

# **Specification for Geofill LD Hybrid Low Density Cellular Concrete Material For Filling Abandoned Pipes & Structures**

## **I – SCOPE OF WORK**

This work consists of providing Geofill LD Hybrid Low Density Cellular Concrete (Hybrid LDCC) greater than 65 PCF to fill abandoned pipes or other structures at the location shown in the plans in accordance with the details in the plans and these specifications.

## **II – MATERIALS**

- A. Portland cement shall comply with ASTM C150 (Type I, II or III).
- B. Fly ash shall be Class C or Class F and compatible with foaming agent.
- C. Aggregate shall be fine or coarse sand, limestone screenings, or other aggregate as approved by pre-formed foam manufacturer.
- D. Water shall be free from deleterious substances.
- E. Foaming agent shall be Geofill Concentrate (Phone #888-820-3455) conforming to ASTM C796.
- F. Admixtures for anti-washout, water reducing, retarding, accelerating, and other specific properties may be used when recommended by the manufacturer of the foaming agent.
- G. Hybrid LDCC shall have the following properties:

Range of Cast Density, PCF	65-85
Minimum Compressive Strength (28 Days), PSI	50
Flow Consistency per ASTM D6107	Greater than 6”

## **III – SUBMITTALS**

- A. Mix design for Hybrid LDCC, including materials to be used and their sources.
- B. Resume of contractor showing qualifications 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 with stable, uniform cellular structure.
- B. Hybrid LDCC 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, the material shall be conveyed promptly in its final location.
- D. All equipment used must be approved by the foam manufacturer.

## V – INSTALLATION

- A. Contractor must fill the existing abandonment as indicated in the plans or as directed by project engineer.
- B. Hybrid LDCC shall be pumped through injection ports located at bulkhead to allow abandonment to be completely filled.
- C. All bulkheads and injection points installed shall be capable of withstanding a minimum of 30 PSI or the allowable maximum pressure, whichever is greater and shall be water tight.
- D. Injection ports and pipes must be securely installed and be able to receive a minimum 3” male threaded NPT.
- E. Space injection points at intervals that allow material to be forced from one injection point to the next at pressures below maximum allowable pressure.
- F. As possible, water and other residual materials should be removed from pipe prior to initiating filling procedure.
- G. Hybrid LDCC will displace residual water through vent ports.
- H. Hybrid LDCC can be placed in lift heights exceeding 10 feet.

## VI – QUALITY CONTROL AND QUALITY ASSURANCE

- A. Contractor shall have a record of experience and quality of work placing low density cellular concrete above 65 pcf that is satisfactory to the Engineer including the following:
  - 1. Shall be capable of developing a mix design, batching, mixing, handling, and placing low density controlled low strength material.
  - 2. Shall be regularly engaged in the production and pumping of low density controlled low strength material for filling abandoned pipes or other structures.
  - 3. Shall have satisfactory completed at least five (5) similar projects placing low density controlled low strength material during the last twelve (12) months.
  - 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 pumping of low density controlled low strength material 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 shift of operation.
- 3. Hybrid LDCC may be tested at any age after three (3) days for compressive strength. At least two (2) specimens from each set should be tested at 28 days in accordance with ASTM C-495 unless otherwise approved by engineer.
- 4. Contractor shall record and measure wet cast densities at the point of placement regularly. Mix shall be adjusted as required to obtain the specified cast density at the point of placement.

5. Contractor shall record and measure flow consistency regularly in accordance with ASTM D6107.

## VII – MEASUREMENT AND PAYMENT

- A. Geofill LD Hybrid shall be paid for at the contract unit price per cubic yard for material produced based on theoretical volume of pipe or other method acceptable to engineer.