
PART 1 GENERAL

1.1 SCOPE:

- A. This Section covers work necessary for reinforcing steel, welded wire fabric, dowels, and accessories, for concrete structures, complete.

PART 2 PRODUCTS

2.1 BAR REINFORCEMENT:

- A. Use steel deformed bars conforming to ASTM A615, Grade 40, unless otherwise shown, except that longitudinal bars in continuously reinforced concrete pavement and high strength bar reinforcement shall be Grade 60.

2.2 DOWELS:

- A. For concrete pavement, slab, or wall load transfer devices at joints and other elements, use dowels conforming to ASTM A306, Grade 70 unless otherwise specified. Coat with plastic or other approved material for bond prevention where specified.

2.3 BAR MATS:

- A. For bar and rod mats, use the clipped type, conforming to ASTM A184.

2.4 SPIRAL REINFORCEMENT:

- A. Use plain wire for spiral reinforcement conforming to ASTM A82, except that f_y shall be the stress corresponding to a strain of 0.35 percent if design yield strength exceeds 60,000 psi.

2.5 WELDED WIRE FABRIC:

- A. Welded wire fabric shall conform to ASTM A185.

2.6 TIES AND SUPPORTS:

- A. Use ties of 16-gauge, black, soft-annealed wire and bar supports approved by Engineer for intended use. Bar supports in beams and slabs exposed to view after stripping must be galvanized or plastic coated. Use concrete supports for reinforcing in concrete placed on grade. Galvanizing shall conform to ASTM A153 Class D. Plastic shall not chemically react with concrete, shall be impervious and a minimum thickness of $3/32$ -inches at point of contact with form.

2.7 CERTIFICATION AND IDENTIFICATION:

- A. Furnish certification that reinforcing bars identified and delivered to project site are as specified. For identification and tagging, include copies of heat numbers, chemical compositions and physical test performed on that heat.

PART 3 EXECUTION**3.1 SHOP DRAWINGS:**

- A. Prior to fabrication and before ordering material, submit all order lists and bending diagrams for approval. Such approval by Engineer in no way relieves Contractor of responsibility for correctness of lists and bending diagrams. Any expense incident to the revision of material furnished in accordance with such lists and bending diagrams in compliance with Plans, shall be borne by Contractor.

3.2 FABRICATION:

- A. Fabricate, ship, tag, and mark bar reinforcement in conformance with Manual of Standard Practice for Reinforced Concrete Construction of the Western Concrete Reinforcing Steel Institute.
- B. Bend all bars cold.

3.3 DELIVERY AND STORAGE:

- A. Deliver steel reinforcement with suitable hauling and handling equipment. Protect at all times from injury. Keep free from dirt, detrimental rust or scale, paint, oil, or other foreign substance.

3.4 PLACING:

- A. Place all steel reinforcement accurately in positions shown on Plans and hold firmly during placing and setting of concrete. For bars in top mats of footings and deck slabs, tie at all intersections. For all other bars, tie at all intersections except where spacing is less than 1-foot in each direction, tie alternate intersections.
- B. Maintain distance from forms by means of stays, blocks, ties, hangers, or other approved supports. For blocks for holding reinforcement from contact with the forms use precast mortar of approved shape and dimensions, and with same compressive strength as concrete in which they are placed. For metal chairs in contact with exterior surface of concrete, fabricate from stainless steel conforming to ASTM A493, Type 430. Turn legs of chairs up a minimum of $\frac{1}{8}$ -inch. Separate layers of bars by precast mortar blocks or by other equally suitable devices. The use of pebbles, pieces of broken stone or brick, metal pipe, and wooden blocks will not be permitted. Reinforcement in any member shall be placed and then inspected and approved by Engineer before placing of concrete begins. Concrete placed in violation of this provision may be rejected and removal required.
- C. If fabric reinforcement is shipped in rolls, straighten it into flat sheets before placing it. For fabric reinforcement, extend fabric to within 2-inches of edges of slab, and lap splices at least $1\frac{1}{2}$ courses of fabric with a minimum of 6-inches. Tie laps and splices in fabric securely at ends and at 24-inch intervals, minimum.

3.5 SPLICING:

- A. Furnish all reinforcement in the full lengths indicated on Plans. Splicing of bars, except when shown on Plans, will not be permitted without written approval of Engineer. Stagger splices as far as possible.
- B. For No. 11 bars and smaller, lap splice as shown on Plans. In lapped splices, place bars in contact and wire together in such a manner as to maintain not less than the minimum clearance to the surface of concrete as shown on Plans.
- C. Lap splicing of No. 14 and No. 18 bars will not be permitted. Splice these sizes in conformance with the following:
 - 1. Splice shall develop at least the specified minimum ultimate strength of reinforcing bars in compression and in tension. Where bars of different sizes or strengths are connected, the governing strength shall be the strength of the smaller or weaker bar.
 - 2. Make splices by an approved mechanical butt splicing method utilizing a ferrous filler metal and an enclosing steel sleeve. Submit method to Engineer for approval prior to making splices. Completed splices will be subject to testing at no expense to Owner.

3.6 MEASUREMENT AND PAYMENT:

- A. Reinforcement in concrete will be incidental to the unit price for structure as stated in the form of proposal.

3.7 SUBMITTAL REQUIREMENTS:

- A. Submit the following as a minimum;
 - 1. Suppliers name, address and phone number.
 - 2. Shop drawings of steel cuts and placements.
 - 3. Lot testing data.

PART 4 TESTING

- A. Certification of bar reinforcement will identify the reinforcement by heat number.
- B. The certification shall also contain the weight, number of pieces and dimensions of each size of material of each heat number shipped, the project identification, and date of shipment. If a color is used for identification, the heat number and color combinations shall also be shown.
- C. Each piece of bar reinforcement shall be identified so the engineer can determine the heat number prior to use in the work. Reinforcement shall be tagged and marked in accordance with CRSI Manual of Standard Practice as certification of testing.

END OF SECTION