SECTION 03 20 00

CONCRETE REINFORCEMENT AND EMBEDDED ASSEMBLIES

PART 1 - GENERAL

1.1 GENERAL

Work of this Section shall conform to requirements of Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification sections.

1.2 SCOPE

Provide all labor, materials, equipment, services and transportation for reinforcing steel, accessories, embedments and miscellaneous anchorage accessories, joint fillers, and waterstops for cast-in-place concrete work as shown on Drawings, as specified herein, and as required by the job conditions.

1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

Submittals	Division 1
Quality Control	Division 1
Thermal and Moisture Protection	Division 7
Concrete Formwork	Section 03 10 00
Cast-in-Place Concrete	Section 03 30 00

1.4 CODES AND STANDARDS

A. Building Code: Concrete work shall conform to the requirements of the Building Code identified on the Structural General Notes, and OSHA requirements, except where more stringent conditions or criteria occur in the latest editions of the standards referenced below and on the drawings.

B. Standards:

1. ACI 117 – Standard Specifications for Tolerances for Concrete Construction and Materials.

2. ACI 301 – Standard Specification for Structural Concrete.

3. ACI 315 – Details and Detailing of Concrete Reinforcement.

4. ACI 318 – Building Code Requirements for Reinforced Concrete.

5. American Society for Testing and Materials "ASTM Standards in Building Codes", various standards as referenced herein, latest edition.

6. ASTM D3963 Fabrication and Jobsite Handling of epoxy Coated Steel Reinforcing Bars.

7. AWS D1.1 – Structural Welding Code-Steel.

8. AWS D1.4 – Structural Welding Code-Reinforcing Steel.

9. AWS D12.1 – Recommended Practices for Welding Reinforcing Steel Metal Inserts, and Connections in Reinforced Concrete Construction.

10. CRD C 572 – Specification for Polyvinylchloride Waterstops.

11. Concrete Reinforcing Steel Institute ”Manual of Standard Practice”

12. United States Green Building Council (USGBC) – LEED for New Construction and Major Renovations Rating System.

C. Definitions:

1. The term “Contract Documents” in this specification is defined as the design drawings and the specifications.

2. The term “SER” in this specification is defined as the Structural Engineer of Record for the structure in its final condition.

3. The term “Design Professionals” in this specification is defined as the Owner’s Architect and SER.

4. The term “Contractor” in this specification is defined to include any of the following: General Contractor and their sub-contractors, Construction Manager, Concrete Contractor and their sub-contractors.

5. The term “Owner’s Testing Agency” in this specification is defined as an independent testing and inspection service engaged by the Owner for quality assurance observation and testing of concrete construction in accordance with applicable building code provisions and any additional activities listed in the Contract Documents.

6. The terms “for record” and “submit for record” in this specification are defined as Contractor submittals that do not require a response from the Design Professionals.

7. Working Days: Monday through Friday, excluding federal or state holidays.

1.5 QUALITY ASSURANCE

A. Reinforcing steel shall not be permitted to rust where there is danger of staining exposed surfaces of adjacent concrete. The Contractor shall replace rust-stained concrete at his expense.

B. The Owner’s Testing Agency will:

1. Provide tests in accordance with the California Building Code (CBC) Section 1913.2.

2. Collect mill test reports for reinforcement.

3. Take samples from bundles at fabricators:

a. When bundles are indentified by the heat number and accompanied by mill analysis, two specimens shall be taken from each ten (10) tons, or fraction thereof, of each size and grade.

b. When reinforcement is not positively identified by the heat numbers or when random sampling is intended, two specimens shall be taken from each 2-1/2 tons, or thereof, of each size and grade.

c. All costs associated with the test of reinforcing that not have mill test reports will be at the contractor’s expense.

4. Test for tensile and bending strengths.

5. The Owner’s Testing Agency will inspect shop and field welding of reinforcing bars per CBC Chapter 17.

6. Provide inspection of welding, including prior fit-up, welding equipment, weld quality and welder certification in accordance with AWS D1.4. When reinforcement is to be welded, chemical analysis sufficient to determine carbon equivalent and minimum preheat temperature shall be performed when reinforcement does not conform to low-alloy steel requirements of American Society for Testing and Materials (ASTM) A706.

