

- 1. CAST STONE TRIM{ } (INCLUDING THE FOLLOWING):
 - a. WINDOW SILLS.
 - b. LINTELS.
 - c. SURROUNDS.
 - d. COPING.
 - e. WALL CAPS.
 - f. BELT COURSES.
 - g. WATER TABLES.
 - h. QUOINS.
 - i. PILASTERS.
 - j. COLUMN COVERS.
 - k. MEDALLIONS.

- 2. CAST STONE STEPS.
- 3. CAST STONE BOLLARDS.
- 4. CAST STONE BENCHES.
- 5. CAST STONE CURBING.

B. RELATED SECTIONS INCLUDE THE FOLLOWING:

- 1. "PLANT-PRECAST ARCHITECTURAL CONCRETE."

- 2. "UNIT MASONRY ASSEMBLIES" FOR INSTALLING CAST STONE UNITS IN UNIT MASONRY.

DEFINITIONS

- A. CAST STONE: ARCHITECTURAL PRECAST CONCRETE BUILDING UNITS INTENDED TO SIMULATE NATURAL CUT STONE

SUBMITTALS

- A. PRODUCT DATA: INCLUDE CONSTRUCTION DETAILS, MATERIAL DESCRIPTIONS, DIMENSIONS OF INDIVIDUAL COMPONENTS AND PROFILES, AND FINISHES FOR CAST STONE UNITS.
- B. SHOP DRAWINGS: SHOW FABRICATION AND INSTALLATION DETAILS FOR CAST STONE UNITS. INCLUDE DIMENSIONS, DETAILS OF REINFORCEMENT AND ANCHORAGES IF ANY, AND INDICATION OF FINISHED FACES.

- 1. INCLUDE BUILDING ELEVATIONS SHOWING LAYOUT OF UNITS AND LOCATIONS OF JOINTS AND ANCHORS

- C. SAMPLES FOR INITIAL SELECTION: FOR COLORED MORTAR.

- D. SAMPLES FOR VERIFICATION:

- 1. FOR EACH COLOR AND TEXTURE OF CAST STONE REQUIRED, 10 INCHES (250 MM) SQUARE IN SIZE.

- 2. FOR COLORED MORTAR: MAKE SAMPLES USING SAME SAND AND MORTAR INGREDIENTS TO BE USED ON PROJECT{ LABEL SAMPLES TO INDICATED TYPES AND AMOUNTS OF PIGMENTS USED.}

- E. MOCKUP SAMPLES: FURNISH SAMPLE UNITS (FOR EACH COLOR AND TEXTURE OF CAST STONE REQUIRED, 10 INCHES (250 MM) SQUARE IN SIZE) (AS INDICATED ON DRAWINGS) FOR INSTALLATION IN MOCKUPS.

- F. FULL-SIZE SAMPLES: FOR EACH TYPE OF CAST STONE UNIT REQUIRED.

- 1. MAKE AVAILABLE FOR ARCHITECT'S REVIEW AT PROJECT SITE[OR AT MANUFACTURING PLANT, IF ACCEPTABLE TO ARCHITECT].

- 2. MAKE SAMPLES FROM MATERIALS TO BE USED FOR UNITS USED ON PROJECT[I IMMEDIATELY BEFORE BEGINNING PRODUCTION OF UNITS FOR PROJECT].

- 3. APPROVED SAMPLES MAY BE INSTALLED IN THE WORK

- C. QUALIFICATION DATA: FOR (MANUFACTURER) [AND] (TESTING AGENCY)

- 1. INCLUDE COPIES OF MATERIAL TEST REPORTS FOR COMPLETED PROJECTS, INDICATING COMPLIANCE OF CAST STONE WITH ASTM C 1364.

- H. QUALITY CONTROL PLAN: MANUFACTURER'S WRITTEN QUALITY CONTROL PLAN THAT INCLUDES ALL ELEMENTS OF THE CAST STONE INSTITUTE'S "QUALITY CONTROL PROCEDURES REQUIRED FOR PLANT INSPECTION."

- 1. PROVIDE COPIES OF DOCUMENTATION SHOWING COMPLIANCE WITH QUALITY CONTROL PLAN AS REQUESTED BY ARCHITECT. MATERIAL TEST REPORTS: FOR EACH MIX REQUIRED TO PRODUCE CAST STONE, BASED ON TESTING ACCORDING TO ASTM C 1364{, INCLUDING TEST FOR RESISTANCE TO FREEZING AND THAWING}.

