The County of Greenville is seeking sealed proposals from vendors to provide stream stabilization for a 900 foot section of the Brushy Creek located between Seth Street and Mills Avenue, subject to the conditions and all provisions set forth herein and attached, will be received at this until 3:00 PM, EST, January 9, 2020, then publicly opened. The service must be furnished as described and specified herein and delivered to Greenville County.

A Mandatory Pre-Proposal meeting and site visit will be held at 10:00 A.M., E.S.T., December 19, 2019 starting at the Greenville County Square, 301 University Ridge, Suite 100, Greenville, South Carolina 29601.

All questions concerning this RFP are to be submitted in writing to Melisa Van Houten, County of Greenville Procurement Services Division, 301 University Ridge, Suite 100; Greenville, SC 29601; faxed to (864) 467-7304, or emailed to mvanhouten@greenvillecounty.org no later than 5:00 PM, EST, January 2, 2020.

PLEASE SUBMIT ONE (1) UNBOUND ORIGINAL AND SIX (6) COPIES.

PLEASE MARK YOUR ENVELOPE TO READ “RFP #53-01/09/20”
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NOTE: PLEASE SIGN ON FOLLOWING PAGE. AN ORIGINAL SIGNATURE IS REQUIRED. FAILURE TO DO MAY VOID YOUR RESPONSE.
INSTRUCTIONS TO RESPONDENTS

RFP #53-01/09/20 BRUSHY CREEK STABILIZATION

1. Unless otherwise required, submit one (1) unbound original and six (6) bound copies of your response/proposal/bid.
2. RFI/RFQ/IFB/Proposals, amendments thereto or withdrawal requests received after the time advertised for opening will be void regardless of when they were mailed.
3. Quote prices on units specified with packing included.
4. Attach complete specifications for and permitted substitutions offered, or when amplification is desirable or necessary.
5. If specifications or descriptive papers are submitted with RFI/RFQ/IFB/Proposals, enter respondents name thereon.
6. If the article bid upon has a trade name or brand, show same in the RFI/RFQ/IFB/proposal.
7. When required, furnish samples, free of expense, prior to opening of RFI/RFQ/IFB/Proposals. Label each sample with respondents name and the item number. Should you wish samples returned, at your expense, when not destroyed in tests, make request for return within 10 days following bid/proposal opening.
8. Show delivery time required after order is received (see below).
9. Address and mark bids/proposals as indicated in the notice.

CONDITIONS

1. The County Agency or Institution submitting this notice reserves the right to reject any and all RFI/RFQ/IFB/Proposals, and to waive all technicalities.
2. Unit prices will govern over extended prices, unless otherwise stated in notice.
3. Time in connection with discount offered will be computed from date of delivery of commodities to carrier, when inspecting and acceptance is at point of origin; or date of delivery at destination; or if laboratory inspection is made part of bid, from date of laboratory report.
4. In case of default of contractor, Greenville County reserves the right to purchase any or all items in default on open market, charging contractor with any excessive costs.
5. All materials and products offered must be guaranteed to meet the requirements of the specifications indicated, given or referred to.
6. Prices bid must be based upon payment in thirty (30) days. Discounts for payment in less than thirty (30) days will not be considered in making award.
7. The right is reserved, in case of tie bids, to make award considered to be most advantageous to Greenville County.
8. The right is reserved to reject any RFI/RFQ/IFB/Proposal in which the delivery time indicated is considered sufficient to delay the operation for which the commodity is intended.
9. Unless otherwise indicated by County Agency or Institution submitting this notice, prices must be firm.

RFI/RFQ/IFB/PROPOSAL

In compliance with invitation, and subject to all conditions, thereof, the undersigned offers and agrees, if this RFI/RFQ/IFB/Proposal is accepted within ______ days from date of opening, furnish any or all items quoted on at prices as set forth after the item and unless otherwise specified, within ______ days after receipt of order, delivered, all transportation costs included,

Discount will be allowed as follows: 30 calendar days ____________ %.

FIRM NAME: ______________________ ADDRESS: ______________________

BY: ________________________________

RFI/RFQ/IFB/PROPOSAL MUST BE SIGNED IN WRITING

PRINT NAME: ______________________ EMAIL: ______________________

TITLE: ______________________ PHONE: ______________________

EMAIL: ______________________ FAX: ______________________
<table>
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<tr>
<th>Date</th>
<th>Event Description</th>
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<tr>
<td>December 19, 2019</td>
<td>A <strong>Mandatory Pre-Proposal meeting</strong> and site visit will be held at 10:00 A.M., E.S.T., December 19, 2019 starting at the Greenville County Square, 301 University Ridge, Suite 100, Greenville, South Carolina 29601.</td>
</tr>
<tr>
<td>January 2, 2020</td>
<td><strong>All Questions</strong> must be submitted in writing to Melisa Van Houten, Procurement Services Division, 301 University Ridge, Suite 100; Greenville, SC 29601 by <strong>5:00 PM, E.S.T.</strong></td>
</tr>
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<td>January 9, 2020</td>
<td><strong>Proposals</strong> must be delivered to Greenville County’s Procurement Services Division, 301 University Ridge, Suite 100; Greenville, SC 29601, no later than <strong>3:00 PM, E.S.T.</strong></td>
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<td>January 9, 2020 - January 15, 2020</td>
<td><strong>Review of Proposals</strong>*</td>
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<tr>
<td>January 15, 2019</td>
<td><strong>Tentative Date of Award</strong>*</td>
</tr>
<tr>
<td>January 15, 2020 – January 22, 2020</td>
<td><strong>Contract Negotiations</strong>*</td>
</tr>
<tr>
<td>January 22, 2020</td>
<td><strong>Issue Notice to Proceed</strong>*</td>
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* All dates after opening are tentative.
REQUEST FOR PROPOSALS
BRUSHY CREEK STABILIZATION
RFP #53-01/09/20

I. Introduction

The County of Greenville is seeking sealed proposals from vendors to provide stream stabilization for a 900 foot section of the Brushy Creek located between Seth Street and Mills Avenue.

II. Scope of Work

The required work includes stream stabilization for a 900 foot section of the Brushy Creek located between Seth Street and Mills Avenue. Several large trees will need to be removed and new trees and plant material placed. In-stream vanes will deflect flows away from at risk banks. Coir logs, A-Jaxs will be used to stabilize and protect from undercutting along portions of the reach. Bank grading and different types of erosion control matting will stabilize eroded or graded banks. Stacked boulders, soil lifts and interlocking concrete block will provide additional structural stabilization to the banks where two sanitary sewer lines are exposed. Live staking will take place on the re-established banks.

The Contractor performing the work shall be fully qualified experienced and equipped to complete this work expeditiously, in a satisfactory manner and in accordance with the specifications referenced as “Attachment A” and the plans referenced in “Attachment B”. The Contractor shall have successfully completed and provide documentation of the following work:

A) 2,000 feet of stream bank stabilization within the past five (5) years as documented by verifiable references.
B) A minimum of at least three years active experience in stream bank restoration is required
C) Two (2) stream channel design and restoration projects utilizing in-stream rock structures. Streams must have been at least 500 feet or more for each project within the past five (5) years.

The Contractor shall submit the above mentioned information for review and approval at the time of bid submittal.
III. **Mandatory Pre-Proposal Meeting**

A Mandatory Pre-Proposal meeting and site visit will be held at 11:00 A.M., E.S.T., December 19, 2019 starting at the Greenville County Square, 301 University Ridge, Suite 100, Greenville, South Carolina 29601.

IV. **Pricing**

The vendor shall utilize the Pricing Sheet (Page 20). An original signature is required on the price sheet.

V. **Bonding**

See Terms and Conditions (page 10) for Bid Bonds and Performance and Payment Bonds required for this project.

VI. **Submission Procedures and Requirements**

A. All submissions must be received by 3:00 PM, EDT, JANUARY 9, 2020, and delivered to Greenville County Procurement Services Division, 301 University Ridge, Suite 100; Greenville, South Carolina 29601. If the submission is late, the proposal will be rejected. There will be no exceptions. Responders submitting proposals shall be responsible for all cost of preparing such proposals.

B. Responders to this solicitation shall closely examine the specific requirements noted herein and the attached Terms and Conditions and submit one (1) original and Six (6) copies of their response to the address listed. To ensure acceptance of the response, the solicitation (RFI/RFQ/IFB/Proposal) number should be clearly shown on the lower left corner of the return envelope. Facsimile transmittals or offers communicated by telephone or email will not be accepted or considered.

C. License and Permits – The Contractor shall obtain all applicable licenses, and promptly pay all taxes required by the State of South Carolina, and/or Greenville County.

VII. **Statement of Qualifications**

Vendors shall provide a Statement of Qualifications that includes the following:

A. Overview of company background.
B. A minimum of at least three (3) years of active experience in stream bank restoration.
C. Corporate/individual qualifications and experiences, including certifications.
D. Current resume(s) for individuals(s) assigned to this project.
E. List of at least three (3) references including names, addresses, and telephone numbers. Vendor should include any South Carolina governmental entity reference.
F. References for comparable work over the last 5 years.
G. Two (2) stream channel design and restoration project utilizing in-stream rock structures within the last five (5) years.

VIII. Inquiries and Addenda

A. Questions – All questions concerning this RFP are to be submitted in writing via fax, electronic mail, or regular mail to Carson Adkins, Procurement Services Division, to the address listed below, no later than 5:00 PM, EDT, January 2, 2020. Please refer all questions in writing about this request for proposals and project to:

County of Greenville
Melisa Van Houten
Procurement Services Division
301 University Ridge, Suite 100
Greenville, South Carolina 29601-3665
Phone: (864) 467-7387
Fax: (864) 467-7304
E-mail: mvanhouten@greenvillecounty.org

All inquiries and responses will be distributed to all vendors known to have received the RFP document. The County will not be responsible for or bound by any oral instructions made by any employee(s) of the County in regard to this RFP.

A. Addenda – This RFP represents the most definite statement Greenville County will make concerning information upon which proposals are to be based. Any changes to this RFP will be in the form of a written addendum, which will be furnished to all vendors who are listed with the County as having received an RFP document. No addenda will be issued later than Three (3) working days prior to the date for receipt for proposals except an addendum which, if necessary, postpones the date for receipt of proposals or cancels this RFP. Vendors shall acknowledge receipt of all addenda with their Bid.

IX. General Information

A. Proprietary Information – The County of Greenville is a public body and governed by the South Carolina Freedom of Information Act. Documents submitted to the County relating to this Solicitation are subject to requirements of the Freedom of Information Act and may be deemed public records.

B. Errors and Omissions – The Responder will not be allowed to take advantage of any errors or omissions in the Request for Proposals. Where errors or omissions appear in the RFP, the Responder shall promptly notify the County of Greenville in writing of such error or omission it discovers. Any significant error, omission and/or inconsistency in the
specifications are to be reported as soon as possible but no later than Three (3) days before such time the response is to be submitted.

C. Withdrawal of Proposal – An official representative of a Responder may withdraw a Responder’s response at any time prior to the proposal submission deadline. Acceptable proof establishing that he/she is the representative of the Responder must be provided.

D. Non-Endorsement – If the County awards a contract, the successful Responder shall not issue any news release or other statement relating to the award or servicing of the agreement which state or imply the County of Greenville’s endorsement of the successful Responder’s services.

X. **Insurance**

The contractor is responsible for and must have all required insurance listed below and shall not commence work under the associated contract until it has obtained all insurance required, and the County has approved such insurance in writing, nor shall the Contractor allow any subcontractor to commence work on its subcontract until all similar insurance required of the subcontractor has been obtained. All insurance policies shall be maintained for the life of the contract.

A. **THE COUNTY SHALL BE NAMED AS “ADDITIONAL INSURED” FOR ITS INTEREST** on all policies of insurance except Worker’s Compensation, Automobile Liability, and Professional Errors and Omissions, as regards ongoing operations, products and completed operations, and this shall be noted on the face of the Certificate of Insurance. As a part of the certificate of insurance requirement the contractor shall also include acknowledgement and acceptance of the wavier of subrogation provision granted to the County of Greenville. This acknowledgement and acceptance should be included in the same section of the Certificate of Insurance that evidences the “Additional Insured” provision.

B. Certificates for all such policies of insurance shall be provided by the Contractor’s insurance agent or broker to the County within 10 working days from the date of Notice of Award.

C. All Certificates of Insurance submitted shall provide on the face of the certificate reference to County's RFP #53-01/09/20.

D. **Contractor** will provide County a minimum of 30 days advance notice in the event the insurance policies (or an insurance policy) are canceled. Subcontractors approved to perform work on this project are subject to all of the requirements in this Section.

E. **Contractor** agrees to maintain and keep in force during the life of this Agreement, with a company or companies authorized to do business in South Carolina, the following insurance policies:
Comprehensive General Liability:
$1,000,000 per occurrence - combined single limit / $2,000,000 general aggregate, to include products and completed operations.

Automobile Liability:
$1,000,000 per occurrence - combined single limit (Coverage shall include bodily injury and property damage and cover all vehicles including owned, non-owned and hired)

Statutory Worker's Compensation:
Coverage A - State of SC
Coverage B - Employers liability
$1,000,000 Each Accident
$1,000,000 Disease, Per Employee
$1,000,000 Disease, Policy Limit

Policies shall contain a waiver of subrogation in favor of and/or that applies to the County of Greenville, its departments, agencies, boards, employees, and commissions for losses from work performed by or on behalf of the contractor.

No deviation from this coverage’s will be accepted unless, in the County’s sole discretion, it is more advantageous to the County, i.e., $1,000,000 - a $2,000,000 or $5,000,000 limit would be acceptable.

XI. Evaluation Criteria

All bids submitted and accepted in accordance with this RFP will be evaluated on the score sheet (Page 19) based on the following criteria, which are in no particular order:

- Responsiveness to RFP
- Experience with Projects of Similar Scope and Size
- Cost
- References

XII. Illegal Immigration Reform Act Compliance

By submitting an offer, Contractor certifies that it will comply with the applicable requirements of Title 8, Chapter 14 of the South Carolina Code of Laws (originally enacted as Section 3 of The South Carolina Illegal Immigration Reform Act, 2008 S.C. Act No. 280) and agrees to provide upon request any documentation required to establish either: (a) the applicability of Title 8, Chapter 14 to Contractor and any subcontractors or sub-subcontractors; or (b) the compliance with Title 8, Chapter 14 by Contractor and any subcontractor or sub-subcontractor. Pursuant to Section 8-14-60, “A person who knowingly makes or files any false, fictitious, or fraudulent document, statement, or report pursuant to this chapter is guilty of a felony and upon

County Square • 301 University Ridge • Suite 100 • Greenville, SC 29601-3660 • Fax (864) 467-7304
conviction, must be fined within the discretion of the court or imprisoned for not more than five years, or both.” Contractor agrees to include in any contracts with its subcontractors language requiring the subcontractors to (a) comply with the applicable requirements of Title 8, Chapter 14, and (b) include in any contracts with the sub-subcontractors language requiring the sub-subcontractor to comply with the applicable requirements of Title 8, Chapter 14. In the event any contractor, subcontractor and/or sub-subcontractor is found not to be in compliance with the SC Immigration Reform Act [hereinafter "The Act"], the contractor agrees to fully indemnify the County for any loss suffered by the County as a result of such contractor, subcontractor or sub-subcontractor’s failure to comply with the Act.

XIII. **Safety, Health, and Security**

Contractor shall be solely responsible for its activities, that of its employees on the site and activities of its consultants, contractors and/or subcontractors for maintaining a safe job site. Contractor’s activities and activities of its consultants, contractors and/or subcontractors shall comply with all local, state, and federal safety regulations and their enforcement agencies. Contractor shall at all times conduct its operations under this Contract in a manner to avoid risk of endangerment to the health and safety of persons and property. The Contractor shall have sole responsibility for implementing its safety and health programs, taking all safety and health precautions necessary and continuously inspecting all equipment, materials and work to prevent, discover, determine and correct any conditions which might result in personal injury, equipment damage or damage to property or the public. Contractor’s safety, health and security programs shall be in compliance with all regulatory requirements and shall furnish accident, incident, injury, and other records and reports required by the Occupational Safety and Health Administration, State and Local laws, or by the County.

XIV. **Sample Contract**

A Sample Contract is included for review.
REQUEST FOR PROPOSALS  
BRUSHY CREEK STABILIZATION  
RFP #53-01/09/20

INSTRUCTIONS/TERMS AND CONDITIONS:

1. **Response Opening and Award:** Responses shall be publicly opened and only the names of the offerors disclosed at the opening. For IFBs, the name of the responder as well as the price will be disclosed. However, no decision will be made until Procurement Services and the user Division have had ample time to review each response. Award will be made at the earliest possible date. The County reserves the right to award in whole or in part, by item, group of items, geographic area or by section where such action serves the County’s best interest. The contract will be awarded to the response that meets the requirements and criteria set forth in the Solicitation. No response may be withdrawn for a period of sixty (60) days after the opening date. Responses, whether mailed or hand delivered, must be received and time/date stamped in the Procurement Services Office by the closing time and date indicated on the solicitation. Responses received after the closing time/date will not be accepted. By submission of a response, you are guaranteeing that all goods and services meet the requirement of the solicitation during the contract period.

2. **Rights Reserved by Greenville County:** Greenville County reserves the right to reject any and all responses, any portion thereof, and waive any technicalities. Accordingly, the right is reserved to make awards in the best interest of the County. Integrity, reputation, experience and past performance will be heavily weighted in response evaluation. This solicitation does not commit the County of Greenville to award a contract, to pay any costs incurred in the preparation of the response, or to procure or contract for goods or services listed herein.

3. **Responders Qualification:** Responders must, upon request of the County, furnish satisfactory evidence of their ability to furnish products or services in accordance with the terms and conditions of these specifications. The County reserves the right to make the final determination as to the responder’s ability to provide the products or services requested herein.

4. **Responders Responsibility:** Each responder shall be fully acquainted with the conditions relating to the scope and restrictions attending the execution of the work under the conditions of this response. It is expected that this will sometimes require on-site observation. The failure or omission of a responder to be acquainted with existing conditions shall in no way relieve the responder of any obligations with respect to this response or to any contract as a result of this response.

5. **References:** The County requires responders to list at least three (3) references, names, addresses, telephone numbers, and email addresses of contact persons for companies with whom the bidder has performed or provided similar work, service or product.
6. **Waiver:** The County reserves the right to waive any Instructions to Responders, General or Special Terms and Conditions, specifications, or technicalities when it is deemed to be in the best interest of the County to do so.

7. **Rejection:** Greenville County reserves the right to reject any response that contains prices for individual items or services that are inconsistent or unrealistic when compared to pricing of like responses; or ambiguous responses which are uncertain as to terms, delivery, quantity, or compliance with specifications may be rejected or otherwise disregarded if such action is in the best interest of the County.

8. **Response Signature and Solicitation Alterations:** The responder shall sign his response correctly or the response may be rejected. If the response shows any omissions, alteration of form, unauthorized additions, a conditional response or any irregularities of any kind, the response may be rejected.

9. **Questions:** Questions shall be submitted by email to the assigned buyer listed in the solicitation or in writing to Procurement Services Division, 301 University Ridge, Suite 100, Greenville SC, 29601, or Fax to (864) 467-7304 by the date listed on the schedule.

10. **Bid Bond:** *Is required* per solicitation, bidders shall submit with their bid a bid bond in the amount of 5% of the bid price. This bond may be in the form of Bid Bond from the American Institute of Architects, Certified Check, Cashier’s or Bank Money Order of any national or state bank and shall be made payable to Greenville County. Bids submitted without being accompanied by any of the foregoing as required, shall be considered informal and will be rejected. Any bid accompanied by a bid bond not properly executed in the opinion of the County Attorney, may be rejected. The bond will be forfeited to the County by the successful bidder as liquidated damages in case a bid award is made to that bidder and the contract and bond are not promptly and properly executed.

11. **Return of Bid Bond:** If required per solicitation and after bids are awarded, the Procurement Services Division will return immediately all checks, except that of the successful bidder. The check of the successful bidder will be returned upon compliance with the performance and payment bond requirements.

12. **Performance and Payment Bond:** If required per solicitation, the successful bidder, within fifteen (15) working days after acceptance of the bidder’s offer by the County, shall furnish a satisfactory performance and payment bonds in the amount of the total bid price. The performance and payment bonds must be received by the county prior to issuance of an executed contract and Notice to Proceed. The fifteen (15) working days may be extended upon written approval by the Procurement Director. A copy of the written approval shall be transmitted to the successful bidder stating the terms of any extension. In the event that the bidder fails to deliver to the County Procurement Services Division the performance and payment bonds in said period of fifteen (15) working days after acceptance of the bidder’s offer by the County, then the bid bond of the bidder shall be retained by the County in its entirety and the award will be withdrawn from the bidder. The successful bidder shall have as surety a corporate surety authorized to act as
13. **Availability of Bonding Agency:** If bonding is required per the solicitation, the bonding company must have an agent available to meet with County officials to clarify and explain the County’s responsibility in maintaining the integrity of the bond.

14. **Specification Changes, Additions and Deletions:** All changes in specifications shall be in writing in the form of an addendum and furnished to all responders. The County of Greenville shall not be responsible for any verbal information given by any employees of the County of Greenville in regard to this proposal.

15. **Number of Response Copies:** Please submit One Unbound Original and Three (3) Bound Copies of your response.

16. **Response Changes:** Responses, amendments thereto or withdrawal requests received after the advertised time for response opening, shall be void regardless of when they were submitted.

17. **Response Price:** The price presented as a result of these specifications shall be for the contract period. The response shall be acceptable for sixty (60) days from the date of opening. All prices and notations shall be printed in ink or typewritten. Errors should be crossed out, corrections entered and initialed by the person signing the response. Erasures or use of typewriter correction fluids may be cause for rejection. No response shall be altered or amended after specified time for opening.

18. **Federal, State and Local Laws:** The contractor assumes full responsibility and liability for compliance with any and all local, state and federal laws and regulations applicable to the contractor and his employees including, but not limited to, compliance with the EEO guidelines, the Occupational Safety and Health Act of 1970, and minimum wage guidelines.

19. **Tie Bids:** In the case of tie bids, the County reserves the right to make the award based on the factors outlined in Section 7-308(9) of the Greenville County Code of Ordinance (Chapter 7, Article VIII), or in what it considers to be in the best interest of the County.

20. **Deduction and Holdbacks:** In addition to the County’s right of termination, the County shall be entitled to full reimbursement for any costs incurred by the County by reason of the contractor’s failure to perform or to satisfactorily perform its responsibilities and duties. Such costs may include, but are not limited to, the cost of using the County’s employees or employees of any other entity to perform the obligations of the contract. The County may obtain any such reimbursement by deduction from payments otherwise due to the contractor or by any other
proper and lawful means. All deductions from any money due the contractor are to be as
liquidated damages and not as a penalty. It is the County’s intent to give the contractor a
reasonable opportunity whenever practicable, to correct any such failure to perform or
satisfactorily perform its responsibilities and duties. In no circumstances shall any uncorrected
situation extend for more than five days. The County will make the following deductions from
the contract sum in the event that the contractor fails to perform any of the required work within the
required time limits in the event the County carries out the work using its forces or another
contractor.

a. For use of County’s forces – actual cost involved.
b. For use of another contractor – the amount charged by said contractor.

The County reserves the right to hold back and/or withhold part of complete payments for
unsatisfactory work, deficiencies, etc. until said defects are satisfactorily corrected or cleared.

21. Evaluation Criteria:
The responses will be evaluated on the following criteria utilizing the score sheet included in this
solicitation. Greenville County reserves the right to interview responders to this solicitation at its
discretion. Greenville County will not be responsible for any costs associated with interviews of
responders.
- Responsiveness to RFP
- Experience with Projects of Similar Scope and Size
- Cost
- References

22. Quality: Unless otherwise indicated in this solicitation it is understood and agreed that any items
offered or shipped on this solicitation shall be new and in first class condition unless otherwise
indicated herein.

23. MBE/WBE Participation – Affirmative Action:

a) MBE/WBE – Vendors submitting responses are encouraged to solicit MBE/WBE
participation in fulfilling their contract. Indicate in your response any MBE/WBE areas of
involvement for monitoring purposes.

b) The successful vendor will take affirmative action in complying with all Federal and State
requirements concerning fair employment and treatment of all employees, without regard
or discrimination by reason of race, color, religion, age, sex, national origin or physical
handicap.

24. Default: In case of default by vendor the County may procure the item or services from other
sources and may recover the loss occasioned thereby from any unpaid balance due the vendor or
by proceeding against the vendor’s performance bond, if any, and/or by suit against vendor.

25. Termination for Cause: Any awarded contract is subject to termination for failure to comply with
the specifications, terms and conditions by the County or the contractor upon written notice by
registered mail. Such termination will be effective not less than ten (10) days nor more than sixty (60) days after receipt of such notice from the County nor less than thirty (30) days nor more than sixty (60) days after receipt by the County from the contractor. Receipt of notice by one party to terminate the contract will nullify any subsequent reciprocal notice by the receiving party prior to the announced termination date. In the event of termination, the County shall be responsible to pay the contractor only for work satisfactorily completed upon the effective date of termination and shall not be responsible for any other charges.

26. **Termination for Convenience:** Greenville County may terminate for convenience any contract resulting from this solicitation by providing sixty (60) calendar days advance written notice to the vendor.

27. **Non-Appropriation:** Any contract entered into by the County resulting from this solicitation shall be subject to cancellation without damages or further obligation when funds are not appropriated or otherwise made available to support continuation of performance in a subsequent fiscal period or appropriated year.

