

## TOUCH UP AND REPAIR

The best insurance against chipped cast stone is care in handling and protection of the unit after installation. Even with special care and protection, cast stone may still become chipped from time to time and a certain amount of touch up is to be expected. Damage to stone either while in transit or during installation is usually classified as a repair.

Any chip obvious from a 20' distance should be touched up with material provided by the manufacturer. Chips measuring  $\frac{1}{4}$  inches and less across the face are usually left alone. The stone mason should include touch up as part of the ordinary pointing and wash down operations prior to final inspection. Repairs which are not conspicuous from a 20' distance when viewed in good typical lighting should be accepted. See Bulletin #36 on Inspection and Acceptance.

Chips measuring larger than  $\frac{1}{4}$  inches across the face are usually addressed in a separate operation as soon as possible following occurrence of damage. The procedure for repair will include dressing the damage and applying fresh material to achieve the desired finish and shape, covering the repair with a wet rag and/or plastic cover, then taking steps to blend the repair into the adjacent areas. Cast stone units with chips larger than eight square inches should be replaced, unless the damaged portion can be salvaged and epoxied back to the unit.

Most cracks can be repaired if the units are reinforced. Units which are load bearing or having cracks larger than .007 inches should be epoxy injected after the cause of the restrained movement has been identified. Cracks which are observed in installed units can be grouted with native material if the crack is less than .007 inches and the forces which caused the crack have been eliminated.



Climatic conditions must be taken into consideration before the repair is to commence. Do not repair stone in freezing weather or if a freeze is anticipated within 24 hours. On hot sunny days repairs should be done during the morning hours where the cast stone is shaded or at temperatures less than 90 degrees Fahrenheit. Repairs should be covered with a damp cloth and plastic sheet to prevent the water from evaporating before the cement has hydrated.

The same material that was used to manufacture the cast stone should be used for touch up and repair. Test batches should be used to achieve a color match. The water/cement ratio used should be as close as possible to the mix at the time of manufacture. It is recommended that a non-redispersible latex bonding agent be used, but not in place of the mixing water. Use as a wetting agent, less than a tablespoon per handful of the concrete material, for plasticity. Never use metal tools for applying a repair. Cast stones which were acid etched at the factory will require the same applied treatment to the touch up or repair.



A properly executed repair will not match in color immediately. Dry tamp produced cast stone will appear lighter where repaired, while wet cast produced cast stone may appear darker. Repairs, matching immediately or in two or three days, have a tendency to change color later on after weathering. Through curing, weathering and ultraviolet light, the repair will eventually return to the original stone color. This process could take 3 months to a year or longer depending on the climatic conditions and exposure to the weather.

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.