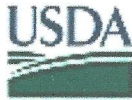


# FINAL PROJECT PLANS & SPECIFICATIONS

INCLUDING  
USDA/NRCS EWP BID SCHEDULE AND SPECIFICATIONS

Prepared For :



United States  
Department of  
Agriculture

Natural Resources Conservation Service

EMERGENCY WATERSHED PROTECTION PROGRAM  
EWP EVENT NO. 5038  
DSR 37-03-18-5038-377

EMERGENCY REPAIR/HAZARDOUS DEBRIS REMOVAL/GRADE STABILIZATION  
FOR  
229 & 247 LONGLEAF DRIVE  
PAMLICO COUNTY, NC

JULY 28, 2021

NATURAL RESOURCES CONSERVATION SERVICE  
OF THE  
U.S. DEPARTMENT OF AGRICULTURE  
AND  
PAMLICO COUNTY, NC

Prepared By:

Ardurra/RMA



ARDURRA

CONSTRUCTION SPECIFICATIONS PREPARED AND SEALED BY:



*J. Michael Healy*  
Ardurra Project Engineer

*7/28/21*  
Date

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\*Note: The Table of Contents contains only major task headings from within the Plans & Specifications; some sub-categories of specifications and details were not included in the above Table of Contents to conserve space. See each Construction Specification heading found in the plans & specifications for complete task details.

**BID SCHEDULE**  
**PAMLICO COUNTY EMERGENCY WATERSHED PROTECTION PROGRAM**

<b>BID SCHEDULE</b>						
HAZARDOUS DEBRIS REMOVAL/GRADE STABILIZATION 2 SITES NRCS EWP Program-Event 5038 Pamlico County, NC 2021 Construction Period						
<b>DSR No. 37-03-18-5038-377</b>						
<b>Pamlico County:</b>						
<b>Sites; 229 &amp; 247 Longleaf Drive, New Bern, NC 28560</b>						
Item		Spec			Unit	
No.	Description of Work	No.	Quantity	Unit	Price	Extended Amount
1	Mobilization/Demobilization	8	1	DSR		
2	Clearing & Grubbing	2	62	TONS		
3	Earthfill	23	140	CYS		
4	Seeding/Mulching/Groundcover	6	1000	SF		
5	Class B Rip Rap	N/A	225	Tons		
<b>TOTAL=</b>						

**Index of Specifications**

Number	Specifications	Bid Item
2	Clearing & Grubbing	2
5	Pollution Control	Sub
6	Seeding/Mulching/Groundcover	4
7	Construction Surveys	Sub
8	Mobilization and Demobilization	1
23	Earthfill	3
94	Contractor Quality Control	Sub
95	Geotextile	Sub
NS	Health & Safety/OSHA	Sub

**USDA/NRCS Emergency Watershed Protection Program**  
**Contract: 37-03-18-5038-001**  
**EWP Event: 5038**



Scope:  
**Plans & Specifications for  
Emergency Watershed Protection-  
Emergency Repairs/Hazardous Debris Removal/Grade Stabilization  
For  
229 & 247 Longleaf Drive, New Bern, NC 28560**

**Pamlico County, North Carolina**

Prepared For:  
**Natural Resources and Conservation Service  
of the  
U.S. Department of Agriculture  
And  
Pamlico County, NC  
Soil & Water Conservation Board**

Prepared By:  
**Recovery Management Associates, LLC/Ardurra of NC**



**And  
Vaughn & Melton Consulting Engineers, Inc.**

**Project Introduction**

The United States Department of Agriculture (USDA)-Natural Resources Conservation Service (NRCS) Emergency Watershed Protection (EWP) program provides recovery assistance for undertaking emergency measures including repair, rehabilitation, and temporary slope stabilization of eligible sites. Eligible recovery measures include practices that conform to all applicable statutes, regulations, and Executive Orders. The EWP Program helps project sponsors implement emergency recovery measures to relieve imminent hazard to life or property created by a natural disaster or man-made disaster. Such hazards often cause sudden impairment of a watershed. EWP technical and financial assistance may be available to sponsors when:

- 1.The President declares an emergency under the Robert T. Stafford Disaster Relief and Emergency Assistance Act.
- 2.The Secretary of Agriculture declares a drought emergency.
3. An appropriation of funding via other Federal or State Programs.

Recovery from flooding and watershed disaster events can potentially be addressed by other federal programs administered by the Federal Emergency Management Agency (FEMA) Public Assistance (PA) grant program. The Sponsors for the EWP Program administering this contract include Pamlico County, USDA, and the NRCS. The term “Sponsor” will be used throughout this document and refers to Pamlico County, NC-Department of Planning who is the sponsor/recipient and administrator of the USDA/NRCS EWP grant. The Sponsor gives notice that this USDA/NRCS EWP contract does not duplicate funding received from the FEMA Public Assistance (PA) Grant reimbursement program used to perform other unrelated repairs and recovery actions to County infrastructure.

Two individual property sites have been identified for emergency repairs under this EWP contract. The extent of the damages to these sites are described in NRCS Disaster Survey Reports (DSRs). Proposed emergency work will be administered under funding provided via USDA/NRCS Contract 37-03-18-5038-377. The two project site have been combined into a single project site located in southwest Pamlico County, North Carolina. The project location is due south of the community of Readsboro and runs perpendicular to Longleaf Drive between the properties located at 229 Longleaf Drive and 247 Longleaf Drive. The project scope generally consists of stabilization of a manmade drainage ditch that runs between the two sites at Longleaf Drive. This ditch eventually discharges into a low-lying area that discharges into un-named tributary of Upper Broad Creek. Persistent rainfall caused significant erosion due to high velocity of runoff and wind driven rain generated during Hurricane Florence. Combined with the high easterly to northeasterly winds, creeks and drainage structures along the northern shore of the Neuse River were inundated to elevations approaching 10 feet by water pushed from the Neuse River only to have all the water backed up by the wind and rain to rush from the creeks and drainage structures once Hurricane Florence wind changed direction. The resulting damages included extensive stream bank erosion and drainage structure degradation.

Detailed field investigations were conducted by NRCS, in conjunction with the Pamlico County Soil & Water personnel which identified damaged drainage structures and adjacent residential properties resulting from Hurricane Florence. NRCS engineers and inspectors used a standardized damage reporting system to capture and document storm related damages to property parcels. Disaster Survey Reports for each site to quantify and prioritize impacts to the sites. Damages for emergency repairs to qualifying sites will be funded under the Robert T. Stafford Disaster Relief and Emergency Assistance Act administered by the USDA/NRCS EWP program. The work scope contained in the following Plans & Specifications, prepared by Ardurra of NC/Recovery Management Associates (Ardurra/RMA), and Vaughn & Melton consulting Engineers, Inc. address the proposed emergency repair measures planned for the damaged sites. The table below list each site, DSR No., Owner/Address and location:

**Location of EWP Project Site  
Emergency Watershed Protection Program  
Pamlico County, NC**

<b>DSR No.</b>	<b>Owner/Address</b>	<b>Latitude/Longitude</b>
No. 37-03-18-5038-377	229 Longleaf Drive, New Bern, NC 28560	35.1211 N -76.9160 W
No. 37-03-18-5038-377	247 Longleaf Drive, New Bern, NC 28560	35.1213 N -76.9162 W

**Contract Objective**

The objective of performing this work is to provide “emergency repairs” to storm damaged streambank slopes at designated properties located in Pamlico County, NC. The design for the emergency repair work specifies using suitable earthfill material to backfill scoured and eroded ditch bank areas as specified in this Plan & Specification set. Suitable earthfill material will be compacted in-place and shaped to a finished grade as shown on the plans. The finished slope will be provided with a non-woven geotextile covered with a minimum of 12 inch Class B Rip Rap. A woven jute mat erosion control blanket and the specified seeding mix and soil amendments will be required on all disturbed areas to establishing a vegetative groundcover. The emergency repairs specified in these plans are designed to provide a solution for grade stabilizing of the eroded ditch bank and to prevent future erosion. Emergency measures identified in these plans are in no way designed as a guaranteed remedy to cease erosion, degradation, or damages that may be caused by future catastrophic events.

Project sites addressed in this contract are denoted by a DSR numeric identification number, as shown in the above table. There is one DSR (No. 37-03-18-5038-377) with a total of 2 sites as shown in the above table.

Several reference sources of construction specifications were used for guidance in the preparation of these Plans & Specifications, however, Title 210, USDA/NRCS National Engineering Manual, Part 642, *Specifications for Construction Contracts*, Rev January 2009 was the primary source. This document was relied upon to address the work scopes anticipated for performing the emergency stabilization repair work to the 2 properties shown in the above table. Below are the construction specifications and details for repair of EWP project site, DSR No. 37-03-18-5038-377:

**Construction Specification 2—Clearing and Grubbing**

**1. Scope**

The work consists of clearing and grubbing and disposal of vegetation including trees, snags, logs, limbs, driftwood, brush, stumps, shrubs, rubbish and storm debris. “Storm debris” is defined as wooden pieces/remnants of failed or damaged building components, or boards that should be removed from the EWP project site. Removal, relocation, or disposal of existing rip-rap is not covered in this construction specification. Areas designated to be cleared and grubbed will be any area shown on the plans that require placement of rip rap and erosion control blanket, identified by the Sponsor in the plans and specifications or delineated in the field during a site-walk with the contractor present. This scope also includes light clearing and removal of limbs, branches, and brush that may be needed for gaining clear ingress/egress to

the EWP site. The costs for this should be included in Bid Item No. 2.

## **2. Protection of Existing Vegetation**

Trees, established landscaping, and other vegetation designated to remain undisturbed shall be protected from damage throughout the duration of the construction period. Any damages resulting from the contractor's operations or neglect shall be repaired by the contractor to like-kind conditions.

Earthfill, stockpiling of materials, vehicular parking, and excessive foot or vehicular traffic shall not be allowed within the drip line of vegetation designated to remain in place. Vegetation damaged by any of these, or similar actions shall be replaced with viable vegetation of the same species, similar condition, and like size unless otherwise approved by the Sponsor.

Any cuts, skins, scrapes, or bruises to the bark of the vegetation shall be carefully trimmed according to local arborist/nursery accepted practice procedures and methods used to seal damaged bark.

Any limbs or branches 0.5 inches or larger in diameter that are broken, severed, or otherwise seriously damaged during construction shall be cut off at the base of the damaged limb or branch flush with the adjacent limb or tree trunk. All roots 1.0 inch or larger in diameter that are cut, broken, or otherwise severed during construction operations shall have the end smoothly cut perpendicular to the root. Roots exposed during excavation or other operations shall be covered with moist earth or backfilled as soon as possible to prevent the roots from drying out.

## **3. Marking**

The limits of all areas proposed for clearing and grubbing will be marked by the contractor using stakes, high visibility flagging, tree paint, obvious markings, or by other suitable methods. Trees to be left standing and uninjured will be designated by special markings placed on the trunk approximately 6 feet above the ground surface. The Sponsor will assist the contractor in making field determinations at each site to define the limits for clearing and grubbing.

## **4. Clearing and Grubbing**

All trees not marked for preservation and all snags, logs, brush, stumps, shrubs, rubbish, and similar materials shall be cleared from within the limits of the designated active work zone. Unless otherwise specified, all stumps, roots, and root clusters that have a diameter of 1 inch or larger shall be grubbed out to a depth of at least 2 feet below subgrade for construction of concrete structures, and 1 foot below the ground surface when constructing embankment sites, earthfill sections, dams, earthfill cuts, and other areas designated by the Sponsor. The Sponsor will assist the contractor in making field determinations at each site to define the limits for clearing and grubbing. Light clearing and removal of limbs, branches, and brush that may be needed for gaining clear ingress/egress is included in this work scope and should be included Bid Item No. 2.

