



Technical Bulletin

Section 09 24 23

Guide for Specifying Portland Cement-Based Stucco in Florida

This is a guide to the specifier that highlights Florida issues with regard to the proper application of stucco. The specifier shall add all other sections of specifications normally used or follow the Section Format titles of CSI or AIA Master Spec.

Portland Cement Stucco

Coordinate section numbers and titles with remainder of Project Manual

PART 1 - GENERAL

1.1 RELATED DOCUMENTS: Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 - Specification Sections, apply to Work of this Section. The Contractor and Installer of the Work shall examine the specifications and shall thoroughly familiarize himself with all provisions regarding the Work of the Section.

1.2 SUMMARY

- A. Section includes __Portland Cement-Based Plaster_____
- B. Related Sections:

Check that open textured units and cut flush mortar joints are specified in Division 04 where concrete masonry surfaces are intended to receive plaster. In some Florida markets, a smooth texture block is typical. If bond between the block and the plaster is a concern, a bonding agent conforming to ASTM C 932 or , a dash bond coat should be specified.

1. Section 03 30 00 - Cast-in-Place Concrete
2. Section 04 22 00 - Concrete Unit Masonry

Check that a minimum 1/8 in. (3 mm) space is specified between all edges of abutting wood based sheathing.

Verify that all fastening for wood based sheathing comply with An Engineered Wood Association (APA) requirements.

3. Section 06 11 00 - Wood Framing

F.I.O.: The APA recommendation is to install wood sheathing with a 1/8 gap on all sides is critical in minimizing stucco cracking caused by stresses that caused by moisture in the sheathing. The plastering contractor should notify appropriate party if conditions are not acceptable.

4. Section 06 16 00 - Sheathing
5. Section 09 22 36 - Metal Lath

1.3 REFERENCES

Just state FBC here since the document is for Florida!

The applicable date for each reference should be given here. Use latest or other desired edition. When a date other than the latest edition is used, the specifier should state his intent in the use of that edition.

- A. Building Code: FBC - _____ (including current supplement) use desired volume

- B. ASTM C 91- Masonry Cement
- C. ASTM C 150- Portland Cement
- D. ASTM C 897- ____ - Aggregates for Job Mixed Portland Cement-Based Plaster
- E. ASTM C 926- ____ - Application of Portland Cement-Based Plaster
- F. ASTM C 932- ____ - Surface-Applied Bonding Agents for Exterior Plastering
- G. ASTM C 979- ____ - Pigments for Integrally Colored Concrete
- H. ASTM C 1063- ____ - Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster
- I. ASTM C 1116- ____ - Fiber-Reinforced Concrete and Shotcrete
- J. ASTM C 1328- Plastic (Stucco) Cement
- K. ACI 524 - Guide to Portland Cement Plastering

1.4 SUBMITTALS

- A. Certification of compliance of materials with product specifications.
- B. Manufacturer's written specifications, proportion mixes, and installation instructions for factory-prepared materials.
Delete if project size does not require such qualifications.
- C. Manufacturer's Safety Data Sheet.
Delete if factory-prepared finish-coat plaster mixes will be used.
- D. Evidence of applicator's experience including project identification with names of Owner and Architect/Engineer.
- E. Samples of colored finish-coat plaster containing coloring compound and specific aggregate to be used during plastering.

1.5 QUALITY ASSURANCE

Delete when project size does not require such qualifications.

