

ADDENDUM NO. 2**BID NO. 25-08****SR-2 CARSINS RUN TRIBUTARY RESTORATION
CITY OF ABERDEEN, MARYLAND**

To all holders of the specifications, the following corrections are hereby made. All other items shall remain unchanged. This addendum shall become part of the Contract Documents for the above referenced project.

Acknowledgement of Addendum

Name: _____

Company: _____

Date: _____

Signature: _____

Item 1: Correction to Bid Documents “012200 Measurement and Payment”
(see included document “012200 Measurement and Payment – corrected”)

Item 2: Addition to of Special Provisions to Bid Documents
(see included document “ 25-08 SR2 Special Provisions”)

SECTION 012200

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. General information in regard to payment.
- B. Procedures for preparation and submittal of applications for payment.

1.2 GENERAL

- A. **The Contractor is advised to review all the requirements and conditions set forth in this section and the Special Provisions prior to submitting a bid.**
- B. See General Conditions for additional requirements.
- C. Payment for the work completed under this Contract will be made at the stipulated prices bid (based on quantity installed). The unit prices shall include the furnishing of all labor, tools, equipment and materials and the performance of all work required to complete the project as indicated and specified in accordance with all requirements of the Contract Documents and to the entire satisfaction of the City and Engineer.
- D. The City shall not have any obligation to pay nor see to the payment of any monies to any contractor except as may otherwise be required by law. The Contractor shall submit an invoice on or about the 15th of each month in which the Contract is in effect for the work completed and verified to date. The City shall pay the Contractor's invoice once the Engineer has reviewed and signed the Contractor's Application for Payment, less retainage, within thirty (30) days after the Engineer affixes his signature to the Contractor's Application for Payment form.
- E. The application for payment shall include a description and verification of work completed by the Contractor. If the certified payrolls are not correct, the City shall withhold all payments to the Contractor without penalty until the certified payrolls are brought into compliance with the Contract Documents.
- F. No certificate for progress payment, nor any progress payment, nor any partial or entire use of occupancy of the Project by the City, shall constitute an acceptance of any Work which is not in accordance with the Contract Documents.
- G. All payments shall be subject to a five (5) percent retainage until the contract is complete and accepted by the City, and the Release of Liens has been completed and submitted.

CITY OF ABERDEEN – MEASUREMENT AND PAYMENT

- H. Payment for materials furnished and work done under this contract will be made as hereinafter stipulated, for the actual amount of materials supplied and work done under authorization of the Engineer and in accordance with the unit prices bid in the Bid Form; and the Contractor shall not be entitled to receive additional compensation for anything furnished or done, except for such extra work as shall be required by written order.
- I. It is intended that all work shown on the Contract Drawings and included in the specifications is to be paid for under the items listed in the Bid Form. The absence from the Bid Form of bid items for any specific category of work shall be interpreted as meaning that the cost of such work, accomplished as defined by the Contract Documents, shall be included in the prices bid for related items listed in the Bid Form. Should the Contractor feel that the cost for any item of work has not been defined by a Bid Form payment item, he shall include the cost for that work in some other applicable bid item, so that his proposal for the project reflects his total price for completing the work in its entirety.
- J. The prices stated in the proposal(s) include all costs and expenses for taxes, labor, equipment, materials, commissions, transportation charges and expenses, patent fees and royalties, labor for handling materials during inspection, together with any and all other costs and expenses for performing and completing the work as shown on the Drawings and specified herein. The basis of payment for an item at the lump sum or unit price shown in the proposal(s) shall be in accordance with the description of that item in this Section.
- K. All items in the Bid which are designated as “Contingent Bid Items” are to be used and will be paid for only at the written direction and authorization of the Engineer, if agreed to by the Owner. Payment under this section will be made for materials furnished and placed in addition to those shown or beyond the limits indicated or reasonably inferred from the Contract Documents. All materials furnished and installed shall be in accordance with these specifications. Measurements and payment will be in accordance with the proposal and will include but not necessarily be limited to the furnishing, hauling, placing, and installing of materials, and the furnishing of such manpower and equipment as required to accomplish the work as directed in writing by the Engineer.
- L. All excavation under this Contract is unclassified; that is, the unit prices bid shall be taken to include and cover all materials required to be excavated and backfilled, whether wet or dry, and regardless of the character of the materials. The excavations, removal and replacement of road surfacing materials, curb, sidewalk, gutter, and yard restoration, as required, shall be included in the unit prices bid with any exceptions as noted herein or as designated on the plans.
- M. The cost of dewatering and associated work will be paid for per the bid item for Maintenance of Stream Flow.
- N. All removal, relocation and disposal work as indicated in the Contract Documents, and/or as necessary to complete the proposed work shall be performed at no additional cost to the Owner. Cost of all removal, relocation and disposal work shall be included in the price bid.

CITY OF ABERDEEN – MEASUREMENT AND PAYMENT

- O. For the unit price Items included in the Bid, the Contractor will be paid for the actual quantity of the authorized work done or material furnished under each item of the proposal, at the unit price bid for such item. The quantities for payment under this Contract shall be determined by actual measurement of the completed items, in place, ready for service and accepted by the Owner, in accordance with the General Conditions.
- P. All items of work shall be measured concurrently, upon installation and before covering or backfilling, by the Resident Project Representative and the Contractor's representative. All items so measured will be recorded by both parties in a format which can be kept current until completion of work. All measurements, to the maximum extent possible, shall be referenced to base dimensions and stationing shown on the Drawings.
- Q. Payments during the course of the work for lump sum items will be made on the basis of percentage completion of the work items listed in the schedule of values for each lump sum item. The Schedule of Values shall be prepared by the Contractor and submitted to the Engineer within 15 days of the execution of the Contract and shall serve as a breakdown of the lump sum bid for the purpose of arriving at a basis for the monthly estimate. The Schedule shall add up to 100% of the Lump Sum bid.

1.3 FORMAT

- A. Contractor's Application for Payment Form provided in the Contract Documents.
- B. For each item, provide a column for listing each of the following:
 - 1. Specification Section No.
 - 2. Description of work.
 - 3. Scheduled Values.
 - 4. Previous Applications.
 - 5. Work in Place [and Stored Materials] under this Application.
 - 6. Authorized Change Orders.
 - 7. Total Completed [and Stored] to Date of Application.
 - 8. Percentage of Completion.
 - 9. Balance to Finish.

1.4 PREPARATION OF APPLICATIONS

- A. Present required information in typewritten form.

CITY OF ABERDEEN – MEASUREMENT AND PAYMENT

- B. Execute certification by signature of authorized officer.
- C. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored Products.
- D. List each authorized Change Order as an extension, listing Change Order number and dollar amount as for an original item of Work.
- E. Prepare Application for Final Payment as specified in Section 006200

1.5 SUBMITTAL PROCEDURES

- A. Submit four copies of each Application for Payment.
- B. Submit an updated construction schedule with each Application for Payment (See Section 006200).
- C. Payment Period: Submit at intervals stipulated in the Contract Form.
- D. Submit with transmittal letter as specified for Submittals in Section 013300.

1.6 SUBSTANTIATING DATA

- A. When Engineer requires substantiating information; submit data justifying dollar amounts in question.
 - 1. Provide one copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.
 - 2. Include the following with the application:
 - a. Current construction photographs specified in Section 013300.
 - b. Partial release of liens from major subcontractors and vendors.
 - c. Affidavits attesting to off-site stored products.
 - d. Construction progress schedules, revised and current.

END OF SECTION

UNNAMED TRIBUTARY TO CARSINS RUN AT SUMMERLIN (SR-2)
STREAM RESTORATION PROJECT
SPECIAL PROVISIONS

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STREAM RESTORATION CERTIFICATION AS-BUILT CHECKLIST

All references to standards and specifications are to MDOT SHA Standard Specifications for Construction and Materials

https://roads.maryland.gov/ohd2/2024_Standard_Specifications_for_Construction_and_Materials.pdf

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**CATEGORY 100
PRELIMINARY**

STREAM RESTORATION SITE AS-BUILT CERTIFICATION

DESCRIPTION. Prepare and submit to the City for approval, a certified As-Built Survey of the completed stream restoration construction to fully illustrate all construction within the established limits of disturbance.

MATERIALS. The As-Built Survey shall be a reproducible mylar copy of the approved Contract Documents. Features to be surveyed shall consist of items listed under the Stream Restoration As-Built Checklist. The As-Built Survey shall be certified by a registered land surveyor licensed within the State of Maryland. During construction, the Contractor shall adhere to tolerances as noted on the plans. The signed, sealed and certified reproducible mylar As-Built drawings along with 3 print copies shall be forwarded to the City for approval.

CONSTRUCTION.

- (a) Notify the City a minimum of two-weeks prior to completion of construction activities.
- (b) Upon completion of construction activities, the contractor has no longer than 4 weeks to furnish the City with a certified As-Built topographic plan.
- (c) The Contractor may choose to submit to the City partial as-built survey drawings in order to illustrate the layout of all stream restoration features and grading; however, this submission of this partial as-built does not automatically convey approval of construction or eliminate the requirement for the Contractor to provide a final as-built survey of the entire completed project certified by a registered land surveyor. The City may, at its sole discretion, grant formal acceptance of the partial as-built in order to expedite the as-built certification process.
- (d) Any errors or omissions found during the course of the as-built survey and determined by the City, who shall be the sole judge, to have occurred during construction shall be repaired by the Contractor to the satisfaction of the City at no additional expense to the City. The Contractor shall make any necessary repairs or corrections required by the City including grading, adjustment of stream restoration structures, etc. Upon completion of corrective action, the Contractor shall furnish the City with a re-survey of the problem area showing the original as-built information and any modification highlighted and noted. A registered land surveyor shall also seal the resurvey.
- (e) Final acceptance of the project by the City will not occur until the certified as-built has been completed for the entire project.

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MAINTENANCE.

- (a) The Contractor will be held fully responsible for maintaining the project during the course of the construction including the period of the as-built certification.
- (b) The Contractor shall be held responsible for maintaining the integrity of the project until final acceptance of the as-built drawing and a determination by the City that no errors or omissions have been made by the Contractor during the course of construction. The City shall make every effort to notify the Contractor within five (5) weeks of the City's receipt of the as-built survey as to the acceptability or rejection of the construction of the stream restoration project; however, lapse of this time frame does not relieve the Contractor of responsibility for maintaining the integrity of the project or for correcting any errors/omissions until final acceptance of the certified as-built for the entire stream restoration project.

MEASUREMENT AND PAYMENT. Preparation of the As-Built Survey and certification will not be measured, but will be paid for at the Contract lump sum price. The payment will be full compensation for surveying, preparation of as-built drawings, and for the Licensed Surveyor to seal the as-built drawings. Payment shall include all materials, labor, equipment, tools, maintenance and incidentals necessary to complete the work.

END OF SECTION

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**CATEGORY 100
PRELIMINARY**

MOBILIZATION, DEMOBILIZATION, BONDS & INSURANCE

DESCRIPTION. This work shall consist of the construction preparatory operations, including the movement of personnel and equipment to the project site necessary to begin work. All work to be performed under this item shall be in accordance with the requirements of Section 108 of the Maryland Department of Transportation, State Highway Administration's Standard Specifications for Construction and Materials, dated 2024 (Standard Specifications), with the following additions and/or modifications. An Engineer's Office is not required for this Contract.