28. **Incorporation of Proposal into Contract:** The terms, conditions, and specifications of this proposal and the selected firm’s response are to be incorporated, in total, into the contract.

29. **S.C. Law Clause:** Upon award of contract under this response, the person, partnership, association or corporation to whom the award is made must comply with the laws of South Carolina which require such person or entity to be authorized and/or licensed to do business with this State. Notwithstanding the fact that applicable statutes may exempt or exclude the successful bidder from requirements that it be authorized and/or licensed to do business in this State, by submission of this signed response, the responder understands and agrees to be bound to the jurisdiction and process of the courts of the State of South Carolina, as to all matters and conflicts or future conflicts under the contract and the performance thereof, including any questions as to the liability for taxes, licenses, or fees levied by the State.

30. **Illegal Immigration Reform Act Compliance:** By submitting an offer, Contractor certifies that it will comply with the applicable requirements of Title 8, Chapter 14 of the South Carolina Code of Laws (originally enacted as Section 3 of The South Carolina Illegal Immigration Reform Act, 2008 S.C. Act No. 280) and agrees to provide upon request any documentation required to establish either: (a) the applicability of Title 8, Chapter 14 to Contractor and any subcontractors or sub-subcontractors; or (b) the compliance with Title 8, Chapter 14 by Contractor and any subcontractor or sub-subcontractor. Pursuant to Section 8-14-60, “A person who knowingly makes or files any false, fictitious, or fraudulent document, statement, or report pursuant to this chapter is guilty of a felony and upon conviction, must be fined within the discretion of the court or imprisoned for not more than five years, or both.” Contractor agrees to include in any contracts with its subcontractors language requiring the subcontractors to (a) comply with the applicable requirements of Title 8, Chapter 14, and (b) include in any contracts with the sub-subcontractors language requiring the sub-subcontractor to comply with the applicable requirements of Title 8, Chapter 14. In the event any contractor, subcontractor and/or sub-subcontractor is found not to
be in compliance with the SC Immigration Reform Act [hereinafter "The Act"], the contractor agrees to fully indemnify the County for any loss suffered by the County as a result of such contractor, subcontractor or sub-subcontractor's failure to comply with the Act.

31. **Assignment Clause:** Successful responder will be required to give the County ninety (90) days’ notice in the event of a change in the ownership of this contract. The County is under no obligation to continue this contract with an assignee. No contract or its provisions may be assigned, sublet, or transferred without the written consent of the County.

32. **Indemnification:** The contractor agrees to indemnify and save harmless the County of Greenville and all County officers, agents and employees from any and all claims, suits, actions, legal proceedings, damages, costs, expenses & attorney fees of every name and description, arising out of or resulting from the use of any materials furnished by the contractor, or any work done in the performance of the contract arising out of a willful or negligent act or omission of the provider, its officers, agents and employees; provided that such liability is not attributable to a willful or negligent act or omission on the part of the County, its officers, agents and employees.

33. **Deviations from Specifications:** Any deviation from specifications indicated herein must be clearly pointed out; otherwise, it will be considered that items offered are in strict compliance with these specifications, and successful responder will be held responsible therefore. Deviations must be explained in detail on separate attached sheets(s). The listing of deviations, if any, is required but will not be construed as waiving any requirements of the specifications. Deviations found in the evaluation of the response and not listed may be cause for rejection. Responders offering substitute or equal items must provide information sufficient enough to determine acceptability of item offered.

34. **Minor Deviations:** The County reserves the right to negotiate minor deviations from the prescribed terms, conditions and requirements with the selected vendor.

35. **Contractor License Requirement:** The contractor shall procure all permits and licenses, and pay all charges and fees necessary and incidental to the lawful conduct of his business. He shall keep himself fully informed of existing and future Federal, State, and Local Laws, ordinances and regulations which in any manner affect the fulfillment of his contract and shall comply with the same.

36. **Conflict of Interest Statement:** The contractor may become involved in situations where a conflict of interest could occur due to individual or organizational activities within the County. The vendor, by submitting a response, is in essence assuring the County that his company, and/or subcontractors, is in compliance with all federal, state, and local conflict of interest laws, statutes, and regulations.
37. **Insurance:**

The contractor is responsible for and must have all required insurance listed below and shall not commence work under the associated contract until it has obtained all insurance required, and the County has approved such insurance in writing, nor shall the Contractor allow any subcontractor to commence work on its subcontract until all similar insurance required of the subcontractor has been obtained. All insurance policies shall be maintained for the life of the contract.

A. **THE COUNTY SHALL BE NAMED AS “ADDITIONAL INSURED” FOR ITS INTEREST** on all policies of insurance except Worker’s Compensation, Automobile Liability, and Professional Errors and Omissions, as regards ongoing operations, products and completed operations, and this shall be noted on the face of the Certificate of Insurance. As a part of the certificate of insurance requirement the contractor shall also include acknowledgement and acceptance of the waiver of subrogation provision granted to the County of Greenville. This acknowledgement and acceptance should be included in the same section of the Certificate of Insurance that evidences the “Additional Insured” provision.

B. Certificates for all such policies of insurance shall be provided by the Contractor’s insurance agent or broker to the County within 10 working days from the date of Notice of Award.

C. All Certificates of Insurance submitted shall provide on the face of the certificate reference to County's RFP #53-01/09/20.

D. Contractor will provide County a minimum of 30 days advance notice in the event the insurance policies (or an insurance policy) are canceled. Subcontractors approved to perform work on this project are subject to all of the requirements in this Section.

E. Contractor agrees to maintain and keep in force during the life of this Agreement, with a company or companies authorized to do business in South Carolina, the following insurance policies.

**Comprehensive General Liability:**
1,000,000 per occurrence - combined single limit / $2,000,000 general aggregate, to include products and completed operations.

**Automobile Liability:**
$1,000,000 per occurrence - combined single limit (Coverage shall include bodily injury and property damage and cover all vehicles including owned, non-owned and hired)
Statutory Worker's Compensation:
Coverage A - State of SC
Coverage B - Employers liability
$1,000,000  Each Accident
$1,000,000  Disease, Per Employee
$1,000,000  Disease, Policy Limit

Waiver of Subrogation
Policies shall contain a waiver of subrogation in favor of and/or that applies to the County of Greenville, its departments, agencies, boards, employees, and commissions for losses from work performed by or on behalf of the contractor.

No deviation from these coverages will be accepted unless, in the County’s sole discretion, it is more advantageous to the County, i.e., $1,000,000 - a $2,000,000 or $5,000,000 limit would be acceptable.

38. Contracts: The County reserves the option to prepare and negotiate its own contract with the vendor, giving due consideration to the stipulations of the vendor’s contracts and associated legal documents. Vendors should include with their submittal a copy of any proposed standard contract.

39. Contractor Liability: The contractor assumes full responsibility for all injuries to, or death of any person and for all damage to property, including property and employees of the County and for all claims, losses or expense which may in any way arise out of the performance of the work, whether caused by negligence or otherwise; and the contractor shall indemnify and save the County harmless from all claims, losses, expense, or suits for any such injuries, death or damages to property, and from all liens, losses, expenses, claims or causes of action of any sort which may arise out of the performance of the work, and shall defend, on behalf of the County and suit brought against the County for attorney’s fees and for all other expenses incurred by the County in connection with or as a result of any such suit, claims, or loss. Under no circumstances and with no exception will Greenville County act as arbitrator between the contractor and any subcontractor. The contractor will be solely responsible for compliance with building code requirements, all dimensions, and all conditions relating to his work under this contract. Workmanship shall be first quality in every respect. All measures necessary to ensure a first class job shall be taken.

40. Sub-Contracting: The contractor shall not subcontract any portion of this contract without proper written approval from the County.

41. Non-Collusion: The contractor expressly warrants and certifies that neither the Contractor nor its employees or associates has directly or indirectly entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in conjunction with this response.
42. **Prohibition of Gratuities:** Neither the contractor nor any person, firm or corporation employed by the contractor in the performance of the contract shall offer or give, directly or indirectly, to any employee or agent of the County, any gift, money, or anything of value, or promise any obligations, or contract for future reward or compensation at any time during the term of this contract.

43. **Publicity Releases:** Contractor agrees not to refer to the award of this contract in commercial advertising in such a manner as to state or imply that the products or services provided are endorsed or preferred by the user. The contractor shall not have the right to include the County's name in its published list of customers without prior approval of the County. With regard to news releases, only the name of the County, type and duration of contract may be used and then only with prior approval of the County. The contractor also agrees not to publish, or cite in any form, any comments or quotes from the County Staff unless it is a direct quote from the Public Information Officer.

44. **Public Record:** The County of Greenville is a public body and governed by the South Carolina Freedom of Information Act. Documents submitted to the County relating to this Solicitation are subject to requirements of the Freedom of Information Act and may be deemed public records.

45. **Precedence:** In the event of conflict between the terms and conditions and the specifications, the more restrictive instruction shall take precedence unless stated otherwise in the specifications.

46. **Compliance With Prison Rape Elimination Act (PREA):** By submitting an offer, Contractor certifies that it will comply with the applicable requirements of The Prison Rape Elimination Act of 2003 and agrees to provide or submit the needed information to (a) examine the criminal history of Contractor or any subcontractor who will perform services, which result in contact with inmates and (b) Contractor agrees to disclose any information regarding past history of allegations of sexual harassment or sexual abuse by Contractor or any subcontractor. Contractor and subcontractor agree to complete Training provided by the County and sign an acknowledgement of understanding of PREA requirements. In the event the Contractor or any subcontractor is found not to be in compliance with PREA, the Contractor agrees to fully indemnify the County for any loss suffered by the County as a result of such Contractor or subcontractor’s failure to comply with the Act.

47. **Americans with Disabilities Act** - All work shall be compliant with the full intent of all ADA (Title II) guidelines for accessibility, play components and design. The Department of Justice's regulation implementing Title II, subtitle A, of the ADA applies to State and local government entities, and protects qualified individuals with disabilities from discrimination on the basis of disability in services, programs, and activities provided by State and local government entities. Further, all Local and County code compliances regarding ADA must be met. For additional information on ADA compliance, refer to (ADA.gov).

48. **Asbestos Management Plan:** Contractor, contractor’s employees or any subcontractors will not introduce asbestos containing materials into any County of Greenville facility and will certify at the end of project that all materials used are free and clear of asbestos containing materials. Further,
will provide a MSDS for all products utilized and installed in County of Greenville facilities.

Failure by Contractor, Contractor’s employees or any subcontractor to comply with the County of Greenville Asbestos Plan and / or any governing agency’s regulations may result in work stoppage, dismissal of individual workers, and/or termination of contract and in addition risk potential citations issued by the governing agencies for violations. It is the responsibility of the contractor to:

A. Review the Asbestos Inspection Reports for the facilities for which they are providing services, provide contractor’s employees and subcontractors notification of ACM
B. Provide proof of asbestos training, medical examinations, proper PPE (when necessary)
C. Provide proper licenses, permits, and certifications
D. Comply with all federal, state and local regulations
E. Provide proof of and/or copies of required records upon request of the County of Greenville when necessary
F. Provide a Safety Data Sheet (SDS) for all products installed in County Facilities.
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<thead>
<tr>
<th>Non Responsive</th>
<th>Low</th>
<th>Medium Low</th>
<th>Average</th>
<th>Medium High</th>
<th>High</th>
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**Maximum Points 20**

**Total Score __________**

**Notes:**

---

**County Square • 301 University Ridge • Suite 100 • Greenville, SC 29601-3660 • Fax (864) 467-7304**
# Brushy Creek Stabilization

<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>DESCRIPTION</th>
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<th>UNIT</th>
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<td>As-Builts</td>
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<td>Debris Removal and Off-Site Disposal</td>
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<td>Large Tree Removal</td>
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<td>9</td>
<td>Coir Log (10 ft)</td>
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<td>10</td>
<td>Compost Sock</td>
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<td>Earth Shield Coir Mat</td>
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<td>White Oak</td>
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<td>Elderberry/ Red Chokeberry/ Serviceberry</td>
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<td>Blueberry/ Huckleberry Bush</td>
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<td>Parking lot repair</td>
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**TOTAL COST**

Authorized Signature__________________________       Name of Company____________________
This AGREEMENT is made and entered into on this ____ day of ________, 2019, by and between the COUNTY OF GREENVILLE, a political subdivision of the State of South Carolina, having its principal place of business at 301 University Ridge, Greenville, S.C. 29601 (“County”), and ________________________________, located at ________________________________ (“Contractor”).

In consideration of the covenants hereinafter set forth, the parties mutually agree as follows:

1. CONTRACT PERIOD. This Agreement shall begin on the effective date of the Notice to Proceed, and shall remain in effect for thirty (30) days, unless extended by the County. The County may elect to extend the contract by providing notice to the Contractor at least ten (10) days prior to the termination date.

2. SCOPE OF SERVICES. County has employed Contractor to provide stream stabilization for a 900 foot section of Brushy Creek located between Seth Street and Mills Avenue in Greenville County.

These services to be provided by Contractor are set forth more fully in County Request for Proposals (“RFP”) #53-01/09/20 and in Contractor’s Response, received ________________ to County RFP #53-01/09/20, attached hereto and incorporated herein by reference.

3. PRICE. County agrees to pay Contractor a total sum not to exceed ________________ dollars ($XXXXX.XX).

4. STANDARD OF CARE. Services performed by Contractor will be conducted in a manner consistent with that level of care and skill exercised by members
of the profession with Contractor’s experience and qualifications currently providing
similar services.

5. DOCUMENTS. In connection with the performance of the services, Contractor may deliver to County one or more reports or other written documents reflecting services provided. All such reports or other written documents shall become the property of County upon delivery; however, all original data gathered by Contractor and work papers produced by Contractor in the performance of services are, and shall remain the sole and exclusive property of Contractor.

6. PAYMENT TERMS. Contractor will submit invoices to County, which shall include a detailed listing of charges upon completion of services. Within ten (10) days of receipt of an invoice County shall notify Contractor of any dispute with the invoice and Contractor, upon such notice, shall provide to County back-up data supporting the invoice. County and Contractor will, thereafter, promptly resolve any disputed items. Payment on undisputed invoice amounts is due upon receipt of the invoice by County and is past due thirty (30) days from the date the invoice is received. If payment remains past due sixty (60) days from the date the invoice is received by the County, then Contractor shall have the right to either suspend all services provided pursuant to this Agreement, without prejudice, or terminate this Agreement in accordance with the provisions of Section 18. NO INTEREST OR OTHER LATE PENALTIES SHALL ACCRUE ON LATE PAYMENTS.

7. NON-APPROPRIATION. It is understood and agreed by the parties that in the event funds are not appropriated in the current fiscal year or any subsequent fiscal years, this contract will become null and void and the County will only be required to pay for services completed to the satisfaction of the County.

8. WARRANTY. Contractor warrants to County that all services and labor furnished to progress the work under this contract will be performed in accordance with the standard of care and diligence normally practiced by recognized firms of this type in
performing services of a similar nature, free from defects which would not normally be found in work of this nature, and that the work will be of good quality, and in strict conformance with this contract. All work not conforming to these requirements may be considered defective.

9. INSURANCE. The Contractor is responsible for and must have all required insurance listed below and shall not commence work under the associated contract until it has obtained all insurance required, and the County has approved such insurance in writing, nor shall the Contractor allow any subcontractor to commence work on its subcontract until all similar insurance required of the subcontractor has been obtained. All insurance policies shall be maintained for the life of the contract.

A. THE COUNTY SHALL BE NAMED AS “ADDITIONAL INSURED” FOR ITS INTEREST on all policies of insurance, except Worker’s Compensation, Automobile Liability and Professional Errors and Omissions, regarding ongoing operations, products and completed operations, and this shall be noted on the face of the Certificate of Insurance. As a part of the certificate of insurance requirement the contractor shall also include acknowledgement and acceptance of the waiver of subrogation provision granted to the County of Greenville. This acknowledgement and acceptance should be included in the same section of the Certificate of Insurance that evidences the “Additional Insured” provision.

B. Certificates for all such policies of insurance shall be provided by the contractor's insurance agent or broker to the County within 10 working days from the date of Notice of Award.

C. All Certificates of Insurance submitted shall provide on the face of the certificate reference to County's RFP#53-01/09/20.

D. Contractor will provide County a minimum of 30 days advance notice in the event the insurance policies (or an insurance policy) are canceled.
E. Subcontractors approved to perform work on this project are subject to all of the requirements in this Section.

F. Contractor agrees to maintain and keep in force during the life of this Agreement, with a company or companies authorized to do business in South Carolina, the following insurance policies:

**Comprehensive General Liability:**
$1,000,000 per occurrence - combined single limit / $2,000,000 general aggregate, to include products and completed operations.

**Automobile Liability:**
$1,000,000 per occurrence - combined single limit (Coverage shall include bodily injury and property damage and cover all vehicles including owned, non-owned and hired)

**Statutory Worker’s Compensation:**
Coverage A - State of SC
Coverage B - Employers liability
- $1,000,000 Each Accident
- $1,000,000 Disease, Per Employee
- $1,000,000 Disease, Policy Limit

Policies shall contain a waiver of subrogation in favor of and/or that applies to the County of Greenville, its departments, agencies, boards, employees, and commissions for losses from work performed by or on behalf of the contractor.

No deviation from these coverages will be accepted unless, in the County’s sole discretion, it is more advantageous to the County, i.e., $1,000,000 - a $2,000,000 or $5,000,000 limit would be acceptable.

Vendors will provide County a minimum of 30 days advance notice in the event the insurance policy (or an insurance policy) is canceled. Subcontractors approved to perform work on this project are subject to all of the requirements in this Section.

10. INDEMNIFICATION. Contractor agrees to defend, indemnify and save harmless the County and all County officers, agents and employees from and against
any loss, damage, claim or action, including all expenses incidental to such claim and action, to the extent arising from any negligent acts or omissions by Contractor, its agents, staff, consultants and contractors employed by it, in the performance of the services under this Agreement. Contractor shall not be responsible for any loss, damage, or liability to the extent arising from acts of the County, its agents, staff, and other consultants employed by it.

11. PERFORMANCE AND PAYMENT BOND. Contractor shall furnish a satisfactory Performance and Payment Bond in the amount of the total contract price no later than fifteen (15) business days after the date of the Notice of Award. The Bond must have approval by the County Attorney's Office before it is made effective. The Contractor shall have as surety a corporate surety authorized to act as surety in South Carolina. The Performance and Payment Bond shall remain in effect for one year after completion of the contract.

12. RIGHT OF ENTRY. The County will provide for the right of entry for Contractor, its subcontractors, and all necessary equipment in order to complete the work under this Agreement. Contractor agrees to be responsible for any damage to property that is caused by Contractor, its subcontractors and/or equipment and further agrees to take all necessary corrective action for any damage to property that is caused by Contractor, its subcontractors and/or equipment.

13. SAFETY, HEALTH, AND SECURITY. Contractor shall be solely responsible for its activities, that of its employees on the site and activities of its consultants, contractors and/or subcontractors for maintaining a safe job site. Contractor's activities and activities of its consultants, contractors and/or subcontractors shall comply with all local, state, and federal safety regulations and their enforcement agencies. Contractor shall at all times conduct its operations under this Contract in a manner to avoid risk of endangerment to the health and safety of persons and property. The Contractor shall have sole responsibility for implementing its safety
and health programs, taking all safety and health precautions necessary and continuously inspecting all equipment, materials and work to prevent, discover, determine and correct any conditions which might result in personal injury, equipment damage or damage to property or the public. Contractor’s safety, health and security programs shall be in compliance with all regulatory requirements and shall furnish accident, incident, injury, and other records and reports required by the Occupational Safety and Health Administration, State and Local laws, or by the County.

14. COMPLIANCE WITH CODES AND STANDARDS. Contractor’s professional services shall incorporate those federal, state and local laws, regulations, codes and standards that are applicable at the time Contractor rendered its services. Contractor shall not be responsible for any claim or liability for injury or loss allegedly arising from Contractor’s failure to abide by federal, state or local laws, regulations, codes and standards that were not in effect or publicly announced at the time Contractor rendered its services.

15. ILLEGAL IMMIGRATION REFORM ACT COMPLIANCE. By submitting an offer, Contractor certifies that it will comply with the applicable requirements of Title 8, Chapter 14 of the South Carolina Code of Laws (originally enacted as Section 3 of The South Carolina Illegal Immigration Reform Act , 2008 S.C. Act No. 280) and agrees to provide upon request any documentation required to establish either: (a) the applicability of Title 8, Chapter 14 to Contractor and any subcontractors or sub-subcontractors; or (b) the compliance with Title 8, Chapter 14 by Contractor and any subcontractor or sub-subcontractor. Pursuant to Section 8-14-60, “A person who knowingly makes or files any false, fictitious, or fraudulent document, statement, or report pursuant to this chapter is guilty of a felony, and upon conviction, must be fined within the discretion of the court or imprisoned for not more than five years, or both.” Contractor agrees to include in any contracts with its subcontractors language requiring the subcontractors to (a) comply with the applicable requirements of Title 8, Chapter
14, and (b) include in any contracts with the sub-subcontractors language requiring the sub-subcontractor to comply with the applicable requirements of Title 8, Chapter 14. In the event any contractor, subcontractor and/or sub-subcontractor is found not to be in compliance with the SC Immigration Reform Act [hereinafter "The Act"], the contractor agrees to fully indemnify the County for any loss suffered by the County as a result of such contractor, subcontractor or sub-subcontractor’s failure to comply with the Act.

16. PUBLIC RESPONSIBILITY. The County has a duty to conform to applicable codes, standards, regulations and ordinances with regard to public health and safety. Contractor will at all times alert the County to any matter of which Contractor becomes aware and believes requires the County to issue a notice or report to certain public officials, or to otherwise conform with applicable codes, standards, regulations or ordinances. If the County decides to disregard Contractor’s recommendations in these respects, Contractor shall employ its best judgment in deciding whether or not it should notify public officials.

17. CLIENT LITIGATION. Contractor agrees to produce documents, witnesses and/or general assistance to any litigation, arbitration or mediation involving the County, if the County requests such documents, witnesses and/or general assistance. The County shall reimburse Contractor for all direct expenses incurred and time according to Contractor’s rate schedule as of the date of the execution of this Agreement.

18. CONFIDENTIALITY. Contractor will maintain as confidential any documents or information provided by the County and will not release, distribute or publish same to any third party without prior permission from the County, unless compelled by law or order of a court or regulatory body of competent jurisdiction. Such release will occur only after prior notice to the County.
19. NOTICES. All notices made pursuant to this Agreement shall be in writing and delivered personally or sent by registered or certified mail, return receipt requested, to the parties at their respective addresses set forth below:

COUNTY
Bob Brewer, CPPO, CPPB
Director
County of Greenville
Procurement Services Division
301 University Ridge, Suite 100
Greenville, SC 29601

CONTRACTOR

Any party may change the person to whom notices are to be sent by giving ten (10) calendar days written notice of such change to the other party.

20. TERMINATION. This contract is subject to termination for failure to comply with the specifications, terms and conditions by the County or the Contractor upon written notice by registered mail. Such termination will be effective not less than ten (10) days nor more than sixty (60) days after Contractor’s receipt of such notice from the County, nor less than thirty (30) days nor more than sixty (60) days after receipt by the County from the Contractor. Receipt of notice by one party to terminate the contract will nullify any subsequent reciprocal notice by the receiving party prior to the announced termination date. In the event of termination, the County shall be responsible to pay the Contractor only for work satisfactorily completed upon the effective date of termination, and the County shall not be responsible for any other charges.

Should the County fail to make payment on any undisputed invoice amount within sixty (60) business days upon receipt of such invoice, Contractor may elect to either suspend the services provided or terminate this Agreement; provided, however, prior to termination, the County shall be given notice of the default and an opportunity to cure
such default within seven (7) business days after receipt of the notice of default. Should this Agreement be terminated by Contractor, Contractor shall be entitled to be paid only for the services actually completed to the satisfaction of the County as of the date of termination.

The County may terminate this contract for convenience by providing thirty (30) calendar days advance written notice to the Contractor.

This Agreement may also be terminated pursuant to the pertinent portions of Section 6 or Section 7 herein.

This Agreement may also be terminated by the written mutual consent of both parties.

21. CONTRACT DOCUMENTS. This Agreement, along with the provisions contained in County RFP #53-01/09/20 and Contractor’s Response to County RFP #53-01/09/20 represents the entire agreement between the parties and supersedes any and all prior agreements, whether written or oral, that may exist between the parties regarding same. If there is a conflict between any of the terms of these contract documents the order of precedence of these contract documents shall be:

   A. Any amendment signed after the execution date of this agreement;
   B. This Agreement;
   C. Contractor’s Response to County RFP #53-01/09/20;
   D. Addenda to County RFP #53-01/09/20.
   E. County RFP #53-01/09/20.

22. ASSIGNMENT. This Agreement may not be assigned by either party without the prior written consent of the other party.

23. SEVERABILITY. Should any section, paragraph, clause, phrase, or provision of this Agreement be determined invalid or held unconstitutional by a court of competent jurisdiction, such declaration shall not affect the validity of this Agreement as a whole or
any part or provision thereof, other than the part so decided to be invalid or unconstitutional.

24. APPLICABLE LAW AND VENUE. The construction, interpretation and performance of this Agreement shall be governed by and construed in accordance with the laws of the State of South Carolina.

