



ROYAL OAK FARM BLUEBLOOD™ RAIN GARDEN SUBSTRATE
Section 02_____

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, General Provisions of the Contract and Division-1 Specifications sections, apply to this section.

1.2 WORK IN THIS SECTION

- A. Section includes:
 - 1. Soil amendments.
 - 2. Soil preparation.
 - 3. Preparation and finish grading of bioretention ponds and/or rain gardens.
- B. Substitutions: Substitute products will be considered only under the terms and conditions of Section _____.

1.3 DEFINITIONS

- A. Compost: Shall be a mature and stable humic soil amendment produced through the aerobic controlled decomposition of organic materials, shall have been produced at a facility permitted by the Virginia Department of Environmental Quality, and shall be tested in accordance with the U.S. Composting Council's (USCC) Seal of Testing Assurance (STA) Program.
- B. Rain Garden Substrate: Soil produced by homogeneously blending mineral soils or sand with stable, mature compost tested in accordance with the USCC STA Program to produce a soil sufficient to establish and support the growth of permanent vegetation in bioretention ponds and/or rain gardens.
- C. Finished Grade: Elevation of the finished surface of the planting soil
- D. Subgrade: Surface or elevation of subsoil remaining after completing excavations, or top surface of a fill or backfill immediately beneath planting soil

1.4 RELATED WORK IN OTHER SECTIONS

- A. The following Sections contain requirements that may relate to this Section:
 - 1. Section 02___ - Earthwork
 - 2. Section 02___ - Irrigation
 - 3. Section 02___ - Trees, Plants, Groundcovers
 - 4. Section 02___ - Seeding

1.5 REFERENCES

- A. United States Department of Agriculture (USDA) Soil Texture System of Classification
- B. U.S. Composting Council, Test Methods for the Examination of Compost and Composting (TMECC)
- C. The Bioretention Manual, published by Department of Environmental Resources Prince George's County, Maryland



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- D. American Society for Testing and Materials, Test Method No. D-2434, “Standard Test Method for Permeability of Granular Soils (Constant Head)”

1.6 SUBMITTALS

- A. Comply with requirements of this Section, Project Manual requirements and Conditions of the Contract.
- B. The following submittals are required for portions of the Work specified in this section.
 - 1. Compost Technical Data Sheet: Submittal prepared by an independent laboratory certified by the USCC to analyze the compost used to create a manufactured soil or a planting soil in accordance with the USCC's Test Methods for the Examination of Compost and Composting (TMECC); such analysis must be dated no earlier than six (6) months from the date of submittal
 - 2. Materials Qualification Test: Submittal prepared by an independent soils testing laboratory to indicate the proposed materials comply with contract document requirements
 - 3. Samples: Submit samples of all topsoil products proposed to be used. Include a list of sources. Samples shall be submitted in one-gallon containers.
- C. At the time of Post-Construction Inspection, furnish copies of material verifications such as load tickets, invoices, sales slips, test results and similar items as specified.

1.7 PROJECT CONDITIONS

- A. All areas to be improved shall be inspected by the Contractor before starting work. Report any defects such as incorrect grading, or drainage problems, to the Owner's Representative before beginning work. The commencement of work by the Contractor indicates his acceptance of the areas to be improved, and acceptance of full responsibility for the work of this section.
- B. Protect existing utilities, paving, walls, and any other facilities from damages caused by operations associated with bioretention pond construction.

1.8 QUALITY ASSURANCE

- A. Qualifications of Contractor: The Contractor shall be active and experienced in work of the type specified, and upon request by the Owner and/or Owner's Representative, be able to show evidence of successful completion of projects of similar scope.
 - 1. Field supervision: The Contractor shall maintain an experienced full-time supervisor on the Project site during those times that work under this section is being performed.
- B. Regulatory Requirements: Obtain and pay for all permits and testing related to the work of this section.
- C. Pre-Grading Inspection: In conformance with the project conditions specified herein, meet with the Owner's Representative to discuss and verify requirements, schedule, and proposed soil preparation methods.



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1.9 GUARANTEE

- A. Guarantee: Guarantee materials and workmanship for a period of one-year following Owner's final acceptance.

1.10 SEQUENCING AND SCHEDULING

- A. Coordinate work of other trades specified elsewhere.
- B. Do not perform bioretention pond work in areas subject to the subsequent work of other sections, unless approved otherwise.
- C. Perform work in accordance with the approved schedule. If a schedule delay greater than three days occurs, immediately revise and resubmit schedule to reflect each schedule delay.

1.11 MAINTENANCE

- A. Maintain the work as specified in this section until final acceptance of the work.

PART 2 - PRODUCTS

2.1 COMPOST

- A. Composted material shall be Royal Oak Farm Blueblood™ Garden Compost or equivalent, and must be in compliance with VA Department of Environmental Quality's specifications, which appear in 9 VAC 20-80-330; plus the following additional requirements.
- B. Additional Requirements
 - 1. The compost must be registered with the USCC STA program.
 - 2. The carbon to nitrogen ratio of the compost shall be below 25:1.
 - 3. The compost shall have an organic matter content of 35% to 65%% as determined by "loss on ignition" test method.
 - 4. Submit one-gallon sample, source, and Compost Technical Data Sheet from the supplier to the Owner's Representative for approval prior to installation.