## **5. Disposal**

All vegetative materials cleared and grubbed from the designated areas located on the EWP sites shall be disposed of at an approved landfill location permitted by the North Carolina Division of Waste Management. Permitted disposal locations are referenced in the project specifications in Section 7 below, of the Plans & Specifications. The contractor is responsible for complying with all state and local rules and regulations regarding removal and disposition of vegetative and storm debris. The contractor shall be responsible for payment of tipping fees or any other fees that may result from disposal of wastes at approved permitted landfill facilities. Approved disposal facilities are identified in Section 7, Work Scope and Construction Details, shown below.



## 6. Measurement and Payment

For payment of items of work covered in this scope, the contractor shall be paid on a per ton basis. Payment based on a per ton basis shall include full compensation for all labor, equipment, tools, landfill, tipping fees, surcharges, fuel, supplies, transportation, rentals, and all other items necessary and/or incidental to the completion of the work for this task. Certified and dated, time-stamped weigh tickets from CRSWMA will be the instrument used for determining the amount (per ton) of waste/debris removed from clearing and grubbing operations and debris removal/disposal.

## 7. Work Scope and Construction Details

The following Scope of Work includes items of work to be performed in conformance with these specifications and the construction details. These include but are not limited to the following:

- a. Bid Item #2: Clearing and Grubbing (including access ways to the site)
  - (1) Section 1: This item shall consist of site preparation work consisting of clearing and light grubbing of vegetation located on the earthfill footprint, adjacent locations shown on the drawings or otherwise conveyed to the contractor by the Sponsor, and ingress/egress to the site. Stripping or Clearing and Grubbing shall not be performed until any such area is needed for access or placement of earthfill in the construction operations. Areas proposed for clearing and grubbing shall be marked by the contractor using high visibility paint or flagging and approved by the Sponsor before clearing operations commence.
  - (2) Section 5: Woody brush, limbs, trees, storm debris and other storm debris shall be removed from the site and disposed of at a NCDSWM permitted disposal site. Grass and earth shall be stockpiled in areas designated by the Sponsor's site representative and may be re-used for spreading over designated areas of the site when construction activities cease.
  - (3) Section 6: Measurement and payment for this item will be weight based and paid by the ton inclusive of all labor, materials, equipment, transportation and disposal costs. All debris must be delivered to the County designated permitted landfill disposal site (see Note (4) below). The Contractor is responsible for any and all tipping and disposal fees, waste characterization fees, waste profile fees, or other fees charged by the disposal facility receiving the vegetative waste.
  - (4) Section 5 and 7: All wastes and debris removed from each EWP site resulting from clearing and grubbing or other purposes, must be disposed of at the following designated permitted facility:

Coastal Regional Solid Waste Management Authority (CRSWMA)  
7400 Old Hwy 70 West  
New Bern, NC 28562  
Phone: 252-633-1564

All waste disposed at this facility by the contractor shall be documented and quantified by certified weigh tickets/manifest issued by the facility and shall show: the facility name, time, truck ID, load details, and tare weight of waste. Payment for waste disposal will be based on the weight of waste material (tons) determined by CRSWMA weigh scales. Time/date stamped

weigh tickets issued by CRSWMA will be used to verify the weight of waste material generated by the work scope defined in Construction Specification 2—Clearing & Grubbing.

If the contractor would like to request consideration of an alternative debris disposal site, such request must be submitted to the Sponsor for approval in writing at least 10 days **prior** to the proposed delivery date to any other waste disposal facilities other than CRSWMA. Debris disposed at any unapproved alternative site or location will result in non-payment for this work scope and will result in the contractor being required to remove all material from the unapproved site and transferring that material to the approved CRSWMA site. Any corrective measures will be performed at the contractor's expense.

- (5) Section 7: Method of Payment will be made in accordance with Method 5 for all vegetative wastes and debris.

## Construction Specification 5—Pollution Control (Sedimentation and Other)

### 1. Scope

The work performed under this specification consists of installing measures and performing work in such a manner that controls and contains erosion and sedimentation from occurring onto adjacent sites or waters. Sedimentation and any other pollutants generated during the repair operations must be contained onsite at all times, and prevented from entering adjacent waters, lands, or properties.

Pollutants covered under this specification includes the following:

- (1) Sedimentation
- (2) Chemical
- (3) Air

For reduction, minimization, and elimination of sedimentation pollutants from occurring, there are a number of USDA Bio-Preferred products recommended for use. The following USDA Bio-Preferred product categories are applicable to this specification: (1) Mulch and compost materials, (2) Erosion control materials/mechanical barriers, (3) Fertilizers, (4) Dust suppressants, and (5) Agricultural spray adjuvants.

### 2. Materials

Silt fence shall be the primary form of sedimentation pollution control and shall conform to the requirements of Construction Material Specification 592-Geotextile. Silt fence shall also meet the requirements of the material specifications listed in Sediment Filters (Silt Fence) shown below, All sedimentation and erosion control measures must be of sufficient size, length, and type to meet site runoff generated by a 10-year/24 hr. peak storm event. Synthetic filter fabric should contain ultraviolet inhibitors and be durable enough to restrain decay/breakdown for at least 6 months. Additional details for silt fences are provided in the below sections.

### 3. Erosion and Sediment Control Measures and Works

Erosion and sediment control measures and works shall include, but are not limited to, the following:

***Staging of Earthwork Activities***—Excavation and moving of soil materials shall be scheduled to minimize the size of areas disturbed and unprotected from erosion for the shortest reasonable time.

***Seeding***—Seeding to protect disturbed areas shall occur as soon as reasonably possible following completion of that earthwork activity and in no case greater than 10 days of Final grading of any area.

***Mulching***—Mulching to provide temporary protection of the soil surface and seed from eroding shall be used in conjunction with establishing a Final groundcover sufficient to restrain accelerated erosion. Mulch shall be applied at a rate that provides a minimum of 85-100 % coverage to all denuded or graded slopes or areas.

***Diversions***—Diversions and swales shall be used to re-route water from work areas and on slopes in the work area to reduce erosion and increase the probability for germination and establishment of seed. These measures are temporary in nature and shall be removed; these areas shall be restored to their original condition when the diversions are no longer required or when a permanent groundcover is established.

***Stream Crossings***—Culverts or bridges where equipment cross streams must be necessary. These are temporary in nature and shall be removed, and the area restored to its near original condition, when the crossings are no longer required or when permanent erosion control measures are installed. No sediment or

earthfill may be placed or allowed to enter any stream or channel. The contractor must obtain permits and/or authorization from the US Army Corps of Engineers prior to performing any stream crossing, placing any culvert, or constructing any bridge during the construction of any EWP project.

***Sediment Basins***—Sediment basins collect, settle, and eliminate sediment from eroding areas from impacting properties and streams below the construction site(s). These basins are temporary and shall be removed and the area restored to its original condition when they are no longer required or when permanent measures are installed.

***Sediment Filters (Silt Fences)***—Geotextile silt fences shall be properly installed along the perimeter of the active Construction Limits prior to commencing grading activities on any site. The silt fence geotextile material shall comply with the requirements of ASTM D 6461. The silt fence will prohibit sediment from migrating off site to sensitive adjacent environmental areas including surface waters, wetlands, marshes, waterways, or adjacent properties. The silt fence shall be constructed to limit runoff and maintain all construction generated sediment or fill material onsite at all times. Silt fences shall be properly trenched into the ground and anchored to prevent erosion from occurring under or around the fence. Silt fences shall be installed and maintained in accordance with ASTM D6462 and the NC Division of Energy, Minerals, and Land Resources/Land Quality Section specifications and requirements for use and maintenance of sedimentation and erosion control measures cited in the NC Erosion and Sediment Control, Planning and Design Manual, May 2013 (see Section 6, Practice Standards and Specifications, *Sediment Traps and Barriers*, 6.62 *Sediment Fence (Silt Fence)*). Silt fences are temporary and shall be maintained at all times during the construction period. Silt fences may be removed when a permanent vegetative groundcover has been established on all grades areas and is sufficient to restrain erosion. The location of all proposed silt fencing for each EWP site must be illustrated in the Pollution Control Plan developed by the contractor for each EWP site.

***Temporary Slope Drains***—Temporary slope drains shall be used as deemed necessary by the contractor to aid in establishing a final permanent vegetative groundcover on the 2H:1V finished-grade slope. An erosion control blanket made of jute mat will also be utilized in establishing the permanent vegetative groundcover on all slopes and banks. Temporary slope drains shall be installed, operated, and maintained in accordance with the NC Erosion and Sediment Control, Planning and Design Manual, May 2013 (see Section 6, Practice Standards and Specifications, *Runoff Conveyance Measures*, 6.32 *Temporary Slope Drains*).

***Waterways***—Waterways include those installed for the diversion and safe disposal of runoff from graded areas, diversion channels, and other temporary structures or measures. These works are temporary and shall be removed and the area restored to its original condition when they are no longer required to restrain erosion or when a permanent groundcover has been established.

***Other***—Additional protection measures as specified in Section 8 of this specification or required by Federal, State, or local government.

#### **4. Chemical Pollution**

In addition to the contractor providing adequate measures to ensure that offsite sediment pollution does not occur, the contractor shall provide adequate containment, watertight tanks, barrels, liners, barriers, or sumps sealed with plastic sheeting and/or synthetic liners to collect and temporarily contain any chemical pollutants generated during the construction process. This includes containment and management of ANY hazardous or deleterious materials used onsite to ensure that such materials are prevented from entering onto the site or adjacent grounds, or adjacent watercourses during construction. This includes but is not limited to collecting and containing fuels for refueling equipment, drained/leaking lubricants, motor oils, degreasers, transmission fluids, brake fluids, grease/oils, surfactants/soaps, cleaning agents, fertilizers, concrete mixer wash-water, or asphalt or liquid-tack, or any other deleterious material produced as a by-product of any of the construction activities performed. Pollutants shall be disposed of in accordance with governing Local, State, and Federal regulations. At the completion of the construction work, tanks, barrels, and sumps shall be removed and the area restored to its original condition as specified in Section 8 of this specification. Sump removal shall be conducted without causing pollution. Any spill of any hazardous or deleterious material as a result of the contractor's operations must be reported immediately to the Sponsor or in no case later than 24 hours, or as required by State or Federal reporting requirements in North Carolina.

Sanitary facilities, such as chemical toilets, or septic tanks shall not be located near or next to live streams, water wells, or springs. They shall be located at a distance at least 150 ft. away from such area to prevent potential contamination of any water source. At the completion of construction activities, chemicals, fuels, wastewaters, etc. shall be properly disposed offsite without causing pollution or contamination as specified in Section 8 of this specification.

#### **5. Air Pollution**

The burning of brush, vegetation, slash, trees, limbs, stumps, wood, wood-waste or wood products, trash, debris, petroleum, or flammable chemicals of any kind shall not be performed onsite or offsite so as not to create air quality impacts during construction. Disposal of any other materials that create the potential for air quality degradation or pollution shall be performed in such a manner that adheres to all Local, State and Federal regulations.

Fire prevention measures and precautions shall be taken by the contractor to prevent the start, ignition, or spreading of wildfires that may result from project activities. Firebreaks or guards shall be constructed and maintained at locations shown on the drawings or otherwise deemed necessary by the Sponsor.

