

ARLINGTON COUNTY DES ENGINEERING SUPPLEMENTAL SPECIFICATIONS

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- **329301** - LIVE STAKES
- **329500** - POST CONSTRUCTION VEGETATION MAINTENANCE

Modify the listed sections as follows:

SECTION 01000 - GENERAL PROVISIONS AND REQUIREMENTS

PART 4 – MEASUREMENT AND PAYMENT

4.1 SWPPP

Delete

- A. No separate payment shall be made by the County for SWPPP implementation, with the exception of E&S items as specified on the E&S plans or listed as pay items. The Contractor shall not be entitled to any additional payment for changes to the SWPPP which are the result of the Contractor's work schedule or resource allocation, weather delays, or other factors not controlled by the County.

Add

- A. Payment for SWPPP implementation shall be made based on the bid form, separately from E&S items listed as pay items. Payment will be a multiplier (expressed as percentage) to be added to the total amount of the Total Bid Amount. The Contractor shall not be entitled to any additional payment for changes to the SWPPP which are the result of the Contractor's work schedule or resource allocation, weather delays, or other factors not controlled by the County.

SECTION 01720- PROJECT AS-BUILT DRAWINGS

PART 1 - GENERAL

1.2 Related Work Specified Elsewhere

Add

- J. Section 0221: Outfall Repair
- K. Section 0222: Stream Channel Excavation
- L. Section 0223: Trail Crossing
- M. Section 0224: Modified Cross Vane

PART 4 – MEASUREMENT AND PAYMENT

Delete:

- 4.1 Project As-Built Drawings are considered a subsidiary obligation of the contract, and therefore no payment shall be made for this work. Final payment will not be released until the project closeout is complete, including the County's receipt and approval of the certified As-Built Drawings.

Add

- 4.1 Payment for Project As-Built drawings and associated survey field work will be made based on the bid form. Survey of completed structures will be performed in accordance with the directions of the design engineer. Where grades or structures are found to be out of tolerance, the contractor will perform an additional survey to document completed adjustments. No additional payment will be made for the survey of these areas. Final payment will not be released until the project closeout is complete, including the County's receipt and approval of the certified As-Built Drawings.

SECTION 02100 - CLEARING AND GRUBBING

PART 3 - EXECUTION

3.1 Clearing

Delete

- A. The area of clearing (limits of disturbance) shall be maintained within the limits shown on the approved plans. The Contractor shall ensure the specifications in the County's Tree Protection and Planting Standards are followed throughout the duration of the work. Clearing shall include removal of trees as designated on the design plans. Trees and other vegetation that shall not be removed shall be properly protected to avoid damage and limit adverse impacts. Contractor shall refer to Specification 311300, 'Tree Protection and Root Pruning'.

Add

- A. The area of clearing shall be contained within the limits of disturbance and further limited to the minimum amount practicable to perform specified repairs to the stream. The contractor shall not remove vegetation or trees within the limits of disturbance that do not directly interfere with the performance of the proposed repairs. All trees within the limits of disturbance, even those marked for removal on the design plan, shall be evaluated for potential preservation in coordination with the County Urban Forester prior to the commencement of any clearing activities. The Contractor shall ensure the specifications in the County's Tree Protection and Planting Standards are followed throughout the duration of the work. Trees and other vegetation that shall not be removed shall be properly protected to avoid damage and limit adverse impacts. Contractor shall refer to Specification 311300, 'Tree Protection and Root Pruning'.

3.2 Grubbing

Delete

- A. The area of grubbing shall be maintained within the limits of disturbance shown on the approved plans. Remove stumps and mated roots to a depth of 24 inches below existing ground surface. Refill excavations made by removal of stumps or roots as specified for backfill in Section 02200.

Add

- A. Grubbing and stump removal will only be performed where necessary to perform the proposed repairs within the limits of disturbance and is subject to prior approval by the County. Where approved, remove stumps and mated roots to a depth of 24 inches below existing ground surface. Refill excavations made by removal of stumps or roots as specified for backfill in Section 02200.