- A. Applicator Qualifications: Application of cement plaster on at least three projects equal in scope to this Work. Evidence of applicator's experience including project identification with names of Owner and Architect/ Engineer.
- B. Sample Panel
 1. Size: 4 ft by 8 ft (1.2 m by 2.4 m).
 2. Construct panel using sub base, base, lathing & furring, accessories, plaster coats, color, and finish texture representative of that required on the project for proper and expected workmanship.
 3. Panel will be reviewed for proper construction, color, texture, and workmanship.
 4. Do not proceed with work until sample plaster panel is approved by Owner and Architect/Engineer.
 5. Maintain sample panel on site for duration of project for comparison purposes.
 6. Remove sample panel from site when directed by Architect/Engineer.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver manufactured materials in original unopened packages or containers, fully identified with manufacturer's label intact and legible. Deliver materials in sufficient quantity to assure continuity of work. Select and utilize handling equipment so as to avoid damage to materials handled and damage to other construction.
- B. Keep materials dry, stored above ground, under cover and away from damp surfaces.
- C. Remove wet or deteriorated materials from project site.

1.7 PROJECT CONDITIONS

Delete if no exterior work. Method of temporary protection and heat is option of Contractor.

- A. Cold Weather Requirements: Do not apply cement plaster when ambient temperature is less than 40°F (4°C).
- B. Hot Weather Conditions
 - 1. Use damp loose sand.
 - 2. Use cool water for mix water.
 - 3. Pre-dampen masonry walls prior to the application of the scratch coat.
 - 4. Prevent the plaster from drying out by covering with a plastic sheet, or moist cure at least two times each day for the first 2 to 3 days

Delete if only exterior work. For unglazed buildings.

- C. Ventilation:
 - 1. Provide ventilation for drying of installed cement plaster.
 - 2. Cover all wall openings with plastic film when building is subject to hot, dry winds.

For Fenestration products and hardware

- D. Protection:
 - 1. Protect adjacent finished surfaces and projections, installed prior to plastering, by covering with plastic sheets, non-staining Kraft paper, removable type masking tape, non-staining petroleum jelly, or other appropriate means.
 - 2. Maintain protection in place until completion of plastering.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Approved Manufacturers:
 - 1. CEMEX
 - 2. Florida Rock Industries
 - 3. Holcim, Inc.
 - 4. Rinker Materials
 - 5. Titan America

Submit all forms and information as required in Division 01.

- B. Approved equivalent:
 - 1.
 - 2.

Coordinate materials selection with "Mixes" ARTICLE below...

2.2 MATERIALS

Check availability of cements. Combinations of cements should be allowed. Refer to "References" Article in Part 1. List only the cements relevant to this project.

- A. Cement:
 - 1. Portland Cement: (White or Grey) ASTM C 150 Type ____; ASTM C 1157 Type ____
 - 2. Blended cement: ASTM C 595 Type ____
 - 3. Masonry cement: ASTM C 91 Type ____
 - 4. Plastic cement: ASTM C 1328 Type ____
 - 5. Colored masonry cement: Conform to ASTM C 91 Type ____; Color.

- B. Aggregate:

Typically the sands in Florida do not meet the gradation limits for all the sieve sizes in ASTM C 897. Historically, they have proven to be an excellent aggregate for plaster and are acceptable by ASTM C 926. An alternate gradation specification to consider is FDOT 902.2 Silica Sand.

1. Base Coats: ASTM C 897, natural or manufactured sand.

Delete "light colored sand" when not required. Delete if finish coat is to be factory prepared. Change if special texture requires different gradation.

2. Finish Coat: Natural or manufactured sand graded to pass the No. 16 (1.18 mm) mesh sieve, light colored.

- C. Water: Potable, cool and free from impurities.

Delete if none required. Discourage indiscriminate use of admixtures.

- D. Admixtures:

Indicate length and identity kind of fiber.

Indicate by brand name and manufacturer.

Indicate by brand name, manufacturer, and purpose for including admixture. Testing to confirm enhancement of desired property is recommended.

1. Fibers: ___ in. (___ mm) fibers meeting the requirements of ASTM C 1116.

2. Integral Bonding Agent: _____ as manufactured by _____.

3. Other: _____ as manufactured by _____ to provide _____.

Delete if not required. In some Florida markets, a smooth texture block is typical. If bond between the block and the plaster is a concern, a bonding agent conforming to ASTM C 932 or, a dash bond coat should be specified.

