

Maryville Waterline Improvements

Georgetown County, South Carolina

Technical Specifications

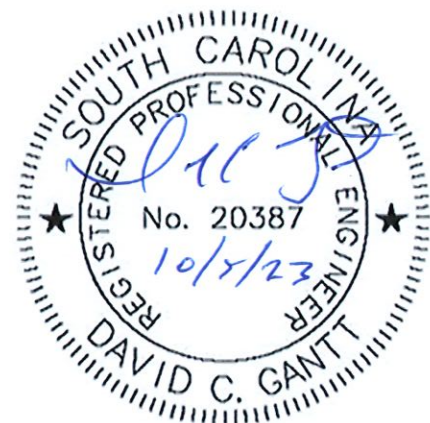
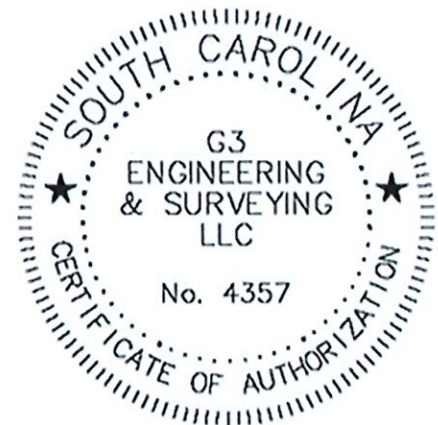
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Prepared for:

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SECTION 02110
CLEARING AND GRUBBING

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Removal of surface debris to limits of the construction areas. Construction areas shall include SCDOT encroachments and rights-of-way boundaries.
- B. Clearing the construction areas of stumps, brush, roots, weeds, and other debris.
- C. Other general clearing and clean-up necessary to eliminate obstacles and to remove features determined not necessary or desirable in the finished work.

1.2 RELATED SECTIONS

- A. Section 02900 – Sediment & Erosion Control.

1.3 REGULATORY REQUIREMENTS

- A. Conform to applicable permits, regulations, and codes for environmental requirements and disposal of debris.
- B. Coordinate clearing Work with utility companies.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 PREPARATION

- A. Provide lines and grades for the work. Staking to be performed under the supervision of a South Carolina Registered Land Surveyor.

3.2 PROTECTION

- A. Locate, identify, and protect utilities that remain from damage.
- B. Protect trees, plant growth, and features adjacent to the area to be cleared and grubbed. Trees so located that they do not interfere with construction shall be protected and preserved.
- C. Protect benchmarks and survey control points from damage or displacement.

3.3 CLEARING & GRUBBING

- A. Clear areas required for access to site and execution of Work.
- B. Remove trees, stumps, shrubs, and surface rock within construction areas.
- B. Remove root systems, as applicable, to a depth of 18 inches below the finished grade of pipelines, or 12 inches below the finished grade of the soil surface.
- C. Clear undergrowth and deadwood, without disturbing subsoils.
- D. Generally remove all material that cannot be compacted to 90% of maximum density in grassed areas and 98% of maximum density elsewhere. The "area of operations" includes all areas on-site and off-site where excavation or any other construction operation is performed.

3.4 REMOVAL

- A. Remove debris, rock, and extracted plant material from the construction areas.
- B. Alternatively, if plant material is to be burned within the construction areas, obtain necessary permits, conduct operation as directed by proper authorities, and remove any remaining ash.

(END OF SECTION)

SECTION 02111
SITE PROTECTION AND RESTORATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Areas of the Work.
- B. Other Considerations.
- C. Sediment and Erosion Control Measures.

1.2 RELATED SECTIONS

- A. Section 02900 – Sediment and Erosion Control.
- B. Section 02936 – Seeding.

1.3 REGULATORY REQUIREMENTS

- A. Conform to applicable permits, regulations, and codes for environmental requirements and disposal of debris.
- B. Coordinate clearing Work with utility companies.

PART 2 – PRODUCTS

PART 3 - EXECUTION

3.1. AREAS OF THE WORK

- A. General: Utilize differing and appropriate types of site protection and restoration activities for the various areas of the work that will be encountered.
- B. Temporary Easements and Adjacent Work Areas:
 - 1. Acquired by the Owner.
 - 2. Occupy only as needed to properly perform the Work.
 - 3. Remove vegetation only when it interferes with the performance of the Work.
 - 4. Restore temporary easements and adjacent work areas in accordance with Section 02936.

- C. Right-of-Way Work:
 - 1. Authorized by appropriate encroachment permit.
 - 2. Clear and prepare area either side of centerline of Work only as needed to properly install piping and appurtenances.
 - 3. Comply with requirements of all associated encroachment permits and permissions. Contact affected agency or utility prior to performing work in rights-of-way.

3.2 OTHER CONSIDERATIONS

- A. Do not occupy or disturb any private property located beyond these areas, unless the owner of such property has granted permission for such occupancy in writing.
- B. Immediately repair any damage made to private property, or make such settlement as may be agreed by the property owner, at no expense to the Owner. Provide written evidence of such repairs or settlement to OWNER.
- C. SCDOT Encroachment Permits and Traffic Control Plan: Comply with provisions of permit and SCDOT procedures regarding open excavations, general highway safety and traffic control.
- D. Permanent Structures Encountered: Protect from damage during all stages of the work. If damaged, make repairs or settlements immediately. Provide written evidence of such repairs or settlement to OWNER.

3.3 SEDIMENT AND EROSION CONTROL MEASURES

- A. Refer to Section 02900 - Sediment and Erosion Control for required sediment and erosion control measures.

(END OF SECTION)

SECTION 02200
EARTHWORK

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Subsoil and aggregate materials.
- B. Removal of subsoil and excavating all classes of material encountered.
- C. Handling, storage, transportation, and disposal of all excavated and unsuitable material
- D. Dewatering, pumping, draining, and handling of water encountered in the excavations.
- E. Sheet piling, shoring, and bracing.
- F. Site filling, backfilling, and compaction around structures, trenches, pits, and from top of utility bedding to subgrade elevations.
- G. Fill under sidewalks, paving, and fill for over-excavation.
- H. Consolidation and compaction as scheduled.
- I. Excavating trenches for utilities.
- J. Related earthwork operations, including, but not limited to preparation of subgrades, surfacing and grading, and any other similar, incidental, or appurtenant earthwork operation which may be necessary to properly complete the work.
- K. Provide all services, labor, materials, and equipment required for all earthwork and related operations necessary or convenient for furnishing complete Work as shown on the Drawings or specified in these Contract Documents.