- 1. PROVIDE TEST REPORTS BASED ON TESTING WITHIN PREVIOUS TWO YEARS

QUALITY ASSURANCE

- A. MANUFACTURER QUALIFICATIONS: A QUALIFIED MANUFACTURER OF CAST STONE UNITS SIMILAR TO THOSE INDICATED FOR THIS PROJECT, WITH SUFFICIENT PRODUCTION CAPACITY TO MANUFACTURE REQUIRED UNITS.

- 1. MANUFACTURER IS A PRODUCING MEMBER OF THE CAST STONE INSTITUTE{ } (OR HAS ON FILE AND FOLLOWS A WRITTEN QUALITY CONTROL PLAN APPROVED BY ARCHITECT THAT INCLUDES ALL ELEMENTS OF THE CAST STONE INSTITUTE'S "QUALITY CONTROL PROCEDURES REQUIRED FOR PLANT INSPECTION.")

- B. TESTING AGENCY QUALIFICATIONS: AN INDEPENDENT TESTING AGENCY QUALIFIED ACCORDING TO ASTM E 329 FOR TESTING INDICATED, AS DOCUMENTED ACCORDING TO ASTM E 548.

- C. SOURCE LIMITATIONS FOR CAST STONE: OBTAIN CAST STONE UNITS THROUGH ONE SOURCE FROM A SINGLE MANUFACTURER

- D. SOURCE LIMITATIONS FOR MORTAR MATERIALS: OBTAIN MORTAR INGREDIENTS OF A UNIFORM QUALITY, INCLUDING COLOR, FROM ONE MANUFACTURER FOR EACH CEMENTITIOUS COMPONENT AND FROM ONE SOURCE OR PRODUCER FOR EACH AGGREGATE.

- E. MOCKUPS: BUILD MOCKUPS TO VERIFY SELECTIONS MADE UNDER SAMPLE SUBMITTALS AND TO DEMONSTRATE AESTHETIC EFFECTS{ AND SET QUALITY STANDARDS FOR MATERIALS AND EXECUTION}.

- 1. BUILD MOCKUP OF TYPICAL WALL AREA AS SHOWN ON DRAWINGS.

DELIVERY, STORAGE, AND HANDLING

- A. COORDINATE DELIVERY OF CAST STONE{ WITH UNIT MASONRY WORK} TO MINIMIZE THE NEED FOR ON-SITE STORAGE AND TO AVOID DELAYING THE WORK.

- B. PACK, HANDLE, AND SHIP CAST STONE UNITS IN SUITABLE PACKS OR PALLETS.

- 1. LIFT WITH WIDE-BELT SLINGS; DO NOT USE WIRE ROPE OR ROPES THAT MIGHT CAUSE STAINING. MOVE CAST STONE UNITS, IF REQUIRED, USING DOLLIES WITH WOOD SUPPORTS.
- 2. STORE CAST STONE UNITS ON WOOD SKIDS OR PALLETS WITH NONSTAINING, WATERPROOF COVERS. ARRANGE TO DISTRIBUTE WEIGHT EVENLY AND TO PREVENT DAMAGE TO UNITS. VENTILATE UNDER COVERS TO PREVENT CONDENSATION.
- C. STORE INSTALLATION MATERIALS ON ELEVATED PLATFORMS, UNDER COVER, AND IN A DRY LOCATION.
- D. STORE MORTAR AGGREGATES WHERE GRADING AND OTHER REQUIRED CHARACTERISTICS CAN BE MAINTAINED AND CONTAMINATION CAN BE AVOIDED.

PROJECT CONDITIONS

- A. COLD-WEATHER REQUIREMENTS: DO NOT USE FROZEN MATERIALS OR MATERIALS MIXED OR COATED WITH ICE OR FROST. DO NOT BUILD ON FROZEN SUBSTRATES. COMPLY WITH COLD-WEATHER CONSTRUCTION REQUIREMENTS CONTAINED IN ACI 530.1/ASCE 6/TMS 602.

- 1. COLD-WEATHER CLEANING: USE LIQUID CLEANING METHODS ONLY WHEN AIR TEMPERATURE IS 40 DEG F (4 DEG C) AND ABOVE AND WILL REMAIN SO UNTIL CAST STONE HAS DRIED, BUT NOT LESS THAN 7 DAYS AFTER COMPLETING CLEANING.

- B. HOT-WEATHER REQUIREMENTS: COMPLY WITH HOT-WEATHER CONSTRUCTION REQUIREMENTS CONTAINED IN ACI 530.1/ASCE 6/TMS 602.

PART 2 - PRODUCTS

MANUFACTURERS

- A. IN OTHER PART 2 ARTICLES WHERE TITLES BELOW INTRODUCE LISTS, THE FOLLOWING REQUIREMENTS APPLY TO PRODUCT SELECTION.