Errant dust and particulates shall be controlled by the contractor at all times during construction. Any public or private access or haul road used by the contractor during the project, shall be sprinkled or otherwise treated with water to fully suppress dust. Dust control methods and measures shall ensure the protection of air quality and safe construction operations at all times. If chemical dust suppressants are applied, the material shall be a commercially available product specifically designed for dust suppression and the application shall follow manufacturer's requirements and recommendations. A copy of the product data sheet and manufacturer's recommended application procedures shall be provided to by the Sponsor at least 5 working days before the first proposed application.

#### **6. Maintenance, Removal, and Restoration**

All pollution control measures and temporary works for sediments, chemicals, and airborne pollutants shall be adequately maintained in a functional condition for the duration of the construction period. All

temporary measures and materials used for these purposes shall be removed from the work site and materials storage areas, and the site restored to its original pre-existing condition prior to the contractor receiving payment of retainage addressed in Construction Specification 00.

## **7. Measurement and Payment**

**Method**—The following provision applies to measurement and payment of Construction Specification 5-Pollution Control. Compensation for any item of work described in the contract, but not listed in specifically in the bid schedule is included in the payment for the item of work to which it is made subsidiary. Payment for Construction Specification 5- Pollution Control will be made subsidiary to Construction Specification - 8 Mobilization and Demobilization. Such items, and the items to which they are made subsidiary, are identified in Section 8 of this specification.

## **8. Work Scope and Construction Details**

The following Scope of Work shall be performed in conformance with the specifications and construction details below:

- a. Subsidiary Item, Pollution Control
  - (1) Section 1: A written Pollution Control Plan is required and shall be prepared by the contractor and submitted to the Sponsor at least 10 days prior to commencement of work. The Contractor's written plan shall be approved by the Sponsor prior to the start of any construction activity. The written plan shall include the proposed measures for minimizing or preventing each of the above described pollution sources from adversely impacting the project or adjacent waters governed by the NC Division of Coastal Management, NC Division of Water Quality, or the US Army Corps of Engineers. Project sequencing should also be considered to minimize the duration and size of disturbed areas in order to prevent offsite sedimentation from occurring. The construction site shall be maintained in a clean and safe condition at all times during construction operations.
  - (2) Section 2: The sediment filter material (silt fence) used for erecting a barrier around the active Construction Limits shall meet the requirements of ASTM D6461. Solid hay bales shall only be used for temporary water diversion or impoundment, and not for sediment control. The Pollution Control Plan shall be prepared by the contractor to include a drawing illustrating the proposed active Construction Limits and the type, and location of all silt fence sections proposed for each EWP repair site. The details for installation and maintenance of the silt fence shall also be included in the Pollution Control Plan.
  - (3) Section 3: Sediment filters shall be installed according to the requirements in ASTM D6462. BEST MANAGEMENT PRACTICES FOR EROSION CONTROL: The finished grade of all disturbed areas not covered with armored ECB mat (jute) shall be protected from runoff by establishing a temporary vegetative groundcover. These areas should be provided with a 3.0 to 4.0 inch thick layer of topsoil and seeded, after excavation, grading, and associated slope repair operations are complete. Topsoil will be placed and spread over the entire disturbed areas to promote vegetative growth. The Pamlico Soil & Water District Conservationist will assist the Sponsor in developing the seeding specification for restoring vegetative groundcovers to each project site. The contractor will be

provided with these seeding specifications prior to construction commencement including temporary and permanent groundcovers. Existing vegetation located downstream of all construction activities will be maintained and utilized to the greatest extent practicable as buffer strips to prevent sediment transport. Sediment that accumulates on grass buffer strips will be removed and placed upgradient of silt fences constructed to delimit the Construction Limits, or Sponsor designated fill/waste areas. , Silt fences shall be maintained as soon as practicable after rainfall events, and in no case, greater than 24 hours from the time of rainfall occurrence.

- (4) Section 4: All chemical pollutants used or generated by the contractor, and other any other non-hazardous pollutants shall be disposed at an offsite at an approved permitted NCDSWM landfill, or other State, or EPA permitted disposal facility that is duly permitted to receive such wastes. Containment and management of chemical pollutants must be identified in the contractor's Pollution Control Plan.
- (5) Section 5: Air pollution, generation of dust and particulates, and burning of any type of combustible material shall not be permitted on the work site. Watering or dust fences shall be utilized to restrain and control dust from leaving the construction site and travel ways. Containment and management of dust or airborne pollutants must be identified in the contractor's Pollution Control Plan.
- (6) Section 7: Measurement and payment for this item will be made. All subsidiary to BID ITEM #1, MOBILIZATION AND DEMOBILIZATION

## Construction Specification 6—Seeding, Sprigging, and Mulching

### 1. Scope

The work consists of preparing the area for treatment; furnishing and placing seed, sprigs, mulch, fertilizer, inoculant, lime, and other soil amendments; and anchoring mulch in designated areas as specified.

The following USDA Bio Preferred product categories are applicable to this specification:

- Mulch and compost materials
- Erosion control materials
- Fertilizers
- Agricultural spray adjuvants

### 2. Material

**Seed**—All grass seed must conform to the current rules and regulations of the State of North Carolina Department of Agriculture and must be from the latest crop available. Seed must meet or exceed the standard for purity and germination listed in Section 7.

Seed must be labeled in accordance with NC State laws and U.S. Department of Agriculture rules and regulations under the Federal Seed Act in effect on the date of invitations for bids. Bag tag figures are evidence of purity and germination. No seed may be accepted with a test date of more than 9 months before the date of delivery to the site.

Seed that has become wet, moldy, or otherwise damaged in transit or storage will not be accepted. The percent of noxious weed seed allowable must be as defined in the current State laws relating to agricultural seeds. Each type of seed must be delivered in separate sealed containers and fully tagged unless an exception is granted in writing by the contracting officer.

**Fertilizer**—Unless otherwise specified, the fertilizer must be a commercial-grade fertilizer. It must meet the standard for grade and quality specified by State law. Where fertilizer is furnished from bulk storage, the contractor must furnish a supplier's certification of analysis and weight. When required by the contract, a representative sample of the fertilizer must be furnished to the contracting officer for chemical analysis.

**Inoculants**—The inoculant for treating legume seeds must be a pure culture of nitrogen-fixing bacteria prepared specifically for the species and must not be used later than the date indicated on the container or as otherwise specified. A mixing medium, as recommended by the manufacturer, must be used to bond the inoculant to the seed. Two times the amount of the inoculant recommended by the manufacturer must be used, except that four times the amount must be used when seed is applied using a hydraulic seeder. Seed must be sown within 24 hours of treatment and must not remain in the hydraulic seeder longer than 4 hours.

**Lime and other soil amendments**—Lime must consist of standard ground agriculture limestone, or approved equivalent. Standard ground agriculture limestone is defined as ground limestone meeting current requirements of the State department of agriculture. Other soil amendments must meet quality criteria and application requirements specified in Section 7.

**Mulch Tackifiers**—Asphalt emulsion tackifiers must conform to the requirements of ASTM D977, Specification for Emulsified Asphalt. The emulsified asphalt may be rapid setting, medium setting, or slow setting. Non-asphaltic tackifiers required because of environmental considerations must be in accordance with those specified in Section 7, if any are anticipated.



***Straw Mulch Material***—Straw mulch must consist of wheat, barley, oat or rye straw, hay, grass cut from native grasses, or other plants as specified in Section 7. The mulch material must be air-dry, reasonably light in color, and must not be musty, moldy, caked, or otherwise of low quality. The use of mulch that contains noxious weeds is not permitted. The contractor must provide a method satisfactory to the Sponsor for determining weight of mulch furnished.

***Other Mulch Materials***—Mulching materials, such as wood cellulose fiber mulch, mulch tackifiers, synthetic fiber mulch, netting, and mesh may be required for specialized locations and conditions. These materials, when specified, must be accompanied by the manufacturer's recommendations for methods of application.

### **3. Seeding Mixtures, Sod, Sprigs, and Dates of Planting**

The application rate per acre for seed mixtures, sprigs, or sod and date of seeding or planting must be in accordance with these plans or as specified in Section 7. The Sponsor reserves the right to change the seeding specifications identified in these plans based on current or local climatic conditions.

### **4. Seedbed Preparation and Treatment**

Areas to be treated must be dressed to a smooth, firm surface. On sites where equipment can operate on slopes safely, the seedbed must be adequately loosened (4 to 6 inches deep) and smoothed. Depending on soil and moisture conditions, disking or culti-packing, or both, may be necessary to properly prepare a seedbed. Where equipment cannot operate safely, the seedbed must be prepared by hand methods by scarifying to provide a roughened soil surface so that broadcast seed will remain in place.

If seeding is to be accomplished immediately following construction operations, seedbed preparation may not be required except on a compacted, polished, or freshly cut soil surface.

Rock fragments larger than 2.0- inches in diameter, trash, weeds, and other vegetative debris that will interfere with seeding or maintenance operations must be removed or disposed of as specified in Section 7.

Seedbed preparation must be discontinued when soil moisture conditions are not suitable for the preparation of a satisfactory seedbed as determined by the Sponsor or their local representative.

### **5. Seeding, Sprigging, Fertilization, Mulching, and Slope Stabilizing**

All seeding or sprigging operations must be performed in such a manner that enables application in the specified quantities to occur uniformly in areas designated for establishment of a vegetative groundcover. The method and rate of seed application must be performed as specified in Section 7. Unless otherwise specified, seeding or sprigging must be accomplished within 2 days after final grading of repaired slope is completed and approved by the Sponsor or its local representative.

Fertilizer, lime, and other soil amendments must be applied as specified in Section 7. Fertilizer and soil amendments must be thoroughly incorporated into the soil immediately following surface application.

For areas where mulch will be used, the rate, amount, and kind of mulching must be as specified in Section 7. Mulches must be applied uniformly to the designated areas and shall provide at least 85% coverage of the ground surface where applied. Mulch must be applied to areas seeded not later than 1 working day after seeding has been performed. Straw mulch material must be stabilized within 24 hours of application using a mulch crimper or an equivalent anchoring tool or by a suitable tackifier. When the mulch crimper or equivalent anchoring tool is used, it must have straight blades and be the type manufactured expressly for and capable of firmly punching the mulch into the soil. Where the equipment can be safely operated, it must

be operated on the contour. Hand methods must be used in areas where equipment cannot safely operate to perform the work required.

Tackifier must be applied uniformly over the mulch material at the specified rate, or it must be injected into the mulch material as it is being applied. Mesh, jute, or netting stabilizing materials must be applied smoothly but loosely on the designated areas. The edges of these materials must be buried or securely anchored using spikes or staples as specified in Section 7.

The contractor must maintain mesh, jute, or netting in all areas applied until all work under the contract has been completed and accepted by the Sponsor. Maintenance must consist of the repair of areas damaged by water erosion, rainfall, wind, fire, lack of proper seed germination, improper soil conditions, or other causes that prohibit a permanent groundcover to be established on all grades or cut/fill areas of the project site. Such areas must be repaired to reestablish the intended condition and to the design lines and grades required by the contract. The areas displaying inadequate germination or insufficient groundcover for any reason, must be re-limed, re-fertilized, re-seeded, and re-mulched as necessary to establish a groundcover before the application of a new mesh, jute, or netting is applied. Until a groundcover has been established and deemed sufficient to restrain erosion as determined by the Sponsor and the NC Division of Energy, Minerals, and Land Resources-Land Quality Section, the contractor will not be eligible to request payment for completion of this work scope.