MEASUREMENT AND PAYMENT. Mobilization will not be measured but will be paid for at the lump sum bid price for "Mobilization, Demobilization, Bonds & Insurance", for which price and payment constitutes full compensation for all work associated with mobilizing and demobilizing the Project as described, all necessary clearing and grubbing, and for furnishing all Materials, labor, equipment, and incidentals required to complete the Work. Fifty percent (50%) of the lump sum Contract price for initial expense will be paid for the first monthly payment, after which the remaining sum will be prorated for the duration of the contract. Price and payment will constitute full compensation for all labor, materials, equipment, tools, and incidentals required to complete the work. Payment of the Contract lump sum price for initial expense will not be made more than once, regardless of the fact that the Contractor may have for any reason shut down work on the Project or moved equipment away from the Project and then back again. The cost of the required insurance and bonds, and any other initial expense required for the start of work will be included in this Section.

END OF SECTION

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**CATEGORY 100
PRELIMINARY**

TEMPORARY ORANGE CONSTRUCTION (SAFETY) FENCE

DESCRIPTION. The Contractor shall install Orange Construction (Safety) Fence around the perimeter of the critical root zone of existing individual trees and along edges of forests to protect the root systems from damage prior to grubbing operations. The critical root zone is defined as one foot per inch of tree diameter at breast height (DBH). This location of fencing for tree protection can be altered with the approval of the Engineer for purposes of specific grading.

Orange Construction Fence shall also be installed as security fencing around the LOD (and Access path as directed) to prevent unauthorized access, and/or in other areas indicated on the plans or as directed by the City or the Engineer.

MATERIALS.

- (a) **Fence.** Orange Construction (Safety) Fence shall be Blaze or International Orange colored, mono-oriented laminar polyethylene plastic, U.V. stabilized material with a mesh size of 3 inches by 1.5 inches and porosity of 60%. The fence shall have a minimum height of 4 feet.
- (b) **Posts.** Posts for attachment of the fence shall be 2-inch by 2-inch wood posts, a minimum of 6 feet long or 5-1/2 ft high, 2 in. steel U-channel posts.
- (c) **Ties.** Ties for attachment of fencing to posts shall consist of plastic or wire of a gauge sufficient enough to bear the weight of the fencing on the posts.

CONSTRUCTION. Trees to be protected during construction will be identified by the City and the Contractor during the pre-construction meeting. All tree protection devices shall be installed before clearing and grubbing commences. Trees to be protected during construction shall be identified by flagging and then Orange Construction Fence as decided during the preconstruction meeting. No paint shall be used to indicate trees to be protected.

Drive posts into the ground to a depth of 12 to 18 inches. Posts shall be spaced a maximum of 6 feet apart. Roll fence out along the posts and secure fence to the posts using a minimum of three ties per post. Tension wire or rope may be used as a top stringer and woven through the top row of strands of the fence to prevent potential sagging.

The Contractor may elect to install Orange Construction Fence in another manner if approved by the Engineer. At such time that the construction is substantially complete and with the Engineer's approval, the Contractor shall remove the fence, fence posts and other materials, which then becomes the property of the Contractor. The Contractor shall maintain fencing

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throughout the life of the project. Should construction sequencing allow, and **with the approval of the Engineer**, fencing from a completed section of the project site can be removed and reused on the site.

MEASUREMENT AND PAYMENT. The payment will be full compensation for the installation, removal, and maintenance of and for all materials, fence, posts, ties, labor, equipment, tools and incidentals necessary to complete the work.

Temporary Orange Construction Fence will be measured and paid for at the Contract unit price per linear foot for the actual number of linear feet installed, measured to the centers of end posts. Fencing reused on-site following completion of a section of the site will be paid for at the same unit cost as the initial installation.

END OF SECTION

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**CATEGORY 100
PRELIMINARY**

SECTION 101 – CLEARING AND GRUBBING

101.01 DESCRIPTION

Per the Maryland Department of Transportation, State Highway Administration's Standard Specifications for Construction and Materials, dated 2024 as modified herein.

101.01.01 Definitions

ADD: The following at the end of (a) Clearing:
Only those trees approved by the City or Engineer may be removed.

DELETE: (d) Limits in its entirety.

INSERT: The following:

(d) Limits. Limits of clearing and grubbing will be directed by the Engineer and includes all portions of the construction area where erosion and sediment controls are to be installed and areas where stream or channel grading will occur. **The Limit of Disturbance (LOD) shown on the plans is not the limit of clearing and grubbing.**

ADD: After (g) Stabilization Measures.

(h) Chipping. Describes chipping of existing stockpiles of cut trees, within the limit of disturbance, and spreading or placing on the site as directed by the Engineer. Chipping will be accomplished by use of a wood chipping machine to a size acceptable to the Engineer. Shredded hard wood mulch from off-site should be mixed with existing wood chips to ensure the wood chips do not suppress seeding and hinder growth.

101.03 CONSTRUCTION

101.03.07 Disposal.

ADD: As the first sentence under (a) Burning.

Burning is strictly prohibited on the project site without prior approval from the City or Engineer.

DELETE: 101.03.08 Damage to Trees and Other Protected Resources in its entirety.

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INSERT: The following:

101.03.08 Destroying Trees and Wetlands Beyond Clearing Limits. The Contractor shall not damage nor destroy any trees and wetland areas that exist beyond the clearing limits.

101.04 MEASUREMENT AND PAYMENT

DELETE: 101.04.01 in its entirety.

INSERT: The following:

101.04.01 Tree Branch and Root Pruning will not be paid for separately but will be incidental to clearing and grubbing.

END OF SECTION

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**CATEGORY 100
PRELIMINARY**

SECTION 107 – CONSTRUCTION STAKEOUT

DESCRIPTION

- (a) Furnish, place, and maintain construction layout stakes.
- (b) Provide and have available to the project an adequate engineering staff which is competent and qualified to set all lines and grades needed to construct the stream restoration.
- (c) Make all field measurements necessary to stakeout the baseline of construction and lay out lines and grades in the Contract Documents or as directed by the Engineer. Use the horizontal and vertical survey controls as shown in the Contract Documents to lay out lines of work, limits of grading, fill placement and to stake out the location of all proposed structures.

The Contractor shall, as a part of his/her construction stakeout operation and before any clearing operation commences, demarcate any wetlands and the Limit of Disturbance throughout the entire project as shown on the Plans and labeled as Limit of Disturbance and/or Wetlands, to the satisfaction of the Engineer.

- (d) At a minimum construction stakeout of the first two phases of work shall occur prior to the pre-construction meeting. Additional phases of stakeout shall occur during construction of prior phases. The staggered stakeout is permitted due to the size of the project and anticipated duration to avoid losses and requiring re-stakeout.
- (g) Notify DEPS once the stakeout or a phase of the stakeout is completed. DEPS will inspect the construction stakeout prior to the Contractor beginning clearing and grubbing activities. The purpose of the inspection is not to verify the stakeout, but to allow the City an opportunity to assess the lines established by the Contractor prior to the start of construction. If there are obvious errors with or questions concerning the stakeout, the visible errors and questions will be discussed with the Contractor, prior to the Contractor proceeding with construction. **This inspection will in no way relieve the Contractor of his/her responsibilities to construct the site as specified in the Contract Documents.**
- (h) Existing elevations and contours shown on the plans, cross-sections, stream bottom profiles, and/or bank alignment shown on the Contract Drawings were correct at the time of the original survey. However, because of interim vegetation growth and/or soil mobilization, existing elevations and grades may have changed since the original survey was completed. It is the Contractor's responsibility to confirm existing grades and adjust quantities, earthwork and work efforts as necessary at no additional cost to the City.

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MATERIALS

The material for flagging the limits of disturbance shall be a 3-in. international orange vinyl material. The material for flagging wetlands shall be standard pink vinyl flagging.

CONSTRUCTION

Line and Grade. The Contractor will provide the following:

- (a) **Stream Channel Stakeout.** Stake the base line of the stream channel as indicated in the Contract Documents. Clearly label stakes with appropriate stations. The stream channel base line of construction shall be staked with 3-ft long wooden stakes. The maximum spacing of stations (stakes, nails, crosses, etc.) will be 25 ft, and the elevations on the top of each marked point will be furnished. The Contractor shall establish appropriately spaced benchmarks and the necessary references including all points of curvature (P.C.), and points of tangency (P.T.) for the preservation and control of the base line. Upon completion of grading, the Contractor will provide a staked base line or working line.
- (b) **In-Stream Structure Stakeout.** For in-stream structures and pools, stake out the boundaries, all breaks in slope, and the tops and toes of banks with a maximum spacing of 25 ft. Stakes will be used to mark pool spot elevations and bank toes and top of bank will be flagged with pin flags. Graphical display of structures on the grading sheets shall not be used for construction stakeout.

Equipment and Personnel The Contractor shall use competent personnel and state of the art equipment for all engineering work required to set and maintain the elevations and dimensions as specified in the Contract Documents.

Control Markers The Contractor shall be responsible for preserving the baseline of construction, working lines, and benchmarks set at the beginning of the project. The Contractor shall replace the baseline of construction, working lines, and benchmarks if they are disturbed or destroyed by the Contractor, at no additional cost to the City.

Control Stakes. For the stream baseline of construction, as specified in 107.03.03(a), set and preserve stakes at each station along each side of the proposed channel. On each of these stakes mark its offset distance from the baseline of construction and its top elevation or the cut or fill to the profile grade line. Additional stakes, as needed for horizontal and vertical controls necessary for correct layout of the work, shall be set by the Contractor.

Layout. For structures specified in 107.03.01(b), the check the proposed structure lengths by electronic distance measurement or chaining. When chaining is used, the measurements must be compensated for horizontal alignment. Check the location of the structure to affirm its correct location with relation to existing on-site features and conditions that are to remain in their original positions. If any discrepancies are found, the Contractor shall notify the Engineer at once

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in writing, otherwise, it will be assumed that all planned dimensions, grades and field measurements are correct. All lines established on the ground shall be preserved or referenced, marked, and kept available at all times.

Utilities. Make available to the utility companies or agencies working within the limits of the project, promptly upon request, reference to control points, alignment and grade data, so that they may properly locate and coordinate their work and improvements in relation to the project.

Intersection Utility Stakeout. The Contractor shall notify the appropriate agencies as noted below a minimum of 72 hours (excluding weekends and holidays) prior to the Contractor's anticipated beginning of any underground work.

(a) Request a MISS UTILITY stakeout and possess a valid MISS UTILITY clearance ticket number for any underground work.

(b) Contact all utilities within the limits of the project that are not a member of MISS UTILITY and obtain a stakeout of their respective facilities.

Flagging. The flagging shall be placed continuously throughout wetland areas. In areas where trees are not to be disturbed, individually flag those trees in a line along the clearing limits, which are not to be moved or destroyed. If the flagging has been destroyed and the Engineer determines that its use is still required, re-flag the area at no cost to the City.

