

## **HORRY COUNTY SOLID WASTE AUTHORITY, INC.**

The Horry County Solid Waste Authority, Inc. is requesting sealed proposals for the construction of a Recycling and Convenience Center on McDowell Shortcut. The work consists of clearing, grubbing and stripping or from rough grade to finish grade, paving of center and entrance road, the construction of culverts, a retention pond, storm sewer inlets and other drainage structures as shown on the drawings and specified herein.

**A Mandatory Pre-bid Conference to answer any questions will be held on February 2, 2017 at 2:00 PM in the Horry County Solid Waste Authority's Multi-Purpose Room, 1886 Hwy 90, Conway, South Carolina.**

Interested parties may obtain information from the Solid Waste Authority Administrative Offices located at 1886 Highway 90, Conway, South Carolina or by calling 843-347-1651. Proposals will be received at the Administrative Offices until **February 9, 2017 at 3:00 PM**. Any proposal received later than the specified time will NOT be accepted/considered. The Solid Waste Authority reserves the right to accept or reject any and all proposals or any one item in a proposal.

All proposals must be properly sealed and identified as: **#016-17-12 Construction of McDowell Shortcut Recycling and Convenience Center - Solid Waste Authority** – mailed / delivered to:

Solid Waste Authority  
1886 Highway 90  
Post Office Box 1664  
Conway, South Carolina 29528-1664

Attn: Jan S. Bitting  
#016-17-12

# HORRY COUNTY SOLID WASTE AUTHORITY

## INSTRUCTIONS TO PROPOSERS

- 1 This request for proposal includes the following:
  - A. Instructions to Proposers
  - B. Specifications
  - C. Proposal Form (s)
2. Proposal (s) will be examined promptly after opening; immediately thereafter, all proposals will be tabulated with said tabulation being made available to all participating. It is not a practice to award any proposal until the Authority has had ample time to review each Proposal. Award will be made however, at the earliest possible date. If the mail is delayed beyond the date and hour set for the proposal opening, Proposal (s) thus delayed, will **NOT** be considered. Any Proposal not present at appointed time will not be opened. Facsimiles will not be accepted. **The proposal number must be clearly visible on the outside envelope.**
3. TAXES - The Authority pays South Carolina State Sales Tax. The Authority is exempt from Federal Excise Tax and will issue exemption certificates as requested.
4. AWARD OF PROPOSAL - Award of Proposal shall be made to the lowest responsible proposer meeting the Specifications, taking into consideration the following:
  - A. Superior Quality
  - B. Adequate Maintenance and Service
  - C. Past Experience with Company's Equipment
  - D. Company's Reputation
  - E. Known as Technically Good and Innovative Company
  - F. Delivery Date
  - G. Guarantees/Warranties
  - H. Performance of Proposer's equipment in hands of other agencies, plants, and firms.
5. Each proposer must submit a proposal (s) on the blank form attached. The Proposer shall sign his proposal form correctly and proposal (s) may be rejected if there are any omissions, alterations of form, additions not called for, conditional proposal or any irregularities of any kind.
6. DEVIATIONS - Any deviations from these Specifications MUST be noted in detail and submitted in writing with this PROPOSAL. The absence of this Specification deviation will hold the Proposer strictly accountable to the Specifications as written herein. Failure to submit this document of Specification deviation, if applicable, shall be grounds for rejection of the item (s) when offered for delivery.

7. CHANGES - Any changes in Specifications after the Purchase Order/Contract has been awarded, must be with the written consent of the Authority; otherwise, the responsibility for such changes shall be with the Vendor.
8. DELIVERY- Complete unit (s) shall be delivered to the Horry County Solid Waste Authority, 1886 Highway 90, Conway, South Carolina.
9. PAYMENT- The Solid Waste Authority will be invoiced after delivery of equipment or completion of project, the payment terms for this invoice shall be Net 30.
10. INFORMATION – **All questions must be submitted, in writing** to Ms. Jan Bitting, Director of Finance and Administration, fax number 843 347-3653. Proper reference to this proposal is required. **Deadline for questions is seven- (7) calendar days prior to proposal opening date.** Questions will be answered in writing and a copy will be forwarded to all vendors who received a proposal package. All changes in specifications shall be in writing and furnished to ALL PROPOSERS. Verbal information obtained otherwise, will **NOT** be considered in awarding of proposal.
11. BUSINESS LICENSE - The successful Proposer must provide a copy of their current Horry County Business License.
12. BID BOND – Proposers shall submit with their Proposal (s) a Bid Bond in the amount of five percent (5%) of the amount of the total delivered price of the equipment, which guarantee may be in the form of Surety Bond, Certified Check, Cashier's Check, Bank Money Order of any National or State Bank and shall be made payable to the Horry County Solid Waste Authority. Bid Proposal (s) submitted without being accompanied by any of the foregoing, when required, shall be considered informal and may be rejected. Checks will be forfeited to the Authority, as liquidated damages in case an award is made and the contract bond are not promptly and properly executed.
13. PERFORMANCE BOND – The successful proposer will be required to furnish a Performance Bond in the full amount of the contract sum, issued by a bonding company licensed to do business in South Carolina and, on the approved list of the Treasurer of the United States.
14. RETURN OF CHECKS – When proposals are awarded, the Authority will return immediately all checks, except those of the successful proposer (s).
15. The Authority reserves the right to reject any or all Proposals. It further reserves the right to waive technicalities and formalities in proposals as well as to accept in whole or in part such proposals or proposals where it deems it advisable in protection of the best interests of the Authority.
16. INSURANCE: The successful proposer shall be required to maintain General Liability Insurance in the amount of One Million Dollars (\$1,000,000.) and maintain Workman's Compensation Insurance. The contractor shall be required to submit a copy of proof of insurance prior to commencement of work.

17. Any material included with the proposal becomes the property of the Authority and are not returnable.
18. Any Proposer aggrieved in connection with the solicitation or award of a contract may protest to the Executive Director in writing within 7 days after such person knows or should have known of the facts giving rise to the grievance.

**SPECIFICATIONS**

**FOR**

**Construction of a Recycling and  
Convenience Center  
McDowell Short-Cut Road in the Burgess  
Community of Horry County, SC**

**January 2017**

**SOLID WASTE AUTHORITY  
P.O. BOX 1664  
CONWAY, SOUTH CAROLINA 29528**

# Request for Proposals

## Introduction

The Horry County Solid Waste Authority, Inc. (SWA) is requesting sealed proposals for the site work associated with the development of a Recycling and Convenience Center on McDowell Short-Cut Road , approximate 0.5 mile south of Inverness Lane (back of the existing recycling facility) in the Burgess Community of Horry County, SC. All proposers should become familiar with the proposal package and develop a full understanding of its content.

Enclosed is a set of plans which were prepared by Mr. David Norris with DN Engineering, Inc. under the direction of Ms. Esther Murphy and Mr. Jamie Suggs, SWA's Unincorporated Collection Systems Manager. Mr. Suggs will be the project manager for the construction of the recycling center. Mr. Suggs can be contacted at (843) 347-1651 or (843) 385-7649 (cell).

**A site visit, with Mr. Suggs in attendance, is recommended for each proposer in order to obtain a complete understanding of the project.**

## Background

The SWA manages and operates twenty – four (24) manned recycling and convenience centers on behalf of Horry County. The layout of the convenience centers vary since each center's property dimensions are different.

The center will contain containers for various materials. The containers will be located on concrete pads; however, SWA is not requesting proposals for the construction of the concrete pads.

## Requirements

The project will consist of the following type of work:

1. Clearing and grubbing approximately 4.70 acres of land.
2. Stripping of topsoil.
3. Providing required fill material.
4. Compacting sub-grade.
5. Providing and installing asphalt and base course for all driving areas.
6. Provide and install: drainage pipes and catch basins.
7. Construct grassed swales and excavate retention pond.
8. Install outfall structure in pond.
9. Install required silt fence.
10. Install Inlet protection, vegetative matting, and hydroseeding.
11. Construction and maintenance of construction entrance.
12. Installation of 6.0" pvc waterline that will have to be tested and chlorinated.
13. Construct a +600 ft entrance road the facility site.
14. Install the 6.0" chainlink fence and gates.
15. Demolish the existing facility after new center is open.
16. Fine grade and grass the old center site back until a thorough stand of vegetation is established.
17. Construction of an earthen berm along the southern property line.
18. All concrete pads.
19. Planting of all landscaping.
20. Grassing/seeding the site to establish a thorough stand of vegetation.
21. Coordinating with SWA and GSWSA their part of the work.
22. Installation of the water and sewer service lines (& outside spigots).
23. Installation of guard rail per SCDOT specifications along the entrance.

In addition to the above, the plans include the following items which the SWA will handle separately from the work requested in this Request for Proposal: a lift station and force main (by GSWSA), the office and storage buildings, the bins, compactors and/or any specialized equipment associated of the recycling center site.

Also, specifications are included for the following work:

- A. Site Clearing & Tree Protection
- B. Erosion and Sediment Control
- C. Trench Excavation and Backfill
- D. Storm Drainage Structures, pipe and Fittings
- E. Concrete (Site work)
- F. Bituminous Paving, Base Course and Paint Markings
- G. Water Distribution System
- H. Earthwork
- I. Sodding, Trees and Shrubs

Please note that the Proposal Form contained in the RFP must be used when submitting your proposal.

Please attach additional information requested in the Proposal Form with your submittal.

**The quantities shown are estimates only. The successful proposer will be paid using the unit prices submitted to SWA times the actual, verified quantity.**

**Design Plans:**

- **Proposed Site Plan** Sheet C1
- **Proposed Drainage Plan** Sheet C2
- **Proposed Grading Plan** Sheet C3
- **Erosion Control Plan** Sheet C4
- **Construction Details** Sheet C5
- **Water & Sewer Plan** Sheet C6
- **Water & Sewer Details** Sheet C7
- **New Driveway Layout** Sheet C8
- **New Driveway Grades** Sheet C9
- **Proposed Landscaping Plan** Sheet L1

## **SITE CLEARING AND TREE PROTECTION**

### **PART 1 GENERAL**

#### **1.01 WORK INCLUDED:**

- A. Clear designated areas of plant life and grass;
- B. Remove designated trees and shrubs including the root system; and
- C. Remove surface debris.
- D. Tree protection barricades for existing trees to remain.
- E. Coordination of and compliance with professional tree work being performed by the Owner.

#### **1.02 RELATED SECTIONS:**

- A. Section 02200 - Earthwork

#### **1.03 REGULATORY REQUIREMENTS**

- A. Conform to applicable laws and rules of the Horry County for disposal of debris.
- B. Comply with tree protection requirements of the Horry County.

### **PART 2 PRODUCTS**

NOT USED

### **PART 3 EXECUTION**

#### **3.01 CLEARING**

- A. Strip existing top soil and stockpile from areas of new construction for use in final grading. Protect stockpile from erosion. See Section 02200.
- B. Remove from the designated areas all underbrush, debris, litter, dead materials, etc., without disturbing subsoil.

#### **3.02 PROTECTION**

- A. Protect benchmarks and existing work from damage or displacement.
- B. Maintain designated site access for vehicular and pedestrian traffic.
- C. Maintain necessary control devices and/or barricades during all work to insure safety of those using school premises.

- D. Protect designated trees to remain from damage including root systems, trunk and canopy. Install a physical barricade at the drip line to insure survival of the tree. After the necessary permit approvals have been granted, and **before** any site work has begun, the Contractor shall cause protected trees to be clearly identified with surveyor's flagging. DO NOT spray paint existing trees to be protected. During construction, a minimum protective zone, marked by orange plastic safety fencing barriers not less than three (3) feet high, shall be established (erected) at the "drip line" and maintained around all trees to be retained as required by this section. Barriers may be supported by wooden or metal posts. There shall be no construction, paving, grading, use of equipment / vehicles (operation, parking or storage), or storage of materials within this protected zone. In addition, the Contractor shall be responsible for compliance with the recommendations of the Owner's tree care professional for the protection and health of these trees.
- E. Tree care services being performed by the Owner's professional consultant include the following for existing trees to remain within or adjacent to areas of new construction:
1. Pruning
  2. Aeration
  3. Fertilization
  4. Root pruning (as needed before and during earthwork operations)
  5. Monitoring trees during construction
  6. Inspection of tree barricades (purchased, erected, and maintained by the Contractor)
  7. On-site meetings / visits with Owner, City, Architect, Contractor

### 3.03 REMOVAL

- A. Remove debris from site.