PART 4 – MEASUREMENT AND PAYMENT in its entirety and replace with:

Delete:

4.1 Payment for Tree/Stump Removal - Class A. Remove and Dispose, up to Up to 6" DBH to 12" DBH (Diameter at Breast Height) shall be measured in units of each. Tree/Stump Removal - Class B. Remove and Dispose, over 12" DBH to 18" DBH (Diameter at Breast Height) shall be measured in units of each. Tree/Stump Removal - Class C. Remove and Dispose, over 18" DBH to 24" DBH (Diameter at Breast Height) shall be measured in units of each. Tree/Stump Removal - Class D. Remove and Dispose, over 24" DBH to 30" DBH (Diameter at Breast Height) shall be measured in units of each. Tree/Stump Removal - Class E. Remove and Dispose, over 30" DBH to 36" DBH (Diameter at Breast Height) shall be measured in units of each.

SECTION 02200 - EARTHWORK

PART 1 - GENERAL

1.2 Related Work Specified Elsewhere

Add

- I. Section 0221: Outfall Repair
- J. Section 02222: Stream Channel Excavation
- K. Section 02223: Trail Crossing
- L. Section 02224: Modified Cross Vane

PART 4 – MEASUREMENT AND PAYMENT

4.1 Excavation

Delete

- A. Excavation, including backfill, shall be considered incidental to other work. Therefore, no separate payment shall be made for Excavation.
- B. If over-excavation is approved by the County Project Officer, payments will be at the stipulated

price and will be based on actual site measurements taken by Arlington County personnel using the contract unit prices.

Add

- A. Payment for stream channel excavation shall be made in accordance with the bid form under Excavation and Bringing to Final Grade and shall be measured in units of cubic yards (CY). This price shall include all costs for equipment and labor to perform the work as specified on the design plan.
- B. Any additional excavation or backfill required to perform other work specified on the design plan will be considered incidental and no additional payment shall be made.

SECTION 311300 - TREE PROTECTION AND ROOT PRUNING

PART 1 – GENERAL

1.4 Related Work Specified Elsewhere

Add

- G. 01501 Access Road

PART 2 – PRODUCTS

2.1 Materials

Delete

- A. Temporary Tree Protection Fence: Unless otherwise indicated in approved plans, tree protection fence shall be two-inch wire mesh fabric measuring 72 inches in height mounted on 1.9" O.D. steel pipes driven 24 inches into the ground, placed 120 inches on-center maximum. Refer to Arlington County DPR standard detail on approved plans.

Add

- A. Per the detail in the approved plans, Temporary Tree Protection Fence shall be orange plastic fencing 4' in height mounted on 2" steel "U" channel posts. Posts shall be a minimum 6' in length driven a minimum 2' into the ground, with a maximum spacing of 6'.

PART 4 – MEASUREMENT AND PAYMENT

Delete

- 4.8 The measurement of TRUNK AND LIMB PROTECTION WRAP to be paid for under this item shall be the number of EACH to be furnished and installed at individual trees in accordance with the approved plans and specifications.

4.9 The unit price for TRUNK AND LIMB PROTECTION WRAP shall include the cost of all labor, materials, and other expenses necessary to complete the work in accordance with the approved plans and specifications.

Add

4.8 The measurement of TREE TRUNK PROTECTION to be paid for under this item shall be the number of EACH to be furnished and installed at individual trees in accordance with the Trunk Armoring detail included in the approved plans.

4.9 The unit price for TREE TRUNK PROTECTION shall include the cost of all labor, materials, and other expenses necessary to complete the work in accordance with the approved plans and specifications.

SECTION 329100 - PLANTING PREPARATION

PART 2 - PRODUCTS

Delete Section 2.8 Soil Stabilization/Erosion Control Fabric in its entirety and replace with:

2.8 Coir Fiber Matting and Biodegradable Stakes

A. Coir fiber matting shall be installed where specified in the design plans and shall:

1. Consist of 100% coconut fiber matting,
2. Have a weight of at least 20.6 oz./SY (700 g/m²),
3. The nominal opening size shall be 0.5-inches x 0.5-inches
4. The thickness shall be between 0.3 and 0.4 inches.
5. Acceptable matting:
 - a. Eco Depot EcoMatting 700
 - b. Rolanka International BioD-Mat 60
 - c. Pinelands Nursery 900 Coir Mat,
 - d. Or approved equal.

B. Stakes used to secure coir matting shall be

1. Wood
2. 12-inch-long minimum
3. Notched or T-topped
4. Wedge stakes are not permitted

PART 4 – MEASUREMENT AND PAYMENT

Add

4.10 The measurement of COIR FIBER MATTING to be paid for shall be per square yard in accordance with the bid form.

- 4.11 The unit price for COIR FIBER MATTING shall include the cost of all labor, materials, and other expenses necessary to install the matting in accordance with the approved plans and specifications.

