



SECTION 04720 CAST STONE COPING

- 1.01 WORK INCLUDED
provide All labor, materials and equipment to provide the Cast Stone Coping shown on architectural drawings and as described in this specification.
- 1.02 REFERENCES
ASTM C 33 - Standard Specification for Concrete Aggregates.
ASTM C 150 - Standard Specification for Portland Cement.
ASTM C 260 - Standard Specification for Air-Entrained Admixtures for Concrete.
ASTM C 270 - Standard Specification for Mortar for Unit Masonry.
ASTM C 494/C 494M - Standard Specification for Chemical Admixtures for Concrete.
ASTM C 979 - Standard Specification for Coloring Pigments for Integrally Pigmented Concrete.
ASTM C 1194 - Standard Test Method for Compressive Strength of Architectural Cast Stone.
ASTM C 1195 - Standard Test Method for Absorption of Architectural Cast Stone.
ASTM C 1364 - Standard Specification for Architectural Cast Stone.
Cast Stone Institute® Technical Manual (Current Edition)

- 1.03 SUBMITTALS
B. Samples: Submit pieces of the Cast Stone that are representative of the general range of finish and color proposed to be furnished for the project.
C. Test results: Submit manufacturers test results of Cast Stone previously made by the manufacturer.
D. Shop Drawings: Submit manufacturers shop drawings including profiles, cross-sections, reinforcement, exposed faces, arrangement of joints , anchoring methods, anchors (if required), annotation of stone types and their location.

- 1.03 QUALITY ASSURANCE
Manufacturer Qualifications:
Manufacturer shall have sufficient plant facilities to produce the shapes, quantities and size of Cast Stone required in accordance with the project schedule.
Manufacturer shall submit a written list of projects similar in scope and at least three (3) years of age, along with owner, architect and contractor references.
Mock-up: Provide full size unit(s) for use in construction of sample wall. The approved mock-up shall become the standard for appearance and workmanship for the project.

PART 2 PRODUCTS

- 2.01 ARCHITECTURAL CAST STONE
A. Physical properties: Provide the following:
Compressive Strength - ASTM C 1194: 6,500 psi (45 Mpa) minimum for products at 28 days.
Absorption - ASTM C 1195: 6% maximum by the cold water method, or 10% maximum by the boiling method for products at 28 days.
3. Air Content - ASTM C173 or C 231, for wet cast product shall be 4-8% for units exposed to freeze-thaw environments. Air entrainment is not required for VDT products.
4. Freeze-thaw - ASTM C 1364: The CPWL shall be less than 5% after 300 cycles of freezing and thawing.
5. Linear Shrinkage - ASTM C 426: Shrinkage shall not exceed 0.065%.

- 2.02 MATERIALS
A. Portland cement - Type I or Type III, white and/or grey, ASTM C 150.
B. Coarse aggregates - Granite, quartz or limestone, ASTM C 33, except for gradation, and are optional for the VDT casting method to match ground face masonry unit.
C. Fine aggregates - Manufactured or natural sands, ASTM C 33, except for gradation.
D. Integral Water Repellent: Provide units made with liquid polymeric, integral water-repellent admixture that does not reduce flexural bond strength for exposed units.
E. Admixtures: Comply with the following:
ASTM C 260 for air-entraining admixtures.
ASTM C 494/C 495M Types A - G for water reducing, retarding, accelerating and high range admixtures.
Other admixtures: integral water repellents and other chemicals, for which no ASTM Standard exists, shall be previously established as suitable for use in concrete by proven field performance or through laboratory testing.
4. ASTM C 618 mineral admixtures of dark and variable colors shall not be used in surfaces intended to be exposed to view.
G. Water - Potable
H. Reinforcing bars:
ASTM A 615/A 615M, Grade 40 steel galvanized.
2. Welded Wire Fabric: ASTM A 185 where applicable for wet cast units.
I. All anchors, dowels and other anchoring devices and shims shall be standard building stone anchors commercially available in a non-corrosive material such as zinc plated, galvanized steel, brass, or stainless steel Type 302 or 304.