**END OF SECTION**

## EROSION AND SEDIMENT CONTROL

### PART I- SCOPE

#### 1.00 Special Conditions:

- A. The contractor shall be responsible for maintaining all sediment and erosion control measures until the duration of the project including maintaining and replacing/repairing any of the structures referenced on the erosion control plan that is not functioning properly.
- B. The contractor shall take appropriate steps (such as using a water truck to keep eliminate dust) to minimize are-borne pollution from the start of construction until the site is thorough stabilized, approved by SCHEC-OCRM (the governing body with jurisdiction) & the engineer and accepted by the owner.
- C. The maintenance of the erosion control measures including the repairing/replacing worn or ineffective devices will be the responsibility of the contractor until the project is completed.
- D. The contractor shall be responsible for the removal of all erosion control devices once the project is finished and the site is thoroughly stabilized.

#### 1.01 WORK INCLUDED

- A. The work included under this section consists of furnishing all labor, equipment, and work includes the installation, inspection, and maintenance of sediment and erosion control structures during land disturbing activities and the removal of these structures upon stabilization of the disturbed areas.
- B. Definitions:
  - 1. Sediment Fence: A temporary sediment barrier consisting of filter fabric stretched across and attached to supporting posts, and entrenched.
  - 2. Permanent Seeding: A permanent sediment control consisting of grass seed or grass sprigs, fertilizer, water, and mulch.
  - 3. Gravel Construction Entrance: A temporary sediment control consisting of a gravel driveway or pad located at a point where vehicles enter and exit the construction site.
  - 4. Dust Control: A temporary control to prevent the surface and air movement of dust.

## PART II- MATERIALS

## 2.01 PRODUCTS

## A. Sediment Fence

1. Synthetic filter fabric shall be a pervious sheet of propylene, nylon, polyester or ethylene yarn certified by the manufacturer or supplier as conforming to the following requirements:

Property	Specification Range	Test Method
1. Tensile Strength (lbs.)	100-190	ASTM D-1682
2. Elongation (%)	35 max.	ASTM D-1682
3. Burst Strength (psi)	200-300	ASTM D-3786
4. Puncture Strength (lbs.)	70-80	ASTM D-751
5. Trapezoidal Tear (lbs.)	50-65	ASTM D-1117
6. Equiv. Opening Sieve Size	30-700	COECW-02215
7. Permeability Coefficient (cm/sec)	0.009-0.2 (75 mm to 25 mm)	Falling Head

## Acceptable Fabrics:

1. Amoco-- Propex Silt Shop
2. Mirafi Environfence
3. Exxon 100S-105S

2. Posts for silt fences shall be 1.33 pounds per linear foot steel, at least 5 feet long. Steel posts shall have projections for fastening wire to them.

3. Wire fence reinforcement for silt fences using standard strength filter cloth shall be a minimum of 42 inches in height, a minimum of 14 gauge, and shall have a maximum mesh spacing of 6 inches.

- B. Permanent Seeding-- Grass seed shall be free from noxious weed seeds and recleaned. Seed shall be recent Grade A crop treated with appropriate fungicide at time of mixing and delivered to the site in sealed containers with dealer's guaranteed analysis

- C. Gravel-- Gravel shall be clean #57 stone.

- D. Hydroseed-- Hydroseed slurry mixture shall be :

Wood Fiber Mulch:	1200 lbs/acre
Carpet grass:	50 lbs/acre
Rye grain:	150 lbs/acre
Centipede grass:	20 lbs/acre
10/10/10 Fertilizer:	400 lbs/acre

## PART III- WORKMANSHIP

### 3.01 SEDIMENT FENCES

#### A. Sheet Flow Applications

1. The height of a sediment fence shall be a minimum of 15 inches and shall not exceed 18 inches.
2. Standard strength synthetic filter fabric shall be in a continuous roll cut to the length of the barrier to avoid the use of joints. When joints are necessary, the fabric shall be spliced together only at a stake, with a minimum 6 inch overlap, and sealed securely.
3. The stakes shall be spaced a maximum of 6 feet apart along the barrier and driven securely into the ground a minimum of 24 inches.
4. A trench shall be excavated approximately 4 inches wide and 4 inches deep along the line of stakes, upslope from the barrier.
5. The filter material with wire backing shall be attached to the steel post, and 8 inches of the fabric shall be extended into the trench. Heavy duty wire staples at least 1/2 inch long shall be used.
6. The trench shall be backfilled and the soil compacted over the filter material.

#### B. Channel Flow Applications

1. A filter barrier to be constructed across a ditch or swale shall be of sufficient length to eliminate flow around the ends, and the plan configuration shall resemble an arc or horseshoe with the ends oriented upslope.
2. Filter barriers shall be removed when they have served their useful purpose, but not before the upslope areas have been permanently stabilized.
3. Any sediment remaining in place after the barrier has been removed shall be either immediately removed or dressed to conform to the exiting grade, and the area shall be vegetated.

### 3.02 HYDROSEEDING

#### A. Sheet Flow Applications

1. Use only equipment and materials specifically designed for use in hydroseeding applications.
2. Apply mixture to result in complete coverage of all areas to receive seeding.
3. Insure all areas are properly fine graded and free from rocks, debris, ridges and ruts before seeding.
4. Any areas seeded, before fine grading is completed shall be re-seeded at no additional cost to the Owner following correction of the conditions.

### 3.03 GRAVEL CONSTRUCTION ENTRANCE

- A. Gravel entrance shall be installed according to the drawings and maintained in good shape daily. If soil pumps up through the gravel during use, additional gravel shall be installed at the contractor's expense.

## PART IV- INSPECTION AND MAINTENANCE

### 4.01 INSPECTION AND MAINTENANCE

- A. The Contractor shall provide a day to day contact person responsible for the implementation and maintenance of all sediment and erosion controls.
- B. The Contractor' site representative shall keep a log book of the all rain events on site.
- C. Once every seven days or after any storm event greater than 0.5 inches of precipitation during a 24 hour period, an inspection shall be made of all sediment and erosion controls. The performance of each sediment and erosion control shall be logged in the Contractor's log book. Maintenance of all controls shall be made immediately as needed.
- D. All inspection and maintenance shall be conducted in compliance with the SCDHEC-OCRM and Horry County Stormwater Specifications and requirements.

**END OF SECTION**

## TRENCH EXCAVATION AND BACKFILL

### PART I-SCOPE

#### 1.01 WORK INCLUDED

- A. This section covers the work necessary for the trench excavation and backfill, complete, except for pipe base and pipe zone backfill which are included under the specification for the pipe.
  
- B. Type of Backfill
  - 1. For bidding purposes, the class of backfill to be used above the pipe zone is as described below. The right is reserved to modify the use, location, and quantities of the various types of backfill during construction as the Engineer considers to be to the best interest of the Owner.
  
  - 2. Trench backfill above the pipe zone will be divided into the following classifications:
    - a. Class A Backfill
      - 1. In general, Class A backfill will be used throughout the project except where Class D backfill is specified. It is intended that all surfaces for which Class A backfill is specified shall be returned to equal or better condition than that which existed prior to construction. Surfaces shall not settle or rut due to normal weathering or vehicular traffic that can be expected for each area.
  
    - b. Class D Backfill
      - 1. Class D backfill shall be used under all paved streets and driveways where final surfacing replacement will be made sometime after backfilling and subsequent trench settlement must be held to a minimum.
  
      - 2. Class D backfill shall also be used under all culverts, water, gas, irrigation, and sewer lines, buried telephone, power and television cable, and any other miscellaneous buried pipelines or cables that cross the excavated trench. This work shall be done at no additional cost to the Owner.
  
- C. Trench Excavation
  - 1. Excavation is unclassified. Complete all excavation regardless of the type of materials encountered. The Contractor shall make his own estimate of the kind and extent of the various materials which will be encountered in the excavation.

## PART II-MATERIALS

### 2.01 SUITABLE BACKFILL MATERIAL

A. Material suitable for backfill in a properly dewatered trench shall consist of any of the following: Well graded coarse granular materials with maximum particle size not exceeding 3 inches; sands; silty-sands or clayey sands. Soils having more than 35 percent of its weight passing a No. 200 sieve shall not be used for backfill.

B. Concrete for Trench Backfill: Conform to ASTM C 94, Alternate 3. Proportion to obtain a 28-day compressive strength of 3000 pounds per square inch. Use a minimum of five sacks of cement per cubic yard of concrete.

C. Imported Topsoil: Imported topsoil shall be suitable sandy loam from an approved source, which possesses friability and a high degree of fertility. It shall be free of clods, roots, gravel, and other inert material.

### 2.02 COMPACTION EQUIPMENT

A. Compaction equipment shall be of suitable type and adequate to obtain the amount of compaction specified. Compaction equipment shall be operated in strict accordance with the manufacturer's instructions and recommendations and shall be maintained in such condition that it will deliver the manufacturer's rated compactive effort.

## PART III-WORKMANSHIP

### 3.01 DISPOSAL OF CLEARED MATERIAL

A. The Contractor shall bear all costs of disposing of trees, stumps, brush, roots, limbs, and other waste materials from the clearing operation. Material shall be disposed of in such a manner as to meet all requirements of State, County, and local regulations regarding health, safety, and public welfare. When authorized by the proper fire authorities, the Contractor may dispose of flammable refuse by burning on the site of the project provided all requirements set forth by the authorities are met. Nonflammable material, and flammable material, when burning is not permitted, shall be disposed of off the construction site in an approved location at the Contractor's expense.

B. In all cases, the authority to burn shall not relieve the Contractor in any way from damages which may result from his operations. In no case shall any material be left on the project, shoved onto abutting private properties, or be buried in embankments or trenches on the project.

C. On easements through private property, the Contractor shall not burn on the site unless specifically permitted in writing by the Owner of the property, in addition to complying with all State, County, and local regulations regarding burning.

### 3.02 OBSTRUCTIONS

A. This item refers to obstructions which may be removed and do not require replacement. Remove obstructions within the trench area or adjacent thereto such as tree roots, stumps, abandoned piling, buildings and concrete structures, logs, and debris of all types without additional compensation. The Engineer may, if requested, make changes in the trench alignment to avoid major obstructions, if such alignment changes can be made within the easement or right-of-way without adversely affecting the intended function of the facility. The Contractor shall pay all additional costs or credit the Owner for any savings resulting from such alignment changes.

B. Dispose of obstructions removed from the excavation in accordance with paragraph, DISPOSAL OF CLEARED MATERIAL.

### 3.03 REMOVAL AND REPLACEMENT OF TOPSOIL

A. Where trenches cross lawns, garden areas, pasturelands, cultivated fields, or other areas on which reasonable topsoil conditions exist, remove the topsoil for a depth of 12 inches for the full width of the trench to be excavated. Stockpile this topsoil to one side of the right-of-way and do not mix with the remaining excavated material. Replace the topsoil in the top 12 inches of the backfilled trench. Minimum finished depth of topsoil over all trenches shall be 10 inches.

B. In lieu of stockpiling and replacing the topsoil, imported topsoil from borrow pits may be substituted in the top 10 inches.

C. Maintain the finished grade of the topsoil level with the area adjacent to the trench until final acceptance by the Engineer. Repair damage to adjacent topsoil caused by work operations. Remove all rock, gravel, clay, and any other foreign materials from the surface, regrade, and add topsoil as required.

