



SECTION 04720

CAST STONE

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PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Interior architectural cast stone.
- B. Exterior architectural cast stone.

1.2 RELATED SECTIONS

- A. Section 06100 – Rough Carpentry.
- B. Section 07620 - Sheet Metal Flashing and Trim.
- C. Section 07900 - Joint Sealers.

1.3 TERMINOLOGY

- A. Attachment Adhesive: Portland cement based synthetic adhesive used to bond the cast stone to the substrate.
- B. Tuscan Grout: Mortar-like synthetic grout used in joints between ends of cast stone pieces. Manufactured by Tuscan StoneWorx.
- C. Substrate: The surface to which the cast stone is attached.
- D. Tuscan Cast Stone: Individual pieces of factory-fabricated, limestone cast architectural stone.
- E. Cold Stone: Individual pieces of factory-fabricated, recycled content cast architectural stone with granite appearance.

1.4 REFERENCES

- A. ASTM International (ASTM):
 1. ASTM B 117 - Standard Practice for Operating Salt Spray (Fog) Apparatus.
 2. ASTM C 39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
 3. ASTM C 297 - Standard Test Method for Flatwise Tensile Strength of Sandwich Constructions.
 4. ASTM C 1185 - Standard Test Methods for Sampling and Testing Non-Asbestos Fiber- Cement Flat Sheet, Roofing and Siding Shingles, and Clapboards.
 5. ASTM C 1186 - Standard Specification for Flat Fiber-Cement Sheets.
 6. ASTM D 2247 - Standard Practice for Testing Water Resistance of Coatings in 100 Percent Relative Humidity.

7. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
 8. ASTM G 155 - Standard Practice for Operating-Xenon Arc Light Apparatus for Exposure of Nonmetallic Materials.
- B. International Code Council (ICC): ICC-ES AC 219 - Acceptance Criteria for Exterior Insulation and Finish Systems.
- C. Gypsum Association GA-253: Recommended Specifications for the Application of Gypsum Sheathing.
- D. Gypsum Association GA-254 - Fire Resistant Gypsum Sheathing.

1.5 PERFORMANCE REQUIREMENTS

- A. Cast Stone: Products shall meet the following performance characteristics:
1. Accelerated Weathering: ASTM G 155, passed, 2,000 hours; no deleterious effects, no cracking, checking, crazing, erosion, rusting, blistering, peeling or delaminating.
 2. Freeze/Thaw Resistance: ICC AC 219, passed, 10 cycles; no deleterious effects, no cracking, checking, crazing, erosion, rusting, blistering, peeling or delaminating.
 3. Water Absorption: ASTM C 1185, < 4%, passed; no deleterious effects, no cracking, checking, crazing, erosion, rusting, blistering, peeling or delaminating.
 4. Tensile Adhesion: ASTM C 297, 25 PSI, Minimum 15 PSI.
 5. Water Resistance: ASTM D 2247, passed, passed 14 days; no deleterious effects, no cracking, checking, crazing, erosion, rusting, blistering, peeling or delaminating.
 6. Salt Spray: ASTM B 117, no deleterious effect, passed at 300 hours; no deleterious effects, no cracking, checking, crazing, erosion, rusting, blistering, peeling or delaminating.
 7. Surface Burning Characteristics: ASTM E 84, 0 Flame Spread/ 0 Smoke Develop, passed.
 8. Compressive Strength: ASTM C 39, < 7,000 PSI, passed.
 9. Flexural Strength: ASTM C 1185/1186, <1,560 PSI, passed.

