REQUEST FOR PROPOSAL ("RFP")
Release date: June 29, 2019

Elizabeth River Project
475 Water Street, Suite C103A
Portsmouth, VA  23704

Project Title: Ingleside Road and E. Princess Anne Road
Stormwater Management Retrofits

DUE DATE/TIME:  July 26, 2019 at noon EST

SUBMISSION REQUIREMENTS:
Proposals should be mailed, emailed, or hand-carried to the Elizabeth River Project, 475 Water Street, Suite C103A, Portsmouth, VA  23704. Digital copies can be emailed to Grace Saunders at gsaunders@elizabethriver.org.

SCHEDULE:
Mandatory Prebid Meeting: July 9, 2019: 9 am – 10:30 am at Ingleside Baptist Church - 925 Ingleside Rd, Norfolk, VA
Questions Due: July 12, 2019
Bid Due Date: July 26, 2019 at noon
Bid Review: July 26- August 4, 2019
Award Notification: August 5, 2019
Project Start Date: August 6, 2019
Project Completion Date: January 31, 2020

NOTE: The Center for Watershed Protection, Inc. (the “Center”) designed stormwater management retrofits along the south side of 847-925 Ingleside Road, Norfolk, VA and at 4605-4625 E. Princess Anne Road, Norfolk, Va. Elizabeth River Project (“ERP” or “Owner”) is seeking Proposals from interested and qualified contractors for the Ingleside Road and E. Princess Anne Road Stormwater Management Retrofit Project(s). The project is broken into three separate projects, with the third project broken into three sub-projects.

Said projects will be discussed throughout this RFP as follows:
• Project 1 - 925 Ingleside Road
• Project 2 - 917-901 & 857-847 Ingleside Road and
• Project 3 - E. Princess Anne Road:
  o Subproject 1 – West Ditch,
  o Subproject 2 – East Ditch, and
  o Subproject 3 – South Ditch.
ERP may award a Contract for some, or all, of the above Projects and Subprojects to conform to available funding. However, it is anticipated that only one Contract will be awarded. Contract award shall be made in accordance with contractor’s qualifications and the Proposal representing best value to the Owner. Award will be made to the Proposer whose Proposal represents the best value to ERP, as determined in ERP’s sole discretion, considering price and technical factors. Contractors are strongly encouraged to carefully review the Design and Specification Documents. Technical questions must be submitted in writing (including by email) so that they are received by ERP on July 12, 2019. Answers to questions will be summarized and distributed to all bidding Contractors not less than five (5) days prior to the bid submission date.
Project Title: Ingleside Road and E. Princess Anne Road  
Stormwater Management Retrofits

A. PROPOSAL INSTRUCTIONS

1. Technical Information**
   The Proposer shall submit the following technical information:
   a. A brief narrative explanation of how it will accomplish the technical, managerial, and supervisory work described below under Section C, Scope of Work.
   b. Information requested to respond to the Technical Factors for evaluation listed in this RFP.
   c. A timeline with milestone dates for accomplishing the tasks.

   ** Note: Proposals that fail to include all the above information may be rejected as non-responsive.

2. Cost Summary
   a. A lump sum bid price for the work required for each Project and for each Subproject must be separately submitted on the attached forms entitled “Bid Price Form: Project 1, 925 Ingleside Road Stormwater Management Retrofits,” “Bid Price Form: Project 2, 917-901 & 857-847 Ingleside Road Ingleside Road Stormwater Management Retrofits,” “Bid Price Form: Project 3, Subproject 1, E. Princess Anne Road Stormwater Management Retrofits,” “Bid Price Form: Project 3, Subproject 2, E. Princess Anne Road Stormwater Management Retrofits,” and “Bid Price Form: Project 3, Subproject 3, E. Princess Anne Road Stormwater Management Retrofits.”
   b. Because Projects 1 and 2 are located in close proximity, and ERP will choose to either award Project 1 alone, or Project 1 and 2 together, a single bid price is requested for “Mobilization, Demobilization, and General Conditions” jointly for Projects 1 and 2. Similarly, a single, joint, bid price for “Mobilization, Demobilization, and General Conditions” for Project 3, inclusive of any or all Subprojects.
   c. All contractors must give each bid price in words and figures. The Bid Price Form must be signed by a corporate officer or other person or person(s) authorized to bind the Proposer. Corrections on the Bid Price Form must be initialed by the Proposer.
   d. All contracts will be Firm Fixed Price.
   e. Conditioned Proposal and Proposals containing escalator clauses will not be accepted. In the event any offer contains alternates, deviations or substitutions from the advertised specifications, the Proposer is required to fully describe and explain the nature of the alternates, deviations or substitution in the Proposal submission.

3. Other Required Information

   The following forms and information must be returned with Proposal:
   a. PROJECT 1 BID COST FORM: 925 INGLESIDE ROAD STORMWATER MANAGEMENT RETROFITS (with Bid for Mobilization, Demobilization, and General Conditions for Projects 1 or Projects 1 & 2).
b. PROJECT 2 BID COST FORM: 917-901 & 857-847 INGLESDIE ROAD STORMWATER MANAGEMENT RETROFITS

c. PROJECT 3, SUBPROJECT 1 BID COST FORM: E. PRINCESS ANNE ROAD– WEST DITCH STORMWATER MANAGEMENT RETROFITS (with Bid for Mobilization, Demobilization, and General Conditions for Project 3, inclusive of any and all Subprojects).

d. PROJECT 3, SUBPROJECT 2 - BID COST FORM: E. PRINCESS ANNE ROAD, – EAST DITCH STORMWATER MANAGEMENT RETROFITS

e. PROJECT 3, SUBPROJECT 3 - BID COST FORM: E. PRINCESS ANNE ROAD– SOUTH DITCH STORMWATER MANAGEMENT RETROFITS


g. Non-Collusion Affidavit

h. U.S. Employer Identification Number, Virginia Employer Identification Number and Certification of Good Standing (if Contractor is a Corporation)

i. Sequence of Construction

j. Schedule with Milestones

4. Submission of Proposals

a. All Proposals shall be mailed, emailed, or hand-carried to Grace Saunders (gsaunders@elizabethriver.org) at the Elizabeth River Project, 475 Water Street, Suite C103A, Portsmouth, VA 23704 and must be received no later than 12:00 p.m. EST on July 26, 2019. The Proposal shall be the Contractor’s “Offer” to enter into the Contract on the terms described in this RFP and the Contractor’s Proposal. It is the contractor’s responsibility to ensure that its Proposal is delivered at the proper time and place. No Proposal received thereafter will be considered, unless it is the only Proposal received.

b. Corrections of, or changes to, Proposals will be acceptable only if received by the Elizabeth River Project prior to the time set out in paragraph 4(a).

c. The Contractor by submitting its Proposal represents that all personnel, equipment, and materials necessary for providing the described services will be available as needed.

d. Errors in preparation of the Proposal will not relieve Contractors from the terms thereof. Failure of the Contractor to thoroughly understand all aspects of this request for Proposal or to become familiar with all conditions that may affect performance before submitting a Proposal will not be an acceptable excuse for withdrawal or change of the Proposal.

e. All quantities provided are approximate and will be viewed as such.

f. This Request for Proposals is sent as a courtesy to known interested companies. The receipt of this Request for Proposal from the Center for Watershed Protection, Inc. or Elizabeth River Project in no way implies a contract has been made by the Center or Elizabeth River Project or that the recipient is a qualified Contractor.

g. The Scope of Work called for in this RFP and the resultant contract is for all site grade work and related stormwater management, gravel wetland construction, swale
expansion, bioretention planter installation, vegetation planting, culvert replacement, and associated labor.

h. The Proposer must be in compliance with the laws regarding conducting business in the Commonwealth of Virginia. The selected Contractor shall provide evidence that the Contractor is registered to do business in Virginia with the Virginia State Corporation Commission (SCC), holds an appropriate General Contractor’s license issued by the Department of Professional and Occupational Regulation (DPOR) – Board for Contractors, is not debarred and is in good standing with the SCC and DPOR. The Elizabeth River Project reserves the right, at its sole discretion, to extend the date this documentation must be provided. The Contractor’s inability to provide this documentation will result in the bid being rejected.

i. Any exceptions to the plans or specifications requested should be attached to the Proposal. An exception to the plans or specifications will not necessarily disqualify the bid. The Elizabeth River Project will determine if the exception is an essential deviation or a minor item. In the case of a minor deviation, the Elizabeth River Project reserves the option to award to that Contractor if it determines the performance is not adversely affected by the exception and the Proposal submitted by that Contractor represents the best overall value to the Owner.

j. If the bid prices exceed the funds available to Elizabeth River Project for this Project, ERP may negotiate with one or more bidders whose bids are deemed advantageous to ERP, to modify the scope or details of the Project, and to award a Contract to a bidder for the Project as modified.

k. The Proposer must also review the attached contract and provide any exceptions to the contract in their Proposal.

5. Assistance to Proposers.

a. Site Inspection. Each Proposer is required to visit the site of work so as to be fully informed as to the conditions under which the work is to be done, to facilitate planning under the specifications set out herein, and to coordinate with related and associated work. To facilitate this, a non-mandatory Pre-Bid Meeting will be held at the project sites. ERP staff will meet with potential Proposers on July 9, 2019 (9:00 am -10:30 pm) at Ingleside Baptist Church, 925 Ingleside Rd, Norfolk, VA. Once that site visit is completed Proposers and ERP will visit the 917-901 & 857-847 Ingleside Road site and the E. Princess Anne Road site. Contractors should RSVP to Grace Saunders gsaunder@elizabethriver.org if planning to attend.

b. Questions. All questions concerning the interpretation of this Proposal, or other contract documents, shall be submitted to: Project Manager, Grace Saunders, Elizabeth River Project, 475 Water Street, Suite C103A, Portsmouth, VA 23704, Phone 757-399-7487, email: gsaunder@elizabethriver.org by July 12, 2019.

B. EVALUATION OF PROPOSALS

a. In determining which Proposal is best value, the Elizabeth River Project will take into consideration the proposed price and the experience, qualifications, and references of the Contractor. Past performance will be a critical factor. The Elizabeth River Project reserves the right to cancel this RFP, to reject any or all Proposals in whole or part, to waive any technicalities or formalities, and to determine in its sole discretion which Proposal will serve in the best interests of the project. The Elizabeth River Project further reserves the right to cancel an award, or Notice of Intent to award, at any time prior to the execution of a contract, without any liability on its part.

b. If two or more technical Proposals are of approximately equal merit, the contract will be awarded to the company whose Proposal has the lowest price among those companies. If two or more companies offer prices that are close to equal, the contract will be awarded to the company whose technical Proposal is evaluated as best among those companies. In general, a highly qualified Contractor that meets all the technical Proposal criteria and also offers the lowest Price will be awarded the contract.

c. Proposals will be evaluated based on the following Technical Factors and the Proposed Price. Technical Criteria 1 through 6 are presented in the order of relative importance, with 1 being the most important. With regard to price-related Criteria 7 and 8, ERP has a budget for the Project and the price must be within ERP’s budget, but award will not necessarily be made to the lowest Price proposed.

1) Technical Knowledge and Experience – Proposers should provide details of 3 prior stormwater projects which they have previously completed or which are currently underway under contract. State if the projects were completed within the original contract price and schedule. Further, Proposers should state if any claims for additional compensation or an extension of the contract schedule were submitted, and if liquidated damages were assessed by the Owner on the Contractor. We would like to see Proposers that understand our project and have past experience with stormwater projects to successfully carryout the proposed work.

2) Evaluation of Past Performance - Proposer should provide contact information (name, address, phone, and email) for Owners of the three projects discussed above so ERP can discuss Proposer’s performance on the projects.

3) Organizational Capacity – Proposers should provide details about the proposed project team who will be working on this project, information should include: qualifications, time with the company, training, and other relevant information. Provide the percent of their time they will spend on the project. In addition, information about the proposed equipment should be provided for the project.

4) Understanding of Specific Task Requirements – Proposer should provide a detailed discussion about how they propose to carry out the work and how key tasks will be carried out.

5) Safety History and Safe Working Practices- (See Form Included as Attachment). Contractor shall provide sufficient information to enable the selection committee to understand and evaluate the capability of the Proposer to provide a safe working environment for all individuals associated with the Project. The Contractor and any proposed subcontractors shall provide a completed Safety Criteria Questionnaire.
6) **Ability to Work Within the Designated Schedule** – ERP’s preferred scheduled is outlined below and Proposer should indicate if they can meet these deadlines. If Proposer cannot meet this schedule please provide an alternative schedule. ERP anticipates awarding a contract to the successful Proposer on August 5, 2019 with construction to occur between August 6, 2019 and January 31, 2020.

7) **Price** – Proposers should fill out the Bid Price Form for each Project and Subproject and note that quantities are only provided as an estimate and it is the responsibility of the contractor to determine if their estimates are different from listed. Award will be on a Firm Fixed Price basis for the Projects and/or Subprojects selected by the Owner. Award will not necessarily be made by Owner to the Proposer submitting the lowest-priced Proposal, and past experience and capacity to complete this project will also be taken into account.

8) **Additional Price-Related Information the Contractor Deems Appropriate, such as:**

   - Project assumptions made by the Proposer to develop the proposed Price, including any assumptions that are different from or in addition to those set forth in the drawings.
   - Additional tasks not specifically mentioned in the project description, which the Proposer believes are needed to successfully complete the Work. The cost of the additional tasks should be identified separately, but must be included in the bid table.
   - Provide a description of conditions that may result in a change order and please provide a copy of your proposed unit rate sheet for equipment, labor, and materials.

2. Notification

   The Elizabeth River Project intends to complete its evaluation and decision process within two weeks after submission of offers. The selected contractor will be notified via email and letter via a “Notice of Intent to Award.”

C. SCOPE OF WORK

1. **Background.** The Center for Watershed Protection, Inc. (Center), designed a stormwater management system at the ditch system at 925 Ingleside Road, 917-901 & 857-847 Ingleside Road, and at 4605-4625 E. Princess Anne Road, Norfolk, VA.

2. **Project Description.**

   **Project 1: 925 Ingleside Road Stormwater Management Retrofits** – Project 1 is located at 925 Ingleside Road, Norfolk VA 23502.
Project 1 above is located at 925 Ingleside Road, and is the site of the Ingleside Baptist Church (see Figure 1 above). There are three ditches in this section labeled west, north and east. All three ditches will be widened to allow for more flow capacity and less steep side slopes, which will help decrease erosion and make maintenance easier. Contributing flow from the north side of the building and the church parking lot currently enters the west ditch, leads around the lawn towards Gatling Road (north ditch) and then into the Ingleside Road, City-maintained, ditch (east ditch). The west ditch was originally larger, but after the parking lot was extended, the ditch was not properly reinstalled. This ditch will be widened and become an amended grass channel with a biochar amendment of 10% by volume, 2’ deep. The grass channel (west ditch) will lead to a two-stage ditch (north ditch) which has a 2’ wide elevated bench. Runoff from the north ditch will enter the roadside ditch on Ingleside Road (east ditch). The roadside ditch on Ingleside Road is maintained by the city and has a history of standing water and non-vegetated sides. The ditch has very steep side slopes, typical of ditches that are cleaned with buckets that are too big for the ditch. By widening the ditch, it will allow more room. The east ditch will also be converted to a gravel wetland to allow for water treatment. After 160 feet of gravel wetland, it will become a widened ditch system. Currently, the drainage from the east side of the church drains directly into the Ingleside ditch. The roof drains will be diverted to a forebay-level spreader-filter strip section before entering the ditch. The flow from the widened ditch system enters a culvert that leads into Section 2 of the project, between Karlin Road and Seay Ave. See Attachment I for more details regarding design and specifications for Project 1.

