SECTION 03300
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the contract, including General and Supplementary Conditions, and Division 1 specification sections, apply to this section.

1.02 DESCRIPTION

A. SCOPE OF WORK

1. Provide all labor, materials, equipment and services necessary to complete all cast-in-place concrete work, including formwork, reinforcing steel and all related work as shown and specified, except as specifically excluded hereinafter.
2. In addition to construction of cast-in-place concrete work, the work includes the items listed below:

    a. Setting anchor bolts, frames, and other items indicated to be embedded in concrete
    b. Grouting of structural steel bearing on concrete
    c. Concrete curbs
    d. Dowels for masonry walls
    e. Concrete walks
    f. Concrete pavement
    g. Laboratory field testing services

3. Cooperate with affected personnel or contractors in setting and/or fastening sleeves, piping, inserts, conduits, hangers, ties and similar items in the forms, where such items are to be furnished and installed under other subdivisions of these specifications.

B. RELATED WORK NOT SPECIFIED UNDER THIS SUBDIVISION

1. Foundations and pads not shown on architectural, civil or structural drawings.
2. Furnishing steel frames and grating.
3. Furnishing miscellaneous steel shapes and plates embedded in concrete.
4. Furnishing anchor bolts for structural steel.
5. Furnishing piping and conduit embedded in concrete.

1.03 QUALITY ASSURANCE

A. APPLICABLE STANDARDS

1. Provide all materials and perform all work in accordance with the latest issue of ACI 301 "Standard Specifications for Structural Concrete A“ and the reference specifications listed therein.

2. The applicable provisions of the latest issue of the following ACI and CRSI Standards are made a part of these specifications. Where the provisions of any reference specification conflict with those of ACI 301, the more stringent provisions govern.

ACI NUMBER	TITLE
302.1R	Guide for Concrete Floor and Slab Construction
304.R	Guide for Measuring, Mixing, Transporting and Placing Concrete
304.2R-91	Placing concrete by pumping methods.
305R	Hot Weather Concreting
308	Standard Practice for Curing Concrete
309R	Guide for Consolidation of Concrete
315	Manual of Standard Practice for Detailing Reinforced Concrete Structures
318	Building code requirements for reinforced concrete
347	Recommended Practice for Concrete Formwork
70-56	Guide for Use of Epoxy Compounds with Concrete - Committee 503 Report
75-18	Concrete committee 503 report. Cold weather concreting.

CRSI NUMBER	TITLE
63	Recommended Practice for Placing Reinforcing Bars

1.04 SUBMITTALS

1. Submit, not less than 21 days prior to placing of concrete, the following proposed concrete mix design data:

   a. Intended usage and location for each type
   b. Mix design for each type
   c. Cement content in pounds per cubic yard
   d. Coarse and fine aggregate in pounds per cubic yard
   e. Water-cement ratio by weight
   f. Cement type and manufacturer
   g. Slump range
   h. Air content range
   I. Admixture types and manufacturers
   j. Percent of admixtures by weight
   k. Strength test data required to establish mix design

2. Submit complete detail and placing shop drawings for all reinforcing steel including accessories that have been reviewed and stamped by the General Contractor.
3. Refer to Section 01300 for all submittals.

PART 2 PRODUCTS

2.01 CONCRETE MATERIALS

A. Portland Cement - ASTM C 150, Type I. Type III may be used where authorized by the Engineer.

B. Air-Entraining Admixtures - ASTM C 260, Darax AEA, W. R. Grace & Company, SIKA AER, SIKA, MB-AE90, Master Builders, Air Mix, Euclid Chemical Corp.

C. Water-Reducing Admixtures - ASTM C 494, Type D. WRDA-64, W.R. Grace & Company Plastiment, SIKA, Pozzolith N, Master Builders.

D. No accelerators, retarders or admixtures containing chlorides will be permitted.

E. Use fresh, clean and drinkable water for concrete.

F. For normal weight concrete use coarse and fine aggregate to conform to ASTM C33.

G. Super Plasticizer ASTM C494 Type F or G where authorized by the Engineer.

H. Fly-ash ASTM C618 Type C618. Maximum loss on ignition shall not exceed 3% by weight. The combined weight of fly-ash shall not exceed 20 percent of the total weight of cementitious material. The fly-ash present in
blended cement conforming to ASTM C595 shall be included in the calculated percentage. Do not use for architectural concrete.

