City of Cambridge
Purchasing Department

Cynthia H. Griffin
Purchasing Agent

TO: ALL BIDDERS

FROM: CITY OF CAMBRIDGE

DATE: MARCH 3, 2011

RE: FILE NO. 5394 – RESTORATION PLANTINGS AT BLACK'S NOOK & GARDEN SLOPE

The following bid opening is being postponed from Thursday, March 3, 2011 @ 2:00 pm **until Thursday, Marh 10, 2011 @ 2:00 pm**.

Attached are the **revised** specifications for items 2950.2 and 2950.3.

All other particulars remain unchanged.

CYNTHIA H. GRIFFIN
PURCHASING AGENT

ADDENDUM NO. 1

REVISED – 3-3-2011

SECTION 02950

PLANTING SOILS

2950.1	**WETLAND PLANTING SOIL**	**CUBIC YARDS**
2950.2	**AMEND EXISTING SOIL AT BLACK'S NOOK**	**SQUARE YARDS**
2950.3	**AMEND EXISTING SOIL AT GLACKEN SLOPE**	**SQUARE YARDS**
2950.4	**COLLECT AND PLACE BASKING LOGS AT BLACK'S NOOK**	**EACH**

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. The General Documents, as listed on the Table of Contents, and applicable parts of Division 1, GENERAL REQUIREMENTS, shall be included in and made a part of this Section.

B. Examine all Drawings and all other Sections of the Specifications for requirements therein affecting the work of this trade.

1.02 SUMMARY

The work of this Section consists of providing all labor, equipment, materials, incidental work, and construction methods necessary to amend Upland and manufacture Wetland Planting Soils as indicated on the Contract Documents and specifications and shall include but not be limited to the following:

1. Manufacturing of Wetland Planting Soils.
2. Manufacturing of Amended Existing Soils, as necessary, to meet project requirements.
3. Collecting stockpiled logs and detritus and placing at Black's Nook.

1.03 RELATED WORK

The following items of related work are specified and included in other Sections of the Specifications:

1. Section 01568 EROSION AND SEDIMENT CONTROL
2. Section 02100, SITE PREPARATION
3. Section 02120, EARTH EXCAVATION, BACKFILL, FILL AND GRADING
4. Section 02550, SLOPE STABILIZATION
5. Section 02952, RESTORATION SEEDING
6. Section 02954, UPLAND PLANTING

1.04 REFERENCES

1. ASTM: American Society for Testing and Materials
   D 2977, Standard Test Method for Particle Size Range of Peat Materials and Horticultural Practices

2. US EPA: United States Environmental Protection Agency
   Test Methods for Evaluating Solid Waste, Physical/Chemical Methods. SW-846. 3rd Edition.

3. TMECC: Test Methods for the Examination of Compost and Composting Sampling and Test Methods
   Jointly published by the USDA and USCC (2002 publishing as part of the USDA National Resource Conservation Technical Bulletin Series)

4. US Composting Council Seal of Testing Assurance Program Documents

1.05 SUBMITTALS

A. At least **30 days prior to ordering materials**, the Contractor shall submit to the Owner's Representative samples, certifications, manufacturer's product data and certified test results for materials as specified below for approval. No materials shall be ordered or delivered until the required submittals have been reviewed and approved by the Owner's Representative. Delivered materials shall closely match the approved samples. Approval shall not constitute final acceptance. The Owner's Representative reserves the right to reject, on or after delivery, any material that does not meet these Specifications. Submit the following in accordance with Section 01300 – SUBMITTALS:

   1. Common fill and topsoil: Sample and test the proposed soils. The Contractor shall sample the soils of the construction site in the following manner:

      a. Preparation of Samples: Contractor shall take one cup of soil from each representative sample and dry it at room temperature (do not dry samples in an oven or on a stove or radiator). Once soil is dry, place soil in sandwich size zip-type plastic bag and close it tightly. Label each sample on outside of bag, identifying sample by reference number.