SECTION 329200 - SEEDING AND SODDING

PART 4 MEASUREMENT AND PAYMENT

Add

- 4.8 The measurement of Seed (Permanent) and Straw to be paid for shall be per SQUARE YARD of reforestation seed mix in accordance with the approved plans and specifications.

SECTION 01501 - ACCESS ROAD

PART 1 - GENERAL

- 1.1 Description of Work
- A. Provide all labor, materials, and equipment required to install temporary construction access paths and material stockpile areas as specified in the design plans.
- 1.2 Related Work Specified Elsewhere
- A. Section 01500 - Erosion and Sediment Control and Pollution Prevention
 - B. Section 311300 Tree Protection and Root Pruning

PART 2 - PRODUCTS

- 2.1 Deck Mats
- A. Timber matting for construction access shall be Deck Mats by Carolina Mat Incorporated or equivalent approved by the Project Officer.
- 2.2 Filter Fabric
- A. Geotextile fabric to be placed under deck mats shall be a woven geotextile product such as US Fabric 2700 or approved equivalent.

PART 3 - EXECUTION

- 3.1 Installation

- A. Deck mats shall be installed in accordance with the Contract Documents and conform to the construction detail. Deck mats will be underlain with a layer of non-woven geotextile filter fabric and a 6" deep layer of wood chips to prevent compaction of soil and tree roots.

PART 4 – MEASUREMENT AND PAYMENT

- 4.1 The measurement of Deck Mats to be paid for shall be per square yard. Unit cost shall include the cost of all labor, materials, and other expenses necessary to install the access road and stockpile areas in accordance with the approved plans and specifications.
- 4.2 The measurement of Wood Chips to be placed beneath deck mats shall be per square yard. The measurement of Wood Chips shall also include the area in square yards of portions of the access path and staging areas to be surfaced only with mulch. Unit cost shall include the cost of all labor, materials, and other expenses necessary to install the access road and stockpile areas in accordance with the approved plans and specifications.
- 4.3 The measurement of Geotextile for Rip Rap Bedding In Place (VDOT Section 245.03.b) to be placed beneath wood chips shall be per square yard. The measurement of Filter Fabric shall also include the area in square yards of portions of the access path and staging area. Unit cost shall include the cost of all labor, materials, and other expenses necessary to install the access road and stockpile areas in accordance with the approved plans and specifications.

END OF SECTION 01501

SECTION 01502 - STREAM PUMP AROUND DIVERSION

PART 1 - GENERAL

1.1 Description of Work

- A. Install and progressively move a pump around diversion in the active work area of the existing stream channel to prevent sediment disturbed during construction activity from being carried offsite by streamflow.

PART 2 - PRODUCTS

- 2.1 Sandbags shall consist of materials which are resistant to ultraviolet radiation, tearing, and puncture and woven tightly enough to prevent leakage of fill material (i.e., sand, fine gravel).
- 2.2 Sheeting shall consist of polyethylene plastic, which is impervious and resistant to puncture and tearing.
- 2.3 Pump(s) shall be large enough to maintain uninterrupted base flow to the channel downstream of

the work area. It is the sole responsibility of the Contractor to understand the stream discharge characteristics of the project site and to perform the items indicated in the design plans.

- 2.4 Hose and/or pipe suitable to convey water overland around the active work area to the downstream section. The minimum linear feet of hose and/or pipe required is equivalent to the maximum estimate for one workday provided by the Contractor.
- 2.5 Filter bags made of non-woven geotextile shall be used for dewatering turbid water within the active work area, as shown in the design plans.