The County and Contractor further agree that this Agreement shall be deemed to be made and performed in Greenville County, South Carolina. For the purposes of venue, all suits or causes of action arising out of this Agreement shall be brought in the courts of Greenville County, South Carolina.
IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the date first above written.

WITNESSES:

___________________________ By: __________________________

___________________________ Its: __________________________

CONTRACTOR

COUNTY OF GREENVILLE

By: Herman G. Kirven, Jr., Chairman
Greenville County Council

By: Joseph M. Kernell
County Administrator

ATTEST: Regina McCaskill
Clerk to Council
SPECIFICATION

MOBILIZATION

1. GENERAL

1.1. DESCRIPTION

Mobilization shall consist of furnishing, transporting, stockpiling, daily use and maintenance, and removal of all materials and equipment necessary for the full and successful completion of the project as defined in the plans and these specifications.

2. EXECUTION

Mobilization shall include, but not be limited to, the following activities:

A. Initial movement of personnel.

B. Moving all the construction tools and other related equipment required to complete the work on site. Equipment must be cleaned (power washed off-site) prior to entering the project site in order to prevent the inadvertent spread/introduction of non-native species.

C. All other initial expenses and operations which must be performed before the beginning of the work.

D. Storage of equipment and materials on-site in designated areas and kept in clean and working order.

E. Maintenance of the site in a safe, secure, and reasonably orderly manner.

F. Demobilization, to include the removal of all tools, equipment, debris designated for removal, and personnel and the restoration of the site to a state satisfactory to the County.

2. MEASUREMENT AND PAYMENT

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

Fifty percent (50%) of the mobilization will be paid on the initial movement of equipment and personnel. Another 25% will be paid midway through the project. The last 25% will be paid at completion of demobilization and acceptance by the County that the site has been returned to stabilized conditions.

END OF SECTION
SPECIFICATION

EROSION AND SEDIMENT CONTROL

1. GENERAL

1.1. DESCRIPTION

This work consists of all work associated with the Erosion and Sediment Control for the construction site before, during, and after construction. This will include implementation of the Stabilized Construction Entrance, Construction Entrance, Perimeter Control, and the use of Geotextile Fabric, Hydraulic Erosion Control Product (HECP), and Seeding in accordance with the associated Plans and Specifications.

This work shall also include the preservation from injury or defacement of all vegetation and objects designated to remain.

1.2. PRODUCTS

1.2.1. MATERIALS

All materials used for Erosion and Sediment Control shall comply with the associated Specifications.

2. EXECUTION

2.1. EROSION AND SEDIMENT CONTROL

The Contractor shall install the Stabilized Construction Entrance and Perimeter Control as indicated on the plans and in accordance with the associated Specifications prior to any land disturbance activities.

Stabilization measures shall be initiated as soon as practicable in portions of the site that have been disturbed by construction activities, but no longer than fourteen (14) days after disturbing activities have ceased on a portion of the site.

All erosion and sediment control measures shall be inspected at least once during each calendar week and shall be repaired or replaced as necessary.

2.2. FINAL STABILIZATION

Final stabilization shall be implemented on all areas of the site that have been disturbed. These areas may include, but are not limited to, tree removals, areas adjacent to disturbances, areas used for access and staging, spoil pile areas, and areas disturbed during the removal of the Erosion and Sediment Control features.

Final stabilization may require the installation of Erosion Control Blankets, HECP, topsoil, seeding, and mulch. Obtain Engineer approval prior to implementation of final stabilization.
3. MEASUREMENT AND PAYMENT

The pay item for Erosion and Sediment Control work will be as lump sum (LS). Activities shall comply with all appropriate Specifications as applicable. Erosion and Sediment Control, unless otherwise indicated shall be full compensation for all labor, materials, equipment, tools, transportation and supplies required to complete the work in accordance with the Plans, Specifications, and other terms of the Contract. Payment is 50% upon approval of installation of Stabilized Construction Entrance and Perimeter Control, 25% midway through the project, and the final 25% will be paid upon project completion and acceptable removal of all items to be removed. Payment includes all direct and indirect costs and expenses required to complete the work.

END OF SECTION
SPECIFICATION

STABILIZED CONSTRUCTION ENTRANCE

1. GENERAL

1.1. DESCRIPTION

Install the stabilized construction entrance as shown on the plans, which is a temporary stone-stabilized pad with a non-woven geotextile fabric underlining, at defined points of vehicular ingress and egress on the project site to reduce the amount of mud, dirt, and rocks transported onto public roads by vehicles, equipment, and runoff. Taper the edges of the entrance out towards the road to prevent tracking of mud at the edge of the entrance, and so that long vehicles do not leave the stabilized area when turning onto or off of the paved roadway.

1.2. PRODUCTS

1.2.1. MATERIALS

Provide a stabilized construction entrance composed of the following materials:

- Class 2 non-woven geotextile fabric and
- Aggregate stone with the gradation in the following table.

<table>
<thead>
<tr>
<th>Nominal Size (Sieves with Square Openings)</th>
<th>Percent Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 in.</td>
<td>100</td>
</tr>
<tr>
<td>1-1/2 in.</td>
<td>35 – 100</td>
</tr>
<tr>
<td>3/4 in.</td>
<td>0 - 15</td>
</tr>
</tbody>
</table>

2. EXECUTION

2.1. INSTALLATION

Install a stabilized construction access as shown on the plans and at all defined points where traffic enters or leaves the project site and moving directly off or onto a public road. Use construction access in conjunction with the stabilization of construction roads to reduce the amount of mud picked up by vehicles.

The stabilized construction access should have a typical width of 24 feet wide and can be modified as necessary to accommodate site constraints. Taper the edges of the entrance out towards the road to prevent tracking of mud at the edge of the entrance.

If washing is used, make provisions to intercept the wash water and trap the sediment before it is carried offsite. Require washdown facilities as needed. In general, establish washdown facilities with crushed gravel and drain into a sediment trap or sediment basin.
Remove all vegetation and any objectionable material from the foundation area. Install a Class 2 non-woven geotextile fabric before placing any stone. If necessary, install a culvert pipe across the entrance to provide positive drainage. Place the aggregate stone at a minimum depth of 6 inches uniform on top of the geotextile fabric.

2.2. INSPECTION AND MAINTENANCE OF STABILIZED CONSTRUCTION ACCESS

Inspect stabilized construction entrances every seven (7) days. Check for mud and sediment buildup and pad integrity. Wash, replace, or add stone whenever the entrance fails to perform effectively or as directed by the inspector. The stone in the entrance should be washed or replaced whenever the entrance fails to reduce mud being carried offsite by vehicles. Frequent washing will extend the useful life of the stone.

Reshape the stone pad as needed for drainage and runoff control. Brush or sweep up soil that has been tracked offsite immediately for proper disposal. Flushing should only be used when the water can be discharged to a sediment trap or basin. Maintain the stabilized construction access until the remainder of the construction site has been fully stabilized. Repair any broken pavement immediately.

If the aggregate material is being tracked offsite, limit larger vehicles from the construction site or use a larger diameter stone. If excessive sediment is being tracked onto the roadway, increase the length of the stabilized construction entrance.

3. MEASUREMENT AND PAYMENT

The pay item Stabilized Construction Entrance will be included in the lump sum (LS) for Erosion and Sediment Control. Activities shall comply with all appropriate Specifications as applicable. Erosion and Sediment Control, unless otherwise indicated shall be full compensation for all labor, materials, equipment, tools, transportation and supplies required to complete the work in accordance with the Plans, Specifications, and other terms of the Contract. Payment is 50% upon approval of installation of Stabilized Construction Entrance and Perimeter Control, 25% midway through the project, and the final 25% will be paid upon project completion and acceptable removal of all items to be removed. Payment includes all direct and indirect costs and expenses required to complete the work.

END OF SECTION
SPECIFICATION

CONCRETE WASHOUT

1. GENERAL

1.1. DESCRIPTION

The purpose of the concrete washout is to minimize or eliminate the discharge of concrete waste materials into waterbodies. Concrete washouts must occur for any on-site process that includes the use of concrete, mortar, slurries containing Portland cement concrete or asphalt concrete, grout, and when any concrete trucks or concrete-coated equipment are washed on-site.

Concrete washout may occur in a chute washout box or chute washout bucket and pump, attached to a concrete truck. Equipment washing or on-site chute washing shall be done in an above-ground washout pit with a minimum size of 10 feet by 10 feet.

2. MATERIALS

Plastic lining material must be a minimum of 10-milimeter polyethylene sheeting that is free of holes, tears, or other defects that may compromise the impermeability of the material.

3. EXECUTION

Concrete washout facilities should be located at least 50 feet from any surface waters, as shown on the Construction Drawings. The soil base shall be prepared to be free of rocks or other debris that may cause tears or holes in the liner. The pit shall be constructed prior to the initiation of any process involving concrete, grout, or other material that will need use of the washout. Pit shall be of adequate size to accommodate sufficient volume to completely contain all liquid and water concrete materials generated during washout procedures, maintaining a freeboard of at least four inches. This pit shall be constructed of hay bales and plastic lining.

Facility should be cleaned out upon reaching 75% of its capacity. Following disposal of concrete washout waste into the washout pit, the slurry shall be allowed to dry and then disposed of as solid waste. If the plastic lining is damaged during the removal, plastic linings must be replaced.

4. MEASUREMENT AND PAYMENT

The pay item for diversion, if implemented by the contractor, shall be an incidental to the associated line items for which the dewatering is implemented. Price and payment shall be full compensation for all labor, materials, equipment, tools, transportation and supplies required to complete the work in accordance with the Plans, Specifications, and other terms of the Contract. Payment is 100% upon approval of acceptable application meeting the requirements of this Specification. The payment includes all direct and indirect costs and expenses necessary to complete the work.

END OF SECTION
SPECIFICATION

CLEARING AND GRUBBING

1. GENERAL

1.1. DESCRIPTION

This work consists of clearing, grubbing, removing and disposing of all vegetation, debris and obstructions within the identified areas, except such objects as are designated to remain, or are to be otherwise removed in accordance with the plans or other sections of these specifications. This work shall also include the preservation from injury or defacement of all vegetation and objects designated to remain.

The Engineer will establish the limits of disturbance as shown on the plans and will designate all trees, shrubs, plants and other items to be removed. Trees, plant specimens or other objects considered valuable by adjacent property owners or aesthetically desirable and which are designated by the Engineer to remain, shall not be removed or damaged. The Contractor shall, when Clearing and Grubbing, exercise care to avoid cutting, damaging or destroying any timber outside of the limits of disturbance as shown on the plans. Likewise, the Contractor shall not cut, damage or destroy timber outside the limits of disturbance unless the plans or special provisions provide for clearing such other areas necessary to complete the work. Any damage to natural terrain or to vegetation or objects to remain shall be repaired, replaced or otherwise compensated for, as determined by the County or Engineer, at the expense of the Contractor.

2. EXECUTION

Clearing and grubbing work shall be performed before other construction work in the same general area is started. No clearing and grubbing shall occur until appropriate sediment and erosion control measures are in place.

Within areas where excavation is to be made and where embankments are to be constructed, the ground shall be cleared of all vegetation, stumps, rubbish, logs, roots, foundations utility connections not in service, and other objectionable material hereinafter indicated or considered necessary to satisfactorily complete the work. This work shall also include the removal and disposal (or salvage if so required by the County) of fences, posts, signs, structures, and other obstructions that interfere with the work and that are not to be adjusted or relocated.

All areas to be excavated shall be grubbed. Stump holes and other holes from which obstructions are removed, except in areas to be excavated, shall be backfilled and compacted with suitable material in accordance with the Excavation, Filling, and Grading specification.

All materials removed by the clearing and grubbing operation shall be removed from the project, or otherwise disposed of as specified or directed at the expense of the Contractor. The Contractor shall be responsible for obtaining disposal sites and securing any applicable State, Federal, County or City permits that may be required. The Contractor shall certify in writing to the County that all permit requirements have been met before placing any material in a disposal area.
Brush, weeds and other designated vegetation, shall be re-cut immediately before final inspection if considered necessary by the County.

3. MEASUREMENT AND PAYMENT

The pay item for Clearing and Grubbing work will be as a lump sum (LS). Price and payment shall be full compensation for all labor, materials, equipment, tools, transportation and supplies required to complete the work in accordance with the Plans, Specifications, and other terms of the Contract. Payment is 100% upon approval of acceptable application meeting the requirements of this Specification. The payment includes all direct and indirect costs and expenses necessary to complete the work.

END OF SECTION
SPECIFICATION

PERIMETER CONTROL

1. GENERAL

1.1. DESCRIPTION

Perimeter Control is used as a temporary sediment control practice on sites where there will be soil disturbance due to construction activities. Perimeter Control consists of a sediment control barrier supported by posts. Use Perimeter Control as a sediment control practice for sheet flow runoff conditions. Do not use Perimeter Control for areas receiving concentrated flow.

1.2. MATERIALS

1.2.1. PERIMETER CONTROL

Provide materials for Perimeter Control complying with the requirements of this Specification, on the Plans, or as approved by the Engineer.

Do not use straw bales, natural pine needle bales, leaf mulch, and or grass clippings as Perimeter Control. Provide Perimeter Control that exhibits the following properties:

- Materials are certified 100% weed free.
- When using Sediment Tubes for Perimeter Control, use Sediment Tubes meeting SCDOT Supplemental Specification for Sediment Tubes for Ditch Checks (SC-M-815-12) or latest revision, except the minimum diameter/height is 9-inches.
- When using Weighted Sediment Tubes for Perimeter Control, use products meeting SCDOT Supplemental Specification for Inlet Structure Filter, Type F - Weighted Inlet Tube (SC-M-815-8) or latest revision, with a minimum diameter/height of 9-inches. Ensure all weighted sediment tubes for perimeter control have a uniform weight per unit length.
- When using compost as a filtering component for Perimeter Control, use Compost meeting SCDOT Supplemental Specification for Compost (SC-M-815-3) or latest revision.
  - When using compost as a filtering component for Perimeter Control, use a knitted netting material with 1/8 inch to 3/8 inch openings.
  - Primary material or netting is stable to ultraviolet light or are treated with ultraviolet stabilizers.

Do not use straw, curled excelsior wood, or natural coconut rolled erosion control products (RECPs) that are rolled up to create a Perimeter Control.

If netting is used to contain a filter material, ensure the openings of the netting are of the proper size and are smaller than the filter material to ensure that the filter material is properly contained.
Table 1: Minimum Perimeter Control Performance Requirements

<table>
<thead>
<tr>
<th>Physical Property*</th>
<th>Test Method</th>
<th>Required Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height or Diameter</td>
<td>Measured</td>
<td>9-inch minimum</td>
</tr>
<tr>
<td>Filtering Efficiency Performance</td>
<td>ASTM D7351 or Equivalent</td>
<td>80% Total Suspended Solids (TSS)</td>
</tr>
<tr>
<td>Primary Material or Netting Ultraviolet Stability (retained strength after 500 hrs. of ultraviolet exposure)</td>
<td>ASTM D 4355</td>
<td>70%</td>
</tr>
</tbody>
</table>

*Unless otherwise indicated, numerical values represent the MARV.

1.2.2. STEEL POSTS

Furnish steel posts meeting the following minimum physical requirements:

- Minimum length of four (4) feet.
- Composed of high strength steel with minimum yield strength of 50,000 psi.
- Standard “T” section with a nominal face width of 1.38 inches and nominal “T” length of 1.48 inches.
- Weighs 1.25 pounds per foot (± 8%).
- Painted with a water based baked enamel paint.

1.2.3. WOOD POSTS

Furnish wood posts meeting the following minimum physical requirements:

- Minimum length of four (4) feet.
- Rectangular in shape with a minimum measured dimension of 3/4 inch x 3/4 inch and a maximum measured dimension of 2 inches x 2 inches.

2. EXECUTION

2.1. SITE PREPARATION

Proper site preparation is essential to ensure Perimeter Control is in complete contact with the underlying soil or underlying surface or is installed in a manner where runoff cannot undermine the Perimeter Control. Remove all rocks, clods, vegetation, or other obstructions that would prevent the installed Perimeter Control from having direct contact with the underlying soil or surface.

2.2. GENERAL INSTALLATION

Install Perimeter Control before any land disturbance in the designated areas has started.
Install Perimeter Control perpendicular to the direction of flow and at the proper distance from the toe of slopes as shown in the table below to provide sediment storage and access for maintenance and cleanout.

<table>
<thead>
<tr>
<th>Height of Fill (ft)</th>
<th>Fill Slope</th>
<th>Minimum Offset from Toe of Slope (ft)</th>
<th>Minimum Right of Way Offset From Toe of Slope (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 6</td>
<td>2:1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>4:1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6:1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-10</td>
<td>2:1</td>
<td>12*</td>
<td>13*</td>
</tr>
<tr>
<td></td>
<td>4:1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>6:1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;10</td>
<td>2:1</td>
<td>12*</td>
<td>13*</td>
</tr>
<tr>
<td></td>
<td>4:1</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>6:1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* The minimum offsets of each group of height of fill cannot be reduced unless curb and gutter or some other feature reduces the flow of water down the slope.

Install Perimeter Control using wooden posts with a minimum measured dimension of 3/4 inch x 3/4 inch and a maximum measured dimension of 2 inches x 2 inches, or using steel posts (1.25 lbs/ linear foot) a minimum of 4 feet in length. Space posts or stakes on maximum 4-foot centers and drive them into the ground to a depth of 2 feet or to the maximum extent practicable.

Install Perimeter Control in continuous lengths to avoid joints. When joints are necessary, lap the ends of adjacent Perimeter Control with a minimum six (6) inch overlap to prevent flow and sediment from passing through the field joint.

When installing Sediment Tubes for Perimeter Control on a soil surface, construct a small U-shaped trench to a depth that is 20% of the perimeter control diameter/height. Lay the Sediment Tubes for Perimeter Control flat in the U-shaped trench and compact the upstream Perimeter Control soil interface with the excavated soil.

Install the posts in the middle, or on the downstream third of the Sediment Tubes for Perimeter Control, or install posts per the manufacturer’s recommendation.

Sediment Tubes for Perimeter Control weighing more than 14-pounds per linear foot do not require posts, trenching, or additional filter media. In areas where concentrated flow is experienced, backfill Sediment Tubes for Perimeter Control weighing more than 14-pounds per foot with No. 5 or No. 57 filter media on the upstream side of the Sediment Tubes for Perimeter Control to increase the contact area with the underlying soil or surface, increase filter size, slow down flow, capture more sediment, and reduce undercutting.
2.3. DELIVERY, STORAGE, AND HANDLING

Follow the manufacturer’s written storage and handling procedures for Perimeter Control labeling, shipment, and storage. Clearly show the Perimeter Control manufacturer or supplier name on product labels.

Store Perimeter Controls off the ground and cover them to adequately protect them from the following:

- Construction damage.
- Precipitation.
- Extended exposure to ultraviolet radiation including sunlight.
- On-site chemicals.
- Flames and sparks.
- Excess temperatures.
- Other environmental conditions that can damage the physical properties.

2.4. INSPECTION AND MAINTENANCE

Inspect Perimeter Control after installation to ensure that no gaps exist under the Perimeter Control or between the joints of adjacent ends of sediment tubes.

Inspect Perimeter Control every seven (7) days. Check where runoff has eroded a channel beneath the Perimeter Control, or where the Perimeter Control has sagged or collapsed by overtopping. Repair rills, gullies, and undercutting near the Perimeter Control.

Remove sediment deposits that impair the sediment control capability of the Perimeter Control when the sediment reaches one-third (1/3) of the height of the exposed Perimeter Control. Remove trapped sediment or stabilize on site. If a Perimeter Control or portion of Perimeter Control is located in an area where removing the sediment is not possible, install a second Perimeter Control, if necessary, at the direction of the Engineer.

Remove and/or replace installed Perimeter Control as required to adapt to changing construction site conditions. Review daily the location of Perimeter Control in areas where construction activities have changed the natural contour and runoff pattern to ensure that the Perimeter Control is properly located for effectiveness. Install additional Perimeter Control as directed by the Owner’s Representative where deficiencies exist.

When the functional longevity of the Perimeter Control is exceeded as determined by the Engineer or manufacturer’s representative, remove them from the site.

Remove Perimeter Control within 30 days after final stabilization is achieved or after temporary Best Management Practices (BMPs) are no longer needed. Permanently stabilize disturbed areas resulting from Perimeter Control removal. The Perimeter Control material remains the property of the contractor and may be used in other locations provided the materials meet the appropriate requirements contained in this Specification and/or on the Plans.
Gather and dispose Perimeter Control in regular means as non-hazardous, inert material. Before final stabilization, backfill all trenches, depressions, or other ground disturbances caused by the removal of Perimeter Control.

3. MEASUREMENT AND PAYMENT

The pay item for Perimeter Control will be included in the lump sum (LS) for Erosion and Sediment Control. Activities shall comply with all appropriate Specifications as applicable. Erosion and Sediment Control, unless otherwise indicated shall be full compensation for all labor, materials, equipment, tools, transportation and supplies required to complete the work in accordance with the Plans, Specifications, and other terms of the Contract. Payment is 50% upon approval of installation of Stabilized Construction Entrance and Perimeter Control, 25% midway through the project, and the final 25% will be paid upon project completion and acceptable removal of all items to be removed. Payment includes all direct and indirect costs and expenses required to complete the work.

END OF SECTION
SPECIFICATION

HYDRAULIC EROSION CONTROL PRODUCT

1. GENERAL

1.1. DESCRIPTION

This work consists of installation of Hydraulic Erosion Control Product (HECP) as stated in these specifications. This work will reinforce BMPs or other areas with a product that will protect against erosion and provide an organic substrate for vegetation to grow.

2. PRODUCTS

2.1. Hydraulic Erosion Control Product

Ensure the HECP is as listed in the most recent edition of the SCDOT Qualified Product List 79.

3. EXECUTION

3.1. INSTALLATION

The HECP shall be used for erosion and sediment control and stabilization in disturbed areas where the plans do not specify a BMP for installation and where seeding or geotextile fabric are not applicable, as stated in these specifications, or as requested by the County or County’s representative. The application rate shall be 3,500 pounds per acre.

4. MEASUREMENT AND PAYMENT

The pay item for HECP will be included in the lump sum (LS) for Erosion and Sediment Control or included with the cost as indicated in applicable specifications. Activities shall comply with all appropriate Specifications as applicable. Erosion and Sediment Control, unless otherwise indicated shall be full compensation for all labor, materials, equipment, tools, transportation and supplies required to complete the work in accordance with the Plans, Specifications, and other terms of the Contract. Payment is 50% upon approval of installation of Stabilized Construction Entrance and Perimeter Control, 25% midway through the project, and the final 25% will be paid upon project completion and acceptable removal of all items to be removed. Payment includes all direct and indirect costs and expenses required to complete the work.

END OF SECTION
SPECIFICATION

DIVERSION/ PUMP AROUND

1. GENERAL

1.1. DESCRIPTION

This work shall consist of maintaining and diverting stream flow for the purpose of isolating work areas when construction activities take place within the stream channel and the contractor elects to work under dry conditions, as indicated in these specifications.

2. MATERIALS

Sandbags shall consist of materials which are resistant to ultraviolet radiation, tearing, and puncture and woven tightly enough to prevent leakage of fill material (i.e. sand, fine gravel, etc.).

Sheeting shall consist of polyethylene plastic, which is impervious and resistant to puncture and tearing.

Pump(s) shall be large enough to maintain uninterrupted base flow to the channel downstream of the work area. The pump around shall include a hose suitable to convey water overland to the downstream section. Minimum linear feet of hose required is equivalent to the maximum estimate for one workday provided by the Contractor. The pump shall be shut off at night and baseflow shall flow through the completed and stabilized portion of the project into the existing downstream channel.

Filter bags made of non-woven geotextile as specified in the Contract Documents shall be used for dewatering the turbid water within the active work area.

3. EXECUTION

Installation of sand bags, sheeting, and pump around shall be in accordance with the erosion and sediment control details, and in a manner to minimize downstream impacts.

The diversion structure shall be installed from upstream to downstream.

The height of the sand bag diversion structure shall be a minimum of baseflow depth plus one foot, and a minimum of 2 feet. Further, the sand bag diversion shall be of sufficient height as to provide a pool deep enough to maintain pumping operations.

Sheeting shall overlap the sandbags such that the upstream portion covers the downstream sandbag face with at least an 18 inch overlap.
When dewatering the work area, the pump shall discharge into dewatering bag, in accordance with the associated specification. The dewatering bag must be placed within the Project Limits on a flat surface to allow dewatering without creating erosive conditions in the area of the outfall.

4. MEASUREMENT AND PAYMENT

The pay item for diversion, if implemented by the contractor, shall be an incidental to the associated line items for which the dewatering is implemented. Price and payment shall be full compensation for all labor, materials, equipment, tools, transportation and supplies required to complete the work in accordance with the Plans, Specifications, and other terms of the Contract. Payment is 100% upon approval of acceptable application meeting the requirements of this Specification. The payment includes all direct and indirect costs and expenses necessary to complete the work.

END OF SECTION
SPECIFICATION

DEWATERING BAG

1. GENERAL

1.1. DESCRIPTION

Dewatering Bags shall be fabricated from non-woven geotextile materials that filter sediment-laden water from dewatering operations. Sediment laden water is pumped into the non-woven geotextile fabric bag that allows filtered water to pass through.

1.2. PRODUCTS

1.2.1. MATERIALS

Use Dewatering Bags composed of a UV resistant, non-woven geotextile sewn into a completely enclosed bag. Use Dewatering Bags sewn with high strength double stitched seams. Use Dewatering Bags that have a sewn-in sleeve to receive the pump discharge hose.

