SP- 121040
(New)

Iowa Department of Transportation

SPECIAL PROVISIONS
FOR
ENGINEERED SOIL

STORY County
STP-U-0155(688)--70-85

Effective Date
January 21, 2015

THE STANDARD SPECIFICATIONS, SERIES 2012, ARE AMENDED BY THE FOLLOWING MODIFICATIONS. THESE ARE SPECIAL PROVISIONS AND SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

PART 1 -- GENERAL

1.1 SUMMARY

A. Section Includes:

1. All labor, materials, equipment, and supervision required to furnish and install the Engineered Soil to finish grade for all rain garden planting areas, as shown on the plan sheets.
2. The material and work specified in this section includes: topsoil, sand, and all other items of pertinence necessary to provide, install and grade the amended soil as detailed herein and on the plans

1.2 MEASUREMENT AND PAYMENT

A. The Engineered Soil for rain garden plantings, as indicated on the plans, complete-in-place and accepted, will be measured by cubic yard quantity for finished quantity. Quantity is calculated by the depths and areas shown on plans. Shrinkage factor shall be considered incidental. Topsoil for inclusion in the Engineered Soil mix shall be included in this quantity. Contractor will be paid for plan quantity. Adjustments may be made to the plan quantities if agreed to by both the Engineer and the Contractor.

B. The Engineered Soil for rain garden plantings measured as provided above will be paid for at the cubic yard price bid, which shall be full compensation for furnishing all equipment, materials, and all other work necessary or incidental to the construction of the complete Engineered Soil for rain garden plantings, and for all equipment, tools, labor, and incidentals necessary to complete the work.

1.3 QUALITY ASSURANCE

A. Codes and Standards: Perform work in accordance with applicable requirements of the Iowa DOT Standard Specifications for Highway and Bridge Construction, Series 2012, and all local and state codes and ordinances.

PART 2 -- PRODUCTS

2.1 MATERIALS

A. Sand: Provide clean sand complying with Iowa DOT Section 4110 of the Standard Specifications, Gradation No. 1.

B. Topsoil: Provide soil taken from the top 6 inches of the A-horizon, have a dark brown to black color, have a granular structure and clay content less than twenty-five percent (25%) verified with a ribbon test that yields no more than one inch. If onsite soil is not approved adequate, contractor shall provide topsoil of the proper structure from an off-site source incidental to unit cost.

C. Mixture: The texture of the Engineered Soil mixture will be loamy sand or sandy loam according to the USDA Soil Classification system, soil textural triangle. A laboratory analysis for particle size or a simplified dispersal method for sand content only can also be used to verify soil texture. Thoroughly blend sand and topsoil materials to provide a mixture with eighty percent (80%) sand and twenty percent (20%) topsoil by volume.

2.2 WATER

A. Supply potable water for consolidating the modified soil layer. In lieu of potable water, supply clean, clear water, free of harmful contaminates, from a source approved by the Engineer.

PART 3 -- EXECUTION

3.1 PRE-INSTALLATION PROTECTION

A. Complete grading, utility installation, and other earth disturbing operations prior to excavating for the rain garden system.

B. Prior to installing the rain garden system with Engineered Soil Mix, install erosion and sediment control practices upstream to protect the rain garden system from sediment in stormwater runoff from disturbed soil.

3.2 RAIN GARDEN SYSTEM INSTALLATION

A. Excavate rain garden system area to the length, width, and depth specified in the contract documents. Do not compact the area subgrade and do not operate heavy machinery on the subgrade. Do not operate heavy machinery in the excavated area while placing the Engineered Soil.

B. Place the first 2 inches of the aggregate base evenly over the bottom of the bioretention area.

C. Underdrain: install slotted pipe at the on top of 2 inches of aggregate base layer at location specified on plans

D. Place remaining aggregate base layer to the elevation specified in the contract documents.

E. Aggregate Filter Layer: install over stone aggregate base layer to the depth specified in contract documents.

F. Place Engineered Soil in eight to twelve inch lifts to the elevation specified in the contract documents. Overfill area with modified soil by five percent (5%) of the specified depth to allow for natural settlement.

G. Avoid over compaction by allowing time for natural settlement. If the project schedule does not allow for natural settlement of soil and the contract documents require compaction by soaking, compact the filter soil matrix by soaking as described below and shall be incidental to unit price:

1. Apply water to uniformly saturate surface by spraying or sprinkling.
2. Ensure entire bioretention area is saturated.
3. Add modified soil as required to restore settled surface to finished elevation.

H. Uniformly grade and rake the top of the Engineered Soil layer to a flat, smooth, uniform surface.

I. Place a 3 inch layer of hardwood mulch over area filled with modified soil. Do not place hardwood mulch over seeded areas. If the contract documents specify plants for the surface of the modified soil layer, install prior to placing mulch. Netting may be needed on top of the surface of the mulch to minimize floating of the mulch.

J. Do not stockpile materials on or near the surface of the completed bioretention cell.

K. Protect completed bioretention area from heavy machinery and other construction equipment.

L. Install and stake 8 inch diameter filter sock around perimeter of bio-cell to prevent sediment from contaminating bio-cell’s modified soil.