- 2.03 COLOR AND FINISH
A. Match approved sample
B. All surfaces intended to be exposed to view shall have a fine-grained texture, with no air voids in excess of 1/32 in. and the density of such voids shall be less than 3 occurrences per any 1 in. and not obvious under direct daylight illumination at a 5 ft distance.
C. Units shall exhibit a texture approximately equal to the approved sample when viewed under direct daylight illumination at a 10 ft distance.
ASTM D 2244 permissible variation in color between units of comparable age subjected to similar weathering exposure.
a. Total color difference - not greater than 6 units.
b. Total hue difference - not greater than 2 units.
D. Minor chipping resulting from shipment and delivery shall not be grounds for rejection. Minor chips shall not be visible under direct daylight illumination from a 20-ft (6 m) distance.
E. Remove cement film, if required, from exposed surfaces prior to packaging for shipment.

- 2.04 REINFORCING
Reinforce the units as required for safe handling and structural stress.
B. Minimum reinforcing shall be 0.25 percent of the cross section area.
C. Reinforcement shall be noncorrosive where faces exposed to weather are covered with less than 1.5 in. of concrete material. All reinforcement shall have minimum coverage of twice the diameter of the bars.
D. Panels greater than 24 in. in one direction shall be reinforced in that direction. Units less than 24 in. in both their length and width dimension shall be non-reinforced unless otherwise specified.
E. Welded wire fabric reinforcing shall not be used in dry cast products.

- 2.05 CURING
Cure units in a warm curing chamber approximately 100°F (37.8°C) at 95 percent relative humidity for approximately 12 hours, or cure in a 95 percent moist environment at a minimum 70°F (21.1°C) for 16 hours after casting. Additional yard curing at 95 percent relative humidity shall be 350 degree-days (i.e. 7 days @ 50°F (10°C) or 5 days @ 70°F (21°C)) prior to shipping. Form cured units shall be protected from moisture evaporation with curing blankets or curing compounds after casting.

- 2.06 MANUFACTURING TOLERANCES
Cross section dimensions shall not deviate by more than ±1/8 in. (3 mm) from approved dimensions.
B. Length of units shall not deviate by more than length/ 360 or ±1/8 in. (3 mm), whichever is greater, not to exceed ±1/4 in. (6 mm).
Maximum length of any unit shall not exceed 15 times the average thickness of such unit unless otherwise agreed by the manufacturer.
C. Warp, bow or twist of units shall not exceed length/ 360 or ±1/8 in. (3 mm), whichever is greater.
D. Location of dowel holes, flashing grooves, false joints and similar features - On formed sides of unit, 1/8 in. (3 mm), on unformed sides of unit, 3/8 in. (9 mm) maximum deviation.

(SECTION 04720 CAST STONE COPING CONTINUED)

- 2.07 PRODUCTION QUALITY CONTROL
A. Testing.
1. Test compressive strength and absorption from specimens selected at random from plant production.
2. Samples shall be taken and tested from every 500 (14 m3) cubic feet of product produced.
3. Perform tests in accordance ASTM C 1194 and C 1195.
4. New and existing mix designs shall be tested for strength and absorption compliance prior to producing units.
- 2.08 DELIVERY, STORAGE AND HANDLING
A. Mark production units with the identification marks as shown on the shop drawings.
B. Package units and protect them from staining or damage during shipping and storage.
C. Provide an itemized list of product to support the bill of lading.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Installing contractor shall check Cast Stone materials for fit and finish prior to installation. Do not set unacceptable units.

3.02 SETTING TOLERANCES

- A. Comply with Cast Stone Institute® Technical Manual.
B. Set stones 1/8 in. (3 mm) or less, within the plane of adjacent units.
C. Joints, plus - 1/16 in. (1.5 mm), minus - 1/8 in. (3 mm).

3.03 JOINTING

- A. Joint size: 3/8 in.
B. Joint materials:
1. Mortar, Type N, ASTM C 270, Color to match Architect's sample.
2. Use a full bed of mortar at all bed joints.
3. Flush vertical joints full with mortar.
4. Leave head joints in copings and projecting components open for sealant.
C. Location of joints:
1. As shown on shop drawings.
2. At control and expansion joints unless otherwise shown.