I. Ground granulated blast-furnish slag ASTM c989. the combined weight of GGBFS shall not exceed 50 percent of the total weight of cementitious material. Slag used in blended hydraulic cement confirming to ASTM C595 shall be included in the calculated percentage.

2.02 PROPORTIONING

B. CONCRETE STRENGTH

1. See Structural contract drawings for minimum concrete compressive strength at 28 days.

C. PROPERTIES

1. Provide concrete having workability and consistency so concrete can be worked readily into forms and around reinforcement without segregation or bleeding, and to provide an average compressive strength adequate to meet acceptance requirements of ACI 301.

2.03 PRODUCTION OF CONCRETE

A. Concrete must be batched, mixed and transported in accordance with specifications for ready-mixed concrete ASTM C 94.

B. Concrete shall be batched to produce a maximum slump of 5" with a range of 3"

to 5". Refer to 2.02B unless noted otherwise.

C. Provide at the site, delivery tickets for each batch of concrete showing the following:

1. Batch number, volume and date
2. Time of loading
3. Design 28-day compressive strength
4. Concrete type
5. Cement content in pounds per cubic yard
6. Water content in pounds per cubic yard
7. Admixtures in amount per cubic yard
8. Maximum amount of water that may be added at the job site.

D. Restrict the addition of mix water at the job site. Do not add water without the approval of the general contractor and do not exceed slump limitations or total allowable water to cement ratio. Use cold water from the truck tank and remix to achieve consistency. The reports shall indicate how much water was added at the job site. Note on delivery ticket amount of water added and name of person authorizing.

E. During hot weather, conform to the detailed recommendations of ACI 305.

2.04 PLACING CONCRETE

A. GENERAL

1. Inner surfaces of conveying equipment must be free of hardened concrete and foreign materials.
2. All reinforcing bars are to be tied in proper position prior to placing concrete.
3. Provide sufficient time for inspection of all preparatory work before proceeding with the placing of concrete.
4. Immediately prior to placing concrete, sprinkle semi-porous sub-grades sufficiently to eliminate suction and seal porous subgrades, except where a vapor barrier is used.
5. Deposit concrete in forms in horizonal layers continuously, no deeper than 18 inches. Horizontal cold joints will not be permitted. Fill forms completely using methods to ensure even distribution of aggregate around reinforcement and into corners of forms.

B. CONSOLIDATION

1. Consolidate concrete by vibration in accordance with the detailed recommendations of ACI 309.
2. Internal vibrators must be used in beams, girders and framed slabs and along bulkheads or slabs-on-grade to thoroughly consolidate the concrete. Do not use grossly oversized equipment.
3. Do not use vibrators to transport concrete within forms.

C. FINISHING

1. Finish concrete slabs in accordance with the finishes and tolerances as specified in ACI 301, and the detailed recommendations in ACI 302. Confirm all finishes with Architect.
2. Dusting of slabs with cement or other materials to absorb excess bleed water is strictly prohibited.

ITEM	TOLERANCE CLASS	FINISH
Exterior Pavement	B	Broom or belt
Exterior Walks/Curbs	B	Fine broom
Interior Slabs	A	Troweled
Exterior Steps	A	Nonslip

3. For flat, very flat and super flat floors, "F" numbers are required for defining flatness and levelness. Refer to ACI 302.1R, Fig. 8.15.1.1, for minimum required “F” numbers for type of slab use.

D. NONSLIP FINISH

1. Give surface a dry shake application as specified in ACI 301 using crushed selected abrasive aggregate of aluminum oxide. The rate of application of blended mixture should not be less than 25 pounds per 100 square feet of surface.

2. Acceptable products are:

TYPE	MANUFACTURER
Grip-It	L&M Construction Chemicals
Frictex N.S.	Sonneborn
Nonslip	Euclid Chemical Co.
Emag 20	Lambert Corp.

2.05 REINFORCEMENT

A. GENERAL

1. Details of concrete reinforcement and accessories not covered herein or shown on drawings to be in accordance with ACI 315.
2. Reinforcement is to be secured in proper position and thoroughly clean of loose rust, scale, grease or other coatings.

