

SECTION 042130 - "CASTCOTTA"

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: "CastCotta"; cast architectural polymer-modified cement-based units manufactured to simulate the following:
 - 1. Natural cut stone.
 - 2. Terra cotta.
 - 3. Cast iron.
 - 4. Cast stone.
 - 5. Façade ornamentation.

1.2 ALLOWANCES

- A. Remove and replace terra cotta as part of terra cotta removal and replacement allowance.

1.3 UNIT PRICES

- A. Work of this Section is affected by unit prices specified in Division 01 Section "Unit Prices."
 - 1. Unit prices apply to authorized work covered by **[quantity allowances]** **[estimated quantities]**.
 - 2. Unit prices apply to additions to and deletions from Work as authorized by Change Orders.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include recommendations for application and use. Include test data substantiating that products comply with requirements.
- B. Shop Drawings: For masonry units from manufacturer:
 - 1. Drawings showing profiles and dimensions of each distinct "CastCotta" unit.
 - 2. Do not fabricate until shop drawings are approved by contractor.
- C. Shop Drawings: From contractor:
 - 1. Locations of anchors and dimensions of holes and recesses in units required for anchors designed and sealed by a licensed structural engineer.

2. Setting number of each new "CastCotta" unit and its location on the structure in annotated plans and elevations.
3. Provisions for expansion joints, mortar joints or sealant joints.
4. Provisions for flashing, lighting fixtures, conduits, and weep holes as required.
5. Replacement and repair anchors. Include details of anchors within individual units, with locations of anchors and dimensions of holes and recesses in units required for anchors.

D. Samples for Verification: For the following:

1. Each type of "CastCotta" unit to be used for replacing existing units. Include sets of Samples as necessary to show the full range of shape, color, and texture to be expected.
 - a. Patterns for "CastCotta": Before manufacturing "CastCotta" units, submit the actual patterns from which molds will be made for casting new units. Package and ship to prevent loss or damage or make patterns available for inspection by Architect at fabrication plant.
 - b. For "CastCotta," provide one of each shape, color, and texture of unit, suitable and ready for installation. [**Make this submittal after acceptance of patterns for "CastCotta."**]
2. Sealant Materials: Refer to Division 07 Section "Joint Sealants."
3. Mortar: Provide triplicate cured samples of custom-matched Edison Coatings Spec Joint 46 produced with ICE -9 RL admixture, measuring 3/8"w x 4" L and labeled with factory color and sample batch numbers.
4. Accessories: Each type of anchor, accessory, and miscellaneous support.

1.5 QUALITY ASSURANCE

- A. Mockups: Prepare mockups of "CastCotta" installation to demonstrate aesthetic effects and set quality standards for materials and execution and for fabrication and installation.
1. Replacement Units: Prepare sample areas not smaller than 48 inches (1200 mm) in least dimension. Erect sample areas in existing walls unless otherwise indicated, to demonstrate quality of materials, workmanship, and blending with existing work. Include a minimum of four "CastCotta" units.
 - a. If sealant joints are required for project, include at least one sealant-filled joint in mockup.
 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- B. Preinstallation Conference: Conduct conference at [Project site] <Insert location>.

1. Review methods and procedures related to "CastCotta" installation including, but not limited to, the following:
 - a. Construction schedule. Verify availability of materials, personnel, equipment, and facilities needed to make progress and avoid delays.
 - b. Materials, material application, sequencing, tolerances, and required clearances.
 - c. **<Insert agenda items>**.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver "CastCotta" to project site in undamaged condition. "CastCotta" components should be secured within shipping pallets. Store in an enclosed location or off the ground with ventilated waterproof covering as needed to protect all materials from moisture, contaminants, corrosion, deleterious temperature changes, and other harmful conditions.
- B. Deliver "CastCotta" with the mold name on unexposed face, corresponding to shop drawings, using non-staining marker.
- C. Store units in their original shipping crates with ventilated waterproof cover or stacked vertically for water to shed off the coated surfaces and dry. Do not stack units directly on top of one another.
- D. Eliminate ponding of water on and around units. Prolonged contact with wet materials during storage should be prohibited.
- E. Protect corners from damage without affecting coated surfaces.
- F. Provide methods of handling to eliminate gouging of coated surfaces. Contact with the coated surface should be minimized in all instances. Prevent any abrasion of coating surface during storage and handling.
- G. Prevent contact with dirt or substances that could hold moisture against the coating for prolonged periods.
- H. Any minor damages to the coating may be repairable using the custom color matched coating used on the "CastCotta" units. Request additional coatings from Edison Coatings, Plainville, CT.
- I. Inspect the CastCotta units immediately upon arrival and reject any damaged items in writing to the manufacturer.

