

SECTION 03200 REINFORCING

PART 1 - GENERAL

1.01 DESCRIPTION.

Requirements specified in Conditions of the Contract and in Division 1 form a part of this Section. Provide reinforcing work, complete as indicated, specified and required.

- A. Work Included in This Section. Principal items are:
 - 1. Furnishing and placing bar reinforcing for cast-in-place concrete.
- B. Related Work Not Included in This Section.
 - 1. Formwork, concrete and cement finish work.

1.02 QUALITY ASSURANCE.

A. Code Requirements. Unless otherwise specified all work specified herein and as shown on the Drawings shall conform to the applicable requirements of Chapter 19 of the Uniform Building Code, 1997 Edition.

B. Testing. Materials shall be tested as hereinafter specified and unless specified otherwise all sampling and testing shall be performed by Owner approved Testing Laboratory with cost borne by the Contractor.

- 1. Test Samples. Bars, ties, and stirrups shall be selected by Testing Laboratory representative from material at the site or from place of distribution. Selection shall include at least 2 pieces, each 18" long, of each sampling.
- 2. Required Tests.
 - a. Identified Bars. Testing will not be required if reinforcement is taken from bundles as delivered from the mill, identified as to heat number and accompanied by certified mill analyses and mill test reports, and is properly tagged with Identification Certificate so as to be readily identified, unless directed by the Owner.
 - b. Unidentified Bars. When positive identification cannot be made or when random samples are taken, tests shall be made from each 5 tons or fraction thereof for each size. One tensile and one bend test shall be made from specimens of each size of reinforcement. Contractor shall bear costs for testing unidentified bars.

C. Standard. Reinforcing steel installations shall conform to the specification requirements of the Concrete Reinforcing Steel Institute "Manual of Standard Practice" (herein referred to as the CRSI Manual) except as otherwise indicated or specified.

D. Field Quality Control. All continuous inspections shall be performed by "Special Inspectors" qualified and approved by Governing Building Official. Reports as required by Code shall be prepared and submitted to Owner and Building Department.

- 1. Inspection of Reinforcing. Refer to Section "Cast-In-Place Concrete".
- 2. Concreting Operations. During concrete placing, assign ironworkers to inspect reinforcement and maintain bars in correct positions at each pour location.

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1.03 SUBMITTALS.

Submit the following at least two weeks in advance of fabrication:

A. Shop Drawings. Submit shop drawings for reinforcing steel prepared in accordance with ACI 315, "Manual of Standard Practice for Detailing Reinforced Concrete Structures". Show layouts, bending diagrams, assembly diagrams, dimensioned types and locations of all bar laps and splices, and shapes, dimensions, and details of bar reinforcing and accessories. Include layout plans for bar supports and chairs, with typical details. These shop drawings are to be submitted prior to the work being performed.

PART 2 - PRODUCTS

2.01 REINFORCING BARS.

Deformed bars conforming to ASTM A615, Grade 60, Type 'S'.

2.02 TIE WIRE.

Annealed steel, 16 gage minimum.

2.03 SUPPORTS AND ACCESSORIES.

Use no aluminum, galvanize steel or stainless-steel supports or accessories. Supports as herein specified shall conform to CRSI Manual of Standard Practice, Chapter 3, for Types SB, BB, BC, JC, HC, CHC, and others of standard types as required. Use precast concrete block supports with embedded wire ties or dowels for placement on grade or on membranes.

2.04 DOWELS.

Where and as designated on Structural Drawings, provide reinforcing bar dowels in new work and for anchorage to existing concrete. For anchorage where shown or required to existing construction use non-shrink epoxy type grout or deferred bolting devices as approved in each instance and conforming to "Product" Article requirements of Section, Cast-In-Place Concrete.

2.05 FABRICATION AND DELIVERY.

Conform to CRSI Manual Chapters 6 and 7 except as otherwise indicated or specified. Bundle reinforcement and tagged with suitable identification to facilitate sorting and placing, and transport and store at site so as not to damage material. Keep a sufficient supply of tested, approved, and proper reinforcement at site to avoid delays.

A. Bending and Forming. Fabricate bars of indicated size and accurately form to shapes and lengths indicated and required by methods not injurious to materials. Do not heat reinforcement for bending. Bars with kinks or bends not scheduled will be rejected. Field bend NO bars that are partially embedded in concrete, except as shown on the Plans or specifically approved by the Owner.

PART 3 - EXECUTION

3.01 PLACING.

Unless otherwise indicated or specified, conform to CRSI Manual Chapter 8 including placement tolerances.

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A. Cleaning. Before placing reinforcing, and again before concrete is placed, clean reinforcement of loose mill scale, oil, or other coating that might destroy or reduce bond. Do not allow form coatings, release agents, bond breaker, or curing compound to contact reinforcement.

B. Concrete Coverage, over reinforcing bars shall be as indicated. The coverage shall be to the outer edge of ties, stirrups, bar spacers, hangers, and like items, and the reinforcing shall be detailed and fabricated accordingly.

C. Securing in Place. Accurately place reinforcement and securely wire tie in precise position at all points where bars cross or 12 inches on center, whichever is greater. Tie stirrups to bars at both top and bottom. Bend ends of binding wires inward allowing no encroachment on the concrete cover; exercise special care at surfaces to remain exposed and unpainted. Support bars in accordance with CRSI Manual Chapter 3, Specifications for Placing Bar Supports, using approved chairs and supports.

D. Splices, shall be wired contact lap splices unless otherwise indicated or approved. Splices shall conform to ACI 318 and Typical Structural Details, except where lap length is indicated on the Drawings.

1. Horizontal Bars. Unless otherwise shown, make Class B lap splice.

E. Welding, of reinforcing bars is not permitted unless indicated or approved in each case. Welds for securing crossing bars are not allowed. Perform welding in shop or field by direct electric arc process, with thoroughly trained and experienced certified operators qualified in accordance with AWS Code D1.1. Conform all welding to AWS D12.1, "Recommended Practices for Welding Reinforcing Steel, Metal Inserts and Connections in Reinforced Concrete Construction." Use low-hydrogen electrodes. Welds shall develop at least 125 percent of the yield strength of the connected bars.

1. Preparation. Clean surfaces to be welded of loose scale and all foreign material. Clean welds each time electrode is changed. Chip burned edges clean before welds are deposited.

2. Characteristics of Welds. When brushed with wire brushes, completed welds shall exhibit uniform section, smoothness of welded metal, feather edges without undercuts or overlays, freedom from porosity and clinkers, and good fusion with penetration into base metal. Cut out welds or parts of welds found defective with chisel and replace with proper workmanship; cutting torch for removing defective welding is not acceptable.

F. Additional Reinforcing. Provide additional reinforcing bars at sleeves and openings as indicated or required. Where additional bars are not shown for such locations, obtain Owner's instructions and provide additional bars as directed, at no extra cost to Owner.

END OF SECTION 03200