B. REINFORCING MATERIALS

1. Unless otherwise indicated, for all reinforcing shown provide deformed bars conforming to ASTM A 615, or a 616 Grade 60.
2. Smooth dowels - ASTM A 615 and A 616, plain bars having a minimum yield strength of 60,000 psi.
3. Welded wire fabric - ASTM A 185 plain wire fabric in flat sheets.
4. Plain wire to conform to ASTM A 82.
5. Accessories to conform to ACI 315.

6. Where reinforcing rods are used as supports, use rods no lighter than No. 5
7. Where concrete surfaces are exposed, make those portions of all accessories in contact with the concrete surface or within 1/2 inch thereof, of plastic or stainless steel.

PART 3 EXECUTION

3.01 PLACING

A. GENERAL

1. Place reinforcing in conformance with the requirements of CRSI 63. Place reinforcement in proper position prior to placing concrete. Placing reinforcement during concrete placement will not be permitted.
2. Unless otherwise shown or indicated, provide minimum concrete protective covering for reinforcement as follows:

    a. Concrete deposited against the ground, 3".
    b. Formed surfaces exposed to weather or in contact with the ground, 2" for reinforcing bars No. 6 or larger, and 1-1/2" for reinforcing bars No. 5 or smaller
    c. Interior surfaces, 1-1/2" for beams, girders and columns, 3/4" for slabs, walls and joists.
    d. See drawing for special conditions.

3. Support reinforcing for slabs-on-grade on staggered concrete bricks or metal or plastic bar chairs and spacers with metal plates.
4. Unless specifically authorized, do not bend reinforcement partially embedded in hardened concrete.
5. Support and fasten all dowels in the formwork prior to placing concrete. Do not place dowels after concrete is in place.

3.02 JOINTS

A. CONSTRUCTION JOINTS

1. Construction joints not shown in the contract documents must be located and made to least impair the strength of the structure.
2. No horizontal construction joints will be permitted in beams, girders or slabs.
3. Location of any construction joint not shown is subject to review and acceptance by Engineer. Reinforcing is continuous through all construction joints, obtain bond by roughening surface of concrete in an acceptable manner which will expose aggregate uniformly and will not leave any latencies, loosened particles or aggregate or damaged concrete at surface.

B. EXPANSION JOINTS

1. Reinforcement or other embedded metal items bonded to the concrete

(except dowels in floors bonded on only one side of joints) will not be permitted to extend continuously through any expansion joint.

C. DOWELED SLIP JOINTS

1. Use completely smooth round bars for dowels.
2. For construction joints, paint half of bar with red lead paint. When dry, coat painted end with satisfactory grease to insure against bond with concrete.
3. For control joints, paint and grease entire bar.
4. For expansion joints, paint, grease and provide a metal expansion cap for one end.
5. Place in forms to insure that bars are perpendicular to joint face. Stop reinforcement at doweled slip joints so that it will not extend through joint.

D. JOINT MATERIALS

1. Expansion joint filler non-bituminous type - ASTM D 1752, resin impregnated fiberboard Homosote 300 or Thermosetting Polyurethane, W. R. Meadows' Rescor. Asphalt impregnated materials are unacceptable.
2. Polyethylene Film - ASTM D 2103 minimum 6 mil.
3. Horizontal Joint Sealer - 2-component self-leveling urethane conforming to Federal Specification TT-S-227E, Type 1, Class A. Color to match concrete. Acceptable products are:

TYPE	MANUFACTURER
Daraseal-U	A. C. Horn
Sonolastic SL2	Sonneborn
Pourthane	W. R. Meadows

4. Vertical Joint Sealer - 1-component Polyurethane conforming to Federal Specification TT-S-002306, Type II, Class A, color to match concrete. Acceptable products are:

TYPE	MANUFACTURER
SIKAFLEX IA	SIKA
SONOLASTIC NPI	Sonneborn

5. Epoxy Joint Sealer - semi-rigid epoxy, MM80 as manufactured by Metzger McGuire Co., master fill 300 by Master Builders.
6. Epoxy Bond - 2-component 100 percent solids epoxy resin, amine cured. Acceptable materials are Concresive Series by Master Builders, Sonneborn=s Epogrip and Epiweld 580 by Lambert Corp.
7. Epoxy Grout - Epoxy bond filled with suitable mineral filler, 100 percent passing the No. 100 sieve, in ratio to insure thixotropic action without impairment of adhesive properties.
8. Compressive Joint Material - expanded polystyrene having a compressive strength not less than 8 psi when the board is compressed to a deformation of 5 percent of its original thickness when tested in conformance with ASTM C 165, modified to change drying temperature to 150^{o}F.