1.6 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations.
 2. Storage and handling requirements and recommendations.
 3. Installation methods.
 4. Cleaning and maintenance instructions.
- C. Shop Drawings: Provide detailed dimensioned elevations of each unit. Shop drawings shall include the following:
1. Preparation instructions and recommendations.
 2. Storage and handling requirements and recommendations.
- D. Verification Samples: For each finish product specified, two hand-size samples of colors, textures and shapes to be used on the project.
- E. Warranty: Copy of manufacturer's standard warranty.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Cast stone manufacturer shall have a formal, written internal quality control program in effect when producing the cast stone.
- B. Installer Qualifications:
 - 1. Installer experienced to perform work of this section when specialized in the installation of work similar to that required for this project.
 - 2. Submit reference list of completed projects.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver all materials in their original sealed containers bearing manufacturer's name and identification of product.
- B. Protect liquid materials from freezing temperatures and temperatures in excess of 90 degrees F (32 degrees C). Store covered, out of direct sunlight.
- C. Protect Portland cement and other dry powder type materials from moisture and humidity. Store under cover and off the ground in a dry location.

1.9 PROJECT CONDITIONS

- A. Maintain ambient and surface temperatures above 40 degrees F (4 degrees C) during application and drying period, minimum 24 hours after application of cast stone.
- B. For outdoor application, provide temporary protection as needed from precipitation, wind, airborne dust and debris, etc.
- C. Provide supplementary heat for installation in temperatures less than 40 degrees F (4 degrees C).
- D. Provide protection of surrounding areas and adjacent surfaces from application of cast stone materials.

1.10 COORDINATION/SCHEDULING

- A. The work in this section requires close coordination with related specifications sections and trades. Sequence work to provide protection of construction materials from weather deterioration.
- B. Coordinate installation of cast stone with related wall elements, including, windows, doors, louvers, ducts, signage, flashings, sealants, weather resistive barrier, sealant tapes and membranes, supporting wall framing and sheathing, surface mounted objects, etc.
 - 1. Coordinate with grade such that cast stone terminates above finished grade.
 - 2. Coordinate with installation of flashing, coping and sealants to ensure that materials are installed immediately after attachment adhesive is dry.
 - 3. Coordinate with installation of surface-mounted objects to ensure that watertight seal is provided.

1.11 WARRANTY

- A. Manufacturer's Warranty: Upon completion of installation of cast stone, provide manufacturer's standard written limited materials warranty.
- B. Contractor's Warranty: Upon completion of installation of cast stone, provide Contractor's standard written labor warranty, two years.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Tuscan StoneWorx Certified Caster, list available from Tuscan StoneWorx; 165 N. 1330 W, Suite C-4, Orem, UT 84057. ASD. Toll Free Tel: (888) 368-9494. Fax: (801) 734-6959. Email: info@tuscanstoneworx.com. Web: <http://www.tuscanstoneworx.com>.
- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 CAST STONE

- A. Cast stone shall be factory pre-fabricated limestone-based cast architectural stone pieces in various lengths, profiles, colors and surface finishes, and composed of minerals, cement, resin, reinforcing fibers and admixtures.
- B. Cast stone shall be a minimum of a 1/2 inch (13 mm) of Tuscan Cast Stone Mix material over a 1# EPS foam core.
- C. At fireplace surrounds, material thickness minimum 1 inch (25 mm) of Tuscan Cast Stone Mix material over a 1# EPS foam core.
- D. Cast stone shall be cast as individual pieces in individual, non reusable foam molds created using a computer-controlled mold making process and/or rubber, fiberglass or wood manufactured molds.
- E. Color of the cast stone shall be integral with the stone mixture or matrix.
- F. Exposed surface of the cast stone shall be finished to match the approved sample.
- G. Provide the following standard cast stone profiles:
 - 1. _____.
 - 2. As indicated on the Drawings.
- H. Provide additional pieces of cast stone in the following quantities, colors and profiles to the Owner for maintenance and repair use.
 - 1. Profile: _____; quantity _____; color _____.
- I. Accessory Materials:
 - 1. Grouting Materials: Tuscan Grout, ready-to use textured caulk with integral color.
 - 2. Adhesive: Dryvit Systems, Inc. Primus Adhesive or equivalent.
 - 3. Surface Sealer: Tuscan Sealer.
 - 4. Sealant Backer Rod: As recommended by manufacturer.