1.6 CONTRACTOR QUALIFICATIONS

A. The work of this section shall be performed by a fabricator specializing in reinforcing steel fabrication of type for cast-in-place concrete work required for this Project, with a minimum of 10 years of documented successful experience, and have the facilities capable of meeting all requirements of Contract Documents.

1. Welders shall be qualified in accordance with AWS D1.4, within 12 months before starting the work.

a. Make qualification records available to the Design Professionals upon request.

2. Work shall be performed in compliance with Owner's insurance underwriters' requirements.

B. Manufacturers shall specialize in manufacturing the types of concrete accessories required for cast-in-place concrete work, with a minimum of 10 years of documented successful experience and shall have the facilities capable of meeting all requirements of Contract Documents as a single-source responsibility and warranty for each type of accessory.

1.7 SUBMITTALS

A. Where the SUBMITTALS section of this specification is in conflict with Division 1 Submittals, the more stringent requirements for the Contractor apply. Do not submit items not requested.

1. Submittal Schedule: See Section 03 30 00.

2. Shop Drawings: Submit shop drawings that shall clearly indicate, but not be limited to:

a. All details, dimensions and information required for fabrication and placement of concrete reinforcement in accordance with Contract Documents, prepared in accordance with ACI 315 recommendations.

b. Elevations, plans, sections, and dimensions of concrete work with required reinforcement clearances.

c. Ledges, brackets, openings, sleeves, anchor rods, embedments, prefabricated bent-in dowel keyway systems, electrical conduit and items of other trades including interference with reinforcing materials.

d. Sizes, grade designations, spacing, locations, and quantities of wire fabric, reinforcement bars, temperature and shrinkage reinforcement dowels.

i. Do not use dimensions scaled from Contract Drawings to determine bar lengths.

ii. Hooks and bends not specifically dimensioned shall be detailed per ACI 318.

e. Bending and cutting schedules, assembly diagrams, splicing and connection requirements, details, and laps.

f. Each type of supporting and spacing devices, including miscellaneous accessories.

g. Construction joint type, details and locations. Contractor shall coordinate with concrete pour schedule and submit for action by the Design Professionals.

h. Submit comprehensive (a single drawing per area/element) layout/placement drawings. Drawings shall consolidate the work of all trades and shall be coordinated by the Contractor. Submit with or prior to reinforcement submittal for same element/area. Drawings shall include:

i. Concrete accessories and embedded items, including fabrication details of items to be placed (exclusive of reinforcement.)

ii. Opening in structural members, including floor slab, shearwalls, columns and beams.

i. Reproduction of structural drawings is not permitted.

3. Product Data – Submit for record for each type of product identified in Part 2. Product Data shall be clearly marked to indicate all technical information which specifies full compliance with this section and Contract Documents, including published installation instructions and I.C.C reports, where applicable, for products of each manufacturer specified in this section.

4. Mill Test Reports: Submit for record.

a. For each heat or melt of steel prior to delivery of material to the job site.

b. Where reinforcing is to be welded, mill test reports shall verify the weldability of the reinforcing.

5. Reinforcement Strain Test: For Grade 75 reinforcement, submit for record certification that steel has a yield strength of no less than 75 ksi as measured by both ASTM A615 and ACI 318 Section 3.5.3.2 procedures.

6. Hazardous Materials Notification: Submit for record. In the event no product or material is available that is free from hazardous substances as determined by the Owner, a "Material Safety Data Sheet" (MSDS) equivalent to OSHA Form 20 shall be submitted for that proposed product or material prior to installation.

B. Submittal Process: See Section 03 30 00

C. SER Submittal Review: See Section 03 30 00

D. Substitution Request: See Section 03 30 00

E. Request for Information (RFI): See Section 03 30 00

1.8 DELIVERY, HANDLING, STORAGE

A. Comply with General Conditions and Division 1, including the following:

1. Deliver reinforcing steel to Project site bundled, tagged and marked.

a. Use weatherproof tags indicating bar sizes, lengths and other information corresponding to markings shown on placement diagrams.

b. Take precautions to maintain identification after bundles are broken.

2. Deliver welded wire fabric in sheets. Do not deliver in rolls.

3. During construction period, properly store reinforcing steel and accessories to assure uniformity throughout the Project.

4. Deliver and store welding electrodes in accordance with AWS D1.4.

5. Immediately remove from site materials not complying with Contract Documents or determined to be damaged.

6. Store reinforcing steel above ground so that it remains clean.

a. Maintain steel surfaces free from rust, grease, dirt, or other materials and coatings that might impair bond.

b. Keep covered.

c. Protect against corrosion or deterioration of any kind.