The Dewatering Bag shall comply with the properties identified in the table below.

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (oz/yd²) (typical)</td>
<td>ASTM D5261</td>
<td>10 oz</td>
</tr>
<tr>
<td>Grab Tensile Strength (MD)</td>
<td>ASTM D4632</td>
<td>250 lbs</td>
</tr>
<tr>
<td>Mullen Burst</td>
<td>ASTM D3786</td>
<td>350 psi</td>
</tr>
<tr>
<td>UV Resistance</td>
<td>ASTM D4355</td>
<td>70% @ 500 hrs</td>
</tr>
<tr>
<td>Flow Rate (gal/min.ft²)</td>
<td>ASTM D4491</td>
<td>70</td>
</tr>
<tr>
<td>Filtering Efficiency</td>
<td>ASTM D5141</td>
<td>80%</td>
</tr>
</tbody>
</table>

1.3. QUALITY ASSURANCE

Provide Dewatering Bags listed on the most recent edition of SCDOT Qualified Product List.

At the time of delivery, provide the Engineer with the Dewatering Bag packing list containing complete identification, including but not limited to the following:

- Manufacturer’s name and location.
- Manufacturer’s telephone number and fax number.
- Manufacturer’s e-mail address and web address.
- Dewatering Bag name, model, and/or serial number.
- Dewatering Bag dimensions.
- Certification that the Dewatering Bag meets the physical and performance criteria of this specification.
2. EXECUTION

2.1. EQUIPMENT

Ensure that the equipment necessary for the proper installation of the work is on site, in acceptable working condition, and approved by the Engineer as to both type and condition before the start of work. Provide sufficient equipment to enable prosecution of the work in accordance with the project schedule and completion of the work in the specified time.

2.2. SITE ASSESSMENT

Assess the proposed site by considering potential water quality impacts and methods to minimize potential impacts from the following site characteristics:

- Potential contaminants in the water to be filtered. Note any odor, discoloration, oil sheen, or other notable conditions. Contact SCDHEC Land & Waste Emergency Response if a hazardous spill is suspected.
- Location of the discharge from the Dewatering Bag.
- Transport method and distance to nearest receiving waters.

When practical, select dewatering locations that are not in close proximity to receiving surface waters. Select locations with a sufficient permeable buffer to allow natural infiltration instead of discharging to receiving surface waters. Do not place Dewatering Bags directly in jurisdictional waters of the state.

2.3. DEWATERING BAG SELECTION

Use the following steps to select an appropriately sized Dewatering Bag. Consult with the Engineer to select Dewatering Bag size if insufficient information is known about the site conditions.

1. Determine the peak flow rate generated from the dewatering pump in gallons per minute.
2. Determine the peak flow rate through the Dewatering Bag in gallons per minute based on the Dewatering Bag peak flow rate and the total surface area provided by the manufacturer.
3. Select a Dewatering Bag that passes a minimum of two times the peak flow rate generated from the dewatering pump as determined in Step 1 to account for a 50% clogging factor.

2.4. INSTALLATION

Install the Dewatering Bag on a mild slope to ensure incoming water flows downhill through the Dewatering Bag. Secure the hose to bag connection using a heavy duty pipe clamp, rope, or other suitable means to prevent leakage. When using a rope to attach the pump hose to the Dewatering Bag, make a minimum of 6 wraps around the hose over a 6-inch width of the bag and fasten with a secure rope knot. The bottom area of Dewatering Bags will not allow flow to pass through when the bag is placed on a low-permeable or impermeable surface.

Place the Dewatering Bag on an aggregate, hay bales, or other highly permeable surface to maximize water flow through the entire surface area of the bag. Monitor the Dewatering Bag at all times while the pump is running. While monitoring, ensure the hose to bag connection is secure with only minimal leaking. Check...
2.5. REMOVAL

Dispose of the Dewatering Bag as directed by the Engineer. If allowed, the Dewatering Bag may be cut open and the contents seeded after removing the fabric. Securely tie off the pump hose connection sleeve when transporting full Dewatering Bags for disposal. Do not clean and reuse a Dewatering Bag after the voids are clogged with trapped sediment.

2.6. INSPECTION AND MAINTENANCE

Follow all manufacturer recommendations for inspection and maintenance guidelines. Replace Dewatering Bags when trapped sediment has accumulated to 50% of the bag capacity or in accordance with the manufacturer’s recommendations.

Dewatering Bags are full when they no longer efficiently filter sediment or pass water at a reasonable rate. Incoming flow rates will vary depending on the size of the Dewatering Bag, the type and amount of sediment discharged into the Dewatering Bag, the permeability of the underlying aggregate, and the degree of slope on which the bag lies.

2.7. ACCEPTANCE

Obtain Engineer acceptance and approval of Dewatering Bag installations. When requested by the Engineer, ensure that a manufacturer’s representative is on-site to oversee and approve the initial installation of Dewatering Bag operations. Obtain a letter from the manufacturer approving the installation when requested by the Engineer.

3. MEASUREMENT AND PAYMENT

The pay item for Dewatering work will be included as part of the pay item Lump Sum (LS) for Erosion and Sediment Control as required by the Specifications. Payment shall be full compensation for installing the Dewatering Bag as specified or directed and includes furnishing, installing, maintaining, inspecting, removing, and disposing of the Dewatering Bag; providing, installing and operating pumps for Dewatering operations; providing documentation of Quality Control and Quality Assurance programs; and all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, Specifications, and other terms of the Contract.

END OF SECTION
SPECIFICATION

EXCAVATION, FILLING, AND GRADING

1. GENERAL

1.1. DESCRIPTION

This work consists of excavating, filling, grading, and other related construction activities indicated in the plans. This excavation will include unclassified excavation and rock excavation, as needed. Additionally, the contractor is expected to minimize impacts to private property and return property to original condition upon completion of the project.

1.2. PRODUCTS

1.2.1. EQUIPMENT

The contractor shall be responsible for providing and maintaining the equipment required all earthmoving and stabilization onsite. Equipment shall be stored, maintained, and fueled in such a manner that oil, gasoline, grease, or other hazardous materials are not discharged into surface waters.

1.2.2. FILL MATERIAL

Fill materials must be free of organic material, debris, and particles larger than 3 inches. Soils used as Engineered Fill material shall conform to the specifications in the table below.

<table>
<thead>
<tr>
<th>Fill Type</th>
<th>USCS* Group Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fine Grain Soils</td>
<td>Lean clay (CL), silt (ML) (Liquid Limit^ &lt;45; Plasticity Index^&lt;25)</td>
</tr>
<tr>
<td>Granular Soils</td>
<td>Poorly graded sand (SP), silty sand (SM), clayey sand (SC), well-graded sand (SW)</td>
</tr>
<tr>
<td>On-Site Soils</td>
<td>Silt (ML), silty sand (SM)</td>
</tr>
</tbody>
</table>

*Unified Soil Classification System
^as defined by the ASTM standard test method ASTM D 4318

Frozen material shall not be used, and fill shall not be placed on a frozen subgrade. All fill soils shall have a maximum dry unit weight (ASTM D698) of no less than 95 pounds per cubic foot.

2. EXECUTION

2.1. EXCAVATION

2.1.1. GENERAL

Contractor shall excavate required material, including rock, to bring site to proper levels. All excess and unsuitable material shall be removed off-site and properly disposed. Excavated material that is to be reused onsite shall be stockpiled in designated areas and properly stabilized. The use of explosives for any excavation activities is NOT permitted.
2.1.2. **ROCK EXCAVATION/UNSUITABLE MATERIAL**

Rock excavation consists of igneous, metamorphic, and sedimentary rock material occupying an original volume of more than 1 cubic yard which cannot be excavated with a single-tooth ripper drawn by a crawler tractor having a minimum draw bar pull rating of not less than 56,000 pounds usable pull and cannot be moved into select backfill area.

It is not anticipated that rock excavation will be required as part of this project. Engineer approval shall be required prior to the excavation of rock or unsuitable material. Blasting is not an acceptable method of rock excavation on this site.

2.1.3. **SURPLUS MATERIAL**

Surplus material shall be disposed of on site or removed from the site and disposed of properly, as directed by the County or County’s representative.

2.2. **FILLING**

Excavated materials meeting the requirements of this specification are considered suitable for use as fill, providing they are suitable for compaction. Blend materials to obtain a consistent fill material. Place fill material in uniform lifts, no greater than eight (8) inches for heavy compaction equipment and four (4) inches for hand-operated tampers.

2.2.1. **COMPACATION**

Fill material shall be compacted by a minimum of two (2) passes over the entire surface with a weighted-wheel excavation equipment, manually-directed power tamper, or two (2) blows with the back of an excavator bucket.

2.3. **GRADING**

Uniformly grade areas within construction limits shown, including transition areas. Smooth finished subgrade surfaces to within tolerances of required elevations, making slopes between elevation points uniform and gradual transition into existing elevations.

Final subgrade elevations, unless otherwise indicated, shall be within one (1) inch of the elevation indicated on the plans.

3. **MEASUREMENT AND PAYMENT**

The quantity of the pay item for Excavation, Filling, and Grading shall be lump sum (LS). Activities shall comply with all appropriate Specifications as applicable. Payment shall be full compensation for completing the work as specified or directed within these specifications. This is to include all materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, Specifications, and other terms of the Contract.

END OF SECTION
SPECIFICATION

TREE REMOVAL

1. GENERAL

1.1. DESCRIPTION

This work consists of tree removal on stream banks and in surrounding riparian area, to include tree cutting, stump grinding, and organic debris removal, and removal of trees from the site as indicated in the plans. Only trees designated for removal on the plans shall be removed.

1.2. PRODUCTS

1.2.1. EQUIPMENT

The contractor shall be responsible for providing and maintaining the equipment required for tree removal.

2. EXECUTION

2.1. SMALL TREE REMOVAL

Small trees are defined by SCDHEC as those trees with a diameter at breast height (DBH) of four (4) inches or smaller and are not specifically shown on the Plans. Small trees may be cleared when necessary to complete work in certain areas with the approval of the Engineer.

These trees may be removed by pulling them out of the ground when feasible. Otherwise, the trees shall be cut close to the ground and, in areas where BMPs are to be installed, and the stump is to be treated via direct application to kill the plant, prevent future growth from the stump, and halt growth of the roots using a direct application method, not a spray.

2.2. LARGE TREE REMOVAL

Large trees are defined by SCDHEC as those trees with a DBH of greater than four (4) inches and are shown on the Plans. These large trees intended for removal are marked in the plan and additionally will be marked in the field with orange flagging tied around the tree trunk.

Trees with a DBH greater than four (4) inches should be cut such that the stump protrudes 0.5-2 feet above level ground. Roots shall only be removed when required for grading or installation of other materials. If grinding is the required to shorten the stump height, this should be done before the installation of any matting.

Only when required, the Contractor shall follow the Site Excavating, Filling and Rough Grading Specification and the Seeding Specification following tree removal to ensure the void is properly stabilized.
All materials removed by the Tree Removal operation shall be removed from the project, or otherwise disposed of as specified or directed. The Contractor shall be responsible for obtaining disposal sites and securing any applicable State, Federal, County or City permits that may be required. The Contractor shall certify in writing to the County that all permit requirements have been met before placing any material in a disposal area.

3. MEASUREMENT AND PAYMENT

The quantity of the pay item Tree Removal is for each tree (EA) for large trees. Small tree removal shall be included in the Clearing and Grubbing lump sum (LS) pay item. Tree removal includes all associated Filling and Stabilizing and Seeding complete and accepted in accordance with this Specification. Payment for Tree Removal is full compensation for completing the work as specified or directed and includes tree removal, filling and stabilizing the resulting voids, and seeding of the disturbed areas, and removal of tree and root debris. This is to include all materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, Specifications, and other terms of the Contract.

END OF SECTION
SPECIFICATION

DEBRIS REMOVAL

1. GENERAL

1.1. DESCRIPTION

There are multiple locations of debris piles within the stream bottom that will need to be removed, as noted on the plans. These debris piles consist of logs, trash, and rock debris. This debris shall be carefully removed by hand or machinery to re-establish a clear flow path and in such a way that minimizes in-stream disturbance and downstream impacts. Natural debris such as logs and rock may be disposed of on site at a location as determined by the County or County’s representative. Non-natural debris must be disposed of off-site by the Contractor.

Streams are naturally shifting systems and it is likely the debris piles noted on the plans have shifted during storm events. Debris to be removed and relocated will be identified at the pre-construction meeting.

2. EXECUTION

2.1. DEBRIS RELOCATION AND REMOVAL

Debris relocation and removal should be done carefully and in a manner that protects the existing stream bottom and banks. Trash items shall be removed, hauled away, and disposed of off-site. Large natural debris shall be removed from the stream and disposed of on-site where possible and off-site if necessary if a suitable on-site disposal location cannot be determined. Small natural debris can be relocated in-stream out of the main flow channel or re-used on-site for the cross vanes, single arm vanes, and/or boulder walls.

3. MEASUREMENT AND PAYMENT

The quantity of the pay item for debris removal is measured per cubic yard (CY), and includes complete removal of the debris and off-site disposal. Payment for debris items to remain on-site shall be included in the costs of the associated BMPs. Payment for debris removal is full compensation for removal of the material as specified or as directed and includes all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, Specifications, and other terms of the Contract.

END OF SECTION
SPECIFICATION

GEOTEXTILE FABRIC

1. GENERAL

1.1. DESCRIPTION

Install nonwoven geotextile fabric as indicated on the plans and in these specifications. The fabric shall be placed on a surface or slope that conforms to the plans and in a relatively smooth condition free from obstructions, debris, or sharp objects that could puncture the fabric. Do not operate construction equipment directly on the fabric. The fabric shall be Crown Resources R080. No other material will be accepted.

1.2. PRODUCTS

1.2.1. MATERIALS

The nonwoven geotextile shall be Crown Resources Style R080, a high strength dimensionally stable fabric that shall comply with the following properties:

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>Units</th>
<th>MARV Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grab Tensile</td>
<td>ASTM D4632</td>
<td>lbs</td>
<td>205</td>
</tr>
<tr>
<td>Grab Elongation</td>
<td>ASTM D4632</td>
<td>%</td>
<td>50</td>
</tr>
<tr>
<td>Puncture Strength</td>
<td>ASTM D6241</td>
<td>lbs</td>
<td>525</td>
</tr>
<tr>
<td>Trapezoidal Tear</td>
<td>ASTM D4633</td>
<td>lbs</td>
<td>80</td>
</tr>
<tr>
<td>AOS</td>
<td>ASTM D4751</td>
<td>US Seive</td>
<td>80</td>
</tr>
<tr>
<td>Permittivity</td>
<td>ASTM D4491</td>
<td>sec⁻¹</td>
<td>1.4</td>
</tr>
<tr>
<td>Water Flow</td>
<td>ASTM D4491</td>
<td>gpm/ft²</td>
<td>90</td>
</tr>
<tr>
<td>UV Resistance</td>
<td>ASTM D4355</td>
<td>% Retained @ 500 hrs</td>
<td>70</td>
</tr>
</tbody>
</table>

2. EXECUTION

2.1. PREPARATION

Prepare the area by grading the slope in accordance with the plans. Clear the area of any obstructions, debris, or sharp objects that could puncture the fabric. At the time of installation, the fabric will be rejected if it has defects, rips, holes, flaws, deterioration, or damage incurred during the manufacture, transportation, or storage.

2.2. INSTALLATION

Place fabric with the long dimension parallel to the toe of the slope and lay smooth and free of tension, stress, folds, wrinkles, or creases. If more than one strip is necessary, overlap the strips a minimum of 18 inches. Place transverse overlaps with the upstream strip overlapping the downstream strip. Install fastener pins, as approved by manufacturer or Engineer, through both strips of overlapped fabric at no
less than 5-foot intervals along a line through the midpoint of the overlap and at any other locations as necessary to prevent any slippage of the fabric.

When placing stone on the fabric, limit the height of the drop to prevent damage to the fabric. When installation is on a slope, begin placement of the stone at the toe of the slope and proceed upward.

Repair or replace any fabric damaged during installation or during placement of filter materials, slope protection, or other materials.

2.3. STABILIZATION

Cover the fabric with the specified stone as required on the plans before damage or deterioration from ultraviolet light occurs. Remove and replace fabric not covered within 30 calendar days after placement. If damage or deterioration is evident before 30 days after placement, remove and replace the fabric.

2.4. INSPECTION AND MAINTENANCE

Inspect geotextile fabric every seven (7) days or after each major rainfall event that produces more than 0.5 inches of rainfall as long as it remains exposed. Check for damage, dislocation, and deterioration.

Remove and replace extensively damaged fabric. Repair individual isolated cuts, tears, or punctures by placing a patch of geotextile fabric over the damaged areas. Extend patch at least 18 inches beyond the damage in all directions.

3. MEASUREMENT AND PAYMENT

The quantity of the pay item for Geotextile Fabric shall be included as an incidental to all project components requiring geotextile fabric. Payment shall be full compensation for completing the work as specified or directed within these specifications. This is to include all materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, Specifications, and other terms of the Contract.

END OF SECTION
SPECIFICATION

COIR LOG

1. GENERAL

1.1. DESCRIPTION

This work consists of the hand placement and installation of a coconut fiber-based product known as coir logs. Coir logs are a biodegradable log made from natural fibers that are often used for erosion prevention and bank stabilization. In this application, coir logs will be used for stabilization of undercut banks along certain portions of the stream as shown on the plans. The coir logs will slow water flow and protect from localized scour in the areas they are installed, and because they are both permeable and biodegradable, vegetation will be well established by the time they degrade, leaving no trace of the original product and a completely natural and stable embankment. EcoDepot EZ-Log coconut coir logs are to be used for this application; equivalent products will not be accepted.

1.2. PRODUCTS

1.2.1. MATERIALS

EcoDepot EZ-Log 12 inch coconut coir logs shall be used due to their ease of install with pre-drilled slots for hardwood stakes and vegetation. Use 10-foot coir logs with a minimum density of 9 lbs/linear foot.

Hardwood stakes, 2 inches by 2 inches in size, shall be no less than 24 inches in length.

2. EXECUTION

2.1. PREPARATION

Coir Logs are to be installed in such a way to cause minimal disturbance to the existing stream while preventing further undercutting of the bank. No roots, stones, or other natural objects shall be removed from the undercut bank during placement of the coir logs without approval from the Engineer.

2.2. INSTALLATION

The coir logs are to be hand placed in the undercut portions of the bank where indicated on the plans while causing minimal disturbance to the existing stream bed and bank. The log should fill the void of the undercut where applicable. If they do not fill the void, consult with the Engineer. Once the coir log has been placed, hardwood stakes shall be driven through the voids in the coir logs at intervals no less than one stake every four feet to a depth at which two (2) inches remain above the log, as shown on the plans.

The coir logs shall be installed so they are butted up against each other, end to end, and secured with coir twine.
2.3. INSPECTION AND MAINTENANCE

Inspect coir logs every 7 days or after a storm than produces more than 0.5 inches of rain. Check for damage, dislocation, or movement. Ensure that placement remains steady over the course of the project and replace or add stakes as necessary.

3. MEASUREMENT AND PAYMENT

The quantity of coir logs is measured per log (10-foot logs), in place, complete and accepted. Payment for coir log installation is full compensation for placing the material as specified or as directed and includes furnishing, placing, maintaining, and inspecting the installation, which includes the appropriate size and density, stakes, replacing or repairing as needed, and all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, Specifications, and other terms of the Contract.

END OF SECTION
SPECIFICATION

COMPOST SOCK

1. GENERAL

1.1. DESCRIPTION

This work consists of the placement of a Filtrexx compost socks as indicated on the plans to provide protection along undercut banks. GroSoxx are filled with Filtrexx’s GrowingMedia™ that supports the growth of bank stabilizing vegetation. This system can be placed and filled in place to maximize contact of the system with the undercut bank to improve structural integrity and minimize erosion around the product. Equivalent products are not acceptable for use.

1.2. PRODUCTS

1.2.1. MATERIALS

Compost socks shall be 18-inch diameter Filtrexx GroSoxx comprised of Filtrexx mesh filled with Filtrexx GrowingMedia. Use the DuraSoxx mesh for this application.

Use hardwood stakes, 2 inches by 2 inches in size, no less than 36 inches in length.

2. EXECUTION

2.1. PREPARATION

Compost socks are to be installed in such a way to cause minimal disturbance to the existing stream while preventing further undercutting of the bank. No roots, stones, or other natural objects shall be removed from the undercut bank during placement of the compost socks without approval from the Engineer.

2.2. INSTALLATION

The compost socks are to be hand placed in the undercut portions of the bank while causing minimal disturbance to the existing stream bed and bank. The size of the socks shall be as indicated above. The sock shall be placed within the undercut bank and then filled with the media to obtain maximum contact between the sock and the undercut bank.

The upstream end of the compost sock shall be keyed into the channel bottom or be secured with a ShoreJacks unit per the specification. Abutting compost socks shall be leveled with each other and placed tightly against one another to encourage a seal and prevent water seeping and erosion. A continuous length shall be used whenever possible. Hardwood stakes shall be installed through the middle of the socks at no less than 10 foot intervals. Stakes shall also be placed at the ends of all socks.

After installation, the compost socks shall be seeded as directed in these specifications.
2.3. INSPECTION AND MAINTENANCE

Inspect compost socks every 7 days or after a storm than produces more than 0.5 inches of rain. Check for damage, dislocation, or movement. Ensure that placement remains steady over the course of the project and repair or replace tubing or stakes as necessary.

3. MEASUREMENT AND PAYMENT

The quantity of compost socks is measured by the linear foot (LF), in place, complete and accepted. Payment for compost socks installation is full compensation for placing the material as specified or as directed and includes furnishing, placing, maintaining, and inspecting the installation, which includes the appropriate size and materials, quality control testing, replacing or repairing as needed, and all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, Specifications, and other terms of the Contract.

END OF SECTION
SPECIFICATION

SHOREJAX

1. GENERAL

1.1. DESCRIPTION

This work consists of hand placement of 24-inch SHOREJAX® concrete armor unit as indicated on the plans to provide protection along undercut banks. The geometry of a SHOREJAX® concrete armor unit consists of six arms extending from a central hub. A complete unit is made up of two identical halves, with each half consisting of a central core with three legs radiating outward at equal spacing. On each half, two fillets are located between adjacent arms. These fillets provide additional structural strength and aid in the proper placement of the armor units. When the symmetrical halves are interlocked, the resultant unit will have geometry, which exhibits six equally spaced arms, with each arm spaced at 90 degrees from the four adjacent arms. When placed in the most stable configuration, each unit will rest on three of the six arms.

These units shall be installed as indicated on the plans and details, in either single layer or double row configuration. Equivalent products are not acceptable for use.

1.2. PRODUCTS

1.2.1. MATERIALS

The 24-inch SHOREJAX® units shall be produced on a pre-determined concrete block machine and will conform to ASTM D 6684-04, Standard Specification for Materials and Manufacture of Articulating Concrete Block (ACB) Revetment Systems.

Aggregates shall conform to the following ASTM specifications, except that grading requirements shall not necessarily apply: Normal Weight - Specification C 33, for Concrete Aggregates.

The concrete units will be produced by a dry cast method. The dry cast units obtain strength in a shorter duration as well as an increase in the durability and overall quality of product. Material and manufacture standards will be compliant with ASTM D6684-04.

At the time of delivery to the work site, the units shall conform to the physical requirements prescribed in Table 1 below.

<table>
<thead>
<tr>
<th>TABLE 1. SHOREJAX® PHYSICAL REQUIREMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressive Strength</td>
</tr>
<tr>
<td>Net Area Min. psi</td>
</tr>
<tr>
<td>Water Absorption Max., lb/ft³</td>
</tr>
<tr>
<td>Avg. of 3 units</td>
</tr>
<tr>
<td>Individual Unit (min. required)</td>
</tr>
<tr>
<td>Avg. of 3 units</td>
</tr>
<tr>
<td>Individual Unit</td>
</tr>
</tbody>
</table>

4000 3,500 9.1 11.7

Units shall be sampled and tested in accordance with ASTM C 140, Standard Test Methods of Sampling and Testing Concrete Masonry Units.
All units shall be sound and free of defects that would interfere with either the proper placement of the unit or impair the performance of the system. Surface cracks incidental to the usual methods of manufacture, or surface chipping resulting from customary methods of handling in shipment and delivery, shall not be deemed grounds for rejection. Cracks exceeding 0.25 inches (.635 cm) in width and/or 1.0 inch (2.54 cm) in depth shall be deemed grounds for rejection. Chipping resulting in a weight loss exceeding 10% of the average weight of a concrete unit shall be deemed grounds for rejection. SHOREJAX® rejected prior to delivery from the point of manufacture shall be replaced at the manufacturer's expense. SHOREJAX® rejected at the job site shall be repaired with structural grout or replaced at the expense of the contractor.

The SHOREJAX® concrete system shall have the following nominal characteristics:

<table>
<thead>
<tr>
<th>Model</th>
<th>Total Length (in)</th>
<th>Volume (ft³)</th>
<th>Weight (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SJ-24</td>
<td>24</td>
<td>0.56</td>
<td>78</td>
</tr>
</tbody>
</table>

1.2.2. GEOTEXTILE FABRIC

The geotextile fabric shall comply with the associated specification. Install geotextile fabric where indicated on the plans.