### **5.1 Temporary Slope Protection/ Slope Stabilization**

Some project sites may experience periods of rainfall causing concentrated surface water flow from adjacent areas over the completed grade stabilized ditch bank. The contractor shall be responsible for providing temporary flexible slope drains, wattles, diversions, hay barriers, or other temporary measures necessary to control or divert flow, while establishing a permanent vegetative groundcover. The contractor shall identify sites that are anticipated to need the types of temporary erosion control measures such as those stated above. The contractor shall provide a written Temporary Slope Protection Plan to the Sponsor identifying the type, details, and locations of slope protection measures proposed. The Plan shall propose measures to control concentrated surface water flow and diverting runoff off earthfill slope faces. The Plan shall include the timing for installing the temporary slope protection measures and the anticipated maintenance for the slope protection measures. The costs for installing temporary erosion control measures should be incorporated into the contractor's bid within Items 1 through 5 and is not required to be delineated as an independent line item. These measures proposed for surface water flow control shall be in accordance with the NC Erosion and Sediment Control, Planning and Design Manual, May 2013, Temporary Slope Drains Practice No. 632.

### **6. Measurement and Payment**

**Method** —For items of work for which specific unit rate prices are established in the contract (cost/SF), each area treated is measured and adjusted as specified in Section 7, to the nearest 0.1 acre. Payment for treatment is made at the contract unit price for the designated treatment, which will constitute full compensation for completion of the work. Payment will be adjusted to actual area seeded and mulched rather than the quantity estimated in the Bid Item 4. Payment will be based on the contract unit rate specified x the square footage actually seeded/mulched and measured to the nearest 0.1 acre.

Jute, mesh, or netting is also measured to the nearest square foot of surface area covered and provided. Payment is made at the contract unit price and will constitute full compensation for completion of the work.

### **7. Scope of Work and Construction Details**

Items of work to be performed in conformance with this specification and the construction details are shown below:

Bid Item #4: Seeding, Sprigging, and Mulching

- (1) Section 1: Scope of work shall include seeding on all disturbed areas including site ingress and egress locations.
- (2) Section 2: Seed shall be common rye grass. Other mulch material shall be erosion control blanket (ECB) as specified in construction notes.
- (3) Section 3: Seeding type and rate shall be as specified by the Pamlico Soil & Water Conservationist or specified in the construction notes. Fertilizer and lime rates shall be based on recommendations of the Soil & Water Conservationist or by soil test results from the North Carolina State University agronomy/soils laboratory.
- (4) Section 4: Incorporate lime and fertilizer to a depth of at least 3" into the soil during preparation of seedbed. All gullies and rills shall be filled and smoothed prior to application of fertilizer. The seedbed will be prepared with common farm tools such as disks, harrows, and cultipackers. Areas not accessible to field machinery shall be prepared by hand.
- (5) Section 5: Apply seed uniformly at a depth of  $\frac{1}{8}$  to  $\frac{1}{4}$  inch with drill or cultipacker type seeder or broadcast seed uniformly and cover  $\frac{1}{8}$  to  $\frac{1}{4}$  inch deep with a cultipacker, harrow, or similar tool. Seeding operation shall be performed immediately after seedbed preparation, if seeding dates permit. Stabilizing shall be accomplished with ECB as specified in construction notes.
- (6) Section 6: Measurement and payment for this item will be made using the Method specified above and in accordance with unit rates described from Bid Item No. 4 of the Bid Schedule. Payment will be adjusted for the actual square footage of surface area provided with seeding/mulching/jute measured to the nearest 0.1 acre.

## **Construction Specification 7—Construction Surveys**

### **1. Scope**

Emergency repair work for the 2 EWP sites will include contractor performed surveys on each site for grade control during construction and to demonstrate final finished slope elevations are met. Earthfill operations at all sites will be completed with a final grade as shown on the drawings. Construction drawings included in this set of Plans & Specifications illustrate the existing grades of each site as well as the proposed finished grade.

Surveying will include the contractor identifying and marking the Constructing Limits shown in the Plans & Specifications for each site. In addition, surveying will include location of property boundaries, setting grade stakes, performing elevation measurements, and performing computations as required by this specification. Temporary benchmarks are provided by the Sponsor on the EWP site for use by the contractor. The TBM locations are identified in the Plans & Specification plan sheets.

### **2. Equipment and Material**

Equipment for construction surveys shall be of a quality and condition to provide the required accuracy. The equipment shall be maintained in good working order and in proper adjustment at all times. Records of repairs, calibration tests, accuracy checks, and adjustments shall be maintained and be available for inspection by the engineer. Equipment shall be checked, tested, and adjusted as necessary in conformance with manufacturer's recommendations.

Materials include field notebooks, stakes, templates, platforms, equipment, spikes, steel pins, tools, and all other items necessary to perform the surveying work specified.

### **3. Quality of Work**

All work shall follow recognized professional practice and the standards of the civil construction industry unless otherwise specified in Section 9 of this specification. The work shall be performed to the accuracy and detail appropriate for the type of job. Notes, sketches, and other data shall be complete, recorded neatly, legible, reproducible and organized to facilitate ease in review and allow reproduction of copies for job documentation. Survey equipment that requires little or no manual recording of field data shall have survey information documented as outlined in Section 9 of this specification.

All computations shall be mathematically correct and shall include information to identify the survey location, purpose, date, and who performed, checked, and approved the computations. Computations shall be legible, complete, and clearly document the source of all information used including assumptions and measurements collected.

If software or common industry computer programs are used to perform the computations, the contractor shall provide the Sponsor with the software identification, vendor's name, version number, and other pertinent data before beginning survey activities. Computer generated computations shall show all input data including values assigned and assumptions made.

The elevations of permanent and temporary benchmarks shall be determined and recorded to the nearest 0.01 foot. Differential leveling and transit traverses shall be of such precision that the error of vertical closure in feet shall not exceed plus or minus 0.1 times the square root of the traverse distance in miles. Linear measurements shall be accurate to within 1 foot in 5,000 feet, unless otherwise specified in Section 9 of this specification. The angular error of closure for transit traverses shall not exceed 1-minute times the square root of the number of angles turned.

The minimum requirements for placing slope stakes shall be at 100-foot stations for tangents, as little as 25 feet for sharp curves, breaks in the original ground surface and at any other intermediate stations necessary to ensure accurate location for construction layout and measurement. Slope stakes and cross-sections shall

be perpendicular to the centerline. Significant breaks in grade shall be determined for cross- sections. Distances shall be measured horizontally and recorded to the nearest 0.1 foot. Side shots for interim construction stakes may be taken with a hand level.

Unless otherwise specified in Section 9 of this specification, measurements for stationing and establishing the location of structures shall be made to the nearest 0.1 foot.

Elevations for concrete work, pipes, and mechanical equipment shall be determined and recorded to the nearest 0.01 foot. Elevations for earth work shall be determined and recorded to the nearest 0.1 foot.

#### **4. Primary Control**

Temporary bench marks (TBM) for primary control, necessary to establish lines and grades needed for construction are shown on the project drawings. TBMs have been established on the site for the contractor's use by Vaughn & Melton, PA, registered land surveyors.

The baselines (Station Locations) and TBMs shall be used as the origin of all surveys, layouts, and measurements to establish construction lines and grades. It is the contractor's responsibility to undertake all necessary measures and precautions to prevent the loss or damage of any primary control point or TBM monument. Any TBM provided by the Sponsor, Sponsor performed construction staking, or control points lost or damaged by the contractor's construction activity or for any reason, will be reestablished by the contractor and at their own expense. TBMs and control points shall be protected by the contractor throughout the construction process.

#### **5. Construction Surveys**

A plan sheet drawing for the EWP project site has been performed by the Sponsor and are contained in these Plans & Specifications. The drawing files are saved in digital format and provided for the contractor's use to initiate the projects. The Cross Sections illustrate station locations, cross section transects, and existing grade. The contractor should utilize these plan sheet drawings to estimate quantities of cut and/or fill necessary at each site. For bidding purposes, estimates of earthfill for each site have been provided in the Bid Schedule but should be verified by the contractor.

Before any sitework is undertaken that requires the contractor to perform surveys, the contractor shall submit a request in writing to the Sponsor for review/approval of their proposed surveyor, or qualified person who will be performing their site surveys. The following information must be submitted to the Sponsor including: the surveyors name, qualifications, licensure (if any), and experience of the individual(s) to be assigned to the survey tasks.

Contractor performed surveys shall consist of all work necessary for the following:

- establishing line and grade for all work
- setting slope stakes for all work
- checking and any supplemental or interim staking
- establishing final grade stakes
- performing quantity surveys, measurements, and computations for reporting earthfill progress
- performing original (initial) and final surveys for determination of final quantities to be back-checked with volumes delivered from the borrow pit
- other surveys as described in Section 9 of this specification.

## 6. Staking

The construction staking required for the item shall be completed before work on any item starts. Construction staking shall be completed as follows or as otherwise specified in Section 9 of this specification:

**Clearing and Grubbing**—The boundary of the area to be cleared and grubbed shall be staked or flagged at a maximum interval of 25 feet, or closer if needed, to clearly mark the limits of the active work zone. When contractor staking is the basis for determining the area for final payment, all boundary stakes will be reviewed by the Sponsor before start of this work item.

**Excavation and Fill**—Slope stakes shall be placed at the intersection of the specified station locations, slopes, and ground lines. Slope and fill stakes shall be marked with the stationing, required cut or fill, slope ratio, and horizontal distance from the centerline or other control line. The minimum requirements for placing slope stakes are outlined in Section 3, Quality of Work.

**Structures**—Centerline and offset reference line stakes for location, alignment, and elevation shall be placed for all structures.

## 7. Records

All survey data shall be recorded in fully identified standard hard-bound engineering survey field notebooks with consecutively numbered pages. All field notes and printed data shall include the purpose or description of the work, the date the work was performed, weather data, sketches, and the personnel who performed and checked the work. Electronically generated survey data and computations shall be bound, page numbered, and cross referenced in a bound field notebook containing the index for all survey activities. All work shall follow recognized professional practice.

The construction survey records shall be available at all times during the progress of the work for examination and use by the engineer and when requested, copies shall be made available. The original field notebooks and other records shall be provided to and become the property of the owner before final payment and acceptance of all work.

Complete documentation of computations and supporting data for progress payments shall be submitted to the Project Engineer with each invoice for payment as specified in Section 9 of the specification. When the contractor is required to conduct initial and final surveys as outlined in Section 7, Construction Surveys, notes shall be provided as soon as possible after completion to the Sponsor for the purpose of determining final payment quantities.

## 8. Payment

**Method**—Payment will not be provided specific to this item for the labor and materials required to perform the work in accordance with the Plans & Specifications. Compensation/payment for this item or any item of work not listed in the Bid Schedule will be included in the payment for the item of work to which it is made subsidiary. Construction Surveys are made subsidiary are identified in Section 9 of this specification.

