, materials and other requirements indicated. Submit samples of materials used for the approval of Engineer as well as mix design.
- b. Base Coat: Proportion materials for respective base coats in parts by volume for cementitious materials and in parts by volume for sum of cementitious materials for aggregates to comply with following requirements for each method of application and plaster base as required. Adjust mix proportions indicated herein within the limits specified to attain workability as follows:
- c. Two-coat Work over Concrete or Unit Masonry: Base coats shall be one part Portland cement, 3/4 to 1-1/2 parts lime, 3 to 4 parts sand.
- d. Finish Coat: Proportion materials for finish coats in parts by volume for cementitious materials for aggregates with one part Portland cement, 3/4 to 1-1/2 parts lime and 3 parts sand.

8.3 GYPSUM PLASTER (FOR INTERNAL PLASTERING)

8.3.1 Gypsum Plaster Materials:

- a. Base Coat Plaster: Conform to ASTM C 28, ready-mixed gypsum, high strength gypsum neat plaster with minimum average dry compressive strength of 19.3 MPa according to ASTM C 472 for a mix of 45 kg plaster and 0.19 m³ of sand.
- b. Finish Coat Plaster: Ready-mixed gypsum finished plaster, manufacturer's standard mill-mixed gauged interior finish or high-strength gypsum gauging plaster, conforming to ASTM C 28, with a minimum average dry compressive strength of 34.5 MPa according to ASTM C 472 for neat mix.
- c. Lime: Conform to ASTM C 206, hydrated lime, Type S, for finishing purposes, unless otherwise indicated.
- d. Aggregates for Base Coat: Conform to ASTM C 35, sand aggregate, unless otherwise indicated.
- e. Bonding Agent: Conform to ASTM C 631.

8.3.2 Gypsum plaster mixes and compositions:

- a. Plaster Base Coat Compositions: Comply with ASTM C 842 and manufacturer's directions for gypsum plaster base coat
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proportions which corresponds to application and plaster bases as indicated below:

1. Three-coat Work over Metal Lath: Scratch and brown coats of high strength gypsum gauging plaster with job-mixed sand.
 2. Two-Coat Work Over Unit Masonry and Concrete: Base coats of gypsum neat plaster with job-mix sand.
- b. Finish Coat: Proportion materials for finish coat to comply with ASTM C 842 for type of finish coat and texture required.

8.4 CEMENT SAND SCREED

- 8.4.1 Cement Sand screed be composed of a mixture of Portland Cement type I, natural sand, crushed stone or a combination of them, as well as water and other additives as indicated on Drawings and as required by the Engineer.
- 8.4.2 Submit the design mix for Engineer's approval. Cement Sand screed shall have minimum thickness of 75 mm unless otherwise indicated on Drawings. Provide wire fabric reinforcement, hardener, protection layer, insulation and membrane waterproofing as required.
- 8.4.3 Test screed for a minimum compressive strength of 22 MPa after 28 days.

9. EXECUTION

9.1 INSTALLATION OF LATHING AND FURRING - GENERAL

- 9.1.1 Install interior lathing and furring materials indicated for plaster to comply with ASTM C 841.
- 9.1.2 Install lathing and furring materials indicated for Portland cement plaster to comply with ANSI A42.3.
- 9.1.3 Install supplementary framing, blocking, and bracing at terminations of work for support of fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, and similar work in accordance with details indicated on Drawings or approved shop drawings.
- 9.1.4 Isolation: Where lathing and metal support system abuts building structure horizontally, and where partition/wall work abuts overhead structure, isolate the work from structural movement sufficiently to prevent transfer of loading into the work from the building structure. Install slip or cushion type joints to
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absorb deflections but maintain lateral support.

- 9.1.5 Frame both sides of control and expansion joints independently, and do not bridge joints with furring and lathing or accessories.

9.2 INSTALLATION OF CEILING SUSPENSION SYSTEMS

- 9.2.1 Coordinate installation of ceiling suspension system with installation of overhead structural systems, ducting and catwalks to ensure that inserts and other structural anchorage provisions have been installed to receive ceiling hangers in a manner that will develop their full strength and at spacing required to support ceiling.
- 9.2.2 Furnish concrete inserts, and other devices indicated, to other trades for installations well in advance of time needed for coordination with other work.
- 9.2.3 Attach hangers to structure above ceiling to comply with ML/SFA - Specifications for Metal Lathing and Furring as well as with referenced standards.
- 9.2.4 Install ceiling suspension system components of sizes and spacing indicated but not in smaller sizes or greater spacing than that required by the referenced lathing and furring installation standards.

9.3 METAL LATHING

Install expanded metal lath for the applications where plaster base coats are required. Provide appropriate type, configuration and weight of metal lath selected from materials required which comply with referenced lathing installation standards.

9.4 INSTALLATION OF PLASTERING ACCESSORIES

- 9.4.1 General: Comply with referenced lathing and furring installation standards for provision and location of plaster accessories of type indicated. Miter or cope accessories at corners; install with tight joints and in alignment. Attach accessories securely to plaster bases to hold accessories in place and alignment during plastering.
 - 9.4.2 Accessories:
 - a. Corner Beads: Install at external corners.
 - b. Casing Beads: Install at terminations of plaster
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work, except where plaster passes behind and is concealed by other work and where metal screed, bases or metal frames act as casing beads.

- c. Control Joints: Install at locations indicated, or if not indicated, at spacings and locations required by referenced standard and recommended by plaster manufacturer and approved by the Engineer.
- d. Corner Reinforcement: Install at external corners.