- E. Surface-Applied Bonding Agent: ASTM C 932, non-oxidizing, non-crystallizing, non-reemulsifiable material.

Delete if coloring compound admixture is not required. Delete if colored masonry cement or colored factory-prepared finish-coat mixture is required.

Identify color compound brand name, color code, and manufacturer.

- F. Coloring Compounds:

1. ASTM C 979 mineral oxide pigment _____ as manufactured by _____.

2. Use coloring compound as prepared by factory certifying compliance to product standard and demonstrating no effect on setting and hardening of plaster mixture when used within recommended dosage range. Do not use carbon black or lampblack or organic pigments.

Delete if factory-prepared finish-coat mixture is not required.

- G. Factory-Prepared Finish Coat

Indicate producer's name and identification of mixture required.

1. Factory-prepared mixture produced by _____, under the product designation of _____.

Specify color required.

2. Color: _____.

Specify texture required.

3. Texture: _____.

2.3 ACCESSORIES PRODUCTS

- A. Specify lath and accessories in separate section 09 22 36 - Metal Lath

2.4 MIXES

- A. Mixing

1. General

- a. Size mixer to produce batches that will be applied within maximum of 1½ hours after mixing.

- b. Accurately proportion materials for initial plaster mixture using measuring devices or known volume. Shovels of sand can be used after mixer is calibrated with known volumes of materials, including water.

- c. Use damp, loose sand.
 - d. Add pigments or other specified admixtures to batch in accordance with manufacturer's recommendations.
 - e. Retempering of base-coat cement plaster is permitted one time only after initial mixing. Plaster not used within 1½ hours of initial mixing shall be discarded.
 - f. Retempering of finish-coat cement plaster is not permitted.
2. Mechanical Mixing
- a. Mix each batch separately; double batching with single batch discharge shall not be permitted.
 - b. Maintain mixer in clean condition before, during, and after plaster preparation. Remove partially set and hardened plaster from mixer drum before next batch. If mixer has been previously used in preparing gypsum plaster, thoroughly clean prior to use to prepare cement plaster.
 - c. Maintain mixer in continuous operation while charging mixer. Add water to bring plaster to desired consistency. Continue mixing for 3 to 5 minutes after all ingredients have been added to the mixer.
 - d. Mix factory-prepared plaster in accordance with manufacturer's recommendations.
- Mechanical mixing is preferred since it usually results in more uniformly mixed batches.*
3. Hand Mixing
- a. Hand mixing shall be allowed only when authorized by Architect/Engineer.
 - b. Provide waterproof protection around mixing tub and water barrels when mixing inside the building.

B. Mix Proportions

Delete if no dash-bond coat is required. A dash-bond coat is used to improve bond between plaster and dense, low-absorption surfaces such as concrete, smooth surface concrete block or clay brick.

1. Dash-bond coat: 1 part of Portland cement and maximum 2 parts of sand, proportioned by volume.

Indicate appropriate plaster mix symbol(s) [M], [CM], [MS], [P], or [CP]. Mix selection is dependent upon materials available, base material, and exposure conditions in service. Coordinate plaster mix designation(s).

2. Base-coat(s):

The recommended plaster mix for base-coat is [MS], using either ASTM C 91 Masonry Cement or ASTM C 1328 Plastic (stucco) Cement.

- a. ASTM C 926 Plaster Mix _____.

Delete if not required. Otherwise, identify fiber as defined in 2.2.D.1; indicate whether it is to be added to scratch coat, brown coat, or both; and indicate addition rate.

- b. Add _____ fiber to the _____ coat per manufacture's recommendation.

Delete if not required. Otherwise, indicate addition rate for admixture of type defined in 2.2.D.2 or 2.2.D.3.

- c. Add _____ admixture to base-coat cement plaster at the addition rate of _____.

Specify factory-prepared finish-coat plaster; site-prepared finish-coat plaster by reference standard and plaster mix designation.