1.2 RELATED SECTIONS

- A. Section 02510 – Paving Repair
- B. Section 02511 - Flowable Fill.
- C. Section 02900 – Sediment & Erosion Control.
- D. Section 02936 – Seeding

- E. Section 33 05 07 – Utility Boring and Jacking
- F. Section 33 10 00 – Water Utility

1.3 REFERENCES

- A. AASHTO - M147 - Materials for Aggregate and Soil-Aggregate.
- B. AASHTO T180 - Moisture-Density Relations of Soils Using a 10-LB Rammer and an 18-in. Drop.
- C. ASTM C33 - Specifications for Concrete Aggregates.
- D. ASTM C136 - Method for Sieve Analysis of Fine and Coarse Aggregates.
- E. ASTM D698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 LB Rammer and 12 inch Drop.
- F. ASTM D1556 - Test Method for Density of Soil in Place by the Sand-Cone Method.
- G. ASTM D1557 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 LB Rammer and 18-inch Drop.
- H. ASTM D2167 - Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
- I. ASTM D2419 - Test Method For Sand Equivalent Value of Soils and Fine Aggregate.
- J. ASTM D2434 - Test Method For Permeability of Granular Soils (Constant Head).
- K. ASTM D2487 - Classification of Soils for Engineering Purposes.
- L. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- M. ASTM D3017 - Test Method for Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- N. ASTM D4318 - Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with ASTM C136, ASTM D2419, ASTM D2434, and the South Carolina Department of Transportation (SCDOT) Standard Specifications for Highway Construction (SSHC), latest edition. Maintain one copy of each on site.

1.5 FIELD MEASUREMENTS

- A. Verify that the survey bench mark and intended elevations for the Work are as indicated.

1.6 GENERAL

- A. The elevations shown on the Drawings as existing are taken from the best existing data and are intended to give reasonably accurate information about the existing elevations. They are not precise. Become satisfied as to the exact quantities of excavation and fill required.
- B. Perform earthwork operations in a safe and proper manner with appropriate precautions being taken against all hazards.
- C. Maintain all excavated and filled areas for structures, trenches, fills, topsoil areas, embankments, and channels in good condition at all times until final acceptance by the Owner. Repair all damage caused by erosion or other construction operations using material of the same type as the damaged material.
- D. Perform earthwork within the rights-of-way of the SCDOT in accordance with requirements and provisions of the permits issued by this agency for the construction within its rights-of-way. Such requirements and provisions, where applicable, will take precedence and supersede the provisions of these Specifications.
- E. Control grading in a manner to prevent surface water from running into excavations. Obstruction of surface drainage shall be avoided and means shall be provided whereby stormwater can be uninterrupted in existing gutters, other surface drains, or temporary drains. Free access must be provided to all fire hydrants and water meters.
- F. No classification of excavated materials will be made. Excavation work will include the removal and subsequent handling of all materials excavated or otherwise removed in performance of the work, regardless of the type, character, composition or condition thereof.
- G. Ensure that all earthwork operations comply with the requirements of OSHA Construction Standards, Part 1926, Subpart P, Excavations, Trenching, and Shoring, and Subpart O, Motor Vehicles, Mechanized Equipment, and Marine Operations. Conduct operations in a manner acceptable to the OWNER.
- H. Make a thorough investigation of the surface and subsurface conditions of the site and any special construction problems which might arise as a result of nearby watercourses and floodplains, particularly in areas where construction activities may encounter water-bearing sands and gravels or limestone solution channels. Provide all services, labor,

equipment, and materials necessary or convenient for completing the work within the time specified in these Contract Documents

1.7 COORDINATION

- A. Coordinate work with the OWNER and other Contractors as required.
- B. Verify work associated with lower elevation utilities is complete before placing higher elevation utilities.

PART 2 - PRODUCTS

2.1 MATERIALS AND CONSTRUCTION A. Earthwork Materials

- 1. Fill Material, General
 - a. Approval Required: All fill material shall be subject to the approval of the OWNER.
 - b. Notification: For approval of imported fill material, notify the OWNER at least one week in advance of the intention to import material, designate the proposed borrow area, and sample as necessary from the borrow area for the purpose of making acceptance tests to prove the quality of the material.
- 2. On-Site Fill Material: Soil exclusive of organic matter, frozen lumps or other deleterious substances, and containing no rocks larger than 2 inches or lumps larger than 3 inches.
- 3. Imported Fill Materials: Meet the requirements of on-site fill material.
- 4. Sand Cushions and Sand Fill: Consists of a sand-gravel fill of such gradation that 100 percent will pass a 3/8-inch sieve and not more than 10 percent by weight is lost by washing.
- 5. Coarse Aggregate: Conform to the SCDOT SSHC 306.03 (SCDOT Aggregate No. 57) and having the following gradation:

SIEVE DESIGNATION	PERCENT BY WEIGHT PASSING
2-inch	-
1-1/2-inch	100
1-inch	95-100
1/2-inch	25-60
No. 4	0-10
No. 8	0-5

- 6. Drainage Aggregate: Conform to the SCDOT SSHC Section 801.02 (SCDOT Aggregate No. 789) and having the following gradation:

SIEVE DESIGNATION	PERCENT BY WEIGHT PASSING
3/4-inch	100
1/2-inch	95-100
3/8-inch	80-100
No. 4	20-50
No. 16	0-6
No. 100	0-2

7. Fine Aggregate: Conform to the SCDOT SSHC 306.04 and having the following gradation:

SIEVE DESIGNATION	PERCENT BY WEIGHT PASSING
No. 4	100
No. 16	25-75
No. 100	0-25

8. Pea Gravel: Clean, naturally rounded aggregate, 1/8 to 3/4-inch in diameter per ASTM C 33.
 9. Topsoil: Dark organic weed-free loam; free of muck, roots, rocks larger than 1/2 inch, subsoil, and foreign matter.