2. EXECUTION

2.1. PREPARATION

The SHOREJAX units are to be installed in such a way to cause minimal disturbance to the existing stream while preventing further undercutting of the bank. No roots, grade stakes, stones, or other natural objects shall be removed from the undercut bank during placement of the Shorejax without approval from the Engineer. If the presence of roots, stones, or other natural features inhibits the placement of A-Jacks units, the Engineer may decide to install a section of coir log.

2.2. INSTALLATION

Install geotextile fabric on the channel bottom as directed on the plans. The geotextile fabric will be placed directly on the prepared area, in intimate contact with the stone and bank, and free of folds or wrinkles. The geotextile will not be walked on or disturbed and will be placed so that the upstream strip of fabric overlaps the downstream strip. The longitudinal and transverse joints will be overlapped at least two (2) feet. Extend the installation of the geotextile fabric by three feet in both the upstream and downstream direction.

Installation of a double row of SHOREJAX shall be as indicated on the plans, or may be decided based on the extent of the undercut bank as determined in the field. Where there is minimal undercutting, standard 1-dimensional packing shall be used, as shown on the plans. Standard spacing between unit center in both the x and y dimension is 12”, which represents a 0.5 packing ratio. Tighter placement tolerances are possible, such as a 0.4 packing ratio, if directed by the Engineer. Standard installation includes placing the units in a consistent repeatable fashion to aid in efficiency. Recommended in-place orientation of the unit(s) emphasizes pointing exposed projecting unit arm (vertical or horizontal) downstream whenever practical during construction.
In areas where there are larger undercuts, the standard density stack with 2 base row shall be used, as shown on the plans. When placed in bundles, SHOREJAX are placed into a pre-determined matrix, spacing them as closely as possible, approximating the maximum packing ratio of 0.4 (9.6” center spacing in x and y directions).

No fill or bedding stone is to be installed to fill the voids within the SHOREJAX. These voids will be filled over time through natural sedimentation within the stream.

2.3. INSPECTION AND MAINTENANCE

Inspect SHOREJAX ® every 7 days or after a storm than produces more than 0.5 inches of rain. Check for damage, dislocation, or movement. Ensure that placement remains steady over the course of the project and repair as necessary.

3. MEASUREMENT AND PAYMENT

The quantity of the pay item SHOREJAX is measured as each (EA) SHOREJAX unit, in-place, complete and accepted. Payment for SHOREJAX ® is full compensation for placing the geotextile material, as indicated on the plans, and Shorejax units as specified or as directed and includes furnishing, placing, maintaining, and inspecting the installation, which includes the appropriate size and gradation, quality control testing, replacing or repairing as needed, and all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, Specifications, and other terms of the Contract.

END OF SECTION
SPECIFICATION

BEDDING STONE

1. GENERAL

1.1. DESCRIPTION

This work consists of the placement of bedding stone under and behind the stacked boulders, cross vanes, arm vanes, Shoreblock, and other BMPs as designated in these specifications and as shown on the plans. The bedding stone will be placed to a normal depth of six inches or the amount required to obtain a stable base and backing for the stacked boulders. The bedding stone shall be underlain by geotextile fabric.

1.2. PRODUCTS

1.2.1. MATERIALS

The material used as bedding stone shall meet the requirements in the table below. SCDOT No. 57 stone is also acceptable for use as bedding stone.

<table>
<thead>
<tr>
<th>Sieve</th>
<th>Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 inch</td>
<td>100%</td>
</tr>
<tr>
<td>⅞ inch</td>
<td>85%</td>
</tr>
<tr>
<td>⅝ inch</td>
<td>50%</td>
</tr>
<tr>
<td>⅜ inch</td>
<td>15%</td>
</tr>
</tbody>
</table>

2. EXECUTION

2.1. INSTALLATION

The bedding stone will be placed in the area under and behind the stacked boulders, cross vanes, arm vanes, Shoreblock, and other BMPs as designated in these specifications and as shown on the plans. The stone will be placed over geotextile fabric, as installed in accordance with the Geotextile Fabric Specification. Care should be taken to not damage the geotextile fabric during bedding stone placement. Bedding stone can be placed by hand or with machinery.

2.2. INSPECTION AND MAINTENANCE

Inspect bedding stone every 7 days or after each major rainfall event that produces more than 0.5 inches of rainfall. Areas of installation should be inspected for shifting or displacement, and if necessary, additional stone may be required.
3. MEASUREMENT AND PAYMENT

The bedding stone shall be an incidental to the BMPs designated to use bedding stone in accordance with these specifications and the plans. Payment for the bedding stone is full compensation for placing the stone as specified or as directed and includes furnishing, placing, maintaining, and inspecting the stone of the appropriate size and gradation, quality control testing, replacing or repairing as needed, and all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, Specifications, and other terms of the Contract.

END OF SECTION
SPECIFICATION

CROSS VANE

1. GENERAL

1.1. DESCRIPTION

A cross vane is a series of placed boulders that create downstream facing “U” with large boulders sloping upwards and tying into the bank. Footer boulders are installed in the channel bottom for stability, and header boulders are placed on top of the footer boulders. Two vanes, each approximately 1/3 of the stream channel’s bankfull width, will form a 20°– 30° angle out from the streambank toward upstream. The top elevation of both vanes will decrease from bankfull elevation toward the center of the channel at a slope of 4 to 20 percent. A vane running perpendicular to the stream’s flow will connect the two outside vanes on the upstream end.

Cross vanes direct water and associated erosive forces away from susceptible banks and back towards the center of the channel and provide grade control. Cross vanes include plunge pools that provide energy dissipation and baseflow habitat. The area between the vane and the bank will fill in with sediment, allowing for vegetation establishment and further stabilization of the bank habitat.

Cross Vanes should be installed under dry conditions, or in such a way that minimizes the downstream impacts of construction. Pump arounds and treatment of sediment-laden water must be included if dewatering is used to install vanes.

2. PRODUCTS

2.1. MATERIALS

2.1.1. BOULDERS

Boulders shall be 24 inches to 30 inches in size, measured by the smallest dimension in any direction. The boulders shall be angular in shape so as to be easily stacked and stable once installed. The boulder material stone should be granite or similar weather and erosion resistant material. Boulder should have no major cracks or fissures that may indicate a loss of structural integrity.

Boulders existing on site may be used if they meet the requirements listed herein and upon approval by the Engineer. Shaping of the existing on-site boulders to obtain the necessary angular shape is permitted using machinery or hand tools; blasting in not permitted. Remaining on-site rock may be used as infill or in other areas of the project with approval by the Engineer.

2.1.2. GEOTEXTILE FABRIC

Geotextile Fabric shall be Crown Resources R080 and comply with the associated specification.
2.1.3. NO.57 STONE

No. 57 Stone shall have the gradation as listed in the following table:

<table>
<thead>
<tr>
<th>Nominal Size (Sieves with Square Openings)</th>
<th>Percent Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 in.</td>
<td>100</td>
</tr>
<tr>
<td>1-1/2 in.</td>
<td>35 – 100</td>
</tr>
<tr>
<td>¾ in.</td>
<td>0 - 15</td>
</tr>
</tbody>
</table>

2.1.4. CLASS A RIPRAP

Riprap shall be Class A riprap and be a well graded stone with test samples falling between the gradation limits for riprap shown in the tables below:

<table>
<thead>
<tr>
<th>Stone Size Range (feet)</th>
<th>Stone Weight Range (pounds)</th>
<th>Percent Smaller Than</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.4 D₅₀ to 1.6 D₅₀</td>
<td>3.0 W₅₀ to 5.0 W₅₀</td>
<td>100</td>
</tr>
<tr>
<td>1.14 D₅₀ to 1.33 D₅₀</td>
<td>2.0 W₅₀ to 2.75 W₅₀</td>
<td>85</td>
</tr>
<tr>
<td>0.95 D₅₀ to 1.09 D₅₀</td>
<td>1.0 W₅₀ to 1.5 W₅₀</td>
<td>50</td>
</tr>
<tr>
<td>0.38 D₅₀ to 0.57 D₅₀</td>
<td>0.1 W₅₀ to 0.2 W₅₀</td>
<td>15</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Riprap Class</th>
<th>Rock Size (Feet)</th>
<th>Rock Size² (Lbs.)</th>
<th>Percent of Riprap Smaller Than</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0.75</td>
<td>37</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>0.50</td>
<td>11</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>0.20</td>
<td>0.7</td>
<td>15</td>
</tr>
</tbody>
</table>

3. EXECUTION

3.1. PREPARATION

The area including channel and banks will be prepared such that the end product will match the plans. This includes, but is not limited to, excavation related to the installation of a filter fabric and footer for the vane, excavation of the banks for tie-ins, and removal of debris from the area of the installation.

3.2. INSTALLATION

Cross vanes shall be constructed according to the Cross Vane Detail shown on the plans. A trench shall be dug for the correct installation of the footer boulders. Select the boulders so they butt tightly together and in a way that there are multiple contact points between all boulders. Footer rocks shall be placed such that the header rocks are at the indicated elevations. Ensure that the crest boulders are level with each other to evenly disperse flow over the crest of the vane. Vane arms should create a smooth slope upward as they go downstream to evenly distribute higher flows into the plunge pool area. Large equipment should be used to place footer stones securely into channel bottom.

Voids between the header and footer rocks can be filled with hand-placed Class A riprap or native gravel as directed. The arm vanes shall be keyed into the bank at the downstream end as shown on the
Cross Vane detail and in such a way that eliminates the possibility of water diverting around them. Install filter fabric and No. 57 stone on the upstream side of the cross vane, along the entire length and extending from under the bottom footer stone to the top of the structure. This shall be a mixture of approximately 75% Class A riprap and 25% No. 57 stone.

3.3. INSPECTION AND MAINTENANCE

Inspect boulders every 7 days or after each storm event that produces more than 0.5 inches of rainfall. Check for damage, dislocation, or movement of the boulders and scour behind the boulders. Ensure that placement remains steady over the course of the project and repair fill voids as necessary.

4. MEASUREMENT AND PAYMENT

The quantity of the pay item for cross vanes is measures as each (EA) cross vane, in-place, complete and accepted. Payment for the vane(s) is full compensation for placing the material as specified or as directed and includes furnishing, placing, maintaining, and inspecting the installation of the boulders, geotextile, stone, riprap, which includes the appropriate size and gradation, quality control testing, replacing or repairing as needed, and all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, Specifications, and other terms of the Contract.

END OF SECTION
SPECIFICATION

SINGLE ARM VANE

1. GENERAL

1.1. DESCRIPTION

A Single arm vane is a series of placed boulders that create downstream-facing extensions from the bank. They help to redirect water and associated erosive forces away from a susceptible bank and back towards the center of the channel. They are often used in series on the outside of river bends, incrementally redirecting base water flow away from the bank toe and help to decrease erosive forces during higher flows. Oftentimes, the area between the vane and the will fill in with sediment, allowing for vegetation establishment and further stabilization or the bank.

Single Arm Vanes should be installed under dry conditions, or in such a way that minimizes the downstream impacts of construction. Pump arounds and treatment of sediment-laden water must be included if dewatering is used to install vanes.

1.2. PRODUCTS

1.2.1. MATERIALS

1.2.1.1. BOULDERS

Boulders shall be 24 inches to 30 inches in size, measured by the smallest dimension in any direction. The boulders shall be angular in shape so as to be easily stacked and stable once installed. The boulder material stone should be granite or similar weather and erosion resistant material. Boulder should have no major cracks or fissures that may indicate a loss of structural integrity.

Boulders existing on site may be used if they meet the requirements listed herein and upon approval by the Engineer. Shaping of the existing on-site boulders to obtain the necessary angular shape is permitted using machinery or hand tools; blasting in not permitted. Remaining on-site rock may be used as infill or in other areas of the project with approval by the Engineer.

1.2.1.2. GEOTEXTILE FABRIC

Geotextile Fabric shall be Crown Resources R080 and comply with the associated specification.

1.2.1.3. NO.57 STONE

No. 57 Stone shall have the gradation as listed in the following table

<table>
<thead>
<tr>
<th>Nominal Size (Sieves with Square Openings)</th>
<th>Percent Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 in.</td>
<td>100</td>
</tr>
<tr>
<td>1-1/2 in.</td>
<td>35 – 100</td>
</tr>
<tr>
<td>3/4 in.</td>
<td>0 - 15</td>
</tr>
</tbody>
</table>
1.2.1.4. **CLASS A RIPRAP**

Riprap shall be Class A riprap and be a well graded stone with test samples falling between the gradation limits for riprap shown in the tables below.

<table>
<thead>
<tr>
<th>Stone Size Range (feet)</th>
<th>Stone Weight Range (pounds)</th>
<th>Percent Smaller Than</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.4 $D_{50}$ to 1.6 $D_{50}$</td>
<td>3.0 $W_{50}$ to 5.0 $W_{50}$</td>
<td>100</td>
</tr>
<tr>
<td>1.14 $D_{50}$ to 1.33 $D_{50}$</td>
<td>2.0 $W_{50}$ to 2.75 $W_{50}$</td>
<td>85</td>
</tr>
<tr>
<td>0.95 $D_{50}$ to 1.09 $D_{50}$</td>
<td>1.0 $W_{50}$ to 1.5 $W_{50}$</td>
<td>50</td>
</tr>
<tr>
<td>0.38 $D_{50}$ to 0.57 $D_{50}$</td>
<td>0.1 $W_{50}$ to 0.2 $W_{50}$</td>
<td>15</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Riprap Class</th>
<th>Rock Size (Feet)</th>
<th>Rock Size² (Lbs.)</th>
<th>Percent of Riprap Smaller Than</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>0.75</td>
<td>37</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>0.50</td>
<td>11</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>0.20</td>
<td>0.7</td>
<td>15</td>
</tr>
</tbody>
</table>

2. **EXECUTION**

2.1. **PREPARATION**

The area including channel and bank will be prepared such that the end product will match the plans. This includes, but is not limited to, excavation related to the installation a filter fabric and footer for the vane, excavation of the banks for tie-ins, and removal of debris from the area of the installation.

2.2. **INSTALLATION**

Single arm vanes shall be constructed according to the Single Arm Vane Detail shown on the plans. A trench shall be dug for the correct installation of the footer boulders. Select the boulders so they butt tightly together and in a way that there are multiple contact points between all boulders. Footer rocks shall be placed such that the header rocks are at the indicated elevations. Vane arms should create a smooth slope upward as they go downstream to evenly distribute higher flows into the plunge pool area and away from the bank. Large equipment should be used to place footer stones securely into channel bottom.

Voids between the header and footer rocks can be filled with hand-placed Class A riprap or native gravel as directed. The vane shall be keyed into the bank at the downstream end as shown on the Single Arm Vane detail and in such a way that eliminates the possibility of water diverting around them. Install filter fabric and No. 57 stone on the upstream side of the Single Arm vane, along the entire length and extending from under the bottom footer stone to the top of the structure. This shall be a mixture of approximately 75% Class A riprap and 25% No. 57 stone.
2.3. INSPECTION AND MAINTENANCE

Inspect stacked boulders every 7 days or after each storm event that produces more than 0.5 inches of rainfall. Check for damage, dislocation, or movement of the boulders and scour behind the boulders. Ensure that placement remains steady over the course of the project and repair fill voids as necessary.

3. MEASUREMENT AND PAYMENT

The quantity of the pay item for single arm vanes is measures as each (EA) vane, in-place, complete and accepted. Payment for the vane(s) is full compensation for placing the material as specified or as directed and includes furnishing, placing, maintaining, and inspecting the installation, which includes the appropriate size and gradation, quality control testing, replacing or repairing as needed, and all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, Specifications, and other terms of the Contract.

END OF SECTION
SPECIFICATION

EARTHSHEILD CM700

1. GENERAL

1.1. DESCRIPTION

This work consist of the placement of Earthshield™ CM700 woven coir matting as indicated in the plans. Earthshield™ CM700 is a 100% biodegradable, long-lasting, durable, heavyweight spun coir fabric that allows hydroseeding before installation. It lasts for 4-5 years and can handle water velocities up to 15 feet per second. Equivalent products will not be accepted.

1.2. PRODUCTS

1.2.1. MATERIALS

Use Earthshield™ CM700 where specified on the plans. The Earthshield™ CM700 shall have the following physical properties:

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>Machine Direction</th>
<th>Cross Match Direction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile Strength (Dry)</td>
<td>ASTM D4595</td>
<td>77 lb/in</td>
<td>86 lb/in</td>
</tr>
<tr>
<td>Tensile Strength (Wet)</td>
<td>ASTM D4595</td>
<td>78 lb/in</td>
<td>87 lb/in</td>
</tr>
<tr>
<td>Grab Elongation</td>
<td>ASTM D4632</td>
<td>26%</td>
<td>26%</td>
</tr>
<tr>
<td>Elongation at Failure (Dry)</td>
<td>ASTM D4595</td>
<td>26%</td>
<td>26%</td>
</tr>
<tr>
<td>Elongation at Failure (Wet)</td>
<td>ASTM D4595</td>
<td>27%</td>
<td>27%</td>
</tr>
<tr>
<td>Apparent Opening Size (AOS)</td>
<td>ASTM D4751</td>
<td>0.59” X 0.67”</td>
<td>-</td>
</tr>
<tr>
<td>Percent Open Area</td>
<td>-</td>
<td>49%</td>
<td>-</td>
</tr>
<tr>
<td>Mass</td>
<td>ASTM D5261</td>
<td>700 gsm</td>
<td>-</td>
</tr>
<tr>
<td>Thickness</td>
<td>ASTM D5199</td>
<td>0.36</td>
<td>-</td>
</tr>
</tbody>
</table>

Use Platipus™ Percussive Driven Earth Anchors (PDEA), wire U-shaped sod staples, and geotextile pins to secure the Earthshield™ CM700 to the underlying soil. Use staples made from a minimum 11-gauge metal wire. Metal pins shall have a minimum diameter of 3/16 in with a 1.5 in steel washer at one end to form a head. Staple/pin length will vary (8 in-18 in) according to soil conditions but should be a minimum 8 inches and have a ground penetration sufficient to resist pulling out once installed.

2. EXECUTION

2.1. PREPARATION

Shape and grade the slope or area on which Earthshield™ CM700 is to be placed to the lines, grades, thickness, or typical sections shown on the plans. The area should be free of soil slumps, roots, stumps, rocks, vehicle imprints, or other features that would prevent Earthshield™ CM700 from lying flush against the ground surface.
Loosen the top 2 to 3 inches of the underlying soil to promote vegetation establishment. Apply Hydraulic Biotic Soil Amendment (HBSA), HECP, and permanent seeding prior to installing Earthshield™ CM700 per the applicable specifications.

2.2. INSTALLATION

Install Earthshield™ CM700 along the slope, perpendicular to the flow of water, as shown on the plans. Anchor trenches, Percussive Driven Earth Anchors, stapling, pinning, and overlapping are required to securely fasten the Earthshield™ CM700. Installation of the ECSC-3TM should comply with manufacturer recommendations.

Excavate a 12-inch deep by 12-inch wide trench a minimum distance of 3 ft from the crest of the slope, away from the stream. Anchor the Earthshield™ CM700 in the trench bottom with a row of staples or pins on 12 inch centers in between PDEAs on 4 ft centers. Backfill and compact the trench after installing the pins and anchors. Apply seed to the compacted soil.

Roll the Earthshield™ CM700 down the slope and place staples, pins and anchors at appropriate locations as defined in this specification.

Install the Earthshield™ CM700 with 3 ft long PDEAs with a horizontal spacing of 4 ft and a vertical spacing of 5 ft, and securing pins and staples with a horizontal spacing of 2 ft and a vertical spacing of 2.5 ft. Pin and anchor placement should reflect a staggered checkerboard pattern across the slope surface for best results.

Parallel rolls of Earthshield™ CM700 should be stapled with a six-inch overlap. The Earthshield™ CM700 shall be overlapped shingle style down the slope with a 3-inch overlap and staples every 12 inches along the overlap.

The bottom slope termination should have the same configuration as the top trench, as should the upstream and downstream edges of the Earthshield™ CM700.

2.3. INSPECTION AND MAINTENANCE

Inspect Earthshield™ CM700 every 7 days or after each storm event that produces more than 0.5 inches of rainfall. The Earthshield™ CM700 should maintain the fill and grade beneath it. Edges should be inspected for lifting/shifting, stakes should be re-secured if loosed, and when necessary, additional soil cover or seeding may be required. If repairs are necessary to the matting, patches should overlap by 12 inches in every direction.

3. MEASUREMENT AND PAYMENT

The quantity of the pay item for Earthshield™ CM700 is measured in square yardage (SY), in-place, complete and accepted. Payment for EarthshieldTM CM700 installation is full compensation for placing the matting as specified or as directed and includes furnishing, placing, maintaining, and inspecting the installation for appropriate coverage, Percussive Driven Earth Anchors (PDEA), other anchors, pins, staples, seeding, securement, and gradation, quality control testing, replacing or repairing as needed, and all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, Specifications, and other terms of the Contract.

END OF SECTION
1. GENERAL

1.1. DESCRIPTION

The East Coast ECSC-3™ is a permanent Composite Turf Reinforcement Mat (C-TRM) made with uniformly distributed 70% agricultural straw, 30% coconut fiber and three polypropylene nets securely sewn together with UV stabilized thread. It is designed to provide extended term, pre-vegetated erosion protection and permanent turf reinforcement in a wide variety of applications, including severe slopes, high flow channels and stream banks. The straw/coconut fiber matrix enhances the permanent matting's initial mulching and erosion control performance for up to 24 months. Equivalent products will not be accepted.

1.2. PRODUCTS

1.2.1. MATERIALS

The ECSC-3™ permanent composite turf reinforcement mat shall have the following physical properties:

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>Typical Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass/Unit Area</td>
<td>ASTM D6566</td>
<td>14.00 oz/yd2</td>
</tr>
<tr>
<td>Thickness</td>
<td>ASTM D6525</td>
<td>0.39 in</td>
</tr>
<tr>
<td>Tensile Strength-MD</td>
<td>ASTM D6818</td>
<td>728 lb/ft</td>
</tr>
<tr>
<td>Elongation-MD</td>
<td>ASTM D6818</td>
<td>21 %</td>
</tr>
<tr>
<td>Tensile Strength-TD</td>
<td>ASTM D6818</td>
<td>632 lb/ft</td>
</tr>
<tr>
<td>Elongation-TD</td>
<td>ASTM D6818</td>
<td>20.8 %</td>
</tr>
<tr>
<td>Light Penetration</td>
<td>ASTM D6567</td>
<td>7 %</td>
</tr>
<tr>
<td>Density/Specific Gravity</td>
<td>ASTM D792</td>
<td>0.919 g/cm³</td>
</tr>
<tr>
<td>Water Absorption</td>
<td>ASTM D1117</td>
<td>259 %</td>
</tr>
<tr>
<td>Resiliency</td>
<td>ASTM D6524</td>
<td>N/A %</td>
</tr>
<tr>
<td>UV Resistance</td>
<td>ASTM D4355</td>
<td>80 %</td>
</tr>
</tbody>
</table>

The composite turf reinforcement mat (C-TRM) shall be a machine-produced mat of 70% straw/30% coconut fiber matrix incorporated into a permanent three-layer permanent turf reinforcement matting. The matrix shall be evenly distributed across the entire width of the matting.

Use Platipus™ Percussive Driven Earth Anchors (PDEA), wire U-shaped sod staples, and geotextile pins to secure the C-TRM to the underlying soil. Use staples made from a minimum 11-gauge metal wire. Metal pins shall have a minimum diameter of 3/16 in with a 1.5 in steel washer at one end to form a head. Staple/pin length will vary (8 in-18 in) according to soil conditions but should be a minimum 8 inches and have a ground penetration sufficient to resist pulling out once installed.
2. EXECUTION

2.1. PREPARATION

Shape and grade the slope or area on which East Coast ECSC-3™ is to be placed to the lines, grades, thickness, or typical sections shown on the plans. The area should be free of soil slumps, roots, stumps, rocks, vehicle imprints, or other features that would prevent the C-TRM from lying flush against the ground surface.

Loosen the top 2 to 3 inches of the underlying soil to promote vegetation establishment. Apply Hydraulic Biotic Soil amendment (HBSA) and permanent seeding prior to installing East Coast ECSC-3™.

2.2. INSTALLATION

Install East Coast ECSC-3TM along the slope, perpendicular to the flow of water. Anchor trenches, Percussive Driven Earth Anchors, stapling, pinning, and overlapping are required to securely fasten the East Coast ECSC-3TM. Installation of the ECSC-3TM should comply with manufacturer recommendations.

Excavate a 12-inch deep by 12-inch wide trench a minimum distance of 3 ft from the crest of the slope. Begin at the top of the slope by anchoring the East Coast ECSC-3TM in the trench bottom. Anchor the East Coast ECSC-3TM in the trench bottom with a row of staples or pins on 12 inch centers in between anchors on 4 ft centers. Backfill and compact the trench after installing the pins and anchors. Apply seed to the compacted soil.

Roll the East Coast ECSC-3TM down the slope and place staples, pins and anchors at appropriate locations. Install the East Coast ECSC-3™ with 3 ft long Percussive Driven Earth Anchors (PDEA) with a horizontal spacing of 4 ft and a vertical spacing of 5 ft, and secure pins and staples with a horizontal spacing of 2 ft and a vertical spacing of 2.5 ft. Pin and anchor placement should reflect a staggered checkerboard pattern across the slope surface for best results.

Parallel rolls of East Coast ECSC-3™ should be stapled with a six-inch overlap. The TRM shall be overlapped shingle style down the slope with a 3 inch overlap and staples over 12 inches along the overlap.