Indicate appropriate plaster mix symbol(s) [FM], [FCM], [FMS], or [FP], basing selection on materials available, base-coat selection, desired appearance, and exposure conditions in service. Coordinate plaster mix designation(s) and 2.2.A on materials.

Caution: The variability of moisture in concrete masonry construction can cause discoloration of pigmented finish coats.

3. Finish-Coat

The recommended plaster mix for field finished coat is [FMS], using either ASTM C 91 Masonry Cement, or ASTM C 1328 Plastic (stucco) Cement.

- a. Site prepared: ASTM C 926 Plaster Mix _____.
Indicate producer's name and identification of mixture as given in 2.4.G.
- b. Factory prepared: Proportion factory-prepared mixture produced by _____, under the product designation of _____ with water as recommended by manufacturer.
Delete if not required. Identify color compound brand name, color code, manufacturer, and addition rate.
- c. Add pre-weighed quantities of _____ mineral oxide pigment at a dosage rate of _____ lb (_____ kg) per bag of cement or as established by accepted color sample, but not to exceed 10% by weight of cement.

PART 3 - EXECUTION

3.1 EXAMINATION

Tolerances for solid substrates (concrete, masonry) shall conform to the applicable sections of ACI 117, ACI 530.1, and ASTM C 926. For further information, see Technical Bulletin TB-ST-03-07 "Tolerances" of the Florida Concrete & Products Association.

- A. Verify that bases to receive plaster conform to the Requirements of ASTM C 926.
- B. Verify that areas and conditions under which work is to be performed permit proper and timely completion in a workmanlike manner.
- C. Notify Architect/Engineer in writing if conditions are not acceptable.

3.2 PREPARATION

Pre-wetting should be specified on all concrete masonry (block) construction. The typical concrete masonry unit produced in Florida should be considered as a high-suction solid base. Pre-wetting the concrete block wall prior to the application of the scratch coat is essential to achieving suitable bond between the block and the scratch coat.

- A. Wet high-suction solid bases with fine water spray to produce a uniformly damp surface.
Delete if not applicable.
- B. Apply dash-bond coat of cement plaster to solid base and moist cure.
****OR****
- C. Apply bonding agent meeting ASTM C 932 directly to concrete surface as recommended by bonding agent manufacturer's instructions.

Building paper and metal base are required over metal and wood frame construction, and may be used over solid bases. Specify installation of building paper and metal base in Section 09 22 36 in accordance with ASTM C 926, ASTM C 1063 and applicable building codes. Should the control joints on the drawing conflict with the codes and standards, the plastering contractor should notify the Architect/ Engineer in writing that the conditions are not acceptable. Where dissimilar base materials abut and are to receive a continuous coat of plaster, install in accordance with ASTM C 926 section A2.3.3.

- D. Install building paper and metal base in accordance with Section 09 22 36. Install control joints in accordance with drawings.

3.3 APPLICATION

Indicate application procedure: [hand]; [machine]; or [both hand and machine].

The plastering contractor is required to apply the plaster according to local building codes and industry standards.

- A. Do not install cement plaster until all accessories are in place (see Section 09 22 36)
- B. Apply individual coats of cement plaster using _____ application to achieve the required thickness.
- C. Apply cement plaster with complete embedment into bases and all accessories. Fill all corner beads with each coat.

- D. Apply cement plaster with interruptions occurring only at junctures of plaster planes, at openings, or at control joints.

The recommended application of stucco to unit masonry in Florida is the two-coat double back method. Three-coat plaster offers no benefits over two-coat plaster, and may actually hinder the bond between the unit masonry and the plaster scratch coat.

Select applicable paragraph(s). When plaster is installed over metal base, check that: 1) building paper, flashing, accessories, and metal lath are specified in Section 09 22 36; 2) requirements for installation of these materials are specified in Section 09 22 36; 3) location of control joints as shown on drawings.