## 9. Scope of Work and Construction Details

Items of work to be performed in conformance with this specification and the construction details are below:

- a. Subsidiary Item, Construction Surveys

- (1) Section 1: Field Surveys, Staking, and Final As-Built Survey to be performed by the contractor shall include:
  - i. The contractor shall make an initial survey of the site (as deemed necessary) to determine the degree of work to be performed. This includes estimating the volume of earthfill material needed. The earthfill quantity estimate shown in the Bid Schedule is for bidding purposes and should not be relied upon as the actual volume that may be required to complete repairs as specified in these Plans. Actual earthfill quantities may vary from those shown in the Bid Schedule.
  - ii. The contractor shall observe the established Construction Limits and mark these limits on each site in the field prior to performing earthfill operations. This also includes using high visibility methods of marking slope widths, property lines, and toe of bank for placement of required earthfill.
  - iii. The contractor will observe and mark the clearing and grubbing limits described in the plans and specifications, or as marked or otherwise indicated by the Sponsor. This includes identifying the locations of displaced rip rap for relocating to designated areas along the toe of fill. The Sponsor will assist the contractor in field verifying rip rap needing relocation to approved areas.
  - iv. The Sponsor will perform periodic grade checks, lift thickness checks, density checks, and other verifications as noted in the construction inspection plan. It is the contractor's responsibility to perform their own verifications for lift thickness, grade, compaction, elevation, slope angle, borrow material compliance with specifications, and other construction quality control checks.
  - v. The contractor should coordinate construction stake-out and grading control with the Sponsor for project layouts at the site. Any Sponsor staking shall be performed once; damaged survey stakes, TBMs, or control points will be replaced by the contractor at their expense. All surveys shall proceed from temporary benchmarks, reference points, and/or stakes set or established by the Sponsor and identified in the attached plan sheets.
  - vi. The Contractor shall perform an As-Built Final Survey of the completed grade stabilized finished ditch bank. The survey must be performed and sealed by a qualified NC Registered Land Surveyor (RLS). The Sponsor reserves the right to approve the proposed survey firm, the RLS performing the survey, and to conduct their own QA survey to verify that the finished stabilized ditch bank and associated slope was built according to the Plans & Specifications.
- (2) Section 3, Quality of Work, Measurements for establishing the location of completed fill-sections or structures shall be made to the nearest 0.1 foot, or as determined in the field by the Sponsor or its engineering representative.
- (3) Section 4: Additional Primary Control, will not be established by the Sponsor to supplement Primary Control identified on the drawings.
- (4) Section 5: Construction Surveys, the Method of Payment described above in No. 8-Payment, shall apply.
- (5) Section 8: Measurement and Payment for this item will not be made. All construction surveys are subsidiary to BID ITEM #3, EARTHFILL

## **Construction Specification 8—Mobilization and Demobilization**

### **1. Scope**

This task consists of mobilization and demobilization of the contractor's forces and equipment necessary for performing the work required under the contract. It does not include mobilization and demobilization for specific items of work for which payment is provided elsewhere in the contract. Mobilization will not be considered as work in fulfilling the contract requirements for commencement of work.

### **2. Equipment and Material**

Mobilization shall include all activities and associated costs for transportation of contractor's personnel, equipment, and operating supplies to the site; establishment of offices, buildings, staging areas, and other necessary general facilities for the contractor's operations at the site; premiums paid for performance and payment bonds including coinsurance and reinsurance agreements as applicable; and other items specified in Section 4 of this specification.

Demobilization shall include all activities and costs for transportation of personnel, equipment, and supplies not required or included in the contract from the site; including the disassembly, removal, repairs, and site cleanup of offices, buildings, staging areas, grounds, and other facilities assembled on the site used specifically for this contract.

The work scope performed under this contract includes **one mobilization and demobilization** for the one DSR. If the Sponsor should change, delete, alter, or add additional scopes of work that are not specified in this contract, then an adjustment in the contract price for such cost additions or reductions will be considered for work that was added or deducted from the scope identified in these Plans & Specifications.

### **3. Payment**

Payment may be requested for 50% of mobilization/demobilization costs upon completion of the mobilization phase. Payment shall be supported with documentation of direct costs by the contractor showing specific mobilization/demobilization costs. This also includes supporting documentation such as charges from suppliers, subcontractors, and equipment vendors, etc., and other costs. Payment will be made in the amount of 50% of the total cost for mobilization/demobilization upon the contractor's arrival and staging of all equipment and personnel necessary to complete the work required for each DSR. When the work scope for each DSR is completed in full and to the Sponsor's satisfaction, the remaining 50% balance for Item 1-Mobilization/Demobilization in the Bid Schedule will be released for final payment including subsidiary cost included in this Bid Item.

### **4. Scope of Work and Construction Details**

Items of work to be performed in conformance with this specification and the construction details therefore are:

a. Bid Item #1: Mobilization and Demobilization

(1) Section 1: the following items are subsidiaries to Bid Item 1-Mobilization and Demobilization: Pollution Control (005), and Contractor Quality Control Plan (094). The demobilization operation shall include but not be limited to the following items of work:

(a) Removal of all debris, trash, tires, equipment, equipment parts, chains, cables, soil, mud, rock, and other such items resulting from the



construction operation shall be collected and removed from the work site. These materials must be disposed in a NC-DSWM permitted landfill that is approved by the Sponsor.

- (b) All access routes whether paved or unpaved, to and from the site off of public/private roadways shall be maintained or restored by the contractor to a like-kind condition that pre-existed prior to construction activities.
- (c) All disturbed areas including the site, adjacent affected areas, staging/lay down areas, or any other temporary area used during construction shall be bladed or smoothed to blend the area with the surrounding land surfaces. The bladed or smoothed surface shall be free of abrupt mounds, windrows, depressions or other irregularities that would prevent the safe operation of ordinary farm equipment thereon. The finished surface shall prevent diversion of surface runoff and shall prevent standing or ponding water. Disturbed areas that were formerly lawn or grassed shall be seeded and mulched as noted in Construction Specification 6 except for graveled travel lanes and ramps used for site access which may remain if authorized by the property owner.
  - (1) All earthwork activities for site ingress/egress (e.g. ramps, travel-ways, matting) shall be included as part of Mobilization/Demobilization and must protected as described below:
    - a.) Construction matting shall have a minimum weight loading of 400 psi, or
    - b.) Clean gravel minimum 2” to 3” thickness over equipment compacted soil subbase. Minimum width for all travel ways shall be widest equipment track/tread width + 2.0 ft. Graveled access routes may be left in place once construction is completed with written permission from the Sponsor and the property owner.
    - c.) All temporary matting and ramps shall be removed from the site. Disturbed areas that were formerly lawn or grassed shall be restored to pre-existing condition by sodding or seeding and mulching as noted in Construction Specification 6 and drawing notes.

## Construction Specification 23—Earthfill

### 1. Scope

The work scope consists of placement of earthfill and constructing earthen embankments which may include earthen slopes, backfills, and other earthfill sections as required by the project drawings and specifications.

Earthfill is composed of natural granular earth materials using the specified soil types defined in the specifications to facilitate placement and compaction using construction equipment and operated in a conventional manner.

Earth backfill is composed of the same type and classification of natural granular earth material placed and compacted in confined spaces or adjacent to structures (including pipe trenches) by hand tamping, manually directed mechanical power tampers, or vibrating plates, or their equivalent.

### 2. Borrow Material

All borrow material proposed for use to perform earthfill construction shall be obtained from permitted and legally authorized borrow areas permitted by the NC Division of Energy, Minerals, and Land Resources (NCDEMLR). Any proposed borrow pit must be permitted and in good standing with the NCDEMLR. A copy of the borrow pit permit shall be included in the submittal of the Borrow Material Plan. The contractor shall prepare and submit a Borrow Material Plan at least 10 days prior to commencement of construction. The Borrow Material Plan shall also identify the geotechnical testing regime proposed to qualify the material as an acceptable fill source, and the location of any proposed borrow pit location.

Geotechnical laboratory testing of any proposed earthfill material source shall be performed by the contractor to pre-qualify the material for use on EWP projects. The geotechnical tests results shall be submitted to the Sponsor at least 10 days prior to commencement of earthfill placement on any site. The selection, blending, augmentation, and use of any earthfill material that deviates from those materials specified as acceptable fill sources in these Plans & Specifications, will not be permitted without the written consent by the Sponsor. Geotechnical testing and construction of test strips for the purpose of evaluating the field performance of any proposed materials, will be required at the discretion of the Sponsor.

Prior to commencement of construction, and prior to placement of earthfill on any project site, the contractor shall collect bulk samples of each proposed borrow material, from each proposed borrow pit, and submit to a certified and licensed geotechnical testing laboratory. The contractor shall perform a series of geotechnical tests on each soil type proposed including maximum dry density (Standard Proctor), gradation analysis, optimum moisture content, Wash No. 200, and Atterberg Limits, (see details below). These tests will assure that proposed borrow sources conform with the contract specifications for acceptable earthfill soil types.

The contractor shall submit a Borrow Material Plan identifying the testing regime proposed to qualify the material as an acceptable fill source. The Borrow Material Plan shall include each proposed borrow pit location, owner's name, GPS coordinates for the pit, and a copy of the NCDEMLR permit. Unless all borrow material located at the proposed borrow pit is homogenous, geotechnical soil samples should be collected for **each different soil type** and tested as shown below. The below geotechnical tests shall be specified in the Borrow Material Plan in order to qualify each proposed material type for use under this contract. At a minimum, at least one test specified by each below test method will be required for each proposed material type, and shall be performed as follows:

- Gradation by ASTM D-422
- Standard Proctor by ASTM D-698
- Moisture Content by ASTM D-2216
- Liquid Limits/PL/PI by ASTM D-4318
- Soil Classification by ASTM D- 2488/2487

As stated in the Plans & Specifications, the only soil types approved for earthfill are those soil types listed and described in the specifications and include: clean SC-SM, SC, SM, CL, and CL-ML soils (per the Unified Soil Classification

System). The Sponsor reserves the right to require more soil tests than one per soil type if it is determined to be warranted. The Sponsor also reserves the right dis-allow the contractor's use of any proposed borrow material or borrow source, if justified.

Earthfill material used for slope building and construction purposes shall not contain organic or fat clay soils, organic matter, debris, wood, vegetation, sod, clay clods, brush, roots, refuse, metal, rock, gravel, or perishable materials. Rock particles larger than 1/8" diameter size in the matrix of each type of specified fill for use shall be screened or otherwise removed prior to compaction of the fill. The contractor's Borrow Material Plan shall identify the testing regime used to qualify the material as an acceptable fill source, the proposed laboratory for performing the test, the laboratory's certifications, and the proposed borrow pit locations.

The types of material for use in the earthfill shall be those soil types listed and described in the specifications and drawings including clean SC-SM, SM, SC, CL, and CL-ML, soils (per the Unified Soil Classification System). The contractor shall also identify the geotechnical testing firm proposed for performing onsite testing of moisture, density, and soil classification of in-bound borrow material. The test measures proposed for onsite soil moisture and density must be identified in the Borrow Material Plan. The field personnel performing the Quality Control testing must demonstrate at least 3 years of expertise performing soil density, soil moisture, and soil classification.

### **3. Foundation Preparation**

The foundation sub-base for earthfill shall be stripped, racked, or excavated to remove organic materials, vegetation, roots, root mat, rubble, debris, unsuitable soils, fat clay, and other unsuitable or any foreign materials to a depth of 1.0 ft. below existing grade.

Except as otherwise specified, each earthfill lift surfaces shall be graded to remove surface irregularities and shall be scarified parallel to the axis of the fill or otherwise acceptably scored, scarified, or loosened to a minimum depth of 0.5 ft. below existing. The moisture content of the loosened soil-material shall be controlled in the same manner specified for earthfill and to the same moisture specification. The surface material of the foundation shall be compacted and bonded with the first layer of earthfill as specified, and for all subsequent layers of earthfill.

Test pits or exploratory excavations shall be filled with compacted earthfill conforming to the specifications for the earthfill to be placed upon the foundation.

#### **3.1 Geogrid Underlayment**

The EWP project site may be comprised of inferior sub-base soils or hydraulic conditions that are inhibit achieving the specified density requirement. This may include wet, saturated, or poor soil quality non-conducive for achieving specified soil densification. To improve these conditions, a triaxial geogrid is required for underlaying the first earthfill lift of imported suitable fill.