B. Sheeting, Bracing, and Timbering:

1. Furnish, place, and maintain all sheeting, bracing and timbering required to properly support trenches, boring and jacking pits, and other excavations in open cut and to prevent all movement of the soil, pavement, structures or utilities outside of the trench or pit.
2. Remove bracing and sheeting in units when backfill reaches the point necessary to protect the structures and adjacent property. Leave sheeting in place when in the opinion of the OWNER it cannot be safely removed. Cut off sheeting left in place at least two feet below the surface.

- C. Other Materials: All other materials, not specifically described but required for proper completion of the work of this Section, shall be as selected and shall be subject to the approval of the OWNER.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify site conditions as required for the completion of this work.
- B. Verify that survey bench mark and intended elevations for the Work are as indicated.

3.2 PREPARATION

- A. Identify required lines, levels, contours, and datum locations.
- B. Stake and flag locations of known utilities.
- C. Locate, identify, and protect utilities that remain, from damage.
- D. Notify utility company to remove and/or relocate utilities.
- E. Maintain and protect above and below grade utilities that remain.
- F. Protect plant life, lawns, and other features remaining as a portion of final landscaping.
- G. Protect benchmarks, survey control points, and property corners from excavating equipment and vehicular traffic.
- H. Compact subgrade to density requirements for subsequent backfill materials

3.3 GENERAL

- A. Safety: Comply with local regulations and with the provisions of the “Manual of Accident Prevention in Construction” of the Associated General Contractors of America, Inc., Occupational Safety and Health Act and all other applicable safety regulations.
- B. SCDOT Encroachment Permit: Comply with the General and Special Provisions of the SCDOT Permit for Construction and Maintenance of Public Service Utility Line Along State Highway.
- C. Bracing and Sheeting
 - 1. Furnish, put in place, and maintain all sheeting, bracing and shoring as may be required to properly support the sides of all excavations and to prevent all movement of earth which could in any way injure the work, adjacent property or workers.
 - 2. Properly support all excavations in locations indicated on the Drawing and where necessary to conform to all pertinent rules and regulations and these Specifications, even though, such locations are not indicated on the Drawings.
 - 3. Exercise care in the removal of sheeting, shoring, bracing, and timbering to prevent collapse or caving of the excavation faces being supported and damage to the work and adjacent property.
 - 4. Do not leave any sheeting or bracing in the trench or excavation after completion of the work, unless approved by the OWNER.

- D. Obstructions: Remove and dispose of all trees, stumps, roots, boulders, and the like, as required for the performance of the work.
- E. Extra Earth Excavation
 - 1. In case soft or excessively wet material which is not suitable, is encountered below the final subgrade elevation of an excavation or underneath a structure, the OWNER may order the removal of this material and its replacement with crushed stone or other suitable material in order to make a suitable foundation for the construction of the structure.
- F. Cutting Paved Surfaces and Similar Improvements
 - 1. Remove existing pavement as necessary for installing pipe utilities and appurtenances or as otherwise shown on the Drawings.
 - 2. Before removing any pavement, mark the pavement neatly, paralleling pipelines and existing street lines. Space the marks the width of the trench.
 - 3. Sawcut asphalt pavement along the marks. Break concrete pavement along with the marks by scoring with a rotary saw and breaking below the score by the use of jackhammers or other suitable tools.
 - 4. Do not pull pavement with machines until completely broken and separated from pavement to remain.
 - 5. Do not disturb or damage the adjacent pavement. If the adjacent pavement is disturbed or damaged, remove and replace the damaged pavement. No additional payment will be made for removing and replacing damaged adjacent pavement.

3.4

EXCAVATION

- A. Method
 - 1. All excavation shall be by open cut from the surface except as indicated on the Drawings.
 - 2. All excavations for pipe and appurtenances shall be made in such manner and to such depth and width as will give ample room for building the structures and for bracing, sheeting and supporting the sides of the excavation, for pumping and draining groundwater which may be encountered, and for the removal from the excavation of all materials excavated.
- B. Grades
 - 1. Excavate to grades indicated on the Drawings.
 - 2. Where excavation grades are not indicated on the Drawings, excavate as required to accommodate installation.
- C. Disposal of Excavated Material
 - 1. Remove and properly dispose of all excavated material not needed to complete filling, backfilling and grading.
 - 2. Dispose of excavated material at locations approved by the OWNER. No debris of any kind shall be deposited in any stream or body of water.

EARTHWORK

3.5 EXCAVATION FOR TRENCHING

- A. Excavate subsoil required for utilities.
- B. Cut trenches sufficiently wide to enable installation and allow inspection. Remove water or materials that interfere with Work.
- C. Do not interfere with 45 degree bearing splay of foundations.
- D. Hand trim excavation. Hand trim for bell and spigot pipe joints. Remove loose matter.
- E. Remove lumped subsoil as required.
- F. Correct areas over excavated in accordance with this section.

3.6 BACKFILLING

- A. Backfill areas and trenches to contours and elevations with unfrozen materials. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen or spongy subgrade surfaces.
- B. Employ a placement method that does not disturb or damage other work.
- C. Maintain optimum moisture content of backfill materials to attain required compaction density.
- D. Backfill carefully to restore the ground surface to its original condition. Dispose of surplus material.
- F. Make gradual grade changes. Blend slope into level areas.
- G. Compact backfill underlying roadways, parking areas, sidewalks, structures, and retaining walls to 95 percent of the maximum dry density.
- H. Backfill for Pipe
 - 1. Initial: Place initial backfill material carefully around the pipe above bedding in uniform 6-inch layers to a depth of at least 18-inches above the pipe bell. Compact each layer thoroughly with suitable hand tools. Do not disturb or damage the pipe. Backfill on both sides of the pipe simultaneously to prevent the uneven side pressures. Initial backfill material is earth material excavated from the trench that is clean and free of rock, organics, and other unsuitable material. If materials excavated from the trench are not suitable for use as initial backfill material, obtain suitable materials elsewhere.

2. Final: After initial backfill material has been placed and compacted, backfill with general excavated material. Place backfill material in uniform layers and thoroughly compact with heavy power tamping tools of the "Wacker" type.
3. Settlement: If trenches settle, re-fill and grade the surface to conform to the adjacent surfaces.
4. Additional Material
 - a. Where final grades above the pre-existing grades are required to maintain minimum cover, additional fill material will be shown on the Drawings.
 - b. Utilize excess material excavated from the trench if the material is suitable.