- 1. AVAILABLE PRODUCTS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO, PRODUCTS SPECIFIED.

- 2. PRODUCTS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE ONE OF THE PRODUCTS SPECIFIED.

- 3. AVAILABLE MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO, MANUFACTURERS SPECIFIED.

- 4. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE MANUFACTURERS SPECIFIED.

CAST STONE MATERIALS

- A. GENERAL: COMPLY WITH ASTM C 1364 AND THE FOLLOWING:

- B. PORTLAND CEMENT: ASTM C 150, TYPE I CONTAINING NOT MORE THAN 0.60 PERCENT TOTAL ALKALI WHEN TESTED ACCORDING TO ASTM C 114.

- C. COARSE AGGREGATES: GRANITE, QUARTZ, OR LIMESTONE COMPLYING WITH ASTM C 33; GRADATION AS NEEDED TO PRODUCE REQUIRED TEXTURES AND COLORS AS NEEDED TO PRODUCE REQUIRED CAST STONE COLORS.

- D. FINE AGGREGATES: NATURAL SAND OR CRUSHED STONE COMPLYING WITH ASTM C 33; GRADATION AS NEEDED TO PRODUCE REQUIRED TEXTURES AND COLORS AS NEEDED TO PRODUCE REQUIRED CAST STONE COLORS.

- E. COLOR PIGMENT: ASTM C 979; SYNTHETIC MINERAL-OXIDE PIGMENTS OR COLORED WATER-REDUCING ADMIXTURES, COLOR STABLE{, FREE OF CARBON BLACK} NONFADING, AND RESISTANT TO LIME AND OTHER ALKALIS.

- F. ADMIXTURES: DO NOT USE ADMIXTURES UNLESS SPECIFIED OR APPROVED IN WRITING BY ARCHITECT.

- 1. DO NOT USE ADMIXTURES THAT CONTAIN MORE THAN 0.1 PERCENT WATER-SOLUBLE CHLORIDE IONS BY MASS OF CEMENTITIOUS MATERIALS. DO NOT USE ADMIXTURES CONTAINING CALCIUM CHLORIDE.

- 2. USE ONLY ADMIXTURES THAT ARE CERTIFIED BY MANUFACTURER TO BE COMPATIBLE WITH CEMENT AND OTHER ADMIXTURES USED.

- 3. AIR-ENTRAINING ADMIXTURE: ASTM C 260{ ADD TO MIXES FOR UNITS EXPOSED TO THE EXTERIOR AT MANUFACTURER'S DESCRIBED RATE TO RESULT IN AN AIR CONTENT OF 4 TO 6 PERCENT, EXCEPT DO NOT ADD TO ZERO-SLUMP CONCRETE MIXES.}

- 4. WATER-REDUCING ADMIXTURE: ASTM C 494/C 494M, TYPE A.

- 5. WATER-REDUCING, RETARDING ADMIXTURE: ASTM C 494/C 494M, TYPE D.

- 6. WATER-REDUCING, ACCELERATING ADMIXTURE: ASTM C 494/C 494M, TYPE E.

- C. REINFORCEMENT: DEFORMED STEEL BARS COMPLYING WITH ASTM A 615/A 615M. USE GALVANIZED OR EPOXY-COATED REINFORCEMENT WHEN COVERED WITH LESS THAN 1-1/2 INCHES (38 MM) OF CAST STONE MATERIAL.

- 1. EPOXY COATING: ASTM A 775/A 775M.

- 2. GALVANIZED COATING: ASTM A 767/A 767M.

- H. EMBEDDED ANCHORS AND OTHER INSERTS: FABRICATED FROM (STAINLESS STEEL COMPLYING WITH ASTM A 240/A 240M, ASTM A 276, OR ASTM A 666, TYPE 304) (STEEL COMPLYING WITH ASTM A 36/A 36M, AND HOT-DIP GALVANIZED TO COMPLY WITH ASTM A 123/A 123M).

CAST STONE UNITS

- A. (AVAILABLE) MANUFACTURERS:

- 1. ADVANCED CAST STONE, INC.

- 2. AHI SUPPLY, INC.

- 3. AMERICAN ARTSTONE CO., INC.

- 4. ARBAN ASSOCIATES, INC.

- 5. ARCHITECTURAL ART STONE, INC.

- 6. ARCHITECTURAL CAST STONE CORP.

- 7. ARCHITECTURAL CAST STONE, INC.

- 8. ARCHITECTURAL CONCRETE COMPANY, INC.