3.04 SETTING

- A. Drench units with clean water prior to setting.
B. Fill dowel holes and anchor slots completely with mortar or non-shrink grout.
C. Set units in full bed of mortar, unless otherwise detailed.
D. Rake mortar joints 3/4 in. (18 mm) in, for pointing.
E. Remove excess mortar from unit faces immediately after setting.
F. Tuck point unit joints to a slight concave profile.

3.05 JOINT PROTECTION

- A. Comply with requirements of Section 07900.
B. Prime ends of units, insert properly sized backing rod and install required sealant.

3.06 REPAIR AND CLEANING

- A. Repair chips with touchup materials furnished by manufacturer.
B. Saturate units to be cleaned prior to applying an approved masonry cleaner.
C. Consult with manufacturer for appropriate cleaners

3.07 INSPECTION AND ACCEPTANCE

- A. Inspect finished installation according to Bulletin #36, Cast Stone Institute.
B. Do not field apply water repellent until repair, cleaning, inspection and acceptance is completed.

END OF SECTION

SECTION 09900 PAINTING

- 1.01 WORK INCLUDED
A. Provide painting and finishing work throughout interior and exterior of Project as indicated on the drawings.
B. Examine Contract Documents to determine full extent of painting and finishing work required.
C. Preparatory work of surfaces to receive paint shall be included as work of this Section.

1.02 SUBMITTALS

- A. Manufacturers Product data.
B. A minimum of 15 days prior to initiating this work, submit to Architect Manufacturer's full range of standard color chips (colors selected by Architect may not necessarily be manufacturer's standard colors).

1.03 QUALITY ASSURANCE

1. Preparation and Workmanship: Comply with requirements in "MPI Architectural Painting Specification Manual" for products and paint systems indicated.
B. Source: Provide primers and undercoat paint produced by same manufacturer of finish coats for each substrate.

1.04 MAINTENANCE PAINT

- A. Furnish Owner with additional three-percent (3%), but not less than one (1) quart of each material and color applied.

1.05 SPECIAL PROTECTION

- A. Use all means necessary to protect paint materials before, during and after application and to protect the installed work and materials of all other trades.

2.01 PAINT, MATERIALS

- A. Colors: Sherwin Williams - #SW6258 (Tricorn Black).

2.02 MANUFACTURERS

1. PPG Industries, Inc. (Pittsburgh Paints) .. (412)434-3131) ...www.ppg.com.
2. Benjamin Moore & Co. (Benjamin Moore) (888)236-6667 www.benjaminmoore.com
3. Sherwin Williams Co. (Sherwin-Williams) (216) 566-000 www.sherwinwilliams.com
A. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated.

3.01 PRIMING

- A. Shop primed surfaces need not receive a field prime coat, except for touch-up where necessary. Feather out edges to make touch-up paint inconspicuous.
B. Remove all rust, scale and loose shop paint from metal work by wire brushing or sanding and prime base metal before proceeding with finish coats.
C. Spot prime all exposed screw heads, nails and other metals which are to be painted with emulsion paints, using a primer recommended by the manufacturer of the paint system.

3.02 APPLICATION

- A. Apply paint evenly, under adequate illumination, free from sags, runs, holidays, crawls and other defects.
B. Apply each coat of paint at proper consistency as received from container and brush out well to show a minimum of brush marks.
C. Do not exceed average rate of coverage recommended by paint manufacturer. Minimum dry film thickness per coat shall not be less than that recommended by manufacturer.
D. Refinish a whole wall where a portion of finish has been damaged or is unsatisfactory, due to work of this Section. Do not spot refinish.
E. Minimum drying time shall not be less than that recommended by paint manufacturer..
H. Finished work shall be uniform as to sheen, gloss, color and texture.
I. Keep sprinkler heads free of paint. Replace paint spattered or coated sprinkler heads.

3.03 SPECIAL CLEANING

- A. Clean off any paint spotting or blemishes from work not intended to receive painting treatment and leave work in original condition.Entirely reinstaate, at this Section's own expense, any surface not to be painted, but soiled and attributable to this Section due to spillage, mixing of material or any other cause



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COMPLETE AND OPERATIONAL
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