

SECTION 047200 - CAST STONE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Architectural cast stone.

1.3 RELATED SECTIONS

- A. Section 042000 - Unit Masonry Assemblies.
- B. Section 079200 - Joint Sealants.

1.4 DEFINITIONS

- A. Cast Stone: An architectural masonry unit manufactured to copy fine grain texture and color of natural cut stone.
- B. Dry Cast Concrete Products: Manufactured from zero-slump concrete.
- C. Machine Casting Method: Vibratory compaction by machine of earth-moist, zero-slump concrete against rigid mold until it is densely compacted.
- D. Vibrant Dry Hand Tamp Casting Method: Vibratory compaction by hand tamp of earth-moist, zero-slump concrete against rigid mold until it is densely compacted.

1.5 SUBMITTALS

- A. Comply with Section 013300 - Submittal Procedures.
- B. Product Data: Submit manufacturer's product data.
- C. Shop Drawings: Submit manufacturer's shop drawings, including profiles, cross sections, modular unit lengths, reinforcement if required, exposed faces, anchors and anchoring method recommendations if required, and annotation of cast stone types and location.
- D. Samples: Submit pieces of manufacturer's cast stone units that represent general range of texture and color proposed to be furnished for project.

E. Test Results:

1. Submit manufacturer's test results from cast stone units previously made by manufacturer using materials from same sources proposed for use in project.
2. Submit manufacturer's test results from plant production testing.

F. Manufacturer's Project References: Submit list of projects similar in scope, including project name and location, name of architect, and type and quantity of cast stone units installed.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications:

1. Sufficient plant facilities to provide quality, shapes, quantities, and sizes of cast stone units required without delaying progress of the Work.
2. Minimum of 10 years experience in producing masonry units or cast stone.

B. Manufacturer Qualifications: Manufacturer is a producing member of the Cast Stone Institute, or has on file and follows a written quality-control plan that includes all elements of the Cast Stone Institute's "Quality Control Procedures Required for Plant Inspection."

C. Mock-Ups: Provide full-size cast stone units for use in construction of mock-ups. Approved mock-ups shall become the standard for appearance and workmanship for project.

1. Mock-ups shall remain as part of the completed Work.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Delivery:

1. Deliver cast stone units secured to shipping pallets and protected from damage and discoloration.
2. Provide itemized shipping list.
3. Number each piece individually, as required, to match shop drawings and schedules.

B. Storage:

1. Store cast stone units and installation materials in accordance with manufacturer's instructions.
2. Store cast stone units on pallets with nonstaining, waterproof covers.
3. Do not double stack pallets.
4. Ventilate units under covers to prevent condensation.
5. Prevent contact with dirt and splashing.

C. Handling:

1. Protect cast stone units, including corners and edges, during storage, handling, and installation to prevent chipping, cracking, staining, or other damage.
2. Handle long units at center and both ends simultaneously to prevent cracking.

1.8 SCHEDULING

- A. Schedule and coordinate production and delivery of cast stone units with unit masonry work.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Basis of Design: Arriscraft International; Cleft Series. Other acceptable manufacturers are:
 1. RockCast, Division of Reading Rock, Inc.; Architectural Series
 2. Continental Caststone
 3. Kerkhoff
 4. Custom Cast Stone

2.2 ARCHITECTURAL UNITS

- A. Compliance: ASTM C 90.
- B. Provide cast stone units complying with ASTM C 1364 using either the vibrant dry tamp or wet-cast method.
 1. Provide units that are resistant to freezing and thawing as determined by laboratory testing according to ASTM C 666/C 666M, Procedure A, as modified by ASTM C 1364.
- C. Casting Method: Machine.
- D. Texture: Smooth
- E. Color: As selected by Architect from manufacturer's standard colors.
- F. Units: As indicated on the drawings.
- G. Test Results:
 1. Compressive Strength, ASTM C 140: Greater than 5,000 psi at 28 days.
 2. Absorption, ASTM C 140: Less than 5.0 percent at 28 days.
 3. Linear Shrinkage, ASTM C 426: Less than 0.065 percent.
 4. Density, ASTM C 140: Greater than 120 pounds per cubic foot.

5. Freeze-Thaw, ASTM C 666: Less than 4.0 percent.

- H. Curing: Cure in enclosed chamber at 95 percent relative humidity and 95 to 120 degrees F for 12 to 18 hours or yard cure for 350 degree-days.
- I. Special shapes: Provide Double Slope Coping with radius, Raised Square, Recessed square, Peaked Pier Caps, Spheres, Bullnose and Corner Units.

2.3 TEXTURE AND COLOR

- A. General: Match color of Arisscraft, Wheat.
- B. Texture of Surfaces Exposed to View:
 1. Fine-grained texture similar to natural stone.
 2. Approximately equal to approved sample when viewed in direct daylight at 10 feet.
- C. Surface Voids:
 1. Size: Maximum 1/32 inch.
 2. Density: Less than 3 occurrences per any 1 square inch.
 3. Viewing Conditions: Not obvious under direct daylight at 10 feet.
- D. Minor Chipping:
 1. Minor chips shall not be obvious under direct daylight at 20 feet, as determined by Architect.
- E. Color Variation:
 1. Viewing Conditions: Compare in direct daylight at 10 feet, between cast stone units of similar age, subjected to similar weathering conditions.