9. Felt - 30 pound asphalt or coal tar roofing felt ASTM D 226 or D 227.

E. PLACING DOWELS IN EXISTING CONCRETE

1. Use deformed reinforcing bars as dowels. Drill holes in existing concrete of size 1/2" larger in diameter than the dowel using power-driven drill with tungsten-carbide tipped bit ground to insure against oversize hole. Clean out holes with air. Thoroughly swab surfaces of hole and embedded portion of dowel with epoxy grout. Force dowel into place. Wipe off excess grout and let set for not less than 12 hours at a temperature above 60°F.

3.03 FORMWORK

A. GENERAL

1. Provide and construct formwork in accordance with ACI 301 and 347.
2. Form design by P.E. registered in the State of Florida.
3. Observe and check formwork continuously while concrete is being placed to determine that there are no evidences of changes of elevations, plumbness, or camber and adjust forms as necessary. If, during construction, any such evidence or other defect appears, stop the work, remove concrete placed, if necessary, and repair formwork or supports before proceeding.
4. Earth cuts may be used as forms for footing vertical surfaces increase size 2 inch.
5. Forms and shoring are the responsibility of General Contractor.

B. FORMWORK MATERIALS

1. Make forms of lumber, plywood, metal or other materials suitable to provide the strength and tolerances specified herein before and the surface finishes specified hereinafter.
2. Forming exposed surfaces use any of the following materials as suitable for the specified finish, and to produce smooth uniform surfaces, true-to-line, in order that surfaces produced will require little finishing:
   a. New plastic-bonded natural plywood, American Plywood Association, HD Overlay Plyform Class I, Ext-APA, or equal.
3. For forming exposed surfaces use plywood, or other nonmetallic surfaces free from knots, warps, breaks, or other defects likely to cause irregular surfaces.
4. Provide commercial formulation form coating compounds with maximum VOC of 350 mg/1 that will not bond with stain or adversely affect concrete surfaces and will not impair subsequent surface treatments.

C. REMOVAL OF FORMS

1. Forms and shoring in the formwork supporting the weight of concrete, in beams, slabs and other structural elements are to remain in place until the concrete has reached its specified 28-day compressive strength.
2. Formwork and facing forms for members such as grade beams, foundation walls and spread footings not supporting the weight of

concrete may be removed as soon as the concrete has hardened sufficiently to resist damage from the removal operations.

3. Arrange shores and other vertical supports so that the non-load carrying form-facing material may be removed without loosening or disturbing the shores and supports.
4. Whenever the formwork is removed during the curing period, continue curing of both the unexposed and exposed concrete by one of the methods specified in section "Curing and Protection".

D. REMOVAL STRENGTH

1. Removal Strength - The concrete will be presumed to have reached its specified strength when additional test cylinders (paid for by contractor) are field cured along with the concrete they represent and have reached the strength specified.

3.04 REPAIR OF SURFACE DEFECTS

A. GENERAL

1. Patch all tie holes and repair all honeycombed and defective areas immediately after form removal.
2. For surfaces other than those to be backfilled against, use patching mortar.
3. For surfaces to be backfilled against, use mastic damp-proofing compound, except that where reinforcing is exposed, use patching mortar.
4. Remove all honeycombed and defective concrete down to sound concrete prior to patching. Thoroughly clean the holes of dirt and debris.

B. PATCHING MORTAR

1. Cut edges of honeycombed and defective concrete to form dove-tail (undercut) joints. No feather edges will be permitted.
2. Apply a chemical bonding agent to voided surface. An acceptable product is L&M Construction chemicals – Everbond or equivalent.
3. Patch the cement mortar as specified in ACI 301, or with proprietary patching compounds, except that proprietary patching mixtures may be not used on exposed surfaces.
4. Acceptable proprietary patching mixtures are:

    a. Euclid Chemical Corporation - Poly Patch
    b. SIKA - Sikaset Mortar
    c. Emaco R Series - Master Builders
    d. Lambert Corp, Lambco Vinyl Patch
    e. Sonneborn - Sonopatch