B. Testing will be at the Contractor's expense. Contractor shall deliver all samples to testing laboratories via overnight courier and shall have the testing report sent directly to the Owner's Representative. Perform all tests for gradation, organic content, soil chemistry and pH by UMASS Soil and Plant Tissue Laboratory, West Experiment Station, North Pleasant Street, University of Massachusetts, Amherst, MA 01003, (413) 545-2311, or another professional testing laboratory approved by the Owner's Representative. Testing reports shall include the following tests and recommendations. Contractor shall deliver samples to testing laboratories and shall have the testing report sent directly to the Owner's Representative from the Soil and Plant Tissue Laboratory. Testing reports shall include the following tests and recommendations.

   1. Mechanical gradation (sieve analysis) shall be performed and compared to the

USDA Soil Classification System. Sieve analysis shall be by combined hydrometer and wet sieving using sodium hexametaphosphate as a dispersant in compliance with ASTM D 422 after destruction of organic matter by H_2O_2. To facilitate review and approval of sieve analysis, provide a computer generated gradation curve from UMASS Soil & Plant Tissue Laboratory.

2. Percent of organics shall be determined by the loss on ignition of oven-dried samples. Test samples minus #10 material shall be oven-dried to a constant weight at a temperature of 450 degrees Fahrenheit.

3. Chemical analysis shall be undertaken for Nitrate Nitrogen, Ammonium Nitrogen, Phosphorus, Potassium, Calcium, Magnesium, extractable Aluminum, Lead, Zinc, Cadmium, Copper, Soluble Salts, pH, and buffer pH. A Conductivity Meter shall be used to measure Soluble Salts in 1:2 soil/water (v/v). Except where otherwise noted, nutrient tests shall be for available nutrients.

4. Soil analysis tests shall show recommendations for soil additives to correct soils deficiencies as necessary, and for additives necessary to accomplish planting work as specified.

5. Leaf Mulch: Submit a one cubic foot sample and supplier's certification of contents.

6. Limestone: Submit supplier's certification that the limestone being supplied conforms to these Specifications.

7. Acidulant: Submit supplier's certification that the acidulant being supplied conforms to these Specifications.

8. Gypsum: Submit manufacturer's product data and one (1) pound sample.

9. All additives needed to amend the existing soils in order to meet these specifications.

1.06 EXAMINATION OF CONDITIONS

A. The Contractor and any Sub-Contractor responsible for the execution of the Work of this section, PLANTING SOILS, shall review and confirm in writing that the existing elevations are correct prior to proceeding with the spreading of the planting soil.

B. Carefully review the requirements of this section, PLANTING SOILS, to understand the requirements of testing, compaction, slope, and absence of debris on the existing soils prior to spreading of the planting soils.

C. The Contractor shall be solely responsible for judging the full extent of work requirements involved.

1.07 DEFINITIONS

A. Planting Soils to include Amended Existing Soil and Wetland Planting Soil. Wetland

Planting Soil for use in vernal pool habitat and Amended Existing Soil for use in all other planted areas as indicated on the Drawings. The following definitions shall apply to the work of this Section.

B. The following size distributions of mineral particles by diameter and sieve size shall apply to the following conventional names of soil types:

Conventional Name	Retained on U.S. Sieve No.	Diameter (mm)
Very coarse sand	#18	1 - 2
Coarse sand	#35	0.5 - 1
Medium sand	#60	0.25 - 0.5
Fine sand	#140	0.10 - 0.25
Very fine sand	#270	0.05 - 0.10
Silt	by hydrometer	0.002 - 0.05
Clay	by hydrometer	Less than 0.002

C. Loamy sands shall conform to USDA Soil Taxonomy definitions and as follows: Soil material that contains at the upper limit 85 to 90 percent sand, and the percentage of silt plus 1.5 times the percentage of clay is not less than 15; at the lower limit the soil material contains not less than 70 to 85 percent sand, and the percentage of silt plus twice the percentage of clay does not exceed 30 percent.

1. Loamy coarse sand: 25 percent or more very coarse and coarse sand, and less than 50 percent any other one grade of sand.
2. Loamy sand: 25 percent or more very coarse, coarse, and medium sand, and less than 50 percent fine or very fine sand.
3. Loamy fine sand: 50 percent or more fine sand or less than 25 percent very coarse, coarse, and medium sand and less than 50 percent very fine sand.
4. Loamy very fine sand: 50 percent or more very fine sand.

