SECTION 03 01 30 MAINTENANCE OF CAST-IN-PLACE CONCRETE
SECTION 03 01 40 MAINTENANCE OF PRECAST CONCRETE
SECTION 03 01 50 MAINTENANCE OF CAST DECKS AND UNDERLAYMENT
SECTION 03 01 70 MAINTENANCE OF MASS CONCRETE
SECTION 03 01 80 MAINTENANCE OF CONCRETE CUTTING AND BORING
SECTION 03 30 53 MISCELLANEOUS CAST-IN-PLACE CONCRETE
SECTION 03 31 00 STRUCTURAL CONCRETE
SECTION 03 33 00 ARCHITECTURAL CONCRETE

[Note to specifier: Verify above references are current and applicable.]

PART I GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the contract, including General and Supplementary Conditions, apply to this section.

1.2 SUMMARY

A. This section specifies material for general construction and very rapid concrete repairs from 2 inches to 24 inches thick.

1.3 SUBMITTALS

A. Substitutions:
[Note to specifier: This paragraph should be included in section 01 25 13. It is shown here as a convenience for your review.] Requests for substitution must be received by Architect at least 14 days prior to bid opening and shall be accepted only from prime bidders. Request shall include: documentation from an approved independent testing laboratory showing compliance with this specification, record of past performance, list of similar installations, detailed comparison of the qualities of the proposed substitute with the specified product, statement of product costs showing all savings passed to owner if approved, and certification by the contractor that the proposed substitute is in every significant way equal to or better than the specified product.

B. Submit 2 copies of product manufacturer's literature and Material Safety Data Sheets (MSDS). [Note to specifier: Add any other required submissions.]

1.4 QUALITY ASSURANCE

A. Comply with the following unless modified by this specification.

1. ASTM C39/C39M-03 Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
2. ASTM C78-02 Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading)
3. ASTM C191-04 Standard Test Method for Time of Setting of Hydraulic Cement by Vicat Needle
4. ASTM C928-00 Standard Specification for Packaged, Dry, Rapid-Hardening Cementitious Materials for Concrete Repairs

1.5 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to jobsite in original, unopened, undamaged containers that clearly show the manufacturer's name, product name, and batch number.

B. Storage: Store material in a dry area off the ground. Protect from rain, snow, and other sources of moisture.

PART 2 PRODUCTS

2.1 MATERIALS

A. Shall be Rapid Set® Concrete Mix manufactured by CTS Cement Manufacturing Corp., 11065 Knott Avenue, Suite A, Cypress, CA, 90630. Phone: 800-929-3030 Website: www.ctscement.com

B. The material shall meet the following minimum performance requirements.

1. Set time per ASTM 191 (Mod.):
   Final set 45 minutes, maximum.
2. Compressive strength per ASTM C39 (Mod.):
   1 hour* 2800 psi
   3 hour 3600 psi
   1 day 5000 psi
   28 day 6000 psi
   * after final set
3. Flexural strength per ASTM C78 (Mod.):

2 hour*	420 psi
1 day	650 psi
28 day	750 psi

* after final set

4. ASTM C928 for packaged concrete repair materials.

C. The material shall be hydraulic cement based, low shrinkage concrete repair material that is non-metallic with no added chlorides. Shall be pre-blended requiring only the additon of water.

D. Material shall be applied in thicknesses ranging from 2” to 24”.

2.2 Water: Potable.

2.3 Admixtures and Additions:

If modification of the setting time, fluidity, color, or other properties is desired, use Rapid Set® Concrete Pharmacy® additives. Add the pre-measured packets per the manufacturer’s recommendations.

Do not add other materials unless specified here or approved in writing by CTS Cement Manufacturing Corporation.

PART 3 EXECUTION

3.1 SURFACE PREPARATION

A. Remove a minimum of 1/16 inch from the application surface.

B. Concrete must be free of materials such as paint, oil, curing compound, bond breaker, or any material that will inhibit bonding. Mechanically remove loose, unsound, contaminated concrete.

C. For partial depth repairs, the perimeter of the area to be repaired shall be sawcut or chipped perpendicular to the surface to a minimum depth of 2 inches. Do not cut or damage reinforcing steel.

D. Reinforcing steel shall be free from rust and other materials that will inhibit bond. [Note to specifier: Add special requirements concerning replacement of reinforcing that has lost too much cross-sectional area.]

E. Thoroughly clean extraneous material such as dirt, loose chips, and dust from concrete surface. If compressed air is used, it shall be free of oil.

F. Concrete surface shall be saturated with potable water. Standing water shall be removed from surface to achieve a saturated-surface-dry (SSD) condition.

G. If placed directly on the subgrade, the subgrade must be well compacted. [Note to specifier: State compaction requirement.]

3.2 MIXING

A. Organize personnel and equipment before mixing.

B. Use 3 to 5 quarts of water per 55 pound bag of repair material.

C. Follow manufacturer's recommendations for mixing in cold or hot conditions. The mixed temperature may be controlled by protecting the bags of repair material from temperature extremes and using hot or cold mix water.

D. Add water to the mixing container. While mixing in a power driven mechanical mixer, such as a mortar mixer or a drill mounted mixer, add repair material.

E. Mix for 1 to 3 minutes to achieve a uniform, lump-free consistency.

F. Do not re-temper.

3.3 PLACEMENT

A. Place Concrete Mix immediately after mixing.

B. Work the mixed Concrete Mix firmly into all application surfaces to achieve good bond. Consolidate to remove air voids.

C. Do not wait for bleed water. Apply final finish as soon as material condition allows.

3.4 CURING

A. Water cure installations per manufacturer's recommendations.

3.5 CLEAN UP

A. Maintain a clean, orderly work area.

B. Clean excess material from surrounding areas immediately.

C. Protect adjacent surfaces that may be damaged, with drop cloths, waterproof paper, or other means to maintain surfaces free of material splashes, water, and debris.

END OF SECTION