3.7 ROADWAY AND DRIVEWAY

SUBGRADE A. Subgrade Preparation

1. Perform roadway subgrade related preparation and earthwork in accordance with the provisions of this section.
2. Prepare the subgrade to the lines and grades indicated on the Drawings.
3. Provide lines and grades for the work. Perform staking under the supervision of a Professional Land Surveyor.

B. Subgrade Drainage

1. Perform grading of the subgrade in such a manner that there will not remain on the roadway subgrade, at any time, berms of earth or other material which will interfere with the immediate and proper drainage of water during construction.
2. Complete all ditches and other drainage structures so as to drain the roadway subgrade effectively prior to placing any construction materials.

C. Protection of Subgrade

1. Take precautions necessary in handling materials, equipment, tools, etc., to protect the subgrade from damage. Only hauling necessary for the purpose of construction will be permitted on the subgrade after completion thereof.
2. If ruts of 2 inches or more in depth are formed in the subgrade, remove all construction material, whether stored or in place, within the range of such ruts, and reshape and roll the subgrade. Smooth and re-roll ruts or rough places developing in the completed subgrade.

D. Subgrade Checking

1. Review subgrade lines, grades, and cross sections with the OWNER prior to proceeding with the construction of base or pavement thereon.
2. Conform to the lines, grades, and cross sections, indicated or directed, prior to proceeding with the construction of base or pavement thereon.

3.8 EXCESS WATER CONTROL

- A. Regulations and Permits: Comply with all pertinent rules, laws, and regulations of all applicable federal, state, county and municipal regulatory agencies.

- B. Unfavorable Weather
 - 1. Do not place, spread or roll any fill material during unfavorable weather conditions.
 - 2. Do not resume operations until moisture content and fill density are satisfactory.
- C. Provide berms or channels to prevent flooding of subgrade. Promptly remove all water collected in depressions.
- D. Pumping and Drainage
 - 1. Provide, maintain and use at all times during construction adequate means and devices to promptly remove and dispose of all water from every source entering the excavations or other parts of the work.
 - 2. Dewater by means that will insure dry excavations, preserve final lines and grades, do not disturb or displace adjacent soil.
 - 3. Perform all pumping and drainage operations with no damage to property or structures and without interference with the rights of the public, owners of private property, pedestrians, vehicular traffic or the work of other contractors, and in accordance with all pertinent laws, ordinances and regulations.
 - 4. Do not overload or obstruct existing drainage facilities.

3.9 SETTLEMENT

- A. Make repairs for all settlement of backfill, fills and embankments that may occur within one year after final acceptance of the Work by the Owner.
- B. Make all repairs or replacements within 30 days after receipt of written notice from the Owner.

3.10 SEDIMENT CONTROL

- A. Shape temporary berms and swales as required to control erosion and turn storm water into drainage structures. Install straw bales around all drainage structures to reduce sediment. Replace bales as needed.
- B. Correct all water and wind erosion and damage to this site and adjoining property.
- C. See Section 02900 for other erosion and sedimentation control requirements.

3.11 CLEANING

- A. Upon completion of the work of this Section, remove all rubbish, trash and debris resulting from construction operations. Remove surplus equipment and tools. Leave the site in a neat and orderly condition acceptable to the Owner.

(END OF SECTION)

SECTION 02275
STONE FOR EROSION CONTROL

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. The work covered by this section consists of furnishing, stockpiling, if directed, placing and maintaining an approved stone liner placed in or at ditches, swales, pipe inlets, pipe outlets, and at other locations designed on the plans or directed by the Engineer. The Contractor shall furnish all equipment, tools, labor and materials necessary to complete the work in accordance with the plans and specifications.

1.2 RELATED SECTIONS

- A. Section 02900 – Sediment & Erosion Control.

PART 2 - PRODUCTS

- 2.1 STONE for erosion control shall conform to Section 804 of the “Standard Specifications for Highway Construction” dated 1986 published by the South Carolina Highway Department.
- 2.2 STONE for erosion control shall be resistant to the action of air and water, be of a hard, durable nature and shall range in size as follows:

<u>Class</u>	<u>Size</u>
A	2” – 6”
B	5” - 15” Rip Rap

- 2.3 ALL STONE shall meet the approval of the Engineer. While no specific gradation is required, the various sizes of stone shall be equally distributed within the required size range. The size of an individual stone particle will be determined by measuring along its long dimension.

PART 3 - EXECUTION:

- 3.1 INSTALLATION: Unless otherwise directed by the Engineer, the stone shall be placed on slopes less than the angle of repose of the material and to the line, grade and slope as indicated on the plans. The stone shall be placed so that the smaller stones are uniformly distributed throughout the mass. All stone shall be placed in a neat, uniform layer with an even surface meeting the approval of the Engineer. Geotextiles shall be used under all stone.

- 3.2 AT LOCATIONS where stone is required for channel changes and drainage ditches, the stone shall be placed prior to diverting the water into the channel changes and drainage ditches.
- 3.3 AT LOCATIONS where stone is required at the outlet of pipe culverts, the stone shall be placed immediately after completion of the pipe culvert installation.

(END OF SECTION)

SECTION 02510
PAVING REPAIR

PART 1 - GENERAL

1.01 APPLICABLE STANDARDS

- A. When used in this section, the term "Standard Specifications" shall mean the South Carolina State Highway Department Standard Specification for Highway Construction.
- B. American Society for Testing Materials (ASTM):

Reference	Title
ASTM D-698	Test for Moisture-Density Relations for Soils Using Standard Effort
ASTM D-1557	Test for Moisture-Density Relations for Soils Using Modified Effort

1.02 GUARANTEE

The Contractor shall guarantee all pavement work and pavement repair work for a period of **two (2) years** following acceptance by the OWNER and/or SCDOT, and shall repair or replace, at no cost to the OWNER, any pavement or pavement repair which crumbles, cracks, or is otherwise unsound during this two year period.

