

## GROUT BAGS

**\*\*From Middlebury-Weybridge BHO 1445(33)**

- xx. DESCRIPTION. This work shall consist of performing underwater repairs of concrete substructure elements by installing grout bag scour and undermining countermeasures at the locations shown on the Plans and as directed by the Engineer.
- xx. GENERAL REQUIREMENTS. Grout bags utilized to fill undermined areas under the substructure footing shall be small, hand-placed fabric bags filled with grout.
- xx. MATERIALS. Materials shall conform to the following requirements:
- (a) Grout. Grout shall be specially formulated for underwater placement with anti-washout admixtures and shall be in accordance with the grout bag system manufacturer's recommendations. Contractor shall submit mix design for approval.
- (b) Fabric Bags. Fabric bags shall be made of high strength water permeable fabric of nylon or approved equal. Seams shall be double stitched. Fabric shall have the following properties:

Property	Test Method	Value
<b>PHYSICAL</b>		
Composition		NYLON
Weight	ASTM D 5261	270 g/m <sup>2</sup> (8 oz/yd <sup>2</sup> )
Thickness	ASTM D 5199	0.76 mm (30 mils)
<b>MECHANICAL</b>		
Grab Tensile Strength	ASTM D 4632	WARP 2270 N (510 lbs) FILL 2310 N (520 lbs)
Grab Tensile Elongation	ASTM D 4632	WARP 25 % FILL 25 %
Wide Width Strip Tensile Strength	ASTM D 4595	WARP 62 KN/m (350 lbs/in) FILL 62 KN/m (350 lbs/in)
Elongation At Break	ASTM D 4595	WARP 15 % FILL 15 %
Trapezoidal Tear Strength	ASTM D 4533	WARP 890 N (200 lbs) FILL 890 N (200 lbs)
<b>HYDRAULIC</b>		
Apparent Opening Size (AOS)	ASTM D 4751	250 mm (60) (U.S. Standard)
Flow Rate	ASTM D 4491	1222 liter/min/m <sup>2</sup> (30 gal/min/ft <sup>2</sup> )

Certification. A Type B Certification shall be furnished in accordance with Subsection 700.02(c).

- (c) Turbidity Curtain. Turbidity Curtain shall meet the requirements of Section 649 for Geotextile for Filter

Curtain.

xx. CONSTRUCTION REQUIREMENTS.

- (a) Preparation. The turbidity curtain shall be installed prior to commencing any work. The area specified for grout bag installation shall be cleared of all sticks, loose debris, and sharp objects. Dewatering of the installation area is not required. Placing grout bags or grout in underwater conditions will be allowed if a turbidity curtain is present.
- (b) Installation. Hand-placed fabric bags filled with grout shall be packed into the undermined location(s) identified on the Plans.

Pump filled fabric grout bags shall be placed over geotextile filter fabric and installed at the locations indicated in the Plans. Hand shovel work may be required to prepare the designated location for grout bag installation. Place one grout bag at a time and fill before moving on to the next grout bag location.

Grout bags should be snugly butted up against the void and each other to minimize any gaps.

Grout injection ports shall be installed facing upward. The grout pump shall be capable of delivering 10 gal/min.

The Contractor shall submit fabric grout bag material specifications and the required material certification to the Engineer for review and approval. The Contractor shall follow the manufacturer's recommendations for the specific fabric grout bag material approved. If material specifications and installation requirements differ between the manufacturer and the Contract Documents, they shall be brought to the attention of the Engineer for review and concurrence prior to installation.

Turbidity Curtain shall be kept in place one full day after the work has been completed.

xx. METHOD OF MEASUREMENT. The quantity of Special Provision (Grout Bags) to be measured for payment will be the number of cubic meters (cubic yards) of grout set in place in the complete and accepted work.

xx. BASIS OF PAYMENT. The accepted quantity of Special Provision (Grout Bags) will be paid for at the Contract unit price per cubic meter (cubic yard). Payment will be full compensation for furnishing and placing the materials specified, and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

Payment for dewatering the installation area, excavating and preparing the grout bag foundation, and furnishing and placing geotextile and turbidity curtain will be paid for separately

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under the appropriate Contract items.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
900.608 Special Provision (Grout Bags)	Cubic Meter (Cubic Yard)