Project 2: 917-901 & 857-847 Ingleside Road Stormwater Management Retrofits – Project 2 is located between 917 and 847 Ingleside Road, Norfolk VA 23502 and is shown above in Figure 1.

At 917–901 Ingleside Road, two dry wells will also be installed in the current ditch to encourage infiltration. The section of ditch closest to Seay Avenue will be expanded to allow for increased water conveyance. The ditch discharges into the gutter on Seay Avenue via a pipe. The existing pipe is deformed and not functioning, so the pipe will be removed along with some broken asphalt, and a wider swale will be created to convey the flow. See Attachment I for more details regarding design and specifications for Project 2.
857 – 847 Ingleside Road ditch runs between North Ingleside Avenue and Ladd Avenue. The portion of ditch on the south side closest to Ladd Avenue will be widened and amended with 10% biochar by volume to a depth of 1’. A dry well will be added to reach the sandy layer roughly 5’ below the surface. The amended ditch will be 150’ long. See Attachment I for more details regarding design and specifications for Project 2.

**Project 3: E. Princess Anne Road Stormwater Management Retrofits** – Project 3 is located between at 4605 E. Princess Anne Road and 4625 E. Princess Anne Road and is shown below in Figure 2.

![Figure 2: Project 3 consists of three Subprojects which include West Ditch (red), East Ditch (blue), and South Ditch (yellow).](image)

**Subproject 1 – West Ditch (4605 E. Princess Anne Road)**

The West Section retrofit is at the existing roadside ditch in front of 4505 E. Princess Anne Road. Currently it is a very steep and narrow ditch that flows to the west. The ditch will be widened to allow for more flow capacity and less steep side slopes, which will help decrease erosion and make maintenance easier. By widening the ditch, it will allow more room for the bucket to clean out the ditch without destabilizing the side slopes. A 2’ deep woodchip bioreactor will be installed in the ditch. The drainage area into the ditch includes the road, a portion of the 4505 E. Princess Anne Road property, and the water draining to the ditch upstream. See Attachment J for more details regarding design and specifications for Subproject 1 – West Ditch.

**Subproject 2 – East Ditch (4625 E. Princess Anne Road)**

The East Section retrofit is at the existing roadside ditch in front of 4525 E. Princess Anne Road. Currently it is a very steep and narrow ditch that flows to the west ditch. The ditch will be widened to allow for more flow capacity and less steep side slopes, which will help decrease erosion and make maintenance easier. By widening the ditch, it will allow more room for the bucket to clean
out the ditch without destabilizing the side slopes. A 2’ deep woodchip bioreactor will be installed in the ditch. The drainage area into the ditch includes the road, a portion of the 4525 E. Princess Anne Road property, and the water draining to the ditch upstream. There will be a pipe from the south side of the building to bring the road water into the east ditch. There is a telecom line that crosses above the pipe. Care must be taken to not damage the line. See Attachment J for more details regarding design and specifications for Subproject 2 – East Ditch.

**Subproject 3– South Ditch (4625 E. Princess Anne Road)**
The South Section is located south of both buildings. There currently exists a clogged drainage ditch that was likely designed to transport water behind the building. Due to the trees growing in the ditch, that area was not considered in the design for the project. In order to decrease the flooding issues at the back of the parking lot, a grass channel that sends the water to the front of the building is proposed. A dry well will also be installed on the south lawn to decrease the amount of flow into the ditch. Much of the water is that flows into that area is coming from the roof drains on the east side of 4625 E. Princess Anne Road building. These roof drains will be re-piped to the front of the building to decrease the amount of water entering the south side. See Attachment J for more details regarding design and specifications for Subproject 3 – South Ditch.

3. **Project Goals.** These practices are part of Elizabeth River Project’s efforts to improve water quality in the Elizabeth River. As such, these retrofits were not designed to meet a minimum standard, but rather were designed to the maximum extent practicable given site constraints. No new impervious areas are being created or developed as part of this project, and these facilities are not part of any development requirement.

4. **Project Benefits.** The expanded ditches, along with soil amendments and decompaction, will allow for more water to be infiltration and filter through the ground. The gravel wetland will treat runoff from approximately 38,000 square feet of road and roof runoff that currently do not have adequate stormwater controls. Dry wells along the Ingleside ditches and behind the industrial buildings on Princess Anne Road will allow for penetration through the clay layer of the ground and increase infiltration. Bioreactors in the existing ditches off Princess Anne Road will improve denitrification of the stormwater. This project will assist in efforts to achieve Chesapeake Bay TMDL pollutant load reduction goals.

5. **Design Intent.** The design intent of the gravel wetlands are to improve water quality by means of capturing rainwater in a flat, shallow, planted basin, to infiltrate (retain) and/or detain rainwater to reduce peak volume flows, filter pollutants, and recharge the groundwater. Visibly ponded water in the gravel wetlands should remain for no more than 24 hours, ideally, and for no more than 48 hours at the maximum. While at the outset the gravel wetlands may appear to be no more than a depressed bed filled with native plants, it also has a high degree of functionality that is integral and implicit in the installation of a successful gravel wetland. While proper grading and soil preparation are important in all landscape installations, their importance cannot be overemphasized when installing a gravel wetland. Particular attention needs to be given to setting sub-grade elevations, basin elevations, and overflow elevations relative to the surrounding grades. In addition to properly installing the materials as prescribed, it is incumbent upon the Contractor to ensure that the gravel wetlands are constructed strictly in accordance with the plans in order for them to function and drain as intended.
D. GENERAL PROVISIONS

1. Construction of the stormwater management system includes:
   a. Construction of all specified stormwater features per approved plan
   b. All materials to specifications
   c. All labor
   d. All equipment
   e. All applicable construction period erosion and sediment control measures
   f. All site grading
   g. All hauling
   h. Installation of herbaceous plant material and plant warranty.

3. The Contract to be executed between the Contractor and ERP shall include warranties of materials and workmanship. The Contract shall also require a one (1) year period following final acceptance of the Project Work, in which the Contractor shall correct any defects in workmanship, materials, and performance and Contractor shall correct or replace any defects which may occur during that period. If any special guarantees in excess of the one-year period are specified by the manufacturer, these guarantees shall take precedence over the one-year period guarantee.

4. General supervision of overall project on behalf of the Owner will be provided by Elizabeth River Project, in coordination with the City of Norfolk. The Center for Watershed Protection, Inc. will also provide consultation services on an as needed basis.

E. GENERAL TERMS AND CONDITIONS

1. **Scope.** The work under this contract includes all labor, materials, and equipment required to complete all items of work necessary or required for the project. Only new materials will be accepted for use on the project.

2. **Laws and Regulations.** The contractor shall comply with all Commonwealth and City Code, Regulations, and Approvals required. Contractor must be licensed as required by the Laws of Virginia. The contractor will coordinate work with the Elizabeth River Project and adjacent property owners to ensure that uses of the adjacent property, particularly the church property, are not adversely affected.

3. **Subcontractors and Suppliers.** The Contractor shall, at the execution of the contract, notify the ERP in writing of the names of subcontractors proposed for parts of the work, and shall not employ any that the Elizabeth River Project may, within a reasonable time, object to as incompetent or unfit. Contractor shall also notify the ERP of any Supplier who is anticipated to provide more than $5,000 of materials to be temporarily used or permanently incorporated into the Project.
4. **Necessary Details, Not Specifically Mentioned.** All work called for in the specifications and not shown on the plans, or shown on the plans and not called for in the specifications, shall be furnished and executed by the Contractor as if designed in both these ways. Should any works or materials be required which are not denoted on the plans and specifications either directly or indirectly, but which are nevertheless necessary for the proper carrying out of the intent thereof, it is understood and agreed that the same is implied and required and the contractor shall perform such work and furnish such materials as fully as if they were completely delineated and described.

Should any detail be omitted from the drawings or specifications, or should any errors appear in either, it shall be the duty of the Contractor to notify the Elizabeth River Project. In no case shall the contractor proceed with the work without notifying and receiving definite instructions from the Center. Work wrongly constructed without such notification shall be corrected by the contractor at his own cost.

5. **Approved Equals.** In all specifications where a material or article is defined by describing a proprietary product or by using the name of a vendor or manufacturer, it can be assumed that an approved equal can be substituted. The use of a named product is an attempt to set a particular standard of quality and type that is familiar to the Elizabeth River Project.

Such references are not intended to be restrictive. However, the Elizabeth River Project shall decide if a product does in fact meet or exceed the quality of the specifications listed in the solicitation. It shall be the responsibility of the vendor that claims his product is an equal to provide documentation to support such a claim.

7. **Changes In Work.** The Owner, without invalidating the contract, may order extra work or make changes by altering, adding or deducting from the work with the contract sum being adjusted accordingly. All such work shall be executed under the conditions of the original contract, except that any claim for the extension of time caused thereby shall be adjusted at the time of ordering such change. The value of any such extra work or change shall be determined in one or more of the following ways:

   (1) By estimate and acceptance of lump sum
   (2) By unit prices named in the contract or subsequently agreed upon

**G. PROJECT CONDITIONS**

1. Protect existing utilities, paving, walls, and any other facilities from damages caused by operations associated with the Project. Do not interrupt utilities serving facilities occupied by the property owner or others. The Contractor is responsible for any and all damages to existing facilities, and subsequent damages resulting from damage or disruption to existing facilities and utilities.

2. Dewater the Project site prior to, and during, the Project as necessary until the work concludes.

3. Parking and Storage: Limited parking is available at the site for employees and equipment.

4. Utilities and Services: Electrical, water, and restrooms are not available at the project site.
5. Fence the perimeter of the active Project site with orange construction fence at the conclusion of each work day.

6. All driveway and parking areas must be kept clear and useable on Friday evenings after 4:00 pm, Saturdays, and Sundays. In addition, property owners must be notified at least 24 hours in advance if vehicle access to their property will be blocked. Efforts should be made to minimize the occurrence of inaccessible driveways.

**H. EXECUTION OF CONTRACT AND TIME FOR COMPLETION**

1. The Contractor to whom the contract is awarded will be notified in writing and by email, and must execute the contract and submit it together with any other required documents within two working days after notification. Failure to do so will be just cause for cancellation of the notice of intent to award by Elizabeth River Project.

2. The successful Contractor shall be required to enter into a contract using the attached form. The terms and conditions of this RFP and Contractor’s Proposal shall be incorporated in said contract and will be binding on the Contractor, however in the case of any conflicts between the terms of this RFP and the Contract, the Contract terms shall take precedence. Before submitting Proposal, each Contractor shall examine the contract documents thoroughly.

3. If the Contractor to whom an award is made shall fail to timely execute the contract and/or submit required documents, the award may be terminated by the Elizabeth River Project, which may then award the contract to the next ranked contractor or reject all remaining offers, as it determines in its sole discretion to be in the best interest of the Project.

4. The successful Contractor shall perform the services described herein as an independent contractor and not as an employee of Elizabeth River Project or the Center.

5. Work under the contract may begin after execution of the contract and be completed by January 31, 2020. A schedule showing completion of the work within the allowed contract time is required as part of the Proposal. A more aggressive schedule may be proposed but must be approved by the Elizabeth River Project.

6. The Site is available for the Project Work from 7:00 a.m. to 5:00 p.m., Monday through Friday.

7. In case of an emergency that may require that work be done on Saturdays, Sundays, and Holidays, the Contractor shall request permission of Elizabeth River Project to do so. If, in the opinion of Elizabeth River Project, the emergency is bona fide and adjacent landowners will not be unduly impacted, permission may be granted to the Contractor to work such hours as may be necessary. Also if in the opinion of the Elizabeth River Project a bona fide emergency exists, the Contractor may be directed to work such hours as may be necessary whether or not the Contractor requests permission to do so.

END OF RFP TERMS
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<td>Non-Collusion Affidavit</td>
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<td>B</td>
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ATTACHMENT A

NON-COLLUSION AFFIDAVIT

1. I, __________________________________________________________, (Owner, Partner, Officer, Representative, Agent)
   of __________________________________________________________, (Company Name) the Contractor that has submitted the attached Bid:

2. Am fully informed respecting the preparation and contents of the attached Bid and of all pertinent circumstances representing such Bid;

3. Such Bid is genuine and is not a collusive or sham Bid;

4. Neither the said Contractor nor any of its officers, partners, owners, agents, representatives, employees, or parties in interest, including this affidavit, has any way colluded, conspired, connived or agreed, directly or indirectly, with any other Contractor firm or person to submit a collusive or sham Bid in connection with the contract for which the attached Bid has been submitted or to refrain from bidding in connection with such contract or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other Contractor, firm or person to fix the price or prices in the attached Bid or of any other Contractor, to fix any overhead, profit or cost element of the Bid price or the Bid price of any other Contractor, or to secure through collusion, conspiracy, connivance or unlawful agreement any advantage against the Center for Watershed Protection, Inc., Elizabeth River Project, or any person interested in the proposed contract; and

5. The price or prices quoted in the attached Bid are fair and proper and are not limited by any collusion, conspiracy, connivance or unlawful agreement on the part of the Contractor or any of its agents, representatives, owners, employees or parties in interest including this affidavit.

I do solemnly declare and affirm under the penalties of perjury that the contents of this affidavit are true and correct.

__________________________________________     ______________
Signature       Date

__________________________________________
Title

__________________________________________
Company
VENDOR: ___________________________________________

Mobilization, Demobilization, and General Conditions for Project 1, or Projects 1 and 2

<table>
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TOTAL LUMP SUM BID PRICE: $______________.
Narrative statement of lump sum Price:

Stormwater Management Retrofits

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TOTAL LUMP SUM BID PRICE: $__________.

Narrative statement of lump sum Price:
## ATTACHMENT C
### PROJECT 2 BID COST FORM:
917-901 & 857-847 INGLESDIDE ROAD STORMWATER MANAGEMENT RETROFITS

VENDOR: ___________________________________________

### Stormwater Management Retrofits

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**TOTAL LUMP SUM BID PRICE:** $___________.___

Narrative statement of lump sum Price:
ATTACHMENT D
PROJECT 3, SUBPROJECT 1 BID COST FORM:
E. PRINCESS ANNE ROAD– WEST DITCH STORMWATER MANAGEMENT RETROFFECTS

VENDOR: ___________________________________________

Mobilization, Demobilization, and General Conditions for Project 3 inclusive of any or all Subprojects.

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TOTAL LUMP SUM BID PRICE: $_______________.
Narrative statement of lump sum Price:

Stormwater Management Retrofits

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TOTAL LUMP SUM BID PRICE: $_______________.
Narrative statement of lump sum Price:
# ATTACHMENT E
PROJECT 3, SUBPROJECT 2 - BID COST FORM:
E. PRINCESS ANNE ROAD, – EAST DITCH STORMWATER MANAGEMENT RETROFITS

VENDOR: ___________________________________________

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<td>Excavation</td>
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TOTAL LUMP SUM BID PRICE: $_____________.

Narrative statement of lump sum Price:
ATTACHMENT F
PROJECT 3, SUBPROJECT 3 - BID COST FORM:
E. PRINCESS ANNE ROAD– SOUTH DITCH STORMWATER MANAGEMENT RETROFITS

VENDOR: ___________________________________________

Stormwater Management Retrofits

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TOTAL LUMP SUM BID PRICE: $___________.____

Narrative statement of lump sum Price:
This Agreement is made this [_____] day of [______], [______], by and between
OWNER, The Elizabeth River Project

and

CONTRACTOR, [_____]

Tax identification number (TIN) [______]. Contractor License No., if applicable [______]

Owner and Contractor are collectively the “Parties.”

