SECTION 13 1202 - WATER FEATURE STEEL REINFORCEMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes the following:
 - 1. Reinforcing Steel Bars
 - 2. Wire Fabric
 - 3. Expanded Metal Lath
 - 4. Reinforcing Fibers
 - 5. Supports and Accessories
- B. Related Sections:
 - 1. SECTION 13 1203 WATER FEATURE CONCRETE FORMWORK
 - 2. SECTION 13 1204 WATER FEATURE CAST IN PLACE CONCRETE
 - 3. SECTION 13 1205 WATER FEATURE SHOTCRETE
 - 4. SECTION 13 1611 WATER FEATURE GROUNDING
- C. References:
 - 1. ACI 301-05 STANDARD SPECIFICATIONS FOR STRUCTURAL CONCRETE
 - 2. ACI 318-05 BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE
 - 3. ACI SP-4 AMERICAN CONCRETE INSTITUTE DETAILING MANUAL
 - 4. ASTM A184– FABRICATED DEFORMED STEEL BAR MATS FOR CONCRETE REINFORCEMENT
 - 5. ASTM A615 DEFORMED AND PLAIN BILLET-STEEL BARS FOR CONCRETE REINFORCEMENT
 - 6. ASTM A641 STANDARD SPECIFICATION FOR ZINC COATED (GALVANIZED) CARBON STEEL WIRE
 - 7. ASTM A706/706M LOW-ALLOY STEEL DEFORMED BARS FOR CONCRETE REINFORCEMENT
 - 8. ASTM A775/775M EPOXY COATED REINFORCING STEEL BARS
 - 9. ASTM A1064 STANDARD SPECIFICATION FOR CARBON-STEEL WIRE AND WELDED WIRE REINFORCEMENT, PLAIN AND DEFORMED, FOR CONCRETE
 - 10. ASTM D3963 EPOXY COATED REINFORCING STEEL
 - 11. AWS D1.4-04 STRUCTURAL WELDING CODE FOR REINFORCING STEEL
 - 12. CRSI CONCRETE REINFORCING STEEL INSTITUTE MANUAL OF STANDARD PRACTICE
 - 13. CRSI 63 RECOMMENDED PRACTICE FOR PLACING REINFORCING BARS
 - 14. CRSI 65 RECOMMENDED PRACTICE FOR PLACING BAR SUPPORTS, SPECIFICATIONS, AND NOMENCLATURE
- 1.2 SUBMITTALS FOR REVIEW
 - A. SECTION 01 3300 SUBMITTAL PROCEDURES
 - B. Product Data: Submit manufacturer's literature and material specification on reinforcement support, chairs, bolsters, spacers, etc. indicating type and location for use. Only approved supports and methods approved by the engineer will be allowed.
 - C. Shop Drawings: Indicate bar sizes, spacing, locations, and quantities of reinforcing steel and wire fabric, bending and cutting schedules, supporting, and spacing devices, and beam reinforcing elevations.
 - D. Submit certified copies of mill test reports of reinforcement material analysis. Certify that products meet or exceed specified requirements.
- 1.3 DELIVERY, STORAGE, AND HANDLING
 - A. Reinforcing Steel shall be free of heavy rust scales and flakes, or other coating at time of delivery and placing. Properly protect rebar on site after delivery to prevent rust scales and flaking.
 - B. Deliver bars separated by size and tagged with manufacturer's heat or test identification number.