### 3.04 TRENCH WIDTH

A. Minimum width of unsheeted trenches in which pipe is to be laid shall be 18 inches greater than the inside diameter of the pipe, but not less than that required for proper compaction around the pipe. Sheet piling requirements shall be independent of trench widths.

B. The maximum width at the top of the trench will not be limited, except where excess width of excavation would cause damage to adjacent structures or property.

### 3.05 GRADE

A. Excavate the trench to the lines and grades shown or as established by the Engineer with proper allowance for pipe thickness and for pipe base or special bedding when required. If the trench is excavated below the required grade, correct any part of the trench excavated below the grade at no additional cost to the Owner, with material of the type specified for pipe base in the appropriate pipe materials section of these Specifications. Place the base material over the full width of trench in compacted layers not exceeding 6 inches deep to the established grade.

### 3.06 SHORING, SHEETING, AND BRACING OF TRENCHES

A. Sheet and brace the trench when necessary to prevent caving during excavation in unstable material, or to protect adjacent structures, property, workmen, and the public. Increase trench widths accordingly by the thickness of the sheeting. Maintain sheeting in place until the pipe has been placed and backfilled at the pipe zone. Shoring and sheeting shall be removed, as the backfilling is done, in a manner that will not damage the pipe or permit voids in the backfill. All sheeting, shoring, and bracing of trenches shall conform to the safety requirements of the Federal, State, or local public agency having jurisdiction. The most stringent of these requirements shall apply.

### 3.07 LOCATION OF EXCAVATED MATERIALS

A. During trench excavation, place the excavated material only within the construction easement, right-of-way, or approved working area. Do not obstruct any private- or public-traveled roadways or streets. Conform to all Federal, State, and local codes governing the safe loading of all trenches with excavated material.

### 3.08 REMOVAL OF WATER

#### A. Dewatering and Drainage

1 At all times during construction the Contractor shall keep excavations free from standing water. Sumps, if required, shall be located outside of load bearing areas so the bearing surfaces will not be disturbed.

## **STORM DRAINAGE STRUCTURES, PIPE AND FITTINGS**

### **PART 1-SCOPE**

#### **1.01 WORK INCLUDED**

A. The work covered and described in the Section includes the furnishing and construction of culverts, storm sewers, inlets and other drainage structures as shown on the Drawings and specified herein.

#### **1.02 RELATED WORK**

A. Section 3000-Concrete

#### **1.03 SUBMITTALS**

A. Shop Drawings: Shop drawings for the following items shall be submitted for approval.

1. Grates and castings
2. Precast structures
3. Radius pipe

B. Pipe certification of quality by producer shall be delivered to Engineer ten days prior to installation.

#### **1.04 JOB CONDITIONS**

A. Existing Drainage System: Maintain operational, prevent siltation.

B. Cleanup: Maintain surface grade within 400 feet of pipe laying operation.

### **PART 2-MATERIALS**

#### **2.01 PRODUCTS**

A. General: The Contractor must furnish reinforced concrete culvert pipe.

B. Concrete Pipe: Concrete pipe shall be reinforced concrete culvert pipe conforming to ASTM Designation C 76, Table III, except when otherwise indicated. Reinforced concrete horizontal elliptical pipe shall conform to the requirements of ASTM Designation C 507, Class HE III. Pipe joints shall be bell and spigot joints joined together with Ram-Nec sealant.

C. Corrugated Polyethylene pipe: Shall conform to AASHTO M 294 and shall be Advanced Drainage System, Inc. Type N-12 with annular corrugations and be furnished in single lengths where practicable.

D. Brick: Brick for drainage structures shall be dense, hard burned, shale or clay brick conforming to ASTM Designation C 32, Grade MM or C 62, Grade MW, except that brick absorption shall be between five and twenty-five grams of water absorbed in one minute by dried brick, set flat face down, in 1/8-inch of water.

E. Cement Mortar: Cement mortar for manhole construction shall be one part cement and two parts clean sharp sand to which may be added lime in the amount of not over twenty-five percent volume of cement. It shall be mixed dry and then wetted to proper consistency for use. No mortars that have stood for more than one hour shall be used.

F. Concrete: Concrete shall conform to the requirements of Section 03000 Concrete and unless otherwise specified all concrete shall be Class B.

G. Precast Concrete Units: Precast concrete inlets shall conform to applicable requirements of Sect. 03000 Concrete of these Specifications. Concrete for use in precast units shall be Class A.

H. Castings: Castings for inlets and other items shall conform to the ASTM Designation A 48, Class 25. Castings shall be true to pattern in form and dimensions and free of pouring faults and other defects in positions which would impair their strength or otherwise make them unfit for the service intended. No plugging or filling will be allowed. Casting patterns shall conform to those shown or indicated on the Drawings.

I. Filter Fabric: A non-woven filter fabric a minimum 48" in width shall be centered over each drainage culvert joints – Mirafi 140N or equal.

## PART 3-WORKMANSHIP

### 3.01 PREPARATION

#### A. Pipe Trenches:

1. Pipe trenches shall be of necessary widths for the proper laying of the pipe and the banks shall be as nearly vertical as practicable. In paved areas the trench shall be vertical and sheeted, if required; the clearance between the pipe and trench wall or back of sheeting shall not exceed 18 inches. The bottom of the trenches shall be excavated to a depth of the outside bottom of the pipe barrel. Any over excavation shall be replaced with suitable compacted material. Excavation for inlets and other appurtenances shall be sufficient to provide a clearance between their outer vertical surfaces and the face of the excavation or sheeting, if used, of not less than 12-inches.

2. Soft, spongy, or otherwise unstable material encountered below the established grade of the excavation which will not provide a firm foundation for subsequent work shall be removed and replaced as directed. Unless otherwise directed, all such unstable materials shall be removed for the full width of the excavation and replaced with approved fill material.

3. Where sheeting and bracing are necessary to prevent caving of the trench sidewalls or sidewalls of excavation for other structures, and to safeguard the workmen, the trench or excavation for other structures shall be dug to such width that the proper allowance is made for the space occupied by the sheeting and bracing to provide clearance as specified above.

### 3.02 INSTALLATION

#### A. Laying Concrete Pipe:

1. All pipe shall be carefully laid true to the line and grade shown on the Drawings. Any deviation from true alignment or grade which would result in a displacement from the normal position of the gasket of as much as 1/4-inch, or which would produce a gap exceeding 1/2-inch between sections of pipe for more than 1/3 of the circumference of the inside of the pipe, will not be acceptable and where such occurs, the pipe shall be relaid without additional compensation. No mortar, joint compound, or other filler which would tend to restrict the flexibility of the gasket joint shall be applied to the gap. Pipes having defects that have not caused their rejection are to be so laid that these defects will be in the upper half of the sewer.

2. Before installation of the pipe gasket, the gasket and the surface of the pipe joint, including the gasket recess shall be clean and free from grit, dirt, or other foreign matter at the time the joints are made. In order to facilitate closure of the joint, application of an approved vegetable soap lubricant immediately prior to closing of the joint will be permitted.

3. All pipes shall be laid with bells or grooves uphill. As the pipes are laid throughout the work, they must be thoroughly cleaned and protected from dirt and water. No length of pipe shall be laid until the two preceding lengths have been thoroughly embedded in place so as to prevent any movement or disturbance of the finished joint. No walking on or working over the pipes after they are laid, except as may be necessary in tamping earth and refilling, will be permitted until they are covered to a depth of 1-foot. No pipe shall be laid except in the presence of the authorized inspector. Fill placed around the pipe shall be deposited on both sides simultaneously to approximately the same elevation and uniformly compacted. Whenever the pipe laying is discontinued, as at night, the unfinished end is to be securely protected from displacement due to caving of the banks or from other injury and a suitable stopper is to be inserted therein.

#### B. Laying Corrugated Pipe:

1. All corrugated pipe shall be carefully laid, true to the line and grade shown on the Drawings. The pipe gasket and coupling and shall be centered over the joint with the coupling band bolts securely tightened without cutting the gasket.

2. Fill placed around the pipe shall be deposited on both sides simultaneously to approximately the same elevation and uniformly compacted. Whenever the pipe laying is discontinued, as at night the unfinished end is to be securely protected from displacement due to caving of the banks or from other injury and suitable stopper is to be inserted therein.

C. Drainage Structures:

1. Concrete inlets or other structures shall be constructed in conformity with the Drawings. Forms shall be designed and constructed so that they may be removed without injury to the concrete and shall be left in place for at least 24 hours after concrete is poured. Concrete shall be thoroughly tamped and shall be cured for at least 5 days after removal of forms. Honeycomb places shall be thoroughly cleaned, saturated with water and pointed up with mortar.

2. Precast inlets or other structures may be used in lieu of cast-in-place structures. Grates are to be set in place in mortar to the proper line and grade.

D. Backfilling For Pipe Culverts And Drainage Structures:

1. After the pipe has been installed, approved selected material from excavation at a moisture content which will facilitate compaction shall be placed along side the pipe in layers not exceeding 6-inches loose measure in depth. Care shall be taken to insure thorough compaction of the fill under the haunches of the pipe. Each layer shall be thoroughly compacted by rolling or tamping the mechanical rammers. This method of filling and compacting shall be continued until the fill is 12-inches above the pipe, then the remainder of the backfill shall be placed in lifts not exceeding 8-inches. The operation of heavy equipment shall be conducted so that no damage to the pipe will result. Backfill material 12-inches and above the top of the pipe shall be compacted to not less than 95 percent of its modified Procter maximum dry density. Selected material for backfill shall not contain any stones or rock larger than 3-inches. Tests for density of compaction may be made at the option of the Engineer, and deficiencies shall be corrected by the Contractor without additional cost to the Owner.

2. Backfill for drainage structures shall be placed and compacted in the same manner as specified above for pipe, except the concrete shall be permitted to cure for not less than five days before the backfill is placed.

E. Backfilling in Wet Trenches: After the installation of the pipe and drainage structures, backfill material shall carefully and uniformly be simultaneously placed on both sides of the pipe or structure by carefully lowering the material into the trenches down to the water surface and then releasing it to settle through the water. Under no circumstances shall backfill material be dumped, pushed or shoved into the wet trench. Backfill material shall be carefully and uniformly rammed around both sides of the pipe to properly bed and support the pipe. No

specified density requirement shall apply to backfill carefully placed in wet trenches until the fill has reached a level 1-foot above the water, at which elevation and above the backfill densities specified in Paragraph 3.02.D.

**END OF SECTION**

## **CONCRETE (SITEWORK)**

### **PART 1 – GENERAL**

#### **1.1 SECTION INCLUDES**

- A. Concrete slabs and curb and gutter.

#### **1.2 RELATED SECTIONS**

- A. Section 02680 – Bituminous Paving, Base Course, and Pavement Markings

#### **1.3 MEASUREMENT AND PAYMENT**

- A. Payment shall constitute full compensation for furnishing all materials, plant, equipment, tools, forms, inserts, and for all labor and incidentals necessary to complete the work required by these specifications. No payment will be made for any material wasted, used for convenience of the Contractor, unused or rejected.

#### **1.4 REFERENCES (LATEST REVISION)**

- A.** ACI 117 – Specifications for Tolerances for Concrete Construction and Materials.
- B.** ACI 304R – Guide for Measuring, Mixing, Transporting and Placing Concrete.
- C.** ASTM C 31 – Making and Curing Concrete Test Specimens in the Field.
- D.** ASTM C 33 – Concrete Aggregates.
- E.** ASTM C 39 – Compressive Strength of Cylindrical Concrete Specimens.
- F.** ASTM C 94 – Ready-Mixed Concrete.
- G.** ASTM C 150 – Portland Cement.
- H.** ASTM C 172 – Sampling Freshly Mixed Concrete.
- I.** ASTM D 1751 – Preformed Expansion Joint Filler for Concrete Paving and Structural Construction. (Nonextruding and Resilient Bituminous Type).
- J.** ASTM E 329 – Agencies Engaged in Construction Inspection and/or Testing.