1.7 PROJECT CONDITIONS

- A. Weather Limitations: Cold weather construction provisions shall be implemented when either the ambient temperature falls below 40°F or the temperature of masonry units is below 40°F.

- B. Salt or other chemicals for lowering the freezing temperature of the mortar shall not be used.
- C. Hot weather construction provisions shall be implemented when temperatures exceed 100° or 90°F with a wind velocity greater than 8 mph.

PART 2 - PRODUCTS

2.1 CASTCOTTA MASONRY MATERIALS

- A. Manufacturer: CastCotta produced by Works In Stone, Inc., 1643 Bridgeton Hill Road Bldg. 6, Upper Black Eddy, PA 18972; Phone: 215-589-9097; Email: Estimating@worksinstone.com utilizing Custom System 45 Type CC , Aquathane UA210, AquaSpex 220 and/or Sil-Quathane 222, manufactured by Edison Coatings, Inc., 3 Northwest Drive, Plainville, CT 06062; Contact: Patrick J. Morrissey, ConSpec Associates, 203-467-4426.

- 1. Provide new "CastCotta" units to match existing deteriorated terra cotta units in physical properties, colors, color variation within units, surface texture, unit profile, and dimensions.

- a. Cast Unit Physical Properties:

- 1) ASTM C67: Modulus of Rupture (flexure test): 1,195 PSI average
- 2) ASTM C67: Compressive Strength: 6,000 psi average with minimum individual unit strength of 3500 psi.
- 3) ASTM C67: Absorption: 24-hour submersion 3% max.
- 4) ASTM C67: Absorption: 5-hour boil 5% max.
- 5) ASTM C67: Freeze / Thaw: 300 Cycles passed (no degradation)
- 6) Coefficient of Linear Expansion: Approx. 4×10^{-6} inch per inch per degree F.

- b. Glaze Coating Properties:

- 1) Chemical Resistance: Unaffected by water (7 days), salt water (7 days), proprietary nonionic cleaning solution (2 hours - Edison Coatings E-Wash 30); Softens/recovers Isopropyl alcohol (1 hour); per ASTM D1308
- 2) Crazing and Cracking Resistance: Min. 100% elongation, min, 500 psi tensile strength, per ASTM D2370.
- 3) Bond Strength: Minimum 150 psi pull-off adhesion, per ASTM D4541.
- 4) Color Stability: dE <2.0, 1000 hours per ASTM G154

2.2 MORTAR MATERIALS

- A. Prepackaged mortar shall be SPEC-JOINT 46 Type S (**ALT: Type N**) as manufactured by Edison Coatings, Inc., Plainville, CT (860) 747-2220. Mortar shall be custom-matched to original mortar unless otherwise specified, including matrix color, aggregate grading and color, and design mix proportions.
1. Portland cement: ASTM C150 Type I, grey or white as required to match original mortar. Fly ash, slag and pozzolans are not permitted as substitutes for Portland cement.
 2. Hydrated Lime: ASTM C207 Type S, incorporated as a finely divided powder in uniform particle size, free of lumps, flakes or other inconsistencies.
 3. Mortar Aggregate: ASTM C144 Natural sand blend, rounded to sub-angular in shape, washed, screened and dried. Aggregate to be selected to match the color and texture of the original mortar aggregates as closely as possible while remaining in compliance with ASTM C144 grading and soundness requirements.
 4. Mortar Colors: Inorganic mineral oxides meeting the requirements of ASTM C797, at levels not to exceed 10% on cement weight, except for carbon black, which may not exceed 2% on cement weight.
 5. Admixtures: NO admixtures shall be used without the express written consent of the Architect and the mortar manufacturer. Calcium chloride is not permitted.
 6. Water: No water is to be used. All gaging liquid shall be ICE -9 RL admixture.
- B. Mortar admixture shall be ICE-9 RL as manufactured by Edison Coatings, Inc., Plainville, CT (860) 747-2220
- C. All mortar shall be pre-blended, pre-colored and prepackaged under controlled factory conditions. All ingredients are to be batched within plus or minus 1% accuracy, except pigments which shall be weighed to a precision of 0.01%.
- D. Mortar shall conform to the minimum property requirements for Type S mortar as given in Table II of ASTM C270, based on 28-day laboratory testing ONLY.
- E. Do not add cement, lime, bonding agents, coloring admixtures, set accelerators, plasticizers, or other materials unless specifically authorized in writing.

Use of ready-mix mortar (ASTM C1142) is PROHIBITED.

2.3 CLEANING MATERIALS

- A. Final cleaning solution shall be E-WASH 30 manufactured by Edison Coatings, a non-ionic, non-toxic, non-corrosive building wash incorporating ingredients from US EPA's Safer Choice program.