D. Sandy Loam shall conform to USDA Soil Taxonomy definitions and as follows: Soil material that contains either 20 percent clay or less, and the percentage of silt plus twice the percentage of clay exceeds 30 percent, and 52 percent or more sand; or less than 7 percent clay, less than 50 percent silt, and between 43 percent and 52 percent sand.

1. Coarse sandy loam: 25 percent or more very coarse and coarse sand and less than 50 percent any other grade of sand.
2. Sandy loam: 30 percent or more very coarse, coarse and medium sand, but less than 25 percent very coarse sand, and less than 30 percent very fine or fine sand.
3. Fine sandy loam: 30 percent or more fine sand and less than 30 percent very fine sand or between 15 and 30 percent very coarse, coarse, and medium sand.

E. Wetland Planting Soil shall consist of excavated soils combined with a highly decomposed organic material containing 4 to 6 percent organic carbon content by weight. To meet this standard, wetland soils shall be produced by combining excavated and stockpiled material with leaf mold compost in an approximate mix ratio of one (1) part by volume topsoil to one (1) part by volume compost, as described in Section 2.02 of this Section – PLANTING SOILS. The resulting soil mix shall be free of stones, stumps, large sticks, shrubs, the seeds and roots of

exotic/invasive plants, or other litter. The Wetland Planting Soil mix shall be tested by the Contractor's soil testing firm to confirm that it meets the minimum requirements outlined below.

1.08 QUALITY ASSURANCE AND QUALITY CONTROL

A. Contractor shall use only employees qualified by education and experience to perform each of the individual tasks (i.e. earthwork, wetland planting soils, and maintenance) within the wetland areas. Education, experience, and certification or license by appropriate organizations will be reviewed to evaluated competence.

B. All costs related to testing or replacement of non-conforming materials shall be paid for by the Contractor at no additional cost to the Owner, and the costs thereof will be deducted by the Owner.

C. Contractor shall attend a pre-construction meeting with the City of Cambridge Conservation Commission or their Administrator to ensure that the Order of Conditions is understood by the Contractor.

D. The Contractor shall maintain a copy of the Order of Conditions at the Site for reference.

E. All work shall conform to the Drawings and Specifications, except as modified by the Owner's Representative, and shall comply with applicable codes and regulations.

1.09 COORDINATION AND CONSTRUCTION SEQUENCE

A. Contractor shall refer to Section 01010, SUMMARY OF WORK, for overall coordination and sequencing.

PART 2 - PRODUCTS

2.01 AMMENDED EXISTING SOIL

A. Amended Existing Soil shall be existing site soils amended with compost that meet the criteria specified in Table 1 of this specification section. Only compost products that meet all applicable state and federal regulations pertaining to its production and distribution may be used in this application. Approved compost products must meet related state and federal chemical contaminant (e.g., heavy metals, pesticides, etc.) and pathogen limits pertaining to the feedstocks (source materials) from which it is derived.

B. The compost shall be composed of nutrient-rich, organic feedstocks that are derived from food and gelatin-producing processes. These nitrogenous materials shall be mixed with bulking agents such as leaves and ground wood that are windrowed, turned, and composted to produce a productive soil amendment.

C. The compost shall contain no biosolids.

D. Compost shall meet all US Composting Council, TMECC, ASTM and US EPA

Standards for compost materials.

Table 1 – Compost Parameters

Parameter	Value
pH	7.1
Moisture Content	40% - 50%
Particle Size	1/2" minus
C:N Ratio	15:1
Organic Matter (dry weight)	45%
Bulk Density (lbs./cu yd)	1100
Soluble Salts (mmhos/cm)	4.0
Nutrient	% Dry Basis
Total Nitrogen	1.7
Phosphorus	0.8
Potassium	0.5
Calcium	3.5
Magnesium	0.4
	Notes: *All values are based on representative averages.