PROJECT: Ingleside Road and E. Princess Anne Road Stormwater Management Retrofits

DESIGN PROFESSIONAL: Center for Watershed Protection, Inc.,

ARTICLE 1 THE WORK

THE WORK Contractor shall use its diligent efforts to perform the “Work,” as described in Exhibit A, in an expeditious manner consistent with the Contract Documents, listed in Exhibit B. Contractor shall provide all labor, materials, equipment, and services necessary to complete the Work in full accord with and reasonably inferable from the Contract Documents.

ARTICLE 2 PRICE

PRICE As full compensation for performance by Contractor of the Work, Owner shall pay Contractor the lump sum price of [______] dollars ($[______]). The lump sum price, “Contract Price,” is subject to adjustment as provided in this Agreement. The Contract Price is broken down among the various Projects and Subprojects comprising the Scope of Work as shown in Exhibit D.

ARTICLE 3 EXHIBITS

EXHIBITS The following attached exhibits are made part of this Agreement:

(a) Exhibit A: Scope of Work, [______] pages.
(b) Exhibit B: Contract Documents
(c) Exhibit C: Change Order Form.
(d) Exhibit D: Contract Price (Bid Forms).
(e) Exhibit E: Partial Lien Waiver and Release Form.
(f) Exhibit F: Final Lien Waiver and Release Form.

ARTICLE 4 ETHICS

ETHICS Each Party shall perform their obligations with integrity. Each shall: (a) avoid conflicts of interest; (b) promptly disclose to the other Party any conflicts that arise; and (c) warrant that it has not and shall
not pay nor receive any contingent fees or gratuities to or from the other Party, including its agents, officers, and employees, subcontractors, suppliers, or others to secure preferential treatment.

**ARTICLE 5 CONTRACTOR’S RESPONSIBILITIES**

5.1 CONTRACTOR’S RESPONSIBILITIES Contractor shall be responsible for supervision and coordination of the Work, including the construction means, methods, techniques, sequences, and procedures utilized, unless the Contract Documents give other specific instructions.

5.1.1 Except for permits and fees that are the responsibility of Owner pursuant to this Agreement, Contractor shall obtain and pay for all necessary permits, licenses, and renewals pertaining to the Work.

5.1.2 Contractor shall pay all applicable taxes for the Work provided by Contractor. Owner, Elizabeth River Project, is exempt from being directly charged Federal excise and Virginia sales tax. A copy of an exemption certificate shall be furnished upon request. According to the Office of the Treasurer of Virginia, the Contractor is responsible for paying sales tax on his/her purchases relating to this project.

5.1.3 Owner may elect to perform work at the Worksite directly or by others retained by Owner. The Parties shall coordinate the activities of all forces at the Worksite and shall agree upon fair and reasonable schedules and operational procedures for Worksite activities. Owner shall require each separate contractor to cooperate with Contractor and to assist with the coordination of activities and the review of construction schedules and operations. Contract Price and Contract Time may be equitably adjusted in accordance with this Agreement for changes made necessary by the coordination of construction activities, and the construction schedule shall be revised accordingly.

5.1.4 Before commencing the Work, Contractor shall examine and compare the drawings and specifications with information furnished in the Contract Documents; relevant field measurements made by Contractor; and any visible conditions at the Worksite affecting the Work.

5.1.5 COMPLIANCE WITH LAWS Contractor shall comply with all laws at its own costs. Contractor shall be liable to Owner for all loss, cost, or expense, attributable to any acts or omissions by Contractor, its employees, subcontractors, suppliers, and agents for failure to comply with laws, including fines, penalties, or corrective measures.

5.1.6 WARRANTY

5.1.6.1 Contractor warrants that all materials and equipment shall be new unless otherwise specified, of good quality, in conformance with the Contract Documents, and free from defective workmanship and materials. Contractor further warrants that the Work will be free from material defects not intrinsic in the design or materials required in the Contract Documents. Contractor’s warranty does not include remedies for defects or damages caused by normal wear and tear during normal usage, use for a purpose for which the Project was not intended, improper or insufficient maintenance, modifications performed by Owner or others retained by Owner, or abuse.

5.1.6.2 If, prior to the Date of Final Acceptance and within one year after the date of Final Acceptance of the Work, any portion of the Work is found to be not in conformance with the Contract Documents (“Defective Work”), Owner shall promptly notify Contractor in writing. Unless Owner provides written acceptance of the condition, Contractor shall promptly correct the Defective Work at its own cost and time and bear the expense of additional services required for correction of any Defective Work for which it is responsible.
5.1.7 SAFETY Contractor shall have overall responsibility for safety precautions and programs in the performance of the Work, except that Contractor’s subcontractors shall also be responsible for the safety of persons or property in the performance of their work, and for compliance with the provisions of laws. Contractor shall prevent against injury, loss, or damage to persons or property by taking reasonable steps to protect its employees and other persons at the Worksite; materials and equipment stored at on-site or off-site locations for use in the Work; and property located at the Worksite and adjacent to Work areas, whether or not the property is part of the Work.

5.1.8 HAZARDOUS MATERIALS A Hazardous Material is any substance or material identified now or in the future as hazardous under any federal, state, or local law or regulation, or any other substance or material which may be considered hazardous or otherwise subject to statutory or regulatory requirement governing handling, disposal, or clean-up. Contractor shall not be obligated to commence or continue work until any Hazardous Material discovered at the Worksite has been removed, or rendered or determined to be harmless by Owner as certified by an independent testing laboratory and approved by the appropriate government agency. If Contractor incurs additional costs or is delayed due to the presence or remediation of Hazardous Material, Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Time.

5.1.9 MATERIALS BROUGHT TO THE WORKSITE Contractor shall be responsible for the proper delivery, handling, application, storage, removal, and disposal of all materials and substances brought to the Worksite by Contractor in accordance with the Contract Documents and used or consumed in the performance of the Work.

5.1.10 SUBMITTALS Contractor shall submit to Owner and Design Professional for review and approval all shop drawings, samples, product data, and similar submittals required by the Contract Documents. Submittals may be submitted in electronic form if required by §6.1.4. Contractor shall be responsible to Owner for the accuracy and conformity of its submittals to the Contract Documents. Contractor shall prepare and deliver its submittals to Owner and Design Professional in a manner consistent with the Schedule of the Work and in such time and sequence so as not to delay the performance of the Work or the work of Owner and others retained by Owner. Contractor submittals shall identify in writing for each submittal all changes, deviations, or substitutions from the requirements of the Contract Documents. The approval of any Contractor submittal shall not be deemed to authorize deviations, substitutions, or changes in the requirements of the Contract Documents unless a Change Order or Interim Directive specifically authorizes such deviation, substitution, or change. To the extent a change, deviation, or substitution causes an impact to the Contract Price or Contract Time, such approval shall be memorialized in a Change Order no later than seven (7) Days following approval by Owner. Neither Owner nor Design Professional shall make any change, deviation, or substitution through the submittal process without specifically identifying and authorizing such deviation to Contractor. Owner shall be responsible for review and approval of submittals with reasonable promptness to avoid causing delay. Contractor shall perform all Work strictly in accordance with approved submittals. Owner’s approval does not relieve Contractor from responsibility for Defective Work resulting from errors or omissions of any kind on the approved shop drawings.

5.1.11 CONCEALED OR UNKNOWN SITE CONDITIONS If a condition encountered at the Worksite is (a) a subsurface or other physical condition which is materially different from those indicated in the Contract Documents, or (b) an unusual and unknown physical condition which is materially different from conditions ordinarily encountered and generally recognized as inherent in the Work provided for in the Contract Documents, Contractor shall stop Work and give prompt written notice of the condition to Owner and Design Professional. Owner shall investigate and then issue an Interim Directive specifying the extent to which Owner agrees that a concealed or unknown condition exists and directing how Contractor is to proceed. Contractor shall not be required to perform any Work relating to the condition without the written mutual agreement of the Parties. Any change in the Contract Price or Contract Time as a result of the unknown condition shall be made by Change Order.
5.1.12 CUTTING, FITTING, AND PATCHING Contractor shall perform cutting, fitting, and patching necessary to coordinate the various parts of the Work and to prepare its Work for the work of Owner or others retained by Owner.

5.1.13 CLEANING UP Contractor shall regularly remove debris and waste materials at the Worksite resulting from the Work. Prior to discontinuing Work in an area, Contractor shall clean the area and remove all rubbish and its construction equipment, tools, machinery, waste, and surplus materials. Contractor shall minimize and confine dust and debris resulting from construction activities. At the completion of the Work, Contractor shall remove from the Worksite all construction equipment, tools, surplus materials, waste materials, and debris.

5.1.14 PROPERTY DAMAGE The Contractor agrees to compensate Owner, and other persons for any loss that they may suffer due to thefts or property damage caused by employees of the Contractor or its subcontractors. Should employees of the Contractor or its subcontractor cause damage or loss to public or private property, and/or furnishing and equipment contained therein, Contractor shall immediately notify Owner of the location, cause, and time of damage. Contractor agrees to repair or replace any such damage or loss, to Owner’s or property owner’s satisfaction, at the Contractor’s own expense.

5.2 LIENS The Project and all Work performed by the Contractor under this Contract shall be kept free from claims, liens, and charges. The Contractor shall be solely responsible for all services provided by any subcontractors, and shall provide to Owner an affidavit that all subcontractors have been paid in full prior to receipt of final payment by Owner. If any subcontractor files a lien or makes a claim against Owner, the Project, or any landowner on whose property the Project is being constructed, the Contractor shall hold Owner and such landowner harmless, and be liable for any and all expenses incurred by Owner or such landowner, inclusive of reasonable attorney’s fees, in the prosecution of the legal proceedings to remove such lien. ..

ARTICLE 6 OWNER’S RESPONSIBILITIES

6.1 OWNER’S RESPONSIBILITIES Any information or services to be provided by Owner shall be provided in a timely manner.

6.1.1 FINANCIAL INFORMATION Before commencing the Work and thereafter at the written request of Contractor, Owner shall provide Contractor with evidence of Project financing. Evidence of such financing shall be a condition precedent to Contractor’s commencing or continuing the Work. Contractor shall be notified prior to any material change in Project financing.

6.1.2 WORKSITE INFORMATION To the extent Owner has obtained, or is required to obtain the following Worksite information, then Owner shall provide Contractor the following:

6.1.2.1 information describing the physical characteristics of the Worksite, including surveys, Worksite evaluations, legal descriptions, data, or drawings depicting existing conditions, subsurface, and environmental studies, reports, and investigations;

6.1.2.2 tests, inspections, and other reports dealing with environmental matters, hazardous material, and other existing conditions, including structural, mechanical, and chemical tests required by the Contract Documents or by law; and

6.1.2.3 any other information or services requested in writing by Contractor which are required for Contractor’s performance of the Work and under Owner’s control.

6.1.3 BUILDING PERMIT, FEES, AND APPROVALS Except for those required of Contractor pursuant to this Agreement, Owner shall secure and pay for all other permits, approvals, easements,
assessments, and fees required for the development, construction, use, or occupancy of permanent structures or for permanent changes in existing facilities, including the building permit.

6.1.4 DOCUMENTS IN ELECTRONIC FORM If Owner requires that Owner, Design Professional, and Contractor exchange documents and data in electronic or digital form, before any such exchange, Owner, Design Professional, and Contractor shall agree on a written protocol governing all exchanges.

ARTICLE 7 SUBCONTRACTS

7.1 SUBCONTRACTS The Contractor shall, at the execution of the contract, notify the Owner in writing of the names of subcontractors and suppliers proposed for parts of the work, and shall not employ any that the Owner may, within a reasonable time, object to. Contractor agrees to bind every subcontractor and supplier (and require every subcontractor to so bind its subcontractors and suppliers) to all the provisions of this Agreement and the Contract Documents as they apply to the subcontractor’s and supplier’s portions of the Work.

7.2 Contractor shall be solely responsible for the payment of all subcontractors and suppliers, and shall provide to the Owner an affidavit that all subcontractors have been paid in full and a Final Lien Waiver and Release form from each such Subcontractor or Supplier prior to receipt of final payment. Owner and Owner and Design Professional shall have no liability for payment to any subcontractor or supplier. The Contractor shall hold Owner and Design Professional harmless for any liability and shall be solely responsible for any and all costs, inclusive of reasonable attorney fees in the event of any legal proceedings or liens for non-payment by a subcontractor or supplier.

ARTICLE 8 CONTRACT TIME

8.1 DATE OF COMMENCEMENT The Date of Commencement is the Agreement date on page one, unless otherwise set forth below: [________].

8.2 TIME The Work shall be finally complete by January 31, 2020, subject to adjustments as provided for in the Contract Documents. Time is of the essence for obligations of the Contract Documents.

8.3 LIQUIDATED DAMAGES If the Contractor fails to achieve Final Completion of the Work under this Contract on or before the time durations established under this Contract, the Contractor agrees to the deduction of the following:

8.3.1 Project Completion: Three Hundred Dollars ($300.00) as fixed and agreed liquidated damages for each calendar day of such delay until the Contract is complete and Finally Accepted by the Owner. Such deductions shall be made by Owner from payments due the Contractor. Liquidated damages are not to be construed in any sense as a penalty. Contractor agrees to waive any claims that such liquidated damages are not reasonably related to anticipated damages or Owner’s actual damages incurred because of delayed completion.

ARTICLE 9 SCHEDULE OF THE WORK

9.1 SCHEDULE OF THE WORK Before submitting its first application for payment, Contractor shall submit to Owner, and if directed, to Design Professional, a Schedule of the Work showing the dates on which Contractor plans to begin and to complete various parts of the Work, including dates on which information and approvals are required from Owner.

9.1.1 The Schedule of the Work submitted by Contractor shall meet the following Project Completion Date as stated in the Request for Proposals (the “RFP”) dated June 29, 2019: January 31, 2020.
9.1.2 Owner may determine the sequence in which the Work shall be performed, provided it does not unreasonably interfere with the Schedule of the Work. Owner may require Contractor to make reasonable changes in the sequence at any time during the performance of the Work in order to facilitate the performance of work by Owner or others. If Contractor subsequently incurs costs or is delayed, Contractor may seek equitable adjustment in the Contract Price and Contract Time under this Agreement.

9.1.3 The Schedule of the Work shall be based on the following permissible working hours and restrictions as stated in the RFP:

9.1.3.1 The Site is available for the Project Work from 7:00 a.m. to 5:00 p.m., Monday through Thursday and 7:00 am to 4:00 pm Friday. However, the work adjacent to the Ingleside Baptist Church may only be done between August 6, 2019 to January 31, 2020.

9.1.3.2 In case of an emergency that may require that work be done on Saturdays, Sundays, and Holidays, the Contractor shall request permission of Owner to do so. If, in the opinion of Owner, the emergency is bona fide, permission may be granted to the Contractor to work such hours as may be necessary. Also if in the opinion of the Owner a bona fide emergency exists, the Contractor may be directed to work such hours as may be necessary whether or not the Contractor requests permission to do so.

9.1.3.3 All driveway and parking areas must be kept clear and useable on Friday evenings after 4:00 pm, Saturdays, and Sundays. In addition, property owners must be notified at least 24 hours in advance if vehicle access to their property will be blocked. Efforts should be made to minimize the occurrence of inaccessible driveways.

