
Supplemental Technical Specification for

Glass Fiber Reinforced Polymer Reinforcement Bars

SCDOT Designation: SC-M-703 (01/22)

1. SCOPE

- 1.1 Provide Glass Fiber Reinforced Polymer (GFRP) reinforcement bars for SCDOT projects in accordance with the Plans, Special Provisions and as specified herein.
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2. REFERENCED DOCUMENTS

- 2.1 ASTM D7957
- 2.2 SCDOT Supplemental Technical Specifications
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3. Materials and Documentation

- 3.1 Provide GFRP reinforcing bars that are deformed, sand coated, or both and meet the requirements of ASTM D7957. Supply GFRP reinforcing bars from a producer included on the most recent edition of SCDOT Qualified Product List 108.
- 3.2 Identify each bundle of GFRP reinforcement with a lot number affixed to the bundle by a durable tag.
- 3.3 Provide with each lot shipped to the project a Material Certification stating that the lot of GFRP reinforcement meets the requirements of ASTM D7957 and this specification. The material certification must include certified test values and test procedures used to determine the physical properties of the GFRP reinforcement and must bear the signature of an authorized representative of the producer.
- 3.4 If the plans require bent GFRP reinforcement, the bends shall be incorporated during bar manufacturing.
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4. Material Delivery Storage and Handling

- 4.1 Deliver, store, and handle GFRP reinforcement as recommended by the manufacturer. Prevent bending, coating with foreign material, or otherwise damaging the GFRP reinforcement. Strap bundled bars together with non-metallic or padded straps.
- 4.2 Provide systems for handling GFRP reinforcement that avoid damaging or abrading the bars and have padded contact areas for the bars. Lift GFRP bundles in a manner that prevents bar to bar abrasion from sags in the bundles. Lift all bundles with multiple supports, a strong back, spreader bar, or a platform bridge. Do not drop or drag the reinforcement.
- 4.3 Store GFRP reinforcement at least 12 inches above the surface of the ground on platforms, skids, or other supports as close to the point of placement as possible. Use supports made of wood or other material that will not damage the surface of the GFRP reinforcement or sand coating. Store bundles of bars in a single layer with each bundle out of contact with adjacent bundles. Cover GFRP bars with opaque plastic or other type of covering to protect bars from ultra-violet radiation.
- 4.4 Prevent exposure of GFRP reinforcement to temperatures above 120 degrees Fahrenheit.

- 4.5 Repair all damaged bars in accordance with the manufacturer's recommendations. Repaired bars must be inspected and accepted by the RCE prior to being incorporated into the project. Do not use bars with total damage greater than 2 percent of the bar surface area, including previously repaired areas. Repair all cuts, scratches, cracks, abrasions or other damage visible to the naked eye. Repair all bars damaged prior to placement within formwork before placing the bars within the formwork.

5. CONSTRUCTION REQUIREMENTS

- 5.1 Field bending of GFRP reinforcement is not allowed. Field cutting of GFRP reinforcement may only be performed when permitted by the RCE. Field cutting shall only be with a high speed cutter, fine blade saw, diamond blade, or masonry saw. Do not shear or flame cut GFRP reinforcement. Treat all cut ends in accordance with the manufacturer's recommendations.
- 5.2 Accurately place GFRP reinforcement, and during the placing and consolidation of concrete, firmly hold in the positions shown on the Plans. Support reinforcement using plastic bar supports meeting the requirements of Section 703.2.6.3 of the SCDOT Standard Specifications.
- 5.3 Hold GFRP reinforcement together by tie wire at all intersections except where the spacing is 12 inches or less in each direction, in which case tie alternate intersections provided such alternate ties accurately maintain the position of the reinforcement during the placing and setting of concrete. Tie reinforcement using self-locking plastic straps, or use ties made of soft annealed wire that has been nylon, epoxy or plastic coated. Hold bars projecting beyond a construction joint in place by templates during concreting to ensure proper position.
- 5.4 Furnish all GFRP reinforcement in full lengths as indicated on the Plans, unless otherwise permitted. Except for splices called for on the Plans, do not splice bars without advance written approval from the BCE. Stagger additional splices as much as possible. Provide lapped splices of the length shown on the plans. Produce lapped splices by placing the bars in contact and tying them together. Do not use mechanical couplers. Ties shall meet the requirements specified herein. In lapped splices, place and tie the bars to maintain the minimum distance to the surface of the concrete shown on the Plans.

6. Measurement

- 6.1 The quantity for GFRP reinforcement for structures is the linear feet of reinforcement placed in a structure in accordance with the GFRP reinforcement schedule shown in the plans unless otherwise directed, and is measured by linear feet, complete, and accepted.
- 6.2 The length of GFRP reinforcement in precast members is not measured when the cost of the reinforcement is included in the contract unit bid price for the precast member
- 6.3 The additional GFRP reinforcement for splices that are not shown on the plans, even though authorized as provided herein, is not measured.

7. Payment

- 6.1 Payment for the accepted quantity of GFRP reinforcement measured in accordance with Subsection 6, is determined using the contract unit bid price for the applicable item. Payment is full compensation for furnishing and placing GFRP reinforcement as specified or directed and includes fabricating, cutting, splicing, repairing or replacing, placing, and securing the reinforcement and all other materials, labor, equipment, tools, supplies,

transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, the Specifications, and other terms of the Contract.

6.2 Payment for each item includes all direct and indirect costs and expenses necessary to complete the work

6.3 Pay items under this section include the following:

Item No.	Pay Item	Unit
7031700	Glass Fiber Reinforcement Bar for Structures	LF