If the Contractor, after notification by the Engineer that replacement flagging is needed, does not replace the destroyed flagging within 48 hours, the Engineer may proceed to have the area re-flagged. The cost of the re-flagging by the Engineer will be charged to the Contractor and deducted from any monies due under the Contract.

At the completion of construction, the Contractor shall remove all flagging.

MEASUREMENT AND PAYMENT

Construction Stakeout will not be measured but will be paid for at the Contract lump sum price. The payment will be full compensation for furnishing, placing and maintaining construction layout stakes, flagging of disturbance limits, trees, and wetland limits, and for all material, labor, equipment, tools, and incidentals necessary to complete the work. Payment of the Contract lump sum price will be prorated and paid in equal amounts on each monthly estimate. The number of months used for prorating will be the number estimated to complete the work.

END OF SECTION

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CATEGORY 200
GRADING
BORROW EXCAVATION

DESCRIPTION

Furnish, excavate, haul, and place approved materials for backfills when sufficient quantities of suitable materials are not available from other excavations specified in the Contract Documents.

The Contractor may obtain Borrow from the City's stockpile if available and meeting specifications. If the City's stockpile is not available or available material is not approved by the Engineer, Borrow meeting the required specifications may be furnished elsewhere.

MATERIALS

Borrow. Refer to Special Provision 900 – Suitable Backfill.

CONSTRUCTION

Borrow material shall be placed in 1' lifts and compacted with the excavator bucket, allowing for topsoil or other specified material per the Contract Documents to establish finished grades.

MEASUREMENT AND PAYMENT

Borrow excavation will be measured and paid for at the Contract unit price per cubic yard for Borrow. The payment will be full compensation for furnishing, excavating, and hauling, the formation and compaction of backfills, subgrade, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

END OF SECTION

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**CATEGORY 200
GRADING**

MICROTOPOGRAPHY

DESCRIPTION

Create roughness features, low elevation depressions, mounds, berms, or other irregular grading to create habitat and flow diversity throughout the proposed floodplain.

MATERIALS

Topsoil. 920.01

Organic Leaf Compost. Organic Leaf Compost must be free of any materials which pose a definitive hazard to human health, must contain less than < 1 percent inert materials, be free of seed and pathogens, and possess a pH of 6.5 – 8.5.

Permanent Seed 700.03

CONSTRUCTION

Create Microtopography with an excavator bucket during the final grading of the proposed floodplain surface and prior to the placement of permanent seed. Final floodplain elevations shall be at the direction of the Engineer.

Microtopography features which create mounds or berms shall not be constructed in a straight down-valley flow direction. Microtopography feature (elevated or depressed) shall not exceed 50 ft. in continuous length and should be field directed by the Engineer.

Finished areas shall be immediately stabilized with permanent seed mix.

MEASUREMENT AND PAYMENT

Microtopography will be measured and paid for at the Contract unit price per square yard.

Organic Leaf Compost will not be measured but considered incidental to the Microtopography.

Placing Furnished Topsoil will be measured and paid for by square yard.

Placing Salvaged Topsoil will be measured and paid for by square yard.

Permanent Seed will be measured and paid for per lb.

END OF SECTION

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**CATEGORY 200
GRADING**

SECTION 202 – CHANNEL OR STREAM CHANGE EXCAVATION (CLASS 5)

202.01 DESCRIPTION

All excavation specified on the plans and in the Contract Documents, unless otherwise specified, shall be classified as Class 5 Excavation. Use all suitable materials, including topsoil, subsoil and channel bed material / bed mixes, and channel sand and gravel or granular filter material, as specified. Dispose of unsuitable material as directed.

202.02 MATERIALS

Not Applicable

202.03 CONSTRUCTION

202.03.01 Layout. The layout of the grading shall be as shown on Contract Drawings. Grade out a smooth transition between cross-sections, with no abrupt changes in channel geometry.

202.03.02 Excavation. Excavation includes the following:

- (a) Cut areas within the boundary faces of the cross-sections, including excavation within the channel, banks or floodplain for stream channel restoration activities. This includes excavation for the installation of stone structures, channel bed materials, and bank treatment techniques.
- (b) Demolition and/or removal of debris from the stream channel, including trees and debris jams, tires, gabion baskets, concrete lining, and broken up concrete and other materials as designated by the engineer.
- (c) Additional rock encountered within the stream channel that may be handled by the same tools and equipment used for channel or stream excavation.
- (d) When excavating for stream restoration or other facilities indicated on the plans, the Contractor may encounter wet or saturated soils. The Contractor is responsible for dewatering and transporting saturated soil off-site in a manner that prevents discharge or spillage of soils or water onto adjacent properties or roads. Should any discharge occur, the Contractor shall be responsible for immediate and complete clean-up.

202.03.03 Grading Units. Refer to Section 201.03.01.

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202.03.04 Use of Excavated Materials. Excavated material may be salvaged and reused onsite with approval from the Engineer. Remove and dispose of unapproved materials.

202.03.05 Disposal of Unsuitable Materials. Remove existing debris, concrete, waste, and other unsuitable materials, as determined by these specifications or by the Engineer. Dispose of unsuitable material in a site with an approved erosion and sediment control permit. Remove all soft and unstable material and any other portions of the subgrade that will not properly compact, disposed of and replaced with suitable material and compacted.

202.03.06 Rock Excavation.

- (a) Boulders and rock from the excavation may not be broken and used for any of the proposed in-stream or bank structures unless authorized by the Engineer or provided for in the Contract Documents.
- (b) **Blasting.** No blasting is allowed on this project.
- (c) **Pre-splitting.** Obtain prior approval from the Engineer before performing any pre-splitting activities, necessary to complete the excavation to the grades and lines indicated on the plans. All pre-splitting shall conform to Section 201.03.04 (c).

202.03.07 Frozen Material. Frozen material shall be handled as specified in Section 201.03.05.

202.03.08 Excavation Beyond Specified Limits. The widening of cut or excavation sections beyond the limits of the cross-sections, is prohibited in all instances except by written order from the Engineer. When so ordered by the Engineer, the procurement of additional suitable materials for fill, except as otherwise specified under Borrow Excavation, shall conform to the following provisions.

- (a) **Finished Excavation.** Refer to Section 201.03.08 (a).
- (b) **Excavation Limits.**

- (1) If the Engineer directs the Contractor to excavate beyond the limits of the cross-sections originally proposed, and within the limits of disturbance, prior to the starting of earthwork construction in an excavation section, then all material within the limits will be classified as Class 5 Excavation.
- (2) If the Contractor, with approval of the Engineer, elects to obtain material by widening cuts beyond the limits of the cross-sections originally proposed and within the limits of disturbance, the excavation of the materials will be classified as Class 5 Excavation.

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- (c) **Borrow Excavation Beyond Specified Limits.** If the Engineer directs the Contractor to excavate beyond the limits of the cross-sections originally proposed and after the Contractor has substantially completed the excavation in a cut section, then all material removed beyond the limits of the cross-sections will be classified as Class 5.

202.04 MEASUREMENT AND PAYMENT

Unsuitable Material and Undercuts. Unstable or other unsuitable material encountered at or below the lowest excavation limit required for a structure's installation, as specified in the Contract Documents, shall be undercut (overexcavated) and removed to the extent directed by the Engineer. The undercutting and removal of unsuitable material shall be incidental to Class 5 Excavation. In rock areas, the limit of measurement for excavation will be at the bottom of the normal plan section. All voids created by the removal of unsuitable material and undercuts, except when rock is encountered at subgrade, shall be backfilled to the lines and grades specified in the Contract Documents. Backfill material for undercuts shall conform to materials specified and shall be incidental to the Class 5 Excavation

Class 5 Excavation is paid for at the Contract unit price per cubic yard. Payment will be full compensation for all excavation, hauling, salvaging, separating, and stockpiling of suitable materials, backfilling old stream beds or otherwise disposing of excess and unsuitable materials, undercutting and backfilling of undercuts, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

END OF SECTION

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**CATEGORY 300
DRAINAGE**

MULCH ACCESS PATH

DESCRIPTION

Furnish all labor, material and equipment required to install the access path at locations delineated in the Contract Documents.

MATERIALS

- (a) **Wood Chip Mulch.** Wood chips shall be either hardwood or softwood chips, produced by a chipping machine to a size acceptable to the Engineer. Chips shall not have been subjected to any conditions that would shorten their life or cause them to lose any of their value as mulch. Wood chips shall be free from leaves, twigs, wood shavings, sawdust, toxic substances, and any foreign materials.

The Contractor will locate potential sources for the wood chips. The Contractor will not be granted an extension of time or extra compensation due to delay caused by sampling, testing, approval or disapproval of material under the requirements of these specifications.

Shredded hard wood mulch from off-site should be mixed with existing wood chips to ensure the wood chips do not suppress seeding and hinder growth.

- (b) **Geotextile Class SE (Nonwoven).** 919.01

- (c) **Natural Fiber Matting.** 920.05.01(d)

- (d) **Temporary Orange Construction (Safety) Fence.** 104.20

CONSTRUCTION

Install Mulch Access Path by lining the path with geotextile SE and cover with a minimum 12" of mulch. Install mulch access path so the width is not less than 12ft. In sensitive areas and where the mulch access path impacts root zones of trees, a thicker layer of mulch may be required, or as required by the Engineer. With permission of the Engineer, Natural Fiber Matting may be used in lieu of geotextile SE.

Remove all parts of the temporary access path once the location is no longer used. Off-site disposal of the mulch should be planned for, but some of the mulch may be dispersed on-site

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with approval and discretion of the Engineer. Once temporary mulch access path has been removed, the contractor will need to loosen any compacted soil left and prepare the soil for landscaping. No mulch shall be left in any delineated or constructed wetland area.

MEASUREMENT AND PAYMENT

Payment will be full compensation for all materials, excavation, and installation of mulch access roads and for all wood chips, geotextile SE or soil stabilization matting, labor, equipment, tools, and incidentals necessary to complete the work as specified in these contract documents.

12" Thick Mulch Access Path shall be measured and paid for at the Contract unit price per square yard.

Wood chips mulch shall not be measured but considered incidental to 12" Thick Mulch Access Path.

Geotextile Class SE (Nonwoven) shall not be measured but considered incidental to 12" Thick Mulch Access Path.

Natural Fiber Matting mulch shall not be measured but considered incidental to 12" Thick Mulch Access Path.

High Visibility Fence will be measured and paid for per linear foot of Temporary Orange Construction (Orange Safety) Fence.

END OF SECTION

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**CATEGORY 300
DRAINAGE**

CLAY PLUG

DESCRIPTION

This work consists of furnishing material and equipment for, and placing a clay plug in areas specified in the Contract Drawings.

MATERIALS

Clay Channel Block. Must be unified soil. Classification SC or CC and must be compacted to 85% of AASHTO specification T-99 or ASTM D698. Moisture content must be +/- 2% of optimum moisture content.

CONSTRUCTION

Excavate 12 inches below existing grade in the location of the clay channel block for key-in.. Place clay channel block material in 12 inch, loose horizontal lifts and compact to 85% as detailed in AASHTO specification T-99 or ASTM D698. Then, place suitable fill around clay channel block and compact to 95% following AASHTO specification T-99 or ASTM D698. Perform testing using methods acceptable to the Engineer at a frequency of 1 test per 5,000 square feet.