ARTICLE 10 DELAYS AND EXTENSIONS OF TIME

10.1 If Contractor is delayed at any time in the commencement or progress of the Work by any cause beyond the control of Contractor, Contractor shall be entitled to an equitable extension of the Contract Time. Examples of causes beyond the control of Contractor include, but are not limited to, the following: (a) acts or omissions of Owner, Design Professional, or others; (b) changes in the Work or the sequencing of the Work ordered by Owner or arising from an Owner decision that impacts Contract Time; (c) encountering Hazardous Materials, or concealed and unknown conditions; (d) delay authorized by Owner pending dispute resolution or suspension by Owner; (e) transportation delays not reasonably foreseeable; (f) labor disputes not involving Contractor; (g) general labor disputes impacting the Project but not specifically related to the Worksite; (h) fire; (i) terrorism, (j) epidemics, (k) adverse governmental actions, (l) unavoidable accidents or circumstances; (m) adverse weather conditions not reasonably anticipated. Contractor shall process any requests for equitable extensions of Contract Time in accordance with the provisions of ARTICLE 12.

10.2 In addition, if Contractor incurs additional costs as a result of a delay that is caused by items (a) through (d) in §10.1, Contractor may be entitled to an equitable adjustment in the Contract Price subject to ARTICLE 12.

10.3 In the event delays to the Work are encountered for any reason, Contractor shall provide prompt written notice to Owner of the cause of such delays after Contractor first recognizes the delay. The Parties each agree to undertake reasonable steps to mitigate the effect of such delays.

10.4 NOTICE OF DELAY CLAIMS If Contractor requests an equitable extension of the Contract Time or an equitable adjustment in the Contract Price as a result of a delay, Contractor shall give Owner written
notice of the claim. If Contractor causes delay in the completion of the Work, Owner shall be entitled to recover its additional costs, subject to ARTICLE 17.

ARTICLE 11 ALLOWANCES

11.1 ALLOWANCES All allowances stated in the Contract Documents shall be included in the Contract Price. While Owner may direct the amounts of, and particular suppliers or subcontractors for, specific allowance items, if Contractor reasonably objects to a supplier or subcontractor, it shall not be required to contract with them. Owner shall select allowance items in a timely manner so as not to delay the Work. Allowances shall include the costs of materials and equipment delivered to the Worksite less applicable trade discounts and including requisite taxes, unloading and handling at the Worksite, and labor and installation, unless specifically stated otherwise. Contractor’s overhead and profit for the allowances shall be included in the Contract Price, but not in the allowances. The Contract Price shall be adjusted by Change Order to reflect the actual costs when they are greater than or less than the allowances.

ARTICLE 12 CHANGES

12.1 Contractor may request or Owner may order changes in the Work or the timing or sequencing of performance of the Work that impacts the Contract Price or the Contract Time. All such changes in the Work that affect the Contract Time or Contract Price shall be formalized in a Change Order, substantially in the format of Exhibit B.

12.2 The Parties shall negotiate in good faith an appropriate adjustment to the Contract Price or the Contract Time and shall conclude these negotiations as expeditiously as possible. Acceptance of the Change Order and any adjustment in the Contract Price or Contract Time shall not be unreasonably withheld. Contractor shall not be obligated to perform changes in the Work without a Change Order or Interim Directive.

12.3 INTERIM DIRECTIVES

12.3.1 Owner may issue a written Interim Directive directing a change in the Work before agreeing on an adjustment to the Contract Price or the Contract Time, or directing Contractor to perform Work that Owner believes is not a change.

12.3.2 The Parties shall negotiate expeditiously and in good faith for appropriate adjustments, as applicable, to the Contract Price or the Contract Time arising out of an Interim Directive. As the directed work is performed, Contractor shall submit its costs for such work with its application for payment. If there is a dispute as to the cost of the Work, Owner shall pay Contractor fifty percent (50%) of its actual (incurred or committed) cost to perform the work. In such event, the Parties reserve their rights as to the disputed amount, subject to the requirements of ARTICLE 19.

12.3.3 When Owner and Contractor agree upon the adjustment in the Contract Price or the Contract Time, for a change in the Work directed by an Interim Directed Change, such agreement shall be the subject of a Change Order.

12.4 COST OR CREDIT DETERMINATION

12.4.1 An increase or decrease in the Contract Price or the Contract Time resulting from a change in the Work shall be determined by one or more of the following methods:

(a) unit prices set forth in this Agreement or as subsequently agreed;
(b) a mutually accepted, itemized lump sum; or
(c) costs calculated on a basis agreed upon by Owner and Contractor plus five percent (5%) and overhead and five percent (5%) profit.
12.4.1.1 If a cost or credit determination cannot be agreed to above, the cost of the change in the Work shall be determined by the reasonable actual expense incurred or savings realized in the performance of the Work resulting from the change. If there is a net increase in the Contract Price, Contractor’s overhead and profit shall be adjusted accordingly. In case of a net decrease in the Contract Price, Contractor’s overhead and profit shall not be adjusted unless ten percent (10%) or more of the Project is deleted. Contractor shall maintain a documented itemized accounting evidencing the expenses and savings.

12.5 UNIT PRICES NOT USED.

ARTICLE 13 PAYMENT

13.1 SCHEDULE OF VALUES NOT USED.

13.2 PROGRESS PAYMENTS Contractor shall submit to Owner and, if directed, Design Professional a monthly application for payment no later than the fifth (5th) business day of the calendar month for the preceding calendar month. Contractor’s applications for payment shall be itemized and supported by Contractor’s schedule of values based on a percentage of completion and shall include any other substantiating data as required by this Agreement. Payment applications shall include payment requests on account of properly authorized Change Orders or Interim Directives. Owner shall pay the amount due on any payment application, less any amounts as set forth below, no later than fifteen (15) Days after Contractor has submitted a complete and accurate payment application. Owner may deduct, from any progress payment, such amounts as may be retained pursuant to §13.3.

13.3 RETAINAGE From each progress payment made before Substantial Completion Owner may retain ten percent (10%) of the amount otherwise due after deduction of any amounts as provided in §13.4. All amounts held as Retainage shall be paid to the Contractor after Final Completion and receipt of all lien waivers from Contractor, all subcontractors and suppliers, and other Project close-out documents as outlined below.

13.4 ADJUSTMENT OF CONTRACTOR’S PAYMENT APPLICATION Owner may adjust or reject a payment application or nullify a previously approved payment application, in whole or in part, as may reasonably be necessary to protect Owner from loss or damage based upon the following, to the extent that Contractor is responsible for such under this Agreement:

13.4.1 Contractor’s repeated failure to perform the Work as required by the Contract Documents;

13.4.2 loss or damage arising out of or relating to this Agreement and caused by Contractor to Owner or to others retained by Owner to whom Owner may be liable;

13.4.3 Contractor’s failure to properly pay either Subcontractors or Suppliers following receipt of payment from Owner for that portion of the work or for supplies, provided that Owner is making payments to Contractor in accordance with the terms of this Agreement;

13.4.4 rejected or Defective Work not corrected in a timely fashion;

13.4.5 reasonable evidence of delay in performance of the Work such that the Work will not be completed within the Contract Time;

13.4.6 reasonable evidence demonstrating that the unpaid balance of the Contract Price is insufficient to fund the cost to complete the Work; and

13.4.7 uninsured third-party claims involving Contractor or reasonable evidence demonstrating that third-party claims are likely to be filed unless and until Contractor furnishes Owner with adequate
security in the form of a surety bond, letter of credit, or other collateral or commitment which are sufficient to discharge such claims if established.

No later than seven (7) Days after receipt of an application for payment, Owner shall give written notice to Contractor disapproving or nullifying it or a portion of it, specifying the reasons for the disapproval or nullification. When the above reasons for disapproving or nullifying an application for payment are removed, payment shall be made for the amounts previously withheld.

13.5 PAYMENT DELAY If for any reason not the fault of Contractor, Contractor does not receive a progress payment from Owner within seven (7) Days after the time such payment is due, Contractor, upon giving seven (7) Days' written notice to Owner, and without prejudice to and in addition to any other legal remedies, may stop Work until payment of the full amount owing to Contractor has been received. If Contractor incurs costs or is delayed resulting from shutdown, delay, and start-up, Contractor may seek an equitable adjustment in the Contract Price or Contract Time.

13.6 SUBSTANTIAL COMPLETION When Substantial Completion of the Work or a designated portion thereof is achieved, Contractor shall prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion, and the respective responsibilities of Owner and Contractor for interim items such as security, maintenance, utilities, insurance, and damage to the Work, and fixing the time for completion of all items on the list accompanying the Certificate. The Certificate of Substantial Completion shall be submitted by Contractor to Owner for written acceptance of responsibilities assigned in the Certificate. Unless otherwise provided in the Certificate of Substantial Completion, warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or a designated portion.

13.7 FINAL COMPLETION When final completion has been achieved, Contractor shall prepare for Owner's acceptance a final application for payment stating that to the best of Contractor's knowledge, and based on Owner's inspections, the Work has reached final completion in accordance with the Contract Documents.

13.7.1 Final payment of the balance of the Contract Price shall be made to Contractor within fifteen (15) Days after Contractor has submitted to Owner a complete and accurate application for final payment and the following submissions:

(a) an affidavit declaring any indebtedness connected with the Work to have been paid, satisfied, or to be paid with the proceeds of final payment, so as not to encumber Owner's property;
(b) as-built drawings, manuals, copies of warranties, and all other close-out documents required by the Contract Documents;
(c) release of any liens from Contractor conditioned on final payment being received; and all subcontractors and suppliers;
(d) consent of any surety, if applicable; and
(e) any outstanding known and unreported accidents or injuries experienced by Contractor or its subcontractors at the Worksite.

13.8 Claims not reserved by Owner in writing with the making of final payment shall be waived except for claims relating to liens or similar encumbrances, warranties, Defective Work, and latent defects. Unless Contractor provides written identification of unsettled claims known to Contractor at the time of making application for final payment, acceptance of final payment constitutes a waiver of all such claims.

13.9 LATE PAYMENT Payments due but unpaid shall bear interest from the date payment is due at the statutory rate at the place of the Project.

13.10 JOINT CHECKS Owner reserves the right to make payment by check made payable jointly to Contractor and to any subcontractor or supplier, upon Owner's receipt of notice of non-payment by such
supplier or subcontractor, or failure of Contractor to provide an appropriate lien waiver from such subcontractor or supplier.

ARTICLE 14 INDEMNITY

14.1 To the fullest extent permitted by law, Contractor shall indemnify and hold harmless Owner, Owner’s officers, directors, members, consultants, agents, and employees and Design Professional (the “Indemnitees”) from all claims for bodily injury and property damage, other than to the Work itself and other property insured under §15.3, including reasonable attorneys’ fees, costs, and expenses, that may arise from the performance of the Work but only to the extent caused by the negligent or intentionally wrongful acts or omissions of Contractor, subcontractors, suppliers, or anyone employed directly or indirectly by any of them or by anyone for whose acts any of them may be liable. Contractor shall be entitled to reimbursement of any defense costs paid above Contractor’s percentage of liability for the underlying claim to the extent provided in the section immediately below.

14.2 To the fullest extent permitted by law, Owner shall indemnify and hold harmless Contractor, its officers, directors, or members, subcontractors, suppliers, or anyone employed directly or indirectly by any of them or anyone for whose acts any of them may be liable from all claims for bodily injury and property damage, other than property insured under §15.3, including reasonable attorneys’ fees, costs, and expenses, that may arise from the performance of work by Owner, Design Professional, or others retained by Owner, but only to the extent caused by the negligent or intentionally wrongful acts or omissions of Owner, Design Professional, or others retained by Owner. Owner shall be entitled to reimbursement of any defense costs paid above Owner’s percentage of liability for the underlying claim to the extent provided in the section immediately above.

14.3 NO LIMITATION ON LIABILITY In any and all claims against the Indemnitees by any employee of Contractor, anyone directly or indirectly employed by Contractor or anyone for whose acts Contractor may be liable, the indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor under Workers’ Compensation acts, disability benefit acts, or other employment benefit acts.

ARTICLE 15 INSURANCE

15.1 Before commencing the Work and as a condition precedent to payment, Contractor shall procure and maintain in force Workers’ Compensation Insurance, Employers’ Liability Insurance, Business Automobile Liability Insurance, and Commercial General Liability Insurance (CGL). The CGL policy shall include coverage for liability arising from premises, operations, independent contractors, products-completed operations, personal injury and advertising injury, contractual liability, and broad form property damage. Contractor shall maintain completed operations liability insurance for one year after Substantial Completion, or as required by the Contract Documents, whichever is longer. If requested, Contractor shall provide Owner with certificates of the insurance coverage required. Contractor’s Employers’ Liability, Business Automobile Liability, and CGL policies, as required in this article, shall be written with at least the following limits of liability:

15.1.1 Employers’ Liability Insurance:

   (a) $1,000,000.00 bodily injury by accident per accident;
   (b) $1,000,000.00 bodily injury by disease policy limit;
   (c) $1,000,000.00 bodily injury by disease per employee.

15.1.2 Business Automobile Liability Insurance $1,000,000.00 per accident or occurrence.

15.1.3 CGL Insurance:

   (a) $1,000,000.00 per occurrence;
(b) $2,000,000.00 general aggregate;
(c) $1,000,000.00 products/completed operations aggregate;
(d) $1,000,000.00 personal and advertising injury limit.

15.2 Employers’ Liability, Business Automobile Liability, and CGL coverage required in the subsection above may be arranged under a single policy for the full limits required or by a combination of underlying policies with the balance provided by excess or umbrella liability policies. Contractor shall maintain in effect all insurance coverage required in the section immediately above with insurance companies lawfully authorized to do business in the jurisdiction in which the Project is located. If Contractor fails to obtain or maintain any insurance coverage required under this Agreement, Owner may purchase such coverage and charge the expense to Contractor, or terminate this Agreement. To the extent commercially available to Contractor from its current insurance company, insurance policies required under §15.1 shall contain a provision that the insurance company or its designee must give Owner written notice transmitted in paper or electronic format: (a) 30 Days before coverage is nonrenewed by the insurance company and (b) within 10 Business Days after cancelation of coverage by the insurance company. Prior to commencing the Work and upon renewal or replacement of the insurance policies, Contractor shall furnish Owner with certificates of insurance until one year after Substantial Completion or longer if required by the Contract Documents. In addition, if any insurance policy required under §15.1 is not to be immediately replaced without lapse in coverage when it expires, exhausts its limits, or is to be cancelled, Contractor shall give Owner prompt written notice upon actual or constructive knowledge of such condition.

15.3 NOT USED.

15.4 ADDITIONAL LIABILITY COVERAGE Owner ☒ shall/ ☐ shall not require Contractor to purchase and maintain liability coverage. If required, Contractor shall provide:

15.4.1 ☒ ADDITIONAL INSURED. Owner shall be named as an additional insured on Contractor’s CGL insurance specified, for on-going operations and completed operations excess/umbrella liability, commercial automobile liability, and any required pollution liability, but only with respect to liability for bodily injury, property damage, or personal and advertising injury to the extent caused by the negligent acts or omissions of Contractor, or those acting on Contractor’s behalf, in the performance of Contractor’s Work for Owner at the Worksite. The insurance of the Contractor and its Subcontractors (both primary and excess) shall be primary to any insurance available to the Additional Insureds. Any insurance available to the Additional Insureds shall be excess and non-contributory.

ARTICLE 16 BONDS

16.1 Performance and Payment Bonds ☒ are/ ☐ are not required of Contractor. Such bonds shall be issued by a surety admitted in the state in which the Project is located and must be acceptable to Owner. Owner’s acceptance shall not be withheld without reasonable cause. The penal sum of the Payment Bond shall equal the penal sum of the Performance Bond.

