

Specification for Geofill LD Marine For Underwater Placement

I – DESCRIPTION

The work shall consist of placing Geofill LD Marine at the locations shown in the plans in accordance with the details in the plans and this specification.

II – MATERIALS

Geofill LD Marine shall be one of the following:

Geofill LD Marine as manufactured by Geofill, LLC

Geofill LD Marine shall be jobsite mixed with pre-generated foam from a liquid concentrate. As cast-in-place, material shall comply with the following properties:

<u>Property</u>	<u>Requirement</u>
Cement Type*	I/II (ASTM C150)
Foaming Agent – Liquid Concentrate	Non Pervious (ASTM 869)
Maximum Cast Wet Density	75 PCF
Minimum Compressive Strength	500 PSI
Aggregate	Sand (ASTM C33)

*Other cementitious materials may be used when specifically approved by the manufacturer in writing.

The foaming agent shall comply with ASTM C869 when tested in accordance with ASTM C796.

Other Admixtures: Admixtures for accelerating, water reducing and other specific properties may be used when specifically approved by the manufacturer. Admixtures containing chloride ions shall not be used.

III – SUBMITTALS

- A. Mix design for Geofill LD Marine, including materials to be used and their sources.
- B. Resume of contractor showing experienced as specified below, including qualifications of contractor's superintendent and/or foreman.
- C. Description of equipment and placement methods to verify compliance with specifications.

IV – PRODUCTION

- A. Foam generating equipment shall be used to produce a predetermined quantity of pre-formed foam which shall be mixed and blended with cementitious slurry. Equipment shall be calibrated to produce consistent foam that shall retain its stability until the cement sets to form a uniform cellular structure.
- B. Geofill LD Marine shall be produced utilizing specialized automated proportioning, mixing, and foam producing equipment, which is capable of meeting the specified properties.

- C. Avoid excessive handling of the material. After sufficient mixing of the foam with slurry, Geofill LD Marine shall be conveyed promptly in its final location.
- D. All equipment used to furnish the Geofill LD Marine must be approved by the manufacturer.

V – INSTALLATION

- A. The area to be filled shall be contained by forms or partitions as necessary. The partitions may consist of grout bags, sheet piling or other materials that will conform to the requirements of this item. Forms and partitions shall be constructed of durable materials having a life expectancy of at least 20 years in seawater, and shall have sufficient strength and rigidity to resist the loads imparted by the concrete and any imposed loads due to currents, waves, tidal action, etc. Forms and partitions shall be provided with vent pipes or other openings to allow the escape of water displaced by the concrete fill. Forms shall be left in place.

VI – QUALITY CONTROL AND QUALITY ASSURANCE

- A. Contractor shall have a record of experience and quality of work placing Geofill LD Marine that is satisfactory to the Engineer including the following:
 - 1. Shall be capable of developing a mix design, batching, mixing, handling, and placing of Geofill LD.
 - 2. Shall be regularly engaged in the production and placement of Geofill LD for engineered fills.
 - 3. Shall have satisfactory completed during the last three (3) years at least five (5) Geofill LD Marine projects of no less than 500 cubic yards each.
 - 4. Workers, including the contractor's superintendent and/or foreman, shall be fully qualified to perform the work and have had previous experience in production and placement of Geofill LD Marine under similar conditions.

B. TESTING

- 1. Testing to be performed by the Owner or approved agency.
- 2. A minimum of four (4) 3"x 6" cylinders shall be molded for each 500 cubic yards placed.
- 3. Geofill LD Marine may be tested at any age (after 3 days) for compressive strength in accordance with ASTM C-495. At least two (2) specimens from each set should be tested at 28 days.
- 4. Contractor shall record and measure wet cast densities near the point of placement hourly. Mix shall be adjusted as required to obtain the specified cast density.

VII – MEASUREMENT AND PAYMENT

- A. Geofill LD Marine shall be paid for at the contract unit price per cubic yard for materials produced.