Repeat lifts at 1:1 side slopes until 12 inches below proposed grade. At this elevation, clay block width will be 2 feet. Place suitable backfill and compacted on top of clay channel block to achieve final grade.

MEASUREMENT AND PAYMENT

Payment will be full compensation for all excavation, backfill, compaction, disposal of excess material, and for all labor, equipment, tools, and incidentals necessary to complete the work. Clay plug is paid for the at the unit price per CY.

Placing Furnished Topsoil will be measured and paid for by square yard.

Placing Salvaged Topsoil will be measured and paid for by square yard.

Furnished Borrow will be paid for per cubic yard as specified in Section 200 – Borrow Excavation.

Salvaged Suitable Backfill will not be measured, but considered incidental to Class 5 Excavation.

END OF SECTION

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**CATEGORY 300
DRAINAGE & UTILITY CONSTRUCTION**

HEAVY TREE PROTECTION

DESCRIPTION. Install heavy tree protection as directed and approved by the City or Engineer. Heavy tree protection is placed on individual trees for protection from moving equipment.

MATERIALS.

(a) **Lumber** – Refer to Section 921.05- Structural Timber and Lumber.

(b) **Burlap** – Refer to Section 709- Soil Stabilization Matting - Natural Fiber Matting.

(c) **Snow Fence** – Snow fence shall be comprised of natural wood lathe and galvanized steel wire. Wood lathe shall be untreated wood aspen, spruce or pine and 3/8 to 1/2 inch thick and 1-1/4 to 2 inches wide. Spacing between lathes shall be between 2 and 3 inches. Wire shall be not less than 13 gauge.

300.06.03 CONSTRUCTION.

Installation. Verify trees for protection within or adjacent to the established and approved LOD. Burlap shall be wrapped completely around the tree starting 12 feet above the ground, or less as directed by the City, and working to the base of the tree. Burlap shall be overlapped a minimum of 6 inches. The tree shall be surrounded with 2 inch x 4 inch x 5 to 12 feet No. 2 Spruce-Pine-Fir (SPF) framing lumber attached per details shown in the construction plans. Trees within the LOD are typically completely surrounded unless otherwise indicated on the Contract Drawings or if connecting to orange construction fence. Where tree is only partially covered by structural timber, the contractor shall use rubber hose or similar material over the rope to ensure the uncovered portion of the tree is not damaged. A snow fence or similar additional fencing shall be placed on the ground at the base of the tree. The snow fence shall be secured with nails or screws to the structural lumber. The snow fence shall not be attached to the tree for any reason.

Heavy tree protection may be adjusted or added as directed by the City or Engineer.

Maintenance. Maintain heavy tree protection during construction ensuring that materials have not been damaged by equipment operation. Replace damaged lumber weekly at no additional cost to the City.

Post Construction. After construction activities are completed for each grading unit and written approval is obtained to remove the erosion control measures, remove the heavy tree protection and dispose of offsite or stockpiled on-site for use in a subsequent grading unit unless otherwise

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directed by the City. Replace damaged trees at no additional cost to the City. The number of replacement trees will be as directed by the City.

300.06.04 MEASUREMENT AND PAYMENT. Heavy Tree Protection will be measured and paid for at the Contract unit price per each. The payment will be full compensation for all lumber, rope, natural fiber matting, snow fence, incidental materials, removal and stockpiling of material following project completion, labor, equipment, tools, and incidentals necessary to complete the work. All maintenance of the heavy tree protection shall be the sole responsibility of the Contractor.

END OF SECTION

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**CATEGORY 300
DRAINAGE**

TIMBER MAT ACCESS PATH

DESCRIPTION

Timber mat access path is to be used to supplement Mulch Access Path in sensitive areas to protect against compaction.

MATERIALS

- (a) Wood Chip Mulch.** Wood chips shall be either hardwood or softwood chips, produced by a chipping machine to a size acceptable to the Engineer. Chips shall not have been subjected to any conditions that would shorten their life or cause them to lose any of their value as mulch. Wood chips shall be free from leaves, twigs, wood shavings, sawdust, toxic substances, and any foreign materials.

The Contractor will locate potential sources for the wood chips. The Contractor will not be granted an extension of time or extra compensation due to delay caused by sampling, testing, approval or disapproval of material under the requirements of these specifications.

Shredded hard wood mulch from off-site should be mixed with existing wood chips to ensure the wood chips do not suppress seeding and hinder growth.

- (b) Geotextile Class SE (Nonwoven).** Refer to Section 921 -Miscellaneous - Geotextile.

- (c) Natural Fiber Matting.** Refer to Section 709 – Soil Stabilization Matting.

- (d) Timber Matting.** Minimum 6” Thick 3-Ply Hardwood Laminated/Construction Mat or Equivalent

- (e) High Visibility Fence.** Refer to Section 111 – Temporary Orange Safety Fence.

CONSTRUCTION

Timber mats are to be utilized within existing wetland boundary limits and critical route zones. If the contractor intends to use any equipment with higher loads, the contractor would be responsible to select appropriate size/strength of timber matting based on equipment to be used, and must be approved by the project engineer prior to implementation. Access routes for the timber matting to be verified by the project engineer at the pre-construction meeting. Revisions to the alignment that minimize tree disturbance are encouraged and require review and approval

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by the Engineer. Timber mat access is to be maintained in working condition throughout the construction period. Timber mats are to be installed continuously without gaps for the length of the Timber Mat Access delineation.

MEASUREMENT AND PAYMENT

Payment will be full compensation for all materials, excavation, and installation of timber mat access path, inclusive of all wood chips, geotextile or soil stabilization matting, timber mats, labor, equipment, tools, and incidentals necessary to complete the work as specified in these special provisions and on the plans.

Timber Mat Access Path is measured and paid for at the Contract unit price per square yard.

END OF SECTION

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**CATEGORY 300
DRAINAGE**

SECTION 308 – EROSION AND SEDIMENT CONTROL

308.01 DESCRIPTION

ADD: The following at the end of the first paragraph.

Erosion and sediment control will consist of the installation, maintenance, and removal of all sediment control devices shown on the Construction Documents, as required by the County or sediment control inspector. Detailed construction requirements and specifications for specific erosion and sediment control devices are shown on the Construction Plans. These requirements are in addition to the requirements of Section 308 of the MDOT SHA Standard Specifications and these specifications.

All erosion and sediment controls are to be inspected daily to ensure that the controls meet the project specifications.

It is the responsibility of the Contractor to monitor any mud and surface debris accumulation beyond the limit of disturbance, and to perform daily cleanup of mud and surface debris accumulation.

All perimeter controls and erosion and sediment control structures and devices must be maintained throughout the duration of the project, conforming to the detailed sequence of construction, or as directed by the Engineer and/or sediment control inspector. Sediment control devices are to remain in place until all disturbed areas are stabilized in accordance with the approved erosion and sediment control plan and after the inspecting authority has approved their removal.

Maintenance of Stream Flow consists of maintaining and diverting stream flow and storm drain flow, and installing flow diversion devices for the purpose of isolating work areas when construction activities take place within the stream channel,

As regulated by the State of Maryland permit conditions, it is imperative that no sediment leaves the active construction site. All sediment and erosion control measures will be strictly enforced by Harford County. The Contractor is advised to carefully consider access to the work area based on overhead utilities, storm drain outfalls, and structures/grading proposed to the given area.

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308.03 CONSTRUCTION.

ADD: The following as the first paragraph.

Erosion and sediment control shall be performed in accordance with 1) the Maryland Standards and Specifications for Soil Erosion and Sediment Control (2011), as published by the Maryland Department of the Environment, Soil Conservation Service and State Conservation Committee, 2) Maryland's Guidelines for Waterway Construction, as published by the Water Resources Administration, 3) in accordance with Section 308 of the MDOT SHA Standard Specifications, 4) as described in the Contract Drawings/Specifications, and 5) as specified by the Engineer.

DELETE: Section 308.03.42 in its entirety.

INSERT: The following:

308.03.42 Maintenance of Stream Flow.

- (a) Main a continuous flow and operation of all waterways, channels and storm drains while minimizing the discharge of sediment to any watercourse. Dewatering of excavation areas directly into the stream is prohibited. Maintenance of Stream Flow measures shall be maintained throughout the duration of the work to the Engineer's satisfaction. Any discharge of sediment resulting from the Contractor's construction shall be remedied to the satisfaction of the Engineer at the Contractor's expense.
- (b) The plans include details and sequencing for maintaining channel flow during construction.
- (c) Utilize sandbags, pumps, sump pits, hoses, energy dissipaters, diversion pipes, dewatering methods, and other approved means to divert flow around the work area, dewater work areas, and control discharges of sediment to receiving waters.
- (d) The height of the dewatering dams are one half of the distance from streambed to the top of the streambank, plus one foot. Overlap sheeting such that the overlying portion covers the underlying portion with at least an 18-inch overlap.
- (e) Remove controls upon completion of the work, after the drainage devices have served their purposes, and with the inspector's approval. Removal and disposal are to be done in compliance with erosion and sediment control and waste disposal requirements of the City of Aberdeen and Harford County Code.

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308.04 MEASUREMENT AND PAYMENT. Erosion and Sediment control will be measured and paid for at the Contract unit price for one or more of the items listed below. Payments for all items will be full compensation for the installation, maintenance, and removal of all erosion and sediment control measures shown on the Contract Drawings, including all materials, labor, equipment, tools, and incidentals necessary to complete the work.

308.04.56 Temporary Access Bridge is measured and paid for at the contract unit price per each.

308.04.08 Stabilized Construction Entrance (SCE) is measured and paid for at the Contract unit price per each and includes all excavation, geotextile, and incidentals to complete the work.

Rehabilitation of Stabilized Construction Entrance. Rehabilitation of Stabilized Construction Entrance is measured and paid for at the Contract unit price per each.

308.04.36 Super Silt Fence is measured and paid for at the Contract unit price per linear foot. Removal, maintenance, and resetting of super silt fence will not be measured but will be incidental to contract unit price for super silt fence.

308.04.53. Filter Bags will be measured and paid for at the contract unit price per each and will include pumps, hoses, connections, straw bales, sizing, locating, disposal or any other incidentals necessary. No adjustments will be made for resizing or relocating to meet Permit conditions.

DELETE: Section 308.04.62 in its entirety.

INSERT: The following:

308.04.62 Maintenance of Stream Flow will not be measured but paid for at the Contract unit price lump sum. The payment will be full compensation for polyethylene sheeting, sandbags, sediment filter bag, excavation and clean-out of dewatering basins, pumps, geotextile, hoses, energy dissipaters for hose outfalls, and all other materials, labor, equipment, tools and incidentals necessary to complete the work. Payment for all work under this item will be made at the lump sum price bid on a prorated basis over the duration of the contract.

END OF SECTION

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**CATEGORY 400
STRUCTURES**

BRUSH / COBBLE RIFFLE (BCR) WITH GRADE CONTROL

DESCRIPTION

Install brush/cobble riffles with grade controls, which are graded aggregate and wood structures designed to improve habitat and provide grade control.

