

# TOWN OF ELKTON – SOUTH FORK SHENANDOAH RIVER BANK STABILIZATION

## TECHNICAL SPECIFICATIONS

Town of Elkton

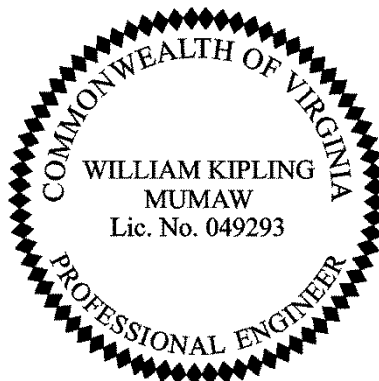
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## **SECTION 1: SITE PREPARATION**

### **SPECIAL PROVISION 1: MOBILIZATION**

#### **1. DESCRIPTION**

Mobilization shall consist of furnishing, transporting, and stockpiling of all materials for assembling and setting up for the project's operations. Mobilization shall include but is not limited to all activities and associated costs for transportation of Contractor's personnel, equipment, and operating supplies to the site; establishment of offices, buildings, staging areas, stockpiling areas and other necessary general facilities for the Contractor's operations at the site; including coinsurance and reinsurance agreements as applicable; and other items specified.

Mobilization shall include sanitary facilities. The Contractor shall furnish and install temporary sanitary facilities for use throughout the construction period. This includes containers to dispense drinking water, enclosed toilet facilities and general washing facilities for construction personnel, which complies with OSHA safety and health regulations and local ordinances for these facilities. Appropriate sanitary facilities are to be established within the project site. Mobilization shall include all activities and costs for demobilization as well including transportation of personnel, equipment, and supplies not required or included in the contract from the site in addition to disassembly, removal, and site cleanup.

#### **2. MEASUREMENT AND PAYMENT**

Mobilization shall be measured and paid for as a lump sum (LS) item. This price shall include demobilization. No additional payment will be made for demobilization and remobilization because of shutdowns, suspensions of work, or other mobilization activities.

Fifty percent (50%) of the mobilization will be paid on the initial movement of equipment and personnel. Another 25% will be paid midway through the project. The last 25% will be paid at completion of demobilization.

### **SPECIAL PROVISION 2: CONSTRUCTION STAKEOUT**

#### **1. DESCRIPTION**

Construction stakeout survey shall include, but not be limited to setting the construction baseline staking the proposed channel centerline (PT, PC, and radius of curvature), staking of structures, and any other survey incidental to construction or as directed by the Town of Elkton. At a minimum, the Contractor is responsible for:

- All construction staking, including point of tangency, point of curvature, radius point and limits of construction.
- Layout and maintenance of a construction baseline that is offset from the

- project.
- Staking all horizontal centerline control, elevation benchmarks, and structure location and elevation.
  - Limits of disturbance and critical areas.
  - Benchmarks shall be set and preserved.

## **2. MEASUREMENT AND PAYMENT**

Construction Stakeout shall be measured and paid for as a lump sum (LS) item. The payment will be full compensation for furnishing, placing, and maintaining construction stakeout necessary to complete the work.

## **SECTION 2: SITE MAINTENANCE**

### **SPECIAL PROVISION 3: PHOTOGRAPHIC DOCUMENTATION**

#### **1. DESCRIPTION**

Photographic requirements shall consist of photographic documentation of construction activities and their associated submittals. At a minimum, the Construction Oversight Consultant is responsible for:

- Submit photographs taken prior to start of construction to show original site conditions.
- Submit color progress photographs in a digital format (JPEG, JPG, BMP, or TIFF file types) with each payment application. Progress photos are to be taken no more than seven (7) days before inclusion with payment application. Files shall be labeled in such a way to easily determine the date taken and photo location. Photos should be submitted on a clearly labeled CD or DVD, or other digital media approved by the Town of Elkton.

#### **2. EXECUTION**

##### **A. Preconstruction Photographs**

- Prior to commencement of any construction, take color photographs of entire limits of project and streets proposed to detour traffic or where construction traffic will ingress/egress the project site. Present digital copy to the Town of Elkton for use in contract administration and inspection.
- Take sufficient number of photographs to show structural condition of concrete/asphalt and conditions of existing trees, shrubs, and grass. Fully document conditions of adjacent features such as driveway entrances, sidewalks, gardens, etc.

##### **B. Progress Photographs**

- Progress photos need only be taken in disturbed or active areas of construction.

##### **C. Post-construction Photographs**

- Upon final stabilization, but prior to project close-out, take color photographs of all features originally documented in item A.
- Document any changes evident in photographs that represent damage or concerns to adjacent property and provide to the Town of Elkton.
- Contractor shall be responsible for repair or replacement of damaged structures or property.

### **3. MEASUREMENT AND PAYMENT**

Payment is included in the cost of construction administration to the Consultant.