2.2 TOPSOIL

- A. A mixture of compost, meeting requirements of Section 2.1 above, and sand or sandy loam per USDA soil texture classification. The mixture shall contain between 3% and 5% organic matter for turf areas and for planting beds. The topsoil shall be free of weeds, herbicides, petroleum-based materials, any other deleterious materials, rocks, and debris, and shall be Royal Oak Farm Blueblood™ Manufactured Topsoil, or equivalent. The topsoil shall have a pH of between 5.5 and 8.0. 100% of the topsoil shall pass through a 3/4" screen, less than 25% shall pass through a #200 sieve.
- B. Submit one-gallon sample, source, and letter of certification from the supplier to the Owner's Representative for approval prior to installation.



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2.3 RAINGARDEN SUBSTRATE/BIORETENTION SOIL

- A. A mixture of compost, meeting requirements of Section 2.1 above, and sand or sandy loam per USDA soil texture classification. The mixture shall be Royal Oak Farm Blueblood™ Rain Garden Substrate, or equivalent. The mixture shall contain between 1% and 3% organic matter, and shall have no more than 5% clay content. The soil mixture shall be 50-60% sand, 20-30% Royal Oak Farm Blueblood™ Garden Compost or equivalent, and 20-30% topsoil and shall have an infiltration capacity of between one and four inches per hour (as measured by ASTM D-2434). The soil shall have a pH of between 5.5 and 8.0. The soil shall be a uniform mix, free of stones, stumps, roots, or other similar objects larger than one inch. The mixture shall be free of noxious weeds such as Bermuda Grass, Quackgrass, Johnson Grass, Mugwort, Nutsedge, Poison Ivy, Canadian Thistle, Tearthumb, etc.
- B. Submit one-gallon sample, source, and letter of certification from the supplier to the Owner and/or Owner’s Representative for approval prior to installation.

2.3 SAND

- A. Coarsely graded sand meeting the specifications for ASTM C-33 Fine Aggregate with a Fineness Modulus greater than 2.75 shall be selected.
 - 1. Sands shall be clean, sharp natural sands. High limestone sands should not be used in manufactured topsoil formulations intended for use with ericaceous plants.
 - 2. Sand used should meet the following particle size distribution:

<u>Sieve</u>		<u>Percent Passing</u>
3/8"	9.50 mm	100
No. 4	4.75 mm	95-100
No. 8	2.36 mm	80 -100
No. 16	1.88 mm	50 – 85
No. 30	0.60 mm	25 – 60
No. 50	0.30 mm	110 – 30
No. 100	0.15 mm	2 - 10

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions where work is to be performed. Do not proceed until unsatisfactory conditions have been corrected.
 - 1. Verify final subgrade has been established.
 - 2. Verify topsoil meets requirements of this Section and soils testing lab reports have been received and approved by Owner’s Representative.
 - 3. As applicable, verify that compaction requirements in Section 02_____ have not been exceeded.



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4. Notify the Owner's Representative, in writing, of any conditions which might prevent satisfactory completion.

3.2 RAINGARDEN SUBSTRATE STORAGE, PLACEMENT PREPARATION AND PLACEMENT

A. Storage

1. Isolate Royal Oak Farm Blueblood™ Rain Garden Substrate, or equivalent, from other soils. Prohibit vehicular and pedestrian traffic over stockpiled soil. Protect soil from air and water erosion.
2. Stockpile Royal Oak Farm Blueblood™ Rain Garden Substrate, or equivalent, generally where indicated and in such a manner that natural drainage is not obstructed and that no off-site sediment transmission will result. Place stockpiles with a maximum 2:1 side slope.
3. Place Filtrexx SiltSoxx™, or equivalent, around Royal Oak Farm Blueblood™ Rain Garden Substrate, or equivalent, stockpiles as sediment control devices.

B. Placement Preparation

1. Confirm rough grading of subsoil at pond invert and report deficiencies.
2. Establish indicated and needed erosion and sediment control items such as diversions, berms, dikes, waterways, sediment basins, etc.
3. Remove any debris and rocks (greater than one inch diameter) from areas where the mixture is to be emplaced.

C. Placement

1. Spread a 6 – to 10- inch layer (a "lift") of Royal Oak Farm Blueblood™ Rain Garden Substrate, or equivalent, over the invert area in the pond, repeat as needed to emplace the required thickness. Lifts are not to be compacted to reduce the possibility of excessive settlement.
2. Avoid excessive compaction of rain garden substrate. Compaction should only be sufficient so that it will show a shallow heel mark when walked upon and will allow water to penetrate at a minimum rate of one inch per hour. Over compaction will require removal and replacement, as directed by the Owner's Representative.
3. Overfill lifts of Royal Oak Farm Blueblood™ Rain Garden Substrate, or equivalent, above the proposed surface invert to accommodate natural settlement to proper grade.

END OF SECTION