ARTICLE 17 LIMITED MUTUAL WAIVER OF CONSEQUENTIAL DAMAGES

17.1 LIMITED MUTUAL WAIVER OF CONSEQUENTIAL DAMAGES Except for (a) losses covered by insurance required by the Contract Documents, or (b) specific items of damages excluded from this waiver as mutually agreed upon by the Parties and identified below, the Parties agree to waive all claims against each other for any consequential damages that may arise out of or relate to this Agreement. This article shall also apply to the termination of this Agreement and shall survive such termination. The Parties shall require similar waivers in contracts with subcontractors and others retained for the project.

ARTICLE 18 NOTICE TO CURE AND TERMINATION
18.1 NOTICE TO CURE A DEFAULT If Contractor persistently fails to supply enough qualified workers, proper materials, or equipment to maintain the approved Schedule of the Work or fails to make prompt payment to its workers, Subcontractors, or Suppliers, disregards law or orders of any public authority having jurisdiction, or is otherwise guilty of a material breach of a provision of this Agreement, Contractor may be deemed in default. If Contractor fails to commence and to continue satisfactory correction of such default with diligence and promptness within seven (7) days after written notification, then Owner shall give Contractor a second written notice to correct the default within a three (3) business Day period. If Contractor fails to promptly commence and continue satisfactory correction of the default following receipt of such second notice, Owner, without prejudice to any other rights or remedies, shall have the right to take reasonable steps it deems necessary to correct deficiencies and charge the cost to Contractor, who shall be liable for such payments including reasonable overhead, profit, and attorneys’ fees.

18.2 TERMINATION BY OWNER FOR DEFAULT Upon expiration of the second notice for default period pursuant to §18.1, Owner may terminate this Agreement by written notice. Termination for default is in addition to any other remedies available to Owner. If Owner’s costs arising out of Contractor’s failure to cure, including the costs of completing the Work and reasonable attorneys’ fees, exceed the unpaid Contract Price, Contractor shall be liable to Owner for such excess costs. If Owner’s costs are less than the unpaid Contract Price, Owner shall pay the difference to Contractor. If Owner exercises its rights under this section, upon the request of Contractor, Owner shall furnish to Contractor a detailed accounting of the costs incurred by Owner.

18.2.1 Owner shall make reasonable efforts to mitigate damages arising from Contractor default and shall promptly invoice Contractor for all amounts due.

18.3 TERMINATION BY OWNER FOR CONVENIENCE
18.3.1 Owner may elect to terminate all or a part of this Contract for its convenience by providing at least ten (10) days prior written notice to the Contractor. Upon receipt of such Notice of Termination, Contractor shall immediately cease all work on such portion of the Work that is to be terminated, and shall take all necessary measures to protect and preserve portions of the Work already in progress or completed.
18.3.2 In the event of such termination for convenience, Contractor shall be paid for all work substantially completed in accordance with the Schedule of Values, and the necessary costs of termination and demobilization.

18.4 TERMINATION BY CONTRACTOR Seven (7) Days after Owner’s receipt of written notice from Contractor, Contractor may terminate this Agreement if the Work has been stopped for a thirty (30) day period through no fault of Contractor for any of the following reasons: (a) under court order or order of other governmental authorities having jurisdiction; (b) as a result of the declaration of a national emergency or other governmental act during which, through no act or fault of Contractor, materials are not available.

18.4.1 In addition, upon seven (7) Days’ written notice to Owner, and an opportunity to cure within three (3) Days, Contractor may terminate the Agreement if Owner does any of the following: (a) fails to furnish reasonable evidence that sufficient funds are available and committed for the entire cost of the Project in accordance with §6.1.1; (b) assigns this Agreement over Contractor’s reasonable objection; (c) fails to pay Contractor in accordance with this Agreement and Contractor has stopped work in compliance with applicable notice provisions; or (d) otherwise materially breaches this Agreement.

18.4.2 Upon termination by Contractor pursuant to this Agreement, Contractor shall be entitled to recover from Owner payment for all Work executed and for any proven loss, cost, or expense in connection with the Work, including all demobilization costs plus reasonable overhead and profit.
18.5 OBLIGATIONS ARISING BEFORE TERMINATION Even after termination the provisions of this Agreement still apply to any Work performed, payments made, events occurring, costs charged or incurred, or obligations arising before the termination date.

ARTICLE 19 DISPUTE MITIGATION AND RESOLUTION

19.1 CLAIMS FOR ADDITIONAL COST OR TIME Except as provided in §10.3 and §10.4 for any claim for an increase in the Contract Price or the Contract Time, Contractor shall give Owner written notice of the claim within fourteen (14) Days after the occurrence giving rise to the claim or within fourteen (14) Days after Contractor first recognizes the condition giving rise to the claim, whichever is later. Except in an emergency, notice shall be given before beginning the Work. Any change in the Contract Price or the Contract Time resulting from such claim shall be authorized by Change Order.

19.2 WORK CONTINUANCE AND PAYMENT Contractor shall continue the Work and maintain the Schedule of the Work during any dispute resolution proceedings. If Contractor continues to perform, Owner shall continue to make payments in accordance with the Agreement.

19.3 DIRECT SETTLEMENT DISCUSSIONS If a dispute arises out of or relates to this Agreement or its breach, the Parties shall endeavor to settle the dispute through direct discussions. Within five (5) Business Days, the Parties’ representatives, who shall possess the necessary authority to resolve such matter and who shall record the date of first discussions shall conduct direct discussions and make a good faith effort to resolve such dispute.

19.4 MEDIATION Disputes between Owner and Contractor not resolved by direct discussion shall be submitted to mediation. The Parties shall select the mediator within fifteen (15) Days of the request for mediation. Engaging in mediation is a condition precedent to any form of binding dispute resolution.

19.5 BINDING DISPUTE RESOLUTION If neither direct discussions nor mediation successfully resolves the dispute, the Parties shall submit the matter to the binding dispute resolution procedure selected below:

☐ ARBITRATION The Parties choose binding arbitration decided by arbitrator in accordance with the Construction Industry Arbitration Rules of the AAA then in effect. Arbitration will be used for any claim or dispute related to this Agreement. EACH PARTY WAIVES THEIR RIGHT TO BE HEARD IN A COURT OF LAW, with or without a jury. This agreement to arbitrate shall be specifically enforceable under the prevailing arbitration law. An arbitrator’s award shall be final and binding upon the Parties, and judgment may be entered upon it in any court having jurisdiction.

☒ LITIGATION Litigation in either the state or federal court having jurisdiction of the matter in the location of the Project.

If not indicated, then litigation is the default and not arbitration.

19.5.1 COSTS The costs of any binding dispute resolution procedures and reasonable attorneys’ fees shall be borne by the non-prevailing Party, as determined by the adjudicator of the dispute.

19.5.2 VENUE The Project location shall serve as the venue.

19.5.3 Neither Party may commence arbitration if the claim or cause of action would be barred by the applicable statute of limitations had the claim or cause of action been filed in a state or federal court. Receipt of a demand for arbitration by the person or entity administering the arbitration shall constitute the commencement of legal proceedings for the purposes of determining whether a claim or cause of action is barred by the applicable statute of limitations. If, however, a state or federal court exercising jurisdiction over a timely filed claim or cause of action orders that the claim or cause of action be submitted to arbitration, the arbitration proceeding shall be deemed commenced as of
the date the court action was filed, provided that the Party asserting the claim or cause of action files its demand for arbitration with the person or entity administering the arbitration within thirty (30) Days after the entry of such order.

ARTICLE 20 MISCELLANEOUS

20.1 EXTENT OF AGREEMENT Except as expressly provided, this Agreement is for the exclusive benefit of the Parties and not for the benefit of any third party. This Agreement represents the entire and integrated agreement between the Parties, and supersedes all prior negotiations, representations, or agreements, either written or oral.

20.2 ASSIGNMENT Neither Party shall assign its interest in this Agreement, in whole or in part, nor any right to the proceeds thereof, without the written consent of the other Party. The terms and conditions of this Agreement shall be binding upon both Parties, their partners, successors, assigns, and legal representatives.

20.3 GOVERNING LAW The law in effect at the location of the Project shall govern.

20.4 NOTICE Unless changed in writing, a Party's address indicated in Article 1 shall be used when delivering notice to a physical address. Except for Agreement termination and as otherwise specified in the Contract Documents, notice is effective upon transmission by any effective means, including U.S. postal service and overnight delivery service.

20.5 JOINT DRAFTING The Parties expressly agree that this Agreement was jointly drafted, and that they both had opportunity to negotiate terms and to obtain assistance of counsel in reviewing terms before execution. This Agreement shall be construed neither against nor in favor of either Party, but shall be construed in a neutral manner.

20.6 NON-DISCRIMINATION IN EMPLOYMENT In the performance of this Contract, the Contractor shall not discriminate or permit the discrimination against any person because of sex, race, color, religion, ancestry, marital status, age, national origin or disability.

20.7 OFFICIALS NOT TO BENEFIT No employee of Elizabeth River Project may be admitted to any part or share of this contract, or to any benefit arising from it. This prohibition does not apply to the extent this contract is with a corporation for the corporation’s general benefit.

20.8 SEVERABILITY If any provision(s) of this Contract shall for any reason be held to be invalid or unenforceable, the invalidity or unenforceability of such provision(s) shall not affect any of the remaining provision(s) of the Contract and this Contract shall be construed and enforced to the fullest extent permitted by law as if such invalid and unenforceable provision(s) had not been contained herein.

20.9 NOTICES

All notices shall be in writing and shall be delivered in person or transmitted by certified mail, return receipt requested.

Notices required to be given to the Contractor shall be addressed to:

_______________________________________________________

_______________________________________________________

Notices required to be given to Elizabeth River Project will be addressed to:

The Elizabeth River Project
IN WITNESS WHEREOF, the parties have duly executed this Contract effective as the date first above written.

<table>
<thead>
<tr>
<th>OWNER: THE ELIZABETH RIVER PROJECT</th>
<th>CONTRACTOR: ________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>BY: __________________________</td>
<td>BY: ______________________</td>
</tr>
<tr>
<td>NAME: _______________________</td>
<td>NAME: _____________________</td>
</tr>
<tr>
<td>TITLE: _______________</td>
<td>TITLE: _______________</td>
</tr>
</tbody>
</table>

| WITNESS: __________________      | WITNESS: _______________    |
| NAME: _______________________    | NAME: _____________________|
| TITLE: _______________           | TITLE: _______________      |
EXHIBIT A
SCOPE OF WORK

1. General Scope of Work.

   The Scope of Work from the RFP, dated June 29, 2019, Sections C (“Scope of Work”) and D (“General Provisions”) are incorporated herein by reference.

2. Permits.

   a. Permits to be obtained by Owner: None

3. Project Conditions

   a. Protect existing utilities, paving, walls, and any other facilities from damages caused by operations associated with the Project. Do not interrupt utilities serving facilities occupied by the property owner or others. The Contractor is responsible for any and all damages to existing facilities, and subsequent damages resulting from damage or disruption to existing facilities and utilities.

   b. Dewater the Project site prior to, and during, the Project as necessary until the work concludes.

   c. Parking and Storage: Parking is available at the site for employees and equipment.

   d. Utilities and Services: Electrical, water, and restrooms are not available at the project site.

   e. Fence the perimeter of the active Project site with orange construction fence at the conclusion of each work day.

   f. All driveway and parking areas must be kept clear and useable on Friday evenings after 4:00 pm, Saturdays, and Sundays. In addition, property owners must be notified at least 24 hours in advance if vehicle access to their property will be blocked. Efforts should be made to minimize the occurrence of inaccessible driveways.

4. Necessary Details, Not Specifically Mentioned.

   a. All work called for in the specifications and not shown on the plans, or shown on the plans and not called for in the specifications, shall be furnished and executed by the Contractor as if designed in both these ways. Should any works or materials be required which are not denoted on the plans and specifications either directly or indirectly, but which are nevertheless necessary for the proper carrying out of the intent thereof, it is understood and agreed that the same is implied and required and the contractor shall perform such work and furnish such materials as fully as if they were completely delineated and described.

   b. Should any detail be omitted from the drawings or specifications, or should any errors appear in either, it shall be the duty of the Contractor to notify the Design Professional. In no case shall the contractor proceed with the work without notifying and receiving
definite instructions from the Design Professional. Work wrongly constructed without such notification shall be corrected by the contractor at his own cost.

5. Approved Equals.

a. In all specifications where a material or article is defined by describing a proprietary product or by using the name of a vendor or manufacturer, it can be assumed that an approved equal can be substituted. The use of a named product is an attempt to set a particular standard of quality and type that is familiar to the Design Professional. Such references are not intended to be restrictive. However, the Design Professional shall decide if a product does in fact meet or exceed the quality of the specifications listed in the solicitation. It shall be the responsibility of the vendor that claims his product is an equal to provide documentation to support such a claim.

6. Delivery, Storage, And Handling

a. Deliver and store products in a manner to protect them from damage and contamination, and to comply with manufacturer's storage instructions.

b. Packaged Materials: Deliver packaged materials in original, unopened bags or containers, each bearing the name of the manufacturer and the name, composition, and quantity of the material.

c. Bulk Materials: If stockpiling is necessary, store materials in approved locations, as directed by the Center's Representative. Prohibit vehicular and pedestrian traffic over stockpiled materials.

d. Stockpile materials in such a manner that natural drainage is not obstructed and that no off-site sediment transmission will result. Stockpile materials away from edge of excavations. Do not stockpile materials within drip line of existing trees to remain.

e. Place, grade, and shape stockpiles to drain surface water, with a maximum 2:1 side slope. Protect soil from air and water erosion. Place sediment control devices around stockpiles as directed by Center's Representative.

7. Workmanship

a. First class work shall be performed and all materials furnished in carrying out the contract shall be of character and quality required by the specifications. Where no standard is specified for such work or materials, they shall be the best of their respective kinds. Any unsatisfactory work done or materials furnished, at whatever time they may be discovered, shall be immediately removed and satisfactorily replaced by the Contractor, when notified to do so by the Center.

b. The Contractor shall employ only competent labor specifically experienced in the proposed work. Any employee who is careless, incompetent, disorderly, or who uses abusive or profane language shall be discharged or removed from the project on request of the Center.

c. The work shall be under the general supervision of the Center and their duly appointed field representatives, in accordance with a general plan agreed upon between the Center and the Contractor. The Contractor shall appoint a competent superintendent and necessary foreman for the direct supervision of the work. The supervisor shall be on the job at all times that the work is in progress, and shall be available during non-working hours in event of an emergency.

8. Submittals
a. At the time of Substantial Completion, furnish copies of material verifications such as load tickets, invoices, sales slips, test results, and similar items as specified.

9. Clean Up

a. During soil preparation and fine grading operations, keep pavements and surrounding areas clean, and maintain work area in an orderly condition.
b. Protect prepared areas from damage due to landscape operations, operations by other contractors and trades, and others. Repair damaged areas prior to planting.
c. Promptly remove surplus materials and debris resulting from said Contract and dispose of legally off site.
d. Do not remove erosion and sediment controls until the site is properly stabilized.
EXHIBIT B
CONTRACT DOCUMENTS

1. Request for Proposals (RFP) dated 6/29/19.

2. Plans and Drawings by Center for Watershed Protection (CWP) dated __________.

3. Permits.
Exhibit C
Change Order Form

CONTRACT NO. ______________  CHANGE ORDER NO. _______ DATE: ________________

Name of Project: Ingleside Road and E. Princess Anne Road Stormwater Management Retrofits

Contractor: _____________________  

This Change Order is executed by Owner and Contractor as a modification to the Contract, and represents a full and complete settlement of all additional compensation and contract time due the Contractor for the described change, and contractor hereby waives and released any additional claims for compensation or time including without limitation claims for delay, impact, or any other cost.