C. MASTIC DAMP-PROOFING COMPOUND

1. Patch full depth of hole and flush the surface with emulsified asphalt mastic heavy viscosity for trowel application. Prepare and place in accordance with manufacturer's directions. Acceptable products are:

a. W. R. Meadows - Sealmastic Trowel Mastic
b. Euclid Chemical Company - Damp-proofing Asphalt Coatings
c. Sonneborn - Hydrocide 700 Mastic
d. Lambert Corp – Waterban 60M

3.05 FINISHING OF FORMED SURFACES - GENERAL

A. After removal of forms, give surfaces of concrete the following finishes as specified in ACI 301.

SURFACE	FINISH
Unexposed	Rough Form
Exposed	Smooth Form
Exposed to Public View	Smooth Rubbed

3.06 CURING AND PROTECTION

A. GENERAL

1. Conform to the applicable detailed recommendations of ACI 301 and 308.
2. Hot weather curing to be in accordance with applicable ACI Standard 305.
3. All cast-in-place concrete must be maintained with minimal moisture loss at a relatively constant temperature for a minimum of 7 days following the placing of the concrete by the use of a water spray, water saturated fabric, moisture retaining membrane or liquid curing compound.
4. Full curing days will be determined by the cumulative number of days or fractions thereof during which the temperature of the air in contact with the concrete is above 50°F
5. Cure slabs-on-grade for the first 72 hours by the use of:

    a. fog spraying
    b. ponding
    c. sprinkling
    d. continuously wet absorptive mats or fabric
    e. continue curing by use of moisture retaining cover until concrete has obtained its specified 28-day compressive strength
    f. or liquid curing compound after finishing process is completed.

5. Fog spraying, ponding, sprinkling or continuously wet absorptive mats or fabric. Continue curing by use of moisture retaining cover until concrete has obtained its specified 28-day compressive strength or liquid curing compound.
6. Submit materials and method of curing for review.
7. Do not use moisture retaining curing compounds for curing surfaces to receive the following coverings, unless it has been demonstrated that such compounds will not prevent bond of:

    a. Carpet
    b. Flexible flooring
    c. Ceramic tiled floors
    d. Other specified floor systems

B. MATERIALS

1. Where moisture retaining membranes or curing compounds are used for curing, provide only materials conforming to the following requirements:

   a. Polyethylene Film - ASTM C171, Type II
   b. Waterproof Paper - ASTM C 171, Type I
   c. Absorptive Cover - AASHTO M 182, Class 3, Burlap cloth made from Jute or Kenaf or ASTM C 440 cotton mats
   d. ASTM C309 spray on at max.

C. TEMPERATURE, WIND AND HUMIDITY

1. Do not permit concrete not fully cured to be exposed to excessive temperature changes or high winds.

3.07 EMBEDDED ITEMS

A. GENERAL

1. Prior to concreting, place all embedded items to be provided under this subdivision or to be furnished under other subdivisions for installation under this subdivision.
2. Give all contractors whose work is related to the concrete or must be supported by it, ample notice and opportunity to introduce and/or furnish embedded items before the concrete is placed.
3. Make certain that all embedded items furnished and set in forms by them are secured in position, and exercise due care not to disturb or damage their work while placing concrete.
4. Set anchor bolts for steel and equipment in accordance with setting drawings or templates which have been reviewed and found satisfactory.
5. Where holes in concrete for such purposes as recesses for railing posts, passageways for pipes, and the like are shown formed by sleeves, the contractor may, at his option, provide such holes by drilling with a acceptable diamond or tungsten carbide tipped drill bits. Fill with epoxy seal after railings are in place.

B. EMBEDDED ITEMS TO BE PROVIDED UNDER THIS SUBDIVISION

1. Dovetail anchor slots and dovetail brick anchors - DAS-G20 beehive dovetail anchor slot as manufactured by Gateway Building Products, together with DBA-G14 dovetail brick anchors. Provide masonry trades with one anchor for each 16" of anchor slot or fraction thereof plus one additional anchor for each vertical section. Place anchor slots 1'-4" on center in beams and walls where masonry abuts and one slot in each face of each column faced with masonry. Furnish anchors to space 16" on center in slots.
2. Plastic reglets for above and below grade counter flashing. Make of Type A rigid polyvinyl chloride, 0.060" thick, as manufactured by Superior Concrete Accessories, Inc. or equal.
3. Sleeves - galvanized steel pipe ASTM A 120, or plastic pipe ASTM D 2661, ASTM D 2665 or ASTM D 2852, bituminized fiber pipe conforming

to ASTM D 1861 or Wilson anchor bolt sleeve.
Anchor Bolts - ASTM F1554-GR 36. Furnish with one leveling nut plus one nut and one washer.

