



Grasscrete Molded Pulp Stone Filled Void System Guideline Specification

SECTION 033000

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this section.

1.2 SUMMARY

- A. Work specified in this section includes all labor, materials, equipment and services necessary to complete the Grasscrete Molded Pulp Stone Filled Void System, including single use formers, reinforcement, sub-base materials, filter fabric, gravel fill and curing compound.
- B. Related Sections include the following:
 - 1. Division 1 Section "Product Requirements" for submittals and substitutions.
 - 2. Division 3 Section "Cast-in Place Concrete" for concrete slabs.

1.3 DEFINITIONS

1.4 SUBMITTALS

- A. Product Requirements:
 - 1. Provide submittal information within 35 calendar days after the contractor has received the owner's notice to proceed.
- B. Product Data:
 - 1. Submit special Bomanite specifications, test data and other data required for each type of manufactured material and product indicated.
 - 2. Submit special Bomanite Technical Bulletins listing manufacturer's name, product name, descriptive data, curing time and application requirements.
 - 3. Submit special Bomanite Material Safety Data Sheet (MSDS) and other safety requirements.

- C. Material Certificates:
- D. Field quality-control test and inspection reports.
 - 1. Documentation by the concrete contractor or General Contractor of the sub-grade compaction results prior to concrete placement.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: The contractor for this work shall be a Bomanite Grasscrete Franchise Partner and Certified Applicator approved by Bomanite Corporation (559) 673-2411.
 - 1. Provide letter of certification from Bomanite Corporation stating that installer is a certified applicator of special concrete finishes and is familiar with proper procedures/installation requirements required by the manufacturer.
 - 2. Use an authorized Bomanite Grasscrete Franchise Partner and adequate number of skilled workmen who are thoroughly trained and experienced in the necessary craft.
 - 3. Applicator shall be familiar with the specified requirements and the methods needed for proper performance of work of this section.
 - 4. Applicator shall be familiar with the previously approved mock-ups that demonstrated standard of workmanship.
 - 5. Authorized Bomanite Grasscrete Systems installers limited to the following:
 - a. www.bomanite.com/locate/
- B. Manufacturer Qualifications: A firm experienced in the support and training of a national installer network and manufacturing products required/listed to complete the work.
 - 1. Bomanite Corporation 559-673-2411 – no equal
- C. Source Limitations:
 - 1. Obtain each type or class of cementitious material of the same brand from same manufacturer's plant, obtain aggregate from one source, and obtain admixtures through one source from a single manufacturer.
- D. Mock-ups:
 - 1. Apply finish to mock-ups constructed by Bomanite Licensed Installer, using each type of finish to demonstrate finished appearance and standard of workmanship.
 - a. Mock-up shall include entire system, including sub-base, geotechnical fabric, and reinforcement with voids opened and filled with stone.
 - b. Notify Architect seven days in advance of dates and time when mock-ups will be constructed.
 - c. Obtain from Architect approval of mock-ups before starting construction.

- d. If the Architect determines that the mock-ups do not meet requirements, General Contractor will demolish and remove them from the site and arrange to assemble more until approved.
- e. Maintain mock-ups during construction in an undisturbed condition as a standard for judging the completed work.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in original packages and containers, with seals unbroken, bearing Bomanite or Bomanite approved labels indicating brand name and directions for storage, mixing with other components and application.
- B. Store materials to comply with Bomanite written instructions to prevent deterioration from moisture or other detrimental effects.
- C. Dispense special concrete finish material from Bomanite factory numbered and sealed containers. Maintain record of container numbers.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations:
 - 1. Comply with Bomanite written instructions for ambient temperature and other conditions affecting installation performance.
 - 2. Concrete must be cured a minimum of 14 days or as directed by the manufacturer before trafficking of Bomanite Grasscrete can begin.

1.8 PERFORMANCE REQUIREMENTS

- A. The product is required to bear daily vehicular traffic weighing a maximum of 80,000 pounds traveling at speeds greater than 20 miles per hour.
- B. The product is required to be continuously reinforced with rebar spaced no greater than 8" on center.
- C. The product is required to be manufactured from cast in place concrete with a minimum thickness of 5 1/2".

