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CAST STONE
QUAILITY CONTROL PROGRAM:

Project: _____

I. Current Records:

A. Approved Mix Design

B. Approved Shop Drawings

C. Mill / Test Reports – Reinforcing, Cement, Aggregates

D. Cast Stone M.S.D.S.

E. Scales are checked and calibrated annually by a state licensed scale company

F. ASTM Certificates for all Materials:

1. Cement (Meets C-150)

2. Steel/Rebar/Other Applicable Reinforcing (Meets A-165)

3. Aggregates (Meets ASTM C33 except for gradation with monthly sieve analysis reports)

4. Admixture (C-494, if mix design requires the use of a water reducing, retarding, or accelerating admixture).

5. Color Pigments (ASTM C979)

6. Water (Potable)

II. Test Reports and Data Requirements:

A. Compressive Strength to be a minimum 6,500 PSI at 28 days, tested by an independent lab at least every (6) months.

B. Water Absorption to be less than 6%, tested by an independent lab at least every (6) months.

C. Current Industry ASTM 1364 Standards on file.

D. CSI Industry Standards and Specifications on file.

E. Product Data and MSDS sheets on hand for all admixtures, release agents, and chemicals used.

F. Product Delivery Records are maintained.

G. Product Inspection Records are maintained.

III. Quality Control Testing:

A. As required by most current ASTM 1364, one (1) sample from every (500) cubic feet cast will be tested to meet ASTM C1194 and C1195 in house or by a private lab and records kept – Last 24 Months on File.

B. All new mix designs used in production of material, classified as Cast Stone, in accordance with most recent ASTM 1364 and CSI 4720, shall be tested for strength and absorption compliance prior to producing units.

IV. Shop Drawings:

A. All dimensions and details are shown on shop drawings.

B. Units are identified with a piece marking system.

C. Finished surfaces are delineated by identifiable markings on drawings.

D. Reinforcing, if applicable, type, size, quantity, and location are identified.

E. Handling/Lifting Devices, where applicable are shown (Type and Location).

V. Samples:

A. Samples are on file and in finishing area for all projects being manufactured.

B. All samples clearly marked and readily identified.

C. Samples are easily accessible and available for review of all products being manufactured, and mix designs on file.

VI. Raw Materials:

A. No Cross Contamination of Aggregates (stored in bins consisting of CMU walls and a concrete floor).

B. Bulk cements are checked for type and color before being pumped into silo.

C. Bag cement is protected from elements.

D. Bag cement is stored clear of ground.

E. Rotate stock of bagged cements so oldest bag is used first.

F. Control Samples are kept of each raw material being used for comparison to new deliveries.

VII. Batching Procedures:

A. Approved Mix Designs are on file and displayed at fully Computerized Batch Plant mixing station.

B. Batching methods are by weight capable of consistency of 3%+/-. Computerized console displays target and actual amount of each component weighed in mixed batch, and logs file of every batch.

C. Batch Plant scales are recalibrated every 6 months to insure accurate weights of raw materials are used.

D. Proper mixing procedures are followed, moist aggregates, cement, water, and admixtures as recommended by manufacturer.

E. Check water content in mix by moisture meter or other consistent procedure. A slump/flow spread test is used for verification of wet cast mix.

F. Mixer is clean, has adequate lighting, and is in good, safe repair.

G. Mixer is completely discharged after mixing, before a new batch is begun.

H. Mixer is thoroughly cleaned between color changes, in order to prevent color inconsistencies.

I. Mix is transported to final mold by means that prevent contamination.

VIII. Molds:

A. Molds are constructed as not to deflect or move during casting.

B. Our qualified casting Supervisor checks all molds for correct dimensions prior to casting.

C. Removable or Drafted sides are provided on all molds to prevent damage while de-molding.

IX. Wet Cast Stone:

A. All molds are sealed and made watertight by either using silicone caulk, clay, or other suitable sealing material.

B. All surfaces of molds in contact with stone mix are coated with a mold release agent.

C. Stone mix is evenly placed into mold, internal vibrator not to be used to spread mix.

D. Adequate vibration is to be used to consolidate mix in mold and to minimize air voids.

E. Non-exposed areas of produced pieces are to be finished with a float or trowel so as to have a flat finish.

F. Steps are taken to contain and keep in moisture during the curing process.

X. Finish:

A. The product finish to have a fine-grained, or custom texture as per approved sample by Architect.

B. Product color to be as per approved sample by Architect. Color of cast stone materials may vary up to four (4) shades in range of approved color.

1. Permissible variation in color between units of comparable age subjected to similar weathering exposure.
    a. Total color difference – not greater than 4 units.
    b. Total hue difference – not greater than 2 units.

C. Finish area has adequate equipment and lighting for handling, finishing, and palletizing finished stone.

D. Trowel marks or imperfections on finished surfaces are sanded or washed away.

E. Cast Stone pieces are identified by project number and adequately packaged to prevent damage in transit.

XI. Finished Product Requirements:

A. All stones are checked against the approved sample for color and texture finish.

B. All stones are checked dimensionally using approved shop tickets or drawings. Manufacturing Tolerances:

1. Cross section dimensions shall not deviate by more then +/- 1/8" from approved dimensions.

2. Length of units shall not deviate by more then length/360 or +/- 1/8", whichever is greater, not to exceed +/- 1/4".

    a) Maximum length of any unit shall not exceed 15 times the average thickness of such unit unless otherwise agreed to by manufacture.

3. Warp, bow, or twist of units shall not exceed length/360 or +/- 1/8", whichever is greater.

4. Location of dowel holes, anchor slots, flashing groves, false joints, and similar features: On formed sides of units 1/8", on unformed sides of unit 3/8" maximum deviation.

C. Piece marks are both visable and permanently marked on each stone and the outside of each pallet.

D. No seams, tamp marks, patches, imperfections, or air voids are visible from a distance of five feet in direct sunlight on any exposed side of stone.

E. All stones are checked for soft edges, or soft tamping, ragged edges, visible cracks, and foreign matter in face of the stones.