PART 3 - EXECUTION

- 3.1 Installation of sandbags, sheeting and pump around shall be in accordance with the approved erosion and sediment control plan in the Contract Documents, or as directed by the Project Officer.
- 3.2 The height of the sandbag diversion structure or dam shall be a minimum of baseflow depth plus one foot, and a minimum of 2 feet. The sandbag dam shall be of sufficient height as to provide a pool deep enough to maintain pumping operations.
- 3.3 Sheeting shall overlap the sandbags such that the upstream portion covers the downstream sandbag face with at least an 18-inch overlap.
- 3.4 Turbid water dewatered from within the active work area shall discharge into a non-woven geotextile filter bag of adequate size to accommodate the incoming flow, as specified in the design plans. The filter bag must be placed within the Limits of Disturbance on a flat surface to allow dewatering without creating erosive conditions in the area of the outfall.
- 3.5 Clear water pumped around the active work area shall discharge onto plastic sheeting and be returned to the channel without causing erosion and increased turbidity. Installation of rip rap and/or sandbags and plastic sheeting may be required for energy dissipation and prevention of erosion and turbidity at the discharge site.
- 3.6 Pump(s) shall be shut off at night and baseflow shall flow through the completed and stabilized portion of the project into the existing downstream channel unless otherwise noted in the Contract Documents.

PART 4 – MEASUREMENT AND PAYMENT

- 4.1 The unit price for Stream Pump Around Diversion shall include the cost of all labor, materials, and other expenses necessary to install and operate the pump around diversion for the duration of the project. No additional payment shall be made for increased pumping requirements resulting from storm events or high flows.

Pay Item

Pay Unit

Bypass Pumping

Crew Day (DAY)

END OF SECTION 01502

SECTION 01503 - TRENCHLESS SUPER SILT FENCE

PART 1 - GENERAL

1.1 Description of Work

- A. Install trenchless super silt fence where specified on the design plans to provide perimeter erosion control without impacting tree roots.

PART 2 - PRODUCTS

- 2.1 Fabric shall be 50" Class F Silt Fabric.
- 2.2 Ground fasteners shall be 12-18" Turf Nails w/ 1.5" Washers.
- 2.3 Fence shall be Standard 9 gauge 2"x2", 48" Tall Chain Link Fence.
- 2.4 Fence posts shall be Standard 6' tall, 2.5" SS40 Metal Posts.

PART 3 - EXECUTION

- 3.1 Install Trenchless Super Silt Fence where specified in the Contract Documents in accordance with the erosion and sediment control details.

PART 4 – MEASUREMENT AND PAYMENT

- 4.1 Trenchless Super Silt Fence shall be measured in linear feet (LF). Payment shall include the cost of all labor, materials, and other expenses necessary to install and maintain the fence in accordance with the erosion and sediment control plan.

END OF SECTION 01503

SECTION 02221 - OUTFALL REPAIR

PART 1 - GENERAL

1.1 Description of Work

- A. Perform repairs and stabilization in the area of the N Utah St outfall in accordance with the Contract Documents.

PART 2 - PRODUCTS

2.1 Riprap bedding shall be Class I & II RBM (See 02225: Reinforced Bed Mix)

2.2 Stone for Outfall Repair shall be Class I & II Riprap (See 02210: Riprap)

2.3 Filter Fabric

- A. Filter Fabric for lining riprap and in-stream structures shall be:

1. Non-woven polypropylene geotextile.
2. Terratex N04.5, Mirafi N-Series, Mirafi S-Series, or Owner approved equal.
3. Puncture resistant greater than 100 pounds,
4. Apparent opening size between 0.3 mm (U.S. 50 sieve) and 0.6 mm (U.S. 30 sieve),
5. At least 30 pounds of tensile strength at a maximum of 20% elongation.

PART 3 - EXECUTION

- 3.1 Excavate and install riprap, RBM stabilization and filter fabric as specified in the Contract Documents.

PART 4 – MEASUREMENT AND PAYMENT

- 4.1 All labor and equipment necessary to perform the Outfall Repairs shall be included in the unit cost of the materials. Filter fabric measured and payment shall be as specified in section 01501. Payment shall include the cost of all labor, materials, and other expenses necessary to install Measurement and payment for other materials shall be as specified in sections 02225 and 02221

END OF SECTION 02221

SECTION 02223 - TRAIL DRAIN

PART 1 - GENERAL

1.1 Description of Work

- A. Install stone trail drain near the N Utah St entrance as specified in the Contract Documents.

PART 2 - PRODUCTS

- 2.1 Materials installed with the trail drain shall be:
- A. Class I Riprap (See 02210: Riprap)
 - B. #3 Stone (See 02210: Riprap)
 - C. #57 Stone (See 02210: Riprap)

PART 3 - EXECUTION

- 3.1 Install stone trail drain in the low spot on the trail in accordance with the representative cross-section shown in the Contract Documents.