Once the foundation sub-base has been removed of organics, root mats, and other materials stated in Item 3. Foundation Preparation above, the first earthfill lift placed on top of native sub-base soils is required to be underlain by a single layer of high tensile strength triaxial geogrid on top of the sub-base soils. This measure is necessary to provide stability of sub-base soils in order to achieve proper compaction of the initial earthfill lift. The width of the triaxial grid placed horizontally across the top of the sub-base soil foundation and shall be the full width of the first placed/compacted lift. All exposed upper surface of the sub-base soil foundation, shall be covered with a single layer of triaxial geogrid comprised of a manufactured punched polypropylene grid oriented in multiple equilateral directions, forming triangular apertures. The triaxial geogrid is designed to provide enhanced in-plane high radial stiffness and creates a "snowshoe effect" by spreading the surface load over a wider area of the subgrade. The triaxial geogrid will produce an improved foundation and will enable subsequent lifts of earthfill to attain specified compaction standards. There are a variety of acceptable geogrid products available such as the TENSAR®TRI-AX®TX130S Geogrid. Approved equivalents are also acceptable for use as an under-layment for slope repair/rehabilitation projects. The contractor should submit a cut-sheet and product specification for approval by the Sponsor for any geogrid material proposed for use on sub-base soils.

### **4. Placement of Earthfill**

Earthfill operations shall not commence until the required sub-base and foundation soils have been properly prepared, compacted/densified, and tested to receive overlying lifts of earthfill. When the sub-base and foundation soils are ready for receiving earthfill, the Sponsor must be contacted to inspect and approve the foundation sub-base. Earthfill shall not be placed upon organic soils, or soils incorporated with vegetation, wood, roots, limbs, debris, sticks, or stumps, rock, or rubble in the sub-base matrix.

Earthfill sections shall be placed in uniform horizontal layers using only approved specified soils. The thickness of each lift before compaction shall not exceed the 9.0 inch maximum thickness specification. Earthfill placed by dumping in piles or windrows shall be spread uniformly across the horizontal fill-section to no more than the 9.0 inch specified thickness before compaction operations commence.

Areas requiring hand compacted earthfill shall be placed in layers not to exceed the specified thickness before compaction. The maximum thickness of 9.0 inches is also specified for layers of earthfill compacted by manual mechanical machinery such as power, vibratory, and plate tampers. If field observation and/or geotechnical testing determines that the specified lift thickness is too thick to enable the compaction specification to be achieved, then the contractor will be required to reduce the thickness in order to attain acceptable compaction.

Earth backfill shall be placed in a manner that prevents damage to any structures, including houses, out buildings, bulkheads, seawalls, walkways, driveways and any other harden structure located on the project sites. The earthfill shall be placed in a manner that allows such structures to assume the load and pressures exerted from the earthfill in a gradual and uniform manner. The height of the earth backfill adjacent to a structure shall be increased at an equal incremental rate on all sides of the structure.

## **5. Control of Moisture Content**

During placement and compaction of earthfill, the moisture content of the material being placed shall be maintained and continuously tested to assure the material is within the specified moisture content range.

The application of water to the earthfill material shall be accomplished at the borrow areas insofar as practicable. Water may be applied by sprinkling the material after placement on the earthfill, if necessary. Uniform moisture distribution shall be obtained by disking in cases where moisture content is too high.

Stockpiled and surplus soil material should remain covered at all times until need for placement to minimize rapid changes in moisture content. Whether located at the borrow pit or the project site, material that is too wet (>1.5% over Optimum Moisture) shall not be placed onsite, or used in any active lift section, or used for any purpose in the slope repairs process until the material is altered to reduce the moisture content within the acceptable range. Any material that is determined by the Sponsors inspector to exceed 1.5% of the Optimum Moisture Content or by field testing methods will either be rejected upon delivery to the site or if already placed into a lift, removed from the lift and discarded, until the material is dried to the specified moisture content. Stockpiled earthfill material, whether onsite or at the borrow pit, shall be covered nightly to prevent rainfall from impacting the natural moisture content of the earthfill. Earthfill excavated at the borrow pit, should be not transported directly to the project site for placement, without some degree of drying using stockpiles, tilling, or windrowing. Wet/saturated earthfill material delivered to the project site without proper drying will be rejected by the Sponsor's construction inspectors.

In the event that earthfill soils placed on the top surface of the sub-base foundation, or a compacted earthfill lift, becomes too dry to permit a suitable bond or achieve the compaction specification, it shall be removed, or scarified/moistened by sprinkling to achieve an acceptable moisture content before placement of the next overlying lift of earthfill. Stockpiled soils proposed for use on any EWP project site, whether onsite or offsite, should be covered each night to prevent excessive moisture infiltration.

## **6. Compaction**

Earthfill—Earthfill shall be compacted according to the following requirements for the class of compaction specified:

**Class A compaction**—Each layer of earthfill shall be compacted as necessary to provide the density of the earthfill matrix not less than the minimum of 90% MDD for all approved earthfill material used in the slope building process. Any density determined to exceed this standard by acceptable specified testing methods will allowed, but in no case,

less than 90% MDD. The earthfill matrix is defined as the portion of the earthfill material finer than the maximum particle size allowed in the reference compaction test method specified (ASTM D-698 or ASTM D-1557). Deviations to lift thickness, material types, moisture, or the compaction density specification will not be accepted by the Sponsor.

Earth backfill—Earth backfill adjacent to structures shall be compacted to a density equivalent to that of the surrounding in place earth material or adjacent required earthfill or earth backfill. Compaction shall be accomplished by hand tamping or manually directed power tampers, plate vibrators, walk-behind, miniature, or self-propelled rollers. Unless otherwise specified heavy equipment including backhoe mounted power tampers or vibrating compactors and manually directed vibrating rollers shall not be operated within 3 feet of any structure. Towed or self-propelled vibrating rollers shall not be operated within 5 feet of any structure. Compaction by means of drop weights operating from a crane or hoist is not permitted.

### **7. Failures, Reworking, Removal, and Replacement of Defective Earthfill**

Any earthfill section or area placed, either too wet, too dry, too loose, or over-compacted or using soil types that are not approved and specified in these construction specifications will be deemed “non-suitable” and will be required to be remedied. Only earthfill types that have been approved by the Sponsor for use are acceptable. Soil that is placed in lifts resulting in densities lower than the specified minimum density or at moisture contents deviating from the specified acceptable range, or not conforming to other project specifications, shall be reworked to meet the minimum requirements OR shall be removed and replaced by acceptable fill as determined by the Sponsor or its representative. Replacement earthfill for foundation soils, and other earthfill surfaces shall conform to all requirements of this specification including preparation, placement, moisture control, compaction, thickness, and grade.

### **8. Testing**

During the course of the earthfill work, the contractor shall perform daily geotechnical testing and record the results in a Daily Log. The Daily Log shall identify types of earthfill and volume of earthfill materials used; the maximum dry density, and optimum moisture content in multiple locations for each completed earthfill lift; and document that each lift conforms to the thickness, testing requirements, and construction specifications stated in this document. All areas tested must be identified on a scaled Site Map showing the lift number, test location, the moisture/density result, and whether the test location passed or failed the project specifications. The Sponsor’s representative must be notified immediately of any failures and the contractor must identify the immediate proposed measures for remedy. A project log (Failure Log) listing the running tally of each failure shall be recorded and maintained by the contractor on a separate sheet for each EWP project site. Failures will be denoted by lift number, failure number, and location including GPS coordinates, and elevation and shall be sufficient to locate each failure. Each failure must be recorded and described with the locations of the failure such as: (ex. Lift 1-F1, 34.7864/77.5638; Lift-2-F4, 34.7854/77.5772, etc.).

Determining Reference Maximum Dry Density and Optimum Moisture Content—For Class A compaction, the reference maximum density and optimum moisture content shall be determined in accordance with the compaction test and method specified below.

Documenting Specification Conformance—In-place densities of earthfill and earth backfill requiring Class A compaction shall be measured in accordance with ASTM D1556, D2167, D2937, or D6938. Moisture contents of earthfill and earth backfill at the time of compaction shall be measured in accordance with ASTM D2216, D4643, or D6938. Values of moisture content determined by ASTM D2216 are considered the true value of the soil moisture. Values of moisture content determined by ASTM D4643 or D6938 shall be verified by comparison to values obtained by ASTM D2216.

For field testing purposes to determine compaction and soil moisture content, the use of nuclear density gauges such as a Troxler or Humbolt are acceptable for this project. The instrument and operator must be properly licensed and certified in Nuclear Density Testing. The instrument must be calibrated daily, and a Daily Calibration Log maintained. All nuclear density test results submitted to the Sponsor shall be supported with calibration logs for the period the gauge was in use.

Values of in-place density and moisture content determined by the above tests shall be compared to the minimum density and moisture content range specified in these Plans & Specifications or on the construction drawings.

A Standard Proctor laboratory test must be performed for **every** earthfill soil type that is proposed for use. In the event that a change occurs in the inbound soils coming from the Borrow Pit, and/or density failures occur, the contractor must discontinue use of that particular soil type for earthfill purposes until a Standard Proctor test can be performed on that soil type to qualify the “new” soil as a suitable fill source. It is the contractor’s responsibility to assure the inbound soils arriving at the construction site meets the geotechnical specifications for: soil type; moisture, and quality of soil (free from organics/debris). Any material rejected by the Sponsor shall be immediately removed from the project site, transported, and disposed at a permitted facility offsite. The location of any soil disposed must be documented by the contractor and reported/communicated to the Sponsor daily in written form or memorandum.

Correction for Oversize Particles—If the materials to be used for earthfill or earth backfill contain more than 5 percent by dry weight of oversize rock particles (particles larger than those allowed in the specified compaction test and method), corrections for oversize particles shall be made using the appropriate procedures explained in ASTM D4718.

The frequency of testing compaction and soil moisture as each earthfill lift is being constructed will be determined by the Sponsor prior to construction. At a minimum, four moisture and compaction tests each will be performed by the contractor for each lift, every 250 square feet (Area=50ft. X 50ft.). If the testing frequency is modified by the Sponsor, the contractor will be notified prior to construction. The frequency and number of tests may change during the construction process. The Sponsor will observe construction and determine if the frequency and number of tests specified in this section should be modified based on field conditions.

## **9. Groundwater**

Any groundwater that the contractor deems necessary for removal or control, shall be the responsibility of the contractor, and shall be performed by the methods selected by the contractor, and approved by the Sponsor. Any costs for groundwater control shall be the contractor’s responsibility and incorporated into the Bid Schedule in the earthfill cost.

## **10. Measurement and Payment**

For items of work for which specific unit prices are established in the contract, the volume of each type and compaction class of earthfill and earth backfill within the specified zone boundaries and pay limits is measured and computed to the nearest cubic yard upon the entry of haul trucks into the construction sites, where Sponsor inspectors will perform volume estimates of the material entering in each delivered truck. Each truck load of earthfill material delivered to the sites will be provided with an inspector’s certification that is signed and dated. Claims for payment of earthfill by the contractor without these Sponsor signed inspection-ticket certifications will not be granted.

The pay limits shall be further defined below, with the provision that earthfill required to fill voids resulting from over-excavation of the foundation, outside the specified lines and grades, or limits will be included in the measurement for payment **ONLY** when both of the following two conditions are met:

- (1) Where such over-excavation is directed by the Sponsor or NRCS engineer to remove unsuitable material, and
- (2) the unsuitable condition in # 1 above is not a result of the contractor's improper construction or excavation operations as determined by the Sponsor or onsite engineering representative.