MATERIALS

- (a) Bed Mix.** Refer to Special Provision 900 – Bed Mix (Type Gravel, 0, I, I No Brush, or II).
- (b) Boulders.** Refer to Special Provision 900 – Select Boulders
- (c) Class 0/I Mix.** Class 0 riprap (D50 of 4” and D100 of 8.5”) and Class I riprap (D50 of 9” and D100 of 16”) is a 50/50 mix.
- (d) Duckbill Anchors.** Duckbill earth anchor model 138 or equivalent with galvanized cables 5/16” diameter by 60” long linked with galvanized, stainless steel, alloy bolt type shackle with working load limit of 10,000 lbs minimum.
- (e) Geotextile Class SE (Nonwoven).** 919.01.
- (f) Live Stakes.** Refer to Special Provision 700 – Live Stake
- (g) Permanent Seed** Refer to Special Provision 700 – Permanent Seed
- (h) Logs.** Logs must meet the specifications noted on the Contract Documents on DE-03.
- (i) Suitable Backfill.** Refer Special Provision 900 – Suitable Backfill
- (j) Channel Sand and Gravel.** Refer Special Provision 900 – Channel Sand & Gravel.
- (k) Natural Fiber Matting.** Refer to Section 709 – Soil Stabilization Matting.
- (l) Matting Stakes or Dead Stakes.** Refer to Section 709 – Soil Stabilization Matting.
- (m) Topsoil.** 920.01

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CONSTRUCTION

Installation of the Brush/Cobble Riffle with GCE shall conform to the dimensions, grades, and details specified in the Contract Documents. Limit the total length of work to that which can be completed and stabilized in a single workday or dry weather period. Surface elevations, widths, and slopes of the brush/cobble riffle structures shall conform to the design stream profiles and cross-sections specified in the Contract Documents within a +/- 0.2 foot tolerance vertically and 0.3 foot tolerance horizontally, unless directed otherwise and approved by the Engineer. Placed material not conforming to the specified limits shall be removed and replaced as directed by the Engineer at no additional cost to the County.

Establish proper subgrade elevations allowing for placement of bed mix and Grade Control Elements (GCEs) and Key-Ins, using suitable backfill placed in lifts and compacted with the excavator bucket.

Stake the Natural Fiber Matting for the channel banks to secure along the channel bed at the toe of slopes. Place the geotextile along the subgrade sufficient to wrap the GCEs.

Install the GCE, ensuring the geotextile is wrapped along the upstream face, and voids are filled.

Boulder GCEs shall be placed so that downstream face of the center 'top' boulder is placed at the point of curvature (PC) with the boulders spanning across the rest of the channel angled slightly downstream creating a minor 'V' shape. Boulders used to key into the channel banks and in situ material are to be placed perpendicular to the channel. Footer boulders shall be a offset slightly downstream of the top boulders.

Log GCEs shall be placed perpendicular to the channel and key into the channel banks and in-situ material. The elevation of the header log shall be set to the elevation of the toe of bank. A notch shall be cut into the log between the toe of bank to ensure the center of the log meets the invert specified on the Contract Documents. Header and Footer logs shall be tied together with duckbill anchors at a minimum horizontal distance of the top of bank.

Complete the placement of all Bed Mix Material to its full depth for the entire length of the Brush/Cobble Riffle as illustrated on the Contract Drawings. Bed Mix Material shall be placed in a manner that shingles the stone in a downstream direction and not dumped to achieve final grade. Larger particles must be placed the full depth of the structure with smaller particles placed around the larger particles to promote interlocking and sealing of the structure. Major limbs used as brush material shall be oriented downstream to reduce snagging. Bed Mix except for Type II shall extend from toe of bank to toe of bank. The toe of bank to top of bank shall be graded with suitable backfill material and live stakes placed between the toe of bank and top of bank.

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Where Bed Mix Type II is specified, the bed mix material shall extend between top of banks and no live stakes shall be utilized.

Large voids shall be filled as needed using Bed Mix Material first followed by Channel Sand and Gravel material throughout installation until all voids are filled. After Bed Mix Material is placed to the specified depth and elevation specified on the Contract Documents and all large voids have been filled, place approximately 2 inches of additional Channel Sand and Gravel on top of the Bed Mix Material and *wash in using a pump and hose to spray the material, forcing the material into the exposed void space*. It is expected that the wash in will force material to an approximate depth of 0.5 feet into the structure. No excess Channel Sand and Gravel shall be sitting on top of the Bed Mix Material after wash in operations. Channel Sand and Gravel shall not be placed on the Bed Mix Material and allowed to “naturally” wash in.

MEASUREMENT AND PAYMENT

Payment will be full compensation for all excavation, boulders, bed mix, logs, suitable backfill, compaction, disposal of excess material, and for all labor, equipment, tools, and incidentals necessary to complete the work.

Subgrade excavation required for placement of GCEs and bed mix shall not be measured but considered incidental to Class 5 Excavation.

Channel Sand and Gravel for washin shall not be measured but considered incidental to Brush/Cobble Riffle.

Bed Mix Type Gravel, 0, Type I, and Type II shall be measured and paid for per square yard of each respective mix type.

Furnished Borrow will be paid for per cubic yard as specified in Section 200 – Borrow Excavation.

Salvaged Suitable Backfill will not be measured, but considered incidental to Class 5 Excavation.

Boulder Type I GCE, Boulder Type II GCE, Imbricated GCE, and Log GCE shall be measured and paid for per each respective type GCE. Boulders Type I, Type II, Imbricated, and Logs used within GCEs shall not be measured but considered incidental to the respective GCE.

Key-in of Boulder Type I, Boulder Type II, Imbricated Boulders, and Header Logs shall be measured from the toe of bank to the end of the keyin feature as illustrated in the Contract Drawings and paid for per linear foot of each respective type of Key-In.

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Geotextile Class SE (Nonwoven) shall not be measured but considered incidental to the respective type of GCE.

Natural Fiber Matting/Matting Stakes shall be measured and paid for per square yard of Natural Fiber Matting for the finished ground area covered.

Live stakes shall be measured and paid for per each live stake.

Permanent Seed (Forested Wetland and Livestake Zones) will be measured and paid for per LB.

Class 0/I shall not be measured but considered incidental to the GCE.

Placing Furnished Topsoil will be measured and paid for by square yard.

Placing Salvaged Topsoil will be measured and paid for by square yard.

END OF SECTION

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**CATEGORY 400
STRUCTURES**

FLOODPLAIN LOG SILL

DESCRIPTION

This work shall consist of installing floodplain log sills, which are buried logs installed in the floodplain perpendicular to the channel and floodplain flow, as specified in the Contract Documents or as directed by the Engineer.

MATERIALS

Logs. A minimum diameter of 10 in and a minimum length of 15 ft.

Duckbill Anchors. Duckbill earth anchor model 138 or equivalent with galvanized cables 5/16" diameter by 60" long linked with galvanized, stainless steel, alloy bolt type shackle with working load limit of 10,000 lbs minimum.

Suitable Backfill. Refer to Special Provision 900 – Suitable Backfill.

Topsoil. 920.01

CONSTRUCTION

Excavate a trench to obtain the necessary sub-grade for the floodplain log sills. Compact suitable backfill in lifts with excavator bucket to reach the sub-grade elevation when the floodplain log sills are in fill. Overlap the logs a minimum of 2 ft and secure each log in its place with two duckbill anchors. Placement of floodplain log sills may be adjusted to minimize disturbance to mature trees as directed by the Engineer.

MEASUREMENT AND PAYMENT

Payment will be full compensation for all excavation, logs, suitable backfill, duckbill anchors, compaction, disposal of excess material, and for all labor, equipment, tools, and incidentals necessary to complete the work. Floodplain Log Sills are paid for by the unit price per linear foot, not accounting for overlap between logs.

Placing Furnished Topsoil will be measured and paid for by square yard.

Placing Salvaged Topsoil will be measured and paid for by square yard.

Furnished Borrow will be paid for per cubic yard as specified in Section 200 – Borrow Excavation.

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Salvaged Suitable Backfill will not be measured, but considered incidental to Class 5 Excavation.

END OF SECTION

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**CATEGORY 400
STRUCTURES**

ROCK LINED POOL WITH DOWNSTREAM SILL

DESCRIPTION

This item includes subgrade preparation, placement of Class II Riprap within the pool, and an imbricated sill (GCE) at the downstream end of the pool.

MATERIALS

- (a) Class II Riprap.** Per MDOT SHA Standard 901.02
- (b) Suitable Backfill.** Refer to Special Provision 900 – Suitable Backfill.
- (c) Bed Mix.** Refer to Special Provision 900 – Bed Mix
- (d) Boulders.** Refer to Special Provision 900 - Select Boulders, Imbricated.
- (e) Geotextile Class SE (Nonwoven).** Refer to Section 921.09, Nonwoven.

CONSTRUCTION

Excavate a section of the existing stream channel and associated banks to obtain the necessary sub-grade and width. Use suitable backfill placed in lifts and compacted with the excavator bucket when working in an area of fill. The subgrade should be smooth, firm, and free from brush, trees, stumps and protruding objects or voids that would affect proper positioning of the bed mix.

Place geotextile at the proposed location of the footer boulder of the Imbricated Sill, with enough material to wrap up the footer boulder and crest boulder on the upstream side of the crest. Once the footer boulder has been properly situated on top of the geotextile, the crest boulder shall be placed on top ensuring they are shingled and interlocking to achieve dimensions and layout specified on Contract Drawings. The Contractor shall survey the elevation of the crest boulder and reset if necessary until the appropriate elevation as detailed in the Contract Drawings is obtained within a +/- 0.3 foot tolerance. All voids between the footer and crest boulders must be chinked with Bed Mix. All geotextile shall be trimmed to the height described above prior to placement of Class II Riprap within the pools.

Refer to DE-04 and Brush Cobble Riffle with Grade Control Element Special Provision for Sill details.

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Place Class II Riprap to meet dimensions and grades as shown on the Contract Drawings. Fill gaps with suitably sized Bed Mix until all gaps are filled. Suitable backfill may be used to fill voids that Bed Mix is too large to fill.

MEASUREMENT AND PAYMENT

Payment will be full compensation for excavation, preparation of surfaces, loading, hauling, placing, supplying and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

Bed Mix, Geotextile, and Suitable Backfill Material used for filling voids is not measured, but will be considered incidental to Rock Lined Pool.

Downstream Sill shall be measured and paid for per each of the Imbricated GCE. Imbricated used within GCE shall not be measured but considered incidental to the GCE.

Key-in of Imbricated Boulders shall be measured from the toe of bank to the end of the key-in feature as illustrated in the Contract Drawings and paid for per linear foot of Imbricated Key-In.

Geotextile Class SE (Nonwoven) shall not be measured but considered incidental to the Imbricated GCE.

END OF SECTION

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**2CATEGORY 400
STRUCTURES**

TOE BOULDERS

DESCRIPTION

Toe Boulders are structures placed along the outer bends of pools (between PC and PT looking downstream) to provide stability to erodible stream banks.