PART 4 – MEASUREMENT AND PAYMENT

- 4.1 All labor and equipment necessary to perform the trail crossing shall be included in the unit cost of the materials. Measurement and payment for materials shall be as specified in Sections 02210.

END OF SECTION 02223

SECTION 02224 - MODIFIED CROSS VANE

PART 1 - GENERAL

- 1.1 Description of Work
- A. Perform repairs to failed stream restoration rock structure as specified in the design plans.

PART 2 - PRODUCTS

- 2.1 Stone riprap shall be Diabase or approved equivalent imbricated rock of the dimensions specified in the structure details in the Contract Documents.
- 2.2 Filter Fabric shall be per the requirements of Section 02221-2.3.

PART 3 - EXECUTION

- 3.1 Repair/rebuild the existing failed structure in accordance with the Contract Documents using engineer- approved salvaged rock or imported imbricated rock.

Part 4 - Measurement and Payment

- 4.1 The unit price for Modified Cross Vane shall include the cost of all labor, equipment, and materials. The cost of imbricated rock and filter fabric used to construct the structure will be considered incidental and no separate payment will be made for these materials.

Pay Item

Pay Unit

Modified Cross Vane

Each (EA)

END OF SECTION 02224

SECTION 02225 - REINFORCED BED MIX

PART 1 - GENERAL

1.1 Description of Work

- A. Install Reinforced Bed Material (RBM) and/or salvaged stream bed material as specified in the Contract Documents.

PART 2 - PRODUCTS

- 2.1 Reinforced Bed Mix (RBM) shall consist of a mixture of rock specified in the Contract Documents which may be sourced from a combination of imported and salvaged materials as approved by the Project Officer.

PART 3 - EXECUTION

3.1 Provide heading

- A. Reinforced Bed Material (RBM) shall be placed along the length and width of the channel and tributaries as shown in the Contract Documents, unless otherwise indicated in the Contract Documents or as directed by the Project Officer.
- B. Salvaged stream bed material meeting the size requirements of the RBM specifications shall be used to supplement RBM or used as specified in the Contract Documents or as directed by the Project Officer.
- C. Installation:
 - 1. The contractor shall prepare the subgrade in preparation of RBM installation to the depth required to achieve the RBM depth, width and elevation indicated on the longitudinal profile, cross-sections and construction details within the design plans.
 - 2. For CL A1 and CL I RBM with installation depths equal to or less than 18 inches, the premixed product may be placed in a single lift. For depths greater than 18 inches, the RBM must be placed in lifts no greater than 12 inches. The contractor shall inspect the installation of RBM to ensure the product is installed as a uniformly distributed mixture of materials, visually free of voids greater than 1 square inch.
 - 3. Installation – RBM installation shall be per the notes in the RBM details on the design plans.
 - 4. Refer to the grading plan and longitudinal profile for the limits of placement, type and depth of the RBM.
 - 5. Additional detail regarding placement is provided in specific structure and feature construction details.

PART 4 – MEASUREMENT AND PAYMENT

- 4.1 The unit prices for Reinforced Bed Mix shall include the cost of all labor, equipment, and materials required to furnish and install the RBM in accordance with the design plans.

Pay Item	Pay Unit
Class I RBM	Cubic Yard (CY)
Class II RBM	Cubic Yard (CY)

END OF SECTION 02225

SECTION - 329301 - LIVE STAKES

PART 1 - GENERAL

- 1.1 Description of Work

- A. Install Live Stake plantings along stream banks in accordance with the Contract Documents.

PART 2 - PRODUCTS

- 2.1 Live Stakes should be 18" to 24" in length and 1/2" to 1 1/2" in diameter cuttings of live mature trees or shrubs of the species identified in the vegetation schedules.

PART 3 - EXECUTION

- 3.1 Provide heading?
 - A. See Section 329300 of the specifications for information regarding the allowable planting dates for live stakes.
 - B. Contractor shall use a planting bar to punch a hole for the cutting.
 - C. Roots shall be treated with root growth hormone prior to planting.
 - D. Install the live stake with the correct side up (see streamside planting detail in the Contract Documents). Live stakes should be cut on an angle on the bottom and flat on the top. When held with the correct end up, the buds must point upward.
 - E. Two-thirds (2/3) of the live stake length must be planted below grade. As long as a few buds are exposed at the top, more than two-thirds (2/3) of live stake may be below grade.
 - F. Tamp in around the cutting to ensure that there are no air pockets along the stem. The planting bar may inserted into the soil immediately adjacent the stem to push the soil against the stem.
 - G. Refer to streamside planting placement diagram in the Contract Documents for specific guidance for plant placement along stream.