PART 2 - MATERIALS

2.01 MATERIALS

- A. Stabilized Aggregate Base Course with Prime
The base shall conform to Section 306 of the Standard Specifications.
- A. Prime
The prime coat shall conform to Section 406 of the Standard Specifications.
- B. Binder Course
The binder course shall conform to Section 402 of the Standard Specifications.
- C. Surface Course - Asphalt Plant Mix
The surface course shall be Type 1 Asphaltic Concrete and shall conform with Sections 401 and 403 of the Standard Specifications.
- D. Rigid Pavement
Portland cement concrete pavement shall conform to Section 501 of the Standard Specifications.

PART 3 - EXECUTION

3.01 COMPACTION

- B. Subgrade
Subgrade soils in all cut areas and all fill areas that are to receive new pavements shall be scarified and re-compacted until a density equivalent to 95% standard Proctor maximum dry density in accordance with ASTM D1557 has been obtained.
- A. Base
Stabilized aggregate base shall have minimum compaction of 95% of the maximum density obtained by the test procedure presented in ASTM D1557, Method D (Modified Proctor). The maximum permissible lift thickness shall be eight (8) inches (compacted).
- B. Moisture Content
Compaction shall be performed only when the moisture content of the soil is within 4% (four percent) of the optimum moisture content at the time of compaction. Soils are to be dried prior to compaction by disk and aeration. An Independent Testing Laboratory shall determine if soils are within the optimum moisture content.

3.02 CONSTRUCTION

- C. Preparation of Subgrade
Prior to placing of base and pavements, the construction of all utility lines (water, sewer, power, gas, etc.) which are to be placed under the pavements shall have been completed.
- A. Base
The base course shall be constructed in accordance with either Section 306 of the Standard Specifications.
- B. Prime
The prime coat shall be applied in accordance with Section 406 of the Standard Specifications.
- C. Binder and Surface Course - Asphalt Plant Mix
The binder and surface courses shall be constructed in accordance with Sections 401 and 403 of the SCDOT Standard Specifications to the thickness required to match existing pavement.
- D. Rigid Pavement
Concrete pavement shall be constructed in accordance with Section 501 of the SCDOT Standard Specifications to the thickness required to match existing pavement.

- A. Prior to removing pavement materials, the Contractor shall mark the pavement for cuts as nearly parallel to the pipe route and the existing street lines as possible.
- B. Asphalt pavement and bituminous surface treatment pavement shall be scored to a depth of 1/4 inch along marked lines with a rotary saw or other approved device. After scoring, the pavement may be broken using a jack hammer with a spade blade or other approved device.
- C. Concrete pavement or asphalt pavement on concrete shall be scored to a depth of 2 inches along marked lines before breaking with a jackhammer or other approved device.
- D. Pavement shall be cut 12-inches wider than the excavated area on each side after the trench is backfilled. Cuts shall be either parallel or perpendicular to the road centerline.
- E. Concrete sidewalks and curbs shall be removed for full width and to the nearest joint undisturbed by construction.
- F. Pavement shall not be machine pulled until completely separated along the marked lines.
- G. Adjacent pavement receiving damage by whatever cause shall be removed to neat lines at least six inches from the damaged edge or as directed. Damaged pavement shall be trimmed and replaced at the Contractors expense. Zig-zagged or rough edges will not be acceptable.

3.04 REPLACEMENT

- A. Backfill in trenches in areas receiving pavement replacement shall be accomplished by compaction methods set forth in Section 02200 of these specifications and in any case shall meet the requirements of the applicable sections of the SCDOT Standard Specifications.
- B. Upon completion of backfilling and consolidation of the backfill, the Contractor shall furnish all materials and labor and shall replace all pavement removed for construction of the pipe lines and appurtenances; and shall also remove and replace, at his own expense, any all pavements adjacent to pipe trenches which may have been disturbed or damaged as the result of construction operations. Stone is not to be removed from the trench before placing pavement, instead, a suitable tap is to be used to further compact the ditch to the depth of paving specified.
- C. Before the replacement of pavement, the existing pavement along the ditch line shall be cut back from the top edge of ditch lines for a distance of at least twelve (12) inches on each side of the ditch to allow for solid bearing edges for the pavement to be replaced.
- D. The various types of pavements removed shall be replaced as follows:

1. Concrete curb and gutter, street, driveway, and sidewalk shall be replaced with concrete of the same thickness as was removed, but not less than 4 inches. Finish surface to match existing surface. The concrete shall be 3000 psi strength.
2. Asphalt pavement or bituminous surface treatment shall be replaced in accordance with details shown on the Plans. Top with a minimum of 2 inches of asphaltic concrete. Finish surface to match existing surface.

(END OF SECTION)

SECTION 02511
FLOWABLE FILL

PART 1 - GENERAL

1.1 SECTION INCLUDES

Basic requirements for furnishing and placing flowable fill.

1.2 DESCRIPTION

- A. Flowable fill is a controlled low-strength material (CLSM) which can be placed in a self-leveling consistency or in a less-flowable state to reduce the fluid pressures exerted by the material. The ultimate unconfined compressive strengths should be less than 200 psi to maintain the ability to re-excavate. All voids of the excavation shall be filled without "honeycombs," and without shrinkage during the hardening process.
- B. Flowable fill is suitable for all routine backfilling and is especially beneficial as structural backfill beneath foundations and as backfill for pipelines, culverts, tanks and other below-grade structures, utility trenches, catch basins and drop inlets, vertical taps, etc.
- C. Flowable fill may be placed from a ready-mix truck in a full-depth layer without compaction of thin layers. The flowable fill hardens within a reasonable time, (at which point pavement shall be replaced), and can carry traffic without future settlement.
- D. Flowable fill is an acceptable material to use in original construction or in maintenance situations. It may be used to reduce the size of the excavation and in all weather conditions, including rain.

1.3 RELATED SECTIONS

- A. Section 02510 – Paving Repair.

PART 2 - PRODUCTS

2.1 AVAILABILITY (SOURCE OF SUPPLY)

- A. Most of the major ready-mix plants can provide flowable fill. It is supplied as a finished product by means of ready-mix trucks and is handled similarly to concrete except that it is flowable and does not require extensive labor for placement.

