



By CTS Cement Manufacturing Corp.

CSI SECTION 09 24 00 – CEMENT PLASTER
09 24 23 – CEMENT STUCCO

Three-Coat, Rapid Hardening, Hydraulic Cement Stucco Assembly

EDITOR NOTE: The following guideline specification has been prepared to assist architects and design professionals in the preparation of project master specifications. It is intended for use by qualified design professionals and is not intended to be used verbatim. Appropriate modifications to meet specific project requirements are required. Make appropriate [selections] where options are provided and delete items that are not applicable to the project. Contact CTS Cement Technical Service for additional information or project specification assistance.

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Supply and installation of a rapid hardening, hydraulic cement, exterior three-coat stucco assembly [over exterior rigid insulation].

1.2 RELATED SECTIONS

- A. Section 03 30 00 - Cast-in-Place Concrete
- B. Section 04 20 00 - Unit Masonry
- C. Section 05 10 00 - Structural Metal Framing
- D. Section 06 11 00 - Wood Framing
- E. Section 06 12 00 - Structural Panels
- F. Section 06 16 00 - Sheathing
- G. Section 07 25 00 - Weather Barriers
- H. Section 07 62 00 - Sheet Metal Flashing and Trim
- I. Section 07 65 00 - Flexible Flashing
- J. Section 07 90 00 - Joint Protection
- K. Section 08 50 00 - Windows
- L. Section 09 21 16 - Gypsum Board Assemblies
- M. Section 09 22 36 - Lath
- N. Section 09 90 00 - Painting and Coating

1.3 REFERENCES

- A. ASTM A641 Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire
- B. ASTM C144 Standard Specification for Aggregate for Masonry Mortar
- C. ASTM C578 Specification for Preformed, Cellular Polystyrene Thermal Insulation
- D. ASTM C847 Standard Specification for Metal Lath
- E. ASTM C897 Standard Specification for Aggregate for Job-Mixed Portland Cement-Based Plaster
- F. ASTM C920 Standard Specification for Elastomeric Joint Sealants
- G. ASTM C926 Standard Specification for Application of Portland Cement-Based Plaster
- H. ASTM C933 Standard Specification for Welded Wire Lath



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- I. ASTM C1032 Standard Specification for Woven Wire Plaster Base
- J. ASTM C1063 Standard Specification for Installation of Lathing and Furring for Portland Cement Based Plaster
- K. ASTM C1177 Specification for Glass Mat Gypsum for Use as Sheathing
- L. ASTM C1278 Specification for Fiber-Reinforced Gypsum Panel
- M. ASTM C1396 Standard Specification for Gypsum Board
- N. ASTM C1600 Standard Specification for Rapid Hardening Hydraulic Cement
- O. ASTM D226 Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing
- P. IBC International Building Code 2012, 2009 and 2006
- Q. IRC International Residential Code 2012, 2009 and 2006
- R. ADIBC Abu Dhabi International Building Code 2013
- S. ICC-ES AC38 Acceptance Criteria for Water-Resistive Barriers
- T. ICC-ES AC212 Acceptance Criteria for Water-Resistive Coatings Used as Water-Resistive Barriers over Exterior Sheathing
- U. ICC-ES ESR-2671 Rapid Set One Coat Stucco System
- V. TSIB Technical Services Information Bureau, Drywall and Plaster Systems Manual

1.4 ASSEMBLY DESCRIPTION

- A. Three-Coat Stucco assembly consisting of a code compliant water-resistive barrier, [rigid insulation,] wire or metal lath, [pre-blended rapid hardening, high early strength stucco basecoat] [rapid hardening, high early strength cement field mixed with high quality graded plaster sand], and finish. The stucco assembly is installed on exterior walls over wood, steel, masonry or concrete construction.

1.5 SUBMITTALS

- A. General: Submit samples, Evaluation Reports and manufacturer's product data sheets in accordance with Division 01 General Requirements Submittal Section.
- B. Samples:
 - 1. Submit samples for approval. Samples must be of materials specified and of suitable size as required to accurately represent each color and texture used on project. Prepare each sample using the same tools and techniques for actual project application.
 - 2. Maintain and make approved samples available at the job site throughout the construction process and until final acceptance.
 - 3. Provide a mock-up of the complete system sample panel, sized to [enter sample mock-up dimensions], using workmen, equipment, and techniques proposed for use on the project. Mock-up must be reviewed for uniformity of depth and thickness, finish color and texture, and overall quality of construction. The approved panel will become the standard of comparison for finished work for the project. The approved panel must remain on site throughout the construction process and until final acceptance.
 - 4. Upon project completion and final acceptance, dispose of the sample in accordance with local construction waste guidelines.