Payment for earthfill will be performed in accordance with the following method:

**Method 1**—The pay limits shall be based on the measured volume of delivered earthfill material in cubic yards (CYS), as verified by the Sponsors site inspectors upon delivery to the site. All earthfill delivered must be verified by the Sponsors inspectors and supported with signed certification tickets documenting the material type, truck number, time/date of delivery, driver name, and measurement/estimated volume of earthfill delivered to the site. All the preceding required information will be necessary to assure payment for earthfill material.

## **11. Scope of Work and Construction Details**

Items of work to be performed in conformance with this specification and the construction details therefore are:

### **Bid Item #3: Earthfill**

- (1) Section 2: Material suitable for earthfill shall be those noted in these construction specifications.
- (2) Section 3: Abutment surfaces may be steeper than 1 horizontal to 1 vertical and as determined by site conditions or noted in construction drawings.
- (3) Section 4: The maximum thickness of each uncompacted granular soil lift shall not exceed 9.0 inches. The finished or completed surface (top) of the compacted berm or slope shall be 2 horizontal to 1 vertical as noted in construction drawings.
- (4) Section 5: Soil moisture content shall be monitored throughout the earthfill and construction process in the field by contractor using a properly calibrated Nuclear Density gauge, Sand Cone Test by ASTM D 1556, or by other methods approved by the Sponsor or its representative prior to commencement of construction: moisture content for all lifts placed and for all stockpiled soils proposed for earthfill use shall be maintained at the Optimum Moisture Content (plus or minus 1.5%).
- (4) Section 6: Class A compaction—Each layer of earthfill shall be compacted as necessary to provide the density of the earthfill matrix not less than the density specified in these Plans which is 90% MDD. The earthfill matrix is defined as the portion of the earthfill material finer than the maximum particle size allowed in the reference compaction test method specified (ASTM D-698 or ASTM D-1557).
- (5) Section 8: Testing: The frequency of testing soil compaction and soil moisture as each earthfill lift is being constructed will be determined by the Sponsor prior to construction. At a minimum, four soil moisture and compaction tests each will be performed by the contractor for each lift, every 250 square feet (Area=50' X 50'). If the testing frequency is modified, the contractor will be notified prior to construction. The frequency and number of test may change during the construction process. The Sponsor will observe construction and determine if the frequency and number of tests specified in this section should be modified based on field conditions.
- (6) Section 9: Measurement and payment for earthfill will be made using Method 1 and shall be at the contract unit rate prices based on the number of certified Cubic Yards (CYS) of approved earthfill placed and compacted.

### **12. Relocation of Existing Rip Rap**

Existing rip rap materials are present within the NCDOT Right Of Way. Existing rip rap shall **not** be relocated by the contractor.

## **Construction Specification 94—Contractor Quality Control**

### **1. Scope**

The work consists of developing, implementing, and maintaining a quality control system to ensure that the specified quality standards are achieved in a safe and effective manner that conforms with the materials and work scope identified in these Plans & Specifications performed.

### **2. Equipment and Materials**

Equipment and material used for quality control shall be of the quality and condition required to meet the test specifications cited in the contract. Testing equipment shall be properly adjusted and calibrated at the start of operations and the calibration maintained at the frequency specified. Records of equipment calibration tests shall be available to the Sponsor at all times. Equipment shall be operated and maintained by qualified operators as prescribed in the manufacturer's operating instructions, the references specified, and as specified in Section 12 of this specification. All

equipment and materials used in performing quality control testing shall be as prescribed by the test standards referenced in the contract in Construction Specification 23-Earthfill.

All equipment and materials shall be handled and operated in a safe and proper manner and shall comply with all applicable regulations pertaining to their use, operation, handling, storage, and transportation.

### **3. Quality Control System**

**QC Method**—The contractor shall develop, implement, and maintain a system adequate to achieve the specified quality of all work performed, material incorporated, and equipment furnished before use. The system established shall be documented in a written Quality Control Plan developed by the contractor and approved by the contracting officer. The system activities shall include the material testing and inspection needed to verify the adequacy of completed work and procedures to be followed when corrective action is required. Daily records to substantiate the conduct of the system shall be maintained by the contractor. The Quality Control Plan shall cover all aspects of quality control and shall address, as a minimum, all specified testing and inspection requirements. The plan provided shall be consistent with the planned performance in the contractor's approved construction schedule. The plan shall identify the contractor's onsite Quality Control Manager and provide an organizational listing of all quality control personnel and their specific duties. The written plan shall be submitted to the Sponsor within 10 calendar days after notice of award. The contractor shall not proceed with any construction activity that requires inspection until the written plan is approved by the Sponsor.

The quality control system shall include, but not be limited to, a rigorous examination of construction material, processes, and operation, including testing of material and examination of manufacturer's certifications as required, to verify that work meets contract requirements and is performed in a competent manner.

### **4. Quality Control Personnel**

**Method**—Quality control activities shall be performed by competent personnel employed by the contractor. A competent person is: One who is experienced and capable of identifying, evaluating, and documenting that materials and processes being used will result in work that complies with the contract, and holds relevant certifications and training for their respective types of testing; and, who has authority to take prompt action to remove, replace, or correct such work or products not in compliance. Off-site geotechnical testing laboratories shall be certified or inspected by a State and/or nationally recognized certifying entity. The Contractor shall submit to the Sponsor, for approval, laboratory certification or inspection documentation to demonstrate that the proposed testing laboratory is duly certified to perform materials testing services. The Contractor shall submit to the Sponsor, for approval, the names, qualifications, statement of authority, certifications, training results, and availability of the competent personnel who will perform the quality control activities.

## **5. Health & Safety/OSHA**

### **5.1 Health & Safety**

The contractor shall prepare a Health & Safety Plan (HASP) describing all measures that will be implemented on EWP projects to ensure worker health and safety. The HASP shall describe the minimum needed protective clothing, gear, and wares (i.e. hand protection, hearing protection, head protection, clothing, eye protection, etc.) and other protective outfitting needed by workers while undertaking specific tasks onsite. The HASP shall identify each critical work task that is anticipated by the contractor to be conducted on each work site, the equipment to be used, and the safety/risk management measures that will be implemented by the contractor to prevent accident or injury to workers.

The HASP shall be reviewed and acknowledged by signatures from all employees of the contractor, subcontractors, vendors, and any other entity or person that will work or enter onto these construction sites on behalf of the contractor. Any person entering upon the work site **must** review the HASP and sign off with their acknowledgement and understanding of its content. The proposed HASP must be submitted to the Sponsor for



review and approval, at least 10 days prior to mobilization or commencement of work on any site. The contractor shall include provisions in the HASP for conducting mandatory daily tailgate safety meetings prior to beginning work each day. The safety meetings shall be conducted by a qualified contractor designated Health & Safety Officer (HSO). The contractor shall identify their designated HSO who will be onsite and in responsible-charge of Health & Safety each day of work. All employees, subcontractors, vendors, or any other party present onsite on behalf of the contractor shall attend the H&S safety meeting each day or received a safety briefing before entering the site. The daily safety meetings shall be documented by written record with a signature by every person attending including meeting start and stop time, and topic/points discussed. A Sponsor representative shall also be in attendance at each daily safety tailgate meeting. A copy of the meeting attendees list shall be provided to the Sponsor daily. The contractor shall keep a copy of the HASP onsite for review for the duration of each project. The contractor shall make the plan available for review (and written acknowledgment) for anyone entering the site.

## **5.2 OSHA Compliance**

The contractor is required to perform all work activities in compliance with all OSHA standards and provisions in order to provide and maintain safe working conditions for all workers at all times on each EWP site. Contractors shall perform their work in accordance with OSHA regulations, and the Contract Work Hours and Safety Standards Act (40USC 327-330) as supplemented by Department of Labor Regulations cited in Title 29 CFR Part 5. Any work to be conducted on any site that is governed under Title 29 CFR 1926, Subpart P, Appendix A pertaining to Selection of Protective Systems; Sloping; Shoring; and Benching rules and regulations including OSHA 1926.652, Subpart P, Excavations (a) through 1926.652(g) shall be identified in writing to the Sponsor prior to commencement. The proposed measures to comply with these requirements shall be included in the notice to the Sponsor for review. Notice to the Sponsor shall include a description of the anticipated tasks to be undertaken to comply with these OSHA requirements, the measures, timeframe, and duration that the tasks taken to comply will be ongoing during the project..

## **6. Post-Award Conference**

The contractor shall meet with the contracting officer before any work begins and discuss the contractor's quality control system. The contracting officer and the contractor shall develop a mutual understanding regarding the quality control system, including procedures for correcting quality control issues.

## **7. Records**

The contractor's quality control records shall document both acceptable and deficient features of the work and corrective actions taken. All records shall be on forms approved by the contracting officer, be legible, and be dated and signed by the competent person creating the record.

Unless otherwise specified in Section 11 of this specification, records shall include:

- a. Documentation of shop drawings including date submitted to and date approved by the contracting officer, results of examinations, any need for changes or modifications, manufacturer's recommendations and certifications, if any, and signature of the authorized examiner.
- b. Documentation of material delivered including quantity, storage location, and results of quality control examinations and tests.
- c. Type, number, date, time, and name of individual performing quality control activities.
- d. The material or item inspected and tested, the location and extent of such material or item, and a description of conditions observed, and test results obtained during the quality control activity.
- e. The determination that the material or item met the contract provisions and documentation that the engineer was notified.

- f. For deficient work, the nature of the defects, specifications not met, corrective action taken, and results of quality control activities on the corrected material or item.

## 8. Reporting Results

The results of contractor quality control inspections and tests shall be communicated to the Sponsor immediately upon completion of the inspection or test. Unless otherwise specified in Section 12, the original plus one copy of all records, inspections, tests performed, and material testing reports shall be submitted to the Sponsor within one working day of completion. The original plus one copy of documentation of material delivered shall be submitted to the engineer before the material is used.

## 9. Access

The Sponsor (including Pamlico County personnel, NRCS/State and local personnel, USDA contracting officer and other USDA personnel conducting construction monitoring), shall be given free access to inspect and observe the contractors performance including: construction methods and practice, equipment, test methods and procedures, calibration records, all field testing equipment, facilities, construction records, field notes, test records/results, safety meeting records, records required for measures/payment, certification of vendor and subcontractor payment, employee proof of citizenship, insurance certifications, copies of permits, and any other records deemed necessary by the Sponsor for the duration of the contract.

## 10. Existing Structures

Existing structures are located at each of the two sites included in this project, some of which have been identified in the project Plan Sheets. These structures may include but are not limited to the following: bulkheads, seawalls, revetments, houses, out-buildings, sidewalks, walkways, terraces, decks, HVAC units, utilities, water/sewer lines, septic tanks, decks, fuel tanks, pools, and/or other types of structures. The contractor shall take all reasonable and necessary precautions to locate, mark, and protect any structure present within or adjacent to the Construction Limits, during construction on each site, regardless of whether such structures are identified on the project Plan Sheets, or not.

## 11. Payment

*Method*—Compensation for any item of work described in the contract, but not listed in the bid schedule, is included in the payment for the item of work to which it is made subsidiary. Such items and the items to which they are made subsidiary are identified in Section 10. Payment for Quality Control Plan and HASP preparation are subsidiary to Bid Item #1 MOBILIZATION/DEMobilIZATION.

