

PART 1-SITE WORK

ENGINEERED FILL MATERIAL

1.1 SCOPE OF WORK

The work covered under this Section shall include providing Engineered Fill specifically in pipe or structures that are shown to be abandoned. Provide Engineered Fill at the locations as specified herein, and as needed for a complete and proper installation.

1.2 REFERENCES

- A. ASTM - The published standards of the American Society for Testing and Materials, West Conshohocken, PA.

1.3 SUBMITTALS

- A. The following items shall be submitted:
  - 1. Technical data sheet on each product used, including ASTM test results indicating the product conforms to and is suitable for its intended use per these specifications.
  - 2. Prepare and submit an abandonment work plan prior to construction. The abandonment work plan shall specifically include the specialized batching, mixing and placing equipment. The Contractor shall submit an installation plan, a traffic control plan and a dewatering plan.

1.4 QUALITY ASSURANCE

- A. Manufacturer/applicator shall initiate and enforce quality control procedures consistent with applicable ASTM standards and the Engineered Fill manufacturer's recommendations.
- B. Use skilled workmen who are trained, experienced and familiar with the specified requirements and the methods for proper performance of this work.
- C. The Contractor shall provide a proposed detailed construction sequence for abandonment of the existing pipe and structures prior to construction for approval.
- D. Specialized batching, mixing, and placing equipment shall be suitable for the abandonment operation.

- E. The manufacturer/applicator shall be regularly engaged in the placement of cellular concrete including completion of grouting/engineered fill installations having at least 3,000 total cubic yards in the past three (3) years.

1.5 WARRANTY

- A. Manufacturer/applicator shall warrant all work against defects in materials and workmanship for a period of two (2) year, unless otherwise noted, from the date of final acceptance of the project. Manufacturer/applicator shall, within 14 days after receipt of written notice thereof, repair defects in materials or workmanship which may develop during said two (2) year period, and any damage to other work caused by such defects or the repairing of same, at his own expense and without cost to the Owner.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Elastizell of St. Louis, Inc., [www.zellstl.com](http://www.zellstl.com) (866) 235-2662 or (636) 225-4311 or FAX (636) 2255-0017
- B. Cellular Concrete Inc., Zimmerman, MN (952) 960-9588

2.2 ENGINEERED FILL MATERIALS

- A. Engineered Fill: The engineered fill material shall be either Class II Elastizell Engineered Fill, Cellular Concrete or approved equal. Other proposed fill material shall be submitted seven (7) days prior to the bid date to be considered. The engineered fill material shall comply with ASTM C869. The engineered fill properties shall comply with the properties listed in Section 2.3.No other engineered fill material will be accepted unless approved prior to receiving bids. The engineer may approve other material as an approved equal and an addendum will be issued naming the approved equal.
- B. Water: Use potable water free from deleterious amounts of alkali, acid, and organic materials which would adversely affect the setting time or strength of the cellular concrete. The Contractor shall be required to furnish all water necessary for the material at their own expense.
- C. Fly Ash: The fly ash shall comply with ASTM C618; either Type C or Type F may be used.
- D. Cement: The Portland cement shall comply with ASTM C150. Pozzolans and other cementations materials are permitted.
- E. Admixtures: Admixtures may be used when specifically approved by the manufacturer of the expansion material.

2.3 PROPERTIES

- A. The Engineered Fill shall meet the following:

Minimum Cast Density        30 PCF +/- 3 PCF

Minimum Compressive Strength @ 28 days 40 psi

Minimum Compressive Strength @ 56 days 40-100 psi

PART 3 - EXECUTION

3.1 EXISTING SITE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed and cause conditions detrimental to timely and proper completion of the work to be corrected.

3.2 INSTALLATION

- A. The area to be filled shall not have any standing water, ice or snow in it prior to placement. Items encased in the fill shall be properly set and stable prior to installing the Engineered Fill. The Contractor shall drain all sewers prior to the placement of the Engineered Fill material.
- B. Engineered Fill shall be placed for void remediation, to fill annular space in tunnels or pipelines, to abandon existing lines and manholes, to stabilize poor soil conditions, to load balance areas where compression or settlement is a problem, to stabilize bridge approaches, to provide a suitable base to build upon where poor conditions exist or wherever a lightweight cellular concrete is needed.
- C. The Contractor shall install vent pipes as shown on the plans. The Contractor may install additional pipes for filling and/or venting as needed during installation. No additional payment will be allowed for the additional pipes.

3.3 MIXING AND CONVEYING

- A. Use automated job site batching, mixing, and placing equipment. Mix the materials and convey promptly to the point of placement.
- B. Engineered Fill shall be placed in lifts not to exceed 5 feet in depth, unless otherwise recommended by the approved contractor. The contractor shall place the engineered fill from one manhole to the next manhole continuously to ensure all air and water is removed from the pipe and no void space is left in the pipe. The contractor shall submit manufacturer references with greater amount lifts.

3.4 **TESTING**

Cast density: During placement of the initial batches, check the density and adjust the mix as required to obtain the specified cast density at the point of placement.

3.5 **SAMPLING**

- A. Take four (4) test specimens for each 300 cubic yards of Engineered Fill placed or for each ten (10) hours of placing.
- B. Test in accordance with ASTM C495 modified by ASTM C796 except:
  - 1. The specimens shall be 3" x 6" cylinders placed in a polystyrene covered box after casting to prevent damage and loss of moisture. Moist cure specimens for a period up to 7 days prior to a 28-day compressive strength test.
  - 2. DO NOT oven dry load test specimens. Specimens may be tested at any age to monitor the compressive strength.
  - 3. Testing should be done by a certified testing facility.

3.6 **PAYMENT**

- A. Work specified in this Section will be paid for at the unit prices for the quantities actually placed. The quantities shall be paid based on a linear footage measurement.

END OF SECTION