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1.6 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Manufacturer:
 - a. Must have marketed stucco assemblies in the United States for at least five (5) years and have completed projects of the same general scope and complexity.
 - b. System components must be manufactured by or approved for use by CTS Cement Manufacturing Corp. (800-929-3030, www.CTScement.com) and distributed by the same or an authorized CTS dealer.
 - 2. Applicator:
 - a. Must be experienced and competent in installation of rapid hardening stucco and plaster-like materials and provide evidence of a minimum of five (5) years experience in work similar in size and scope to that required by this section.
 - b. Must provide proof of current Approved Applicator status from the stucco materials manufacturer. Temporary approvals must be approved in writing by an authorized CTS Cement Manufacturing Technical Representative at least 15 days prior to installation and are required to have an authorized CTS Representative on site for initial application.
- B. Functional Criteria:
 - 1. General:
 - a. Stucco application must be to code compliant vertical substrates or to substrates sloped for positive drainage.
 - b. Uses and installation must comply with all applicable building codes.
- C. Substrate Conditions:
 - 1. Substrate materials and construction must conform to the building code having jurisdiction.
 - 2. Substrates must be sound, dry and free of dust, dirt, laitance, efflorescence and other harmful contaminants.
 - 3. Substrate Dimensional Tolerances: Flat with 1/4 in (6.4 mm) within any 10 ft (3 m) radius.
 - 4. Maximum deflection of substrate system under positive or negative design loads must not exceed L/360 of span.
- D. Expansion and Control Joints: Continuous expansion and control joints must be installed at locations in accordance with ASTM C1063 and ASTM C926.
 - 1. Substrate movement, and expansion and contraction of the stucco assembly and adjacent materials must be taken into account in design of expansion joints, with proper consideration given to sealant properties, installation conditions, temperature range, coefficients of expansion of materials, joint width to depth ratios, and other material factors. Minimum width of expansion joints must be as specified by the designer or shown on the project drawings.
 - 2. In accordance with ASTM C1063, expansion or control joints must be installed in walls not more than 144 ft² (13.4 m²) in area, and not more than 100 ft² (9.3 m²) in area for all non-vertical applications. The distance between joints must not exceed 18 ft (5.5 m) in either direction or a length-to-width ratio of 2-1/2 to 1.
 - 3. For direct application to concrete or masonry, stucco joints are required only at control/expansion joints in the underlying concrete or masonry.



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1.7 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver products in original, unopened, undamaged packaging with manufacturer's identification (i.e., brand logo, product name, weight of packaged unit, lot number).
- B. Storage: Store products in a dry location, covered, out of direct sunlight, off the ground, and protected from moisture. Maintain storage temperature required by the manufacturer. Keep materials dry until used. Store bulk sand in a well-drained area on a clean, solid surface. Cover sand to prevent contamination.
- C. Handling: Handle products in accordance with manufacturer's published recommendations.

1.8 SITE / ENVIRONMENTAL CONDITIONS

- A. Temperature: Maintain ambient and surface temperatures between 32°F (0°C) to 110°F (78°C). Do not apply stucco materials if ambient temperature falls below 32°F (0°C) within 24 hours of application. Protect stucco from uneven and excessive evaporation during dry weather, windy conditions and strong blasts of dry air.
- B. Inclement Weather: Do not apply stucco base during inclement weather unless appropriate protection is employed.
- C. Sunlight Exposure: Avoid, whenever possible, installation of stucco materials in direct sunlight which could adversely affect aesthetics.
- D. Substrate: Prior to installation, the wall surfaces must be inspected for surface contamination or other conditions that may adversely affect the performance of the stucco materials and be free of residual moisture.
- E. Protect adjacent and surrounding surfaces not specified to receive finishing with drop cloths, waterproof paper, or other means to ensure protection against overspray, water or other harmful debris.

1.9 COORDINATION AND SCHEDULING

- A. Coordinate installation of stucco materials with all other trades to avoid damage of installed stucco materials and to avoid impeding other construction.
- B. Sufficient manpower must be provided to ensure continuous application and timely finishing, and to prevent cold joints, scaffolding lines, variations in texture, etc.

