

SECTION 032000 – CONCRETE REINFORCING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Steel reinforcement bars.
2. Welded-wire reinforcement.

B. Related Sections:

1. Section 031000 – Concrete Forming and Accessories.
2. Section 033000 – Cast-in-Place Concrete.

C. Reference and Industry Standards

1. The following reference standards shall be applicable to this Section:
 - a. 2020 Enterprise Green Communities (EGC) Criteria, 15th edition and the 2020 New York City Overlay dated April 6, 2020.
 - b. New York City Building Code, **current** edition, as amended, inclusive of:
 - Chapter 19 Concrete
 - Subchapter 1907 Details of Reinforcement.
 - Subchapter 1908 Modifications to ACI 318.
2. Industry Standards
 - ACI (American Concrete Institute).
 - AISC (American Institute of Steel Construction).
 - ASTM (American Society for Testing and Materials).
 - AWS (American Welding Society).
 - CRSI (Concrete Reinforcing Steel Institute).

D. The NYC Overlay of the 2020 Enterprise Green Communities Criteria

1. Mandatory Requirements: See the NYC Overlay of the 2020 EGC reference standards for full specification.
 - a. All projects must achieve compliance with the mandatory criteria measures that are applicable:
 - Criterion 6.4: Healthier Material Selection.
 - Criterion 6.10: Construction Waste Management.
2. Optional Project Requirements for Certification Points

- a. Additionally, rehab projects are required to achieve **55** optional points. Criteria with optional points related to this Specification Section include, but may not be limited to:
 - Criterion 6.2: Recycled Content and Ingredient Transparency.
 - Criterion 6.4: Healthier Material Selection.
 - Criterion 6.5: Environmentally Responsible Material Selection.
 - Criterion 6.7: Regional Materials.
 - Criterion 6.10: Construction Waste Management.

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

- A. Product Data: For the following:
 1. Each type of steel reinforcement.
 2. Bar supports.
 3. Mechanical splice couplers.
- 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.
- C. Construction Joint Layout: Indicate proposed construction joints required to build the structure.
 1. Location of construction joints is subject to approval of the [**Design-Professional-of-Record**] [**HPD**].

1.4 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
 1. Reinforcement to Be Welded: Welding procedure specification in accordance with AWS D1.4.
- B. Material Certificates: For each of the following, signed by manufacturers:
 1. Epoxy-Coated Reinforcement: CRSI's Epoxy Coating Plant Certification.
- C. 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.
 2. Mechanical splice couplers.
 - D. Field quality-control reports.
 - E. Minutes of preinstallation conference.
- 1.5 QUALITY ASSURANCE
- A. Welding Qualifications: Qualify procedures and personnel in accordance with AWS D1.4.

PART 2 - PRODUCTS

2.1 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A615, [**Grade 60**] [**Grade 75**] [**Grade 80**] [**Grade 100**], deformed.
- B. Headed-Steel Reinforcing Bars: ASTM A970.
- C. Galvanized Reinforcing Bars:
 1. Steel Bars: [**ASTM A615, Grade 60**] [**ASTM A615, Grade 75**] [**ASTM A615, Grade 80**] [**ASTM A615, Grade 100**] [**ASTM A706**], deformed bars.
 2. Zinc Coating: ASTM A767, [**Class I**] [**Class II**] zinc coated after fabrication and bending.
- D. Epoxy-Coated Reinforcing Bars:
 1. Steel Bars: [**ASTM A615, Grade 60**] [**ASTM A615, Grade 75**] [**ASTM A615, Grade 80**] [**ASTM A615, Grade 100**] [**ASTM A706**], deformed bars.
 2. Epoxy Coating: [**ASTM A775**] [**or**] [**ASTM A934**] with less than 2 percent damaged coating in each 12-inch bar length.
- E. Plain-Steel Welded-Wire Reinforcement: ASTM A1064 plain, fabricated from as-drawn steel wire into flat sheets.
- F. Deformed-Steel Welded-Wire Reinforcement: ASTM A1064, flat sheet.
- G. Galvanized-Steel Welded-Wire Reinforcement: ASTM A1064, plain, fabricated from galvanized-steel wire into flat sheets.
- H. Epoxy-Coated Welded-Wire Reinforcement: ASTM A884, Class A coated, Type 1, [**plain**] [**deformed**] steel.

2.2 REINFORCEMENT ACCESSORIES

- A. 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 zinc-coated reinforcement, use galvanized wire or dielectric-polymer-coated wire bar supports.
- B. Mechanical Splice Couplers: ACI 318 [**Type 1**] [**Type 2**], same material of reinforcing bar being spliced; [**compression-only type**] [**tension-compression type**] [**dowel-bar type**] [**mechanical-lap type**].
- C. Steel Tie Wire: ASTM A1064, annealed steel, not less than 0.0508 inch in diameter.
 - 1. Finish: [**Plain**] [**Galvanized**] [**ASTM A884, Class A, Type 1, epoxy coated, with less than 2 percent damaged coating in each 12-inch wire length**].

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.
- 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.
 - 3. Mechanical Splice Couplers: Install in accordance with manufacturer's instructions.
 - 4. Weld reinforcing bars in accordance with AWS D1.4, where indicated on Drawings.
- 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 **[Design-Professional-of-Record] [HPD]**.
 - 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.

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.
- B. Testing Agency: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

C. Inspections:

1. Steel-reinforcement placement.
2. Steel-reinforcement mechanical splice couplers.
3. Steel-reinforcement welding.

END OF SECTION 032000