

SECTION 032000 - CONCRETE REINFORCEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections apply to this section.

1.2 SECTION INCLUDES

- A. Steel reinforcing bars, ties, dowels and welded wire fabric, miscellaneous reinforcement and accessories.

1.3 RELATED WORK

- A. Sections of Division 3, Concrete, as well as all other sections including interface with concrete work.

1.4 QUALITY ASSURANCE

- A. References: Conform to and perform work in accordance with the current editions of:
 - 1. Local and State Building Codes.
 - 2. "Building Code Requirements for Reinforced Concrete", ACI 318-95.
 - 3. "Manual of Standard Practice for Detailing Reinforced Concrete Structures", ACI 315, and CRSI 63 and CRSI 65.
 - 4. Specifications for Structural Concrete Buildings ACI 301.
 - 5. ANSI/AWS D1.4 Welding Code.
- B. Manufacturing Source: Reinforcing Steel of domestic origin.
- C. Fabricator: Maintain a competent engineering department and adequate equipment to fabricate steel in accordance with CRSI Manual of Standard Practice, latest edition.

1.5 SUBMITTALS

- A. Shop Drawings: Show plan layouts (including dimensioned slab openings), elevation drawings, bending, splicing, sizes, spacing and details of all reinforcing and accessories.
Please note that the Contract Documents in CADD format will not be made available to the contractor for their use in the preparation of the shop drawings, unless a release is signed, and a fee is paid for each cadd file requested.
- B. Reports and Results: From inspection and testing as soon as determination is made.

1.6 PRODUCT HANDLING

- A. Packing: Reinforcement must be tagged as required to indicate respective mill test and job condition.
- B. Storage and Handling: Protect products in such a manner as to prevent damage, bending, or undue rusting. Store at site to permit easy access for proper inspection and identification of each shipment. Separate material of each shipment for size and shape.

PART 2 - PRODUCTS

2.1 REINFORCING: Manufacture and deform in accordance with ANSI/ASTM A-615, except all reinforcing to be welded shall conform to ASTM A-706. All rebar shall consist of domestic manufacture billet steel of clean, new stock.

- A. All Bars: Use Grade 60 (yield) min. 60,000 psi.

2.2 WELDED WIRE FABRIC: Manufacture in accordance with ANSI/ASTM A185.

- A. Unless otherwise specified in the contract documents, provide 6"x 6"-W.2.9 / W2.9 W.W.F., Grade 65 (yield) min. 65,000 psi.

2.3 FASTENERS AND SPLICE

- A. Tie Wire: Double annealed steel wire, minimum #16 gauge, conforming to ANSI/ASTM A497.

2.4 ACCESSORIES: Provide all spacers, chairs, bolsters, ties and other devices necessary to properly place, space, support, and maintain reinforcement in locations. Provide in accordance with ACI-315. No aluminum inserts or accessories will be permitted.

- A. Bar Supports: Conform to "Bar Support Specifications", CRSI Manual of Standard Practice, Chapter 3, latest edition, and be of the following types:

1. Support reinforcing in footings with precast concrete blocks.
2. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs which are plastic protected (CRSI, Class 1) or stainless steel protected (CRSI, Class 2).
3. Support reinforcement for slabs on grade with precast concrete blocks, or No. 5 rebar placed on metal chairs with plate bases as required to prevent penetration of earth or vapor barrier. Spacing of blocks, chairs, and No. 5 rebar shall be as necessary to prevent sagging of the reinforcement under the weight of construction workers and wet concrete.
4. Support reinforcement for framed slabs (including slabs poured on metal deck) with No. 5 rebar placed on slab bolsters or chairs spaced as necessary to prevent sagging of the reinforcement under the weight of construction workers and wet concrete.

2.5 FABRICATION: Shop fabrication according to approved shop drawings. All fabrication of bars performed in a shop, with field fabrication done only where unavoidable, and approved.

- A. Reference: Fabricate in accordance with CRSI Manual of Standard Practice for Reinforced Concrete Construction.