1.9 WARRANTY

A. Comply with General Conditions, agreeing to repair or replace specified materials or Work that has failed within the warranty period. Failures include but are not limited to the following:

1. Bars with kinks or bends not indicated on drawings or on approved shop drawings.

2. Bars damaged due to bending, straightening or cutting.

3. Bars heated for bending.

PART 2 - PRODUCTS

2.1 REINFORCEMENT

A. Reinforcing Steel:

1. Type: Deformed billet steel bars, ASTM A 615, Grade 60 or 75 as indicated on drawings.

2. Size: As indicated on structural drawings.

3. Where indicated on drawings, reinforcing steel shall be hot-dipped galvanized after fabrication in accordance with ASTM A 767, Class II, with galvanizing material protected from embrittlement during galvanizing process in accordance with ASTM A 143.

   a. Galvanized finish shall meet the bend and shear test requirements of ASTM A 615.

4. Epoxy-Coated: ASTM A 775 where indicated on drawings.

5. Weldable reinforcement: ASTM A 706 where indicated on drawings.

B. Welded Wire Reinforcement:

1. Plain Steel Welded Wire Reinforcement: ASTM A 185.

2. Deformed Steel Welded Wire Reinforcement: ASTM A 497.

3. Epoxy-Coated Welded Wire Reinforcement: ASTM A 884, Class A.

4. Steel wire, plain finish, ASTM A 82.

5. Steel wire, deformed, ASTM A 496.

6. Size: As indicated on structural drawings.

7. Where indicated on drawings, welded wire reinforcement shall be hot-dipped galvanized after fabrication in accordance with ASTM A 767, Class II, with galvanizing material protected from embrittlement during galvanizing process in accordance with ASTM A 143.

   a. Galvanized finish shall meet the bend and shear test requirements of ASTM A 615.

C. Shear Reinforcement At Slab-Column Connections:

1. Type: Steel studrail assemblies for shear reinforcement at slab-column connections shall be DECON STUDRAILS supplied by DECON USA, Medford New Jersey.

   a. Shear studs shall be in accordance with ASTM A108, Grade C1015.

   b. Rails shall be low carbon steel Type 44W.

c. Studs shall be welded in accordance with AWS D1.1, latest edition.

2. Size: As indicated on structural drawings.

3. Installation: Per manufacturer's instructions.

4. Supports: Use plastic molded plastic chairs as provided by the manufacturer to maintain the bottom rebar cover as specified on the drawings. Tie studrails to adjacent top bars to maintain vertical position.

2.2 ACCESSORIES

A. Tie Wire and Spirals:

1. Type: Minmum 16 gauge annealed steel wire, ASTM A510 and ASTM A853.

2. Wire Bar Type: Comply with CRSI.

B. Mechanical Couplers:

1. Provide mechanical couplers with a valid ICC-ES report from one of the following manufacturers: HRC 500/510 Xtender by Headed Reinforcement Corporation; Bartec by Dextra; Taperlock by Dayton Superior; Lenton Interlok LK Series by Erico; Lenton Standard and Transition Couplers A2/A12 Series by Erico; Lenton Form Saver Couplers by Erico; or equal product substituted per Division 1.

2. Couplers shall be Type 2. Couplers shall develop 125-percent of the specified yield strength of the reinforcement and shall develop the specified tensile strength of the spliced bar.

C. Mechanical Bar Terminators:

1. For bar sizes #11 (ø36) or smaller where specifically detailed on drawings, mechanical bar terminators shall be used.

2. Provide headed reinforcement with a valid ICC-ES report from one of the following manufacturers: HRC 555 Headed Bars by Headed Reinforcement Corp.; Bartec by Dextra; or equal product substituted per Section 01 25 00.

D. Supports for Reinforcement:

1. Types: Bolsters, chairs, spacers, clips, chair bars, and other devices for properly placing, spacing, supporting, and fastening the reinforcement, hot-dip galvanized after fabrication, in accordance with ASTM A123, or epoxy coated to match supported reinforcement.

2. For Contact with Forms: Use types with not less than 3/32" (2.5mm) of plastic between metal and concrete surface.

a. Plastic tips shall extend not less than ½" (12mm) on metal legs.