The bottom slope termination should have the same configuration as the top trench, as should the upstream and downstream edges of the East Coast ECSC-3™.

2.3. INSPECTION AND MAINTENANCE

Inspect East Coast ECSC-3™ every 7 days or after each storm event that produces more than 0.5 inches of rainfall. The East Coast ECSC-3™ should maintain the fill and grade beneath it. Edges should be inspected for lifting/shifting, stakes should be re-secured if loosed, and if necessary, additional soil cover or seeding may be required. If repairs are necessary to the C-TRM, patches should overlap by 12 inches in every direction.
3. MEASUREMENT AND PAYMENT

The quantity of the pay item for East Coast ECSC-3™ is measured in square yardage (SY), in-place, complete and accepted, unless included in a lump sum fee for another item as indicated in a specification. Payment for East Coast ECSC-3™ installation is full compensation for placing the C-TRM as specified or as directed and includes furnishing, placing, maintaining, and inspecting the installation for appropriate coverage, Percussive Driven Earth Anchors (PDEA), other anchors, pins, staples, securement, and gradation, quality control testing, replacing or repairing as needed, and all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, Specifications, and other terms of the Contract.

END OF SECTION
SPECIFICATION

ENKAMAT

1. GENERAL

1.1. DESCRIPTION

This work consists of the placement of Enkamat 7020 as indicated in the plans. Enkamat is a three dimensional polyamide mat with an open structure intended to prevent erosion on slopes. Enkamat functions as a protective reinforcing and integrated intermediate layer between natural vegetation and soil. It provides protection above and below the waterline thereby creating a permanent solution. Either seeded, filled with topsoil or mulched, Enkamat keeps the fertile soil in place and prevents the fill from being washed out. Vegetation soon establishes itself with root systems that are reinforced by Enkamat’s special mat structure. Equivalent products will not be accepted.

1.2. PRODUCTS

1.2.1. MATERIALS

Use Enkamat 7020 infilled with a Type 4 HECP and permanent seeding where specified on the plans and in accordance with applicable specifications.

Use PlatipusTM Percussive Driven Earth Anchors (PDEA), wire U-shaped sod staples, and geotextile pins to secure the C-TRM to the underlying soil. Use staples made from a minimum 11-gauge metal wire. Metal pins shall have a minimum diameter of 3/16 in with a 1.5 in steel washer at one end to form a head. Staple/pin length will vary (8 in-18 in) according to soil conditions but should be a minimum 8 inches and have a ground penetration sufficient to resist pulling out once installed.

2. EXECUTION

2.1. PREPARATION

Shape and grade the slope or area on which Enkamat is to be placed to the lines, grades, thickness, or typical sections shown on the plans. The area should be free of soil slumps, roots, stumps, rocks, vehicle imprints, or other features that would prevent Enkamat from lying flush against the ground surface.

Loosen the top 2 to 3 inches of the underlying soil to promote vegetation establishment. Apply Hydraulic Biotic Soil amendment (HBSA) prior to installing Enkamat 7020.

2.2. INSTALLATION

Install Enkamat along the slope, perpendicular to the flow of water. Anchor trenches, Percussive Driven Earth Anchors, stapling, pinning, and overlapping are required to securely fasten the Enkamat.
Excavate a 12-inch deep by 12-inch wide trench a minimum distance of 3 ft from the crest of the slope. Begin at the top of the slope by anchoring the Enkamat in the trench bottom. Anchor the Enkamat in the trench bottom with a row of staples or pins on 12 inch centers in between anchors on 4 ft centers. Backfill and compact the trench after installing the pins and anchors. Apply seed to the compacted soil.

Roll the Enkamat down the slope and place staples, pins and anchors at appropriate locations. Install the Enkamat with 3 ft long Percussive Driven Earth Anchors (PDEA) with a horizontal spacing of 4 ft and a vertical spacing of 5 ft, and secure pins and staples with a horizontal spacing of 2 ft and a vertical spacing of 2.5 ft. Pin and anchor placement should reflect a staggered checkerboard pattern across the slope surface for best results.

Parallel rolls of Enkamat should be stapled with a six-inch overlap. The Enkamat shall be overlapped shingle style down the slope with a 3-4 inch overlap and staples over 12 inches along the overlap.

The bottom slope termination should have the same configuration as the top trench, as should the upstream and downstream edges of the Enkamat.

The installed Enkamat shall be subsequently seeded and back filled with a Type 4 HECP. Every effort should be made to obtain a uniform distribution HECP Type 4 and permanent seed over the seeded area. No vehicles may be driven over the Enkamat. Care should be taken to not overfill the Enkamat; the backside of a rake may be used to fill in the Enkamat with a thin layer of native soil as necessary.

2.3. INSPECTION AND MAINTENANCE

Inspect Enkamat every 7 days or after each storm event that produces more than 0.5 inches of rainfall. The Enkamat should maintain the fill and grade beneath it. Edges should be inspected for lifting/shifting, stakes should be re-secured if loosed, and if necessary, additional soil cover or seeding may be required.

3. MEASUREMENT AND PAYMENT

The quantity of the pay item for Enkamat is measured in square yardage (SY), in-place, complete and accepted. Payment for Enkamat installation is full compensation for placing the mat as specified or as directed and includes furnishing, placing, maintaining, and inspecting the installation for appropriate coverage, Percussive Driven Earth Anchors (PDEA), other anchors, pins, staples, securement, and gradation, quality control testing, replacing or repairing as needed, and all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, Specifications, and other terms of the Contract.

END OF SECTION
SPECIFICATION

FLEXAMAT

1. GENERAL

1.1. DESCRIPTION

This work consists of the placement Flexamat tied concrete block mat, a permanent erosion control matting as shown on the plans. Flexamat is manufactured from individual concrete blocks tied together with high strength polypropylene bi-axial geogrid. Each block is tapered, beveled and interlocked and includes connections that prevent lateral displacement of the blocks within the mats when they are lifted for placement. Equivalent products will not be accepted.

1.2. PRODUCTS

1.2.1. MATERIALS

Flexamat is a system of individual concrete blocks tied together with high strength polypropylene biaxial geogrid. Each block is tapered, beveled, and interlocked.

Blocks are manufactured with concrete conforming to cement requirements of ASTM C150 and to aggregate requirements of ASTM C33. They meet a minimum compressive strength of 5,000 psi at 28 days. Each block has a minimum weight of 3 lb. per block and is placed no further than 2 in. apart.

The polypropylene bi-axial geogrid is constructed of high tenacity, low elongating, and continuous filament polypropylene fibers securely cast into and embedded within the base of the concrete blocks and obtains connection strength greater than that of the geogrid. Ensure the geogrid meets the requirements in the table.

<table>
<thead>
<tr>
<th>Description</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>UV Stabilization</td>
<td>2% Carbon Black</td>
</tr>
<tr>
<td>Ultimate Tensile Strength</td>
<td>2055 lb./lf</td>
</tr>
</tbody>
</table>

Use standard Flexamat with a Curlex® II backing.

Curlex II erosion control blanket (ECB) consists of a specific cut of naturally seed free Great Lakes Aspen curled wood excelsior with 80% six-inch fibers or greater fiber length. It is of consistent thickness with fibers evenly distributed throughout the entire area of the blanket. The top and bottom of each blanket is covered with degradable polypropylene netting.

Cover the mat or otherwise protect it during long periods of storage to protect against degradation of the backing material as recommended by the manufacturer. Mats will be rolled for shipment and are packaged with handling straps. These handling straps shall only be used for lifting below 2 ft. as a means to place heavy duty lifting straps under rolls. Upon delivery, rolls may be left exposed for up to 30 days. If exposure will exceed 30 days, cover or tarp the rolls to minimize UV exposure.
All mats shall be inspected upon delivery. Assure that all units are sound and free of defects that would interfere with the proper placing of the unit or impair the strength or permanence of the construction.

Chipping or missing concrete resulting in a weight loss exceeding 15% of the average weight of a concrete unit is grounds for rejection by the engineer. Replace, repair or patch the damaged areas per the manufacturer’s recommendations.

2. EXECUTION

2.1. PREPARATION

Shape and grade the slope or area on which Flexamat is to be placed to the lines, grades, thickness, or typical sections shown on the plans. The area should be free of soil slumps, roots, stumps, rocks, vehicle imprints, or other features that would prevent Flexamat from lying flush against the ground surface.

Ensure the prepared subgrade provides a smooth, firm, and unyielding foundation for the mats. The subgrade shall be graded into a parabolic or trapezoidal shape in order to concentrate flow to middle of mat or mats.

Loosen the top 2 to 3 inches of the underlying soil to promote vegetation establishment. Apply Hydraulic Biotic Soil amendment (HBSA) and permanent seeding prior to installing Flexamat.

2.2. INSTALLATION

Install mats to the line and grade shown on the plans and according to the manufacturer’s guideline. Provide a minimum 18 in. deep concrete mat embedment toe trench at all edges exposed to concentrated flows. Recess exterior edges subject to sheet flow a minimum of 3 in. When needed, provide fastening or anchoring as shown on the plans.

For seams parallel to the flow line in ditch or channel applications, center a minimum 3 ft. wide strip of soil retention blanket under the seam. Fasten along the seam at 5 ft. maximum spacing.

Shingle seams perpendicular to the flow line with the downstream mat recessed a minimum of 2 blocks under the upstream mat and fastened together along the seam at 2 ft. maximum spacing if required by manufacturer or Engineer.

Install Flexamat with 3 ft long Percussive Driven Earth Anchors (PDEA) with a horizontal spacing of 4 ft and a vertical spacing of 5 ft. Anchor placement should reflect a staggered checkerboard pattern across the slope surface for best results.

2.3. INSPECTION AND MAINTENANCE

Inspect Flexamat every 7 days or after each major rainfall event that produces more than 0.5 inches of rainfall. The Flexamat should maintain the fill and grade beneath it. Edges should be inspected for lifting/shifting, stakes should be re-secured if loosed, and if necessary, additional soil cover or seeding may be required.
3. MEASUREMENT AND PAYMENT

The quantity of the pay item for Flexamat is measured in square yardage (SY), in-place, complete and accepted. Payment for Flexamat installation is full compensation for placing the mat as specified or as directed and includes furnishing, placing, maintaining, and inspecting the installation for appropriate coverage, Curlex® II backing, Percussive Driven Earth Anchors (PDEA), other anchors, pins, staples, securement, and gradation, quality control testing, replacing or repairing as needed, and all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, Specifications, and other terms of the Contract.

END OF SECTION
SPECIFICATION

PYRAMAT® 25 ARMORMAX SYSTEM

1. GENERAL

1.1. DESCRIPTION
This work consist of the placement of PYRAMAT® 25 High Performance Turf Reinforcement Matting (HPTRM) as indicated in the plans. Pyramat is a three-dimensional, lofty, woven polypropylene geotextile designed for erosion control on steep slopes, banks, and channels. Equivalent products will not be accepted.

1.2. PRODUCTS

1.2.1. MATERIALS
Use PYRAMAT® 25 where specified on the plans.

Use PlatipusTM Percussive Driven Earth Anchors (PDEA), wire U-shaped sod staples, and geotextile pins to secure the C-TRM to the underlying soil. Use staples made from a minimum 11-gauge metal wire. Metal pins shall have a minimum diameter of 3/16 in with a 1.5 in steel washer at one end to form a head. Staple/pin length will vary (8 in-18 in) according to soil conditions but should be a minimum 8 inches and have a ground penetration sufficient to resist pulling out once installed.

Install PYRAMAT® 25 as shown on the plans and as described in this specification unless otherwise approved by the Engineer.

2. EXECUTION

2.1. PREPARATION
Shape and grade the slope or area on which PYRAMAT® 25 is to be placed to the lines, grades, thickness, or typical sections shown on the plans. The area should be free of soil slumps, roots, stumps, rocks, vehicle imprints, or other features that would prevent PYRAMAT® 25 from lying flush against the ground surface.

Loosen the top 2 to 3 inches of the underlying soil to promote vegetation establishment. Apply Hydraulic Biotic Soil amendment (HBSA) and permanent seeding prior to installing PYRAMAT®.

2.2. INSTALLATION
Install PYRAMAT® as specified by the manufacturer.

Excavate a 12-inch deep by 12-inch wide trench a minimum distance of 3 ft from the crest of the slope. Begin at the top of the slope by anchoring the PYRAMAT in the trench bottom. Anchor the PYRAMAT in the trench bottom with a row of staples or pins on 12 inch centers in between anchors on 4 ft centers. Backfill and compact the trench after installing the pins and anchors. Apply seed to the compacted soil.
Roll the PYRAMAT down the slope and place staples, pins and anchors at appropriate locations. Install the PYRAMAT with 3 ft long Percussive Driven Earth Anchors (PDEA) with a horizontal spacing of 4 ft and a vertical spacing of 5 ft, and secure pins and staples with a horizontal spacing of 2 ft and a vertical spacing of 2.5 ft. Pin and anchor placement should reflect a staggered checkerboard pattern across the slope surface for best results.

Parallel rolls of PYRAMAT should be stapled with a six-inch overlap. The PYRAMAT shall be overlapped shingle style down the slope with a 3-4 inch overlap and staples over 12 inches along the overlap.

The bottom slope termination should have the same configuration as the top trench, as should the upstream and downstream edges of the PYRAMAT.

2.3. INSPECTION AND MAINTENANCE

Inspect PYRAMAT every 7 days or after each storm event that produces more than 0.5 inches of rainfall. The PYRAMAT should maintain the fill and grade beneath it. Edges should be inspected for lifting/shifting, stakes should be re-secured if loosed, and if necessary, additional soil cover or seeding may be required.

3. MEASUREMENT AND PAYMENT

The quantity of the pay item for PYRAMAT is measured in square yardage (SY), in-place, complete and accepted. Payment for PYRAMAT installation is full compensation for placing the mat as specified or as directed and includes furnishing, placing, maintaining, and inspecting the installation for appropriate coverage, Percussive Driven Earth Anchors (PDEA), other anchors, pins, staples, securement, and gradation, quality control testing, replacing or repairing as needed, and all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, Specifications, and other terms of the Contract.

END OF SECTION
SPECIFICATION
SHOREBLOCK BD-400 OC

1. GENERAL

1.1. DESCRIPTION

This work consists of the placement of SHOREBLOCK® BD-400 OC hard-armor revetment system to prevent erosion and provide slope stability as indicated on the plans. SHOREBLOCK® BD-400 OC is a cabled concrete revetment system consisting of interlocking blocks in a sheet referred to as a cellular concrete mattress. The SHOREBLOCK® BD-400 OC system, by ShoreTec, allows for expansion and contraction to form a soil revetment system. Equivalent products will not be accepted.

1.2. PRODUCTS

1.2.1. MATERIALS

1.2.1.1. SHOREBLOCK

The Prefabricated Open Cellular Concrete Mattresses shall be SHOREBLOCK® BD-400 OC. The typical single mattress width shall be 8 feet wide and the typical mattress length shall be 18.67 feet.

The Prefabricated Open Cellular Concrete Mattresses shall be pre-manufactured as an assembly of concrete blocks when connected into mattresses by the use of polyester revetment cables. Two (2) integral longitudinal cables per block are required, as well as one (1) integral transverse cable. No partial or “half” blocks will be allowed without a transverse cable. The final revetment system must be tied continuously throughout with cables in two perpendicular directions.

SHOREBLOCK® BD-400 OC shall be manufactured in conformance with the requirements of ASTM D 6684 “Materials and Manufacture of Articulating Concrete Block (ACB) Revetment Systems”, except that, unless otherwise specified, freeze-thaw requirements shall not apply.

Cellular concrete blocks shall be formed by a vibratory block forming machine. Cellular concrete blocks shall be interlocking; and penetrations shall be included for revetment cables as necessary to bind the individual blocks into mattresses in two perpendicular directions. Cable penetrations shall prevent any exposure of cables to potential UV degradation within the dimensions of the individual blocks (i.e., cables shall not pass through open areas within the dimensions of individual blocks). The blocks shall be open cell and capable of articulation when formed into mattresses.

The concrete shall conform to ACI requirements for normal weight concrete and shall have a minimum compressive strength of 4,000 psi at 28 days when tested in accordance with ASTM C 140-96B.

1.2.1.2. GEOWEB

The GEOWEB® GW30V4 System is a polyethylene geocell cellular confinement system that shall meet the following requirements:
- Percent Cell Wall open Area: 16.8% ± 1.0%
- Density: 18.2 yd2
- Cell Nominal Area: 71.3in2
- Cell Depth: 6 inches

Aggregate shall meet the requirements of ASTM C 33 except for grading requirements. Aggregate grading shall be reasonably consistent and shall be well graded from the maximum size, which can be conveniently handled with available equipment.

2. EXECUTION

2.1. PREPARATION

Areas on which SHOREBLOCK system are to be placed shall be constructed to the lines and grades shown on the drawings. The subgrade for the system shall be free of voids, pits, or depressions and shall be compacted to a minimum of 90% of the ASTM D 698 density. Voids, pits or depressions shall be brought to grade by backfilling in accordance with the applicable portions of the project specifications. All obstructions, such as roots and projecting stones larger than 1 inch remaining on the surface, shall be removed and all of the soft or low density pockets of material removed must be filled with selected material and compacted to a minimum of 90% of the ASTM D 698 density.

Excavation and preparation for anchor trenches, side trenches, and toe trenches or aprons shall be done in accordance to the lines, grades and dimensions shown on the drawings.

2.2. INSTALLATION

The Prefabricated Open Cellular Concrete Mattresses system shall be placed within the limits shown on the drawings. The cellular concrete mats or blocks shall be placed on top of the underlying GEOWEB® GW30V4 System in such a manner as to produce a relatively planar surface. The Contractor shall hold the owner harmless from liability of any kind arising from the use of any patented or non-patented invention used in the performance of this work.

The contractor shall first install geotextile fabric per the associated specification. Install the GEOWEB per the manufacturer’s recommendations. Manually expand the GEOWEB over the installed geotextile fabric, taking care to not damage or dislodge the fabric. Use stakes to anchor the GEOWEB into position and ensure ATRA key connection devices are used at any adjoining sections. Fill the GEOWEB cells with Bedding Stone in compliance with the associated specification. Overfill cells to a height of two (2) inches above the top of the cell and compact the infill materials with machinery or by hand tamping.

The Contractor shall then install a Synteen SF35 MicroGrid or Equivalent on top of the underlying GEOWEB® GW30V4 System.

The SHOREBBLOCK Prefabricated Open Cellular Concrete Mattresses shall be placed on top of the GEOWEB and microgrid using mats attached to a spreader bar or other approved device to aid in the lifting and placing of the mats in their proper position by the use of a crane or other approved equipment. The mats shall be placed side-by-side and/or end-to-end so that the mats abut each other. The maximum space or gap between mattresses shall be 3 inches, except that local wider gaps may be accepted if the length of the gap is less than 3 feet and the entire gap is grouted. No overlapping of mats will be accepted and no blocks shall project vertically more than 1 inch beyond the adjacent blocks. All placements of mats shall be in accordance with the Manufacturer’s
recommendations. As adjacent mats are placed, they shall be secured to each other by fastening the protruding horizontal and vertical cable connections and end cable loops together along each side of the mats. The fastening shall be done with approved sleeves.

The bottom of the concrete mattress should be trenched in to a depth of twelve (12) inches below the bottom of the stream bed. Care should be taken to minimize in-stream disruption.

The voids of the cellular concrete mats for the limits shown on the drawings shall be filled with topsoil. The soil should then be seeded in accordance with the Seeding Specification.

2.3. INSPECTION AND MAINTENANCE

The Engineer shall inspect the system prior to infilling the GEOWEB and prior to placing the SHOREBLOCK mats. Prior to the infill of topsoil, the engineer shall inspect the installed cellular concrete mattresses for defects and/or damage. Individual blocks which are broken and the weight reduced below 1/3 of the original individual block weight shall be replaced or removed and grouted prior to the placement of any required top soil.

Inspect ShoreBlock BD-400 OC every 7 days or after a storm than produces more than 0.5 inches of rain. Check for damage, dislocation, or movement. Ensure that placement remains steady over the course of the project and repair, or add more topsoil fill to voids as necessary.

3. MEASUREMENT AND PAYMENT

The unit of measurement for SHOREBLOCK® BD-400 OC is measured in square yardage (SY), in-place, complete and accepted. Payment for SHOREBLOCK® BD-400 OC installation is full compensation for placing the geotextile fabric, GEOWEB, microgrid, and SHOREBLOCK block mattress as specified or as directed and includes furnishing, placing, maintaining, and inspecting the installation for appropriate coverage, securement, and gradation, quality control testing, replacing or repairing as needed, and all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, Specifications, and other terms of the Contract.

END OF SECTION
SPECIFICATION

STACKED BOULDERS

1. GENERAL

1.1. DESCRIPTION

This work consists of the placement of boulders to form a stacked stone wall along certain portions of the stabilization project. Stacked boulders are used as a natural-look stream bank armor in areas that require immediate and permanent protection from future erosion. The boulders are often stacked 2-5 high depending on the desired protection. Layers of stacked rock shall be imbricated (arranged with regular overlapping edges).

1.2. PRODUCTS

1.2.1. MATERIALS

1.2.1.1. BOULDERS

Boulders shall be 24 inches to 30 inches in size, measured by the smallest dimension in any direction. The boulders shall be angular in shape so as to be easily stacked and stable once installed. The boulder material stone should be granite or similar weather and erosion resistant material. Boulder should have no major cracks or fissures that may indicate a loss of structural integrity.

Boulders existing on site may be used if they meet the requirements listed herein and upon approval by the Engineer. Shaping of the existing on-site boulders to obtain the necessary angular shape is permitted using machinery or hand tools; blasting is not permitted. Remaining on-site rock may be used as infill or in other areas of the project with approval by the Engineer.

1.2.1.2. GEOTEXTILE FABRIC

Geotextile Fabric shall be Crown Resources R080 and comply with the associated specification.

1.2.1.3. BEDDING STONE

Bedding stone shall have the gradation as listed in the following table. No. 57 Stone is acceptable.

<table>
<thead>
<tr>
<th>Nominal Size (Sieves with Square Openings)</th>
<th>Percent Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 in.</td>
<td>100</td>
</tr>
<tr>
<td>1-1/2 in.</td>
<td>35 – 100</td>
</tr>
<tr>
<td>¾ in.</td>
<td>0 - 15</td>
</tr>
</tbody>
</table>

1.2.1.4. CLASS A RIPRAPP

Riprap shall be Class A riprap and be a well graded stone with test samples falling between the gradation limits for riprap shown in the tables below.
<table>
<thead>
<tr>
<th>Stone Size Range (feet)</th>
<th>Stone Weight Range (pounds)</th>
<th>Percent Smaller Than</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.4 $D_{50}$ to 1.6 $D_{50}$</td>
<td>3.0 $W_{50}$ to 5.0 $W_{50}$</td>
<td>100</td>
</tr>
<tr>
<td>1.14 $D_{50}$ to 1.33 $D_{50}$</td>
<td>2.0 $W_{50}$ to 2.75 $W_{50}$</td>
<td>85</td>
</tr>
<tr>
<td>0.95 $D_{50}$ to 1.09 $D_{50}$</td>
<td>1.0 $W_{50}$ to 1.5 $W_{50}$</td>
<td>50</td>
</tr>
<tr>
<td>0.38 $D_{50}$ to 0.57 $D_{50}$</td>
<td>0.1 $W_{50}$ to 0.2 $W_{50}$</td>
<td>15</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Riprap Class</th>
<th>Rock Size (Feet)</th>
<th>Rock Size² (Lbs.)</th>
<th>Percent of Riprap Smaller Than</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0.75</td>
<td>37</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>0.50</td>
<td>11</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>0.20</td>
<td>0.7</td>
<td>15</td>
</tr>
</tbody>
</table>

1.2.1.5. GROUT

Grout shall consist of one part Portland cement and three parts sand. Adjust water content of the grout to permit gravity flow of the grout to fill the voids, as applicable.

1. EXECUTION

1.1. PREPARATION

Bank shall be clear of all debris and shaped according to the plans. Clear the area of any obstructions, debris, or sharp objects that could puncture the fabric. Excavation of the bank may be required at the most upstream and downstream extents of the stacked boulder wall and additional excavation may be required as outlined in the plans.

1.2. INSTALLATION

Install stacked boulders per the plans and detail. Place fabric with the long dimension parallel to the toe of the slope and lay smooth and free of tension, stress, folds, wrinkles, or creases. If more than one strip is necessary, overlap the strips a minimum of 18 inches. Place transverse overlaps with the upstream strip overlapping the downstream strip. Overlaps may be eliminated if the joint is sewn using an approved method.

Select the boulders so they butt tightly together and in a way that there are multiple contact points between all boulders. Grout boulders when adequate contact cannot be achieved or as requested by the County. Fill behind boulders with bedding stone over fabric after each row is completed.

Fill toe with hand-placed Class A riprap and bedding stone, with a mixture of approximately 75% Class A riprap and 25% No. 57 stone. Ensure that the stone placed in the toe is such that larger stones and smaller stone are distributed evenly. Make sure the top of the toe-fill is below the water surface at the level specified in the plans.
1.3. INSPECTION AND MAINTENANCE

Inspect boulders every 7 days or after each storm event that produces more than 0.5 inches of rainfall. Check for damage, dislocation, or movement of the boulders and scour behind the boulders. Ensure that placement remains steady over the course of the project and repair fill voids as necessary.