#### **SPECIAL PROVISION 4: EROSION & SEDIMENT CONTROL**

##### **1. DESCRIPTION**

An Erosion and Sediment Control (ESC) Plan has been completed and is included in the approved construction plan set. Contractor shall perform all work in accordance with the ESC Plan. A Construction General Permit Registration will be required for this project and the registration statement must be filled out and submitted to Rockbridge County along with a \$756 VSMP fee.

##### **2. MEASUREMENT AND PAYMENT**

Erosion and Sediment Control will be measured for payment on a linear foot (LF) basis for Silt Fence and Orange Safety Fence, and per each (EA) Construction Entrance. The payment will be full compensation for furnishing, installing, maintaining, and removing all erosion and sediment control measures shown on the plans, including all materials, labor, equipment, tools, and incidentals necessary to complete the work as specified in the Construction Drawings, or as directed by the Town of Elkton.

#### **SPECIAL PROVISION 5: POLLUTION PREVENTION**

##### **1. DESCRIPTION**

A Stormwater Pollution Prevention Plan (SWPPP) has been prepared and is available for review. Contractor shall perform all work in accordance with the approved Stormwater Pollution Prevention Plan (SWPPP). The SWPPP shall be maintained throughout construction in accordance with the Construction General Permit and Virginia Stormwater Management Program (VSMP) Regulation (9VAC25-870).

## SECTION 3: STREAM CONSTRUCTION

### SPECIAL PROVISION 6: EARTHWORK

#### 1. DESCRIPTION

Earthwork shall consist of performing all operations necessary to excavate and transport all cut & fill material, process material as required, deposit, place, and compact material in accordance with the grades as shown on the plans or as directed by the Town of Elkton. Such earthwork shall include the loosening, removing, loading, transporting, stockpiling, depositing, and compacting of all materials (including topsoil) wet and dry, as required for the purposes of completing the work.

Earthwork has been divided into three line items, Earthwork & Haul Off – Landfill Waste, Earthwork & Haul Off – Fill, and Fill Material (Salvaged).

Earthwork & Haul Off – Landfill Waste shall consist of excavating, stockpiling, and transporting the landfill waste to the Rockingham County Landfill.

Earthwork & Haul Off - Fill line item shall consist of excavating, stockpiling, and transporting excess fill to the County Landfill.

Fill Material (Salvaged) line item shall consist of excavating and temporarily stockpiling fill material to then be used in conjunction with salvaged and imported topsoil to construct the Geolifts and proposed grades as shown on the construction plans.

Three alternative line items, Earthwork & Haul Off – Landfill Waste (Less Than 2 Inches), Earthwork & Haul Off – Landfill Waste (Greater than 2 Inches), and Earthwork – Fill (Stockpile Onsite for Town), have also been provided.

The Earthwork & Haul Off – Landfill Waste (Less Than 2 Inches) and Earthwork & Haul Off – Landfill Waste (Greater than 2 Inches) line items shall consist of excavating, stockpiling, screening, separating, and transporting landfill waste to the County Landfill.

The Earthwork – Fill (Stockpile Onsite for Town) shall consist of excavating and stockpiling fill material within the designated stockpile area shown on plans. The Town will utilize their own resources to properly transport and dispose of this material to an offsite location.

#### 2. MATERIALS

- A. Excavated material shall consist of material excavated within the limits of the project. It is assumed that this material will not meet the criteria below for suitable fill therefore will be hauled off to an approved disposal site at the expense of the Contractor. If excavated material meets the criteria specified below for fill material, then it shall be stockpiled and used as necessary in conjunction with furnished fill material.

- B. Furnished fill material shall consist of material used to raise the site elevations to those specified in the grading plan. If sufficient satisfactory soil materials for use as earth fill are not available from onsite excavations, it shall be the Contractor's responsibility to provide suitable earth fill material. Soils sufficient for use as earth fill include ASTM D 2487 Soil Classification Groups GW, GP, GM, GC, SW, SP, SM, and SC, or combination of these groups or as approved by the Town of Elkton. Earth fill shall be free of debris, waste, frozen materials, vegetation, invasive species, pathogens, and any other deleterious matter.
- C. Class A topsoil – See Special Provision 13 – Topsoil
- D. Class B topsoil – See Special Provision 13 - Topsoil

### 3. CONSTRUCTION

- A. Existing elevations and grades may have changed since the original survey was completed due to erosion, sediment accretion, or fill. It is the Contractor's responsibility to confirm existing grades and adjust earthwork as necessary at no additional cost to the Town of Elkton.
- B. All erosion and sediment control devices shall be in place prior to commencement of earthwork activities.
- C. All excess material shall be removed from the site and disposed of at a properly permitted disposal site at the expense of the Contractor.