C. It shall be free of stones greater than one and one-quarter inches, lumps, plants and their roots, debris, and other extraneous matter as determined by the Owner's Representative.

D. Organic content and pH for specific planting use shall be as follows:

1. Areas planted with plants and restoration seed mixes:
   a. pH: 5.5 through 6.5 for non-acid loving plants
   b. pH: 4.5 through 5.5 for *Ericaceae* and other acid-loving plants
   c. Organic Content 4.0 - 6.0 percent as determined by the loss on ignition of oven-dried samples passing #10 sieve (Muffle furnace temperature: 450 +/- 10 degrees C for 8 hours)

2.02 SOIL ADDITIVES

A. General: Soil additives shall be used to counteract soil deficiencies as recommended by the soils analysis as specified herein.

B. Acidulant for adjustment of Planting Soils pH shall be commercial grade flours of sulfur, ferrous sulfate, or aluminum sulfate that are unadulterated. Acidulants shall be delivered in unopened containers with the name of the manufacturer, material, analysis and net weight appearing on each container.

C. Ground limestone for adjustment of Planting Soils pH shall contain not less than 85 percent of total carbonates and shall be ground to such fineness that 40 percent will

pass through 100 mesh sieve and 95 percent will pass through a 20 mesh sieve. Contractor shall be aware of Planting Soil pH and the amount of lime needed to adjust pH to meet the requirements of the testing lab recommendations.

2.03 WETLAND PLANTING SOILS

A. Wetland Planting Soils shall be comprised of native site soils that have been excavated from the Vernal Pool Habitat area and that has been approved by the Owner's Representative. Wetland Planting Soils should only be manufactured for other areas of the Black's Nook Project Area if existing soils are found to not be suitable for plug growth. Contractor shall notify Owner's Representative immediately for further instruction.

B. It shall be free of stones greater than one and one-quarter inches, lumps, plants and their roots, debris, and other extraneous matter as determined by the Owner's Representative. Wetland Planting Soils shall follow the grain size distribution as outlined for Amended Existing Soil.

C. Maximum size shall be one and one quarter inches largest dimension. The maximum retained on the #10 sieve shall be 25% by weight of the total sample. It is anticipated that stripped, on-site Subsoils will require screening to meet these requirements.

D. General: No soil additives shall be used in the Wetland Planting Soils, with the exception of compost as specified in this section 02950 – PLANTING SOILS.

2.04 EROSION CONTROL

A. Erosion Control methods include straw wattles, straw mulch, coir mesh Rolled Erosion Control Blanket, and coir logs as required in Sections 01568 – EROSION AND SEDIMENT CONTROL, 02550 –SLOPE STABILIZATION, 02952 - RESTORATION SEEDING, and 02954 - UPLAND PLANTING.

2.05 BASKING LOGS

A. Basking logs shall be supplied by the Owner. They shall be constructed from either live or dead hardwood trees with a minimum 8-inch diameter. They shall be a minimum of 8' long.

PART 3 - EXECUTION

3.01 WETLAND PLANTING SOIL

A. Excavated native soil shall be stockpiled and amended with compost for use as Wetland Planting Soil per this Specification Section – PLANTING SOILS prior to be being placed in areas designated on the Contract Drawings.

B. Place wetland soil on subgrades free of mud, frost, snow, or ice.

3.02 FILLING AND COMPACTION

A. Under no circumstances shall wheeled vehicles be driven over existing soils.

3.03 FINE GRADING

A. Immediately prior to dumping and spreading Amended Existing Soil and Wetland Planting Soils, the area shall be cleaned of all stones greater than 2 inches and all debris or rubbish. Such material shall be removed from the site, not raked to the edges and buried. Notify the Owner's Representative that the area has been cleaned and request his/her attendance on site to review and approve surface conditions prior to spreading stockpiled Amended Existing Soil and Wetland Planting Soils.

B. The existing soil shall be scarified to a four (4) inch depth for bonding of amendments and existing soils.

C. No soil shall be handled, planted, or seeded in any way if it is in a wet or frozen condition. A moist condition is desirable.