2. MEASUREMENT AND PAYMENT

The quantity of the pay item for stacked boulders is Tons (TN), in-place, complete and accepted. Payment for the stacked boulders is full compensation for placing the material as specified or as directed and includes furnishing, placing, maintaining, and inspecting the installation, which includes the appropriate size and gradation, quality control testing, replacing or repairing as needed, and all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, Specifications, and other terms of the Contract.

END OF SECTION
SPECIFICATION

SOIL LIFT

1. GENERAL

1.1. DESCRIPTION

Soil lifts are layers of some combination of soil, riprap, coconut fiber logs (or similar) wrapped in heavy geotextile fabric with live stakes or rooted plants installed between the layers. Soil lift typically vary in depth from three to five feet into the bank, but may be more depending on site conditions. The plantings provide additional bank stability as their root systems grow as well as desirable habitat and aesthetics. The soil lifts will be comprised of Rolanka BioD-Block™ 12-300, fill material, boulders, and riprap. Equivalent products to the BioD-Block™ products listed here will not be accepted.

1.2. PRODUCTS

1.2.1. MATERIALS

The BioD-Block™ is a coir fiber block system consisting of a densely packed elongated mattress coir fiber block attached to a bristle coir woven fabric. Coir fabric is tightly wrapped around 12-in tall, 5-in thick coir blocks, 10 ft in length. The fabric is connected to the coir block on three sides leaving the other side open to fill with dirt. Each coir block has a female and a male end. These male and female ends in BioD-Block™ create a strong and easy-to-handle connection, providing an excellent face to the soil layers. In addition, the BioD-Block™ shall meet the following specifications:

<table>
<thead>
<tr>
<th>Property</th>
<th>BioD-Block™ 12-300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit weight</td>
<td>4.2 lbs/ft (6.3 kg/m)</td>
</tr>
<tr>
<td>Block size</td>
<td></td>
</tr>
<tr>
<td>Height</td>
<td>12 in (30 cm)</td>
</tr>
<tr>
<td>Thickness</td>
<td>5 in (13 cm)</td>
</tr>
<tr>
<td>Length</td>
<td>10 ft (305 cm)</td>
</tr>
<tr>
<td>Fabric length</td>
<td></td>
</tr>
<tr>
<td>Top</td>
<td>47 in (117.5 cm)</td>
</tr>
<tr>
<td>Bottom</td>
<td>47 in (117.5 cm)</td>
</tr>
<tr>
<td>Tensile strength of fabric</td>
<td></td>
</tr>
<tr>
<td>MD</td>
<td>1740 lbs/ft (25.4 kN/m)</td>
</tr>
<tr>
<td>CD</td>
<td>1176 lbs/ft (17.2 kN/m)</td>
</tr>
<tr>
<td>Fabric length at female end</td>
<td>6 in (15 cm)</td>
</tr>
</tbody>
</table>
2. EXECUTION

2.1. PREPARATION

Installer should pre grade the area such with the intention of adding 5.5-6’ of fill material so that the soil lifts can be installed correctly and installed to the grade specified in the plans. Grading and installation should be installed such that the garden boxes are not damaged. The area below the first lift should be relatively level and clean of any stones, roots, snags, or other material that would prevent the bottom lift from being in contact with the soil.

2.2. INSTALLATION

Lay the fabric over the ground and roll away from bank. Stake the fabric as along each 3 feet using an 18” hardwood stake. Situate the Rolanka Bio-D Block such that the end of the block corresponds with the grade specified in the plans. Because blocks come pre-ached to fabric, the block and fabric must be installed together. Insert male end of fabric into female end as shown in Figure 1.

![Figure 1: Manufacturer-supplied schematic of Bio-D Block installation.](Figure_1.png)

Fill the void behind the log with excavated material and compact. Soil should have 3-5% organic matter. Roll the fabric over the top of the block and back towards the bank. Cut the fabric such that 4’ of the fabric will lie under the next lift. Install live stakes in accordance with the live stakes specification between each soil lift. Continue the process until all lifts are installed such that they match the plans. Refer to plans for all other details.

2.3. INSPECTION AND MAINTENANCE

Inspect bedding stone every 7 days or after each major rainfall event that produces more than 0.5 inches of rainfall. Check for damage, dislocation, or movement. Ensure that placement remains steady over the course of the project and repair or replace plantings as they are lost.
2.4. ACCEPTANCE

Obtain Engineer approval after installation of the bank toe and as the first level of the first lift is installed.

3. MEASUREMENT AND PAYMENT

The quantity of soil lifts as measured by number of linear feet (LF) of soil lifts installed (per lift). Payment for soil lift installation is full compensation for placing the material as specified or as directed and includes furnishing, placing, maintaining, and inspecting the installation, which includes the appropriate size and gradation, quality control testing, replacing or repairing as needed, and all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, Specifications, and other terms of the Contract.

END OF SECTION
SPECIFICATION

FENCE REMOVAL AND REPLACEMENT

1. GENERAL

1.1. DESCRIPTION

This work includes the removal or salvage of the existing fence and installation of a seven-foot chain link fence to the existing lines and grades as needed for access to and completion of the work as described in the Construction Documents. Wherever the materials to be removed are not in good condition, as judged by the County or County’s representative, or wherever the contractor has damaged the materials during the process of removal, the contractor shall provide equal or better quality fencing material, to match existing, for installation.

This work will also include the installation of temporary fencing to enclose the dog park and maintain its functionality during the project.

2. MATERIALS

Chain link fabric and required fittings and hardware shall conform to the requirements of AASHTO M181 for the kind of metal, sizes of wire and mesh specified. Zinc coating for steel fabric shall conform to ASTM A392, Class I and aluminum coating for steel fabric to ASTM A491, Class I.

Steel posts shall be galvanized in accordance with AASHTO M111M/M111. Fittings, hardware, and other appurtenances shall be standard commercial grade, and in accordance with current standard practice.

Temporary construction fencing must be standard safety construction fencing, or better.

3. EXECUTION

All rails, posts, chain link, and associated parts shall be removed of and salvaged or disposed of to allow construction of the project in accordance with the Construction Drawings.

If posts are removed, replacement posts shall be securely imbedded in the ground in concrete. The complete fence shall be plumb and in the same alignment and at the same elevations as the existing fence. Connect the existing fence to the new fencing as applicable.

Temporary fencing must be installed in such a way as to maintain the form and function of the dog park before the removal of the 7-foot chain link fence.

4. MEASUREMENT AND PAYMENT

The pay item for fence removal and replacement is per linear foot (LF). Price and payment shall be full compensation for all labor, materials, equipment, tools, transportation and supplies required to
complete the work in accordance with the Plans, Specifications, and other terms of the Contract. Payment is 100% upon approval of acceptable application meeting the requirements of this Specification. The payment includes all direct and indirect costs and expenses necessary to complete the work.

END OF SECTION
SPECIFICATION

LIVE STAKES

1. GENERAL

1.1. DESCRIPTION

This work consists of installation of live stakes as indicated on the plans. This work will reinforce BMPs with a steadily increasing pull-out strength over time, returning a designed streambank stabilization to a more natural state as BMPs degrade or are covered with vegetation and detritus.

1.2. PRODUCTS

1.2.1. LIVE STAKES

Live stakes shall be commercially supplied, dormant stakes 1-2 inches in diameter and 2-6 feet long, relatively straight, with no visible signs of disease or damage. No leaf buds should have growth of more than ¼” and the live stake should be moist and otherwise healthy. The bottom end of the cutting should be cleanly cut at a 45 degree or sharper angle for installation.

Live stakes shall be a selection from the following species:

- American Sycamore (*Platanus occidentalis*)
- Swamp Chestnut Oak (*Quercus michauxii*)
- Box Elder (*Acer negundo*)
- Black Willow (*Salix nigra*)
- Eastern Cottonwood (*Populus deltoids*)
- Common Elderberry (*Sambucus nigra ssp. Canadensis*)
- Common buttonbush (*Cephalanthus occidentalis*)

2. EXECUTION

2.1. STORAGE

All live stakes should be kept in a cool, covered, moist environment until installed. For best results, live stakes should be installed within 24 hours of harvest.

2.2. INSTALLATION

Live stakes must be installed after the leaf drop in the fall and before the bud break in the spring, with preference on planting in the spring. A punch/planting bar or auger may be used to create a hole for the live stake.

All live stakes should be installed, angle end first, such that the base penetrates the TRM or other geotextile and goes into the topsoil. For products resistant to penetration, pre-slit these products
if live stakes are to be used in them. Live stakes shall be installed 2 to 3 feet apart using triangular spacing with a density of 2 to 4 stakes per square yard.

Tap the stake into the ground using a rubber mallet until 80% of the live stake length is below the surface. Fill the holes as needed with a topsoil and water slurry and tamp around the stake once installed. If live stakes are damaged during subsequent activities, simply cut stem back to undamaged portion of stake. Replace stake if damaged within 3 inches of surface.

Contractor will be expected to replace live stakes such that 70% of the stakes installed are alive after one (1) year.

3. MEASUREMENT AND PAYMENT

Live stakes shall be measured and paid for at the Contract unit price per bundle (BN) of 50 live stakes in accordance with the landscaping plan and plan details. Payment for live stakes shall be full compensation for furnishing, installing, maintenance and warranty, including all materials, labor, equipment, stockpiling, tools, and incidentals necessary to complete the work as specified in the Contract Documents, or as directed by the County.

END OF SECTION
SPECIFICATION

PLATIPUS PERCUSSIVE DRIVEN EARTH ANCHOR (PDEA)

1. GENERAL

1.1. DESCRIPTION

This work consists of the placement of Platipus Percussive Driven Earth Anchors (PDEA) where shown on the plans or in the specifications. These will consist of both standard Platipus PDEAs and Platipus Zip Anchors where defined. These anchors help to better secure the erosion control blankets, turf reinforcement matting, Flexamat, and tied concrete block matting used on the project and help to reduce the risk of failure. No equivalent product will be accepted.

1.2. PRODUCTS

1.2.1. MATERIALS

Two types of Platipus Earth Anchors may be utilized:

1. In high load applications, Platipus S2 Geo /S2 ARGS are specified. The Platipus S2 Percussive Driven Earth Anchor (PDEA assembly GEO / ARGS) comes in a variety of configurations. Where specified, the Platipus S2 PDEA GEO/ARGS anchors for this project will have the following configuration:
   - Platipus S02EA Anchor
   - Anchor Head: aluminum alloy- gravity die cast and heat treated
   - Wire Tendon: 3.3 foot 3mm Stainless steel (Grade 316)
   - Lower Termination: Stainless Steel Soft Eye including Copper Ferrule
   - Top Accessory: 3.5 inch diameter UV stabilized plastic Load Plate
   - Top Termination: 3mm Duplex Brass/Stainless Steel self-setting wedge grip

2. In lower load applications and along common failure points, Platipus S2 Zip Anchors are specified. The S2 Zip Anchor can be installed, in a wide range of soils, using simple hand tools. The system’s unique design incorporates Platipus T-Loc technology with a simple ‘cable tie style’ strap to receive an adjustable self-locking load plate. Can be used as an alternative to traditional staples and pins which can easily pull out. Common applications may include TRMs, liners, and grass pavers.

2. EXECUTION

Complete all grading and installation of designated products as outlined on the plans and specifications.

The following installation requirements are provided by Platipus. Failure to follow these requirements may result in failure of the anchor and ultimately the failure of secured BMP.

2.1. EQUIPMENT

Use driving equipment adequate to obtain required embedment depth of the anchor in the subgrade encountered. Drive anchors using a percussive/demolition style hammer only, vibration or rotary type hammers are not recommended. Post tensioning of anchors to be accomplished by use of a
tensioning device capable of applying the required tension loads and for load tested PDEAs, including appropriate gauges to indicate the load applied.

2.2. ANCHOR PLACEMENT

Do not install any anchors which are bent, cracked, of insufficient length, of reduced cross section due to any reason, or damaged in any way which would decrease the tension load carrying capacity of the anchor. Install anchors at the locations indicated on the plans and in these specifications, to the embedment length as directed by the Engineer and at a right (90°) angle of inclination. All anchors to be continuous full length without splices.

2.3. LOAD TESTING

All production anchors shall have a minimum ultimate load capacity of 550 lbs. and a minimum working load of 150 lbs. Load test 10% of the anchors to the required working load. Keep a record of all anchors tested and provide a copy to the Engineer. Load testing to be performed by means of a hydraulic jack or appropriate tensioning device that includes an appropriate gauge that indicates a certified load in tension.

2.4. INSPECTION AND MAINTENANCE

The anchors should be inspected every 7 days or after each storm event that produces more than 0.5 inches of rainfall. The anchors should maintain the fill and grade beneath them. The anchors should be inspected for lifting/shifting and should be re-secured if loosed, and if necessary, additional anchors should be installed if required.

3. PAYMENT

There is no measurement for Platipus Percussive Driven Earth Anchors (PDEA). This item is included in the measurement of EarthshieldTM CM700, Eastcoast ECSC-3TM, Enkamat 7020, Flexamat, Pyramat, and other places as indicated in these Specifications. Payment includes placing the anchors as specified or as directed and includes furnishing, placing, maintaining, and inspecting the installation for appropriate coverage, securement, and gradation, quality control testing, replacing or repairing as needed, and all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, Specifications, and other terms of the Contract.

END OF SECTION
SPECIFICATION

SEEDING

1. GENERAL

1.1. DESCRIPTION

The Contractor shall perform permanent seeding and stabilize all disturbed areas on the project site. The work of seeding shall be performed on a section-by-section basis, immediately upon completion of earthwork sections. No exception will be made to this requirement, unless otherwise permitted in writing by the Engineer or Engineer’s Representative. When grading operations have been suspended and seeding has been performed on areas where work has been suspended, the work of seeding adjacent sections shall include any necessary overlapping of operations on previously established grass cover.

Limestone, fertilizer, seed and mulch shall be applied within 24 hours after completion of seed bed preparation, unless otherwise permitted by the Owner’s Representative; but, no limestone or fertilizer shall be distributed and no seed shall be sown when the Owner’s Representative determines that weather and soil conditions are unfavorable for such operations.

Equipment to be used for the application of limestone, fertilizer, seed and mulch shall have been approved by the Owner’s Representative before being used on the project. Approval may be revoked at any time, if equipment is not maintained in satisfactory working condition or if the equipment operation damages the seed. Limestone, fertilizer and seed shall be applied within 24 hours after completion of seed bed preparation, unless otherwise permitted by the Engineer or Engineer’s Representative; but, no limestone or fertilizer shall be distributed and no seed shall be sown when the Owner’s Representative determines that weather and soil conditions are unfavorable for such operations.

1.2. PRODUCTS

1.2.1. MATERIALS

At the time of delivery, the Contractor will furnish the Engineer or Engineer’s Representative with invoices and or documentation of all materials received in order to verify the application rate of materials.

1.2.1.1. SEED

Use seed that conforms to all state laws and all requirements and regulations of the South Carolina Department of Agriculture (SCDA). Seeds containing species designated by the State Crop Pest Commission as a plant pest (i.e., noxious weeds) are not permitted. Use seed that is individually packaged or bagged and tagged. Each tag must clearly state:

- Name of company or responsible party for analysis (seller or grower)
- Net weight
Greenville County  
Brushy Creek Stabilization

- Botanical name
- Common name
- Variety
- Lot number
- Percent purity (pure seed)
- Percent germination ≥ 80%
- Percent by weight other crop seed
- Percent by weight of inert matter
- Percent by weight common (non-noxious) weed seed ≤ 1.0% (99.0% weed free). If weed seed is present, provide a list of species by botanical name
- Origin
- Date of packaging or date tested (date must be within 9 months of the planned date of seed application).

It is preferred that the Contractor use pre-blended permanent seed mixtures that meet the requirements of SCDOT QPP 88 and listed on the most recent edition of the SCDOT Qualified Product List 88 for the Upstate and application area (slopes and flat areas).

http://info2.scdot.org/Materials/Pages/QualifiedProd.aspx

These pre-blended permanent seed mixtures are individually packaged or bagged and tagged with the tag specifying the botanical and common name of each species contained in the blend, and the percentages of each species.

Select the appropriate pre-blended permanent seed mixture based on application (slopes) and the time of year of the application (spring/summer or fall/winter).

When pre-blended seed mixtures are not used, each species is weighed and mixed in the proper proportions on-site in the presence of the Engineer or Engineer’s Representative, if not Owner’s Representative may deny payment.

The Engineer or Engineer’s Representative reserves the right to review, test, reject, or approve all seed before seeding operations begin.

Seed must be used within 9 months from the date of packaging. Seed exceeding 9 months from the date of packaging will not be accepted.
1.2.1.2. TOPSOIL

If topsoil is obtained from offsite, it shall meet the following requirements:

<table>
<thead>
<tr>
<th>By Weight</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Clay content</td>
<td>25%+</td>
</tr>
<tr>
<td>Silt content</td>
<td>20%+</td>
</tr>
<tr>
<td>Sand content (max. size #30 sieve)</td>
<td>45%+</td>
</tr>
<tr>
<td>Decomposed organic content</td>
<td>10%+</td>
</tr>
<tr>
<td>pH</td>
<td>6.5 – 7.5</td>
</tr>
</tbody>
</table>

1.2.1.3. LIME

Ensure that lime is agricultural grade, standard ground limestone conforming to the current Rules, Regulations, and Standards of the Fertilizer Board of Control. These rules, regulations, and standards are promulgated and issued by the Fertilizer Board of Control at Clemson University in accordance with Section 16 of the South Carolina Liming Materials Act. Ensure that each bag has affixed in a conspicuous manner a tag or label, or in the case of bulk sales, a delivery slip showing the brand or trade name, calcium carbonate equivalent, percent by weight passing prescribed U.S. Standard sieves, and other pertinent information to identify lime as agricultural grade, standard ground limestone.

Use fast acting liquid forms and/or dry forms of lime for all permanent cover and temporary cover by seeding applications that meet all of the requirements of agricultural grade granular lime specified herein, except percent by weight passing U.S. Standard Sieves.

A soil analysis is required prior to limestone applications (see Section 5 of these Materials Specifications for soil test requirements). The soil analysis determines the need and rate of limestone applications for the specific vegetation species.

1.2.1.4. FERTILIZER

Provide commercial fertilizers that comply with state fertilizer laws. When a fertilizer is required for any grass, use a mixed fertilizer with a designation such as 10-10-10, where the first number represents the minimum percent of nitrogen required, the second number represents the minimum percent of available phosphoric acid required, and the third number represents the minimum percent of water soluble potash required in the fertilizer.

A soil analysis is required prior to agricultural granular fertilizer applications (see Section 5 of these Materials Specifications for soil test requirements). The soil analysis determines the need and rate of fertilizer applications for the specific vegetation species.

Use fertilizer that incorporates a minimum of 50% slow release (water insoluble) nitrogen for all permanent cover applications under this Specification. Apply nitrogen at a rate of 120 lbs per acre (60 lbs of slow release nitrogen per acre).
1.2.1.5. SOIL ANALYSIS

A soil analysis is required prior to all permanent seeding applications. A soil analysis is required on all representative soil types for the specified vegetation species prior to agricultural granular lime and granular fertilizer applications. The Owner’s representative will determine where distinguishable representative soil types are located on the project site. Representative soil types include existing predominate soils on the project site, cut slopes, fill material, and areas of exposed subsoil.

Collect one (1) soil sample for each distinguishable representative soil type. One (1) sample consists of mixing ten (10) sub-samples taken uniformly over each distinguishable representative soil type. Soil samples should be taken from stockpiles where the material will be the top six (6) inches of the seedbed. Take each sub-sample within the top four (4) to six (6) inches of the soil surface.

Submit a separate soil sample for each representative soil type to Clemson University or a certified soil testing laboratory.

At a minimum, a standard soil test includes pH, buffer pH, extractable phosphorus, potassium, lime requirements and recommendations, calculations for CEC (cation exchange capacity), and fertilizer requirements and recommendations.

The soil analysis determines the need and rate of agricultural granular lime and slow release nitrogen granular fertilizer applications.

A separate soil organic matter test is also required to determine if an organic soil amendment is required and the rate at which the organic soil amendment is applied

2. EXECUTION

2.1. SEEDBED PREPARATION

Ensure the seedbed conforms to the finished grade or as otherwise directed by the Engineer or Engineer’s Representative. Perform minor shaping and evening of uneven and rough areas outside of graded sections as directed by the Owner’s Representative in order to provide more effective erosion control and for ease of mowing operations.

Use topsoil, compost or other acceptable soil amendments as directed by the Engineer or Engineer’s Representative if good seedbed material is not located on site as determined by the results of a soil test.

The Contractor shall cut and satisfactorily dispose of weeds or other unacceptable growth on areas to be seeded.

Loosen the seedbed to a minimum depth of three (3) inches before topsoil, compost, other acceptable soil amendments, agricultural lime, fertilizer, mulch, or seed is applied.
Prepare the seedbed in a manner that ensures the seeding application remains on slopes and germinates. The preferred method is vertically tracking the seedbed up and down the slope with proper equipment.

Ensure that the seedbed is uniform and remove stones larger than two and one-half (2½) inches in any dimension, large clods, roots, or other debris brought to the surface.

The preparation of seed beds shall not be done when the soil is frozen, extremely wet, or when the Owner’s Representative determines that it is in an otherwise unfavorable working condition.

2.2. TOPSOIL PLACEMENT

Topsoil shall be incorporated as needed by the results of a soil test (see Section 1.2 of this specifications for soil test requirements) to ensure successful establishment of a vegetative cover, as described here.

Place topsoil in areas where seeding and planting is to be performed. Place to a minimum depth of 3 inches for seeded areas to finished grade elevation except where otherwise specified.

Use topsoil in relatively dry state and place during dry weather.

Fine grade topsoil, eliminating rough and low areas to ensure positive drainage. Maintain levels, profiles, and contours or subgrades.

Remove stone, roots, grass, weeds, debris, and other foreign material while spreading.

Manually spread topsoil around trees, plants, and structures to prevent damage which may be caused by grading equipment. Do not add additional soil depth over existing tree root zones. Maintain existing grade within drip line of trees.

Lightly compact placed topsoil. Do not over compact.

2.3. LIMESTONE PLACEMENT

Use agricultural granular limestone for all permanent cover applications.

A soil analysis is required prior to agricultural granular lime applications. Based on the results of the soil analysis, furnish granular lime to provide a long term pH adjustment.

Uniformly spread lime over the designated areas. Thoroughly mix agricultural granular lime with the soil to a depth of approximately two (2) inches. Lime may be applied by approved mechanical spreaders or by hydraulic methods as a mixture of lime and seed.

Limestone may be applied as a part of the seed bed preparation, provided it is immediately worked into the soil. If not so applied, limestone shall be distributed uniformly over the prepared seed bed at the specified rate of application and then harrowed, raked or otherwise thoroughly worked or mixed into the seed bed.

Mixing is not required when spreading lime with hydraulic methods.
Apply all agricultural granular lime at a rate that is within ±10% of the weight recommendation of the soil analysis. Do not apply more than 4,000 lbs/acre of agricultural lime in a single application. If a soil analysis recommends greater than 4,000 lbs/acre, apply agricultural lime by:

- Surface apply 4,000 lbs/acre initially, after 3 months, surface apply the additional lime not to exceed 4,000 lbs/acre to meet the overall recommended application.
- If the initial soil analysis recommends greater than 6,000 lbs/acre, provide select material, compost or other acceptable soil amendments to the seedbed according to this specification, and then perform an additional soil analysis to determine the recommended agricultural lime application.

Use both fast acting liquid and fast acting dry forms of lime for all permanent seeding applications. Fast acting liquid and dry lime provides an immediate pH adjustment. Apply fast acting liquid lime at a rate of 5 gallons per acre or per the manufacturer’s recommendations. Apply fast acting dry lime at a rate of 100 pounds per acre or per the manufacturer’s recommendations.

2.4. FERTILIZER PLACEMENT

A soil analysis is required prior to agricultural granular fertilizer applications. Following advance seedbed preparation, uniformly spread fertilizer over the designated areas in accordance with the results of the soil analysis.

Adequately scarify all slopes that are inaccessible to power equipment. Fertilizer may be applied by approved mechanical spreaders or by hydraulic methods. When fertilizer is applied with combination seed and fertilizer drills, no further incorporation is necessary. Apply the fertilizer and seed together when hydraulic methods of seeding are used.

Apply all fertilizer at a rate that is within ±10% of the weight recommendation of the soil analysis. Apply fertilizer that is within ±2 percentage points of the recommendation of the soil analysis.

When a fertilizer blend meeting the soil analysis requirements is not readily available, the Contractor may combine fertilizers of different compositions to meet the soil analysis composition requirements. Apply the fertilizer at a rate to achieve the amount of nitrogen, phosphoric acid, and potash that would have been accomplished by utilizing the fertilizer specified by the soil analysis.

In all cases, under the guidelines of this Specification, apply nitrogen and phosphorus at a rate that does not exceed the soil analysis recommendation while keeping the actual nitrogen and phosphorus rate as close to the soil analysis recommended rate to the maximum extent practicable.

2.5. APPLYING SEED

Seed shall be distributed uniformly over the seed bed at the required rate of application and immediately covered with an acceptable Mulch.
When a combination seed and fertilizer drill is used, fertilizer may be drilled in with the seed, after limestone has been applied and worked into the soil. If two kinds of seed are being used which require different depths of covering, the seed requiring the lighter covering may be sown broadcast or with a special attachment of the drill or drilled lightly following the initial drilling operation.