2.4 ACCESSORIES

- A. Anchor pins and dowels should be stainless steel. Shelf angles and other similar structural items should be galvanized.
- B. "CastCotta" Anchors: Type and size indicated or, if not indicated, to match existing anchors in size and type. Fabricate anchors from [**Type 304**] [**Type 316**] stainless steel.

- C. Joint Sealant and Backing: As specified in Division 07 Section "Joint Sealants."

2.5 FABRICATION

- A. Shapes: Unless otherwise indicated on Drawings, provide the following:
 - 1. Suitable wash on exterior sills, copings, projecting courses, and components with exposed top surfaces.
 - 2. Drips on projecting components, wherever possible.
 - 3. Replicate exact profile and finish of stones submitted to manufacturer for duplication.
- B. Tolerances: Fabricate "CastCotta" components within specified tolerances.
 - 1. All dimensions: Plus or minus 1/8 inch (3 mm).
 - 2. Maximum Bow, Camber, or Twist: Length/360.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine construction to receive "CastCotta" components. Notify Architect if construction is not acceptable. Do not begin installation until unacceptable conditions have been corrected.

3.2 INSTALLATION

- A. General: Install "CastCotta" components in conjunction with masonry complying with requirements of Division 04 Section "Unit Masonry."
- B. Setting:
 - 1. Do not use equipment in a manner that could damage "CastCotta" components.
 - 2. Fill dowel holes and anchor slots completely with mortar or non-shrink grout.
 - 3. Ensure that all rebates in bed and cross-joints on sides are filled solid with mortar.
 - 4. Point joints with pointing mortar except where sealant-filled joints are specified and indicated on Drawings.
 - 5. Make all joints 3/8 inch (9.5 mm), except as otherwise detailed.
 - 6. Do not allow mortar to dry on coated surfaces. Improper tooling of joints and cleaning of surrounding surfaces may lead to damage of the coated surfaces. Carefully remove excess mortar and mortar smears immediately from all coated surfaces using non-abrasive methods.
 - 7. Tool joints to a slight concave profile.
 - 8. Ensure all weep holes are clear and free of debris to allow for drainage.
 - 9. Do not moist-cure mortar except as may be required under hot weather and low humidity conditions to avoid plastic shrinkage cracking. Do not moist-cure beyond 24 hours.

- C. Pointing: all pointing shall conform to US National Park Service Preservation Brief 2; Repointing Mortar Joints in Historic Masonry Buildings.
- D. Sealant Joints:
 - 1. Comply with requirements of Division 07 Section "Joint Sealants."
 - 2. Prime ends of "CastCotta" components, insert properly sized foam backing rod, and install sealant using sealant gun.
 - 3. *Provide sealant joints at following locations and as otherwise detailed:*
 - a. *"CastCotta" components with exposed tops.*
 - b. *Joints at relieving angles.*
 - c. *At control and expansion joints.*
 - d. *Perimeters open to weather.*

3.3 TOLERANCES

- A. Installation Tolerances: Comply with manufacturers recommendations, unless otherwise specified.
 - 1. Variation from Plumb: Do not exceed 1/8 inch in 10 feet (3 mm in 3 m) or 1/4 inch in 20 feet (6 mm in 6 m) or more.
 - 2. Variation from Level: Do not exceed 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 3/8 inch (9 mm) maximum.
 - 3. Variation in Joint Width: Do not vary joint thickness more than 1/8 inch in 36 inches (3 mm in 900 mm) or 1/4 of nominal joint width, whichever is less.
 - 4. Variation in Plane Between Adjacent Surfaces (Lipping): Do not exceed 1/16-inch (1.5-mm) difference between planes of adjacent units or adjacent surfaces indicated to be flush with units.

3.4 ADJUSTING

- A. Surface Repair:
 - 1. Repair chipping and other surface damage noticeable when viewed in direct daylight at 10 feet (3 m).
 - 2. Repair with matching touch-up material provided by manufacturer and in accordance with manufacturer's instructions.
 - 3. Repair methods and results to be approved by Architect and noted on "as-built" drawings for future reference.

3.5 CLEANING

- A. In-Progress and Final Cleaning:
 - 1. Clean "CastCotta" before sealants are applied, if applicable, and after units have been installed for a minimum of 10 days.
 - a. Wet surfaces with water before applying cleaner.

- b. Apply cleaner to "CastCotta" in accordance with manufacturer's instructions.
- c. Remove cleaner promptly by low-pressure rinsing thoroughly with clean water.

3.6 PROTECTION

- A. Protect "CastCotta" components from splashing and other damage.

END OF SECTION 042130