The following changes are hereby made to the CONTRACT DOCUMENTS:

<table>
<thead>
<tr>
<th>#</th>
<th>Description</th>
<th>Change in Cost (-)</th>
</tr>
</thead>
</table>

TOTAL CHANGE = $ ________

DESCRIPTION OF CHANGE OR CHANGED CONDITION::

Change to CONTRACT PRICE: $ ______

Original CONTRACT PRICE: $ ______

Current CONTRACT PRICE adjusted by previous CHANGE ORDER: $ ______

The CONTRACT PRICE due to this CHANGE ORDER will be increased by: $ ______

The new CONTRACT PRICE including this CHANGE ORDER will be: $ ______

CHANGE TO CONTRACT TIME:
The CONTRACT TIME will be increased by ___ calendar days. The date for completion of all work will be ___ calendar days from the Notice to Proceed.

Requested: ________________________________
(Elizabeth River Project)  (Date)

Recommended: ________________________________
(Project Manager)  (Date)

Accepted: ________________________________
(Contractor)  (Date)

Authorized: ________________________________
(President)  (Date)
EXHIBIT D

CONTRACT PRICE

[INSERT BID PRICE SHEETS SUBMITTED BY CONTRACTOR FOR PROJECTS AND SUBPROJECTS SELECTED BY OWNER FOR AWARD]
EXHIBIT E
CONTRACTOR’S PARTIAL LIEN WAIVER AND RELEASE

TO: Owner: ___________________________

Project: ___________________________

Invoice/App. #: _____________________

For the Period Ending: _______________

The undersigned Contractor, in consideration of the payments previously made and payment for the period covered by
the current invoice/application set forth above, hereby waives and releases all liens and claims of right to liens and for the imposition
of personal liability regarding bond rights, all rights to file or claim any such liens in the future, and all claims, demands, changes,
damages and causes of action against the owner of the real property (“Owner”), and the real property on which the Project is
located, in any manner arising out of work, labor, services, equipment or materials, performed or furnished by Contractor, its
subcontractors and suppliers, in connection with the Project and Contract Agreement through the period ending set forth above.

Except as noted below, Contractor acknowledges and represents that for the period and work covered by all previous
invoices for which Contractor has received payment:

1. Contractor has paid in full all amounts for subcontracts, labor, materials and rented equipment, and that none of
such entities have any claims, demands or rights to file or claim liens against the property or to assert any
personal liability against Contractor or Owner.

2. Subcontractor has properly applied previous payments to pay all outstanding invoices and applications for
payment related to the Project.

3. Contractor is aware of no claims nor any circumstances that could give rise to any future claims against
Contractor, Owner or other Subcontractor on the Project.

4. All payroll, withholding, sales and other taxes, union benefits, insurance premiums and any other amount
required by law or agreement to be paid in connection with labor, materials and equipment for the Project have
been paid in full.

List exceptions, if any:

Contractor represents that the amounts set forth below are correct and that the amount of the current payment due will be
promptly applied to full payment of all outstanding amounts due from Contractor to others in connection with the Project.

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract Sum to Date</td>
<td>$</td>
</tr>
<tr>
<td>Total Completed and Stored to Date</td>
<td>$</td>
</tr>
<tr>
<td>Total Retention to Date</td>
<td>$</td>
</tr>
<tr>
<td>Total Earned Less Retention</td>
<td>$</td>
</tr>
<tr>
<td>Less Previous Payments</td>
<td>$</td>
</tr>
<tr>
<td>Current Payment Due</td>
<td>$</td>
</tr>
</tbody>
</table>

I hereby certify, under penalties of perjury, that the facts, information and representations set forth above are true and
accurate to the best of my knowledge, information and belief.

BY: _______________________________________
Name of Contractor

BY: _______________________________________
(Signature, Printed Name and Title), Duly Authorized Agent of Contractor

STATE OF __________________

(CITY)(COUNTY) OF __________________

On this _____ day of __________, 20___, appeared before me ___________________, and he/she
made oath in due form of law that the facts, information and representations set forth in the foregoing Contractor’s Partial Lien
Waiver and Release, are true and accurate to the best of his/her knowledge, information and belief.

________________________________________   My Commission Expires: ___________________
Notary Public
EXHIBIT F
CONTRACTOR’S FINAL LIEN WAIVER AND RELEASE

TO:                               Owner: ___________________________

Project: __________________________

Date: _____________________________

The undersigned Contractor, in consideration of the final payment set forth herein, hereby waives and releases all liens and claims of right to liens and for the imposition of personal liability regarding bond rights, all rights to file and/or claim any such liens in the future, and all claims, demands and causes of action against the owner of the real property (“Owner”), and the real property on which the Project is located, in any manner arising out of work, labor, services, equipment or materials, performed or furnished by Contractor, its subcontractors and suppliers, in connection with the Project and Contract Agreement. Contractor further agrees to indemnify and save harmless, the Owner, its successors and assigns from all causes of action, suits, debts, contracts, damages, judgments, decrees, claims, demands, liens, rights to assert liens, awards and expenses, including attorney’s fees, in law, equity or otherwise, which Contractor, its subcontractors and suppliers, their successors and assigns and any persons claiming through them or based upon their acts or omissions ever had, now have or hereafter may have against the Owner, and any real property or improvements of Owner, in any manner relating to or arising in connection with the above referenced Project.

Contractor represents that the amounts set forth below are correct and that the amount of the current payment due will be promptly applied to full payment of all outstanding amounts due from Contractor to others in connection with the Project.

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final Contract Sum</td>
<td>$____________</td>
</tr>
<tr>
<td>Less Previous Payments</td>
<td>$____________</td>
</tr>
<tr>
<td>Current Payment Due</td>
<td>$____________</td>
</tr>
</tbody>
</table>

I hereby certify, under penalties of perjury, that the facts, information and representations set forth above are true and accurate to the best of my knowledge, information and belief.

BY: ________________________________________
Name of Contractor

BY: ________________________________________
(Signature, Printed Name and Title), Duly Authorized Agent of Contractor

STATE OF ________________________
(CITY)(COUNTY) OF ________________________

On this _____ day of ________________, 20____, appeared before me ____________________, and he/she made oath in due form of law that the facts, information and representations set forth in the foregoing Contractor’s Final Lien Waiver and Release, are true and accurate to the best of his/her knowledge, information and belief.

_______________________________________   My Commission Expires: ____________________
Notary Public
Attachment D - Safety Criteria Questionnaire
SAFETY, HEALTH & ENVIRONMENTAL
SUBCONTRACTOR SAFETY CRITERIA QUESTIONNAIRE

Company Name: ____________________________ Date: ____________________________
Address: ________________________________________________________________
City: ____________________ State: ________________________________

List Service(s) to be provided:

1. Experience Modification Rates
   a) List your firm’s Experience Modification Rate (EMR) for the three (3) most recent years. *(Information is available from your Workers’ Compensation Insurance Carrier)*

<table>
<thead>
<tr>
<th>Year</th>
<th>Interstate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   b) If your organization does not have an EMR or your EMR is greater than 1.10, please explain why.

   ________________________________________________________________

2. Please consolidate your firm’s OSHA Form 300 injury and illness data for the last three (3) years and complete the following:

<table>
<thead>
<tr>
<th>Data</th>
<th>Year</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Number of Lost Workday Cases (not days lost)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) Number of Restricted Workday Cases (not restricted days)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) Number of Medical Treatment Cases* (not including first aid)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) Total Recordable Cases (a + b + c)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) Total Corporate Hours Worked (hourly and salaried employees)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f) Recordable Case Frequency Rate (RCFR) (td x 200,000) / e</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   *Medical Treatment Case is a case in which an on-the-job injury requires other than first aid treatment (and is not considered a restricted or lost workday) as defined by the U.S. Bureau of Labor Statistics recordability criteria (i.e., prescribed medication, physical therapy - more than one visit, fractures, imbedded foreign body, etc.) First aid injury treatment cases are not required to be added to the OSHA Form 300 log.

   a) Does your organization have fewer than 10 employees? ☐ Yes ☐ No

   **Note:** If you check Yes, you are required to only complete rows d) and e) in the above table.

3. List any fatalities your firm has had in the last three (3) years. Include location, cause, and corrective actions. *(Attach supplemental information as required)*

   ________________________________________________________________
   ________________________________________________________________

4. List any OSHA REPEAT, WILLFUL, or CRIMINAL citations your firm has had in the last three (3) years. Please describe. *(Attach supplemental information as required)*

   ________________________________________________________________
   ________________________________________________________________
ATTACHMENT I
DESIGNS FOR 847-925 INGLESIDE ROAD STORMWATER RETROFITS
(SEE LINK BELOW RFP ON ELIZABETH RIVER PROJECT'S WEBSITE FOR DRAWINGS)
ATTACHMENT J
DESIGNS FOR 4605-4625 E. PRINCESS ANNE ROAD STORMWATER RETROFIT
(SEE LINK BELOW RFP ON ELIZABETH RIVER PROJECT’S WEBSITE FOR DRAWINGS)
REPORT OF
SUBSURFACE
EXPLORATION
AND
GEOTECHNICAL
ENGINEERING
SERVICES

Elizabeth River BMPs
Norfolk, Virginia
GET Project No: VB18-158G
May 4, 2018

PREPARED FOR:
TO:  Center for Watershed Protection  
      3290 North Ridge Road, Suite 290  
      Ellicott City, MD 21043

Attn:  Ms. Carol Wong, P.E.

RE:  Report of Subsurface Exploration and Geotechnical Engineering Services  
     Elizabeth River BMPs  
     Norfolk, Virginia  
     G E T Project No:  VB18-158G

Dear Ms. Wong:

In compliance with your instructions, we have completed our Subsurface Exploration and 
Geotechnical Engineering Services for the above referenced project. The results of this study, 
together with our recommendations, are presented in this report.

Often, because of design and construction details that occur on a project, questions arise 
concerning subsurface conditions. G E T Solutions, Inc. would be pleased to continue its role 
as Geotechnical Engineer during the project implementation.

We appreciate the opportunity to work with you on this project. We trust that the information 
contained herein meets your immediate need, and should you have any questions or if we could 
be of further assistance, please do not hesitate to contact us.

Respectfully Submitted,  
G E T Solutions, Inc.

Edward Setnicky  
Project Geologist

Bruce Spiro, P.E.  
Principal Engineer  
VA Lic. # 015791

Copies:  (1) Client
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APPENDIX I  BORING LOCATION PLAN
APPENDIX II CLASSIFICATION SYSTEM FOR SOIL EXPLORATION
APPENDIX III SUMMARY OF LABORATORY CLASSIFICATION RESULTS
APPENDIX IV BORING LOGS
APPENDIX V GENERALIZED SOIL PROFILES
APPENDIX VI HYDRAULIC CONDUCTIVITY WORKSHEETS
1.0 PROJECT INFORMATION

1.1 Project Authorization

G E T Solutions, Inc. has completed our subsurface exploration and geotechnical engineering services for the proposed Elizabeth River BMPs project located in Norfolk, Virginia. The geotechnical engineering services were conducted in general accordance with the scope presented in G E T Proposal No. PVB18-239G Rev-2. Authorization to proceed with our services was received from the client in the form of an executed Work Order Form dated March, 23, 2018.

1.2 Project Site Location and Description

The project sites are located on Ingleside Road between Gatling Avenue and Ladd Avenue and off of East Princess Anne Road and Juniper Street in the Norfolk, Virginia. A site vicinity map is provided in Figure 1 with the project site indicated below and on the following page in Figure 2.

Figure 1: Project Site Vicinity Map
1.3 Project Construction Description

The proposed construction at these project sites will consist of installing new storm water management areas.

If any of the noted information is incorrect or has changed, please inform G E T Solutions, Inc. so that we may amend the recommendations presented in this report, if appropriate.

1.4 Purpose and Scope of Services

The purpose of this study was to obtain information on the general subsurface conditions at the proposed project site. The subsurface conditions encountered were then evaluated with respect to the available project characteristics. In this regard, engineering assessments for the following items were formulated:

1. General assessment of the soils revealed by the borings performed at the proposed development.

2. General location and description of potentially deleterious material encountered in the borings that may interfere with construction progress or structure performance, including existing fills or surficial/subsurface organics.
3. Determine pertinent information regarding groundwater and subsurface permeability conditions. (Installation of temporary groundwater monitoring wells and infiltration testing).

The scope of services did not include an environmental assessment for determining the presence or absence of wetlands or hazardous or toxic material in the soil, bedrock, surface water, groundwater or air, on or below or around this site. Prior to development of this site, an environmental assessment is advisable.

2.0 FIELD AND LABORATORY PROCEDURES

2.1 Field Exploration

In order to explore the general subsurface soil types and to aid in developing associated design parameters and recommendations, the following exploration program was performed:

- Six (6) 10-foot deep SPT borings (designated as B-1 through B-6) were drilled within the proposed BMP footprints.
- Four (4) temporary groundwater monitoring wells were installed adjacent to the boring locations to obtain groundwater level readings.
- One (1) infiltration test was performed adjacent to a temporary groundwater monitoring well (B-5) and within the infiltration design alignment at the request of the client.

Standard Penetration Tests were performed in the field in general accordance with ASTM D 1586. The tests were performed continuously from the existing ground surface to depths of 10 feet. The soil samples were obtained with a standard 1.4” I.D., 2” O.D., 30” long split-spoon sampler. The sampler was driven with blows of a 140 lb. hammer falling 30 inches, using a safety hammer. The number of blows required to drive the sampler each 6-inch increment of penetration was recorded and is shown on the boring logs. The sum of the second and third penetration increments is termed the SPT N-value (uncorrected for automatic hammer and overburden pressure). A representative portion of each disturbed split-spoon sample was collected with each SPT, placed in a sealed glass jar, and returned to our laboratory for review.

Temporary groundwater monitoring wells were installed at borings B-1 and B-4 through B-6 to a depth of 10 feet below the existing site grades for the purpose of obtaining groundwater level readings in the days following initial drilling. The temporary groundwater monitoring wells were installed by means of hollow stem auger (HSA) drilling procedures.

The boring locations were established by the design team and staked in the field by a representative of G E T Solutions, Inc. with the use of a hand-held Global Positioning System (GPS) device and by corroborating with easily identifiable landmarks. Upon completion of the soil borings, the holes were backfilled with the soil clippings. Approximate soil boring locations are shown on the attached “Boring Location Plan” (Appendix I) which was developed by the design Civil Engineer.
2.2 Field and Laboratory Testing

Soil testing provided by G E T Solutions, Inc. was performed in accordance with American Society for Testing and Materials (ASTM) standards. All soils and materials tests were performed in our AASHTO resource (formally AMRL) and US Army Corps of Engineers certified Virginia Beach laboratory.

2.2.1 Soil Classification and Index Testing

Representative portions of all soil samples collected during drilling operations were labeled, preserved and transferred to our laboratory in accordance with ASTM D4220 for classification and analysis. Soil descriptions on the boring logs are provided using visual-manual methods in general accordance with ASTM D2488 using the Unified Soil Classification System (USCS). Soil samples that were selected for index testing were classified in general accordance with ASTM D2487. It should be noted that some variation can be expected between samples classified using the visual-manual procedure (ASTM D2488) and the USCS (ASTM D2487). A summary of the soil classification system is provided in Appendix II.