1.10 WARRANTY

- A. Warranty: Upon request, at completion of installation, provide manufacturer's Standard Limited Warranty for stucco one-coat materials.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: CTS Cement Manufacturing Corp., 12442 Knott Street, Garden Grove, CA 92841 (800-929-3030, www.CTScement.com)
- B. Components: Obtain stucco materials components manufactured by CTS Cement from authorized distributors. No substitutions or additions of other materials are permitted without prior written permission from the manufacturer for this project.



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2.2 MATERIALS

A. Stucco Basecoat

- [1. Eisenwall® Cement: a rapid-setting, high early strength, low shrinkage plastic cement mixed with clean, cool, potable water and ASTM C897 or ASTM C144 sand added in the field.

- a. Cement Performance Criteria

| | | |
|--|-----------|----------|
| Compressive Strength, Minimum (ASTM C109) | 1,500 psi | 6 hours |
| | 2,500 psi | 24 hours |
| | 3,500 psi | 28 days |

- [2. Rapid Set® Stucco Mix: a rapid-setting, high early strength, low shrinkage plastic cement, pre-blended with quality plaster sand and high performance additives, mixed with clean, cool, potable water in the field.

- a. Cement Performance Criteria

| | | |
|--|-----------|----------|
| Compressive Strength, Minimum (ASTM C109) | 1,500 psi | 6 hours |
| | 2,500 psi | 24 hours |
| | 3,500 psi | 28 days |

- [B. Sand: Clean and free from deleterious amounts of loam, clay, silt, soluble salts and organic matter. Sampling and testing must comply with ASTM C897 or ASTM C144 and graded within the following limits:

| | |
|---------------|-----------|
| No. 4 | ----- 0 |
| No. 8 | 0 to 10 |
| No. 16 | 10 to 40 |
| No. 30 | 30 to 65 |
| No. 70 | 70 to 90 |
| No. 95 | 95 to 100 |

- C. Water: Clean, potable water free of deleterious amounts of silt and dissolved salts.

- D. Primer: As specified in [Section 09 90 00 – Painting and Coating] [Section 04 21 13 – Brick Veneer Masonry] [Section 04 22 00 – Concrete Unit Veneer Masonry] [Section 04 26 14 – Masonry Veneer] [Section 04 43 13 – Stone Masonry Veneer].

- E. Finish: As specified in [Section 09 90 00 – Painting and Coating] [Section 04 21 13 – Brick Veneer Masonry] [Section 04 22 00 – Concrete Unit Veneer Masonry] [Section 04 26 14 – Masonry Veneer] [Section 04 43 13 – Stone Masonry Veneer].

2.3 RELATED MATERIALS AND ACCESSORIES

- A. General: Stucco assembly and its related materials must conform to the requirements of IBC, IRC, and this specification.

- B. Substrate Materials:

- 1. Gypsum Sheathing: Minimum 1/2 in (13 mm) thick, core-treated, weather-resistant, exterior gypsum sheathing complying with ASTM C79 or ASTM C1177.
- 2. Cement Board Sheathing, Minimum 1/2 in thick, conforming to ASTM C1186.
- 3. Fiberboard: Minimum 1/2 in (13 mm) thick exterior grade, structural fiberboard complying with ANSI/AHA A194.1 as a regular density sheathing complying with ASTM C208.