### 4. MEASUREMENT AND PAYMENT

The following line items shall be measure and paid ofr on a per ton (TN) basis: Earthwork & Haul Off – Landfill Waste, Earthwork & Haul Off – Landfill Waste (Less Than 2 Inches), Earthwork & Haul Off – Landfill Waste (Greater than 2 Inches).

Earthwork – Fill (Stockpile Onsite for Town) and Fill Material (Salvaged) line items shall be measured and paid for on a cubic yard (CY) basis.

**The County Landfill will accept landfill waste on a per ton basis at a fixed price of \$58.00 per ton for material greater than 2 inches. The County Landfill will accept fill and nonhazardous material that is less than 2 inches in diameter at no cost. Therefore, Contractor's unit prices shall reflect this.**

## SPECIAL PROVISION 7: COIR FIBER MATTING

### 1. DESCRIPTION

This work shall consist of furnishing, transporting, maintaining, stockpiling and properly installing coir fiber matting (secured with biodegradable stakes) on all stream bank slopes which will not receive additional stabilization techniques and at other locations designated in the Construction Drawings, or as directed by the Town of Elkton.



## 2. MATERIALS

Coir fiber matting for both stream bank grading and soil lifts shall meet the specifications shown in the construction plans. Coir fiber matting shall consist of 100% coconut fiber matting having a weight of at least 700 g/m<sup>2</sup>. For Geolifts, contractors shall use KoirWrap™ 1000 or an approved equivalent.

Biodegradable stakes used to secure coir matting shall be made of native hardwood species and meet the specifications shown in the Construction Drawings. The source of coir fiber matting and stakes shall be submitted to the Town of Elkton for review and approval prior to beginning construction. Installation shall be in accordance with the Construction Drawings, or as directed by the Town of Elkton.

## 3. CONSTRUCTION

- A. The Contractor shall place coir fiber matting along the stream edge as shown in the Construction Documents or as directed by the Town of Elkton. The coir fiber matting shall be unrolled along the top of bank and across the full width of any bankfull or low flow benches, if present. Matting shall be placed in full contact with the soil. All exterior edges (those edges not overlapping with an adjacent coir fiber matting roll) shall be “keyed” into the ground a minimum of 6 inches in such a way that a seamless grade is created (no humps or bulges in fabric will be permitted).
- B. Coir fiber matting edges (matting installed side by side at any given elevation) shall be overlapped a minimum of 6 inches and staked down using biodegradable stakes at 2 foot on center.
- C. Coir fiber matting ends (where upstream roll abuts downstream roll) shall be placed such that the upstream roll overlaps the downstream roll a minimum of 6 inches and staked down using biodegradable stakes at 2 feet on center.
- D. Coir fiber matting ends (matting installed where ends of matting abut in-stream structures) shall be ‘keyed-in’ a minimum of 6 inches in such a way that a seamless grade, or transition, is created. (No humps or bulges will be accepted.) These edge areas shall be staked as specified on Construction Drawings.

## 4. MEASUREMENT AND PAYMENT

Coir Fiber Matting, including biodegradable stakes, used in the construction of the Geolift structures shall not be measured but shall be incidental to the materials used in the construction of the Geolift structure.

## SPECIAL PROVISION 8: GEOTEXTILE FABRIC

### 1. DESCRIPTION

This work shall consist of furnishing, transporting, maintaining, stockpiling, and properly installing geotextile fabric in the stream channel as specified in the Construction Drawings, or as directed by the Town of Elkton.

## **2. MATERIALS**

Geotextile fabric shall be Class D non-woven polypropylene geotextile. The fabric shall have a typical weight of 8 oz/sy (ASTM D-5261), apparent maximum opening size of 0.212 mm (ASTM D4751), minimum grab tensile strength of 120 lbs. (ASTM D-4632), and minimum puncture strength of 65 lbs. (ASTM D-4833). Specifications are also shown on plans.

## **3. MEASUREMENT AND PAYMENT**

Geotextile fabric shall not be measured but shall be incidental to the materials used in the construction and installation of the Rock Vane structure.

## **SPECIAL PROVISION 9: STREAM BED MATERIAL**

### **1. DESCRIPTION**

This work shall consist of furnishing, transporting, stockpiling, maintaining and placing stream bed material to be utilized for construction of the protection of the Rock Vane structure and at other locations as specified in the Construction Drawings or as directed by the Town of Elkton.

### **2. MATERIALS**

- A. Stream bed material shall consist of natural field rock or natural river rock or crushed rock. The stream bed material shall be sound, tough, dense, resistant to the action of air and water, and suitable in all respects for the purpose intended.
- B. Source of stream bed material shall be from an approved mining operation with up-to-date regulatory permits. Stream bed material shall NOT be indiscriminately mined from active streams and rivers other than the project site.
- C. Stream bed material shall be a mixture that matches as closely as possible the gradation provided in the construction plans.
- D. Samples of stream bed material shall be reviewed and approved by the Town of Elkton (in consultation with Consultant) from the Contractor's selected source, prior to its use in the project. Any unsuitable material brought onsite shall be removed at the Contractor's expense.

