



6310 - 1 DESCRIPTION

- 1.01 The work shall consist of placing and fastening the reinforcement at the locations identified on the plans, and in accordance with this specification.

6310 - 2 MATERIALS

- 2.01 Reinforcement material will be supplied by the Department f.o.b. at the bridge site. The reinforcement will be supplied in proper lengths and bent to proper shape as shown on the plans. The Contractor shall be responsible for unloading and properly storing this material.
- 2.02 The Contractor shall be responsible for the supply of ties, chairs and other supports associated with the installation of the reinforcement.

6310 - 3 CONSTRUCTION

Protection of Material

- 3.01 Reinforcement shall be stored on suitable non-metallic supports so as not to be in contact with the ground surface.
- 3.02 All reinforcement contaminated with dirt, paint, oil, or other foreign substances during unloading, storage or placing shall be cleaned using a method approved by the Department, and at the Contractor's expense.
- 3.03 All equipment and procedures used for unloading, handling, storing and installing epoxy coated reinforcement shall be such that the epoxy coating is not damaged. Bundles of coated bars shall be lifted with multiple pick-up points spaced less than 4 m apart. Bar to bar abrasion and excessive sagging of the bars shall be prevented. Bars shall not be dropped or dragged.
- 3.04 Epoxy coated reinforcement shall be covered with an opaque polyethylene sheeting, or other equivalent protective material, until the reinforcement is positioned in the structure.
- 3.05 Epoxy coated reinforcement partially embedded in concrete, and which will remain exposed for more than 30 days, shall be protected from the elements by covering with opaque polyethylene sheeting or other equivalent protective material. The protection shall be adequately supported and secured in place until its removal is required in preparation for subsequent concrete placement.
- 3.06 Reinforcement damaged by the Contractor during unloading, handling, storage, or installation, and considered by the Department as unfit for use in the structure, shall be repaired or replaced at the Contractor's expense.

Placing of Reinforcement

- 3.07 Reinforcement shall be free from mud, oil or other coatings that adversely effect the anchorage of bars within the concrete. Concrete mortar adhering to the bars from previous concrete pours shall be removed before embedding the bars in fresh concrete.
- 3.08 Reinforcement shall be accurately placed in the positions shown on the plans and firmly held during the placing of concrete.
- 3.09 Reinforcement shall be placed within tolerances relative to the direction of the controlling dimensions as represented by the width, depth, thickness or diameter of the member. Tolerances for controlling dimensions shall be:
- | | |
|--|---------|
| 200 mm or less: | ± 8 mm |
| More than 200 mm but less than 600 mm: | ± 12 mm |
| 600 mm or more: | ± 20 mm |

- 3.10 Clear cover shall not be reduced by more than the above tolerances, or one-third of the specified clear cover, whichever is the lesser.
- 3.11 The longitudinal location of bends and ends of bars shall be placed within a tolerance of 50 mm except that at the ends of members the tolerance shall be 10 mm.

Fastening of Reinforcement

- 3.12 Bars shall be tied firmly with wire at all intersections except that where spacing is less than 300 mm in each direction alternate intersections may be tied. All tie wires shall be bent away from the nearest formed or finished surface such that the tie wires shall have the same clear cover as the reinforcing steel. Tie wires used for fastening epoxy coated reinforcement shall consist of nylon or plastic coated steel.
- 3.13 Welding shall not be allowed as means of fastening the bars together unless so detailed on the plans or authorized by the Department in writing.
- 3.14 Clear cover shall be maintained by means of ties, hangers, chairs, or other approved supports. Metal chairs shall be galvanized or epoxy coated. Layers of bars shall be separated by spacers or by other equally suitable devices. The use of pebbles, pieces of broken stone or brick, metal pipe and wooden blocks shall not be permitted.
- 3.15 Reinforcement shall be placed and then inspected and approved by the Department before the placing of concrete begins. Concrete placed in violation of this provision may be rejected and its removal undertaken at the expense of the Contractor.
- 3.16 If fabric reinforcement is shipped in rolls, it shall be straightened into flat sheets before being placed.

Splicing

- 3.17 All reinforcement will be furnished in the full lengths indicated on the plans. Location of splices and minimum lap lengths shall be as indicated on the plans. Splicing of bars to accommodate construction procedures will not be permitted without the written approval of the Department.

Repair of Epoxy Coating

- 3.18 Epoxy coating which is damaged during the shipping, handling or installation of the reinforcement shall be repaired with patching material supplied by the Department. The repair shall be done in accordance with the patching material supplier's recommendations. The coating in repair areas shall have a minimum thickness of 175 μm .
- 3.19 Any individual damaged area larger than 15 mm^2 shall be repaired. However, when the sum of all damaged areas in any 300 mm length of bar exceeds 0.25 percent of the surface area, all defects within that length shall be repaired. Where disbondment of the coating occurs, the disbonded coating shall be removed before establishing the need for repair. Repairs are not required for hairline cracks in the coating.
- 3.20 The temperature of the bar and its immediate surroundings shall be 5°C or above during the repair, and the surface of the bar shall be free of rust and moisture. Patching material shall not be applied if precipitation is expected within 4 hours of the repair procedure.

6310 - 4 MEASUREMENT

- 4.01 Steel reinforcement incorporated in the concrete will be measured in kilograms based on the total computed mass for the sizes and lengths of bars as shown on the plans or as authorized by the Department.

4.02 The mass of bars will be calculated as follows:

BAR DESIGNATION	MASS kg/m
10	0.785
15	1.570
20	2.355
25	3.925
30	5.495
35	7.850
45	11.775
55	19.625

- 4.03 No allowance will be made for clips, wires, spacers, chairs, coating and other material used in fastening the reinforcement in place. If bars are substituted upon the Contractor's request, and as a result, more steel is used than specified, only the amount specified shall be included.
- 4.04 When laps are made for splices other than those shown on the plans for the convenience of the Contractor, the extra steel shall not be included.

6310 - 5 PAYMENT

- 5.01 Payment for INSTALLING REINFORCEMENT will be at the contract unit price per kilogram. The unit price will be full compensation for all labour and equipment, including the supply of wire ties and supports, necessary for placing the reinforcing steel in the finished work, and for unloading, storing, protecting and placing, including field bending when called for on the plans. It will also be full compensation for the repair of epoxy coating and for replacement of reinforcement damaged by the Contractor.