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4. Plywood: Minimum 5/16 in (8 mm) thick exterior grade or Exposure I plywood, compliant with U.S. Department of Commerce Product Standard PS-1, for studs spaced 16 in (406 mm) o.c. and 3/8 in (9 mm) thick exterior type plywood minimum for studs spaced 24 in (610 mm) o.c.
 5. Oriented Strand Board (OSB): 7/16 – 1/2 in Wall-16 or Wall-24, approved by the APA, TECO, or PSI/PTL. Stamped as Exposure 1 or Exterior Sheathing with a PS2 or PRP-108 rating. The system is qualified for application to OSB (oriented strand board) sheathing only in areas shown in the manufacturer's Acceptable Substrates and Areas of Use Technical Bulletin.
 6. Concrete Masonry Construction: Non-painted (uncoated), must conform to current IBC and IRC building codes.
 7. Other approved by stucco manufacturer in writing prior to the project.
- C. Water-Resistive Barrier Sheet:
1. For Non-Wood Based Sheathing: Minimum one layer of No. 15 asphalt-saturated felt compliant with ASTM D226, Type I, or a water-resistive barrier recognized as equivalent to ASTM D226, Type I or better, holding a current ICC-ES Evaluation Report compliant with UBC Standard 14-1 or ICC-ES Acceptance Criteria AC38 incorporating in itself a means of drainage.
 2. For Plywood Sheathing: Minimum two layers of Grade D kraft building paper per IBC Section 2510.6 and IRC Section R703.6.3, or an equivalent recognized in a current ICC-ES Evaluation Report compliant with ICC-ES Acceptance Criteria AC38 incorporating in itself a means of drainage.
 3. Other Code Approved Water-Resistive Barrier and a means of drainage.
- D. Water-Resistive Barrier Coating:
1. For Non-Wood Based Sheathing: A Code compliant water-resistive barrier coating holding a current ICC-ES Evaluation Report compliant with ICC-ES Acceptance Criteria AC212 covered by a water vapor permeable intervening material such as building wrap incorporating in itself a means of drainage.
 2. For Plywood Sheathing: Minimum two (2) coats of a code compliant water-resistive barrier coating holding a current ICC-ES Evaluation Report compliant with ICC-ES Acceptance Criteria AC212 covered by a water vapor permeable intervening material such as building wrap incorporating in itself a means of drainage.
 3. For Solid Sheathing Covered with Flat Foam Plastic Insulation: A Code compliant water-resistive barrier coating holding a current ICC-ES Evaluation Report compliant with ICC-ES Acceptance Criteria AC212 covered by a water vapor permeable intervening material such as drainage wrap or building wrap incorporating in itself a means of drainage.
 4. For Solid Sheathing Covered with Grooved/Channeled Foam Plastic Insulation: A Code compliant water-resistive barrier coating holding a current ICC-ES Evaluation Report compliant with ICC-ES Acceptance Criteria AC212 covered by a grooved/channeled insulation board and maintaining a current ICC Evaluation Report.
- [E. Continuous Insulation:
- [1. Expanded (EPS) or Extruded (XPS): Nominal density of 1 lb/ft³ (14 kg/m³), maximum thickness of 1.5 inches configured with channels per stucco assembly design.
 - [2. Polyisocyanurate Foam plastic complying with ASTM C1289 as Type II board with a nominal density of 2 psf (32 kg/m³).

EDITOR NOTE: *Modify lath, accessories, weights and sealant types below to suit project requirements. Suitable materials are determined by environmental conditions specific to the region (e.g., salt air, industrial pollution, high humidity, etc.).*



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- E. Lath and Accessories: Conform to ASTM C847, ASTM C933, ASTM C1032, ASTM C1063 and Appendix.
 - 1. Accessories: Manufacturer's standard steel products with minimum G60 galvanizing unless otherwise indicated as rigid polyvinyl chloride (PVC plastic) or zinc alloy.
 - 2. Metal Plaster Bases: Minimum 2.5 lb/yd² (1.4 kg/m²) or 3.4 lb/yd² (1.8 kg/m²) expanded metal diamond lath, minimum 1.14 lb/yd² self-furred welded wire lath, or minimum 1.40 lb/yd², 17 gauge, 1-1/2" opening woven wire plaster base in accordance with applicable codes and standards.
 - 3. Weep Screeds: Foundation weep screed with minimum 3-1/2 inch vertical attachment flange.
- F. Seals, Sealants and Bond Breakers: Sealants must conform to ASTM C920, Grade NS, Class 25, Use NT. Backer rod must be closed-cell polyethylene foam.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify project site conditions under provisions of Section 01 00 00.
- B. Compliance: Comply with manufacturer's instructions for installation of the stucco materials.
- C. Substrate Examination: Examine prior to stucco base installation as follows:
 - 1. Substrate must be of a type approved by stucco manufacturer. Plywood and OSB substrates must be gapped 1/8 in (3.2 mm) at all edges.
 - 2. Substrate must be examined for soundness, and other harmful conditions.
 - 3. Substrate must be free of dust, dirt, laitance, efflorescence, and other harmful contaminants.
 - 4. Substrate must be installed to ensure all stucco surfaces will be true, level, and plumb without requiring additional or uneven thickness of stucco materials or finishes.
 - 5. Substrate construction in accordance with substrate material manufacturer's specifications and applicable building codes.
- D. Ensure flashing has been installed per Section 07 60 00 - Flashing and Sheet Metal.
- E. Advise Contractor of discrepancies preventing proper installation of stucco materials. Do not proceed with stucco work until unsatisfactory conditions are corrected.