### **3. CONSTRUCTION**

The Contractor shall install stream bed material as specified in the Construction Drawings, and as directed by the Town of Elkton.

#### **4. MEASUREMENT AND PAYMENT**

Streambed Material shall not be measured but shall be incidental to the materials used in the construction and installation of the Rock Vane structure.

### **SPECIAL PROVISION 10: BOULDER MATERIAL**

#### **1. DESCRIPTION**

This work shall consist of furnishing, transporting, stockpiling, maintaining and placing of rock for the Rock Vane and Geolift structures as specified in the Construction Drawings, or as directed by the Town of Elkton.

#### **2. MATERIALS**

- A. Rock shall consist of angular flat rock of appropriate color (e.g., green/gray, brown/gray, dark gray, and/or dark brown in color) obtained from an approved source. Rock shall NOT be harvested from streams or rivers outside a commercial quarry operation. All rock shall be free from laminations, weak cleavages and shall not disintegrate from the action of air, salt water and in handling and placing. Granular sedimentary rock shall generally be unacceptable. Concrete shall not be considered as an alternative for rock. White rock is not acceptable.
- B. Rock sizes shall be as specified in the Construction Drawings for Rock Vanes and Geolift structures.
- C. The rock shall have a minimum unit weight of 160 pounds per cubic foot and meet the dimensions specified in the construction plans.
- D. The Contractor shall obtain from the quarry and submit to the Town of Elkton a certificate verifying the following – 1) Rock, 2) Classification, 3) Weight per cubic foot, 4) Weight of rock being supplied, and 5) Rock quantity shall meet all the above specifications.
- E. Due to the anticipated quarry preparatory time, and/or demand for the rock as specified in the Construction Drawings, it shall be the Contractor's responsibility to make all necessary arrangements with the source of supply in a timely fashion, so that the Contractor shall maintain an adequate supply of rock material and that work shall not be unnecessarily delayed due to insufficient supply.

#### **3. CONSTRUCTION**

The Contractor shall install Boulder Material as specified in Construction Drawings.

#### **4. MEASUREMENT AND PAYMENT**

Boulder Material shall not be measured but shall be incidental to the materials used in the construction and installation of the Rock Vane and Geolift structures.

## SPECIAL PROVISION 11: ROCK VANE

### 1. DESCRIPTION

This work shall consist of furnishing, stockpiling, transporting, installing and maintaining Rock Vane as specified in the Construction Drawings, or as directed by the Town of Elkton. The quantity of Rock Vane structures may be increased, decreased, or eliminated entirely at the direction of the Town of Elkton and Consultant. Such variations will not be considered as alterations in the details of construction or a change in the character of the work.

### 2. MATERIALS

#### A. Footer Rock

Footer rock shall meet the specifications for Special Provision 10 - Boulder Material. Footer rock consists of rock placed below the invert of the proposed channel to provide support for the top rock and prevent downstream scour.

#### B. Top Rock (Header)

Top rock (header rock) shall meet the specifications for Special Provision 10 - Boulder Material. Top rock consists of rock placed upon the footer rock.

#### C. Geotextile Fabric

Geotextile fabric shall meet the Specifications for Special Provision 8 – Geotextile Fabric and as specified in the Construction Drawings.

#### D. Stream Bed Material

Stream Bed Material shall meet the specifications of Special Provision 9 - Stream Bed Material and as specified in the Construction Drawings.

### 3. CONSTRUCTION

A. A trench shall be dug in such a manner that the footer rocks and a minimum of 95 percent of the header rocks area buried beneath the bed surface elevation in locations specified on the Construction Drawings. Refer to the Construction Drawings for exact installation guide and locations of Rock Vanes to be installed.

B. Footer rocks shall be placed first with header rocks placed on top prior to backfilling the trench.

C. Boulders shall be selected and positioned such that they butt tightly together and there are multiple contact points between all vane boulders (flat smooth surfaces that fit together).

D. Geotextile fabric shall be placed on the upstream side of structure to prevent the washout of

sediment through boulder gaps. Fabric shall extend from the bottom of footer boulder (minimum of 1-foot fabric underneath of footer) to the finished grade elevation and shall be placed the entire length of the structure. Gaps between boulders shall be filled with Stream Bed material until plugged.