MATERIALS

- (a) Bed Mix.** Refer to Special Provision 900 – Bed Mix.
- (b) Geotextile Class SE (Nonwoven).** 921.09
- (c) Live Stakes.** Refer to Special Provision 700 – Live Stakes
- (d) Permanent Seed.** Refer to Special Provision 700 - Permanent Seeding.
- (e) Natural Fiber Matting.** Refer to Special Provision 709 – Soil Stabilization Matting.
- (f) Suitable Backfill.** Refer to Special Provision 900 – Suitable Backfill.
- (g) Boulders.** Refer to Special Provision 900 – Select Boulder.
- (h) Topsoil.** 920.01

CONSTRUCTION

Excavate for placement of toe boulders along the streambank in areas where Toe Boulder structures will be installed. Final excavation of subgrade must be smooth and firm, free of brush, trees, and stumps, compacted, and constructed in a manner acceptable to the Engineer.

Place the Geotextile SE on top of the natural fiber matting and lowest layer of Toe Boulders and on the prepared subgrade with the adjacent edges overlapping at least 2 feet. Ensure boulders have at least 3 points of contact to adjacent boulders to ensure stability. Cut the Geotextile SE flush with the top boulder.

Place toe boulder in an interlocking fashion with overlapping boulders so that gaps are avoided and there are no pockets of undersized material. Chink remaining voids in toe boulder with Bed Mix material using the largest particle size that can be used to fill the void. Suitable backfill material may be used when Bed Mix material is too large to fill a gap.

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Upon completion of the Toe Boulder installation, secure the natural fiber matting between the bottom and top toe boulder. Fold the matting over the toe boulders, such that the outer face of the matting is facing down towards the channel bed. Place Suitable Backfill Material to form a lift with the slope including the 6 inch layer of topsoil. Apply necessary Permanent Seeding, then flip the matting to wrap around and on top of the placed Backfill Material.

MEASUREMENT AND PAYMENT

Payment for Toe Boulders will be measured and paid for by Linear Foot (LF). Payment includes all excavation, boulders, backfill, compaction, placement and repositioning of boulders, disposal of excess material, natural fiber matting, Geotextile SE, and for all labor, equipment, tools, and incidentals necessary to complete the work.

Furnished Borrow will be paid for per cubic yard as specified in Section 200 – Borrow Excavation.

Salvaged Suitable Backfill will not be measured, but considered incidental to Class 5 Excavation.

Bed Mix and Suitable Backfill Material used for filling voids is not measured, but will be considered incidental to Toe Boulders.

Live Stakes will be measured and paid for by the unit cost per EA

Permanent Seed (Forested Wetland and Livestake Zones) will be measured and paid by the unit cost per LB.

Reinforced Natural Fiber Matting/Matting Stakes shall not be measured but considered incidental to Toe Boulder.

Natural Fiber Matting/Matting Stakes shall be measured and paid for per square yard of Natural Fiber Matting for the finished ground area covered.

Placing Furnished Topsoil will be measured and paid for by square yard.

Placing Salvaged Topsoil will be measured and paid for by square yard.

Geotextile Class SE (Nonwoven) shall not be measured but considered incidental to Toe Boulder.

END OF SECTION

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**CATEGORY 400
STRUCTURES**

WOODY DEBRIS PLUG

DESCRIPTION

Woody Debris Plug includes the selection and placement of salvaged woody debris within the filled portions of the existing channel.

MATERIALS

- (a) **Suitable Backfill.** Refer to Special Provisions 900 – Suitable Backfill.
- (b) **Topsoil.** 920.01.
- (c) **Woody Debris.** Woody Debris includes salvaged trees with rootwads approximately 10 to 20 feet in length with a diameter of 10 to 20 inches. Final log selection will be made after clearing and grubbing prior to any debris removal from site.

CONSTRUCTION

During the filling of existing channel in the areas specified in the Contract Documents, Woody Debris will be incorporated into the filled channel. Once rough fill grades are achieved, selected Woody Debris will be placed across the former channel, with the dominant orientation being roughly perpendicular to the former lines of flow. The length of the Woody Debris should extend to the former top of banks, at a minimum. A minimum of two large trunks with rootwads shall be necessary to promote interlocking of the Woody Debris.

After Woody Debris has been selected and roughly placed in planview, according to the Contract Documents or as directed by the Engineer, the individual pieces shall be displaced vertically to depress the trunk and rootwad. The Woody Debris shall be buried a maximum of 4 feet below the surface.

Backfill material shall be placed and compacted around the woody debris to final grades as shown on the Contract Drawings, allowing for 6" of topsoil. Rootwads or branches may be exposed, but trunks shall generally remain at or below the final grade. Branches on tree tops can also be trimmed for ease of placement.

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MEASUREMENT AND PAYMENT

The payment will be full compensation for the preparation of surfaces, loading, hauling, placing, and supplying and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

Woody Debris Plugs shall be measured and paid for at the Contract unit price per each location.

Woody Debris Material will not be measured but considered incidental to the installation of Woody Debris Plug.

Subgrade excavation required for placement of material shall not be measured, but will be considered incidental to the Woody Debris Plug.

Suitable backfill shall not be measured but shall be incidental to Woody Debris Plug.

Placing Furnished Topsoil will be measured and paid for by square yard.

Placing Salvaged Topsoil will be measured and paid for by square yard.

END OF SECTION

UNNAMED TRIBUTARY TO CARSINS RUN AT SUMMERLIN (SR-2)
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**CATEGORY 400
STRUCTURES**

WOODY TOE PROTECTION

DESCRIPTION

Work consists of placing woody material along the stream bank to protect against erosion.

MATERIALS

- (a) Woody Debris Material.** Woody Debris includes salvages trees with rootwads – approximately 10 to 20 feet in length with a diameter of 10 to 12 inches. Final log selection will be made at the time of construction.
- (b) Foundation Logs.** Foundation Logs consists of 12 inch min. diameter hardwood tree trunks cut to 10 to 15 feet in length and salvaged from Clearing and Grubbing activities.
- (c) Reinforced Natural Fiber Matting.** Refer Special Provision 900 – Reinforced Natural Fiber Matting.
- (d) Natural Fiber Matting.** Refer to Section 709 – Soil Stabilization Matting.
- (e) Live Stakes.** Refer to Special Provisions 700 – Live Stakes.
- (f) Permanent Seed.** Refer to Special Provision 700 - Permanent Seeding.
- (g) Suitable Backfill.** Refer to Special Provision 900 – Suitable Backfill.
- (h) Topsoil.** 920.01

CONSTRUCTION

Woody Toe Protection consists of a base of Foundations Logs oriented slightly downstream approximately 30-degrees from tangent to the baseline. The Foundation Logs should cover a broad area so the perpendicularly placed Woody Debris Material layers are fully supported. Place Foundation Logs so the top of the log is approximately equal in elevation to the toe of the bank, based on the cross section at that location, and spaced as needed to support the woody layers and soil lifts After the Foundation Logs are in place, fill any gaps with Suitable Backfill between the excavated bank and the Foundation Logs. The Foundation Logs and soil should create a level surface on which to build the woody toe bank.

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After the Foundation Logs are installed and stabilized with backfill, the Woody Debris Material can be installed. This consists of layers of neatly stacked 2-8-inch diameter Woody Debris Material and backfill. The layers begin at the stable Foundation Logs and extends 1 to 1.5 feet above the toe of bank as shown on the Contract Documents. The Woody Debris Material shall protrude from the bank no more than 3 inches, but this distance of protrusion shall be achieved with a gradual taper at the up- and down-stream extents of the Woody Toe Protection placement. Woody Debris Material shall be installed in 6 to 10 inch lifts. Suitable backfill material shall then be deposited over the Woody Debris Material such that it settles between the branches. The backfill should continue to be deposited over the Woody Debris Material until there is no more settling between the Woody Debris Material and it begins to pile above the branches. Additional layers of Woody Debris Material and backfill should be continued until the height noted in the Contract Drawings is achieved. Orient all butt ends toward the stream and ensure that the size of all material is well-mixed in order to minimize gaps between individual branches/limbs and create the intended effect of a unified structure. Further ensure the minimization of gaps/voids by gently compressing the Woody Debris Material at regular intervals, without breaking the material, as the structure height is gradually increased to meet the top elevation.

Upon completion of the Woody Material installation place Reinforced Natural Fiber Matting on top of the Woody Material, such that the outer face of the matting is facing down towards the channel bed. The matting shall be placed in a manner that will allow for a minimum of 3 feet of matting to be keyed in under the soil lift. The matting should be secured to the Woody Debris and backfill material with dead hardwood stakes, placed every 2 feet. Backfill material shall be placed to a height specified on the Contract Documents. Natural Fiber Matting shall be installed on top of the Reinforced Natural Fiber Matting in a similar manor to the height specified on the Contract Documents and formed to achieve the slopes and finished grades as shown on the Contract Documents within ± 0.3 feet vertically of the specified top of bank elevation. Apply necessary seeding and topsoil per the Contract Documents, then flip the matting to wrap around and on top of the placed backfill material.

After all Woody Toe Protection have been placed, the Contractor shall plant live stakes. Live Stakes shall be planted in accordance with the Contract Documents.

MEASUREMENT AND PAYMENT

Payment shall be in full compensation for all Foundation Logs, Woody Debris Material, other materials, excavation, installation, and resetting of materials, and for all labor, equipment, tools, and incidentals necessary to complete the work as specified in the Contract Documents.

Woody Toe Protection shall be measured and paid for at the Contract unit price per linear foot. The length is measured along the outer bank as shown on DE-01 structure table of the contract documents.

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Live Stakes shall be measured and paid for as specified in Section 700.02 – Live Stakes.

Permanent Seed (Forested Wetland and Livestake Zones) will be measured and paid for per LB.

Reinforced Natural Fiber Matting/Matting Stakes shall not be measured but considered incidental to Toe Boulder.

Natural Fiber Matting/Matting Stakes shall be measured and paid for per square yard of Natural Fiber Matting for the finished ground area covered.

Placing Furnished Topsoil will be measured and paid for by square yard.

Placing Salvaged Topsoil will be measured and paid for by square yard.

Furnished Borrow will be paid for per cubic yard as specified in Section 200 – Borrow Excavation.

Salvaged Suitable Backfill will not be measured, but considered incidental to Class 5 Excavation.

END OF SECTION

UNNAMED TRIBUTARY TO CARSINS RUN AT SUMMERLIN (SR-2)
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**CATEGORY 700
LANDSCAPING**

INVASIVE SPECIES TREATMENT

DESCRIPTION

The Contractor shall treat all areas of invasive species. The Contractor shall identify invasive species at the site and propose treatment to the Engineer for approval prior to commencing operations.

MATERIALS

Herbicide	As Approved
Surfactant	As Approved
Adjuvant	As Approved
Marking Dye	920.09.04
Basal Oil	As Approved

Herbicide. The Contractor shall apply a glyphosate-based or other selective broadleaf herbicide approved for use in aquatic habitats as directed by the product label. Herbicide shall be approved by the City prior to application.

Surfactant. The Contractor shall use a soy oil-derived, non-ionic surfactant at a rate of 1% in combination with the herbicide as directed by the product label. Surfactant shall be approved by the City prior to application.

Adjuvant. The Contractor shall apply adjuvants as directed by the City in conformance with label instructions.

CONSTRUCTION

Invasive species are considered undesirable plants within the project site and any invasive species growing within the planting area shall be treated. During the growing season following installation, the Contractor shall notify the City representative and will inspect the site to determine if weed control is acceptable.

