

# **SECTION 03 20 00 CONCRETE REINFORCING**

## **PART 1 GENERAL**

### **1.1 SECTION INCLUDES**

- A. Reinforcing steel bars, wire fabric or rod mats for cast-in-place concrete.
- B. Support chairs, bolsters, bar supports, and spacers for supporting reinforcement.

### **1.2 REFERENCES**

- A. AASHTO M 254: Standard Specification for Corrosion Resistant Coated Dowel Bars.
- B. ACI 301: Specifications for Structural Concrete for Buildings.
- C. ACI 315: Details and Detailing of Concrete Reinforcement.
- D. ASTM A 82: Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
- E. ASTM A 185: Standard Specification for Steel Welded Wire, Fabric, Plain, for Concrete Reinforcement.
- F. ASTM A 615: Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
- G. ASTM A 706: Standard Specification for Low-Alloy Steel Deformed Bars for Concrete Reinforcement.
- H. ASTM C 1116: Standard Specification for Fiber-Reinforced Concrete and Shotcrete.
- I. ASTM D 3963: Standard Specification for Epoxy-Coated Reinforcing Steel.
- J. AWS D1.1: Structural Welding Code Steel.
- K. AWS D1.4: Structural Welding Code Reinforcing Steel.
- L. CRSI Document: Manual of Standard Practice.

### **1.3 SUBMITTALS**

- A. Manufacturer's Certificate: Submit mill test certificates of supplied concrete reinforcement, indicating physical and chemical analysis.
- B. Welder's certification.
- C. Shop Drawings.
  - 1. Indicate sizes, spacings, locations, and quantities of reinforcing steel, wire fabric, bending and cutting schedules, splicing, stirrup spacing, supporting, and spacing devices.
  - 2. When required, prepare shop drawings by an engineer who complies with Utah licensing law and is acceptable to agency having jurisdiction.

### **1.4 QUALITY ASSURANCE**

- A. Perform concrete reinforcement work per CRSI Manual of Standard Practice.
- B. Comply with ACI 301.
- C. Welders: Certified to comply with AWS D1.1 or AWS D1.4 as applicable.

### **1.5 ACCEPTANCE**

- A. Unless specified otherwise, chairs for supporting reinforcement in flat slabs are spaced as follows.
  - 1. 3 feet maximum for No. 5 and smaller bars.
  - 2. 5 feet maximum for bars larger than No. 5.
- B. Dowels are placed on dowel baskets and properly aligned.
- C. Epoxy and galvanized coatings are not chipped or cut. Ends of cut bars are epoxy coated or galvanized painted prior to placement.
- D. Minimum covering over reinforcement is as specified.

## **PART 2 PRODUCTS**

### **2.1 MATERIALS**

- A. Fiber Reinforcement: ASTM C 1116 glass.
- B. Reinforcing Steel: Deformed 60 ksi yield grade steel, ASTM A 615 and supplementary requirements S1 or ASTM A 706 for welding.
- C. Welded Steel Wire Fabric: ASTM A 185 plain type in flat sheets or coiled rolls.  
Dimensions of the mesh 4"x 4" or as indicated.
- D. Stirrups: ASTM A 82 steel.
- E. Plain Dowel Bars for Expansion Joints: Smooth grade 60 ksi yield grade steel, ASTM A 615,
  - 1. Galvanized or epoxy coated in roadway Pavements.
  - 2. Provide metal dowel cap at one end of dowel to permit longitudinal movement of dowel within concrete section. Design caps with 1 end closed.
  - 3. Provide for movement equal to joint width plus 1/2 inch.
  - 4. For load transfer bars, paint with 1 coat of paint conforming to AASHTO M 254 and coat 1/2 with grease.
- F. Coatings for Corrosion Protection:
  - 1. Epoxy coat, ASTM D 3963.
  - 2. Galvanized, Section 05 05 10.

### **2.2 ACCESSORY MATERIALS**

- A. Tie Wire: Minimum 16 gage annealed type or an acceptable patented system.
- B. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during installation and placement of concrete.

### **2.3 FABRICATION**

- A. Fabricate reinforcement, ACI 315 providing for concrete cover.
- B. Locate reinforcing splices not indicated on Drawings at points of minimum stress.  
Indicate location of splices on shop drawings.
- C. Weld reinforcing bars; with AWS D1.4.

## **PART 3 EXECUTION**

### **3.1 PLACING**

- A. All reinforcement to be free of loose mill scale, loose or thick rust, dirt, paint, oil or grease.
- B. Place all reinforcement in the exact position indicated. With tie wire, tie bars together at all intersections except where spacing is less than 12 inches in each direction, in which case tie alternate intersections.
- C. Maintain the distance from vertical forms and between layers of reinforcement by means of prefabricated chairs, ties, hangers, or other approved devices. Placing and fastening of reinforcement in each section of the Work must be approved before concrete is placed.
- D. Overlap sheets of metal mesh one square plus 6 inches to maintain a uniform strength. Securely fasten at the ends, edges, and supports to maintain clearances.
- E. Flat Slab Work:
  - 1. Support reinforcing steel of formed flat slabs with metal chairs, precast concrete blocks or other slab bolsters.
  - 2. Size chairs or bolsters to position the steel in the exact location indicated.
  - 3. Space chairs for supporting the top steel and bolsters for supporting the bottom steel not more than 5 feet on centers in each direction.
  - 4. Plastic or epoxy coat that portion of the metal support in contact with the forms to prevent rust.
  - 5. Tie down deck steel to beams or forms at regular intervals of not more than 5 feet on centers along the beams or forms to prevent movement of the steel during concrete placement.

### **3.2 SPLICING**

- A. Furnish all reinforcement in the full lengths indicated unless otherwise permitted. Splicing of bars, except where indicated is not permitted without written approval. Stagger splices where possible.
- B. Unless indicated otherwise, overlap reinforcing bars a minimum of 30 diameters to make the splice. In lapped splices, place the bars and wire to maintain the minimum distance for clear spacing to the surface of the concrete.
- C. Do not use lap splices on bars greater in diameter than No. 11 unless approved.
- D. Weld reinforcing steel only if indicated or if authorized in writing. Weld in conformance to AWS D1.4.
- E. Do not bend reinforcement after embedding in hardened concrete.
- F. Do not permit reinforcement or other embedded metal items bonded to the concrete, to extend continuously through any expansion joint, except dowels in floors bonded on only one side of joints.

### **3.3 PLACING EMBEDDED ITEMS**

- A. Place all sleeves, inserts, anchors and embedded items prior to concrete placement. Temporarily fill voids in embedded items to prevent entry of concrete.

B. Give all trades whose work is related to the concrete section ample notice and opportunity to introduce or furnish embedded items before concrete placement.

END OF SECTION