#### **1.5 SUBMITTALS FOR REVIEW**

- A. Product Data: Provide data on expansion joint materials, admixtures, and curing compounds.
- B. Concrete Design Mix.

## 1.6 QUALITY ASSURANCE

- A. Perform work in accordance with ACI 301, ACI 318, and ACI 330R.
- B. Obtain cementitious materials from same source throughout.
- C. Conform to ACI 117 – Specifications for Tolerances for Concrete Construction and Materials.

## 1.7 REGULATORY REQUIREMENTS

- A. Conform to SCDOT standards, latest edition.

## 1.8 ENVIRONMENTAL REQUIREMENTS

- A. Do not place concrete when base surface temperature is less than 40 degrees F, or surface is wet or frozen, or if freezing conditions are forecast within 24 hours of placement.

## 1.9 GUARANTEE

- A. Contractor shall guarantee the quality of materials and workmanship for a period of 12 months after acceptance. Defects discovered during this period shall be repaired by Contractor at no cost to the Owner.

## 1.10 TESTING

- A. Testing laboratory shall operate in accordance with ASTM D 3740 and E 329.
- B. Owner's testing laboratory and Project Engineer/Project Representative shall be given a minimum of 48 hours notice prior to taking any tests.
- C. Owner shall select and engage the testing laboratory. Testing laboratory shall be responsible to the Owner and Owner's Engineer. Payment for laboratory and all tests shall be by Owner, except Owner specifically reserves the right to deduct from Contractor's payment, expense, and charges of testing laboratory when:
  - 1. Contractor gives notice work is ready for inspection and testing, and fails to be ready for the test, and/or
  - 2. Testing of the Contractor's work, products, or materials fail, and retesting is required, and/or
  - 3. Contractor abuses services or interferes with the work of testing laboratory in conduct of this work.
- D. Test results shall be furnished to the Engineer prior to continuing with associated or subsequent work.

## PART 2 – PRODUCTS

### 2.1 FORM MATERIALS

- A. Wood or steel form material, profiled to suit conditions.
- B. Joint Filler: ASTM D1751 type; 1/2 inch thick.

### 2.2 CONCRETE MATERIALS

- A. Cement: ASTM C 150, Type I – Normal.
- B. Fine and Coarse Mix Aggregates: ASTM C 33. Coarse aggregate shall consist of granite stone.
- C. Water: Potable, not detrimental to concrete.
- D. Air Entrainment: ASTM C 260.
- E. Chemical Admixture: ASTM C 494, Type A – Water Reducing.

### 2.3 ACCESSORIES

- A. Curing Compound: ASTM C309, clear with fugitive dye.
- B. Sealant: Joints shall be sealed, conforming to ASTM C 920, Type S or M, Grade P or NS, Class 25.

### 2.4 CONCRETE MIX – BY PERFORMANCE CRITERIA

- A. Provide concrete to the following criteria:
  - 1. Compressive Strength: 3,000 psi @ 28 days.
  - 2. Slump: 4 to 5 inches.
- B. Use accelerating admixtures in cold weather only when acceptable to Engineer. Use of admixtures will not relax cold weather placement requirements.
- C. Use calcium chloride only when accepted by Engineer.
- D. Use set retarding admixtures during hot weather only when accepted by Engineer.

### 2.5 SOURCE QUALITY CONTROL AND TESTS

- A. All sampling and testing services shall be performed, at Owner's expense, by a testing agency operating in accordance to ASTM D 3740 and E 329 latest edition and acceptable to the Engineer.

- B. Contractor shall submit to the Engineer a design mix on each class of concrete proposed for use. The mix shall be prepared by an acceptable testing laboratory. Compressive strength of at least four specimens of the design mix shall indicate 15% higher than 28 days strengths specified. During the work, Contractor shall make three test cylinders for each 50 cubic yards, or fraction thereof, of concrete placed each day. One cylinder shall be tested at 7 days and the other two at 28 days in accordance with ASTM C 39. Copies of all test reports shall be furnished to the Engineer.

## PART 3 – EXECUTION

### 3.1 EXAMINATION

- A. Verify subgrade conditions.
- B. Verify compacted subgrade is acceptable and ready to support concrete and imposed loads.
- C. Verify slopes and elevations of subgrade are correct.

### 3.2 CONSTRUCTION OBSERVATION

- A. Engineer or Project Representative will have the right to require any portion of work be completed in their presence and if work is covered up after such instruction, it shall be exposed by Contractor for observation. However, if Contractor notifies the Engineer such work is scheduled, and Engineer fails to appear within 48 hours, Contractor may proceed. All work completed and materials furnished shall be subject to review by the Engineer or Project Representative. Improper work shall be reconstructed. All materials, which do not conform to requirements of specifications, shall be removed from the work upon notice being received from Engineer for rejection of such materials. Engineer shall have the right to mark rejected materials to distinguish them as such.

### 3.3 SUBGRADE

- A. Prepare subgrade in accordance with Section 02200 – Earthwork.

### 3.4 PREPARATION FOR PLACING

- A. Water shall be removed from excavations before concrete is deposited. Hardened concrete debris and other foreign materials shall be removed from the interior of forms and inside of mixing and conveying equipment. The reinforcement shall be made secure in position and shall be subject to examination and acceptance.
- B. Moisten subgrade to minimize absorption of water from fresh concrete.
- C. Coat surfaces of inlet and catch basin frames with oil to prevent bond with concrete pavement.

- D. Notify Engineer minimum 48 hours prior to commencement of concreting operations.

### 3.5 FORMING

- A. Place and secure forms to correct location, dimension, profile, and gradient.
- B. Assemble formwork to permit easy stripping and dismantling without damaging concrete.
- C. Place joint filler in position, in straight lines. Secure to formwork during concrete placement.
- D. Forms shall be constructed to the shape, line, and grade required and shall be maintained sufficiently rigid to prevent deformation under load. Form work and details of construction joints shall conform to ACI-318, Chapter 6.

### 3.6 PLACING CONCRETE

- A. Placing of concrete shall conform to Chapter 5 of the American Concrete Institute Standard A.C.I. 318. Concrete having attained initial set or having contained water for more than 45 minutes shall not be used in the work. Concrete shall not be dropped freely more than 5 feet. Concrete shall be mixed and placed only when the temperature is at least 40 degrees F and rising. Concrete shall be placed only upon surfaces free from frost, ice, mud and other detrimental substances or conditions. When placed on dry soil or pervious material, water proof paper or polyethylene sheeting shall be laid over surfaces to receive the concrete.
- B. Ensure reinforcement, inserts, embedded parts, formed joints and forms are not disturbed during concrete placement.
- C. Place concrete continuously over the full width of panel and between predetermined construction joints. Do not break or interrupt successive pours so cold joints will not occur.
- D. Place concrete to elevations indicated on the contract drawings.

### 3.7 JOINTS

- A. Place expansion joints at maximum 30-foot intervals and radius points.
- B. Place hand-tooled contraction joints at maximum 10-foot intervals (see plans for joint patterns). Do not utilize sawcutting for joint construction.
- C. Place joint filler between paving components and building or other appurtenances. Recess top of filler 1/8 inch.

### 3.8 FINISHING

- A. Place curing compound on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.

- B. Surfaces shall be stable, firm, and slip resistant. Provide light broom finish perpendicular to the direction of dominant travel. See plans for hand tooling requirements.

### 3.9 JOINT SEALING

- A. Separate pavement from vertical surfaces with 1/2 inch thick joint filler.
- B. Place joint filler in pavement pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
- C. Extend joint filler from bottom of pavement to within 1/8 inch of finished surface.

### 3.10 TOLERANCES

#### General Site Concrete:

1. Maximum Variation of Surface Flatness: 1/4 inch in 10 feet.
2. Maximum Variation From True Position: 1/4 inch.

### 3.11 CONCRETE CURING

- A. Immediately after placement and finishing, concrete shall be protected from moisture loss for not less than 7 days. For surfaces not in contact with forms, curing compound shall be uniformly applied after water sheen disappears from the concrete. Formed surfaces shall receive an application of curing compound if forms are removed during the 7 day curing period. Curing compound shall not be applied during rainfall.
- B. Curing compound shall be applied under pressure at the rate of 1 gallon per 150 square feet by mechanical sprayers. The spraying equipment shall be of the fully atomizing type. At time of use, curing compound shall be thoroughly mixed with a fugitive dye uniformly dispersed throughout the sprayer. Care shall be taken to prevent application to joints where concrete bond is required, to reinforcement steel and to joints where joint sealer is to be placed. The compound shall form a uniform continuous coherent film which will not crack or peel and shall be free from pinholes and other imperfections. Concrete surfaces subjected to heavy rainfall within 3 hours after curing compound has been applied shall be resprayed by above method and at above coverage at no additional expense to the Owner.
- C. No pedestrian or vehicular traffic shall be allowed over the surface for seven days unless surface is protected by planks, plywood, or sand. Protection shall not be placed until at least 12 hours after application of the curing compound.
- D. Protect concrete by suitable methods to prevent damage by mechanical injury or excessively hot or cold temperatures.

### 3.12 FIELD QUALITY CONTROL

- A. Field quality control tests specified herein will be conducted by the Owner's Independent Testing Laboratory at no cost to Contractor. Contractor shall perform additional testing as considered necessary by the Contractor for assurance of quality control. Retesting required as a result of failed initial tests shall be at the Contractor's expense.
- B. Field testing, frequency, and methods may vary as determined by and between the Owner and Owner's Testing Laboratory.
- C. Review the Contractor's proposal materials and mix design for conformance with specifications.
- D. Perform testing in accordance with ACI 301 and testing standards listed herein.
- E. Strength Tests
  - 1. Secure composite samples in accordance with ASTM C 172. Sample at regularly spaced intervals from middle portion of the batch. Sampling time shall not exceed 15 minutes.
  - 2. Mold and cure specimens in accordance with ASTM C31.
  - 3. Test cylinders in accordance with ASTM C 39.
  - 4. Evaluation and Acceptance
    - a. Strength level of concrete will be considered satisfactory if the average of all sets of three consecutive strength tests equal or exceed specified strength and no individual strength test (average of two cylinders) results are below specified compressive strength test by more than 500 psi.
    - b. Completed concrete work will not be accepted unless requirements of ACI 301, have been met, including dimensional tolerances, appearance, and strength of structure.

### 3.13 PROTECTION

- A. Immediately after placement, protect pavement from premature moisture loss, excessive hot or cold temperatures, and mechanical injury.
- B. Do not permit vehicular traffic over pavement or curb for seven days minimum after finishing. Do not permit pedestrian traffic over concrete for three days.

**END OF SECTION**

## BITUMINOUS PAVING, BASE COURSE, AND PAVEMENT MARKINGS

### PART 1 GENERAL

#### 1.01 WORK INCLUDED

- A. Construction of pavement consisting of a Graded Aggregate Base Course (GABC) type base course, bituminous concrete surface course, and pavement markings.

#### 1.02 RELATED SECTIONS

- A. Section 03320 – Site Concrete

#### 1.03 SUBMITTALS

- A. Certificates of Compliance:
1. Prime Coat
  2. Tack Coat
  3. Base Course
- B. Design Mix: Submit a bituminous concrete mix formula prepared within the last twelve months by an approved testing laboratory.
- C. Testing Reports: Provide written testing reports for base course compaction and flexible pavements to confirm that required thickness, density, and quality are followed.

