

JOB SITE HANDLING AND INSTALLATION

The proper use of cast stone in the design of a project and the job site handling of the cast stone can affect the overall performance. On-site personnel should be familiar with the Cast Stone Institute® specifications and the project specification covering delivery, storage, setting, touch-up and repair, cleaning, pointing, caulking and sealing. In case of a conflict between the two specifications, the project specification should take precedent. Where the project specification may not include a particular issue, the industry standards should be followed.

The following checklist has been developed for the handling and installation of cast stone.

- Prior to delivery there should be a set of the approved shop drawings and color and texture sample on file. All test reports specified should be submitted as required.
- Upon delivery, all cast stone should be checked for chips, cracks, stains, or broken pieces. Any damage should be noted on the delivery slips and communicated to the manufacturer.
- Color and texture should be inspected in accordance to approved color sample or mock-up panel set up at the job site. In general, the color and texture of the cast stone should be approximately equal to the approved sample when viewed in typical daylight conditions at a distance of twenty foot. (See Technical Bulletin #36 Inspection and Acceptance.)
- Storage of cast stone should be above the ground on non-staining planks or pallets. The storage site should be away from heavy construction traffic. Cast stone stored for an extended period of time should be kept on pallets or non-staining planking and covered with non-staining tarpaulins. Allow for air circulation.
- Prior to setting, ensure climatic conditions are within thermal limitations of mortar. Cast stone should not be set if the environmental conditions are not within the acceptable temperature range specified by the manufacturer's recommendations. Mortar set retarders and set accelerators should be used according to manufacturer's recommendations but not with touch-up and repair material.
- Set cast stone within size limitations in full mortar joints and fill in all dowel holes and anchor slots completely with project approved bonding material (usually Mortar, Non-Shrink Grout or Epoxy). Ensure uniform joint widths within specification tolerances. If shims are required in the mortar joints, mortar should be raked back and caulked to mitigate hairline cracking in the joints. Sealant joints may be sanded to give the appearance of mortar when desired.
- Ensure that all specified flashing and damp-proofing is installed. Flashing pierced by stone anchors must be sealed either by metal thimble, grommet or approved sealant.
- Concrete should never be poured against unprotected cast stone. Where poured in place concrete is placed against cast stone sills, separate with an appropriate barrier material prior to pouring concrete.
- Cast stone anchors must meet specified standards and be non-corrosive. Cast stone slots to receive anchors should be completely filled with project approved material usually mortar, non-shrink grout or epoxy.
- Prior to setting, each surface to be set in mortar should be wetted before mortar is applied. This helps to secure the bond between the mortar and the cast stone and may help to prevent shrinkage and hairline cracking in the joints.
- Weep holes must be installed over windows, at relieving angles and at the bottom of walls. No mortar droppings shall be allowed in the wythe between back of stone and face of back-up structure.
- All joints in cast stone units, which are set using mechanical anchors and plastic bearing shims, should be sealed. All control joints and any floor line joints at relief angles should be sealed to allow for movement.
- Only the ends of load bearing lug sills shall be set in a full bed of mortar to prevent cracking from future wall settlement. After setting, prime the joints, insert properly sized backup rod and gun in sealant.

- All trim items must align with control joints.
- Bridge parapet coping units over control joints to maximize their effectiveness. All coping should have a minimum $\frac{1}{2}$ " wash to control runoff.
- Do not bridge parapet coping over expansion joints.
- Cast stone should be handled to minimize chipping. Handle stones with the wide portion of the cross section in the vertical position to minimize breakage.
- After setting, columns, pilasters, entry jambs, window sills and all cast stone with projecting profiles should be protected during the remaining construction.
- During construction, cover the top of the walls when rain is anticipated.
- Chipped cast stone must be patched by skilled labor. A trial patch must be approved before general touch and repair is to commence.
- Planter coping, fountain coping, swimming pool coping, treads, risers, stone pieces above grade, and pavers may be treated with a silane or silane/siloxane blend water repellent coating after setting. A waterproof product may be applied to the back, sides and at and below grade surfaces. This will minimize the likelihood of dirt and groundwater entering the surface of the stone; a frequent cause of staining, efflorescence and enhancement of crazing. Check that the water repellent coating does not affect color or texture when dry.
- Load bearing cast stone units should be reinforced as necessary. They may not be designed to be handled in a different orientation than they will be installed in the structure. Lintels and large panels must be kept vertical.
- Any exposed reinforcement is to be cut back to a minimum depth of 1.5 inches. Apply a galvanized compound, zinc primer or other reinforcement protection to all exposed reinforcement. Fill recessed pocket containing coated reinforcement with repair material prior to setting the cast stone.
- When installing in extreme weather conditions consult Cold Weather Setting Practices Technical Bulletin #41, and Hot Weather Setting Practices Technical Bulletin #48.

This Technical Bulletin addresses generally accepted practices, methods and general details for the use of Architectural Cast Stone. This document is designed **only as a guide** and is **not** intended for any specific application or project. It is the responsibility of design and construction professionals to determine the applicability and appropriate application of any detail to a specific project based on professional judgment, specific project conditions, manufacturer's recommendations and solid understanding of product characteristics. The Cast Stone Institute makes no express or implied warranty or guarantee of the techniques or construction methods identified herein. Technical references shall be made to the edition of the International Building Codes for the location of the structure, the latest edition of the TMS 402/406 Masonry Standards document and TMS 404, 504, 604 Standards for Design, Fabrication and Installation of Architectural Cast Stone.

The Cast Stone Institute (CSI) is a not-for-profit organization created to advance the design, manufacture and use of Architectural Cast Stone. To further this goal, the CSI continually disseminates information to targeted construction industry audiences through presentations, programs and technical publications.

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