- E. The header rocks in the channel shall be placed at the bed elevation, while the header rocks on the banks shall be tie into the bankfull elevation as shown on the Construction Drawings. The header rocks slope upward from the stream channel until it ties into the stream bank as specified by Construction Drawings. Header and footer rocks at the bank shall be fitted securely into the bank in such a way that eliminates the possibility of stream flow diverting around them.
- F. The area between the streambank and the vane on the upstream side of the structure will be backfilled with Stream Bed Material (see Special Provision 9 as specified by the Construction Drawings or as directed by the Town of Elkton.
- G. The Town of Elkton may adjust the number and placement of structures during construction. Such variations in quantity will not be considered as alterations in the details of construction or a change in the character of the work.

#### **4. MEASUREMENT AND PAYMENT**

Payment for Rock Vane structures shall be measured and paid for at the Contract unit price per each (EA) structure and as specified in the Construction Drawings, or as directed by the Town of Elkton. Payment shall be full compensation for the furnishing, transport, stockpiling, and placement, and for all material, labor, equipment, tools and incidentals necessary to complete the work as specified in the Construction Drawings, or as directed by the Town of Elkton. The quantity of material to be installed shall be affected by the actual conditions that occur during the construction of the project. Such variations in quantity shall not be considered as alterations in the details of construction or a change in the character of work.

### **SPECIAL PROVISION 12: GEOLIFT**

#### **1. DESCRIPTION**

The work covered by this specification includes, but is not limited to furnishing, installing and maintaining the Geolifts structures on the graded stream banks and floodplain as specified in the Construction Drawings, or as directed by the Town of Elkton.

#### **2. MATERIALS**

Erosion control matting shall meet all the requirements of Special Provision 7, Coir Fiber Matting. Soil used to construct the Geolift shall meet the requirements of Excavated and Furnished fill as specified in Special Provision 6 - Earthwork. Soil shall be compactible. Sand or sandy soils shall not be utilized in the construction of the soil lifts of this structure.

Live branches shall be cut from fresh, green, healthy, dormant parent plants which are adapted

to the site conditions when possible with the following guidelines; woody branches up to 1" in diameter and 3-5 feet (minimum) in length can be used. Live cut species types are indicated in the Construction Drawings. Live branch cuttings shall be harvested within a 200-mile radius of the job site unless otherwise approved by the Town of Elkton.

While plants are being transported to site, from heeling-in beds, or are being distributed in planting beds, or are awaiting planting after distribution, the Contractor shall protect the plants from drying out by means of wet canvas, burlap, straw, or by other means acceptable to the Town of Elkton and appropriate to weather conditions and the length of time the roots will remain out of the ground. Live branches shall be oriented with butt ends touching the back of each soil lift.

### **3. CONSTRUCTION**

The Contractor shall install Geolifts structures in locations shown on the plans, to the thickness, widths, and lengths shown on the plans and described in the Construction Drawings or as directed by the Town of Elkton.

### **4. MEASUREMENT AND PAYMENT**

Geolifts shall be measured and paid for at the Contract unit price per linear foot (LF) of structure and as specified in the Construction Drawings, or as directed by the Elkton Town. The payment will be considered as full compensation for all material, labor, equipment, excavation, and related expenses that are incurred through the Geolift construction.

## SECTION 4: PLANTING

### SPECIAL PROVISION 13: TOPSOIL

#### 1. DESCRIPTION

This work shall consist of furnishing and placing topsoil as specified in the Construction Drawings, or as directed by the Town of Elkton. Contractor shall provide documentation of furnished topsoil to the Town of Elkton for approval.

#### 2. MATERIALS

- A. Topsoil furnished by the Contractor shall consist of friable surface soil reasonably free of grass, roots, weeds, sticks, stones, or other foreign materials. The topsoil shall consist of sandy loam, with soil particles within the following percentages: clay; 0-25; silt; 25-50; sand; 50-70; decomposed organic matter; 5-10. The clay content is optional. The soil shall have a soil acidity range between a pH 5.0 to pH 7.0.
- B. Class A topsoil shall consist of material salvaged on site during excavation and shall consist of the original layer of the soil profile formed under natural conditions, technically defined as the "A" horizon. It shall be free from refuse and any other materials toxic to plant growth and subsoil, stumps, viable noxious weeds, roots, brush, rocks, clay lumps, or similar objects larger than 3 inches in any dimension.
- C. Class B topsoil shall be topsoil furnished from sources outside the project limits and shall be the original top layer of a soil profile formed under natural conditions, technically defined as the "A" horizon or a mixed material meeting the following specifications. Class B topsoil shall be a "sandy loam," "loamy sand," or "sandy clay loam" soil as defined by the USDA Soil Textural Classification System with an organic matter content greater than 10% or as approved in writing by the Town of Elkton. Material shall be free from refuse and any other materials toxic to plant growth and subsoil, stumps, viable noxious weeds, roots, brush, rocks, clay lumps, or similar objects larger than 2 inches in any dimension.

Excess topsoil shall become the responsibility of the Contractor and shall be completely removed from the project site prior to final site inspection and approval of the project.