2.2 MIX DESIGNS (MAXIMUM DENSITY)

- A. The mixes fall into the categories of "very flowable" and "less flowable," which is controlled by the amount of water that is added. Both mixes contain sand from an

approved source with sufficient cement and fly ash to obtain maximum density at optimal moisture with load-bearing capacity and stability characteristics as good as or better than a well compacted granular base material. In either category, the mix design is the same except for the water content. The added volume shown in the very flowable mix is comprised only of the extra water used to obtain extra flowability. That extra water will be displaced during the consolidation process and the resulting in place volume (yield) will be approximately 27 cubic feet (one cubic yard).

- B. The less flowable mix can be used when it is desirable to put traffic back on a roadway quickly (usually 8 to 10 hours) or when being used to backfill pipes which could "float" out of position due to the buoyant effect of the very flowable fill mix. This mix will still have the workability necessary to self-consolidate around pipes without any "honeycomb" areas. The very flowable mix is still self-leveling and requires minimal effort to place but requires longer time to displace the extra water and develop load-bearing capacity (usually 10 to 20 hours). Adding water to flowable fill to obtain the desired plastic characteristics will not compromise the quality of the hardened flowable fill.

Mix 1 Less Flowable		Mix 2 Very Flowable	
Weights	Volume(ft ³)	Weights	Volume(ft ³)
Min. 50 lbs.	Cement .25	Min. 50 lbs.	Cement .25
Min. 600 lbs.	Fly Ash 4.24	Min. 600 lbs.	Fly Ash 4.24
SSD 2500 lbs.	Sand 15.17	SSD 2500 lbs.	Sand 15.17
55 Gal 458 lbs.	Water 7.34	65 Gal 541 lbs.	Water 8.68
Total Cubic Feet = 27.00		*Total Cubic Feet = 28.34	

* One cubic yard of very flowable fill will be mixed to contain more than 27 cubic feet due to the additional water.

- C. Above values are based on the following specific gravities: cement 3.15, fly ash 2.27, sand 2.64, and water 1.00. Anticipated unconfined compressive strength is 80 psi at 28 days and 150 psi at 56 days.
- D. If the situation demands greater flowability than Mix 2, the OWNER may increase the fly ash in increments of 50 pounds while decreasing the sand in increments of 58 pounds. If higher unconfined strengths are needed and the ability to easily re-excavate is not necessary, the OWNER may increase the cement in increments of 10 pounds while decreasing the sand in increments of 8 pounds.

2.3 LOW DENSITY FLOWABLE FILL

- A. Low-density flowable fill is an option. Low-density flowable fill depends on about 30% air entrained into the plastic material to obtain the flowability characteristics of maximum-density flowable fill. Low-density flowable fill also depends on the

development of cementitious bonds to obtain the load-bearing characteristics associated with the standard maximum-density flowable fill.

- B. Before using low-density flowable fill, the mix design, and laboratory test data shall be submitted to the OWNER for approval at least 30 days in advance of starting the work. Test data should show set times, flowability characteristics, and compressive strength at 28 days.

2.4 MATERIAL AND EQUIPMENT

- A. The material and equipment used to produce flowable fill shall be in compliance with the requirements of the Department's Standard Specifications for Highway Construction (Latest Edition, Subsection 700) and applicable Special Provisions. Sampling and testing of maximum density flowable fill and the materials used to produce it will not be required.

PART 3 - EXECUTION

3.1. GENERAL

- A. The trench shall be prepared and the PVC pipe and appurtenances shall be wrapped in a polyethylene encasement. There should be at least 6 inches of flowable fill above the pipe.
- B. The OWNER will select the appropriate mix design for the application at the site. Typically, the less flowable mix will be used to cover the pipe. Once the pipe is covered, it will be sufficiently anchored and water may be added to the remaining flowable fill to ease placement without danger of floating the pipe. If it is important to quickly return traffic to the roadway, the less flowable mix would be preferred full depth.
- C. The flowable fill shall be discharged directly from the truck into the space to be filled, or by other methods approved by the OWNER. The mix may be placed part depth or full depth as conditions at the site dictate. Formed walls or other bulkheads shall be constructed to withstand the hydrostatic pressure exerted by the flowable fill. Trench ends outside the roadway should be blocked with sandbags or mounded soil rather than wood or metal forms. When backfilling utility lines such as water mains or force mains, flowable fill shall be distributed evenly to prevent any movement of the pipe.
- D. The flowable fill material is self-consolidating and there is no need to use vibrators, even when placed in a less-flowable state. No field testing is needed when using flowable fill. The less flowable mix can be placed in the rain or in standing water and the hardened flowable fill will obtain uniform (controlled) density.
- E. Finishing can be accomplished with a square shovel if the fill surface is at the bottom of the pavement.

- F. Once the flowable fill is in the trench, the self-consolidating material displaces the extra water not needed for maximum density. Provision shall be made for this "bleed water" to run off and away from surface of the hardening flowable fill (use of vapor barriers such as plastic sheets are not desired). Typically, full traffic can be allowed on the hardened flowable fill within 8 to 20 hours (depending on the mix used, site conditions, volume to be backfilled, etc.) without damage to the fill or any structure below. Steel plates shall be used to bridge over the hardening flowable fill as directed by the OWNER. If the filled cavity is too wide to bridge, steel plates shall be placed on top of the hardening flowable fill as soon as it is able to support foot traffic (one hour after bleeding ends). With steel plates in place, full traffic can be allowed without damage to the fill or the structure below.

- G. As the extra water is displaced from the consolidating flowable fill, there will be an initial subsidence of about one-eighth of an inch per vertical foot. Once the flowable fill hardens there will be no future settlement. The hardened flowable fill can be shaped to grade the next day to allow the pavement thickness required by the OWNER. The pavement may be applied directly on top of the flowable fill.

- E. Furnish the necessary information to obtain approval of the suggested mix design and to use the necessary construction techniques to assure that the finished material will perform as intended.

(END OF SECTION)

SECTION 02675
DISINFECTION OF POTABLE WATER MAINS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Disinfection of potable finished water transmission main and water distribution system mains and any surfaces that will be in contact with potable water.
- B. Testing and reporting results.

