

DIVISION 3

SECTION 03200 – CONCRETE REINFORCING

PART 1 – GENERAL

1.01 Work Included

- A. Furnish, bend and install all reinforcing bars, welded wire fabric, ties and supports.
- B. Furnish and install fiber reinforcing materials.
- C. Related work specified elsewhere:
 - 1. Section 03300, Cast-in-Place Concrete.

1.02 Quality Assurance

- A. Fabricate and place reinforcing steel in accordance with the latest edition of ACI 315, "Manual of Standard Practice for Detailing Reinforced Concrete Structures", and as detailed on the Drawings.
- B. Contractor Quality Assurance Program: Refer to Section 03300 for requirements.
- C. Reference Standards: Comply with requirements of the following codes and standards, except as otherwise shown or specified:
 - 1. ACI 318, "ACI Standard Building Code Requirements for Reinforced Concrete".
 - 2. ACI 315, "Manual of Standard Practice for Detailing Reinforced Concrete Structures".
 - 3. ACI 301-72, "Specifications for Structural Concrete for Buildings".
 - 4. CRSI "Manual of Standard Practice".
 - 5. CRSI "Recommended Practice for Placing Reinforcing Bars".
 - 6. CRSI "Recommended Practice for Placing Bar Supports".
 - 7. AWS D12.1, "Recommended Practices for Welding Reinforcing Steel, Metal Inserts and Connections in Reinforced Concrete Construction".
- D. Contractor shall obtain specific approval from the Architect/Engineer for the following items:
 - 1. Relocation of bars to an extent that causes placement tolerances to be violated.
 - 2. Bar chairs and spacers.
 - 3. Splices not shown on the Drawings and mechanical connectors.
 - 4. Bending of reinforcement embedded in hardened concrete.

1.03 Product Delivery, Storage and Handling

- A. Deliver reinforcement to site in strongly tied bundles with metal tags corresponding to bar schedules and diagrams. Store on the site free of rust, scale, oil or other coating. Store bars off the ground and protect from moisture, dirt, oil or deleterious coatings.
- B. If concreting is delayed for any considerable period of time after reinforcement is in place, it shall be protected by suitable covering.
- C. Protect exposed reinforcement intended for bonding with future extensions by suitable covering, if applicable.

PART 2 – PRODUCTS

2.01 Reinforcing Materials

- A. Bars: ASTM A615-82, 60 KSI grade, deformed billet steel bars, plain finish, as indicated on the Drawings. Bars shall be free of scale or other bond-reducing coatings.
- B. Ties, stirrups and field bent bars, #3 or smaller, may be ASTM A615, 40 KSI grade. Welded Wire Fabric: ASTM A185 or A497, plain type in flat sheets, plain finish, welded intersections, in sizes as indicated on the Drawings. Use of coiled rolls shall not be permitted.
- C. Steel Wire: Provide plain cold-drawn wire conforming to ASTM A82.
- D. Fiber Reinforcing: Collated, fibrillated polypropylene fiber, Fiber Mesh I, Fiber Mesh, Inc., Chattanooga, TN, or equal.

2.02 Accessory Materials

- A. Accessories shall be of suitable type conforming to ACI 315 and shall include spacers, chairs, tie bars, support bars and all other devices for properly assembling, placing and supporting reinforcement, weight of concrete and workmen without displacement of reinforcement. Wood, brick, block, concrete chips and other non-metallic devices are not acceptable.
- B. For exposed-to-view concrete surfaces where legs of supports are in contact with forms, provide supports with legs which are hot-dipped galvanized, plastic protected or stainless steel protected.
- C. Wire Ties: Wire for tying shall be annealed, cold-drawn wire of at least 16-gage.

2.03 Fabrication

- A. Shop fabricate reinforcing bars to conform to the required shapes and dimensions with fabrication tolerance complying with ACI 315. Cold bend bars in a manner which will not injure material.
- B. Straightening or rebending at site will not be permitted for bars over 40 KSI yield strength.
- C. Where reinforcing bars are shown welded to structural steel, bars are to be furnished by rebar supplier and welded in place by structural steel erector.

PART 3 – EXECUTION

3.01 Preparation

- A. Site preparation and compaction of existing and/or imported fill materials shall be in accordance with the requirements of Section 02225. If the foundation structure design shown on the Drawings and/or specified will not strictly conform to this requirement, advise Architect/Engineer before proceeding with work of this Section.

3.02 Splices

- A. Splices not shown on the Drawings must be approved by the Architect/Engineer.
- B. Lapped splices shall be securely wired together. Minimum laps shall be in accordance with requirements of ACI 318 and ACI 301-72 and as shown on the Drawings. Offset vertical lap splices at least one bar diameter.
- C. Lapped splices for welded wire fabric shall be made so that overlap of outermost wires is not less than one full mesh. Lace splices together with 16-gage wire.

3.03 Placing Reinforcing Steel

- D. Prior to placing into position, thoroughly clean reinforcement of mill and excessive rust, scale, dust, mud, oil, ice and all other deleterious coating which may destroy or reduce bond.
- E. All reinforcing shall be placed in accordance with the Drawings and the "Manual of Standard Practice for Detailing Reinforced Concrete Structures", ACI 315, ACI 301 and ACI 318.
- F. Accurately place and support reinforcing steel with chairs, bar supports, spacers or hangers as recommended by ACI detailing manual except in slab-on-grade work. Support bars in slabs-on-grade and footings with approved accessories.
- G. Place reinforcing bars to a tolerance of $\pm 1/4"$, except that minimum spacings between bars shall be to a tolerance of $\pm 1/4"$. Bars may be moved as necessary to avoid interference with other reinforcing steel, conduit or embedded items. The Architect/Engineer's approval must be obtained prior to moving bars under these circumstances.
- H. Securely anchor and tie reinforcing bars and dowels prior to placing concrete.
- I. Place reinforcement to obtain at least the minimum coverage for concrete protection shown on the Drawings and specified. Do not place reinforcement with additional concrete cover unless expressly approved by the Structural Engineer.
- J. Steel reinforcing bars shall run continuous through cold joints.

3.04 Placing Welded Wire Fabric

- A. Welded wire fabric shall be placed 2" below slab surface or as indicated on the Drawings and shall not be permitted to be placed on subgrade prior to concrete placement and hooked into position. Reinforcement shall be fully supported at required elevation prior to concrete placement. Use continuous chairs or support bars in structural slabs to maintain proper locations as shown on the Drawings.
- B. Install welded wire fabric using full sheets as large as possible. Lap adjoining pieces as specified herein. Offset end laps in adjacent widths to prevent continuous laps in either direction.

3.05 Placing Fiber Reinforcing

- C. Place fiber reinforcing in accordance with manufacturer's written instructions and recommendations.
 - 1. 1-1/2 lbs. per cu. yd., unless otherwise recommended by manufacturer.

PART 4 – SCHEDULES

4.01 Schedule of Reinforcing Materials

- A. Reinforcing materials shall be placed in quantities, sizes and spacing as shown on the Drawings and/or as scheduled herein:
 - 1. Reinforcing bars and welded wire fabric shall be installed where shown or scheduled on the Drawings.
- B. Fiber reinforcing shall be placed in all poured-in-place concrete flatwork, including exterior concrete drives, apron pavements and curb and gutter sections, sidewalks, etc., regardless of whether these already are reinforced with steel or wire materials.
- C. Fiber reinforcing is not required in footings, foundation walls, grade beams and piers.

END OF SECTION