## 12. Scope of Work and Construction Details

Items of work to be performed in conformance with this specification and the construction details therefore are:

- (a.) Subsidiary Item, Contractor Quality Control
  - (1) Section 3: Method 1 shall be utilized. Due to exigent nature of work, identification of quality control personnel shall be with 10 calendar days of award.
  - (2) Section 4: The Method described in Section 4 shall be utilized and will be paid subsidiary to BID ITEM #1, MOBILIZATION AND DEMOBILIZATION (see Section 11).
  - (3) Section 5: Measurement and payment for this item will be made subsidiary to BID ITEM #1, MOBILIZATION AND DEMOBILIZATION (see Section 11).

## Construction Specification 95—Geotextile

### 1. Scope

This specification covers the quality of geotextile, including geotextile for temporary silt fence.

### 2. General Requirements

Fiber (thread and yarn) used in the manufacture of geotextile must consist of synthetic polymer composed of a minimum of 85 percent by weight polypropylene, polyester, polyamide, polyethylene, polyolefin, or polyvinylchloride. The fiber must be formed into a stable network of filaments retaining dimensional stability relative to each other. The geotextile must be free of defects such as holes, tears, and abrasions. The geotextile must be free of any chemical treatment or coating that significantly reduces its porosity. Fibers must contain stabilizers, inhibitors, or both to enhance resistance to ultraviolet light. Geotextile, other than that used for temporary silt fence, must conform to the requirements in tables 592-1 or 592-2, as applicable. Geotextile used for temporary silt fence must conform to ASTM D6461.

Thread used for factory or field sewing must be of a color contrasting to the color of the fabric and made of high-strength polypropylene, polyester, or polyamide material. It must be as resistant to ultraviolet light as the geotextile being sewn.

### **3. Classification**

There are two geotextile classifications, woven and nonwoven. Geotextile for temporary silt fence may be either woven or nonwoven. Slit film woven geotextile may not be used except for temporary silt fence.

Woven geotextiles are made from fabric that is formed by the uniform and regular interweaving of the threads or yarns in two directions. Woven fabrics must be manufactured from monofilament yarn formed into a uniform pattern with distinct and measurable openings, retaining their position relative to each other. The fabric must have a selvedge edge or otherwise be finished to prevent unraveling.

Nonwoven geotextiles are made from fabric that is formed by a random placement of threads in a mat and bonded by needle punching, heat bonding, or resin bonding. Nonwoven geotextile must have distinct but variable small openings, retaining their position relative to each other when bonded. The use of heat- or resin-bonded nonwovens is restricted as specified in Note 2 of Table 592-2. Non-woven geotextile fabric is a suitable material for wrapping filter stone to form a filter blanket for facilitating drainage.

### **4. Sampling and Testing of Geotextile**

The geotextile must conform to tables 592-1, 592-2, or ASTM D6461 as applicable for the product type shown on the label. Documentation described in either a. or b. below is required to verify the product meets the specified requirements:

- A. Product properties as listed in the latest edition of the "Specifiers Guide," Geosynthetics (Industrial Fabrics Association International, 1801 County Road B, West Roseville, MN 55113-4061 or at <http://www.geosindex.com>), and that represent average roll values, are acceptable.
- B. Test data from the geotextile production run for each of the specified tests listed in Tables 592-1, 592-2, or ASTM D6461, as applicable. Requirements for woven geotextiles are shown below in Tables 592-1 and 592-2.

### **5. Shipping and Storage**

Each roll of geotextile must be labeled or tagged to clearly identify the brand, class, and the individual production run in accordance with ASTM D4873. The geotextile must be shipped and transported in rolls wrapped with cover for protection from moisture, dust, dirt, debris, and ultraviolet light. The cover must be maintained undisturbed to the maximum extent possible before placement. Replacement for woven geotextile materials is shown below in Table 592-1 and 592-2.

### **6. Scope**

This specification covers the quality of geotextile, including geotextile for temporary silt fence.

**Table 592-1** Requirements for woven geotextiles <sup>1/</sup>

Property	Test method	Class I	Class II	Class III	Class IV
Grab tensile strength (lb)	ASTM D4632	247 minimum	180 minimum	180 minimum	315
Elongation at failure (%)	ASTM D4632	<50	<50	<50	<50
Trapezoidal tear strength (lb.)	ASTM D4533	90 minimum	67 minimum	67 minimum	112 minimum
Puncture strength (lb.)	ASTM D6241	495 minimum	371 minimum	371 minimum	618 minimum
Ultraviolet stability (% retained strength)	ASTM D4355	50 minimum	50 minimum	50 minimum	70 minimum
Permittivity (sec <sup>-1</sup> )	ASTM D4491		as specified		
Apparent opening size (AOS) <sup>2/</sup>	ASTM D4751		as specified		
Percent open area (POA) (%)		USACE <sup>3/</sup> CWO-02215-86			

1/ All values are minimum average roll values (MARV) in the weakest principal direction, unless otherwise noted.

2/ Maximum average roll value.

3/ Note: CWO is a USACE reference.

**Material Specification 592** Geotextile (continued)

**Table 592-2** Requirements for nonwoven geotextiles <sup>1/</sup>

Property	Test method	Class I <sup>2/</sup>	Class II <sup>2/</sup>	Class III <sup>2/</sup>	Class IV <sup>2/</sup>
Grab tensile strength (lb.)	ASTM D4632 grab test	202 minimum	157 minimum	112 minimum	202 minimum
Elongation at failure (%)	ASTM D4632	50 minimum	50 minimum	50 minimum	50 minimum
Trapezoidal tear strength (lb.)	ASTM D4533	79 minimum	56 minimum	40 minimum	79 minimum

Puncture strength (lb.)	ASTM D6241	433 minimum	309 minimum	223 minimum	433 minimum
Ultraviolet light (retained strength) (%)	ASTM D4355	50 minimum	50 minimum	50 minimum	50 minimum
Permittivitysec <sup>-1</sup>	ASTM D4491		0.70 minimum or as specified		
Apparent opening size (AOS) (mm) <sup>3/</sup>	ASTM D4751		0.22 maximum or as specified		

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- 1/ All values are minimum average roll values (MARV) in the weakest principal direction, unless otherwise noted.  
2/ Needle punched geotextiles may be used for all classes. Heat-bonded or resin-bonded geotextiles may be used for class IV only.  
3/ Maximum average roll value.
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**Table 592-2**      Requirements for nonwoven geotextiles <sup>1/</sup>

<b>Property</b>	<b>Test method</b>	<b>Class I <sup>2/</sup></b>	<b>Class II <sup>2/</sup></b>	<b>Class III <sup>2/</sup></b>	<b>Class IV <sup>2/</sup></b>
Grab tensile strength (lb.)	ASTM D4632 grab test	202 minimum	157 minimum	112 minimum	202 minimum
Elongation at failure (%)	ASTM D4632	50 minimum	50 minimum	50 minimum	50 minimum
Trapezoidal tear strength (lb.)	ASTM D4533	79 minimum	56 minimum	40 minimum	79 minimum
Puncture strength (lb.)	ASTM D6241	433 minimum	309 minimum	223 minimum	433 minimum
Ultraviolet light (retained strength) (%)	ASTM D4355	50 minimum	50 minimum	50 minimum	50 minimum
Permittivitysec <sup>-1</sup>	ASTMD4491		0.70 minimum or as specified		
Apparent opening size (AOS) (mm) <sup>3/</sup>		ASTM D4751		0.22 maximum or as specified	

1. All values are minimum average roll values (MARV) in the weakest principal direction, unless otherwise noted.
2. Needle punched geotextiles may be used for all classes. Heat-bonded or resin-bonded geotextiles may be used for class IV only.
3. Maximum average roll value.

## **Construction Specification 95—Construction Schedule**

The contractor shall prepare a construction schedule that identifies all sites by DSR/Group No./Site No. and Property Owner. The schedule must visually illustrate and show all tasks, scopes of work, milestones, and proposed completion dates planned for executing of each DSR. The anticipated completion date for completing all work required by each DSR shall also be shown in the chart. A Gant chart, XCEL chart, or other commercially available visual graphic type construction schedule shall be submitted at least 10 days prior to construction.

## **Construction Specification 00—Invoicing/Retainage of Payment**

For interim work task or milestones completed prior to the time of Substantial Completion of the project, the contractor shall submit progress payment request at 30 day intervals. Invoices submitted **must** include all of the following:

- (1) Brief description of the work completed
- (2) Every invoice **must** include the following project billing code identifiers: DSR number/  
**No. 37-03-18-5038-377**
- (3) Quantities and costs

- (4) Contract amount for the DSR payment requested/Percent that present invoice represents; and the amount remaining in the DSR budget

Each DSR will have a “not-to-exceed” contract amount that the contractor shall be responsible for managing **cost accounting for the contract so as to not exceed the cost for the DSR. Costs shall not exceed** the ceiling cost awarded for the DSR. The Sponsor may determine that circumstances or reasons for the contractor exceeding the DSR award ceiling may be warranted and will provide written authorization only in such cases when sufficient justification has been provided. No guaranty is implied or expressed that payment will be authorized for any DSR that is exceed.

For each progress payment made by the contractor prior to the time Substantial Completion of the work has been reached, the Sponsor shall retain ten percent (10%) of the contract amount for the DSR for which the contractor has provided services and goods, Retainage shall be managed in accordance with North Carolina Code and State Law. The prevailing requirements for payment of services will be defined in the contract between Pamlico County Government Administrative Office and each contractor awarded under this contract.

### **Design Specifications 01—Exceptions and Exclusions**

Ardurra/RMA’s work scope under this EWP contract did not include precursor studies, assessments, investigations, or evaluations to determine the structural or geotechnical integrity of property or structures. This includes soil conditions, subsurface conditions, foundation, slopes, terraces, or any other existing structures or features. No inference is made in these Plans & Specifications regarding the existing condition of such features.

Ardurra/RMA’s specifically asserts no claim as to the condition of existing or newly constructed harden structures including rip-rap armor, dwellings, buildings, garages, walkways, driveways, utilities, septic tanks, water lines, gas lines, dwelling foundations, or any other structure present on these sites. Ardurra’s design considerations has not proposed or effected any change to the purpose, size, function, dimension, or structural integrity of any structure located on the EWP project site. The design engineer has included no specifications or direction to cause contractor’s working on these sites to alter or change any of the harden structures specified above, especially any existing marine structures (new or old) and residential dwellings. Contractors proposing work on these EWP sites are advised to do so with extreme caution and to implement precautionary measures prior to construction, to protect any and all structures. The designer accepts no responsibility for any damages that may be claimed or caused by the contractor’s performance during the implementation of the emergency repairs identified in these Plans & Specifications.

### **Construction Specification 02—Reliance on Surveying Data**

The Pamlico County Government Administration Office procured Vaughn & Melton, PA for surveying services needed in the preparation of these Plans & Specifications. Surveying services included: boundary surveys/property line identification; establishment of temporary benchmarks; preparation of plan sheets showing existing conditions; preparation of cross-sections; estimates of cut/fill quantities; identification of top of bank and toe of fill; determination of existing pre-construction elevations and contours; and preparation of proposed final grade details, elevations/location, and geometry. The Sponsor and Ardurra/RMA relied on the accuracy of the survey data, details, and contracted services provided by Vaughn & Melton, PA to facilitate the preparation of these Plans & Specifications. Errors or omissions that may be discovered in the sealed Vaugh & Melton, PA site surveys, plan sheets, or other the drawings performed, are the sole responsibility of Vaugh & Melton. Should errors, omissions or inaccuracy be identified in the surveys or drawings that affect or impede the proposed construction methods or costs, the Sponsor or their representatives, will request Vaugh & Melton, PA to take immediate action, at their costs, to remedy any and all deficiencies.

-----**END OF PLANS & SPECIFICATIONS**-----