3. Individual and continuous slab bolsters and chairs shall be of type to suit various conditions encountered and must be capable of supporting 300 pound (1.5kN) load without damage or permanent distortion.

4. Unless otherwise indicated on drawings, bottom reinforcing bars in footings shall be supported by precast concrete bricks or individual high chairs with welded sand plates on bottom.

5. Slabs on Grade reinforcement to be supported by precast concrete bricks or supports with sand plates or horizontal runners where base material will not support chair legs.

E. Dovetail Anchor Slots:

1. Type: Formed 22 gauge (0.85mm) galvanized steel manufactured by Heckmann Building Products/Chicago, Illinois or Hohmann and Barnard/Hauppauge, New York.

2. Location of Use: Continuous installation of anchor slots, full height of masonry walls, where masonry walls abut poured concrete walls.

3. Fill slot with temporary filler or cover face opening to prevent intrusion of concrete or debris.

4. Finish: Hot-dip galvanized or zinc-plated steel.

5. Stainless steel anchors are acceptable.

F. Welding Electrodes:

1. All welding shall be in conformance with AWS D1.4 and AWS A5.1.

2. Welded joints of ASTM A615, grade 60 bars shall be made with low hydrogen weld filler metals classified as E90 electrodes with a minimum tensile strength of 90 ksi.

3. Welded joints of ASTM A706, grade 60 bars shall be made with low hydrogen weld filler metals classified as E80 electrodes with a minimum tensile strength of 80 ksi.

2.3 JOINT FILLERS

A. Permanent Compressible Joint Filler:

1. Type: W. R. Meadows: “Ceramar” closed-cell expansion joint filler, ultraviolet stable, minimal moisture absorption, non-impregnated, nonstaining and nonbleeding, inert and compatible with cold-applied sealants.

2. Location of Use: Slabs and curbs as indicated on drawings or required.

3. Thickness: As indicated on drawings or required.

B. Temporary Compressible Joint Filler:

1. Type: White molded polystyrene beadboard.

2. Location of Use:

a. In slabs, curbs, and walls which must be removed prior to joint sealant installation.

b. Vertically to isolate walls from columns or other walls.

C. Noncompressible Joint Filler:

1. Type: Dow Chemical's "STYROFOAM 40" rigid closed-cell extruded polystyrene board, square edges, 40 psi (275kPa) compressive strength, ASTM C 578, Type IV.

2. Thickness: As indicated on drawings.

3. Location of Use: As indicated on drawings or required.

D. Asphalt-Impregnated Joint Filler:

1. Type: W.R. Meadows Asphalt Expansion Joint Filler, preformed, ASTM D 994.

2. Thickness: ½" (12mm) maximum, as indicated on drawings or required.

3. Location of Use: Sidewalks at foundation walls and as indicated on drawings or required.

E. Asphalt-impregnated fiberboard expansion joint filler for interior work:

1. Type: ASTM D1751.

F. Self-expanding cork board expansion joint filler for exterior work:

1. Type: ASTM D1752.

G. Construction Joints:

1. Type: Tongue and groove type profile of galvanized steel, with knock-out holes at 6" (150mm) on center to receive dowelling, complete with anchorage.

2.4 WATERSTOPS

A. Preformed Bentonite Waterproofing Strips especially formulated for concrete cold joints at footings, walls, or slabs.

1. Acceptable Products:

a. Volclay Waterstop RX by CETCO Building Materials Group, Hoffman Estates, IL

b. Adcor ES by W. R. Grace & Co., Cambridge, MA

2. Size: 3/4" (20mm) by 3/8" (10mm) strips minimum, 25 ft. (7.5m) long, and weighing at least 0.165 lbs/ft (0.245kg/m).

3. Location of Use: Concrete cold joints at footings, walls and slab joints.

4. Comply with manufacturer product application and installation instructions.

B. Polyvinyl Chloride Waterstops:

1. Type: “PVC Waterstops” by Bometals, Inc. Carrollton, GA, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections and directional changes. U.S. Corp of Engineers Specification CRD C 572.

2.5 FABRICATION

A. Reinforcing Steel Fabrication:

1. Fabricate in accordance with approved shop drawings, ACI 315 and Contract Documents.

2. Heating of Reinforcement: Will be permitted only with specific prior approval of the SER.

3. Welding: Comply with AWS D1.4.

a. Employ shielded metal-arc method and conform to AWS D1.4.

b. Ensure equipment supplies proper current and voltage and is adjustable to suit arrangement and thickness of items welded.

c. Only welders specifically certified for reinforcing steel in accordance with AWS D1.4 shall perform welding of reinforcing steel.