PART 4 – MEASUREMENT AND PAYMENT

- 4.1 The unit prices for Live Stakes shall include the cost of all labor, equipment, and materials required to install the live stakes in accordance with the Contract Documents.

Pay Item	Pay Unit
Vegetation - Live Stakes (1' O.C.)	Each (EA)

END OF SECTION 329301

SECTION 329500: - POST CONSTRUCTION VEGETATION MAINTENANCE

PART 1 - GENERAL

- 1.1 Description of Work
 - A. Maintain and replace plantings for a period of two years following substantial completion to ensure success/survival.

PART 2 - PRODUCTS [Section Not Used]

PART 3 - EXECUTION

- 3.1 Contractor shall guarantee a minimum survival rate of each vegetation species after 12 months of 85% for B&B, container grown, and tubelings, and 60% for bare root, tuber stock, and live stakes.
- 3.2 If survival rates are less than the above warranty rates, then landscape contractor shall replace the quantity of dead plants within the next planting window following the end of the applicable warranty period.

PART 4 – MEASUREMENT AND PAYMENT

- 4.1 All costs associated with the maintenance and replacement of plants during the warranty period shall be considered incidental to the initial planting costs and no additional payment shall be made for this work.

END OF SECTION 329500

SECTION 01551 - INVASIVE SPECIES CONTROL

PART 1 — GENERAL

- 1.1 This work shall consist of activities to control or eradicate invasive vegetation within the project area. Control areas shall include floodplain, side slopes, and upland forested areas. Contractor to ensure that vehicles and equipment are free of invasive species and use weed-free materials while on-site. The effort will continue invasive species control and is comprised of pre-construction control and eradication, control during construction, and post construction control for a period of two (2) years following substantial completion of the project as determined by the Project Officer through the application of approved herbicides, and may include hand extraction, or grubbing in combination with the herbicide application.

Related specifications include:

Section 329200 – Seeding and Sodding

Section 329300 – Exterior Plants

Section 329301 – Live Stakes

Section 329500 – Post-Construction Vegetation Maintenance

- 1.2 All work shall be performed in accordance with this specification, the plans, and as directed by the County. Invasive vegetation control shall include plants on the Virginia Department of Conservation & Recreation (DCR) Division of Natural Heritage *Virginia Invasive Plant Species List* and the *Non-Native Invasive Plants of Arlington County, Virginia Plant List* (<https://arlingtonva.s3.amazonaws.com/wp-content/uploads/sites/13/2013/11/invasive-1.pdf>), and other species designated by the County.
- 1.3 All herbicides shall be EPA registered chemicals that are approved for use in or adjacent to waterways to control and prevent re-growth of undesirable vegetation. The Contractor shall use triclopyr, glyphosphate, or imazapyr using application methods appropriate to the size and quantity of invasive plants at a rate as approved by the County. The Contractor shall select herbicide appropriate to the

species being managed and shall submit selection to the County for approval. The Contractor shall submit a written request for use of herbicides other than those listed above and receive written approval prior to use of such chemicals on the project. Manufacturer's specification sheets (labels) for herbicide, wetting agent, basal oil, and dyes shall be submitted to the County. A colorant shall be added to the herbicide in order to easily identify plants that have been treated.

PART 2 – PRODUCTS [Section Not Use])