The applicator must be an MDA certified applicator with Category 5 (aquatic) and Category 6 (right of way). Weeds shall be treated following label directions in accordance with all legal requirements including posting and notifications as appropriate. The Contractor shall be responsible for replacing (or overseeding as appropriate) any non-target plant material that is killed or damaged by the Contractor in controlling weeds on the project. The Contractor shall be responsible for replacing and

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pruning any Live Stakes which are killed or excessively damaged by the Contractor in controlling weeds on the project. Chemical application of the approved herbicide with surfactant shall occur when ambient air temperature is above 65 degrees Fahrenheit but below 85 degrees Fahrenheit. Wind should be less than 8mph and 12 hours of dry time should be anticipated. Prior to application, the applicator shall mix the specified herbicide and surfactant according to the product's label.

Woody Invasive Species Treatment. Invasive shrubs may include, but not be limited to multiflora rose, oriental bittersweet, winter creeper, Japanese honeysuckle, Japanese barberry, wineberry, privet, tree of heaven, and English ivy. Small shrubs and vines can be manually removed if possible, carefully removing the entire root. All woody invasive species can receive the following treatments.

The basal bark herbicide applications shall be made using a low pressure backpack sprayer to thoroughly wet the lower 12 to 15 inches of the entire stem, root collar area, and any exposed roots. Use Triclopyr (ester) at 20-30% in basal oil. This can be done year round as long as no snow/ice or water prevent spraying to ground.

Cut stem is a recommended method when native, non-target species are mixed in with invasive plants, or when shrubs will be cut due to other restoration activities. This technique is most effective during the growing season, with diminishing success through early fall. Stems are cut near ground level and immediately treated with 25% glyphosate with water or 20% triclopyr with 80% basal oil.

Foliar spraying of leaves and sprouts is also an option when there is minimal risk to non-target species and when infestations are large. Late fall and early spring are the best time of year for treatment as long as the ambient air temperature meets the requirements specified. Wind should be less than 8mph and 12 hours of dry time should be anticipated. A solution of 2% glyphosate or triclopyr plus 0.5% non-ionic surfactant if the herbicide does not already contain surfactant should be applied in a low pressure spray. Treat only the exposed area and the entire surface area of the plant. Avoid excessive application at the soil line. Treat the entire plant down to the soil line.

Herbaceous Invasive Species Treatment. Herbaceous invasive species may include, but not be limited to Japanese stiltgrass, mile-a-minute, garlic mustard, Indian strawberry, and Japanese pachysandra. These species are best treated with foliar methods when infestations are large and non-target species are minimal. Generally a 1-2% glyphosate mixed with water and a non-ionic surfactant is used.

MEASUREMENT AND PAYMENT

Invasive Species Treatment shall be paid for at the Contract lump sum price. The payment will be full compensation for application, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

END OF SECTION

UNNAMED TRIBUTARY TO WHITE MARSH RUN AT UPTON ROAD
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**CATEGORY 700
LANDSCAPING**

SECTION 300 – LIVE FENCE

MATERIALS.

(a) Live Fencing. Live fencing materials shall be dormant branches of *Cornus sericea* (Red Osier Dogwood), *Cornus racemosa* (Gray Dogwood), *Cornus amomum* (Silky Dogwood), *Salix lucida* (Shining Willow), *Salix sericea* (Silky Willow), *Salix discolor* (Pussy Willow), and *Salix interior* (Sandbar Willow). Materials shall be purchased from a nursery specializing in the production of similar materials and shall include confirmation of species. Live fencing material shall measure 0.5 to 2.5 inches diameter at its smallest point, and 5 to 6 feet in length.

(b) Topsoil.

920.01.01 or 920.01.02

CONSTRUCTION.

Live fencing materials shall be transported in climate-controlled conditions to ensure against temperatures greater than 50°F. Live fencing materials stored on site shall be kept moist, shaded, and protected against desiccation. Materials stored offsite shall be refrigerated and kept moist. In no case shall non-refrigerated materials be stored longer than five (5) days.

During installation, live fencing materials shall be kept damp by covering with wet burlap or heeling into moist mulch until ready for use. Live fencing materials shall be inspected for signs of desiccation including any blackening of cut ends and lengthwise wrinkling of bark, and unsuitable materials shall be discarded.

The Contractor shall remove all side branches from all live fencing materials, cleanly and without causing damage to bark. Buds shall be oriented toward the top of each stake. Within two (2) hours prior to installation, using pruning shears or a power saw, the Contractor shall cut each stake at an angle on the bottom end of approximately 45 degrees.

Submittals and Inspection.

Live fencing materials shall be installed as shown on the plans and details. The Contractor shall prepare a trench 3 to 4 feet in depth and 1.5 to 2 feet in width. Live fencing materials shall be placed to full depth of trench, observing correct diameter spacing required for each cutting. Topsoil shall be placed back into the trench to a thickness of approximately 1 foot. The remainder of the trench shall then be backfilled with excavated material according to the Contract Documents. The Contractor shall firmly backfill by hand, all voids within the trench

UNNAMED TRIBUTARY TO WHITE MARSH RUN AT UPTON ROAD
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surrounding all cuttings, hand tamping the soil tightly against each cutting without scarring the cutting. Immediately after installation, the site shall be watered lightly but thoroughly so that the top four (4) inches of soil is saturated

The Contractor shall maintain a minimum 85% survival rate, without areas of complete die off, of Live Fencing specified in the Contract Documents for one year after final inspection. This shall include necessary care and replacement to achieve the required survival rate.

MEASUREMENT AND PAYMENT.

Live Fence will be measured and paid for at the Contract unit price per linear foot. The payment will be full compensation for all excavation, grading, transportation, preparation, and suitable backfill, compaction, and disposal of excess material, and for all material, labor, equipment, tools, and incidentals necessary to complete the work, including cuttings.

Placing Furnished Topsoil will be measured and paid for by square yard.

Placing Salvaged Topsoil will be measured and paid for by square yard.

END OF SECTION

UNNAMED TRIBUTARY TO CARSINS RUN AT SUMMERLIN (SR-2)
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**CATEGORY 700
LANDSCAPING**

LIVE STAKES

DESCRIPTION

Furnish and install Live Stakes to provide vegetated stream bank protection.

MATERIALS

Live Stakes. Live Stakes are freshly cut, dormant branches consisting of the species listed within the Master Plant Schedule. The cuttings may be obtained from a landscape nursery that specializes in production of bioengineering plant materials, with prior approval of the source by the Engineer.

CONSTRUCTION

Live Material Handling. Bundle and cover cut Live Stakes with a tarpaulin during transport. Bundles should not be transported in an unheated portion of the vehicle to prevent desiccation and stress. Keep bundles moist by wrapping with a wet cloth material or wet paper towel. Make sure cut side of stem is full covered by the wet wrap. Until installed, Live Stakes must be kept refrigerated (below 40°) and moist to prevent pre-mature budding and desiccation. Live stakes shall be properly prepared to the correct size and cutting angle prior to planting.

Live Stake Installation. Install Live Stakes into the ground with a dead blow hammer, if needed, with the budding side facing upwards at perpendicular with the streambank. For hard packed or sealed soil, hammer a ½ rebar into the soil and remove to provide a pilot hole for aid in placing the Live Stake. Install so that at least 2/3 the length of the Live Stake is within the soil. Trim or replace any Live Stake that is damaged during installation.

Landscape Inspection. Inspection of installed Live Stakes will be within two weeks of written notification from the Contractor that the staking operation is complete.

Maintenance. Maintain all Live Stakes in conformance with the original specifications.

Removal and Replacement. Inspection of the Live Stakes will occur in the fall season, prior to leaf-drop. The Contractor is responsible for the removal and replacement of Live Stakes to meet 85% stem survivability success rate, as determined by the City representative.

(a) If needed replacement of Live Stakes will occur as outlined above.

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MEASUREMENT AND PAYMENT

Live Stakes will be measured and paid for at the contract unit price per each (EA) Live Stake installed. Payment will be full compensation for furnishing, handling, preparation, transport, storage, installation, removal and replacement, and for all materials, labor, equipment, tools and incidents necessary to complete the work.

END OF SECTION

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**CATEGORY 700
LANDSCAPING**

SECTION 709 – SOIL STABILIZATION MATTING

709.01 DESCRIPTION

INSERT: As the first sentence of the first paragraph, “Soil Stabilization Matting shall be considered the same as Natural Fiber Matting.”

709.02 MATERIALS

DELETE: Soil Stabilization Matting (SSM) 920.05.02

(a) **INSERT:** **Natural Fiber Matting.** Matting for the bank treatment areas shall consist of a machine produced mat of degradable natural fibers and shall meet the following *minimum* specifications:

Material:	Woven coir fiber yarn or twine
Thickness:	0.25 in.
Elongation (Dry/Wet):	29%/35%
Weight:	20 oz/SY
Open Area:	50%
Size:	6 ft. wide X 150 ft in length (100 SY per roll)
Flow Velocity:	8 ft./sec.
Life Expectancy:	3 years

DELETE: Fasteners 920.05.02

INSERT: Fasteners (Matting Stakes). Stakes for securing the matting along other portions of the matting material above the toe trench and for the key-in trench at the top of the slope shall consist of 1 ½” X 1 ½” hardwood stakes, 18-inches in length, tapered at the bottom end for easy insertion into the soil and flat at the top end for hammering.

709.03 CONSTRUCTION

INSERT: As the first sentence, “Refer to the Contract Documents for proper installation method.”

END OF SECTION

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**CATEGORY 700
LANDSCAPING**

**SECTION 710 – TREE, SHRUB, AND PERENNIAL INSTALLATION AND
ESTABLISHMENT**

710.02 MATERIALS.

ADD: Plant materials shall conform to 920.07 with the following clarifications:

All Trees, Shrubs, and Perennials will have at a minimum one branched growth at the time of planting. The plant species shown in the Contract Drawings may be unavailable from standard landscape nurseries. Make arrangements with competent wetland restoration and/or native plant supply sources to ensure a supply of the required materials. Submit to the Engineer a source of supply for all plant materials two (2) weeks prior to planting.

Tree protection: Install Tree Protection to circle the tree trunk with 2 to 3 inches of space between trunk and protection. Tree Protection should be similar or equal to BioBark, or plastic mesh fence, stable black polypropylene, or other suitable material functioning in a similar matter with approval from the Engineer. Secure Tree Protection using a 4 foot wooden stake measuring greater than 1" x 1" and use appropriate wire ties to secure the protection. Drive stake into the ground a minimum of 1 foot, maximum of 1.5 feet without damaging the tree including the root ball. Installation must be approved by the Engineer. Installation of tree shelters is applicable for all trees.

710.03 CONSTRUCTION.

710.03.03 Utilities Marketing, Layout, and Inspection.

INSERT: The following after the last sentence.

The Contractor is not required to stake out each individual planting pit. However, upon planting a typical 50-foot by 50-foot area within each planting zone, the Contractor shall have the Engineer inspect and approve plant spacing and planting techniques prior to proceeding. The contractor shall relocate plants that are deemed to interfere with power-lines, access, etc. at his/her own expense. No trees shall be planted within 15 feet of a sanitary sewer line.