### PART 2 PRODUCTS

#### 2.01 GRADED AGGREGATE BASE COURSE

- A. Conform to South Carolina Department of Transportation (SCDOT) “2007 Standard Specifications for Highway Construction”, Section 305. Base course shall consist of one or more materials blended and free from vegetative matter and lumps or balls of clay. Material shall be a non-plastic, granular soil of natural or crushed gravel, crushed stone, crushed slag, or natural or crushed sand. Base course shall meet the gradation requirements below:

REQUIREMENTS	LIMITS
Passing 2" sieve	100%
Passing 1" sieve	70-100%
Passing 1/2" sieve	50-85%
Passing #4 sieve	30-60%
Passing #30 sieve	17-38%
Passing #200 sieve	0-20%
L.L.	0-25
P.I.	0-6

**Coquina and sand clay are not acceptable and shall not be used.**

- 2.02 PRIME COAT: AASHTO M81, Grade MC-70 or AASHTO M82, Grade MC-70.
- 2.03 TACK COAT: AASHTO M81, Grade CRS.
- 2.04 SURFACE COURSE: SCDOT Standard Specification, Section 403, Bituminous Plant Mix, Type C for parking areas and driveways. Asphalt cement shall be PG64-22 conforming to AASHTO M226.
- 2.05 PAINT (Parking and driveways): Paint / or re-paint all new and existing lines and graphics on the property as shown on the plans. Use latex, water-base emulsion, ready-mixed, complying with FS TT-P-1952. Use white for wording, parking stall stripes, and handicapped access aisles and handicapped symbol. Use blue for square handicapped symbol background. Any required pavement wording and graphics shall comply with the Manual on Uniform Traffic Control Devices for Streets and Highways, 2003 edition, with revisions.

PART 3 EXECUTION

3.01 CONSTRUCTION:

- A. Graded Aggregate Base Course (GABC): Following successful compaction of the subgrade materials, begin spreading the base material at the point nearest the source of supply. Hauling shall be done and traffic permitted over the base to assist in compaction. Fill ruts formed by the traffic and re-roll. After the base course is in place, continue machining and rolling until the surface is smooth, hard, well bonded and true to the designed cross section. Base course shall be compacted to 100% of the Modified Proctor (SC T-140) maximum dry density. Machine the base as often as necessary to maintain it smooth and true to grade and cross section until the surface course is applied.
- B. Bituminous Prime Coat: Provide a bituminous prime coat on the finished base course. Apply prime coat material at a uniform rate of 0.10 to 0.15 gallon residual asphalt per square yard. Allow prime coat to cure for a period of at least 48 hours prior to placing the surface material. Apply the prime coat only when the surfaces to be treated are dry and the atmospheric temperature is at least 50 degrees Fahrenheit. Maintain the treated surfaces and protect them from damage until the bituminous paving material is placed.
- C. Bituminous Tack Coat: Provide tack coat at joints with and over existing pavement to remain, or at new joints where pavement has cooled. Apply tack coat material at the rate of 0.05 to 0.15 gallon residual asphalt per square yard. Thoroughly clean surfaces to receive the tack coat just prior to application. Allow tack coat to cure to insure that it is tacky at the time of placement of surface course.

D. Bituminous Concrete Surface Course:

1. Placing Temperature: The temperature of the asphalt mixture at the time of dumping into the mechanical spreader shall not be less than 250 degrees Fahrenheit. Mixtures which have a temperature of less than 250 degrees Fahrenheit when dumped into the spreader will be rejected.
2. Joints: Where new pavement abuts existing flexible pavement, cut back the existing surface course along uniform lines approximately 6 inches from the edge. Make a vertical cut and extend cut full depth of the surface course. Prior to placing the surface course, paint the exposed edge of cold joints with a thin layer of asphalt cement.
3. Spreading and Finishing Equipment: Shall be capable of spreading the bituminous mixture to a uniform density and striking a smooth finish, true to cross section and free from inequalities. Provide adjustable screed to shape the surface to true cross section.
4. Compaction: Equipment and compaction procedures shall be in accordance with SCDOT Standard Specifications, Section 401.
5. Do not produce or place bituminous materials or mixtures when weather is rainy and foggy, when the base course is frozen and shows any evidence of excess moisture, or when the air temperature is less than 40 degrees Fahrenheit in the shade away from artificial heat.
6. Finished surfaces shall be uniform in texture and appearance and free of cracks and creases.
7. Protection of Pavement: After final rolling, do not permit vehicular traffic of any kind on the pavement until it has cooled and hardened, and in no case in less than 6 hours.

3.02 PAVEMENT MARKING

- A. Mark vehicle parking spaces with painted lines 4 inches in width. Do not apply paint on bituminous concrete until at least 7 days after completion of the bituminous concrete paving. Apply paint to clean, dry surfaces only and protect from traffic until thoroughly dry. Provide uniform paint film of sufficient thickness, a minimum of 15 mils, as required **to completely conceal the pavement**. Areas that are not completely concealed will require re-painting prior to approval. The color of paint to be as specified in paragraph 2.06 above.

**3.03 TESTING:**

- A. The Contractor shall coordinate with the Owner's testing agency to perform specified services and testing for concrete and asphalt paving.
- B. Testing to include subgrade, base, and asphalt paving.

**END OF SECTION**

## WATER DISTRIBUTION SYSTEM

### PART 1- SCOPE

#### 1.01 WORK INCLUDED

- A. The work under this Section includes providing a complete system of water distribution pressure piping and appurtenant items.

#### 1.02 STANDARDS

- A. The installation of the water mains and appurtenances shall be conducted in accordance with section C of the AWWA standards and/or manufacturers recommended installation procedures.

#### 1.03 QUALITY ASSURANCE

- A. Design Requirements:

1. Water mains shall be laid with a minimum cover of 36-inches below finished grade, unless otherwise indicated.
2. Water mains shall be constructed of the materials indicated on the Drawings.
3. Water mains 4 inches and smaller shall be constructed of PVC pipe with PVC fittings.
4. PVC water mains 6 inches and larger in diameter shall be constructed with cast iron fittings.
5. Changes in horizontal alignment of 45 degrees or less may be achieved through use of allowable pipe deflection in lieu of fittings shown on the Drawings at the Contractor's option, but subject to approval of the Engineer as to layout. Said deflection shall not exceed 80% of limits set forth in applicable AWWA Standards.
6. All mains shall be detectable within three (3) feet with electronic locating equipment. Nonmetallic pipes shall be installed with copper wire or other means of detection.

- B. Pipe Inspection: The Contractor shall obtain from the pipe manufacturer a certificate of inspection to the effect that the pipe and fittings supplied for this Contract have been inspected at the plant and that they meet the requirements of these specifications. All pipe and fittings shall be subjected to visual inspection at time of delivery by rail or truck, also just before they are lowered into the trench to be laid, and joints or fittings that do not conform to these specifications will be rejected and must be removed immediately by the Contractor. The entire product of any plant may be rejected when, in the opinion of the Owner, the methods of manufacture fail to secure uniform results, or where the materials used are such as to produce inferior pipe or fittings.

C. Prevention of Electrolysis:

1. Where deemed necessary, electrolytic action through the contact of dissimilar metals, shall be prevented by either:
  - a. The separation of one material from the other by means of an insulating or dielectric coupling, or
  - b. The use of alternative materials, as directed by the Engineer.

1.04 SUBMITTALS

A. Shop Drawings:

1. In general, 6 copies of the following shop drawings shall be submitted to the Engineer for approval prior to construction:
  - a. Mill test certificates or certified test reports on pipe
  - b. Details of restrained and flexible joints
  - c. Hydrants
  - d. Valves and valve boxes
  - e. Service connection assemblies
  - f. Joint lubricant
  - g. Pipe laying schedule
  - h. Temporary plug and anchorage system for hydrostatic pressure test

B. Acceptance of Material:

1. The Contractor shall furnish an Affidavit of Compliance certified by the pipe manufacturer that the pre-stressed concrete pipe, fittings and specials furnished under this Contract comply with all applicable provisions of AWWA Standard C301 and these Specifications. No pipe or fittings will be accepted for use in the work on this project until the Affidavit has been submitted and approved by the Engineer.
2. The Owner reserves the right to sample and test any pipe or fitting after delivery and to reject all pipe and fittings represented by any sample which fails to comply with the specified requirements.

## 1.05 JOB CONDITIONS

A. Water in Excavation: Water shall not be allowed in the trenches while the pipes are being laid and/or tested. The Contractor shall not open more trench than the available pumping facilities are able to dewater to the satisfaction of the Engineer. The Contractor shall assume responsibility for disposing of all water so as not to injure or interfere with the normal drainage of the territory in which he is working. In no case shall the pipelines being installed be used as drains for such water, and the ends of the pipe shall be kept properly and adequately blocked during construction by the use of approved plugs and not be improvised equipment. All necessary precautions shall be taken to prevent the entrance of mud, sand, or other obstructing matter into the pipelines. If on completion of the work any such material has entered the pipelines, it must be cleaned as directed by the Engineer so that the entire system will be left clean and unobstructed.

## PART 2- MATERIALS

### 2.01 MATERIALS

- a. All materials/products that contact potable water must be third party certified as meeting the specifications of ANSI/NSF Standard 61. The certifying party shall be accredited by the ANSI.
- b. Pipe, fittings, packing, jointing materials, valves, and fire hydrants shall conform to Section C of the AWWA Standards.
- c. Natural rubber or other material which will support microbiological growth may not be used for any gaskets, O-rings, and other products used for jointing pipes, setting meters or valves, or other appurtenances which will expose the material to the water.
- d. Lubricants which will support microbiological growth shall not be used for slip-on joints
- e. Solvent-weld PVC pipe and fittings shall not be used in water mains four (4) inches and larger.

### 2.02 PRODUCTS

A. Polyvinyl Chloride Pipe: Polyvinyl Chloride (PVC) pipe 4 inches and larger in diameter shall conform to the latest edition of AWWA-C900 with a pressure class 100-DR25. All PVC pipe shall bear the approval seal of the National Sanitation Foundation (NSF) for potable water pipe. PVC pipe 4 inches and larger shall have a provision for expansion and contraction provided in the joints. All joints shall be designed for push on make up connection. Joints shall conform to the requirements of ASTM D3139 and provide for the pressure rating of the pipe. PVC pipe must be installed in accordance with ASTM D-2321, latest revision. Pipe less than 4 inches shall meet ASTM pipe standards D-2241; joint D-3139 with a pressure class of 160 SDR 26.

B. Cast Iron Fittings: Cast Iron Fittings shall be mechanical joint with a minimum pressure rating of 150 psi and shall conform to the requirements of ANSI A21.10. The interior of the fittings shall have a bituminous seal coat over a mortar lining conforming to ANSI A21.4. Exterior of the fittings shall have a bituminous coating. All valves shall be manufactured to meet this requirement.

- C. Polyethylene Tubing: Polyethylene tubing for service lines shall be municipal service tubing copper tube sized and approved by the National Sanitation Foundation for use in transmitting fluids for human consumption. The tubing shall be designed for a minimum burst pressure of 630 psi for water at 23 C (73.4 F). Tubing shall conform to the requirements of ASTM Designation D2737, SDR 7, PE 3406 and shall be as manufactured by Yardley or equal.
- D. Gate Valves--2 to 12 inches (Resilient-seated)
1. All gate valves to be provided shall be resilient-seated gate valves which shall open counterclockwise and have square nuts and be manufactured in accordance with ANSI/AWWA C509-80. The resilient seated gate valve body and bonnet shall be of Class B gray iron conforming to or exceeding ASTM A/26, Class B. Valve ends shall be mechanical joint (AWWA C111/A21.11) complete with accessories and shall be suitable for 200 psi working pressure for valves 4 inches through 12 inches. Test pressure shall be twice the rated working pressure and at all times zero leakage will be maintained. Resilient seats shall be bonded or mechanically attached to the gate. If the resilient seat is a rubber material, the method used for bonding or vulcanizing shall be proved by ASTM D-429, Method A (minimum strength 250 psi) or Method B (peel strength not less than 75 lb/in). If resilient seat is mechanically seated the rubber disc shall be internally reinforced attached to the face of the disc with self-locking stainless steel screws. Two-inch wheel valves will not be accepted. Valves shall be American Flow Control, Mueller, Clow, or approved equal.
  2. All interior areas of the cast iron shall be provided with a two part thermosetting epoxy protective coating and shall function as a physical, chemical, and electrical barrier between the base metal to which it is applied and the surroundings. The coating shall be nontoxic and shall not impart taste to the water. The coating must be formulated from materials deemed acceptable per the Food and Drug Administration Document Title 21 of the Federal Regulations on Food additives, Section 121.2514 entitled, "Rosins and Polymeric Coatings". Further the coating shall have a satin finish and be suitable for filed overcoating and touch up without sanding or special surface preparation of application of heat in excess of room temperature. The coating shall have a successful record of performance in valves, pipe or other allied equipment for a minimum of three years.
  3. Exterior areas of the valve shall have two coats of asphalt varnish which shall conform to the requirements of Federal Specification TT-V-51 Asphalt Varnish, or equal.

