



STANDARD SPECIFICATION FOR HYDRAULIC BIOTIC SOIL AMENDMENT (HBSA)

V. 1.5 May 9, 2016

PART 1 GENERAL

1.1 SUMMARY

- A. This section specifies a Hydraulic Biotic Soil Amendment (HBSA). A HBSA is a manufactured, pre-packaged material that is mixed with water and hydraulically-applied as a uniform slurry. HBSAs are engineered to foster the development of top soil in deficient substrates within the rhizosphere, promote faster seed germination, and provide long term nutrient cycling that enhances sustainable vegetation establishment. HBSAs are designed to be used as topsoil or compost alternatives when topsoil is not present, soil is lacking organic matter, or there is little to no biological activity. In order to meet the criteria of replacing the compost or topsoil growth media, HBSAs typically contain a blend of organic and natural fibers with soil building components and soil enhancing chemistry. These materials are manufactured under controlled conditions with specific formulations that ensure product consistency. The components increase the water and nutrient holding capacity of the soil and create an environment for growth of beneficial microorganisms while allowing seed germination and vegetation establishment.

HBSAs shall be a pre-packaged, commercially available, hydraulically applied blend of natural fibers, growth media and other biologically active material.

HBSAs offer some level of erosion protection, but typically do not replace the use of hydraulic or rolled erosion control products (HECPs or RECPs). HBSAs are typically installed beneath and complement HECPs or RECPs as a growing media. Refer to Erosion Control Technology Council HECP and RECP specifications for proper erosion control.

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1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data, mixing and application instructions and application rates.

- B. Certifications: Submit a letter from manufacturer certifying that the HBSA meets or exceeds all performance properties and packaging requirements found in this specification.

1.3 PACKAGING, DELIVERY, STORAGE AND HANDLING

- A. Deliver materials and products in ultraviolet (UV) and weather resistant factory labeled packages that are supplied on unitized pallets. Store and handle in strict compliance with manufacturer's instructions and recommendations. Protect product from damage due to climatic conditions and construction operations.

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PART 2 PRODUCTS

2.1 MATERIAL REQUIREMENTS

A. The HBSA to be used shall meet the standards below:

HBSA Property	Test Method	Values
Physical		
Color	Observation	Naturally colored green, brown or black to contrast area.
Organic Matter	ASTM D586	85% minimum
Acute Toxicity	ASTM 7101 & EPA Method 2021.0	Non-toxic
pH	ASTM D1293	5.5 – 8.5
C:N Ratio	ASTM E1508	20:1 minimum 100:1 maximum
Water Holding Capacity	ASTM D7367	400% minimum
Moisture Content	ASTM D2974	10% minimum, 40% maximum
Performance		
Vegetation Establishment	ASTM D7322	400% minimum

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PART 3 EXECUTION

3.1 SUBSTRATE AND SEEDBED PREPARATION

- A. Ensure the seedbed conforms to the finished grade and cross section shown on the Plans and described in the project specifications. Before applying the HBSA remove any large stones, clods or other debris on the surface to ensure the area is uniform. HBSAs are typically installed beneath and complement HECs or RECs as a growing media. Refer to Erosion Control Technology Council HEC and REC specifications for proper erosion control

3.2 APPLICATION

- A. Strictly comply with manufacturer's mixing and application instructions, machinery requirements and other recommendations. For optimum pumping and application performance use recommended hydraulic seeding/mulching machines with appropriate nozzle tip. Apply HBSA uniformly at the specified unit rate based on site conditions and/or manufacturer's recommendations.
- B. Fill the tank of the hydraulic machine approximately 1/3 full with water. Continue to add water slowly while adding HBSA at a steady rate. Utilize the HBSA manufacturer's recommended water-to-HBSA ratios. Confirm loading rates with equipment manufacturer. All HBSA and supplemental materials should be loaded into the tank before it is approximately ¾ full. Finish filling the tank with water to the desired level. Uniform slurries may require agitation or mixing for a minimum of 10 minutes after all water and HBSA are in the tank.
- C. Mix and apply HBSA over the prepared substrate. Best performance is achieved when HBSA is applied to unsaturated ground and allowed to undergo an appropriate curing period as determined by the manufacturer and/or site conditions. Use an appropriate nozzle tip to ensure uniform surface coverage. Hose applications may be required for certain sites and locations.

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- D. Application rates of HBSA shall be **3,500 – 5,000** pounds per acre and meet manufacturer's specific guidelines for proper performance. A soil test is recommended to determine the agronomic needs of a site. Typically soils or substrates with at least 5 percent organic matter do not need the addition of HBSA. Refer to Erosion Control Technology Council HECP and RECP specifications for proper erosion control.
- E. HBSA is not intended to be applied in channels, swales or other areas where concentrated flows are anticipated, unless installed in conjunction with Rolled Erosion Control Products (RECPs).
- F. After application, thoroughly flush the tank, pumps and hoses to remove all HBSA material. Wash all material from the exterior of the machines and remove any spills.

3.3 PROTECTION

- A. Areas treated with HBSA shall be protected from foot and vehicle traffic, grazing and other disturbances. Any damaged area shall be repaired utilizing the application specification and procedure detailed above.

4.1 PAYMENT

- A. HBSA will be paid for the unit area treated. The price shall include; full compensation furnishing all labor, materials, tools, equipment and incidentals for doing all the HBSA work, complete in place, shown on the plans and as specified in these Standards and Specifications.

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The Erosion Control Technology Council (ECTC) is committed to promoting cost-effective erosion and sediment control through leadership, standardization and education. ECTC assists agencies, engineers, designers, contractors and other entities in the proper application, installation and specification of erosion control technologies while establishing guidelines for product quality, testing and performance.

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