4. Tolerances: Comply with ACI 117.

5. Unacceptable Materials: Reinforcement with any of following defects will not be permitted in Work.

a. Bar lengths, depths, and bends exceeding ACI fabrication tolerances.

b. Bends or kinks not indicated on Drawings or final shop drawings.

c. Bars with reduced cross-section due to excessive rusting or other cause.

B. Welded Wire Reinforcement:

1. Type: As fabricated in accordance with CRSI, unless otherwise noted.

C. Templates:

1. Required for all footing and column dowels, and where required for proper alignment of reinforcing.

D. Assemblies:

1. Fabricate and assemble structural steel items in shop in conformance with the latest editions of AISC 360, AISC 303, Section 05 12 00, Section 05 12 10 and AWS D1.1. Shearing, flame cutting, and chipping shall be done carefully and accurately. Cut, drill, or punch holes at right angles to the surface of the metal. Do not make or enlarge holes by burning. Holes shall be clean-cut without torn or ragged edges.

2. Welding of deformed bar anchors and welded studs shall be installed by full-fusion process equivalent to TRW Nelson Stud Welding Division or KSM Welding Services Division, Omark Industries.

3. Welding of reinforcement shall be done in accordance with AWS requirements. Welding shall be performed subject to the observance and testing by Owner's Testing Laboratory.

4. Galvanizing where required, shall be applied after fabrication and prior to casting concrete.

5. Welding of crossing bars (tack welding) for assembly of reinforcement is not permitted without use of weldable reinforcement and express written consent of SER.

2.6 INSTALLATION OF REINFORCEMENT

A. General:

1. Perform the work of this section in accordance with approved shop drawings, ACI 318 and CRSI recommended practice for “Placing Reinforcing Bars”, for details and methods of reinforcement placement and supports, and as specified.

2. Before placing reinforcement steel, inspect forms for proper fitting and compliance with allowable tolerances.

3. Reinforcement shall be free of form coatings, sealers, powdered and scaled rust, loose mill scale, earth, ice, and other materials which will reduce or destroy bond with concrete.

4. Do not place concrete until the completed reinforcement steel work has been observed and accepted by Owner’s Testing Laboratory.

5. Reinforcement steel is not permitted to be “floated into position”.

6. Bend bars cold.

    a. Do not heat or flame cut bars.

    b. No field bending of bars is permitted, unless specifically approved by the SER and tested by Independent Testing Laboratory for cracks.

7. Weld only as indicated.

    a. Perform welding per AWS D1.4, latest edition.

    b. See structural drawings for additional requirements.

8. Tag reinforcement steel for easy identification.

9. Contractor shall coordinate the placement of the reinforcing indicated on the drawings to avoid interference while maintaining minimum cover requirements.

10. All reinforcement shall be continuous. See drawings for lap splice schedule. Stagger splices where possible. Contact lap splices shall be securely wired together to maintain alignment.

11. Ensure placement will permit concrete protection in conformance with CRSI or to extent shown.

12. Do not bend bars around openings or sleeves. Wherever conduits, piping, inserts, sleeves, etc. interfere with placing of reinforcement, obtain the Architect’s approval of placing before placing concrete.

B. Placement of Reinforcement Bars:

1. Comply with approved shop drawings, ACI 318 and Contract Documents.

2. Accurately position, support and secure reinforcement in a manner to prevent displacement before and during placement of concrete.

    a. Place reinforcement bars within tolerances specified in ACI 117 and ACI 318 Section 7.5.

    b. Locate and support reinforcement by metal chairs, runners, bolsters, spacers, hangers and other accessories for fastening reinforcing bars and welded wire reinforcement in place.

3. If bars are displaced beyond specified tolerance when relocating the bars to avoid interference with other reinforcement or embedded items, notify the Design Professionals for approval prior to concrete placement.

4. Avoid cutting or puncturing vapor retarder during reinforcement placement.

    a. Repair damages before placing concrete.

5. Concrete Coverage: Maintain concrete cover around reinforcement as indicated on drawings.

6. Bar Supports: Use type specified in this section.

7. Tie Wires: After cutting, turn tie wires to the inside of section and bend so that concrete placement will not force ends to be exposed at face of concrete.