PART 2 - PRODUCTS

- 2.1 MATERIALS
 - A. Reinforcing Steel:
 - 1. For general use: Deformed, new billet steel bars conforming to ASTM A615. Provide Grade 60 bars (400 MPA) unless otherwise noted on Contract Drawings, bars shall have grade identification marks.
 - For saltwater pools, wet pits, and locations exposed to moisture: Deformed, new billet steel bars, conforming to ASTM A615, Grade 60 (400 MPa) bars, Epoxy Coated in accordance with ASTM D3963.
 - 3. For freshwater pools, wet pits, and locations exposed to moisture: Deformed, new billet steel bars conforming to ASTM A615, Grade 60 (400 MPa) bars. Provide Epoxy Coated bars as noted on Contract Drawings.
 - 4. Fabricate and bend reinforcing steel in accordance with latest edition of the "ACI Detailing Manual" and details on Contract Drawings.
 - B. Welded Wire Fabric:
 - 1. Welded Steel Wire Fabric with fiber yield strength of 60,000 psi (400 MPa) conforming to ASTM A185.
 - Provide 4- x 4-inch W1.4/1.4 (100 x 100 MW9.1/9.1) for 4-inch (100mm) slabs and 6- x 6-inch W2.1/2.1 (150 x 150 MW13.3/13.3) for 5-inch (125mm) slabs unless otherwise noted on the Contract Drawings
 - 3. Provide mesh in flat sheets only. Mesh rolls will not be acceptable.
 - C. Expanded Metal Lath:
 - 1. Expanded Metal Lath with galvanized finish conforming to ASTM C847.
 - D. Reinforcing Fibers:
 - 1. Acceptable Manufacturers
 - a. Euclid Chemical, Fiberstrand 100
 - b. W. R. Grace, Grace Fibers
 - c. Fibermesh, Inc.
 - 2. Fibrillated virgin polypropylene fibers, 3/4-inch (20mm) long.
 - E. Supports and Accessories
 - 1. Tie Wire:
 - a. 14-gauge, 0.0641-inch (1.63mm) or 16-gauge, 0.0508-inch (1.29mm) deformed wire conforming to ASTM A496.
 - b. 14-gauge, 0.0641-inch (1.63mm) or 16-gauge, 0.0508-inch (1.29mm) black, soft, smooth iron wire conforming to ASTM A82.
 - 2. Supports for Reinforcement:
 - a. Use 5,800 psi (40 MPa) pre-cast concrete chairs or "Dobies" with embedded wire ties where concrete is placed over water or vapor proof membranes.
 - b. Wire bar type supports complying with CRSI MPS 1-90, Chapter 3, with spacers and upturned legs. Where support legs are in contact with forms, provide supports with plastic protected legs, CRSI Class C.
 - c. Provide chairs, bar supports, spacers, or hangers as recommended by "ACI Detailing Manual", latest edition, except slab on grade. Engineer must approve work, materials, and methods.

PART 3 - EXECUTION

- 3.1 PLACEMENT
 - A. Provide following minimum concrete cover for reinforcement (ACI 318-89):
 - 1. Concrete cast against and permanently exposed to Earth
 - a. Exterior Slabs on Grade 2-inches (50mm)
 - b. Interior Slabs on Grade 2-inches (50mm)
 - c. Sections other than Slabs 3-inches (75mm)
 - 2. Concrete exposed to Earth, Water, or Weather
 - a. No. 5 (T16) and smaller bars 2-inches (50mm)
 - b. No. 6 (T19) and larger bars 2-inches (50mm)
 - 3. Concrete not exposed to Earth, Water, or Weather
 - a. Slabs, Walls, and Joists 1-inch (25mm)
 - b. Beams and Columns 1.2-inches (37mm)
 - B. Accurately place and support reinforcement with engineer approved chairs, bar supports, spacers, or hangers as recommended by the "ACI Detailing Manual", latest edition, except slabs on grade work. Support bars in slabs on grade and footings with specified and approved supports to maintain specified concrete cover.
 - C. Securely anchor and tie reinforcing bars and dowels prior to placing concrete.
 - D. Coordinate with other trades, locations of all formed openings or penetrations for piping or conduits prior to placing concrete. Accommodate openings and penetrations by providing necessary reinforcement around openings.
 - E. Avoid splices of reinforcing bars at points of maximum stress. Lap bars 40 bar diameters minimum unless dimensioned otherwise on the Contract Drawings.
 - F. Run steel reinforcing bars continuous through cold joints.
 - G. Torches will not be allowed for cutting or bending reinforcing bars. Cut bars using cutter. Do not use torches to heat bars for bending, bend bars cold.
 - H. Provide full length bars, accurately bent to details. Do not field bend bars partially embedded in concrete except as indicated on the Contract Drawings or specifically permitted by the engineer.
 - I. Bond and ground all reinforcement in accordance with National Electrical Code (NEC) requirements. When epoxy coated water feature steel reinforcement is specified or used, then the Contractor shall provide #8 AWG copper wire overlaying the encapsulated reinforcing steel to provide the equipotential bonding grid in the shell of the feature.
 - J. Lay welded wire fabric continuously, with edges and ends of adjoining sheets overlapping at least one full mesh, and not less than 6-inches (150mm), tie splices with 16-gauge, 0.0508-inch (1.29mm) wire. Offset end laps in adjacent sheets to prevent continuous laps.
 - K. Support welded wire fabric 2-feet (0.6m) on centers throughout the field and 2-feet (0.6m) on center along all edges.

3.2 EXAMINATION

A. Provide 48-hour notice to engineer to allow for inspection of completed concrete reinforcement before placing concrete.

B. Coordinate scheduling of concrete placement to allow for structural engineer inspection and observation and for making necessary adjustments to the reinforcing placement before delivery of concrete.

END OF SECTION