- 9. ARCHITECTURAL MOLDED COMPOSITES, INC.

- 10. ARCHITECTURAL ORNAMENTAL CASTINGS, INC.

- 11. ARCHITECTURAL ORNAMENTS, INC.

- 12. ARTISAN STONE COMPANY, INC.

- 13. CAST STONE SYSTEMS, INC.

- 14. CLASSIC CAST STONE OF DALLAS, INC.

- 15. CONART, INC.

- 16. CONTINENTAL CAST STONE EAST, RUSSELL, INC.

- 17. CONTINENTAL CAST STONE MANUFACTURING, INC.

- 18. CUSTOM CAST STONE, INC.

- 19. CUT ART CASTINGS CO.

- 20. DALLAS CAST STONE CO., INC.

- 21. DURA ART STONE.

- 22. DURASTONE.

- 23. EDWARDS CAST STONE COMPANY.

- 24. FRITCHMAN & ASSOCIATES CAST STONE.

- 25. HOYLE STONE PRODUCTS.

- 26. KERCKHOFF, D. C. CO

- 27. MILLER PRECAST, INC.

- 28. OLDE WORLD CAST STONE.

- 29. OLYMPIAN PRECAST, INC.

- 30. PINEAPPLE GROVE DESIGNS.

- 31. PLASTICRETE ARCHITECTURAL CONCRETE PRODUCTS.

- 32. PRECISION DEVELOPMENT.

- 33. SITEWORKS, INC.

- 34. SOUTHERN CAST STONE MANUFACTURING, INC.

- 35. STEPS PLUS, INC.

- 36. STONCO.

- 37. STONE CASTLE INDUSTRIES, INC.

- 38. STONE LEGENDS DIV., C.S.C.S., INC.

- 39. SUN PRECAST CO., INC.

- 40. TECHCRETE ARCHITECTURAL PRECAST.

- 41. THUNDERSTONE.

- 42. TOWNE HOUSE RESTORATIONS, INC.

- 43. OBERFIELD'S INC.

- B. PROVIDE CAST STONE UNITS COMPLYING WITH ASTM C 1364 USING 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, PROCEDURE A, AS MODIFIED BY ASTM C 1364{, OR ARE MADE FROM CAST STONE THAT HAS A HISTORY OF SUCCESSFUL RESISTANCE TO FREEZING AND THAWING}.

- C. FABRICATE UNITS WITH SHARP ARRIS AND DETAILS ACCURATELY REPRODUCED WITH INDICATED TEXTURE ON ALL EXPOSED SURFACES, UNLESS OTHERWISE INDICATED.

- 1. SLOPE EXPOSED HORIZONTAL SURFACES 1:2, UNLESS OTHERWISE INDICATED.

- 2. PROVIDE RAISED FILLETS AT BACKS OF SILLS AND AT ENDS INDICATED TO BE BUILT INTO JAMBS.

- 3. PROVIDE DRIPS ON PROJECTING ELEMENTS, UNLESS OTHERWISE INDICATED.

- D. FABRICATION TOLERANCES:

- 1. VARIATION IN CROSS SECTION: DO NOT VARY FROM INDICATED DIMENSIONS BY MORE THAN 1/8 INCH (3 MM).

- 2. VARIATION IN LENGTH: DO NOT VARY FROM INDICATED DIMENSIONS BY MORE THAN 1/360 OF THE LENGTH OF UNIT OR 1/8 INCH (3 MM), WHICHEVER IS GREATER, BUT IN NO CASE BY MORE THAN 1/4 INCH (6 MM).

- 3. WARP, BOW, AND TWIST: NOT TO EXCEED 1/360 OF THE LENGTH OF UNIT OR 1/8 INCH (3 MM), WHICHEVER IS GREATER.

- 4. LOCATION OF GROOVES, FALSE JOINTS, HOLES, ANCHORAGES, AND SIMILAR FEATURES: DO NOT VARY FROM INDICATED POSITION BY MORE THAN 1/8 INCH (3 MM) ON FORMED SURFACES OF UNITS AND 3/8 INCH (10 MM) ON UNFORMED SURFACES.

- E. CURE UNITS BY ONE OF THE FOLLOWING METHODS:

- 1. CURE UNITS WITH STEAM IN ENCLOSED CURING ROOM AT TEMPERATURE OF 105 DEG F (41 DEG C) OR ABOVE AND 95 TO 100 PERCENT RELATIVE HUMIDITY FOR 6 HOURS.

- 2. CURE UNITS WITH DENSE FOG AND WATER SPRAY IN ENCLOSED WARM CURING ROOM AT 95 TO 100 PERCENT RELATIVE HUMIDITY FOR 24 HOURS.