1.2 RELATED SECTIONS

- A. Section 02676 – New Construction Water Usage

1.3 REFERENCES (LATEST EDITION)

- A. AWWA B300 - Standard for Hypochlorites.
- B. AWWA B301 - Standard for Liquid Chlorine.
- C. AWWA B303 - Standard for Sodium Chlorite.
- D. AWWA C605 - Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water (Reference Section 7.4 - Disinfecting).
- E. AWWA C651 - Standard for Disinfecting Water Mains.
- F. South Carolina State Primary Drinking Water Regulations: R.61-58 (Reference paragraph R.61-58.4(D)(f)).

1.4 SUBMITTALS FOR INFORMATION

- A. Section 01300 – Submittals: Procedure for submittals.
- B. Test Reports: Include results comparative to specified requirements.
- C. Certificate: Certify that cleanliness of water distribution system meets or exceeds specified requirements.

1.5 PROJECT RECORD DOCUMENTS

- A. Disinfection report:
 - 1. Type and form of disinfectant used.
 - 2. Date and time of disinfectant injection start and time of completion.
 - 3. Test locations.
 - 4. Initial and 24-hour disinfectant residuals (quantity in treated water) in ppm for each outlet tested.
 - 5. Date and time of flushing start and completion.
 - 6. Disinfectant residual after flushing in ppm for each outlet tested.

- B. Bacteriological report:
 - 1. Date issued, project name, and testing laboratory name, address, and telephone number.
 - 2. Time and date of water sample collection.
 - 3. Name of the person collecting samples.
 - 4. Test locations.
 - 5. Initial 24-hourhour disinfectant residuals in ppm for each outlet tested.
 - 6. Coliform bacteria test results for each outlet tested.
 - 7. Certification that water conforms, or fails to conform, to bacterial standards of zero coliform and <80 non-coliform bacterial colonies per 100 ml.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with AWWA C651.
- B. Testing Firm: Laboratory contracted to analyze samples shall be certified by the SCDHEC for coliform and non-coliform bacteria testing.

PART 2 - PRODUCTS

2.1 DISINFECTION CHEMICALS

- A. Chemicals: AWWA B300, Hypochlorite, AWWA B301, Liquid Chlorine, and AWWA B303, Sodium Chlorite.

2.2 WATER

- A. Once the new water mains are connected to the City of Georgetown water system, the Contractor shall coordinate the delivery of water for the purpose of filling, pressure testing, disinfection, and flushing of the new mains with the City of Georgetown.
- B. Any use of City of Georgetown water must be coordinated with City of Georgetown (843 545-4501) in accordance with Section 02676 – New Construction Water Usage. City of Georgetown will set water flow rates and volumes as well as the time and duration of availability.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that piping system has been cleaned, flushed, and pressure tested.
- B. Perform scheduling and disinfecting activity with start-up, testing, adjusting and balancing, demonstration procedures, including coordination with related systems.

- C. OWNER shall verify chlorine residual levels to confirm that it is within the range of the existing distribution system, preferably using the Hach Pocket Colorimeter Model 46700-00 on the Low-End Levels. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review. All "or-equal" substitutions must be submitted to Engineer for review.

3.2 EXECUTION

- A. Perform disinfection of new water mains in accordance with AWWA Standard for Disinfecting Water Mains, C651. Use one of three methods of chlorination: Tablet Method, Continuous-Feed Method, or Slug Method.
- B. Exercise all valves, service lines, and hydrants contained within the section of main being tested. Maintain isolation of water mains to be disinfected and tested.
- C. Dependent upon the chlorination method used, achieve the required chlorine concentrations and maintain disinfectant in the system for the prescribed periods. At the end of the test period, check for the presence of the required free chlorine residual. Flush the tested section until the free chlorine residual is no higher than that generally prevailing in the existing distribution system or is acceptable for domestic use. Include the chlorine residual reading on the Chain of Custody form.
- D. Flush heavily chlorinated water in such a manner as not to damage the environment. Use neutralizing chemicals as may be required.
- E. Two consecutive satisfactory bacteriological tests, taken at least 24 hours apart, are required at each sample site. The number of sample sites varies depending on the amount of new construction, but must be representative of the water in the newly constructed mains. Samples will be taken at each dead end and at a minimum of every 1,200 linear feet of new water main. Include a schedule of how to determine the number of samples to be taken.
- F. Upon completion of the disinfection procedure, reduce the chlorine residual to levels required for discharge to the environment. Treat disposed water with sulfur dioxide or other reducing agent to neutralize chlorine residual.
- G. The lab report for analytical testing must provide the chlorine residual at each sample point as well as the bacteriological test result for each sample point. If the membrane filter analysis method is used for bacteriological testing, non-coliform

growth must also be provided. If the non-coliform growth is greater than 80 colonies per 100 milliliters, the sample result is invalid and must be repeated. All samples analyzed must show the water line to be absent of total coliform bacteria. The Contractor is responsible for coordinating and providing these services.

3.3 FIELD QUALITY CONTROL

- A. Representative of the Owner must be present during sample collection.
- B. Collect and transport samples in accordance with the quality control procedures of the contract laboratory.

(END OF SECTION)

SECTION 02676

NEW CONSTRUCTION WATER USAGE

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Procedures for coordinating and reporting water usage for filling, pressure testing, disinfection and flushing.

1.2 RELATED SECTIONS

- A. Section 02675 – Disinfection of Potable Water Mains

PART 2 – PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

2.1 FILLING

- A. After a new line is installed and prior to filling, the Engineer will calculate the volume of water needed to fill the line. This information will be forwarded to the City of Georgetown along with a written request to fill the line. This information will be required 72 hours in advance of filling any new lines.

2.2 FLUSHING

- A. Once the Contractor is ready to flush in preparation for bacteriological testing, the Contractor shall coordinate with the City of Georgetown 72 hours in advance following the procedures below:

- 1.1 If the Contractor will be using hydrants for flushing, the Contractor shall pay a \$1,200.00 refundable deposit per hydrant meter to the City of Georgetown. The meter(s) shall be installed on the affected hydrant(s). The Contractor shall record all flow and forward this information to the City of Georgetown by 8:00 a.m. on the Monday after the previous week's flushing actions.
- 1.2 If the Contractor is using service connections for flushing, the Contractor shall pay a \$150.00 refundable deposit per service line meter. The meter(s) shall be installed on the affected service line(s). The Contractor shall record all flow data and forward this information to the City of Georgetown by 8:00 a.m. on the Monday after the previous week's flushing actions.
- 1.3 Once all meters are returned to the City of Georgetown, the Contractor's deposit will be refunded.