E. Gate Valves (less than 3-inches)

1. Gate valves for pipe less than 3-inches in diameter shall conform to the requirements of Federal Specifications WW-V-54 for Class A, Type I, and shall be bronze, single wedge, nonrising stem, screwed bonnet, 125 pound S.P., 200 pound W.O.G., with stuffing box repackable under pressure and all parts renewable. Ends shall be as shown on the drawings.

F. Valves Boxes: Cast iron valve boxes shall be provided for all valves installed underground. The valve boxes shall be adjustable to fit the depth of earth cover over the valve and shall be designed so as to prevent the transmission of surface loads directly to the valve or piping. Valve boxes shall have an interior diameter of not less than 5-inches. The valve boxes shall be provided with covers marked WATER which shall be so constructed as to prevent tipping or rattling. Boxes shall be Clow or approved equal. Extension sections shall be cast iron only. The protective ring shall be constructed of Class B concrete. Valve boxes located outside of paved or concrete areas shall be provided with a 18" diameter concrete collar, 8" thick in the center, tapered to 6" thick at the outside edge. Valve boxes located in paved or concrete areas shall be provided with a Standard concrete valve box footing. A concrete valve marker shall be provided for each valve with the direction and distance from the marker to the valve stamped in the top of the marker.

G. Hydrants: Fire hydrants shall be of the compression type with break away upper sections capable of ready replacement without water loss in the event of traffic damage. They shall be designed for a working pressure of 150 pounds per square inch and shall conform to AWWA Standard C502 "Dry Barrel Fire Hydrants". Each hydrant shall have a 6-inch bottom inlet connection and valve opening at least 5 1/4-inches in diameter. Hydrants shall turn to the left (counterclockwise) to open. Each hydrant shall be fitted with one 4 1/2-inch pumper connection, and two 2 1/2-inch hose connections, both having threads that conform to the Fire division Standard for the area. Hose caps shall be chained to the hydrant barrel and fitted with nuts similar to the hydrant operating nuts. Each hydrant shall have a barrel of sufficient length to bring the bottom of the 6-inch pipe connection 30-inches below the surface of the finished ground. Each hydrant shall be made in at least two sections bolted together. All interior working parts of the hydrant shall be removable from the top of the hydrant to allow repairs without removing the hydrant barrel after it has been installed. Hydrants shall have renewable O-ring stem seals and shall be Mueller Super Centurion or approved equal. Hydrant barrels shall be painted **red**.

H. Water Meters—to be installed by Grand Strand Water & Sewer Authority.

I. Meter Boxes—To be installed by GSWSA.

## PART 3- WORKMANSHIP

### 3.01 PREPARATION

#### A. Bedding:

1. Back-fill material shall be tamped in layers around the pipe and to a sufficient height above the pipe to adequately support and protect the pipe.
2. Stones, other than crushed bedding, shall not come into contact with the pipe and shall not be within six (6) inches of the pipe.
3. Bedding materials should be placed to provide uniform and adequate longitudinal support under the pipe. Blocking should not be used to bring the pipe to grade. Bell holes at each joint should be provided to permit the joint to be assembled properly while maintaining uniform pipe support. The trench bottom shall be overexcavated and a 4" to 6" depth of granular or sandy material, composed of one of the following soil classifications: GW, GP, SW, SP, GM, GC, SM, SC shall be compacted to not less than 95 percent of maximum density as determined by AASHTO T99.
4. After each pipe has been aligned and placed in final position, bedding material shall be deposited and densified under the pipe haunches and on each side of the pipe up to 6" over the top of the pipe being laid for PVC and equal with the top of the pipe for DIP.
5. Cleanliness: The interior of the pipes shall be thoroughly cleaned of all foreign matter before being gently lowered into the trench and shall be kept clean during laying operations by means of plugs or other approved methods. During suspension of work for any reason at any time, a suitable stopper shall be placed in the end of the pipe last laid to prevent mud or other foreign material from entering the pipe.

### 3.02 INSTALLATION

#### A. Pipe:

1. Gradient: Lines shall be laid straight, and depth of cover shall be maintained uniform with respect to finish grade, whether grading is completed or proposed at time of pipe installation. When a grade or slope is shown on the drawings, laser alignment equipment or other previously approved means, shall be used by the Contractor to assure conformance to required grade.
2. Pipe Joint Deflection: Whenever it is desirable to deflect pipe, the amount of deflection shall not exceed 80% of the maximum limits as shown in AWWA Standard C600 for ductile iron pipe and as established by the manufacturer of PVC pipe.
3. Rejects: Any pipe found defective shall be immediately removed and replaced with sound pipe at the Contractor's expense.

4. Joint Compounds: No sulphur base joint compound shall be used.
5. Anchors: Thrust blocking or mechanical restraints must be specified for all tees, bends and plugs on lines 2.5 inches in diameter and larger, for all post hydrants on lines 3 inches in diameter and larger, and for all hydrants on lines 6 inches in diameter and larger. Concrete thrust blocks shall be placed at all bends, tees, plugs and other fittings to provide lateral support, except when restrained joints are specified. Thrust blocks shall conform to the details shown on the Drawings and shall be of Class C concrete.
6. Separation of water mains and sewers:

- a. Parallel Installation: Water mains shall be laid at least 10 feet horizontally from any existing or proposed sewer. The distance shall be measured edge to edge. In cases where it is not practical to maintain a ten-foot separation, the Department may allow deviation on a case-by-case basis, if supported by data from the design engineer. Such deviation may allow installation of the water main closer to a sewer, provided that the water main is laid in a separate trench or on an undisturbed earth shelf located on one side of the sewer at such an elevation that the bottom of the water main is at least 18 inches above the top of the sewer.

- b. Crossings: Water mains crossing sewers shall be laid to provide a minimum vertical separation of 18 inches between the outside of the water main and the outside of the sewer. This shall be the case whether the water main is either above or below the sewer line. Whenever possible, the water main shall be located above the sewer line. Where a new water main crosses a new sewer line, a full length of pipe shall be used for both the water main and sewer line and the crossing shall be arranged so that the joints of each line will be as far as possible from the point of crossing and each other. Where a new water main crosses an existing sewer line, one full length of water pipe shall be located so both joints will be as far from the sewer line as possible. Where a water main crosses under a sewer, adequate structural support shall be provided for the sewer line to prevent damage to the water main.

B. Ductile Iron Pipe and Polyvinyl Chloride Pipe Joints:

1. Type: The joints of all pipelines shall be made absolutely tight. The particular joint used shall be approved by the Owner prior to installation. Where shown on the Drawings or where, in the opinion of the Owner, settlement or vibration is likely to occur, all pipe joints shall be bolted.

2. Mechanical Joints: All types of mechanical joint pipes shall be laid and jointed in full conformance with manufacturer's recommendations, which shall be submitted to the Engineer for review and approval before work is begun. Only especially skilled workmen shall be permitted to make up mechanical joints. Torque wrenches set as specified in AWWA

Standard C111, shall be used; or spanner type wrenches not longer than specified therein may be used without the permission of the Engineer.

3. Push on Joints: Push on joints shall be made in strict, complete compliance with the manufacturer's recommendations. Lubricant, if required, shall be an inert, nontoxic, water soluble compound incapable of harboring, supporting, or culturing bacterial life. Manufacturer's recommendations shall be submitted to the Engineer for review and approval before work is begun.

C. Installing Valves and Boxes:

1. Valves: Valves shall be carefully inspected, opened wide and then tightly closed and the various nuts and bolts shall be tested for tightness. Special care shall be taken to prevent any foreign matter from becoming lodged in the valve seat. Gate valves, unless shown otherwise, shall be set with their stems vertically above the center line of the pipe. Any valve that does not operate correctly shall be removed and replaced.

2. Valve Boxes: Valve boxes shall be carefully centered over the operating nuts of the valves so as to permit a valve key to be fitted easily to the operating nut. In areas to be paved, valve boxes shall be set to conform to the level of the finished surface and held in position by a ring of concrete placed under the support flange as shown on the Drawings. The valve box shall not transmit surface loads to the pipe or valve. Care shall be taken to prevent earth and other material from entering the valve box. Any valve box which is out of alignment or whose top does not conform to the finished ground surface shall be dug out and reset. Before final acceptance of the work all valve boxes shall be adjusted to finish grade.

D. Installing Hydrants: Hydrants shall be set plumb and in true alignment with mains. Care shall be taken to insure the free draining of the hydrant barrel and, to this end, coarse material shall be placed around the rain outlet. Backfilling around hydrants shall be carefully done so as not to disturb the hydrant and shall be thoroughly compacted so as to support the hydrant securely.

E. Flush Out Connections: Flush out connections shall be installed at the locations and in accordance with the details shown on the Drawings.

F. Service Connections: Service connections shall be installed at the locations and in the manner shown on the Drawings.

G. Final Backfilling:

1. Final backfill above the pipe zone shall be in accordance with details on the approved drawing.

### 3.03 FIELD QUALITY CONTROL

A. Flushing: All water mains shall be flushed to remove all sand and other foreign matter. The velocity of the flushing water shall be at least 4-feet per second.

Flushing shall be terminated at the direction of the Engineer. The Contractor shall dispose of the flushing water without causing a nuisance or property damage. Flushing shall be in accordance with City of Conway requirements

B. Hydrostatic Tests:

1. All components of the water distribution system, including fittings, hydrants, connections and valves of the water distribution system shall remain uncovered until tested and accepted; provided, however, that pipe trenches under traveled streets or roads or in unstable soil conditions may be backfilled with the permission of the Engineer. No testing shall be done until all concrete thrust blocking is in place and set. If high-early strength concrete is used, testing may be conducted 48 hours after the concrete is placed; otherwise thrust block concrete must cure 5 days before pressure testing commences. In testing, the part of the system under test shall be filled with water and subjected to a sustained pressure of 150 pounds per square inch for a minimum of 3 hours. The piping shall be tested in sections, thereby testing each valve for secure closure. While the system is being filled, air shall be carefully and completely exhausted. If permanent air vents are not located at all high points, the Contractor shall install corporation stops or fittings and valves at such points so the air can be expelled as the pipe system is slowly filled with water.

2. Test pressure shall be maintained by pumping for at least 3 hours and until all sections under test have been checked for evidence of leakage. Rate of loss shall not exceed that specified hereinafter. Visible leaks shall be corrected regardless of total leakage shown by test.

3. The system as a whole, or any part, shall be retested after completion of backfilling. Such retest will be required for final acceptance.

4. All pumps, gauges and measuring devices shall be furnished, installed and operated by the Contractor and all such equipment and devices and their installation shall be approved by the Engineer. All pressure and leakage testing shall be done in the presence of a representative of the Engineer and City of Conway.

5. Water for testing and flushing shall be potable water provided by the Contractor from a source approved by the Engineer and City of Conway.