D. Contractor shall install Amended Existing Soil as backfill for planting holes and Wetland Planting Soils to a minimum thickness of six (6") inches and graded to the elevations and slopes shown.

E. For areas to receive Wetland Planting Soils:

1. Lightly spread the soil mixture into place, but do not compact.

1. Create micro topography necessary for finish grades as shown on Contract Drawings.

2. Once placed, do not traverse the soil with equipment or vehicles.

F. Select equipment and otherwise phase the installation of the planting soils to ensure that wheeled equipment does not travel over existing soils. Movement of tracked equipment over said soils will be reviewed and considered for approval by the Owner's Representative. If it is determined by the Owner's Representative that wheeled equipment must travel over exiting soils, provide a written description of sequencing of work that ensures that compacted soil is loosened and uncompacted as the work progresses.

G. Do not compact Wetland Planting Soils.

H. Disturbed areas outside the limit of planting work shall be graded smooth and spread with a minimum of 6 inches of Amended Existing Soil to the finished grade.

3.04 EROSION CONTROL

A. For Amended Soils refer to Specification Sections 01568 - EROSION AND SEDIMENT CONTROL and Section 02952, RESTORATION SEEDING.

B. For Wetland Planting Soils, no temporary or permanent seed mix, or straw mulch shall be used for erosion control. Vernal pool area to only have natural detritus as

erosion control.

3.05 BASKING LOGS

A. Basking logs shall be placed at the locations as shown on the Contract Drawings prior to planting.

B. The basking logs are designed to provide wildlife habitat.

C. Adjustments to the arrangement of the basking logs may be made during construction by the Owner's Representative based on field conditions.

3.06 ACCEPTANCE

A. Confirm that the final grade of the Amended Existing Soil and Wetland Planting Soils are at the proper finish grade elevations. Adjust grade as required to meet the contours and spot elevations noted on the Plans. Request the presence of the Owner's Representative to inspect final grade. Do not proceed with the remaining work of this Contract until the Owner's Representative has given his/her written approval of the final grade.

PART 4 – COMPENSATION

Item 2950.1 – Wetland Planting Soil

METHOD OF MEASUREMENT:

Measurement for payment for this item is based on actual quantity of cubic yards of existing soils excavated, stockpiled, amended with compost, and placed for all locations as noted on the drawings.

BASIS OF PAYMENT:

Under the Unit Price for this item, the Contractor shall furnish all labor, equipment, materials, incidental work, and construction methods necessary to excavate, mix stockpiled soil and compost and place wetland planting soils. This includes hiring an independent soil-testing firm at the Contractor's expense to verify compliance with these Specifications.

Item 2950.2 – Amend existing soil at Black's Nook

METHOD OF MEASUREMENT:

Payment for this item shall be based on the unit price bid for this item in the proposal. Measurement for payment for shall be based on the actual number of square yards of Amended Existing Soils required for all locations as noted on the drawings.

BASIS OF PAYMENT:

Under the Unit Price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required to Amend Existing Soils, including, but not limited to, tilling

and compost amendments, as shown on the Contract Drawings, at the direction of the Owner's Representative, and as specified.

Item 2950.3 – Amend existing soil at Glacken Slope

METHOD OF MEASUREMENT:

Payment for this item shall be based on the unit price bid for this item in the proposal. Measurement for payment for shall be based on the actual number of square yards of Amended Existing Soils required for all locations as noted on the drawings.

BASIS OF PAYMENT:

Under the Unit Price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required to Amend Existing Soils, including, but not limited to, tilling and compost amendments, as shown on the Contract Drawings, at the direction of the Owner's Representative, and as specified.

Item 2950.4 – Collect and place basking logs at Black's Nook

METHOD OF MEASUREMENT:

Payment for this item shall be based on the unit price bid for this item in the proposal. Measurement for payment for shall be based on the actual number of basking logs placed as noted on the drawings.

BASIS OF PAYMENT:

Under the Unit Price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required to collect and place basking logs, as shown on the Contract Drawings, at the direction of the Owner's Representative, and as specified.

-END OF SECTION 02950-