- J. Water: Clean, clear and potable.
- K. Portland Cement: Type I in conformance with ASTM C 150, fresh and free of lumps.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If rough opening preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 SUBSTRATE INSPECTION

- A. Verify substrate is suitable in accordance with manufacturer's recommendations. Check dimensions of substrate surfaces (length, width, height, radiuses, angles) and openings to insure that supporting wall surface, as built, will accept the pieces as manufactured.
- B. Inspect pieces as delivered to insure that all the profiles, length, colors and finishes that are needed to install all the pieces are on hand.
- C. Inspect Surfaces For the Following:
 - 1. Contamination including algae, chalkiness, dirt, dust, efflorescence, form oil, fungus, grease, laitance, mildew or other foreign substances.
 - 2. Surface absorption and chalkiness.
 - 3. Cracks; measure crack width and record location of cracks.
 - 4. Damage and deterioration.
 - 5. Moisture content and moisture damage. Use a moisture meter to determine if the surface is dry enough to receive the pieces and record any areas of moisture damage.
 - 6. Compliance with specification tolerances. Record areas that are out of tolerance, greater than 1/4 inch in 8 feet (6mm in 2438 mm) deviation in plane.
- D. Inspect sheathing application for compliance with manufacturer's recommendations.
- E. Report deviations from the requirements of project specifications or other conditions that might adversely affect the installation to the Contractor. Do not start work until deviations are corrected.

3.3 SUBSTRATE PREPARATION

- A. Repair damaged or cracked surfaces.
- B. Level surfaces to comply with required tolerances in this specification.
- C. Remove surface contaminants on concrete and concrete masonry surfaces, such a form release oils, dust, paint, waterproofing, and similar items.
- D. Apply conditioner to substrate by sprayer or roller to chalking or excessively absorptive surfaces.

3.4 CAST STONE INSTALLATION

- A. General: Install in accordance with manufacturer's recommendations.

1. Install one piece at a time, next to the most recently installed piece.
 2. If multiple courses are to be installed, work from the bottom up.
 3. Comply with the drawings and manufacturer's drawings for location of pieces and joints.
 4. Do not add any other materials to the adhesive mixture other than those listed below. Prohibited additional materials include rapid binders, anti-freeze, resins, pigments, sand, lime, aggregates, minerals, extenders, nor more than 1 cup total of water.
 5. Compare the dimensions of each piece to be installed in a specific location to see if it will fit, prior to applying the adhesive and attaching the piece to the substrate.
 6. If the piece is too long, or if a precision fit is required (no Tuscan Grout joints) trim the piece using a masonry or diamond saw, or by diamond grinding.
- B. Preparation of Attachment Adhesive:
1. Mix only enough attachment adhesive at one time that can be used for the size of the wall area being built, and before the adhesive starts to set.
 2. Follow approved adhesive manufacturer's preparation instructions on the packaging and the manufacturer's written paper instructions.
- C. Application of Adhesive:
1. Using a stainless steel or plastic trowel, apply prepared adhesive only to area on the back side (that will be adhered to the substrate) of the piece.
 2. Apply the adhesive in a 1/4 inch (6 mm) thick layer to cover approximately the middle 2/3 of the back side.
 3. Do not apply adhesive all the way to the edge of the back side.
 4. Do not apply adhesive to the end (Tuscan Grout) areas of the piece.
- D. Attachment to Substrate:
1. Install piece (with adhesive applied) to the substrate.
 2. Press the piece against the substrate, press firm to achieve full contact of adhesive with substrate.
 3. Align pieces in the same plane as the visible outside surfaces of adjacent pieces.
 4. Use positive means, such as spacers, to maintain consistent Tuscan Grout joint width spacing.
- E. Temporary Support for Pieces:
1. Using positive means such as screws, nails, wires, straps, tapes, ties or props, support the piece so as to maintain adhesion and correct position while the adhesive is curing. Do not run fasteners through the pieces.
- F. Curing of Attachment Adhesive:
1. Maintain temperature above 40 degrees F for at least overnight as the adhesive sets.
 2. Protect the pieces from physical damage and precipitation during curing period.
- G. Grouting Between Pieces:
1. Place strippable painters masking tape continuously on either side of joint at the edge of the piece.
 2. Using specified Tuscan Grout color and caulking gun, apply the Tuscan Grout material into the joint. Use backer rod to avoid unnecessary high-volume use of Tuscan Grout material.
 3. Tool joints convex, forcing the Tuscan Grout into the joint and against the edge of the pieces, and make the Tuscan Grout slightly convex and flush with the outside face of the piece.
 4. Remove masking tape immediately after the Tuscan Grout has been tooled.
- H. Applying Sealer:

1. Avoid application in direct sunlight.
2. Apply Tuscan Interior/Exterior Flat Sealer in a continuous application, and work to an architectural break in the wall, such as a corner, a projection or a joint.
 - a. Brush: Preparation and application of sealer using brush.
 - b. Spraying: Preparation and application of sealer by spraying.
 - c. Sponge: Preparation and application of sealer using a sponge.

3.5 PROTECTION AND CLEANING

- A. Protection:
 1. Protect installed materials from water impinging on the visible surface, Tuscan Grout, sealants joints, and from behind.
 2. Protect installed materials from dust, dirt, precipitation, freezing, damage, spilled materials, and continuous high humidity until they are fully dry.
- B. Cleanup and Job Close-Out:
 1. Remove temporary supports, if employed, once adhesive and Tuscan Grout has set.
 2. Remove left over materials from work area and dispose of properly.
 3. Refurbish any adjacent areas adversely affected by this work.
 4. Furnish Owner with extra pieces for future maintenance, if any, as specified herein.
- C. Cleaning and Maintenance: Comply with the following recommendations and guidelines.
 1. Avoid impacts. Care should be taken to protect pieces from impact as it can be chipped, especially at corners and edges.
 2. Avoid the Use of Salt and Other Deicers:
 - a. In winter, use of any deicing compound, even if it is not chemically reactive with cast stone, can cause spalling and pop-outs by subjecting the pieces to the deleterious effects of naturally occurring freeze-thaw cycles.
 - b. New cast stone, less than one-year old, is especially susceptible to salt and deicer type of damage and may be affected with just one application. If salt or other ice melting chemicals must be used, apply Tuscan Sealer for protecting cast stone from the effects of salt and other deicers. Tuscan Sealer may prevent or significantly reduce the amount of damage that occurs from the use of deicers. When shoveling, sweeping, plowing, or snow-blowing deicer contaminated snow, efforts should be made not to throw the contaminated snow so that it lands on or against any cast stone (such as wall caps or trim) as this could lead to spalling of those items.
 - c. Since the effectiveness of most sealers will wear off over time, they may need to be reapplied periodically.
 3. Protect Cast Stone from Extreme Heat: Do not expose extreme heat to pieces. Do not use torches to melt ice. Do not weld against pieces.
 4. Cleaning Cast Stone Surfaces: Minimize abrading of the finish to promote the long-standing appearance, consistency, and integrity of the cast stone.
 - a. Primary recommended cleaning method (least abrasive), lightly scrub with a soft bristle fiber brush, using a mild detergent and water followed by a thorough rinse with clean running water.
 - b. Alternative cleaning methods (progressively more abrasive), use of a bucket of water with mild detergent and soft bristle brush.
 - c. Before cleaning, thoroughly drench all surrounding masonry and concrete surfaces to prevent the dirty wash-down water from being absorbed into it. When cleaning has been completed, wash down entire work area to ensure no residual dirty or contaminated rinse water remains. No acids or prepared cleaners shall be used without the approval of Tuscan StoneWorx.

END OF SECTION

