

## **SECTION 03 20 00 - CONCRETE REINFORCING**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section Includes:
  - 1. Steel reinforcement bars.
  - 2. Welded-wire reinforcement.
- B. Related Requirements:
  - 1. Section 031000 "Concrete Forming and Accessories".
  - 2. Section 033000 "Cast-in-Place Concrete": for preinstallation conference requirements.
  - 3. Item P-501 "Cement Concrete Pavement" for reinforcing related to concrete pavement and walks.

#### **1.2 ACTION SUBMITTALS**

- A. Product Data: For the following:
  - 1. Each type of steel reinforcement.
  - 2. Epoxy repair coating.
  - 3. Zinc repair material.
  - 4. Bar supports.
  - 5. Mechanical splice couplers.
  - 6. Structural thermal break insulated connection system.
- B. Shop Drawings: Comply with ACI SP-066:
  - 1. Include placing drawings that detail fabrication, bending, and placement.
  - 2. Include bar sizes, lengths, materials, grades, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, location of splices, lengths of lap splices, details of mechanical splice couplers, details of welding splices, tie spacing, hoop spacing, and supports for concrete reinforcement.
  - 3. For structural thermal break insulated connection system, indicate general configuration, insulation dimensions, tension bars, compression pads, shear bars, and dimensions.
- C. Construction Joint Layout: Indicate proposed construction joints required to build the structure.
  - 1. Location of construction joints is subject to approval of the Architect/Engineer.

#### **1.3 INFORMATIONAL SUBMITTALS**

- A. Welding certificates.
  - 1. Reinforcement To Be Welded: Welding procedure specification in accordance with AWS D1.4/D1.4M
- B. Material Test Reports: For the following, from a qualified testing agency:
  - 1. Steel Reinforcement:

- a. For reinforcement to be welded, mill test analysis for chemical composition and carbon equivalent of the steel in accordance with ASTM A706/A706M.
2. Mechanical splice couplers.

#### **1.4 QUALITY ASSURANCE**

- A. Welding Qualifications: Qualify procedures and personnel in accordance with AWS D1.4/D 1.4M.
- B. Mockups: Reinforcing for cast-concrete formed surfaces, to demonstrate tolerances and standard of workmanship.
  1. Build panel approximately 100 sq. ft. for formed surface> in the location indicated on Drawings or, if not indicated, as directed by Architect.
  2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

#### **1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.
  1. Store reinforcement to avoid contact with earth.
  2. Do not allow epoxy-coated reinforcement to be stored outdoors for more than 60 days without being stored under an opaque covering.
  3. Do not allow dual-coated reinforcement to be stored outdoors for more than 60 days without being stored under an opaque covering.
  4. Do not allow stainless steel reinforcement to come into contact with uncoated reinforcement.

### **PART 2 - PRODUCTS**

#### **2.1 STEEL REINFORCEMENT**

- A. Reinforcing Bars: ASTM A615/A615M, deformed bars; grade as shown on drawings
- B. Headed-Steel Reinforcing Bars: ASTM A970/A970M.
- C. Deformed-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, flat sheet.

#### **2.2 REINFORCEMENT ACCESSORIES**

- A. Joint Dowel Bars: ASTM A615/A615M, Grade as noted on plan, plain-steel bars, cut true to length with ends square and free of burrs.
- B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place.

1. Manufacture bar supports from steel wire, plastic, or precast concrete in accordance with CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
  - a. For concrete surfaces exposed to view, where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire, all-plastic bar supports, or CRSI Class 2 stainless steel bar supports.
  - b. For epoxy-coated reinforcement, use CRSI Class 1A epoxy-coated or other dielectric-polymer-coated wire bar supports.
  - c. For dual-coated reinforcement, use CRSI Class 1A epoxy-coated or other dielectric-polymer-coated wire bar supports.
  - d. For zinc-coated reinforcement, use galvanized wire or dielectric-polymer-coated wire bar supports.
  - e. For stainless steel reinforcement, use CRSI Class 1 plastic-protected steel wire, all-plastic bar supports, or CRSI Class 2 stainless steel bar supports.

C. Steel Tie Wire: ASTM A1064/A1064M, annealed steel, not less than 0.0508 inch in diameter.

## **2.3 FABRICATING REINFORCEMENT**

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

## **PART 3 - EXECUTION**

### **3.1 PREPARATION**

- A. Protection of In-Place Conditions:
  1. Do not cut or puncture vapor retarder.
  2. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.

### **3.2 INSTALLATION OF STEEL REINFORCEMENT**

- A. Comply with CRSI's "Manual of Standard Practice" for placing and supporting reinforcement.
- B. Accurately position, support, and secure reinforcement against displacement.
  1. Locate and support reinforcement with bar supports to maintain minimum concrete cover.
  2. Do not tack weld crossing reinforcing bars.
- C. Preserve clearance between bars of not less than 1 inch, not less than one bar diameter, or not less than 1-1/3 times size of large aggregate, whichever is greater.
- D. Provide concrete coverage in accordance with ACI 318 and values noted in the notes and details of the contract documents.
- E. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- F. Splices: Lap splices as indicated on Drawings.

1. Bars indicated to be continuous, and all vertical bars shall be lapped not less than 36 bar diameters at splices, or 24 inches, whichever is greater.
  2. Stagger splices in accordance with ACI 318.
- G. Install welded-wire reinforcement in longest practicable lengths.
1. Support welded-wire reinforcement in accordance with CRSI "Manual of Standard Practice."
    - a. For reinforcement less than W4.0 or D4.0, continuous support spacing shall not exceed 12 inches.
  2. Lap edges and ends of adjoining sheets at least one wire spacing plus 2 inches for plain wire and 8 inches for deformed wire.
  3. Offset laps of adjoining sheet widths to prevent continuous laps in either direction.
  4. Lace overlaps with wire.

### **3.3 JOINTS**

- A. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
1. Place joints perpendicular to main reinforcement.
  2. Continue reinforcement across construction joints unless otherwise indicated.
  3. Do not continue reinforcement through sides of strip placements of floors and slabs.
- B. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length, to prevent concrete bonding to one side of joint.

### **3.4 INSTALLATION TOLERANCES**

- A. Comply with ACI 117

### **3.5 FIELD QUALITY CONTROL**

- A. Special Inspections: Owner will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports in accordance with project special inspection requirements.
- B. Inspections:
1. Steel-reinforcement placement.
  2. Steel-reinforcement mechanical splice couplers.
  3. Steel-reinforcement sizes and arrangement in accordance with project structural documents.

### **END OF SECTION**