Representative split-spoon soil samples were selected and subjected to natural moisture, #200 sieve wash, and Atterberg Limits testing in order to corroborate the visual classification. These test results are presented in Appendix III and on the soil test boring logs provided in Appendix IV. Generalized subsurface soil profiles are provided in Appendix V.

3.0 SITE AND SUBSURFACE CONDITIONS

3.1 Site Geology

The project site lies within a major physiographic province called the Atlantic Coastal Plain. Numerous transgressions and regressions of the Atlantic Ocean have deposited marine, lagoonal, and fluvial (streamlain) sediments. The regional geology is very complex, and generally consists of interbedded layers of varying mixtures of sands, silts and clays. Based on our review of existing geologic and soil boring data, the geologic stratigraphy encountered in our subsurface explorations generally consisted of marine deposited Sands, Silts and Clays.

3.2 Recent Land Reclamation and Site Development

Based on a review of historical United States Geological Survey (USGS) topographic maps of Virginia Beach, Virginia, and Norfolk, Virginia produced between the years of 1902 and 2016, the project site does not appear to be located within a previously reclaimed area.
3.3 Subsurface Soil Conditions

A summary of the subsurface soil conditions encountered at the SPT boring locations is presented in Table I.

**Table I – Subsurface Soil Conditions**

<table>
<thead>
<tr>
<th>Average Depth (ft)</th>
<th>Stratum</th>
<th>Description</th>
<th>Ranges of SPT(^{(1)}) N-Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 0.08 - 0.75</td>
<td>Surficial</td>
<td>1 to 9 inches of Topsoil</td>
<td>-</td>
</tr>
<tr>
<td>0.08 - 0.75 to 2</td>
<td>Poss. FILL</td>
<td>Gray-Tan Lean CLAY (CL)</td>
<td>-</td>
</tr>
<tr>
<td>0.08 - 0.75 to 2 - 6</td>
<td>I</td>
<td>Gray and Orange and Brown CLAY (CL, CH)</td>
<td>3 - 11</td>
</tr>
<tr>
<td>2 - 6 to 10</td>
<td>II</td>
<td>Gray-Tan, Tan, and Orange SAND (SC, SC- SM, SP-SM, SM)</td>
<td>4 - 19</td>
</tr>
</tbody>
</table>

Note(s): (1) SPT = Standard Penetration Test, N-Values in Blows-per-foot (uncorrected)

The subsurface descriptions are of a generalized nature provided to highlight the major soil strata encountered. The records of the subsurface exploration are included in Appendix IV (Boring Log sheets) and in Appendix V (Generalized Soil Profiles) which should be reviewed for specific information as to the individual borings. The stratifications shown on the records of the subsurface exploration represent the conditions only at the actual boring locations. Variations may occur and should be expected between boring locations. The stratifications represent the approximate boundary between subsurface materials and the transition may be gradual. It is noted that the “Topsoil” designation references the presence of surficial organic laden soil, and does not represent any particular quality specification. It is recommended that this material be tested for approval prior to use as topsoil.

3.4 Groundwater Discussion

The groundwater level was recorded at the boring locations and as observed through the relative wetness of the recovered soil samples during the drilling operations. The initial groundwater levels were measured to occur at depths of 3.5 to 8 feet below current grades at the boring locations. The boreholes were backfilled upon completion for safety considerations. As such, the reported groundwater levels may not be indicative of the static groundwater levels.
Groundwater readings were taken at the temporary groundwater monitoring wells located at borings B-1 and B-4 through B-6. The groundwater information associated with these wells is presented in Table II below.

<table>
<thead>
<tr>
<th>Boring No.</th>
<th>Initial Groundwater Reading (ft)*</th>
<th>24-hour Groundwater Reading (ft)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-1</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>B-4</td>
<td>8</td>
<td>6.25</td>
</tr>
<tr>
<td>B-5</td>
<td>3.5</td>
<td>3.6</td>
</tr>
<tr>
<td>B-6</td>
<td>4</td>
<td>4.1</td>
</tr>
</tbody>
</table>

The estimated seasonal high groundwater table (ESHWT) can fluctuate from year to year depending on many factors that include, but are not limited to, natural drainage, tidal patterns, man-made drainage, surrounding development, and frequency and magnitude of rainfall patterns. Historically, the ESHWT is expected to occur within the “wetter” months of the year, typically November through April. However, periods of high water tables are expected to occur at other times of the year (usually associated with major weather events). A few indicators of ESHWT include hydric soil indicators (color patterns and shades), variation in density of the soils within the presumed fluctuation zone, and current and historical monitoring well data. Of the three listed, analyzing data obtained from current and historical groundwater monitoring programs tends to be the most reliable indicator of the ESHWT. Soil coloring (redoximorphic features, mottling, etc.) is the result of saturation cycles over numerous years. Hydric indicators and relying on density variations can lead to false readings as development and added drainage features continue to alter the fluctuation zones.

4.0 EVALUATIONS AND RECOMMENDATIONS

Our recommendations are based on the previously discussed project information, our interpretation of the soil test borings and laboratory data, and our observations during our site reconnaissance. If the proposed construction should vary from what was described, we request the opportunity to review our recommendations and make any necessary changes.

4.1 In-Situ Permeability Testing

Constant-Head Borehole Permeameter Testing was performed at boring location B-5 only in Silty SAND (SM) layers at the direction of the client. The borehole was prepared utilizing an auger to remove soil clippings from the base. Permeability testing was then conducted within the vadose zone utilizing a Johnson Permeameter™ and the following testing procedures:
A support stand was assembled and placed adjacent to the boreholes. This stand holds a calibrated reservoir and a cable used to raise and lower the water control unit (WCU). The WCU establishes a constant water head within the borehole during testing by use of a precision valve and float assembly. The WCU was attached to the flow reservoir with a braided PVC hose and then lowered by cable into the borehole to the test depth elevation. As required by the Glover solution, the WCU was suspended above the bottom of the borehole at an elevation of approximately 5 times the borehole diameter. The shut-off valve was then opened allowing water to pass through the WCU to fill the borehole to the constant water level elevation. The absorption rate slowed as the soil voids became filled and an equilibrium developed as a wetting bulb developed around the borehole. Water was continuously added until the flow rate stabilized. The reservoir was then re-filled in order to begin testing. During testing, as the water drained into the borehole and surrounding soils, the water level within the calibrated reservoir was recorded as well as the elapsed time during each interval. The test was continued until relatively consistent flow rates were documented. During testing the quick release connections and shutoff valve were monitored to ensure that no leakage occurred. The flow rate (Q), height of the constant water level (H), and borehole diameter (D) were used to calculate Ks utilizing the Glover Solution.

Based on the field testing, the hydraulic conductivity of the soil is presented in Table III below. The comprehensive hydraulic conductivity worksheet is provided in Appendix VI.

<table>
<thead>
<tr>
<th>Boring ID</th>
<th>Test Depth (ft) (^{(1)})</th>
<th>(K_{sat}) Value (in/hr)</th>
<th>(K_{sat}) Class</th>
<th>USCS Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-5</td>
<td>2.7</td>
<td>0.992</td>
<td>Moderately High</td>
<td>SM</td>
</tr>
</tbody>
</table>

Note(s): \(^{(1)}\) Test depth refers to depth below the existing grade at the test location.

The Johnson Permeameter™ has an operating range of 1.42 to \((1.4 \times 10^{-4})\) in/hr. Infiltration rates outside of this range should be considered approximate and laboratory permeameter testing is recommended to further corroborate the infiltration rates. Varying site conditions, including soil composition, soil density, stratum depth, and stratum thickness should be expected throughout the site. As such, the infiltration test results indicated in Table III should not be assumed for all locations and depths across the project site.
5.0 REPORT LIMITATIONS

The recommendations submitted are based on the available soil information obtained by GET Solutions, Inc. and the information supplied by the client and their designated agents for the proposed project. If there are any revisions to the plans for this project or if deviations from the subsurface conditions noted in this report are encountered during construction, GET Solutions, Inc. should be notified immediately to determine if changes in the recommendations are required. If GET Solutions, Inc. is not retained to perform these functions, GET Solutions, Inc. can not be responsible for the impact of those conditions on the geotechnical recommendations for the project.

The Geotechnical Engineer warrants that the findings, recommendations, specifications or professional advice contained herein have been made in accordance with generally accepted professional geotechnical engineering practices in the local area. No other warranties are implied or expressed. After the plans and specifications are more complete, the Geotechnical Engineer should be provided the opportunity to review the final design plans and specifications to make sure our engineering recommendations have been properly incorporated into the design documents, in order that the earthwork and foundation recommendations may be properly interpreted and implemented. At that time, it may be necessary to submit supplementary recommendations.

This report has been prepared for the exclusive use of the client and their designated agents for the specific application to the proposed Elizabeth River BMPs project in Norfolk, Virginia.
# APPENDICES

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<thead>
<tr>
<th>APPENDIX I</th>
<th>BORING LOCATION PLAN</th>
</tr>
</thead>
<tbody>
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<tr>
<td>APPENDIX V</td>
<td>GENERALIZED SOIL PROFILES</td>
</tr>
<tr>
<td>APPENDIX VI</td>
<td>HYDRAULIC CONDUCTIVITY WORKSHEETS</td>
</tr>
</tbody>
</table>

*© GET Solutions, Inc.*
Boring Location Plan

PROJECT: Elizabeth Rive BMPs
PROJECT LOCATION: Norfolk, Virginia
PROJECT NO: VB18-158G
CLIENT: Center for Watershed Protection
DATE: 3/23/2018
PLOT BY: E.Setnicky
APPENDIX II

CLASSIFICATION SYSTEM FOR SOIL EXPLORATION
CLASSIFICATION SYSTEM FOR SOIL EXPLORATION

Standard Penetration Test (SPT), N-value

Standard Penetration Tests (SPT) were performed in the field in general accordance with ASTM D 1586. The soil samples were obtained with a standard 1.4” I.D., 2” O.D., 30” long split-spoon sampler. The sampler was driven with blows of a 140 lb. hammer falling 30 inches. The number of blows required to drive the sampler each 6-inch increment (4 increments for each soil sample) of penetration was recorded and is shown on the boring logs. The sum of the second and third penetration increments is termed the SPT N-value.

NON COHESIVE SOILS
(SILT, SAND, GRAVEL and Combinations)

Relative Density

<table>
<thead>
<tr>
<th>Consistency</th>
<th>N-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Loose</td>
<td>4/ft. or less</td>
</tr>
<tr>
<td>Loose</td>
<td>5 to 10/ft.</td>
</tr>
<tr>
<td>Medium Dense</td>
<td>11 to 30/ft.</td>
</tr>
<tr>
<td>Dense</td>
<td>31 to 50/ft.</td>
</tr>
<tr>
<td>Very Dense</td>
<td>51/ft. or more</td>
</tr>
<tr>
<td>Soft</td>
<td>2/ft. or less</td>
</tr>
<tr>
<td>Medium Stiff</td>
<td>5 to 8/ft.</td>
</tr>
<tr>
<td>Stiff</td>
<td>9 to 15/ft.</td>
</tr>
<tr>
<td>Very Stiff</td>
<td>16 to 30/ft.</td>
</tr>
<tr>
<td>Hard</td>
<td>31/ft. or more</td>
</tr>
</tbody>
</table>

Consistency

- Very Loose: 4 blows/ft. or less
- Loose: 5 to 10 blows/ft.
- Medium Dense: 11 to 30 blows/ft.
- Dense: 31 to 50 blows/ft.
- Very Dense: 51 blows/ft. or more
- Soft: 2 blows/ft. or less
- Medium Stiff: 5 to 8 blows/ft.
- Stiff: 9 to 15 blows/ft.
- Very Stiff: 16 to 30 blows/ft.
- Hard: 31 blows/ft. or more

Particle Size Identification

- Boulders: 8 inch diameter or more
- Cobbles: 3 to 8 inch diameter
- Gravel:
  - Coarse: 1 to 3 inch diameter
  - Medium: 1/2 to 1 inch diameter
  - Fine: 1/4 to 1/2 inch diameter
- Sand:
  - Coarse: 2.00 mm to 1/4 inch
  - Medium: 0.42 to 2.00 mm
  - Fine: 0.074 to 0.42 mm
- Silt:
  - 0.002 to 0.074 mm (cannot see particles)

CLASSIFICATION SYMBOLS (ASTM D 2487 and D 2488)

Coarse Grained Soils
- More than 50% retained on No. 200 sieve
- GW - Well-graded Gravel
- GP - Poorly graded Gravel
- GW-GM - Well-graded Gravel w/Silt
- GW-GC - Well-graded Gravel w/Clay
- GP-GM - Poorly graded Gravel w/Silt
- GP-GC - Poorly graded Gravel w/Clay
- GM - Silty Gravel
- GC - Clayey Gravel
- GC-GM - Silty, Clayey Gravel
- SW - Well-graded Sand
- SP - Poorly graded Sand
- SW-SM - Well-graded Sand w/Silt
- SW-SC - Well-graded Sand w/Clay
- SP-SM - Poorly graded Sand w/Silt
- SP-SC - Poorly graded Sand w/Clay
- SM - Silty Sand
- SC - Clayey Sand
- SC-SM - Silty, Clayey Sand

Fine-Grained Soils
- 50% or more passes the No. 200 sieve
- CL - Lean Clay
- CL-ML - Silty Clay
- ML - Silt
- OL - Organic Clay/Silt
- Liquid Limit 50% or greater
- CH - Fat Clay
- MH - Elasic Silt
- OH - Organic Clay/Silt

Highly Organic Soils
- PT - Peat

COHESIVE SOILS
(CLAY, SILT and Combinations)

Relative Proportions

<table>
<thead>
<tr>
<th>Descriptive Term</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trace</td>
<td>0-5</td>
</tr>
<tr>
<td>Few</td>
<td>5-10</td>
</tr>
<tr>
<td>Little</td>
<td>15-25</td>
</tr>
<tr>
<td>Some</td>
<td>30-45</td>
</tr>
<tr>
<td>Mostly</td>
<td>50-100</td>
</tr>
</tbody>
</table>

Strata Changes

In the column “Description” on the boring log, the horizontal lines represent approximate strata changes.

Groundwater Readings

Groundwater conditions will vary with environmental variations and seasonal conditions, such as the frequency and magnitude of rainfall patterns, as well as tidal influences and man-made influences, such as existing swales, drainage ponds, underdrains and areas of covered soil (paved parking lots, side walks, etc.).

Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:
- Less than 5 percent: GW, GP, SW, SP
- More than 12 percent: GM, GC, SM, SC
- 5 to 12 percent: Borderline cases requiring dual symbols

Plasticity Chart

CLASSIFICATION SYMBOLS (ASTM D 2487 and D 2488)
APPENDIX III

SUMMARY OF LABORATORY CLASSIFICATION RESULTS
## SUMMARY OF LABORATORY RESULTS

### Project Details
- **Client:** Center for Watershed Production
- **Project Name:** Elizabeth River BMPs
- **Project Number:** VB18-158G
- **Project Location:** Norfolk, Virginia
- **Project Number:** VB18-158G
- **Project Name:** Elizabeth River BMPs
- **Project Location:** Norfolk, Virginia

### Laboratory Results

<table>
<thead>
<tr>
<th>Borehole</th>
<th>Depth (m)</th>
<th>Liquid Limit</th>
<th>Plastic Limit</th>
<th>Plasticity Index</th>
<th>Maximum Size (mm)</th>
<th>%&lt;200 Sieve</th>
<th>Classification</th>
<th>Water Content (%)</th>
<th>Dry Density (pcf)</th>
<th>Saturation (%)</th>
<th>Void Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-1</td>
<td>3.0</td>
<td>22</td>
<td>14</td>
<td>8</td>
<td>0.075</td>
<td>36</td>
<td>SC</td>
<td>17.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-2</td>
<td>3.0</td>
<td>27</td>
<td>12</td>
<td>15</td>
<td>0.075</td>
<td>22</td>
<td>SC</td>
<td>16.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-4</td>
<td>1.0</td>
<td>51</td>
<td>16</td>
<td>35</td>
<td>0.075</td>
<td>86</td>
<td>CH</td>
<td>27.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-4</td>
<td>5.0</td>
<td>43</td>
<td>15</td>
<td>28</td>
<td>0.075</td>
<td>76</td>
<td>CL</td>
<td>21.4</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>B-4</td>
<td>7.0</td>
<td>26</td>
<td>14</td>
<td>12</td>
<td>0.075</td>
<td>45</td>
<td>SC</td>
<td>23.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-4</td>
<td>9.0</td>
<td>23</td>
<td>12</td>
<td>11</td>
<td>0.075</td>
<td>48</td>
<td>SC</td>
<td>26.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-5</td>
<td>1.0</td>
<td>20</td>
<td>11</td>
<td>9</td>
<td>0.075</td>
<td>49</td>
<td>SC</td>
<td>12.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-6</td>
<td>1.0</td>
<td>31</td>
<td>19</td>
<td>12</td>
<td>0.075</td>
<td>63</td>
<td>CL</td>
<td>18.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-6</td>
<td>3.0</td>
<td>21</td>
<td>12</td>
<td>9</td>
<td>0.075</td>
<td>23</td>
<td>SC</td>
<td>12.8</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX IV

BORING LOGS
### STRATA DESCRIPTION

<table>
<thead>
<tr>
<th>Elevation (ft)</th>
<th>Depth (ft)</th>
<th>Sample Type</th>
<th>Sample ID</th>
<th>Sample Recovery (in.)</th>
<th>Blowing Count (N-Values)</th>
<th>Plastic Limit</th>
<th>Liquid Limit</th>
<th>Water Content</th>
<th>%&lt;200</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.2</td>
<td></td>
<td></td>
<td>1</td>
<td>14</td>
<td>1-3-3-3 (6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.0</td>
<td></td>
<td></td>
<td>2</td>
<td>24</td>
<td>2-5-4-5 (9)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.0</td>
<td></td>
<td></td>
<td>3</td>
<td>21</td>
<td>6-7-7-5 (14)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td></td>
<td></td>
<td>5</td>
<td>24</td>
<td>4-4-3-5 (7)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**2" Topsoil**
- Brown, moist, Lean CLAY (CL) with trace fibrous organic material, medium stiff

**Gray and Orange, moist, Clayey SAND (SC), medium dense**

**Gray and Orange, moist to wet, Silty Clayey fine to medium SAND (SC-SM), medium dense**

**Gray-Tan, wet, Poorly Graded fine to medium SAND with Silt (SP-SM), loose**

Boring terminated at 10 feet below existing grade.
**RECORD OF SUBSURFACE EXPLORATION**

**BORING ID**

**B-2**

**PROJECT NAME:** Elizabeth River BMPs

**CLIENT:** Center for Watershed Production

**PROJECT LOCATION:** Norfolk, Virginia

**BORING LOCATION:** See Boring Location Plan

**DRILLING METHOD(S):** Rotary wash "mud"

**GROUNDWATER:**
- INITIAL (ft): 6
- AFTER ____ HOURS (ft): 
- CAVE-IN (ft): 

**GROUNDBRACK:***

*The initial groundwater readings are not intended to indicate the static groundwater level.*

**PROJECT NUMBER:** VB18-158G

**SURFACE ELEVATION (MSL) (ft):**

**LOGGED BY:** K. Brownfield

**DATE STARTED:** 4/19/2018

**DATE COMPLETED:** 4/19/2018

**DRILLER:** GET Solutions, Inc.

---

**STRATA DESCRIPTION**

<table>
<thead>
<tr>
<th>Elevation (ft)</th>
<th>Depth (ft)</th>
<th>Sample Type(s):</th>
<th>Notes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1</td>
<td></td>
<td>SS - Split Spoon</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>5.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>6.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>10.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**STRATA DESCRIPTION**

1" Topsoil

Gray and Orange, moist, Sandy Lean CLAY (CL) with fibrous organic material, soft

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Sample ID</th>
<th>Sample Type</th>
<th>Recovery (in.)</th>
<th>Blow Counts (N-Values)</th>
<th>%&lt;200</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1</td>
<td>1</td>
<td></td>
<td>2-1-2-3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2</td>
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<td>4-5-4-4</td>
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<td>5</td>
<td>3</td>
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<td>3-2-2-3</td>
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<tr>
<td>6</td>
<td>4</td>
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<td>3-2-2-2</td>
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<tr>
<td>10</td>
<td>5</td>
<td></td>
<td>2-2-2-2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TEST RESULTS**

<table>
<thead>
<tr>
<th>Plastic Limit</th>
<th>Liquid Limit</th>
<th>Water Content</th>
<th>Penetration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X</td>
<td>○</td>
<td>/</td>
</tr>
</tbody>
</table>

**Sample Type(s):** SS - Split Spoon

---

Boring terminated at 10 feet below existing grade.
The initial groundwater readings are not intended to indicate the static groundwater level.
**RECORD OF SUBSURFACE EXPLORATION**

**BORING ID**

**B-4**

- **PROJECT NAME:** Elizabeth River BMPs
- **CLIENT:** Center for Watershed Production
- **PROJECT LOCATION:** Norfolk, Virginia
- **BORING LOCATION:** See Boring Location Plan
- **DRILLING METHOD(S):** Rotary wash "mud"
- **GROUNDWATER:** INITIAL (ft) 8
- **SURFACE ELEVATION (MSL) (ft):** __________
- **CAVE-IN (ft):** __________
- **AFTER HOURS (ft):** 6.3
- **DATE COMPLETED:** __________
- **DATE STARTED:** __________
- **LOGGED BY:** K. Brownfield
- **DRILLER:** GET Solutions, Inc.
- **PROJECT NUMBER:** VB18-158G
- **PROJECT LOCATION:** Norfolk, Virginia
- **CLIENT:** Center for Watershed Production
- **PROJECT NAME:** Elizabeth River BMPs
- **DATE COMPLETED:** 4/19/2018
- **DATE STARTED:** 4/19/2018
- **LOGGED BY:** K. Brownfield
- **DRILLER:** GET Solutions, Inc.
- **PROJECT NUMBER:** VB18-158G
- **DATE COMPLETED:** 4/19/2018
- **DATE STARTED:** 4/19/2018
- **LOGGED BY:** K. Brownfield
- **DRILLER:** GET Solutions, Inc.

### STRATA DESCRIPTION

<table>
<thead>
<tr>
<th>Elevation (ft)</th>
<th>Depth (ft)</th>
<th>Strata Legend</th>
<th>Sample ID</th>
<th>Sample Type(s)</th>
<th>Sample Recovery (in.)</th>
<th>Blowing Count (N-Values)</th>
<th>Plastic Limit</th>
<th>Liquid Limit</th>
<th>Water Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.3</td>
<td>3</td>
<td>3&quot; Topsoil</td>
<td>1</td>
<td>SS - Split Spoon</td>
<td>20</td>
<td>1-1-2-3 (3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td>3</td>
<td>3&quot; Asphalt</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>Gray and Orange, moist, Fat CLAY (CH), with trace fibrous organic material, soft</td>
<td>2</td>
<td></td>
<td>22</td>
<td>3-5-6-6 (10)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>Gray and Orange, moist, Lean CLAY (CL) with trace fibrous organic material, stiff</td>
<td>3</td>
<td></td>
<td>23</td>
<td>5-6-6-6 (11)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>Change to Gray 5'6&quot; to 6&quot; below grade</td>
<td>4</td>
<td></td>
<td>24</td>
<td>5-6-4-3 (10)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>10</td>
<td>Gray and Tan, moist to wet, Clayey fine SAND (SC), loose</td>
<td>5</td>
<td></td>
<td>24</td>
<td>3-3-3-3 (6)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td>10.0</td>
<td>Boring terminated at 10 feet below existing grade.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Sample Type(s):**
- SS - Split Spoon

**Notes:**

The initial groundwater readings are not intended to indicate the static groundwater level.

This information pertains only to this boring and should not be interpreted as indicative of the site.

---

**Virginia Beach**
204 Grayson Road
Virginia Beach, VA 23462
757-518-1703

**Williamsburg**
1598 E Botetourt Road
Williamsburg, VA 23165
757-564-6452

**Elizabeth City**
101 Capital Trace Unit E
Elizabeth City, NC 27909
252-325-9765

**Jacksonville**
415-A Western Blvd
Jacksonville, NC 28546
910-479-9915

---

**PROJECT LOCATION:** Norfolk, Virginia
**CLIENT:** Center for Watershed Production
**PROJECT NAME:** Elizabeth River BMPs
**DATE COMPLETED:** 4/19/2018
**DATE STARTED:** 4/19/2018
**LOGGED BY:** K. Brownfield
**DRILLER:** GET Solutions, Inc.

---

**PROJECT NUMBER:** VB18-158G
<table>
<thead>
<tr>
<th>Elevation (ft)</th>
<th>Depth (ft)</th>
<th>STRATA DESCRIPTION</th>
<th>Sample Type(s):</th>
<th>Notes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Topsoil</td>
<td>9&quot; Topsoil</td>
<td>SS - Split Spoon</td>
<td></td>
</tr>
<tr>
<td>0.8</td>
<td></td>
<td>Gray and Orange, moist, Clayey fine SAND (SC), loose</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.0</td>
<td></td>
<td>Gray, moist to wet, Silty fine to medium SAND (SM), loose</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.0</td>
<td></td>
<td>Tan and Gray, wet, Silty Clayey fine to medium SAND (SC-SM), loose</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>Gray, wet, Poorly Graded SAND with Silt (SP-SM), loose</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>Boring terminated at 10 feet below existing grade.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Record of Subsurface Exploration

**Project Name:** Elizabeth River BMPs  
**Client:** Center for Watershed Production  
**Project Location:** Norfolk, Virginia  
**Boring Location:** See Boring Location Plan  
**Drilling Method(s):** Rotary wash "mud"  
**Groundwater:** Initial (ft) 4.0  
After ____ Hours (ft) 4.1  
Cave-In (ft) C: __  

---

#### Strata Description

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Strata Description</th>
</tr>
</thead>
</table>
| 0.3       | 4" Topsoil  
Brown, moist, Lean CLAY (CL) with some fibrous organic material, medium stiff |
| 2.0       | Gray-Tan, moist, Clayey fine to medium SAND (SC), medium dense                    |
| 4.0       | Gray-Tan, moist, Poorly Graded fine to medium SAND (SP), loose to medium dense     |
| 7.5       | Change to Tan at 7.5 ft below grade.                                              |
| 10.0      | Boring terminated at 10 feet below existing grade.                               |

---

#### Sample Type(s):

SS - Split Spoon

---

#### Notes:

The initial groundwater readings are not intended to indicate the static groundwater level.

---

#### Test Results

<table>
<thead>
<tr>
<th>Elevation (ft)</th>
<th>Strata Legend</th>
<th>Sample ID</th>
<th>Sample Type</th>
<th>Sample Recovery (in.)</th>
<th>Blow Count (N-Values)</th>
<th>Penetration</th>
<th>Liquid Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.3</td>
<td>CC</td>
<td>1</td>
<td>SS</td>
<td>7</td>
<td>2-3.2-3</td>
<td>63</td>
<td>X</td>
</tr>
<tr>
<td>2.0</td>
<td></td>
<td>2</td>
<td>SS</td>
<td>24</td>
<td>3-6.7-8</td>
<td>23</td>
<td>X</td>
</tr>
<tr>
<td>4.0</td>
<td></td>
<td>3</td>
<td>SS</td>
<td>19</td>
<td>6-9-10-10</td>
<td>19</td>
<td>X</td>
</tr>
<tr>
<td>7.5</td>
<td></td>
<td>4</td>
<td>SS</td>
<td>20</td>
<td>4-3.7-8</td>
<td>10</td>
<td>X</td>
</tr>
<tr>
<td>10.0</td>
<td></td>
<td>5</td>
<td>SS</td>
<td>24</td>
<td>3-3.4-6</td>
<td>7</td>
<td>X</td>
</tr>
</tbody>
</table>

---

**Boring ID:** B-6  
**Project Number:** VB18-158G  
**Surface Elevation (MSL) (ft):**  
**Logged By:** K. Brownfield  
**Date Started:** 4/19/2018  
**Date Completed:** 4/19/2018  
**Driller:** GET Solutions, Inc.
APPENDIX V

GENERALIZED SOIL PROFILES
PROJECT NAME: Elizabeth River BMPs
PROJECT LOCATION: Norfolk, Virginia
PROJECT NUMBER: VB18-158G
CLIENT: Center for Watershed Production

GENERALIZED SOIL PROFILE

LEGEND

Depth Below Ground Surface (ft)

(Numerical Value) = Sample N-Value
### Constant-Head Borehole Permeameter Test

<table>
<thead>
<tr>
<th>VOLUME (ml)</th>
<th>Volume Out (ml)</th>
<th>TIME (h:mm:ss A/P)</th>
<th>Interval Elapsed Time (min)</th>
<th>Flow Rate Q (cm/min)</th>
<th>Ksat&lt;sub&gt;B&lt;/sub&gt; Equivalent Values (cm/day)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,200</td>
<td>1,600</td>
<td>10:35:00 AM</td>
<td>0:07:27</td>
<td>7.45</td>
<td>214.77</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1,400</td>
<td>10:42:27 AM</td>
<td>0:08:45</td>
<td>8.75</td>
<td>160.00</td>
<td>0.012</td>
</tr>
<tr>
<td>200</td>
<td>1,600</td>
<td>10:51:12 AM</td>
<td>0:09:06</td>
<td>9.10</td>
<td>175.82</td>
<td>0.103</td>
</tr>
<tr>
<td>3,200</td>
<td>1,600</td>
<td>10:52:00 AM</td>
<td>0:10:57</td>
<td>10.95</td>
<td>127.85</td>
<td>0.075</td>
</tr>
<tr>
<td></td>
<td>1,400</td>
<td>11:01:06 AM</td>
<td>0:12:51</td>
<td>12.85</td>
<td>108.95</td>
<td>0.064</td>
</tr>
<tr>
<td>3,200</td>
<td>1,600</td>
<td>11:13:00 AM</td>
<td>0:14:26</td>
<td>14.43</td>
<td>97.00</td>
<td>0.057</td>
</tr>
<tr>
<td></td>
<td>1,400</td>
<td>11:36:44 AM</td>
<td>0:16:42</td>
<td>16.70</td>
<td>83.83</td>
<td>0.049</td>
</tr>
</tbody>
</table>

### Terminology and Solution (R. E. Glover Solution)

- **Ksat<sub>B</sub>:** (Coefficient of Permeability) @ Base Temp. T<sub>B</sub> (°C)

### Notes

- Field-Estimated Ksat: 0.042 7.00E-04 60.480 0.992 1.984

*Glover, R. E. 1953. Flow from a test-hole located above groundwater level, pp. 69-71. in: Theory and Problems of Water Percolation. (C. N. Zanger, ed.). USBR. The condition for this solution exists when the distance from the bottom of the borehole to the water table or an impervious layer is at least twice the depth of the water in the well. **H/r<sub>B</sub>** to >10 Johnson Permeameter, LLC Revised 11/29/13*