2.4 MORTAR

- A. Mortar: As specified in Section 042000.

2.5 ACCESSORIES

- A. Anchors: Non-corrosive type, sized for conditions. Type 304 stainless steel.
- B. Sealant: As specified in Section 079200.
- C. Cleaner: Prosoco Sure Klean Custom Masonry Cleaner, Prosoco Sure Klean 600 Detergent, or Prosoco Sure Klean Vana Trol. Other acceptable manufacturers are:
 1. Addiment
 2. Chargar Corporation

2.6 FABRICATION

- A. Shapes: Unless otherwise indicated on drawings, provide:
 - 1. Suitable wash on exterior sills, copings, projecting courses, and units with exposed top surfaces.
 - 2. Drips on projecting units, wherever possible.
- B. Reinforcement: As required to withstand handling stresses.

2.7 TOLERANCES

- A. General: Manufacture cast stone units within tolerances in accordance with Cast Stone Institute Technical Manual, unless otherwise specified.
- B. Cross Section Dimensions: Do not deviate by more than plus or minus 1/8 inch from approved dimensions.
- C. Length of Units: Do not deviate by more than length/360 or plus or minus 1/8 inch, whichever is greater, not to exceed plus or minus 1/4 inch.
- D. Warp, Bow, or Twist: Do not exceed length/360 or plus or minus 1/8 inch, whichever is greater.

2.8 PRODUCTION QUALITY CONTROL

- A. Mix Designs: Test new and existing mix designs for compressive strength and absorption before manufacturing cast stone units.
- B. Plant Production Testing: Test compressive strength and absorption from specimens selected at random from plant production. Obtain samples every 500 cubic feet of product produced.
 - 1. Architectural Units: Test in accordance with ASTM C 140.
 - 2. Custom Cast Stone Units: Test in accordance with ASTM C 1194 and C 1195.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine construction to receive cast stone units. Notify Architect if construction is not acceptable. Do not begin installation until unacceptable conditions have been corrected.
- B. Examine cast stone units before installation. Do not install unacceptable units.

3.2 INSTALLATION

- A. Install cast stone units in conjunction with masonry, as specified in Section 048300.
- B. Pull units from multiple cubes during installation to minimize variation in color.
- C. Cut units using motor driven masonry saws.
- D. Do not use pry bars or other equipment in a manner that could damage cast stone units.
- E. Fill dowel holes and anchor slots completely with mortar or nonshrink grout.
- F. Set cast stone units in full bed of mortar, unless otherwise indicated on the drawings.
- G. Fill vertical joints with mortar.
- H. Make joints 3/8 inch, unless otherwise indicated on the drawings.
- I. Leave head joints in copings and similar units open for sealant.
- J. Rake mortar joints 3/4 inch for pointing.
- K. Tuck point mortar joints to slight concave profile.
- L. Remove excess mortar immediately.
- M. Remove mortar fins and smears before tooling joints.
- N. Sealant Joints:
 - 1. As specified in Section 079200.
 - 2. Prime ends of cast stone units, insert properly sized backing rod, and install sealant.
 - 3. Provide sealant joints at following locations:
 - a. Cast stone units with exposed tops.
 - b. Joints at relieving angles.
 - c. Control and expansion joints.
 - d. As indicated on the drawings.

3.3 TOLERANCES

- A. Installation Tolerances: Comply with Cast Stone Institute Technical Manual.
 - 1. Variation from Plumb: Do not exceed 1/8 inch in 5 feet or 1/4 inch in 20 feet or more.
 - 2. Variation from Level: Do not exceed 1/8 inch in 5 feet, 1/4 inch in 20 feet, or 3/8 inch maximum.
 - 3. Variation in Joint Width: Do not vary joint thickness more than 1/8 inch or 1/4 of nominal joint width, whichever is greater.
 - 4. Variation in Plane Between Adjacent Surfaces: Do not exceed 1/8-inch difference between planes of adjacent units or adjacent surfaces indicated to be flush with units.

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3.4 CLEANING

- A. Clean exposed units after mortar is thoroughly set and cured.
- B. Wet surfaces before applying cleaner.
- C. Apply cleaner to cast stone units in accordance with cleaner manufacturer's instructions.
- D. Perform test of cleaner on small area and receive approval by Architect before full cleaning.
- E. Do not use the following to clean cast stone units:
 - 1. Muriatic acid.
 - 2. Power washing.
 - 3. Sandblasting.
 - 4. Harsh cleaning materials or methods that would damage or discolor surfaces.

3.5 REPAIR

- A. Repair chips and other surface damage noticeable when viewed in direct daylight at 20 feet.
- B. Repair with touchup materials provided by manufacturer in accordance with manufacturer's instructions.
- C. Repair methods and results to be approved by Architect.

3.6 INSPECTION AND ACCEPTANCE

- A. Inspect completed installation in accordance with Cast Stone Institute Technical Manual.

3.7 PROTECTION

- A. Protect installed cast stone from splashing, stains, mortar, and other damage.

END OF SECTION 047200

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