PART 3 — EXECUTION

- 3.1 Herbicide application is strictly regulated, and the Contractor must ensure that all regulations are followed. Application equipment, personal protective equipment and application rates of the herbicide shall be in conformance with manufacturer's recommendations as shown on the product label and in accordance with state pesticide application laws.
- A. Pre-Construction Meeting: A pre-construction meeting shall be scheduled prior to commencement of invasive plant control operations. Meeting shall include Arlington County Department of Parks and Natural Resources Natural Resource Division staff.
 - B. Qualifications: The Contractor shall employ at least one Botanist, Practical Botanist, Species Surveyor, Certified Arborist or Landscape Architect that is qualified to distinguish between beneficial native plant species and harmful invasive plants. Additional qualifications are as follows:
 - 1. One such contractor professional shall directly supervise all work being performed.
 - 2. Any person working on this scope of work shall receive training that will minimize non-target damage.
 - 3. All field staff shall receive training that will minimize non-target damage.
 - 4. All laborers shall receive basic safety instructions before beginning work at each site.
 - 5. The County reserves the right to conduct random tests of project staff and shall have the authority to direct the Contractor to remove certain staff from the project if, in the County's opinion, such staff is not qualified to do the work.
 - 6. The Contractor shall ensure that the herbicide applicator is certified by the Virginia Department of Agriculture and Consumer Services for Category VI herbicide application. The Contractor shall be responsible for obtaining all necessary permits prior to initiating application and will ensure that all regulations are followed. The Contractor shall submit qualifications of key personnel who will be performing and/or supervising work on site, including a copy of the herbicide applicator's license.
 - C. Notification: The Contractor shall notify the County at least 48 hours prior to all herbicide applications.
 - D. Flagging: The areas planned for treatment shall be clearly flagged in the field and reviewed by the County and Natural Resources Division Staff prior to commencement of treatment activities. The Contractor shall be prepared to discuss invasive species control and native plant preservation methodologies during this field review.
 - E. Timing of Herbicide Application: Herbicide shall be applied at the time of year most suitable for eradication of the target species as specified on the plans. Herbicide application shall only be conducted during appropriate weather conditions as indicated on the product label. The herbicide shall not be applied when it is raining or if rain is forecasted within 24 hours of the planned application. The wind speed cannot be greater than 10 mph at the time of application

- F. Application Method: Herbicide application shall be selective low volume treatments with a backpack sprayer, truck mounted spray rig with low volume pump and spray gun, squirt bottle, injection gun, paint brush or other methods, as approved by the County. Broadcast high volume applications will not be permitted. The herbicide shall be applied with approved spraying apparatus directly to the target plant. Extreme caution shall be used when spraying adjacent to off-target, non-invasive vegetation or directly adjacent to any waterways/wetlands. Overspray of herbicide onto non-target plants shall be avoided to the greatest extent possible. The Contractor shall be responsible for any act of negligence in applying and handling of the herbicide on the project.
- G. Pre-Construction Invasive Plant Eradication: The Contractor shall conduct a field walk of the project area to identify the location and density of the invasive plant species to be managed prior to construction. At the direction of the Project Officer, pre-construction invasive species control may include area 25 feet outside the LOD as depicted on the approved plans. Once the Contractor has identified these areas and approved the locations and methods to be used, he will manage the invasive plants as described below.
1. Dense stands of invasive plants: Thoroughly wet all leaves with approved herbicides. Cut large stems and apply approved herbicides to cut surfaces immediately using spray bottle or paint brush. Bamboo stands shall be cleared and grubbed and treated with herbicide upon re-emergence.
 2. Individual plants or small patches of invasive plants: Utilize spot treatment methods being sure to minimize over spray onto surrounding desirable plants. Cut large stems and apply these herbicides to cut surfaces immediately using spray bottle or paint brush.
- H. Maintenance prior to Substantial completion: Inspect planted areas monthly during the growing season (April to October) and undertake manual invasive species control as necessary to maintain the planted areas prior to substantial project completion as determined by the Project Officer. Chemical control shall not be used unless authorized by the Project Officer.
- I. Post-Construction Invasive Plant Eradication: The Contractor will be responsible for post-construction management of invasive plants for two (2) years starting from the date of substantial completion.
1. Inspect all areas within the limits of work bi-monthly during the growing season (April to October). Identify and flag individual plants and areas dominated by invasive plants. Manually pull plants and treat the remnants left in the ground at the appropriate time of year to best control the target plant, between July 1st and October 1st for most species. Spot treat individual invasive plants being sure to minimize over spray onto surrounding desirable plants. Cut large stems and apply these herbicides to cut surfaces immediately using spray bottle or paint brush.
- J. Herbicide Handling: The Contractor shall store, transport and handle the herbicide in accordance with the manufacturer's recommendations. Materials shall be stored in the original container at a secured location. Any spills or leaks must be cleaned up immediately.