710.03.23 Establishment Phase.

ADD: The following at the end of the first sentence:

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An 85% stem survival rate will be required at the end of the one-year maintenance period. Inspection for the required survival will take place during the first growing season once the one-year period has been reached.

710.04 MEASUREMENT AND PAYMENT.

710.04.01 Tree, Shrub, and Perennial Installation and Establishment

ADD: After the last sentence:

Tree shelters will not be measured but considered incidental to the installation of trees.

Replacement of any trees, shrubs, and perennials required by a survival rate below 85% at the end of the one-year maintenance period will be provided at no additional cost to the City.

END OF SECTION

UNNAMED TRIBUTARY TO CARSINS RUN AT SUMMERLIN (SR-2) STREAM
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**CATEGORY 900
MATERIALS**

CHANNEL SAND AND GRAVEL

Channel Sand and Gravel. Channel Sand and Gravel shall meet the following specifications and gradation as approved by the Engineer.

% less than	Particle Diameter Passing through Sieve (in) or Sieve No.
100	2.5 in
85-100	1 in
60-100	0.5 in
35-70	No. 10
20-50	No. 40
3-20	No. 200

Salvaged Channel Sand and Gravel. Suitable material for channel sand and gravel material salvaged from the Class 5 Excavation that is not topsoil and meets the above specifications and gradation as approved by the Engineer.

Furnished Channel Sand and Gravel. Only when Salvaged Channel Sand and Gravel material is not available, Furnished Bank Run Gravel - Base (BRG-Base) per MDOT SHA 901.01 can be used to meet the required specifications. Material shall not be composed of Riprap. Sand and stones shall be angular in shape and brown in color, no white rock will be accepted.

END OF SECTION

UNNAMED TRIBUTARY TO CARSINS RUN AT SUMMERLIN (SR-2)
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**CATEGORY 900
MATERIALS**

REINFORCED NATURAL FIBER MATTING

Reinforced Natural Fiber Matting

Matting for Woody Toe Protection lifts consists of a double-layered biodegradable fabric: a bottom layer of jute fabric and a top layer of high strength coir matting, connected together. Reinforced Natural Fiber Matting must meet or exceed the following *minimum* specifications:

Materials:	Woven coir fiber (top layer) and jute fabric (bottom layer)
Thickness:	0.35 in.
Elongation (Dry/Wet):	30%/26% (top layer) and 8%/9% (bottom layer)
Weight:	33.3 oz/SY
Permeability:	1.03 in/sec
Shear Stress:	4.5 psf
Flow Velocity:	12 ft./sec.
Life Expectancy:	3 years

END OF SECTION

UNNAMED TRIBUTARY TO CARSINS RUN AT SUMMERLIN (SR-2)
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**CATEGORY 900
MATERIALS**

SELECT BOULDERS

All Select Boulder material used will be angular rock, of appropriate color (green/brown/gray/dark brown/dark gray) from an approved source. White colored boulders are not acceptable. All Select Boulder material must be free from lamination, weak cleavages and will not disintegrate from the action of air water or in handling and placing. Granular sedimentary boulders are not acceptable. Concrete will not be considered as an alternative for boulders. Select Boulders must have a minimum unit weight of 150 lbs per cubic foot.

- (a) **Boulder Type I.** Type I Boulders are not to be blocky but should be irregular or rounded in shape and follow the sizing set forth in the Contract Documents on DE-01.
- (b) **Boulder Type II.** Type II Boulders are not to be blocky but should be irregular or rounded in shape and follow the sizing set forth in the Contract Documents on DE-01.
- (c) **Imbricated.** Imbricated should be blocky in shape and follow the sizing set forth in the Contract Documents on DE-01.

Suitable salvaged material must be used prior to using furnished material. Provide a sample of the Select Boulders to the Engineer for review and approval two weeks prior to its intended use. Only approved material will be accepted to be placed at the site.

END OF SECTION

UNNAMED TRIBUTARY TO CARSINS RUN AT SUMMERLIN (SR-2) STREAM
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**CATEGORY 900
MATERIALS**

SUITABLE BACKFILL

Suitable Backfill. Suitable Backfill materials shall be salvaged from Class 5 Excavation when possible and shall meet the required specifications as described below or as approved by the Engineer. Only approved material shall be placed at the site.

If salvaged material is not available, Borrow may be furnished from the City of Aberdeen's stockpile area. Borrow shall be used for all other fill requirements (beyond where other specified material is placed).

Borrow. Borrow shall meet specifications for Select Borrow per MDOT Standard 916.01 modified to allow for material meeting MSMT Classification A-2-7 Clayey Sand, A-7-2 Sandy Clay, or as approved by the Engineer.

END OF SECTION

UNNAMED TRIBUTARY TO CARSINS RUN AT SUMMERLIN (SR-2)
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**CATEGORY 900
MATERIALS**

SECTION 920 – LANDSCAPING MATERIALS

920.06 SEED AND TURFGRASS SOD STANDARDS

920.06.07

INSERT: The following:

(d) Permeant Seeding for Riparian Forest Zone and Riparian Forest Seed Only Zone. Refer to the Contract Documents on LD-01 for species components. All seed must have a minimum purity of 95%, and a minimum germination of 85%.

(e) Permeant Seeding for Forested Wetland and Livestake Zone and Forested Wetland Seed Only Zones. Refer to the Contract Documents on LD-01 for species components. All seed must have a minimum purity of 95%, and a minimum germination of 85%.

END OF SECTION

UNNAMED TRIBUTARY TO CARINS RUN AT SUMMERLIN (SR-2) STREAM
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AS-BUILT STREAM RESTORATION CHECKLIST

PROJECT NAME: Unnamed Tributary to Carsins Run at Summerlin (SR-2) Stream
Restoration Project

This list is supplemental to the requirements contained in these Special Provisions.

The as-built conditions shall be clearly shown and differentiable from all other features. The approved construction drawings with all revisions noted shall be used as a base sheet for the as-built drawings. All as-built sheets shall be labeled "AS-BUILT" in the lower right hand corner of each sheet.

The following checklist is a list of items to be included as part of the as-built survey. The items shall be drawn on top of the respective feature of the approved plan.

LEGEND FOR REVIEW CHECKLIST:

ACC. Accepted **N/A** Not Applicable **NC** Not Checked
X Not Acceptable **REQ.** Required, Not Submitted **INC.** Incomplete

MINIMUM INFORMATION REQUIRED:	COMMENTS
<i>1. Certifications – See end of Checklist for format:</i> ____ a. Survey Certification ____ b. Design Consultant Certification	
<i>2. Plan View</i> ____ a. Show the extent of the constructed grading ____ b. Identify and show extent of each bioengineering feature ____ c. Identify elevations and dimensions of any structure ____ d. Verify the geometric curve information – note any changes ____ e. Show the location and elevation of monitoring benchmarks	
<i>3. Profile Along Thalweg:</i> ____ a. Elevations at design stations and at locations of any revisions ____ b. In-stream structures / bioengineering controls should be identified with elevations noted	
<i>4. Cross-Sections (at design stations and at locations of any</i>	

UNNAMED TRIBUTARY TO CARINS RUN AT SUMMERLIN (SR-2) STREAM
RESTORATION PROJECT
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_____ <i>revisions</i>): _____ a. Elevations identified at inverts and grade breaks _____ b. Identify and show the placement of structures, bioengineering controls and any bank stabilization with elevations noted _____ c. Show existing grading and the extent of constructed grading	
STREAM STABILIZATION FEATURES Construction shall match design details – any modifications to design details shall be drawn and noted on plans Minimum Items To Be Verified:	
_____ 1. <i>Microtopography</i> _____ a. Extent of rough graded area _____ b. Update structure tables and grading sheets with actual square yardage of microtopography	
_____ 2. <i>Concrete Monitoring Benchmarks</i> _____ a. All monitoring benchmarks have been installed	
_____ 3. <i>Clay Plug</i> _____ a. Placement of the clay _____ b. Update structure tables and grading sheets with actual cubic yardage of clay	
_____ 5. <i>Brush Cobble Riffles</i>: _____ a. Placement of bed mix; note length, width, and thickness _____ b. Indicate placement of grade control elements; note length, depth, width, elevation, and key in lengths _____ c. Update structure tables and grading sheets with actual extent of structure	
_____ 6. <i>Toe Boulders</i>: _____ a. Stone keyed into channel invert _____ b. Finished grade _____ c. Update structure tables and grading sheets with actual extent of structure	
_____ 7. <i>Rock Lined Pools</i>: _____ a. Indicate placement of start and end stability structure _____ b. Update structure tables and grading sheets with actual extent of structure	
_____ 8. <i>Woody Toe</i>: _____ a. Indicate extents of structure _____ b. Update structure tables and grading sheets with actual extent of structure	

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_____ 9. <i>Floodplain Log Sill:</i> _____ a. Indicate placement of logs and sill; note length, depth and elevation _____ b. Update structure tables and grading sheets with actual extent of structure	
_____ 10. <i>Woody Debris Plugs</i> _____ a. Indicate placement of logs and sill; note length, width, depth and elevation _____ b. Update structure tables and grading sheets with actual extent of structure	
_____ PLANTING _____ a. Certify installation in accordance with quantity, type and quality as specified in the design plans and specifications _____ b. Contractor shall submit to the City copies of delivery tickets / receipts from any plant supplier	

UNNAMED TRIBUTARY TO CARINS RUN AT SUMMERLIN (SR-2) STREAM
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CERTIFICATIONS

All certifications are to appear on the title page as noted below in quotation marks:

- 1) **Survey Certification** – The Contractor shall have the as-built topographic survey certified by a registered land surveyor licensed within the State of Maryland. The licensed surveyor shall attest that:

“I hereby certify that this As-Built Survey is an accurate representation of the locations and elevations in the field as of **(Date)**.”

Registered Land Surveyor (print name)
Seal & Signature

License Number

Date

- 2) **Design Certification** – The Consultant shall personally attest that:

“I have personally observed components of this stream restoration project, but not full time oversight. I have also reviewed the as-constructed conditions depicted on this As-Built Survey. I hereby certify that the stream restoration construction meets the design intent of this project and / or the construction is within the accepted tolerances as noted on the plans and within the Special Provisions.”

Consultant (print name)
Seal & Signature

License Number

Date

UNNAMED TRIBUTARY TO CARINS RUN AT SUMMERLIN (SR-2) STREAM
RESTORATION PROJECT
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SUBMITTALS

The approved construction drawings with all revisions noted shall be used as a base sheet for the As-Built drawings. The Contractor shall furnish the City with this checklist signed by the certifying surveyor and three (3) prints and a reproducible mylar copy of the as-built topographic survey. The City will forward to the Consultant – the Contractor’s certified as-built topographic survey and this checklist. The Consultant is then responsible for submitting: this completed checklist, a certified reproducible mylar set along with three (3) prints of the As-Built drawings to the City for final review and approval according to the time schedule established in the Special Provisions.

The following section is to be completed by the Consultant and the Certifying Surveyor.

SIGNATURES

I have reviewed this checklist and the referenced special provisions.

Consultant (print name)
Seal & Signature

License Number

Date

Registered Land Surveyor (print name)
Seal & Signature

License Number

Date

END OF SECTION