C. Pressure and leakage tests must be conducted in accordance with AWWA Standards C600. The pressure must be at least 1.5 times the maximum working pressure at the point of testing for at least two (2) hours

Allowable Limits For Leakage:

1. The hydrostatic pressure tests shall be performed as hereinabove specified and no installation, or section thereof, will be acceptable until the leakage is less than the number of gallons per hour as determined by the formula:

$$L = \frac{SD(P)^{1/2}}{133200}$$

in which,

L= Allowable leakage, in gallons per hour  
 S= Length of pipe being tested in feet  
 D= Nominal pipe diameter; in inches  
 P=Average test pressure during the test, in psi gauge

2. For a 1000-foot segment of main with an average test pressure of 150 psi the following table may be used.

Pipe Diameter (D) <u>Inches</u>	Allowable Leakage (L) <u>Gal/Hr.</u>
4	0.37
6	0.55
8	0.74
10	0.92
12	1.10

3. Water shall be supplied to the main during the test period as required to maintain the test pressure within 5 psi of the specified pressure. The quantity used, which shall be compared to the above allowable quantity, shall be measured by pumping from a calibrated container. A 5/8-inch meter installed on the discharge side of the pump may be used to measure the leakage for large mains when approved by the Engineer.

D. Correction Of Work: Where leakage exceeds the allowable limit, as specified hereinbefore, the defective pipe or joints shall be located and repaired. If the defective portions cannot be located, the Contractor shall remove and reconstruct as much of the work as is necessary in order to conform to the specified limits. Any visible leaks or any defective pipe or joint shall be repaired or replaced as directed by the Engineer even though the total leakage is within the specified allowable limits. No additional payment will be made for the correction of defective work, or to damage to other parts of the work resulting from such corrective work.

E. Disinfection:

1. Before any portion of water distribution system is to be placed in service it shall be disinfected in accordance with the requirements of AWWA Standard C601; and its disinfection shall be demonstrated by bacteriological test conducted in accordance with "Standard Methods for Examination of Water and Wastewater" for the coli-aerogenes group, by an approved laboratory, acceptable to the Engineer and the County Health Department having jurisdiction.

2. Before being placed in service, all new mains and repaired portions of, or existing mains should be thoroughly flushed then chlorinated with not less than fifty parts per million (50 ppm) of available chlorine. Chlorine gas or seventy percent high-test calcium hypochlorite can be used. Water from the existing distribution system or other source of supply should be controlled so as to flow slowly into the newly laid pipeline during the application of chlorine. The solution should be retained in the pipeline for not less than twenty-four (24) hours and a chlorine residual of 25 mg/l should be available at this time. Then the system should be flushed with potable water and the sampling program started.

3. Two (2) or more successive sets of samples, taken at 24 hour intervals and tested by a State approved private laboratory, shall indicate bacteriologically satisfactory water and the results submitted to the District Office.

4. If samples do not demonstrate satisfactory results, the disinfection procedure shall be repeated until two series of satisfactory samples are obtained, the period between such series of samples to be a minimum of twenty-four hours.

5. Disinfection Requirements:

Disinfection of all new water mains shall be in accordance with current American Water Works Association (AWWA) Standard C651 for the disinfection of water mains. In general, one approved method referred to as "continuous feed method" is as follows:

- a. Prior to sampling, the chlorine residual must be reduced to normal system residual levels or be non-detectable in those systems not chlorinating.
- b. The chlorine residual must also be measured and reported.
- c. If the membrane filter method of analysis is used for the coliform analysis, non-coliform growth must also be reported.
- d. If the non-coliform growth is greater than eighty (80) colonies per one hundred (100) milliliters, the sample result is invalid and must be repeated.

### 3.04 SCHEDULE

#### A. Connection To Existing System:

1. All connections to existing mains shall be made after complete disinfection of the proposed system and shall be made under the direction of the GSWSA. Valves separating the mains being installed from existing mains shall be operated by or under the direction of GSWSA. The cost of the work in making the connections shall be paid for by the Contractor.

2. In the event the proposed main is to be connected to a main which has one or more active services between the point of connection and the first existing line valve, a temporary plug or cap shall be installed on the new main until the pressure tests and disinfecting are completed. Upon satisfactory completion, the cap or plug shall be removed from both mains and the connection made with pipe which has been swabbed out with a solution of chlorine and water. The connection shall be made as swiftly as possible and any water in the ditch shall be kept below the level of the pipe. The pipeline shall then be placed in service by the owners' personnel.

3. In the event any existing users will be without water while a connection is being made, the Contractor shall notify them when the water will be turned off and when he estimates service will be resumed. In some instances, these connections may have to be made at night. No user shall be without water service for more than two hours.

**END OF SECTION**

## **EARTHWORK**

### **PART 1 PRODUCTS**

#### **1.01 SOILS**

- A. Topsoil: Natural, friable soil free of subsoil, stumps, rocks larger than 2 inches in diameter, weeds and other material detrimental to plant growth.
- B. Structural Fill: Fill material placed inside the line of the building foundation or slab shall. III, or IV.
- C. Fill Beneath Pavement: Fill material used beneath pavement and for road shoulders.
- D. Trench Backfill: Material used for bedding and initial back fill shall be as specified hereinafter.

### **PART 2 EXECUTION**

#### **2.01 GENERAL**

- A. Familiarization: Prior to commencement of the work, become thoroughly familiar with the site, the site conditions, and all portions of the work specified.
- B. Approvals: Backfilling and grading operations in and around building foundations, pipes, and other portions of the work to be covered shall not commence until the Owner's Soils Consultant and/or Architect has completed all required inspections, tests and approvals. Work covered prior to inspection shall be uncovered for inspection purposes and backfilled at no additional cost to the Owner.

#### **2.02 EXCESS WATER CONTROL**

- A. General: Grade and maintain all areas of the site to preclude surface runoff into excavations and prevent ponding of water.
- B. Dewatering: Excavations should be kept free of surface water and/or groundwater. Provide and maintain at all times the necessary means and devices to prevent water from entering the excavations and for removing all water entering the excavations.
- C. Softened Subgrade: Remove all soil softened or eroded by the presence of water and replace with suitable backfill material.

#### **2.03 EXCAVATION**

- A. General: All excavation of every description and of whatever substances encountered shall be performed to the lines and depths indicated on the Drawings and required for the work. During excavation, material suitable for filling shall be stockpiled in an orderly manner. Excavated materials not required or not suitable for filling shall be removed from the site and disposed of.
- B. Unsuitable Material: Unsuitable materials encountered in an excavation shall be removed as directed by the Owner's soil consultant, backfilled with suitable material, and compacted. Unsuitable materials include organic soils, muck, soft and compressible silts and clays, and running sands.

#### 2.04 PREPARATION OF SUBGRADE

- A. General: After the excess fill dirt has been stripped away, the construction area should be proofrolled with a loaded dump truck or other similar heavy construction equipment. Areas that pump or rut excessively should be reworked and recompactd in-place. If compaction cannot be successfully achieved, the Owner's soil consultant shall determine if the soil is unsuitable.

#### 2.05 FILL AND COMPACTION

- A. Moisture Conditioning: Moisten or aerate the subgrade and fill material as required to obtain proper compaction.
- B. Topsoil Fill: Contractor to place topsoil material from on site stockpile and distribute in quantity and depths as indicated in the specifications and drawings. Contractor shall clean the topsoil prior to final placement by removing all unsuitable material. Topsoil shall be natural, friable soil free of subsoil stumps, rocks larger than 2 inches in diameter, weeds and other material detrimental to plant growth.
- C. Structural Fill: Compact the stripped subgrade to a minimum of 95 percent of its Modified Proctor Density prior to placement of controlled fill. Compact controlled fill to at least 95 percent of its Modified Proctor Maximum Dry Density as determined by ASTM D1557 for structural areas.
- D. Pavement Areas: Compact the subgrade and fill material beneath paved areas and shoulders to a minimum 95 percent of its Modified Proctor Maximum Dry Density.
- E. Landscaped Areas: In areas subject to construction traffic, compact the subgrade and fill to a minimum 95 percent of its Modified Proctor Maximum Dry Density. Compact final topsoil fill to 90 percent of its Modified Proctor Maximum Dry Density.

## 2.06 FINISH GRADING

- A. General: Perform finish grading to the lines and grades shown on the drawings. Finished grades should be smooth and uniform and provide positive drainage.
- B. Tolerances:
  - 1. Rough Grade:
    - a. Roadway/Parking Area Plus or minus 0.1 foot
    - b. Landscaped Areas Plus or minus 0.2 foot
  - 2. Finish Grade:
    - a. Roadway/Parking Area Plus or minus 0.1 foot
    - b. Landscaped Areas Plus or minus 0.2 foot
- C. Topsoil: The top 4 inches of soil in landscaped areas shall be topsoil.
- D. Protection: Protect areas which have been graded from equipment traffic.
- E. Excess Soils: Should any excess soils remain on site after all areas have been properly graded, the contractor shall scatter all excess soils onsite and grass/hydro-seed.

## 2.07 TRENCHING, BACKFILLING AND COMPACTION FOR DRAINAGE WATER, AND SEWER SYSTEMS

- A. General: Refer to specific utility sections in these Specifications for installation requirements. Trench, backfill, and compact as specified except as modified herein.
- B. Trenching: Trench widths at and below the top of the pipe shall be the minimum necessary for proper installation. Trench banks above the top of the pipe shall be a vertical as practicable. Over-depth excavation shall be backfilled with suitable bedding material and compacted. The Contractor shall provide, at his expense and as directed by the Owner's representative, special bedding material or concrete encasement as may be necessary due to over-width excavation.
- C. Depth: Trench to the lines and grades shown on the drawings. Where elevations are not shown, trench to a depth sufficient to provide at least 36 inches of cover above the top of the pipe, unless otherwise specified. Grade the trenches to provide a constant slope free of sags and high spots.

- D. Trench Bracing: Properly brace, sheet and support trench walls in strict conformance with all pertinent laws and regulations. Provide adequate bracing and shoring to protect adjacent improvements.
- E. Bedding and Initial Backfill: Tamp subgrade to provide firm, even bedding. Excavate bedding material to match the shape of the bottom of the pipe and bell, as detailed in the Drawings. Place bedding material so as to provide full bearing around to bottom of the pipe.

**END OF SECTION**

## **SODDING, TREES AND SHRUBS**

### **PART 1 GENERAL**

#### **1.01 DESCRIPTION**

- A. Work Included: Provide landscape vegetation, sodding, mulch, and other materials as indicated on the Drawings, specified herein, and needed for a complete and proper installation.
- B. Related Work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.

#### **1.02 QUALITY ASSURANCE**

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work in this Section.
- B. Standards:
  - 1. Plants and Planting Material: Meet or exceed the specifications of Federal, State and County laws requiring inspection for plant disease and insect control.
  - 2. Quality and Size: Comply with the current edition of the "American Standard for Nursery Stock" as adopted by the American Nursery and Landscape Association.
  - 3. All Plants:
    - a. True to name, with one of each bundle or lot tagged with the name and size of the plants in accordance with standards of practice of American Nursery and Landscape Association.
    - b. In all cases, botanical names take precedence over common names.

### 1.03 SUBMITTALS

- A. Product Data: Within 45 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
  - 1. Complete materials list of items proposed to be provided under this Section.
  - 2. Complete data on source, size, and quality.
  - 3. Sufficient data to demonstrate compliance with the specified requirements.

### 1.04 PRODUCT HANDLING

- A. Immediately remove from the site plants which are not true to name, and materials which do not comply with the specified requirements, and promptly replace the plants and material meeting the specified requirements.

## PART 2 PRODUCTS

### 2.01 FERTILIZER

- A. Provide commercial balanced fertilizer delivered to the site in bags labeled with the manufacturer's guaranteed analysis.

### 2.02 MULCH

- A. Provide fresh clean pine straw mulch. Mulch to have a deep, fresh color and shall be applied to all shrub planting beds to a minimum depth of 3", compacted and a minimum rate of one bale per fifty (50) square feet of plant bed area. Mulch should be free of all deleterious materials immediately following installation.