- K. Mapping: Contractor shall provide survey and/or GPS services for locating and/or establishing property lines, RPA boundaries, specific areas to be treated, etc. All completed work shall be submitted to the Arlington County Project Manager in digital format.
1. Maps/data shall be fully compatible with Arlington County's GIS (Arc) System.
 2. Maps/data shall contain at a minimum: Delineations of treatment areas in polygon format with attribute data that includes the names of invasive plants treated, their density, chemicals used, percent of chemical used, treatment method, type of equipment used, weather conditions, and date of treatment.
- L. Site Cleanup: During the execution of invasive vegetation control measures, all areas shall be kept neat and clean and free of trash and debris. Final cleanup shall be the responsibility of the Contractor and shall consist of the removal of all trash and materials incidental to the project to an approved off-site disposal location.
- M. Replacement of Native Plants Damaged: The Contractor shall be responsible for replacing and/or pruning of any native plant material that is killed or damaged through any act of negligence by the Contractor in applying and handling of the herbicide on the project.
- N. Final Inspection: The Contractor shall be responsible for correcting all deficiencies within seven (7) calendar days of inspection. The County's representative and the Contractor shall perform a final inspection and any corrective actions at the closeout of the contract.

PART 4 — MEASUREMENT AND PAYMENT

Pre-construction invasive species control shall be measured and paid for as lump sum. Such price and payment shall be full compensation for the work, including materials, including chemicals, equipment, tools, transport and disposal, and incidentals needed to perform the intended work. Invasive species control performed to maintain planted areas following planting, but prior to the date of substantial completion shall not be measured, but shall be considered incidental to the work.

END OF SECTION 01551

SECTION 329500 - POST-CONSTRUCTION VEGETATION MAINTENANCE

PART 1 – GENERAL

1.1. Description of Work

Warranty all plants for two (2) years beginning with the date of substantial completion as determined by the Project Officer. Provide all materials and labor required to maintain installed vegetation for two (2) years post-construction including watering, Deer protection maintenance, and plant maintenance and replacement.

1.2. Related Work Specified Elsewhere

- Section 01551 – Invasive Species Control
- Section 329200 – Seeding and Sodding

- Section 329300 – Exterior Plants
- Section 329301 – Live Stakes

1.3. Plant Warranty and Replacement

Warranty: Guarantee that plants will be alive and in satisfactory growth for a period of two (2) years, beginning the date of substantial completion as determined by the Project Officer.

PART 2 – MATERIALS

Materials shall be in accordance with the Contract Documents and specifications herein.

PART 3 – EXECUTION

3.1 Watering

In accordance with the approved plans, 20-gallon gator bags, or approved equal, shall be installed on all upland and steep slope trees. Trees shall be watered weekly during periods with rainfall of <1 inch from installation to two (2) year following the date of substantial completion.

3.2 Tree Shelter Maintenance

Tree shelters shall be inspected bi-monthly during the growing season (April to October) and maintained for two (2) years following the date of substantial completion.

3.3 Plant Maintenance and Replacement

- a. All plantings shall be inspected annually during the growing season (April to October) starting with the first growing season following substantial completion.
- b. Dead, dying and diseased plants shall be replaced. Any plant that is 25% dead or more shall be considered dead and shall be replaced at no charge to the County. A tree shall be considered dead when the main leader has died back, or 25% of the crown is dead.
- c. The Contractor shall submit an inspection report summarizing the inspection findings and proposed replacement species, quantities and schedule to the Project Officer by 10/15 of each year.
- d. Live Stakes: A target survival rate of 80 percent shall apply to live stakes, based on the installed quantity from the approved plan. The Contractor shall replace any dead live stakes with bare root plants to account for lost growth, unless otherwise authorized by the Project Officer.
- e. Herbaceous Plants: Replace dead or dying herbaceous plants between April 1 and May 15 of each year at no additional cost to the County.

- f. Woody Plants: Inspect woody plants annually in spring following leaf out to determine required replacement for the subsequent fall. Replace dead or dying woody plants between March 15 and May 15 or between September 15 and December 1, unless otherwise directed by the Project Officer and Urban Forester.
- g. Plants used for replacement shall be the same species and size as specified in Plant List; plant, mulch, maintain and warrant as specified.
- h. Properly maintain all planting and planting areas during the warranty period to include as needed watering, invasive control, repair of excessive soil rutting/erosion, and pruning.
- i. All replacement plants shall be furnished and installed in accordance with the relevant technical specifications.

PART 4 – MEASUREMENT AND PAYMENT

The measurement for Post-construction Vegetation Maintenance shall be lump sum, to include all watering, tree shelter maintenance, pruning, and plant replacement during the two (2) year warranty period.

END OF SECTION 329500