- 3. CURE UNITS TO COMPLY WITH ONE OF THE FOLLOWING:

- a. NOT LESS THAN 5 DAYS AT MEAN DAILY TEMPERATURE OF 70 DEG F (21 DEG C) OR ABOVE.

- b. NOT LESS THAN 6 DAYS AT MEAN DAILY TEMPERATURE OF 60 DEG F (16 DEG C) OR ABOVE.

- c. NOT LESS THAN 7 DAYS AT MEAN DAILY TEMPERATURE OF 50 DEG F (10 DEG C) OR ABOVE.

- d. NOT LESS THAN 8 DAYS AT MEAN DAILY TEMPERATURE OF 45 DEG F (7 DEG C) OR ABOVE.

- F. ACID ETCH UNITS AFTER CURING TO REMOVE CEMENT FILM FROM SURFACES TO BE EXPOSED TO VIEW.

- G. COLORS AND TEXTURES: *264 INDIAN SUMMER.

MORTAR MATERIALS

- A. PROVIDE MORTAR MATERIALS THAT COMPLY WITH DIVISION 4 SECTION "UNIT MASONRY ASSEMBLIES"

- B. PORTLAND CEMENT: ASTM C 150, TYPE I OR II EXCEPT TYPE III MAY BE USED FOR COLD-WEATHER CONSTRUCTION. PROVIDE NATURAL COLOR OR WHITE CEMENT AS REQUIRED TO PRODUCE MORTAR COLOR INDICATED.

- C. HYDRATED LIME: ASTM C 207, TYPE S.

- D. PORTLAND CEMENT-LIME MIX: PACKAGED BLEND OF PORTLAND CEMENT COMPLYING WITH ASTM C 150, TYPE I OR TYPE II AND HYDRATED LIME COMPLYING WITH ASTM C 207, TYPE S.

- E. MASONRY CEMENT: ASTM C 91.

- 1. (AVAILABLE) PRODUCTS:

- a. CAPITAL MATERIALS CORPORATION; FLAMINGO COLOR MASONRY CEMENT.

- b. ESSROC, ITALCEMENTI GROUP, (BRIXMENT) (OR) (VELVET).

- c. HOLCIM (US) INC., (MORTAMIX MASONRY CEMENT) (RAINBOW MORTAMIX CUSTOM BUFF MASONRY CEMENT) (WHITE MORTAMIX MASONRY CEMENT).

- d. LAFARGE NORTH AMERICA INC., (MAGNOLIA MASONRY CEMENT) (LAFARGE MASONRY CEMENT) (FLORIDA SUPER MASONRY) (TRINITY SUPER WHITE MASONRY TYPE S) (TRINITY WHITE MASONRY TYPE N).

- e. LEHIGH CEMENT COMPANY, (LEHIGH MASONRY CEMENT) (LEHIGH WHITE MASONRY CEMENT).

- f. NATIONAL CEMENT COMPANY, INC., COOSA MASONRY CEMENT.

- g. MANUFACTURER: _____

- F. MORTAR CEMENT: ASTM C 1329.

- 1. (AVAILABLE) PRODUCTS:

- a. LAFARGE NORTH AMERICA INC., (LAFARGE MORTAR CEMENT) (OR) (MAGNOLIA SUPERBOND MORTAR CEMENT).

- b. MANUFACTURER: _____

- G. MORTAR PIGMENTS: NATURAL AND SYNTHETIC IRON OXIDES AND CHROMIUM OXIDES, COMPOUNDED FOR USE IN MORTAR MIXES. USE ONLY PIGMENTS WITH A RECORD OF SATISFACTORY PERFORMANCE IN MASONRY MORTAR.

- 1. (AVAILABLE) PRODUCTS:
- a. BAYER CORPORATION, INDUSTRIAL CHEMICALS DIV.; BAYFERROX IRON OXIDE PIGMENTS.

- b. DAVIS COLORS, TRUE TONE MORTAR COLORS.

- c. SOLOMON GRIND-CHEM SERVICES, INC.; SGS MORTAR COLORS.

- d. (INSERT MANUFACTURER'S NAME, PRODUCT NAME OR DESIGNATION.)

- H. COLORED CEMENT PRODUCT: PACKAGED BLEND MADE FROM (PORTLAND CEMENT AND LIME) (MASONRY CEMENT) (OR) (MORTAR CEMENT) AND MORTAR PIGMENTS, ALL COMPLYING WITH SPECIFIED REQUIREMENTS AND CONTAINING NO OTHER INGREDIENTS.

- 1. FORMULATE BLEND