3.2 PREPARATION

EDITOR NOTE: *Coordinate accessory terminations with Project's Sealant Section to ensure required spacing for joint dimensions.*

- A. Wire Fabric Lath and Metal Lath: Install according to ASTM C1063 and Appendix and current Building Code.
- B. Concrete (Cast-in-Place): Provide a surface that is slightly scarified, water absorbent, straight and true to line and plane. Remove form ties and trim projecting concrete so it is even with the plane of the wall. Remove form release agents. Pre-moisten the surface with water just prior to placement of stucco, or apply one uniform coat of acrylic emulsion additive according to application instructions.
- C. Concrete Masonry Units: Remove projecting joint mortar so it is flush with the plane of the wall. Remove surface contaminants such as efflorescence, existing paint or any other bond inhibiting material by sandblasting, waterblasting, wire brushing, chipping or other appropriate means. Pre-moisten the surface with water just prior to placement of stucco, or apply one uniform coat of acrylic emulsion additive according to application instructions.



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3.3 MIXING

- A. Mix proprietary products in accordance with manufacturer's instructions and applicable Product Data Sheets.
- B. Admixtures must be approved for use in writing by an authorized CTS Cement Manufacturing Technical Representative prior to use.

3.4 APPLICATION

- A. General: Stucco assembly and its related materials must conform to the requirements of applicable building codes and this specification.
- B. Comply with stucco manufacturer's instructions for cold and warm weather installation.
- C. Water-Resistive Barrier: Install in accordance with all applicable building codes, Evaluation Reports and manufacturer's instructions. Application must comply with IBC Section 1402.1.
 - 1. Flash all rough openings and treat all sheathing joints to ensure protection from moisture intrusion.
- D. Metal Lath and Accessories: Install in accordance with all applicable building codes, Evaluation Reports and manufacturer's instructions.
- E. Stucco Basecoat:
 - 1. Over Sheathing: Apply scratch and brown coats by hand trowel or pneumatic gun to a minimum 3/8" thickness for each application to a minimum 3/4" total thickness. The second coat must be applied as soon as the first coat has attained sufficient rigidity to accept the mechanical force of application without damage. Use sufficient pressure and mechanical force to fully embed lath, filling all spaces and ensuring consistent thickness of the basecoat.
 - 2. Over Concrete and Masonry: Apply scratch and brown coats by hand trowel or pneumatic gun in one coat to a minimum 1/2" thickness. Basecoat must be brought to ground, straightened to a true surface, and finished with sufficient texture to ensure adequate bond with the finish coat.
 - 3. Rod the surface to true plane and float to densify.
 - 4. Trowel to smooth and uniform surface to receive specified finish.
- F. Curing:
 - 1. Stucco Basecoat:
 - [a. Eisenwall® Cement: Immediately begin moist curing for at least one (1) hour by lightly fogging stucco surfaces with clean, potable water as needed to maintain a wet sheen.
 - [b. Rapid Set® Stucco Mix: Immediately begin moist curing for at least 90 minutes by lightly fogging stucco surfaces with clean, potable water as needed to maintain a wet sheen after material has hardened.
 - 2. Complete all work in the same plane and panel each day. Do NOT stop work short at control joints, expansion joints, etc. Avoid cold joints.
 - 3. Apply primer and finish to a minimum 1/8" thickness.
 - 4. Basecoat may require light misting to ensure even suction and drying of finish materials. Apply finish coat evenly and consistently to achieve uniform color and texture.
 - 5. Comply with stucco manufacturer's instructions for cold and warm weather installation.



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EDITOR NOTE: *Modify Primer and Finish Sections to suit project requirements.*

- G. Primer: As specified in [Section 09 90 00 – Painting and Coating] [Section 04 21 13 – Brick Veneer Masonry] [Section 04 22 00 – Concrete Unit Veneer Masonry] [Section 04 26 14 – Masonry Veneer] [Section 04 43 13 – Stone Masonry Veneer].
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3.5 CLEAN-UP

- A. Remove and legally dispose of stucco material and debris from the jobsite.
- B. Remove all tools, equipment and unused materials.
- C. Clean up all overspray/splatters from surrounding surfaces.
- D. Clean all residual materials from joints.

3.6 PROTECTION

- A. Protect installed materials from water infiltration into or behind them.
- B. Protect installed stucco materials from dust, dirt, precipitation and freezing during installation.
- C. Protect installed finish from dust, dirt, precipitation, freezing and continuous high humidity until fully cured and dry.
- D. Clean exposed surfaces using materials and methods recommended by the manufacturer of the material or product being cleaned. Remove and replace work that cannot be cleaned to the satisfaction of the Project Designer/Owner.

END OF SECTION

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This sample guideline specification is intended for use by a qualified design professional. The sample guideline specification is not intended to be used verbatim as an actual specification without appropriate modifications for the specific project requirements.