#### 3. CONSTRUCTION

- A. Prior to the start of placing topsoil, all grass, weeds, brush, stumps, and other objectionable material shall be removed from the surface of stockpiles.
- B. Placing and spreading of topsoil shall not be done when the ground is frozen, excessively wet or otherwise in a condition detrimental to the work. Furnished topsoil shall be placed, spread, and maintained over the areas designated to a depth of at least 6 inches, that after settlement, the completed work shall be in conformance with the thickness, lines, grades, and elevations specified in the Construction Drawings.

- C. Surfaces designated to be covered shall be lightly scarified just prior to the spreading operation. Compaction of topsoil will not be required. After placement is completed the surface of the topsoil shall be finished to a reasonably smooth surface.
- D. The Contractor shall completely prepare and finish the surface of all areas to be covered with topsoil as specified in the Construction Drawings.
- E. Seeding of topsoil should be carried out simultaneously to prevent excessive and undesirable soil compaction.

#### **4. MEASUREMENT AND PAYMENT**

Topsoil used in the construction of the Geolift structures shall not be measured but shall be incidental to the materials used in the construction of the Geolift structure.

Topsoil shall be measured and paid for as a lump sum (LS) item. Payment shall be full compensation for the transport of all materials, excavation, installation, and maintenance of clay cores, and for all material, labor, equipment, tools, stockpiling and incidentals necessary to complete the work as specified in the Construction Drawings or as directed by the Town of Elkton.

### **SPECIAL PROVISION 14: PLANTING TREES, SHRUBS, AND GRASSES**

#### **1. DESCRIPTION**

- A. This work shall consist of furnishing, transporting, storing and installing trees, shrubs, and grasses to complete the work for the planting plan as specified in the Construction Drawings, or as directed by the Town of Elkton.
- B. Prior to start of work, the Contractor shall submit a proposed planting schedule, including species and quantities, anticipated planting dates, and the source of plant material to the Town of Elkton for review. No work shall be performed until this information has been reviewed and approved by the Town of Elkton.
- C. The Town of Elkton may request the Contractor to stake the location of individual plants within the approved Planting Zones.
- D. The Contractor shall coordinate planting with the Town of Elkton.

#### **2. MATERIALS**

- A. Plant Material
  - 1. All plant material shall conform to the current issue of the American Standard for Nursery Stock published by the American Association of Nurserymen.



2. Plant materials must be selected from certified nurseries that have been inspected by state and/or federal agencies. Nursery inspection certificates shall be furnished to the Town of Elkton upon request.
  3. The nursery supply source shall certify that the origin of the seeds from which the trees, shrubs, and grasses were produced is Hardiness Zone 6 or 7, east of the Mississippi River. Stock from different zones may be accepted, subject to approval by the Town of Elkton.
  4. Plant material collected from the wild is prohibited unless approved by Town of Elkton and Consultant.
  5. Container grown stock shall have been grown in a container long enough for the root system to have developed sufficiently to hold its soil. Roots shall visibly extend to the inside face of the growing container. All container grown plants shall be grouped and kept moist and cool until they are planted. Plants left to dry in the sun prior to planting may be rejected on-site by the Inspector.
  6. Bare Root grown stock shall be freshly dug. The packing material must be moist when delivered to the site. All bare root plants shall be dormant when planted.
  7. Live stakes shall be cut from fresh, green, healthy, dormant parent plants which are adapted to the site conditions when possible with the following guidelines; woody branches up to 1" in diameter and 18" (minimum) in length can be used. Live cut species types are indicated in the Construction Drawings. Live stakes shall be harvested within a 200-mile radius of the job site unless otherwise approved by the Town of Elkton.
  8. The Town of Elkton may reject plants damaged in handling or transportation.
  9. No plants shall be installed unless the Town of Elkton approves both the condition of the plantings and the process of installation.
- B. Substitute Plant Material
1. Prior to Contractor mobilization, the Town of Elkton must approve all plant substitutions.
  2. If a substitute is selected, it must be native to the Ridge & Valley physiographic province of Virginia and of the same size, value, and quality as the original plant.
- C. Water
1. Water used in the establishment or caring of plants and seed shall be free from any substance that is injurious to plant life.
- D. Fertilizer
1. No broadcast fertilization shall be permitted on stream restoration projects unless specifically noted in Construction Drawings.

2. The Contractor shall use organic fertilizers in lieu of petroleum-based fertilizers. Suitable products that are commercially available are marketed and certified as 'organic' or 'natural' fertilizers. Organic materials shall include such items as sea grasses/kelp, rock powder, bone meal, whey, bean meal, blood meal, composted manure, etc. Product nutrient content shall be identified in the standard form of Nitrogen (N), Phosphorous (P) and Potassium (K) ratios. Fertilizer nutrient content shall be 20-10-5. The application rate shall be equivalent to a 5-gram tablet per plant. Contractor shall submit the label to Town for review prior to installation. The Town must approve any proposed substitution to this nutrient content.