- E. Install plaster over metal base in accordance with the requirements of ASTM C 926 for the application of cement plaster on metal plaster bases.

****OR****

- F. Install plaster in accordance with the requirements of ASTM C 926 for the application of three-coat cement plaster on solid bases.

****OR****

Delete for interior two-coat plaster applications. Refer to applicable building code and industry guides for recommendations on delay period between scratch and brown coat.

This wording permits the "double-back" application. This suggested method has historically produced a stronger bond between the base and the scratch coat.

- G. Install plaster in accordance with the requirements of ASTM C 926 for the application of two-coat plaster on solid bases.

Consider applicable codes, industry guides, and anticipated climatic conditions to determine moist curing period. Recommended minimum moist curing times generally range from 3 to 5 days.

The party responsible for curing the plaster should be identified in the specification.

- H. For exterior plaster, delay application of brown coat until scratch coat has attained sufficient rigidity to resist cracking or other physical damage when the next coat is applied. Use a long rod or slicker to densify each coat.
- I. Curing: When ambient relative humidity will be below 75% during non-work hours, moist cure the set and hardened base-coat plaster at the end of the workday by spraying a fine mist of water over the entire surface. Repeat application of a fine mist of water morning and evening until plaster has been in place 2 to 3 days (follow ASTM C 926, Section X1.4.2.5). Alternatively, coverage of the base-coat plaster with plastic membrane until application of subsequent coat or finish-coat plaster is permitted.
- J. Finish Coats:
1. Apply plaster finish coats in number of coats and consistency necessary to achieve specified texture.
Enter finish texture desired: [trowel]; [float]; [_____].
 2. Texture finish coat to match accepted sample panel.
- K. Tolerance: Complete plaster work such that the deviation from true plane (exclusive of texture) is no greater than 1/4 in. (6 mm) as measured from line of a 10-ft (3.5-m) straightedge placed at any location on surface.

Delete if not required. The level of inspection may vary depending on project complexity and owner requirements.

3.4 FIELD QUALITY CONTROL

- A. Inspection: The inspection agency will:

Tolerances for solid substrates (concrete, masonry) shall conform to the applicable sections of ACI 117, ACI 530.1, and ASTM C 926. For further information, see Technical Bulletin TB-ST-03-07 "Tolerances" of the Florida Concrete & Products Association.

1. Confirm and document that bases and accessories to receive plaster meet requirements of ASTM C 926, ASTM C 1063 and applicable building codes, prior to application of plaster.
2. Confirm and document that materials used in base-coat and finish-coat plaster meet the requirements of 2.2.
Indicate frequency of inspection (twice per day, daily, first batch mixed, etc.)
3. Confirm and document, _____, that plaster proportioning and mixing procedures are in accordance with 2.4.
Inspect prior to and during plaster application.
4. Confirm and document, _____, that preparation of bases and application of plaster are in accordance with 3.2 and 3.3.

3.5 ADJUSTING AND CLEANING

For information on patching and repairing, refer to ACI 524 Guide to Portland Cement Plastering.

A. Patching:

1. Point-up plaster around trim and other locations where plaster abuts dissimilar materials.
2. Remove defective and damaged plaster by cutting it out.
3. Remove by cutting out stained and discolored finish-coat plaster scheduled to remain natural and unpainted.
4. Replace removed plaster using plaster with same composition and brought to desired texture and color consistent with surrounding area.

B. Cleaning:

1. Remove protective materials masking adjacent surfaces.
2. Remove stains that affect uniformity of plaster finish.
3. Use Cleaning methods approved in advance by the Architect/Engineer.

- C. Color Uniformity: To correct non-uniform color throughout the field of the plaster, fog coat spray entire finish-coat surface. Fog coats shall consist of finish-coat materials, except aggregate, spray applied to entire finish-coat surface on discolored elevations identified by the Architect/Engineer.

END OF SECTION