5. Cast Iron Frames and Grates - as manufactured by Neenah Foundry Company. Castings as manufactured by Flockhart Foundry Company or McKinley Iron Works may be acceptable, provided the dimensions and design are comparable in all respects.
6. Water stops locations as shown on drawings.

3.08 VAPOR BARRIER

1. Provide sub-grade under concrete slabs-on-grade with vapor barrier consisting of polyethylene film not thinner than 6 mils, conforming to ASTM C 171, or asphalt laminated reinforced Kraft paper with polyethylene coating on both sides. Moistop as manufactured by St. Regis Laminated and Coated Products Division.
2. Provide film in width and length not less than one foot larger than dimensions of slab sub-grade unless patently impracticable. Where joints are necessary, lap edges not less than 6" and tape continuously. Take care to avoid puncturing film. Immediately prior to placing concrete, tape-seal all tears, cuts and holes.

3.09 GROUTING OF BASE PLATES

1. Nonferrous grout acceptable products are:

TYPE	MANUFACTURER
Crystex	L&M Construction Chemicals
Five Star	U.S. Grout
Sonogrout	Sonneborn
Euco N.S.	Euclid Chemical Company
Construction Grout	Master Builders
Vibroprvf #11	Lambert Corp.

2. Mix and place in conformance with printed instructions of the manufacturer.

3.10 TESTING

A. GENERAL

1. The services of an independent testing laboratory shall be retained for obtaining test specimens and performing quality control work, routine testing of materials or proposed mix designs and of resulting concrete for compliance with technical requirements of specifications.
2. Testing of field-cured test cylinders, or testing required because of changes requested by contractor in materials or proportions of the mix, as well as any extra testing of concrete or materials occasioned by failure to meet specification requirements, to be at contractor's expense.
3. Failure of the testing laboratory to detect any defective work or materials is not in any way to prevent later rejection when such defect is discovered, nor is it to obligate the owner for final acceptance.

4. The testing agency and/or its representatives are not authorized to revoke, alter, relax, enlarge or release any requirement of the specifications, not to approve or accept any portion of the work, not to act as foreman or perform other duties for contractor.

B. SERVICES PROVIDED BY THE TESTING AGENCY

1. Field Sampling - Secure from different batches, on a truly random basis, composite samples for all field testing required below in accordance with ASTM C 172 where applicable. Take all samples at discharge end of conveying system. Clearly mark each test specimen master as to exact part of the structure represented, class of concrete curing conditions, temperature of concrete, and time and date of sample.
2. Compressive Strength Test - mold and cure test cylinders in accordance with ASTM C 31 and test each cylinder for strength in accordance with ASTM C 39. Take one "test set" consisting of four cylinders for each day's pour of 50 cubic yards, or fraction thereof. Test cylinders one at 7 and two 28 days, one hold.
3. Slump Tests - determine slump range for each "test set" in conformance with ASTM C 143.
4. Air Content Test - determine air content for each "test set" for air-entrained concrete in accordance with ASTM C 231.
5. Submit two copies of the results in each of the above tests and inspection to the contractor and the owner's representative and Engineer.
6. Should any of the test results fail to meet the requirements specified, make an immediate telephone report to the contractor and the owner's representative.
7. Furnish evaluation reports of compression tests as recommended by ACI 214 when any compression test fails to meet the specified strength.

3.11 ACCEPTANCE OF STRUCTURE

A. GENERAL

1. Acceptance of structure will be made in conformance with ACI 301, except that contractor must pay all costs incurred for providing any additional testing or analysis required when strength of structure is considered potentially deficient.

B. CRACKS

1. The contractor will be required to restore without cost to the owner any concrete which develops cracks within a period of one year after placement which has not been caused by action of the owner or others in over stressing the concrete.
2. Repair the cracks by means that will restore the cracked members to their designed strength and appearance by acceptable methods which will not impair the appearance of the affected surfaces, if exposed. Such repairs must be performed by use of suitable epoxy cements employed by an organization having satisfactorily demonstrated ability in the techniques necessary to affect such repairs, or by other acceptable methods.

END OF SECTION 03300