When a hydraulic seeder is used for application of seed and fertilizer, the seed shall not remain in water containing fertilizer for more than 30 minutes prior to application.

When adverse seeding conditions are encountered due to steepness of slope, height of slope, or soil conditions, modifications may be made in the above requirements as approved by the Engineer or Engineer’s Representative which pertains to incorporating limestone into the seed bed, covering limestone, seed and fertilizer, and compaction of the seed bed.

2.6. MULCH PLACEMENT

Apply mulch according to the following Table.

<table>
<thead>
<tr>
<th>Mulch 1,5</th>
<th>Applicable Slopes 2</th>
<th>Minimum Application Rate (lbs/acre -dry) 3</th>
<th>Min Slope Length (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Straw or Hay with Tackifier</td>
<td>≤ 4:1</td>
<td>2,000</td>
<td>N/A</td>
</tr>
<tr>
<td>HECP Type 1 - Tracer under RECP</td>
<td>Per RECP</td>
<td>1,000</td>
<td>N/A</td>
</tr>
<tr>
<td>HECP Type 1</td>
<td>≤ 4:1</td>
<td>2,000</td>
<td>N/A</td>
</tr>
<tr>
<td>HECP Type 2</td>
<td>4:1 &lt; S ≤ 3:1</td>
<td>2,500</td>
<td>N/A</td>
</tr>
<tr>
<td>HECP Type 3</td>
<td>3:1 &lt; S ≤ 2:1</td>
<td>3,000</td>
<td>N/A</td>
</tr>
<tr>
<td>HECP Type 4</td>
<td>2:1 &lt; S ≤ 1:1</td>
<td>3,500</td>
<td>N/A</td>
</tr>
<tr>
<td>HECP Type 4</td>
<td>&gt; 1:1</td>
<td>4,000 (temp cover only) 4</td>
<td>N/A</td>
</tr>
<tr>
<td>Compost Mulch</td>
<td>≤ 2:1</td>
<td>200 CY/acre</td>
<td>N/A</td>
</tr>
</tbody>
</table>

When site constraints exceed the acceptable application for mulch, use Rolled Erosion Control Products (RECPs); Erosion Control Blankets (ECB) or Turf Reinforcement Matting (TRM)

| Temporary ECB 2 or Type 1 TRM | ≤ 2:1 | N/A | 5 |
| Type 2 TRM | ≤ 1.5:1 | N/A | 5 |
| Type 3 TRM | ≤ 1:1 | N/A | 5 |

1 A higher level of mulch may be applied than as specified on the Plans, Specifications, and other terms of the Contract. In this situation, the higher level mulch is applied at the specified mulch rate for the actual slope conditions of the site in accordance with the mulch tables. Payment is made for the mulch specified not the higher level mulch.

2 The maximum allowable continuous slope length for all straw and hay mulch, HECP, compost mulch, and ECB applications is 50 feet. Slope interruption devices or TRMs are required for continuous slope length longer than 50 feet. At the discretion of the Owner’s Representative, use slope interruption devices on slope lengths less than 50 feet when slope erosion is observed.

3 Strictly comply with the manufacturer’s mixing recommendations and installation instructions for the actual slope steepness and the actual continuous slope length of the application.

4 HECP Type 4 may be used for permanent cover applications on slopes 1:1 or greater at a minimum rate of 4,500 pounds per acre as directed by the Owner’s Representative only when proper TRM...
installation is not practicable due to site constraints. Slope interruption devices or TRMs are required for continuous slope length longer than 50 feet. At the discretion of the Owner’s Representative, use slope interruption devices on slope lengths less than 50 feet when slope erosion is observed.

Wood chips or shredded woody materials generated during the clearing stage when trees are shredded using large tub grinders is an acceptable temporary mulch. At the discretion of the Owner’s Representative, place wood chip mulch on slopes ≤ 3:1. Wood chip mulch is not acceptable for temporary seeding or permanent seeding applications.

2.7. MAINTENANCE OF SEEDING AND MULCHING

Areas where seeding has been performed shall be maintained in a satisfactory condition until final acceptance of the project.

Maintenance of seeded areas shall consist of watering, weed and pest control, fertilization, erosion repair, reseeding and incidental operations as necessary to establish a vigorous, healthy and uniform stand of specified permanent grass. All areas which fail to show a uniform stand of grass for any reasons shall be treated repeatedly until a uniform stand of at least 90 percent coverage is attained with no bare areas greater than five square feet.

Maintenance shall also include mowing of all areas until final acceptance of the permanent grass. Mow flat areas and slopes when vegetation reaches a height of approximately eighteen (18) to twenty four (24) inches or as directed by the Engineer or Engineer’s Representative. Do not perform mowing of slopes resulting in ruts, furrows or grooves. Do not perform mowing of slopes that damage or inhibits the establishment of the slope vegetation. All mowing and turf maintenance shall be done by the Contractor until final acceptance.

Ensure that mowing results in a uniform vegetation height of four (4) to six (6) inches, unless otherwise directed by the Owner’s Representative. Mow as closely as possible to all fixed objects exercising care not to cause damage. Hand trimming around such objects will be required of the Contractor.

Where correction will require extensive seed bed preparation or where earthwork repairs or complete reshaping are necessary, the seeding and mulching shall be redone in accordance with this Section.

As an exception to the above, areas of damage or failure resulting either from negligence on the part of the Contractor in performing subsequent construction operations or from not taking adequate precautions to control erosion and siltation as required throughout the various sections of the specifications shall be repaired by the Contractor as directed by the Owner’s Representative at no cost to the owner.

2.8. INSPECTION AND ACCEPTANCE

The Engineer or Engineer’s Representative shall be the sole judge as to acceptance of permanent seeding. Acceptable seeded areas shall be deemed areas with a vigorous and uniform stand of grass with bare areas less than 5 square feet in size. All areas which fail to provide a uniform stand of turf shall be treated...
(planted, as specified) repeatedly until a uniform stand of grass of at least 90% coverage is attained with no bare areas greater than five square feet.

Final Acceptance of permanent seeding is only in conjunction with final acceptance of all other work performed under this Contract and are guaranteed under the terms of the Contract.

3. MEASUREMENT AND PAYMENT

Seeding and mulching shall be paid for under the pay items for associated practices as defined in these specifications. Price and Payment shall be full compensation for all labor, materials, equipment, tools, transportation and supplies required to complete the work in accordance with the Plans, Specifications, and other terms of the Contract. Payment is 100% upon approval of acceptable application meeting the requirements of this Specification.

END OF SECTION
SPECIFICATION

HYDRAULIC BIOTIC SOIL AMENDMENT

1. GENERAL

1.1. DESCRIPTION

This work consists of installation of Hydraulic Biotic Soil Amendment (HBSA) as stated in these specifications. This application will reinforce BMPs or other areas with a product that will protect against erosion and provide an improved substrate for vegetation establishment and growth.

1.2. PRODUCTS

1.2.1. Hydraulic Biotic Soil Amendment

Ensure the HBSA is comprised on non-toxic materials and certified to be free of weeds and other undesirable materials, as listed in the most recent edition of the SCDOT Qualified Product List 79.

2. EXECUTION

2.1. INSTALLATION

The HBSA shall be installed prior to the installation of other Best Management Practices as indicated on the plans and defined in these specifications. The application rate shall be 3,500 pounds per acre. The product shall by hydraulically applied, unless an alternative application method is approved by the County or County’s representative prior to installation.

3. MEASUREMENT AND PAYMENT

The quantity of the pay item for HBSA shall be included as an incidental to all project components requiring HBSA. Payment shall be full compensation for completing the work as specified or directed within these specifications. This is to include all materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, Specifications, and other terms of the Contract.

END OF SECTION
SPECIFICATION

TREE AND SHRUB PLANTING

1. GENERAL

1.1. DESCRIPTION

The work required under this Section consists of all preparation, planting, and related items necessary to complete the work indicated as described in the Specifications, in addition to supplying all plants (trees and shrubs) specified and shown on the Drawings.

1.2. MATERIALS

1.2.1. PLANTS

Plants shall be of the species and size indicated on the Planting Plan and typical of their species and variety; have normal growth habits; well-developed branches with no crotch angles sharper than 45°, densely foliated; and vigorous, fibrous root systems. No trees will be accepted unless they show healthy growth and satisfactory foliage conditions.

Plants shall be free from defects and injuries. Plants shall be certified by the State and Federal authorities to be free from plant diseases and insect infestations.

Size of plants, spread of roots, and size of balls shall be in accordance with ANSI Z60-J- latest edition, American Standard for Nursery Stock, as published by the American Association of Nurseryman, Inc. Quality shall appreciably exceed these standards.

All plants of each particular variety shall be reasonably uniform configuration. All plants shall be labeled with correct plant name and size. Labels shall be attached securely to all plants, bundles and containers of plant materials delivered. Plant labels shall be durable and legible, stating the correct plant name and size in weather-resistant ink or embossed process lettering.

Plants shall not be pruned before planting. When plants are pruned, it will be in accordance with American Standard for Nursery Stock standards.

Plants shall be freshly dug and nursery grown. Nursery-grown plants shall have been transplanted or root pruned at least once in the past three (3) years. No plants showing evidence of damaged root balls will be accepted.

No plants shall be delivered to the project site, except for required samples, until inspection has been made in the field or at the nursery, or unless specifically authorized in writing by the Engineer. Inspection of plants to be balled and burlapped or otherwise transported must be made and plants must be approved before they are planted. Inspection shall be for quality, size and variety only, and shall not in any way impair the right of rejection for failure to meet other requirements during progress of the work.

All new trees must have straight trunks with a single leader intact, unless multi-stem are specified.
Bark shall be free of abrasions, and all cuts shall be completely callused over.

Trees will not be accepted which have had their branches shortened, leaders cut or which have leaders damaged so that cutting is necessary.

Dig ball and burlap (B&B) plants with firm, natural balls of earth, of diameter not less than that recommended in the “Tree and Shrub Transplanting Manual”, and of sufficient depth to include the fibrous and feeding roots. Plants moved with a ball will not be accepted if the ball is dry, cracked or broken before or during planting operations.

Unless otherwise specified, major deciduous trees shall be free of branches up to four (4) feet from top of ball or to half their height, up to eight (8) feet whichever is greater, well-branched, and with reasonably straight stems.

Plants shall conform to measurements specified in the plant lists, except that plants larger than specified may be used if approved by the Engineer. Use of such plants shall not increase the contract price. If larger plants are approved, the root ball shall be increased in proportion to the size of the plant.

1.2.2. BACKFILL

Back fill planting mix shall contain the following specified percentages of constituents:

A. 80% Native Soil (incorporate fertilizer/lime)
B. 20% Approved Soil Conditioner

Loose mulch or hydraulic mulch will be placed as specified in the plans. Mulch shall be non-dyed, double ground hardwood mulch with sample provided for approval. All mulch should all be free of lumps, roots, large sticks and other extraneous matter.

1.2.3. SPECIES SUBSTITUTIONS

The species or varieties, materials, products or sizes specified herein by common name shall be provided as specified. Substitutions will be permitted only upon written application by the Contractor to the County and when approved in writing. Request for permission to substitute will not be entertained, unless adequate evidence substantiating the non-availability of the specified time accompanies the request for substitution.

If proof is submitted, and substantiated in writing, that any plant specified is not obtainable, a proposal will be considered for use of the nearest available size or similar variety with a corresponding adjustment of the Contract price.
EXECUTION

2.1. PLANTING SEASON

Planting of large trees and shrubs shall be done between October 15 and April 15. If special conditions exist which may warrant a variance in the above planting dates, a written request shall be submitted to the Engineer stating the special conditions and the proposed variance. Permission for the variance will be given, if warranted in the opinion of the Engineer.

2.2. SHIPMENT AND DELIVERY

Promptly notify the Engineer, in advance, when the plant material is to be delivered and the manner of shipment. Furnish an itemized list of the actual quantity and sizes. Deliver the necessary inspection certificates to accompany each plant or shipment prior to acceptance and planting.

When shipment is made by truck, pack all plant material to provide adequate protection against climate and breakage during transit, and tie to prevent whipping. Cover the tops with tarpaulin to minimize wind whipping and drying, or spray adequately with anti-transparent.

When shipment is made by rail, pack boxcars carefully, and adequately ventilate in accordance with plant requirements to prevent sweating of plants during transit.

Exercise care at all times during handling operations to prevent damage to bark, branches, and root system. Employ a suitable method of handling to ensure the careful, workmanlike delivery of heavy balled plants to preclude cracked plant balls. No balled plant shall be planted if the ball is cracked or broken either before or during the planting operation. All balls over 36" diameter are to be platformed.

2.3. PLANT LOCATION

Plan locations for plants and outlines for areas to be planted shall be located and marked on the ground by the Contractor for approval by the Engineer, prior to digging plant holes or beds.

Where so directed by the Engineer, the Contractor shall install identification stakes to designate individual plants in major planting areas. Such stakes will be color coded in sizes as follows and shall be installed by the Contractor to supplement plant location markers. Wire flags will be acceptable when not interfering with utility staking.

Stakes will not be required for all plants required by the Contract, but shall be used on portions of the project, until plant locations in these portions are approved by the Engineer. Following the Engineer approval, the stakes shall be moved to other portions of the project as directed by the Engineer, and this sequence shall continue until all plant locations have been approved.

Unforeseen conditions may make it necessary to make minor adjustments in plant locations, due to utility lines, rock, drainage, etc.; and such adjustments will be permitted, subject to approval of the Engineer.
2.4. EXCAVATION

Each tree pit outside of planting bed shall be two (2) feet wider than the spread of roots or ball of earth. Dig tree pits deep enough to allow for six (6) inches of compacted topsoil in the bottom. Prepare all planting pits with straight sides. Shape the pit bottom with the center slightly raised for proper drainage.

2.5. BACKFILLING

When partially backfilled and compacted, cut the ball ties and remove the burlap from the top and side of the ball, and cut or adjust to prevent the formation of air pockets. No burlap shall be pulled from under the balls.

Backfill one half (2) of remaining hole with planting mixture herein before specified, and water thoroughly. Backfill rest of hole with planting mixture. Firm down, eliminating all air pockets. Do not pack. Build a four (4) inch high berm around the edge of the root ball to form a basin for holding water. The bottom of the basin shall be at surrounding finish grade.

2.6. WATERING

Thoroughly water all plants immediately after planting. This shall mean full and thorough saturation of all backfill in the pits during the same day of planting. Apply water only by open-end hose at a very low pressure to avoid air pockets and injury to the roots. When planted, watered, and fully settled, the plants shall be vertical and the top of the root ball shall not be below the existing grade.

Fill basin with water, being careful not to break down berm with hose stream or to gouge out holes in the backfill.

2.7. PRUNING

All pruning will be done in accordance with accepted National Arborist Association Standards. Prune only after initial inspection and approval by Engineer. Prune in a manner to preserve natural character of plant and in manner appropriate to its particular requirement in the landscape design. In general, prune all dead, broken, weak, damaged, rubbing, or crossing branches back to main supporting branch or trunk at time of planting. Do not shorten branches or cut any leaders.

Pruning of evergreen plants shall be limited to that required for correcting irregularities. Remove soft wood or sucker growth and broken or badly bruised branches. Prune with sharp tools; make cuts flush and clean.

2.8. MULCHING APPLICATION

Within two (2) days after planting, mulch all planting areas (individual tree pits, entire shrub and ground cover beds) with a four (4) inch layer of mulching material in compliance with the Seeding Specification.
2.9. MAINTENANCE

The Contractor is immediately responsible for all maintenance of all plants and facilities until the deemed **substantially complete**. This includes all necessary watering, one spring and one fall application of appropriate fertilizer and any necessary pruning and weed control. Watering of woody plant material will be the responsibility of the Contractor until deemed **substantially complete**.

2.10. GUARANTEE AND REPLACEMENT

All plants (trees, shrubs, ground cover) shall be fully guaranteed for a period of one (1) year from date of interim acceptance. If any plants become damaged or injured, they shall be treated or replaced as directed by the Engineer at no additional cost to the Owner. Replacements will be made by the Contractor.

All dead or unhealthy plants are to be promptly removed from the project by the Contractor; and, if this occurs during planting season (November to April), these plants shall be the same kind and size as specified in the plant list. Plants having sizable die back beyond the normal pruning limit, as determined by the Engineer, shall also be replaced. When plant replacements are made, plants, plant soil mix, fertilizer and mulch, etc., shall be replaced as originally specified.

2.11. FINAL INSPECTION (ACCEPTANCE)

At the end of the one (1) year guarantee period, and upon written notice submitted by the Contractor at least ten (10) days before the anticipated date, an inspection will be made by the Engineer and the Contractor.

As required under this Contract, any plant that is dead or not in satisfactory growth, as determined by the Engineer, shall be removed from the site. These and any plants missing shall be replaced as soon as conditions permit, but during the normal planting season.

3. MEASUREMENT AND PAYMENT

The quantity of the pay item Tree and Shrub Planting is each (EA) for each tree or shrub up to 50 shrubs, 10 large trees, and 15 small trees. Payment for Tree and Shrub Planting, unless otherwise indicated, is full compensation for completing the work as specified or directed and includes tree removal, filling and stabilizing the resulting voids, and seeding of the disturbed areas, and removal of tree and root debris. This is to include all materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, Specifications, and other terms of the Contract.

END OF SECTION
SPECIFICATION
PARKING LOT REPAIR

1. GENERAL

DESCRIPTION

This work consists of repairing any damage caused to the parking lot of the Lofts at Mills Mill apartment building during use of the parking lot for access to the project site. Parking lot asphalt shall be milled and replaced to the same thickness as existing conditions.

2. MATERIALS

Type S Asphalt Concrete (Type S-1 or S-3) is required. The equivalent fine Type SP (Superpave) Asphalt Concrete mixture (Traffic Level C) meeting the requirements of SCDOT Specification Section 334 may be selected as an alternate at no additional cost to the Town. The equivalent mixes are as follows:
- Type S-1: Type SP-12.5
- Type S-3: Type SP-9.5

Asphalt plant and equipment shall meet the requirements in SCDOT Specification Section 320.

2.1. AGGREGATE

Coarse Aggregate, Stone, Slag, or Crushed Gravel shall meet the requirements in SCDOT Specification Section 901.

Fine Aggregate shall meet the requirements in SCDOT Specification Section 902.

Aggregate gradation shall meet the following:

<table>
<thead>
<tr>
<th>Type</th>
<th>Total Aggregate Passing Sieves1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3/4-inch [19.0 mm]</td>
</tr>
<tr>
<td>S-1²</td>
<td>100</td>
</tr>
<tr>
<td>S-3²</td>
<td>100</td>
</tr>
<tr>
<td>ABC-1</td>
<td>100</td>
</tr>
<tr>
<td>ABC-2</td>
<td>100</td>
</tr>
<tr>
<td>ABC-3²</td>
<td>70-100</td>
</tr>
<tr>
<td>FC-2³</td>
<td>100</td>
</tr>
<tr>
<td>FC-3³</td>
<td>100</td>
</tr>
</tbody>
</table>

1. In inches [mm] or sieves [μm].
2. 100% passing 1-1/2-inch [37.5 mm] sieve.
3. The Town may increase the design range for the No. 10 [200 mm] sieve for lightweight aggregates.
4. The Town may retain up to 1% on the maximum sieve size.
Use clean aggregate containing no deleterious substances. Do not use coarse or fine aggregate which contains more than 0.5% of phosphate. In laboratory tests, and for the purpose of proportioning the paving mixture, consider all material passing the No. 10 [2.00-mm] sieve and retained on the No. 200 [75 μm] sieve as fine aggregate, and the material passing the No. 200 [75 μm] sieve as mineral filler. Do not use any screenings in the combination of aggregates containing more than 15% of material passing the No. 200 [75 μm] sieve. When two screenings are blended to produce the screening component of the aggregate, one of such screenings may contain up to 18% of material passing the No. 200 [75 μm] sieve, as long as the combination of the two does not contain over 15% material passing the No. 200 [75 μm] sieve. Screenings may be washed to meet these requirements.

2.2. ASPHALT CEMENT

Superpave PG Asphalt Binder or Recycling Agent shall meet the requirements in SCDOT Specification Section 916.

Mineral Filler shall meet the requirements in SCDOT Specification Section 917.

Marshall design mix shall be in accordance with the following:

<table>
<thead>
<tr>
<th>Mix Type</th>
<th>Minimum Marshall Stability (lbs.)</th>
<th>Flow* (0.01 in)</th>
<th>Minimum VMA (%)</th>
<th>Air Voids (%)</th>
<th>Minimum Effective Asphalt Content (%)</th>
<th>VFA Voids Filled with Asphalt (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>S-1</td>
<td>1,500</td>
<td>8-13</td>
<td>14.5</td>
<td>4-5</td>
<td>**</td>
<td>65-75</td>
</tr>
<tr>
<td>S-3</td>
<td>1,500</td>
<td>8-13</td>
<td>15.5</td>
<td>4-6</td>
<td>**</td>
<td>65-75</td>
</tr>
<tr>
<td>ABC-1</td>
<td>500</td>
<td>7-15</td>
<td>15</td>
<td>5-16</td>
<td>6.0</td>
<td>-</td>
</tr>
<tr>
<td>ABC-2</td>
<td>750</td>
<td>7-15</td>
<td>15</td>
<td>5-14</td>
<td>5.5</td>
<td>-</td>
</tr>
<tr>
<td>ABC-3</td>
<td>1,000</td>
<td>8-13</td>
<td>14</td>
<td>4-7</td>
<td>**</td>
<td>65-78</td>
</tr>
<tr>
<td>FC-2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>**</td>
<td>-</td>
</tr>
<tr>
<td>FC-3</td>
<td>1,500</td>
<td>8-13</td>
<td>15.5</td>
<td>4-6</td>
<td>**</td>
<td>65-75</td>
</tr>
</tbody>
</table>

* The maximum Flow value during production shall not exceed one point more than shown in the Table.

** The ratio of the percentage by weight of total aggregate passing the No. 200 sieve to the effective asphalt content expressed as a percentage by weight of total mix shall be in the range of 0.6 to 1.2.

2.3. BITUMINOUS MIXTURE

Use a bituminous mixture composed of a combination of aggregate (coarse, fine or mixtures thereof), mineral filler, if required, and bituminous material. Ensure that no more than 20% by weight of the total aggregate used is silica sand or local materials as defined in SCDOT Specification Section 902. Size, grade, and combine the several aggregate fractions in such proportions that the resulting mixture meets the grading and physical properties of the verified mix design.
3. EXECUTION

Areas of the parking lot to be repaired will be defined by the County or County’s representative at the completion of the project. Damaged areas shall be cut straight, clean and square with a power saw or other tools and equipment suitable for the work. Pavement shall be replaced to the depth, lines, and grades of the existing pavement. All work shall comply with the City of Greenville Design and Specifications Manual, Chapter 7, or the SCDOT’s 2007 Standard Specifications for Highway Construction for any items not included in the City of Greenville’s Manual.

4. MEASUREMENT AND PAYMENT

The pay item for Clearing and Grubbing work will be as a lump sum (LS). Price and payment shall be full compensation for all labor, materials, equipment, tools, transportation and supplies required to complete the work in accordance with the Plans, Specifications, and other terms of the Contract. Payment is 100% upon approval of acceptable application meeting the requirements of this Specification. The payment includes all direct and indirect costs and expenses necessary to complete the work.

END OF SECTION
NOTE: ALL CROSS-SECTION VIEWS DEPICTED LOOKING DOWNSTREAM.
**SOIL LIFT (BIO-BLOCK COR BLOCK SYSTEM) INSTALLATION**

1. **BEFORE INSTALLATION**: Clean and grade base of streambank, strengthening the toe and foundation using rocks if necessary. Place unit on level surface, keeping female end towards direction of extending, and spread the bottom fabric. Anchor down bottom fabric and fill with soil to height of unit.

2. **COVER THE FULL MATERIAL, IN TOP FABRIC AND ANCHOR IT.**

3A. **IF WATER TABLE IS CLOSE TO TOP OF FIRST LAYER**: Plant native hydrophytic plants on and around BIOD-BLOCK. Repeat earlier procedure and install another layer of BIOD-BLOCK.

3B. **IF WATER TABLE IS BELOW FIRST LAYER**: Plant woody plant cuttings on the BIOD-BLOCK. Repeat earlier procedure and install another layer of BIOD-BLOCK.

**NOTES:**
1. Fabric extending beyond BID-BLOCK at female end provides structural support for inserted male end.
2. Installation to be completed in accordance with manufacturers' specifications.
3. Do not scale drawings.
4. Installation to be completed in accordance with manufacturers' specifications.
5. Information contained herein was current at the time of development but must be reviewed and approved by the product manufacturer to be considered accurate.
6. Contractor's note: For product and company information visit www.CADdetails.com/info and enter reference number 084-009.
LANDSCAPE NOTES
1. All landscape areas are to receive a minimum of 4" of topsoil.
2. All plants utilized shall be native, dormant, and free of pests and diseases.
3. All plants shall be planted in a manner ensuring that the plant bed will be protected from leaf litter and debris.
4. All plants shall have a minimum grade and soil mix, and their installation requirements followed.
5. All plant material shall be under a 30-day warranty upon acceptance.
6. The Contractor is responsible for permanent seeding all harvested areas.
7. Permanent seeding and weed control are the responsibility of the Contractor.
8. Illustrations for the executed grades shall be utilized upon written approval by the Contractor at the time of bid stages.
9. All plants will be subject to approval by the County. The County shall be provided with all tax and other permits and a list of all plant species.