E. Mycorrhizal Fungi

All bare root seedlings shall be treated with root dip absorbent polymers and mycorrhizal root dip inoculates in accordance with the manufacturer's recommendations.

F. Root Growth Hormone

All live stake plantings shall be treated with Root Growth Hormone prior to installation.

G. Straw Mulch

Straw mulch shall consist of un-rotten small grain straw.

H. Topsoil – See Special Provision 13 – Topsoil.

**3. CONSTRUCTION**

- A. All areas shall be planted in accordance with the composition and planting schedules for each designated planting zone. Areas within designated planting zones not disturbed by construction shall be supplemented with trees and shrubs to meet the acre quantities specified in the schedule.
- B. The Contractor shall refer to the planting plan, vegetation schedule, planting details and notes in the Construction Drawings for specific spacing requirements.
- C. The Contractor shall use the overall spacing requirements and the Planting Notes and Details in the Construction Drawings to determine the spacing between each species of vegetation and among the same species vegetation.
- D. Immediately after site preparation and approval, trees, shrubs, and grasses shall be planted. Containerized plants shall be installed between September 30 and March 31, or as directed by the Town of Elkton. Live stakes shall only be planted between February 1 and March 31 (when stock is dormant). Herbaceous Plugs shall be planted between September 30 and March 31. No planting shall occur when soil is frozen.
- E. Root stock of the plant material shall be kept moist during transport, from the source, to the job site and until planted.

- F. The Contractor may be required to flag and label individual planting pits at specific locations. Upon planting a typical area within each planting zone, the Contractor shall have the Town of Elkton inspect and approve plant spacing and planting techniques before proceeding.
- G. All planting pits shall be dug by hand or mechanically. Walls of planting pits shall be dug so that they are vertical or sloping outward in heavy soils. Scarify the walls of the pit after digging.
- H. Excavate the planting pit to a depth of 1 foot plus the container depth in which the plant was grown and 2 feet wider than the container.
- I. Planting holes for bare root trees shall be 1-2 inches deeper than the root collar (i.e. 1-2 inches deeper than they were growing in the nursery). Bare root seedlings shall be installed with the use of a "sharpshooter shovel".
- J. Remove all non-organic debris from the pit and tamp loose soil in the bottom of the pit by hand.
- K. Remove the plant either by cutting or inverting the container.
- L. Do not handle the plant by the branches, leaves, trunk or stem.
- M. Place the plant straight in the center of the planting pit, carrying the plant by the root mass. Never lift or carry a plant by the trunk or branches.
- N. Place controlled release fertilizer in the planting hole in accordance with Section 16.2.D of these specifications (above).
- O. Treat all bare root seedlings with root dip absorbent polymers and mycorrhizal root dip inoculates in accordance with the manufacturer's recommendations.
- P. Treat all live stake plantings with Root Growth Hormone prior to installation.
- Q. Backfill planting pit with existing soil and hand tamp as pit is being backfilled to completely fill all voids and air pockets. Do not over compact soil. Make sure plant remains straight during backfilling/tamping procedure.
- R. Do not cover the top of the root mass with soil.
- S. An additional 18-inch diameter area of topsoil shall be placed around each tree and shrub. Topsoil shall be 2 inches thick.
- T. Water plants thoroughly immediately after planting, unless otherwise directed by the Town of Elkton.
- U. Town of Elkton reserves the right to require supplemental watering during construction or during the first growing season after substantial completion, at their sole discretion. Such watering may be required, for example, if plant materials are installed outside the approved planting window or in areas where vegetative establishment does not provide adequate cover

(85% min.) to protect against erosion. Supplemental watering shall be done using a submersible-style pump to pump water from an adjacent pool whenever possible in order to avoid damage associated with vehicular access. Any such supplemental watering shall be at the Contractor's expense, not subject to change order requests.

- V. The Contractor shall leave no open planting pits at the close of each day.
- W. Remove all tags, labels, strings and wire from the plant materials, unless otherwise directed by the Town of Elkton.

#### **4. WARRANTY**

- A. The Contractor shall maintain a 2-year care and replacement warranty of 85% on all B&B, container grown, and Herbaceous Plugs and 60% on all bareroot and tuberstock.
- B. The period of care and replacement shall begin after final inspection and approval of the initial installation of all plants and continue for 2 years, with a potential plant replacement period after the year warranty inspection.
- C. Plant warranty replacements shall be performed in accordance with the Construction Drawings and these specifications.

#### **5. MEASUREMENT AND PAYMENT**

Planting trees, shrubs, and grasses shall be measured and paid for at the Contract unit price per each (EA) plant in accordance with the plant schedule and planting plan. Payment for planting trees, shrubs, and grasses shall be full compensation for furnishing, installing, maintenance and warranty, including all materials, labor, equipment, stockpiling, tools, and incidentals necessary to complete the work as specified in the Construction Drawings, or as directed by the Town of Elkton.