C. Placement of Wire Reinforcement:

1. Install in lengths as long as practicable.

2. Support in position adequately to prevent bending of reinforcement between supports before and during placement of concrete.

3. Overlap the wire reinforcement 6” (150mm) or one panel width + 2” (50mm), whichever is larger.

    a. Securely tie together with wire.

4. Offset laps of adjoining widths to prevent continuous laps in either direction.

5. Locate wire fabric in the top third of slabs, unless noted otherwise on structural drawings.

D. At Construction Joints:

1. Reinforcement bars and wire reinforcement shall be continuous through construction joints, unless otherwise indicated on Drawings. See Drawings for scheduled lap splices.

E. At Expansion Joints:

1. Reinforcing bars and wire fabric shall not be continuous through expansion joints, unless otherwise indicated on drawings.

F. Splicing:

1. Unless otherwise indicated on drawings provide lap splices for bar sizes #11 (ø36) and smaller by lapping ends, placing bars in contact, and tying tightly with wire in accordance with requirements of ACI 318 for lap lengths indicated on drawings.

2. At all #14 (ø43) and #18 (ø57) bars and where mechanical splices are specifically indicated on drawings, comply with requirements specified in this Specification section under “Mechanical Couplers”.

3. Do not splice reinforcement except as indicated on structural drawings.

4. Tension couplers may be used and installed per manufacturer’s specifications where indicated on drawings or as approved by Engineer.

G. Reinforcement for Shotcrete Applications:

1. Place reinforcement in accordance with CBC Section 1910.

2.7 INSTALLATION OF ACCESSORIES

A. Install concrete accessories in accordance with manufacturer's published instructions and Contract Documents.

1. Set and secure embedments, including embedded plates, bearing plates, and anchor bolts, per approved setting drawings and in such a manner to prevent movement during placement of concrete and to allow removal of formwork without damage.

2. Inspect locations to receive concrete accessories.

3. Immediately report to the Design Professionals in writing of conditions that will adversely affect the Work or fails to meet Contract Document requirements.

4. Do not place concrete until reinforcement, accessories and other built-in items have been inspected and accepted by Owner’s Testing Laboratory.

B. Construction and Contraction (Control) Joints:

1. Construction and contraction (control) joints indicated on drawings are mandatory and must not be omitted.

    a. Provide construction joints in accordance with ACI 318.

2. Provide waterstops in construction joints as indicated on the Contract Documents in sizes to suit joint.

3. Install waterstops to form continuous diaphragm in each joint.

4. Support and protect exposed waterstops during progress of Work.

5. Field-fabricate joints in waterstops according to manufacturer's printed instructions.

C. Coordinate the installation of pipes, bolts, hangers, anchors, flashing and other embedded items with the work of other trades.

2.8 FIELD QUALITY CONTROL

A. General: The Owner's Testing Laboratory shall test and inspect concrete reinforcement and embedded assemblies as Work progresses. Failure to detect any defective work or material shall not in any way prevent later rejection when such defect is discovered nor shall it obligate the Design Professionals for final acceptance.

B. Owner's Testing Laboratory shall provide qualified personnel at site to inspect reinforcement and embeds using the latest Drawings and reviewed shop drawings, as follows:

1. Prior to placement, inspect reinforcement and embeds for grade, quality of material, absence of foreign matter, and for suitable storage.

2. Provide continuous inspection of reinforcement and embedded assemblies during placement and immediately prior to concreting operations for: size, quantity, vertical and horizontal spacing and location, correctness of bends and splices, mechanical splices, clearances, compliance with specified tolerances, security of supports and ties, concrete cover, and absence of foreign matter.

3. Inspect epoxy-coated reinforcement for coating damage and required applied coatings.

C. Owner's Testing Laboratory shall submit inspection, observation, and/or test reports to the Design Professionals as required herein and shall provide an evaluation statement in each report stating whether or not concrete reinforcement and embedded assemblies conforms to requirements of Specifications and Drawings and shall specifically note deviations there from.

D. Immediately report deficiencies to the Contractor. Contractor shall prepare proposed remedy for deficiency. Contractor shall present proposal to the Design Professionals for

approval. After an approved proposal is accepted by the Design Professionals, the Contractor shall correct the deficiency at no cost to the Owner.

END OF SECTION