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce products, the following requirements apply to product selection:
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturer listed. For other manufacturers to be considered, submit according to the specifications in "Product Requirements."
 - a. Bomanite Corporation (559) 673-2411
 - b. Cultec Inc. (203) 775-4416

2.2 MATERIALS

- A. Bomanite Molded Pulp Formers: Vacuum formed bio-degradable tools.
 - 1. Sizing: Molded Pulp 5 1/2" sized formers.
- B. Bomanite Clear Cure: Water-based acrylic polymer curing compound designed to bond to fresh concrete and holds in the mix water to achieve improved concrete properties and complies with ASTM C309.
- C. Bomanite Fibers: 7 denier x 3/4" monofilament fibers packaged in 1.5-pound, water-soluble bags for jobsite addition to the ready mix truck.
- D. Bomanite Coloration Concentrate: Concentrated dry powder iron oxide pigments designed to color concrete (optional- dependent upon Grasscrete System selected).
- E. Cultec No. 410 Filter Fabric: A 4-oz non-woven polypropylene fabric designed to minimize silt transfer into the open granular base beneath the Grasscrete.
- F. No substitutions or alternates to the above will be accepted.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Sub-grade for vehicle traffic shall be in accordance with local concrete street specifications. For most applications, except for very heavy loads, native soil having a minimum "R" Value of 30 and a compaction of 95% will provide a suitable sub-grade. A minimum 6" bed of well graded granular stone will be required to provide an adequate sub-base under the void grassed only system. Consult General Contractor, Structural Engineer, Architect and Concrete Contractor prior to installation of concrete slab to ensure complete understanding of substrate preparation, reinforcement, penetrations, mix design, placing and finishing requirements, water capacity, elevations, etc.
- B. The concrete shall have a minimum compressive strength of 4,000 psi in 28 days when placed at a 6-8" slump. Portland cement shall conform to ASTM C 150, Type I, II or V. Aggregates shall conform to ASTM C 33 and be 1/2" minus. Mixing water shall be fresh, clean and potable. In freeze-thaw areas, air entrainment shall be provided. Water reducing admixtures and/or super-plasticizers are permitted and shall conform to ASTM C 494.
- C. The Grasscrete slab shall have a minimum thickness of 5 1/2". All perimeters of the Grasscrete slab should be restrained by a 12" minimum concrete border poured monolithically.
- D. The Grasscrete shall be reinforced 8" on center with #3 black steel bar in both directions seated on the integral former chair.

3.2 PREPARATION

- A. Examine sub-grade, with installer present, for conditions affecting performance of finish. Rectify conditions detrimental to timely and proper work. Do not proceed until unsatisfactory conditions are corrected.
- B. Verify that elevations and compaction meet Project Conditions above.
- C. Prior to concrete pour, verify that formers are free of construction damage and contaminants.

3.3 INSTALLATION

A. Construction Process:

1. Sub-grade shall be leveled to a uniform plane 5 1/2" below the final grade of the Grasscrete slab with 1" of ASTM C-33 washed concrete sand placed over the filter fabric.
2. Grasscrete formers shall be placed on the sub-grade. In sloped situations the use of steel spikes or rebar lengths hammered through the formers into the sub-base may be necessary to hold the formers in place during the concrete placement process.
3. The reinforcement is placed 8" on center once in an alternating, stacking patten. 16" on center north-south, 16" on center east-west, 16" on center north-south and finally 16" on center east-west. This stacking of the steel will place it at the most desirable height with minimal exposure to former material.
4. Three pounds of fibers are added to the ready mix truck in conjunction with the high range water reducers (if required to meet mix design specifications).
5. Concrete shall be placed and leveled to the top of the Grasscrete formers. The concrete surface shall have a coarse broom swept finish.
6. Grasscrete formers shall have the void tops removed after the concrete has hardened sufficiently with some residual paper pulp left in the voids acceptable.
7. The open voids will be filled with clear (no fines) 3/4" crushed stone to within a minimum of 1/2" of the concrete surface.

3.4 PROTECTION

- A. General: Protect finished work from traffic until fully cured in accordance with manufacturer's recommendations.

END OF SECTION 033000



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