9.5 PLASTER APPLICATION

- 9.5.1 Prepare monolithic surfaces for bonded base coats and use bonding compound or agent to comply with requirements of referenced plaster application standards for conditioning of monolithic surfaces.
 - 9.5.2 Tolerances: Do not deviate more than 3 mm in 3000 mm from a true plane in finished plaster surfaces, as measured by a 3000 mm straightedge placed at any location on surface.
 - 9.5.3 Grout hollow metal frames, bases and similar work occurring in plastered areas, with base coat plaster material, and prior to lathing where necessary. Except where full grouting is indicated or required for fire-resistance rating, grout 150 mm lengths at each anchorage.
 - 9.5.4 Sequence plaster application with the installation and protection of other work, so that neither will be damaged by the installation of the other.
 - 9.5.5 Plaster finish with metal frames and other built-in metal items or accessories which act as a plaster ground, unless otherwise indicated. Where plaster is not terminated at metal by casing beads, cut base coat-free from metal before plaster sets and groove finish coat the juncture with metal.
 - 9.5.6 Apply thickness and number of coats of plaster as indicated or as required by referenced standards, and as per manufacturer's recommendations.
 - a. Cement Plaster: Base coat shall be 20 mm thick for concrete and CMU. Finish coat shall be 3 mm.
 - b. Gypsum Plaster (for internal use): Base coat shall be 12 mm thick. Finish coat shall be 3 mm.
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- 9.5.7 Concealed Plaster: Where plaster application will be concealed by wood paneling, above suspended ceilings and similar locations, finish-coat maybe omitted. Where plaster application will be concealed behind cabinets and similar furnishings and equipment apply finish-coat. Where plaster application will be used as a base for adhesive application of tile and similar finishes, omit finish-coat and coordinate thickness with overall dimension as shown and comply with tolerances specified.

9.6 SAND-CEMENT SCREED

- 9.6.1 Roughened the concrete slabs to receive screeding before hardening. Clean and wet the hardened base surfaces, preferably overnight prior to laying of screeds.
- 9.6.2 Batch accurately aggregates and cement by weight at a ratio of cement-aggregate ranging from 1-3 to 1-4.5. Mix screeding material mechanically.
- 9.6.3 Lay and finish the screed mix carefully to true levels and correct heights for the required thickness. Tolerance in level over a 2 m length shall not exceed plus or minus 3 mm.
- 9.6.4 Provide adequate means of curing to prevent rapid drying of screed as directed by the Engineer.

9.7 CUTTING AND PATCHING

- 9.7.1 Cut, patch, point-up and repair plaster as necessary to accommodate other work and to restore cracks, dents and imperfections. Repair or replace work to eliminate blisters, buckles, excessive crazing and check cracking, dry-outs, efflorescence, sweat-outs and similar defects and where bond to the substrate has failed.
- 9.7.2 Sand smooth-trowelled finishes lightly to remove trowel marks and arises.

9.8 CLEANING AND PROTECTION

- 9.8.1 Remove temporary protection and enclosure of other work. Promptly remove plaster from door frames, windows, and other surfaces which are not to be plastered. Repair floors, walls and other surfaces which have been stained, marred or otherwise damaged during the plastering work. When plastering work is completed, remove unused materials, containers and
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equipment and clean remove unused materials, containers and equipment and clean floors of plaster debris.

- 9.8.2 Provide final protection and maintain conditions which ensure plaster work being without damage or deterioration at the time of substantial completion.

10. MEASUREMENT AND PAYMENT

10.1 General

Except otherwise specified herein or elsewhere in the Contract Documents, no measurement and payment will be made for the under mentioned specified works related to the relevant items of the Bill of Quantities. The cost thereof shall be deemed to have been included in the quoted unit rate of the respective item of the Bill of Quantities.

The rates quoted by the Contractor in the Bill of Quantities shall include work to be executed under these specification in any floor and at any height except where otherwise specifically stated in the relevant item of Bill of Quantities and the Contractor shall not be entitled to any claim or claim any compensation on this account.

- 10.1.1 Metal lath over reinforced concrete and masonry joint.
 - 10.1.2 Joints, junctions, corners, beads, drip course edge, roundings, and aluminum U/Y channels in groves. Etc.
 - 10.1.3 More than one layer due to any unevenness in the finished works and base coat plaster in stucco plaster including marble chips/colour pigments.
 - 10.1.4 Cutting & patching of all defective works.
 - 10.1.5.1 Surface preparation, cleaning and protection as specified.
 - 10.1.6 Marble chips & pigments in stucco plaster.
 - 10.1.7 Roughning of first coat of plaster before application of 2nd coat incase where overall required plaster thickness exceeds 13mm.
 - 10.1.8 Pudlo or approved equivalent water proofing agent.
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10.2 Plain Plaster

10.2.1 Measurement

Deductions shall not be made for ends of joints, beam posts, etc., and openings not exceeding 0.5 square meter each and no addition shall be made for reveals, jambs, soffits, sills, etc. of these openings non for finishing the plaster around ends of joints, beams posts, etc.

In case of opening of area exceeding 0.5 square meter each, deduction shall be made for the openings and also no addition shall be made for reveals jambs, soffits, sills, etc., of these openings.

Measurement of acceptably completed works of plaster will be made on the basis of actual area in square foot / meter of the surface plastered as shown on the Drawings, or as directed by the Engineer.

10.2.2 Payment

Payment will be made for acceptable measured quantity of plaster on the basis of unit rate per square foot / meter quoted in the Bill of Quantities and shall constitute full compensation for all the works related to the item.

*** End of Section 6521 ***