PART 3 - EXECUTION

- 3.1 INTENT: All concrete shall be reinforced. For conditions not specifically shown or detailed, framing and reinforcement shall be provided in a manner consistent with other similar details or conditions shown on the drawings. Prior to work under these conditions, notify the Architect for confirmation.
- 3.2 PREPARATION
 - A. Clean bars of loose mill scale, rust, oil, and all coatings that will destroy or reduce the bond before placing, and again before concrete is placed.
 - B. Examine the drawings and specifications for all other Sections of Work, especially the mechanical and electrical work.
- 3.3 PLACEMENT OF REINFORCEMENT: Accurately place in positions and spacings shown. Securely support and fasten to prevent displacement before or during concrete placement. Place reinforcing steel, bar supports, and splice devices, in accordance with CRSI Manual of Standard Practice, latest edition; ACI 315 and ACI 318.
 - A. Support: Use approved accessories to hold reinforcement at proper distances from surrounding surfaces, with minimum coverage as indicated. Tying reinforcing steel with wire to nails in forms or using wood spacers is not permitted.
 - B. Spacing: In no case shall the clear distance between bars be less than 1 inch, nor less than 1-1/2 times the maximum size of coarse aggregate in the concrete, unless specifically indicated as bundled.
 - 1. Concrete Coverage and Protection: ACI-318.2.
 - 2. Clearance: The clear distance between bars also shall apply to the clear distance between contact splices and adjacent splices or bars.
 - C. Layering: Where reinforcement in beams or girders is placed in two or more layers, the clear distance between layers shall not be less than 1 inch, and the bars in the upper layers shall be placed directly above those in the bottom layer.
 - D. Field Adjustments: Move concrete reinforcing steel as necessary to avoid interference with other reinforcing steel, other embedded items; however prior to placing concrete, bars moved more than tolerances herein shall be inspected and approved.
 - 1. Sleeves and Embedded Items: Do not cut bars to clear sleeves or slots through slabs or walls. Wrap bars around these openings.
 - 2. Openings: Bar reinforcement terminated at openings in slabs and walls shall be compensated for by placing one half of reinforcement terminated on each side of openings for the full span length.

- E. Install welded wire fabric in as long lengths as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset end laps in adjacent widths to prevent continuous laps in either direction.
 - F. Minimum Rebar and Dowel Extent: Provide minimum temperature reinforcing in all walls and slabs where no reinforcing is shown or noted.
 - G. Minimum Placement: All reinforcing steel must be in place, wired, and inspected, before depositing concrete.
 - H. Protection: Protection care must be exercised in placing reinforcing steel to prevent any marring of interior faces of forms, shifting of forms, or damaging epoxy coating on reinforcing.
 - I. Provide protection for all vertical reinforcing bars that are not immediately enclosed by formwork.
- 3.4 FASTENING INTERSECTIONS: Wire tie reinforcement together at all points where bars cross. Splice as indicated. Welding or tack welding of reinforcement bars to other bars or to plates, angles, etc. is prohibited. Work shall be performed in accordance with CRSI Recommendations.
- 3.5 LAP SPLICES: Lap bars as scheduled on drawings and securely tie with wire at frequent intervals. Stagger so that adjacent splices will be apart with care taken to maintain proper clearance, between parallel bars and between bars and forms. Make lap splices in a manner to provide laps consistent with structural drawings, and CRSI.
- A. Tie Wires: Cut loose ends and turn wire twists inside of the section and bend so that placement of concrete will not force ends to exposed concrete surfaces.
- 3.6 DOWELS: Install with a template to hold bars in the proper position, placed as located on the drawings.
- A. Size: Dowels shall be of the diameter size indicated in various sections with lengths equivalent to twice that required for the indicated spliced. One-half of the length shall be embedded with the required splice length exposed for attachment.
- 3.7 INSPECTION
- A. Comply with inspection requirements of Sections 01 4000, Quality Control, 03 3000 Cast in Place Concrete, and Division 4 Masonry.
 - B. Inspect concrete and masonry reinforcement as indicated in ACI 301, Section 18, paragraph 18.4.1.2.
 - C. Inspect reinforcing size, quantity, strength, position (location), and arrangement. Concrete and masonry reinforcement includes welded wire fabric and mild reinforcing bars. Inspection shall include but is not limited to the following.
 - 1. Insure rebar and welded wire fabric is not displaced during placement of concrete and masonry grout.

2. Rebar size, quantity, strength, position (location) and arrangement in columns, beams, slabs, footings, walls, etc.
- D. Submit daily reports indicating conformance and exceptions of concrete operation to contract documents.
- E. See specification Section 03 3000 for further requirements.

3.9 CONTRACTOR'S RESPONSIBILITY

- A. Submit copies of all reports indicating conformance and exceptions to contract documents in a timely fashion to General Contractor for distribution to design consultants, owner, subcontractors and other interested parties.
- B. Final Report: The Inspection Agency shall prepare a written report that summarizes the work inspected during the course of the project, and certifies that the work meets the requirements of the contract documents, specifications, and all governing agencies.

END OF SECTION 032000