### 2.03 TREE STAKES

- A. All trees shall be staked using the “Arbor Tie” triangular tree staking systems, or approved Substitution. Arbor Tie, Deep Root Partners, L.P., San Francisco, CA 94103. Phone: 800-458-7668. Online at: [www.deeproot.com](http://www.deeproot.com)

#### 2.04 HYDRO SEEDING

- A. Not used unless necessary for erosion and sediment control purposes. See Section 02201.

#### 2.05 SOD

- A. Provide rolls or squares of Centipede (*Eremochloa ophiuroides*) sod, good, healthy, free of weeds, insects and disease.
- B. Do not deliver more sod than can be laid within 24 hours. Protect exposed roots from dehydration.
- C. Prepare surface to receive sod by smooth raking of topsoil. Moisten prepared surface immediately prior to laying sod. Topsoil elevation prior to placement of sod shall be two inches (2”) below finished grade of sidewalks or top of curb where sod is adjacent to these surfaces.
- D. Lay sod tight with no open joints visible; stagger end joints 12 inches minimum. Do not stretch or overlap sod pieces. Do not use “scrap” sod pieces unless they are fresh, contain a full root system, and have not been damaged or stretched during the installation of the parent sod piece.
- E. Water sodded areas immediately after installation.
- F. Roll as necessary to provide smooth uniform surface and provide good root-to-soil contact.
- G. **Nylon mesh backing or similar non-biodegradable materials are prohibited for use beneath sod.** Sod will be rejected if it is delivered to the site with this material.

#### 2.06 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contract subject to the approval of the Architect.

### PART 3 EXECUTION

#### 3.01 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

### 3.02 SPREADING TOPSOIL

- A. Finish grading shall be performed under Section 02200. The landscape contractor shall examine finish grading prior to commencement of work to assure all areas are suitable for planting operations. Notify the General Contractor of any unacceptable conditions. Commencement of landscaping work shall imply acceptance of the finish grading work.
- B. Upon completion of finish grading, perform fine grading required in planting areas including removal of any remaining debris, trash, rocks and roots 2" in dimension and larger.
- C. All turfgrass sod areas shall have a minimum four (4") inch depth of topsoil placed prior to any installation of sod.

### 3.03 PLANTING TREES

- A. General:
  - 1. Plant nursery stock immediately upon delivery to the site and approval by the Architect except that, if this is not feasible, heel-in all bare root and balled materials with damp soil and protect from sun and wind.
  - 2. Regularly water nursery stock in containers, and place them in a cool area protected from sun and drying winds.
  - 3. Do not store nursery stock on paved areas while awaiting installation.
- B. Excavating:
  - 1. For shrubs, excavate the planting hole width a minimum of two-times (2X) the container width or root ball diameter, and six inches (6") deeper than the depth of the container to accept planting soil amendments.
  - 2. For trees, excavate the planting hole width a minimum of one and one-half times (1.5X) the container width or root ball diameter, and twelve inches (12") deeper than the depth of the root ball to accept planting soil amendments.
  - 3. At holes more than 12" deep, probe by hand to determine if mechanical auger will hit any in-place utilities.
- C. Planting:
  - 1. Fill holes with backfill mixture consisting of three parts soil taken from the hole and one part soil amendment, by volume. The

components shall be mixed outside the planting hole prior to placement.

2. Fill to proper height to receive the plant, and thoroughly tamp the mixture before setting the plant.
  3. Remove the plant from the container and gently loosen exposed or circling roots. Set plant in upright position in the center of the hole, and compact the backfill mixture around the ball or roots.
  4. Thoroughly water each plant when the hole is 2/3 full.
  5. Cut away burlap and metal basket wiring (if applicable) from the top 1/3 of tree root balls.
  6. After watering, tamp the soil in place until the surface of the backfill is level with the surrounding area and the crown of the plant is at the finished grade of the surrounding area.
  7. Build up a temporary watering basin around the base of each tree, unless otherwise directed by the Architect, except no basins around trees in raised or mounded planter beds.
- D. Apply the specified mulch to a minimum depth of 3", evenly spread over the entire area of each planting area sufficient to completely conceal the soil below.

#### 3.04 HYDRO SEEDING

- A. Hydro seeding is not to be used on this project unless required for temporary sediment and erosion control measures.

#### 3.05 STAKING

- A. Use the specified staking system(s) in 2.03 above. Do not penetrate root ball with stakes.

**END OF SECTION**

# HORRY COUNTY SOLID WASTE AUTHORITY, INC.

## McDowell Short-Cut Road Recycling and Convenience Center

February 9, 2017 ~ 3:00 P.M.

### Proposal Form

The undersigned does hereby offer to provide the following services at the unit prices stated below:

#### A. Convenience Center Site

<u>Service Description</u>	<u>Unit Price</u>	x	<u>Estimated Quantity</u>	=	<u>Projected Total Cost</u>
3" Type I asphalt	\$/_____ /sy		11,080 sy		\$_____
8" GABC course	\$/_____ /sy		11,080 sy		\$_____
Compacted subgrade	\$/_____ /sy		11,080 sy		\$_____
24" Select fill	\$/_____ /cy		10,000 cy		\$_____
Stripping of topsoil	\$/_____ /sy		17,000 sy		\$_____
Land clearing	\$/_____ /Acre		3.6 Acre		\$_____
24" RCP	\$/_____ /lf		832 lf		\$_____
3x4 Catch basins	\$/_____ /ea		7 ea		\$_____
Outfall structure	\$/_____ /each		1 ea		\$_____
Swale @ wetlands	\$/_____ /lf		90 lf		\$_____
Pond Excavation	\$/_____ /cy		1800 cy		\$_____
Underdrain w/rock	\$/_____ /lf		1250 lf		\$_____
4" pvc solid pipe	\$/_____ /lf		550 lf		\$_____
Transition adapters	\$/_____ /ea		8 ea		\$_____
Silt Fence	\$/_____ /lf		2000 lf		\$_____

Construction Entrance	\$_____ /each	1 ea	\$_____
Inlet Protection	\$_____ /each	8 ea	\$_____
Rip-rap outlet	\$_____ /each	1 ea	\$_____
Faircloth Skimmer	\$_____ /each	1 ea	\$_____
Concrete washout	\$_____ /each	1 ea	\$_____
Rain gauge & post	\$_____ /each	1 ea	\$_____
Vegetative Matting	\$_____ /ls	lump sum	\$_____
Hydroseeding	\$_____ /ls	lump sum	\$_____
Traffic Signage	\$_____ /each	3 ea	\$_____
Wheel stops	\$_____ /each	5 ea	\$_____
Pavement markings	\$_____ /ls	lump sum	\$_____
Concrete curbing	\$_____ /lf	170 lf	\$_____
6" concrete pad (4000 psi)	\$_____ /sy	1985 sy	\$_____
Berm along property line	\$_____ /	lump sum	\$_____
20' roll gate	\$_____ /each	1 ea	\$_____
6' Chain link fence	\$_____ /lf	1600 lf	\$_____
6" PVC waterline	\$_____ /lf	1030 lf	\$_____
1" pvc (sch-40)	\$_____ /lf	200 lf	\$_____
1.5" pvc (sch-40)	\$_____ /lf	1080 lf	\$_____
Fire hydrant assembly	\$_____ /ea	1 ea	\$_____
Spigotd w/ post	\$_____ /ea	5 ea.	\$_____
Soaker hose on berm	\$_____ /LF	400lf	\$_____
<b>Subtotal –site cost</b>			<b>\$_____</b>

**B. Entrance driveway**

<u>Service Description</u>	<u>Unit Price</u>	x	<u>Estimated Quantity</u>	=	<u>Projected Total Cost</u>
3" Type I asphalt	\$_____/sy		1540 sy		\$_____
8" GABC course	\$_____/sy		1540 sy		\$_____
Compacted subgrade	\$_____/sy		1540 sy		\$_____
30" Select fill	\$_____/cy		3500 cy		\$_____
Stripping of topsoil	\$_____/sy		5500 sy		\$_____
Land clearing	\$_____/Acre		1.1 Acre		\$_____
24" RCP	\$_____/lf		200 lf		\$_____
Swale @ entrance	\$_____/lf		300 lf		\$_____
Rip rap shoulders	\$_____/ton		125 ton		\$_____
Silt fence	\$_____/lf		2900 lf		\$_____
Sodding roadway shoulders	\$_____/sf		7000 sf		\$_____
Remove GABC @ entrance	\$_____/ls		lump sum		\$_____
2.0' berm @ entrance	\$_____/ls		lump sum		\$_____
SCDOT Guardrail	\$_____/lf		1290 lf		\$_____
<b>Subtotal –entrance driveway</b>					<b>\$_____</b>

**C. Existing convenience center**

3" Type I asphalt	\$_____ /sy	1180 sy	\$_____
8" GABC course	\$_____ /sy	1180 sy	\$_____
Compacted subgrade	\$_____ /sy	1180 sy	\$_____
30" Select fill	\$_____ /cy	700 cy	\$_____
Pavement markings	\$_____ /ls	lump sum	\$_____
15" RCP	\$_____ /lf	15 lf	\$_____
18" RCP	\$_____ /lf	116 lf	\$_____
Grassed swales	\$_____ /lf	540 lf	\$_____
Flared end sections	\$_____ /each	2 ea	\$_____
Sediment tubes	\$_____ /ea	4 ea	\$_____
Connect drainage (new to old)	\$_____ /ls	lump sum	\$_____
Fine grade & hydroseed (all pervious areas)	\$_____ /ls	lump sum	\$_____
6' chain-link fence	\$_____ /lf	80 lf	\$_____
20' fence gates	\$_____ /ea	2 ea	\$_____
Traffic control (McDowell)	\$_____ /ls	lump sum	\$_____
Ex. asphalt removal	\$_____ /sy	2230 sy	\$_____
Ex. base removal	\$_____ /sy	2340 sy	\$_____
Ex. concrete removal	\$_____ /sy	400 sy	\$_____
Ex. culvert removal	\$_____ /lf	70 lf	\$_____
		<b>Subtotal –ex. convenience center</b>	<b>\$_____</b>

**D. Surveying/Construction Staking**

Construction Staking	\$_____ /ls	lump sum	\$_____
Drainage Asbuilts	\$_____ /ls	lump sum	\$_____
Waterline asbuilts	\$_____ /ls	lump sum	\$_____
<b>Subtotal –surveying/construction</b>			<b>\$_____</b>

**Grand Total of the proposal \$\_\_\_\_\_**

**E. Unit Prices**

Muck & Fill w/ select material	\$_____ /cy
4” concrete pad (4000 psi)	\$_____ /sy
5” concrete pad (4000 psi)	\$_____ /sy

**F.** Provide three (3) references for similar type project work. Please provide company name, contact person, and telephone number, along with project site location.

**G.** What equipment do you have available to work on this project?

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**H.** How quickly (number of days) after being notified your company was selected to perform the project could you begin?

\_\_\_\_\_ days

I. How many days do you estimate it will take to complete the project?

\_\_\_\_\_ days

J. Provide proposer's information:

\_\_\_\_\_  
Company's Name

\_\_\_\_\_  
Address (Mailing & Physical Location)

\_\_\_\_\_  
City, State, Zip

\_\_\_\_\_  
Contact Person

\_\_\_\_\_  
Phone

**K. Certification:** The undersigned hereby certifies this proposal shall be in effect for a period of 90 days following the proposal date. Proposer further acknowledges that the SWA will not necessarily award the proposal on price only, but will consider all proposal information to determine which proposal will be in the best interest of the SWA. Proposer shall understand that all information requested in this specification package will be evaluated and contribute to the selection process.

\_\_\_\_\_  
Authorized Representative Signature

\_\_\_\_\_  
Please Print Name

\_\_\_\_\_  
Date