### **SPECIAL PROVISION 15: HERBACEOUS TEMPORARY & PERMANENT SEEDING**

#### **1. DESCRIPTION**

- A. This work shall consist of furnishing, transporting, storing, and installing all herbaceous temporary and permanent seeding for the Planting Zones as specified in the Construction Drawings, or as directed by the Town of Elkton.
- B. Prior to start of work on this item, the Contractor shall submit all herbaceous permanent seeding paperwork, to include shipping invoices, seed bag tickets for the herbaceous permanent seed mixes to be installed and the source of the seed to the Town of Elkton for review. No work shall be performed until the seeding paperwork is approved by the Town of Elkton.

#### **2. MATERIALS**

A. Seed Mix

Seed Mix shall consist of the varieties specified in the vegetation schedule located within the Construction Drawings for all planting zones. All seed and seed varieties shall be free from State and Federal prohibited noxious weed seeds.

B. Topsoil – See Special Provision 13.

C. Straw Mulch

Straw mulch shall consist of un-rotten small grain straw.

D. Water

Water used in the establishment or caring of plants and seed shall be free from any substance that is injurious to plant life.

**3. CONSTRUCTION**

A. All areas disturbed by construction shall be seeded in accordance with the planting plans and schedules. The herbaceous permanent seeding is specified on the planting schedules in the Construction Drawings. Areas not disturbed, shall not be seeded.

B. All areas to be seeded shall conform to the finished grades as specified on the plans and be free of all weeds, trash, debris, brush, clods, loose rocks and other foreign that would interfere with seeding. All gullies, washes or disturbed areas that develop after final dressing shall be repaired prior to seeding.

C. Seeding shall be accomplished by using a broadcast spreader. The broadcast spreader used shall be capable of placing seed at the specified rate.

D. Seed shall be spread immediately following fine grading of an area, as construction progresses, in order to achieve rapid germination and stabilization. After seeding and raking, the Contractor shall cover the seeded areas with straw mulch, as indicated in the Construction Drawings. No seed shall be spread on top of straw or coir matting.

E. At the sole discretion of the Town of Elkton, additional seeding may be required in areas where poor vegetative establishment is observed (less than 85% surface coverage). Additional seeding may be requested at any time prior to substantial completion or in association with planting inspections during the two-year warranty period. Additional seeding shall be considered within the original contract scope and shall not be subject to change order request.

**4. WARRANTY**

A. The period of care and replacement shall begin after final inspection and approval of the initial installation of all plants and continue for 2 years.

- B. Herbaceous permanent seeding warranty replacements shall be performed in accordance with the Construction Drawings and these specifications.

**5. MEASUREMENT AND PAYMENT**

Herbaceous temporary and permanent seeding shall be measured and paid for on a per acre (AC) basis. Payment will be full compensation for furnishing and incorporating all seed, including all maintenance and warranty, materials, labor, equipment, tools, and incidentals necessary to complete the work as specified in the Construction Drawings, or as directed by the Town of Elkton. The Contractor shall maintain a minimum 85% aerial coverage of herbaceous seeding for two (2) years after final inspection. This shall include necessary care and replacement to achieve the required coverage.

## SECTION 5: CONSTRUCTION TOLERANCES AND OVERSIGHT

### SPECIAL PROVISION 16: CONSTRUCTION TOLERANCES

#### 1. DESCRIPTION

All stream work shall be performed such that the finished product adheres to the stream restoration construction tolerances contained herein. The Contractor is solely responsible for ensuring the finished product meets the tolerances. The Town of Elkton staff shall issue final approval and acceptance.

#### 2. SPECIFICATIONS

- A. Locations, elevations, and dimensions of all structures and channel features shall constructed within the tolerances provide below:

Vertical tolerance	+/- 0.1 ft maximum
Horizontal tolerance	+/- 0.5 ft maximum

- B. It is recognized that field conditions may warrant adjustments to design elements (such an adjustment requires the prior written approval of the Town of Elkton staff). In addition, certain design elements that fail to meet the above listed tolerances may be acceptable. Such acceptance will be on a case-by-case basis by the Town of Elkton staff. The Contractor is encouraged to identify these cases with the Consultant during construction and keeps a record or changes or modifications.

### SPECIAL PROVISION 17 CONSTRUCTION OVERSIGHT

#### 1. DESCRIPTION

Construction Oversight shall be conducted by both the Town of Elkton and the firm which produced the Construction Drawings, Ecosystem Services (ES).

#### 2. MEASUREMENT AND PAYMENT

Construction oversight and management services shall be performed under a separate contract and shall not be a pay item paid to the Contractor.