(END OF SECTION)

SECTION 02900
SEDIMENT AND EROSION CONTROL

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Furnishing all equipment, labor, and materials necessary to comply with all Federal, State, and local laws and regulations pertaining to sedimentation and erosion control, including the approved South Carolina Department of Health & Environmental Control (SCDHEC) "Stormwater Management Permit."
- B. Temporary and permanent erosion and sedimentation control measures.
- C. Best management practices for erosion and sedimentation control.
- D. Sequence of erosion and sedimentation control construction activities.

1.2 RELATED SECTIONS

- A. Section 02200 - Earthwork.
- B. Section 02275 – Stone for Erosion Control
- C. Section 02936 - Seeding.

1.3 REFERENCES

- A. FHWA - (Federal Highway Administration) - Task Force 25 – Geotextile Engineering Manual.
- B. SCLRCC - (South Carolina Land Resources Conservation Commission) - Erosion and Sediment Control Practices for Developing Areas.
- C. AASHTO - (American Association of State Highway and Transportation Officials) - Guide Specifications for Highway Construction.
- D. SCDOT - (South Carolina Department of Transportation) - Standard Specifications for Highway Construction.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with the SCDOT Standard Specifications for Highway Construction.
- B. Maintain one copy of approved SCDHEC Stormwater Management permit, plans, and specifications at the project site.

PART 2 - PRODUCTS

2.1 BALED STRAW

Standard size (18 in. by 48 in.) rectangular, mechanically baled straw.

2.2 SILT FENCE A.

Manufacturers:

1. Mirafi, Inc. - 100X.
2. Amoco Fabric and Fibers Company - 1380 Silt Stop.
3. Engineer approved equal.

B. Silt Fence and Support Devices:

1. Demonstrate proven record of satisfactory performance.
2. Silt fence fabric: Meet the Task Force 25 Specifications as published in the FHWA Geotextile Engineering Manual.
3. Netting: Polymer-type with a built-in cord running throughout the top edge of the fabric.
4. Support posts: Steel or pressure treated Southern yellow pine; spaced not more than six feet on center.
5. Equivalent opening size (EOS): 40 to 100.
6. Fabric permeability: 40 gallons per minute per square foot maximum.

2.3 TEMPORARY SEEDING

- A. General: Seed and fertilizer to conform with all State law and to all requirements and regulations of the South Carolina Department of Agriculture.
- B. Seeding and Fertilization Schedule: In accordance with Section 810 of the SCDOT Standard Specifications for Highway Construction.

2.4 GRAVEL

- A. Gravel for Temporary Site Access: 1 to 2 ½ inch washed stone meeting AASHTO designation M43, size No. 2.

2.5 FILTER FABRIC A.

Manufacturers:

1. Mirafi, Inc. – 140NS.
2. Engineer approved equal.

- B. Non-biodegradable, 4 oz. non-woven filter fabric.

2.6 EROSION CONTROL & REVEGETATION MAT A.

Manufacturers:

- 1. Mirafi, Inc. – Miramat.
- 2. Engineer approved equal.
- B. Non-biodegradable, bonded vinyl monofilament.

PART 3 - EXECUTION

3.1 BEST MANAGEMENT PRACTICES

- A. General: Properly care for all disturbed areas during construction to prevent or minimize sedimentation damage downstream of the construction area. Conduct site grading and drainage operations in such a manner as to prevent or minimize soil erosion on and around the construction site.
- B. Minimum Requirements: Measures shown on the Drawings. Method of operation may dictate additional erosion and sedimentation control measures not indicated. Failure to stabilize disturbed areas immediately following intermediate or final grading may dictate additional erosion and sedimentation control measures not indicated.
- C. Sediment and Erosion Control:
 - 1. Provide satisfactory means of preventing or minimizing the movement and washing of soil onto downstream properties or into adjacent waterways and drainage channels. If such erosion occurs, provide immediate means of removing soil and debris from the affected areas.
 - 2. Periodically review site grading and drainage operations with the Owner to determine the areas most susceptible to erosion.
 - 3. Provide temporary measures to minimize the washing away of the site soils that would likely occur before the areas are finish graded, topsoiled, grassed, and accepted by the Owner.
 - 4. Notify the Owner of any changes or additions to the erosion and sedimentation control plan as submitted.
 - 5. Pay all fines imposed for improper erosion and sedimentation control.

3.2 GENERAL SEQUENCE OF EROSION AND SEDIMENTATION CONTROL

ACTIVITIES DURING CONSTRUCTION

- A. Clear and grub areas necessary for installation of perimeter control measures.
- B. Install sediment control measures.
- C. Construct perimeter control measures.
- D. Complete clearing and grubbing operations.
- E. Install underground utilities.
- F. Finish grade work site and restore disturbed areas.
- G. Remove sediment and erosion controls measures once permanent vegetation is established.

3.3 BALED STRAW CHECK DAMS AND INLET FILTERS

- A. Provide and construct baled straw check dams and inlet filters in accordance with details as shown on the Drawings and as specified.
- B. Locate as depicted on the Drawings, as directed by the Engineer, or as necessary to control on-site erosion.
- C. Provide additional straw bales wherever severe erosion occurs during the construction process.

3.4 SILT FENCING

- A. Provide and install silt fences in accordance with details as shown on the Drawings and as specified by the manufacturer.
- B. Locate as depicted on the Drawings, as directed by the Engineer, or as necessary to control on-site erosion.
- C. Adjust location and length of silt fencing as necessary to ensure proper sedimentation and erosion control.
- D. Maintain silt fencing until capacities are reached or erosion activity in the construction areas is stabilized. Construct additional silt fencing when original fencing has reached its functional capacity.

3.5 MAINTENANCE AND REMOVAL

- A. Inspect all sediment control measures at least once every seven calendar days and after every rain event of 1/2 inch or greater during any 24 hour period. Repair and maintain all sediment control measures until final stabilization has been obtained.
- B. Remove any sediment spilled, dropped, washed or tracked onto public rights-of-way immediately.

3.6 COMPLETION OF CONSTRUCTION

- A. Remove and dispose of all temporary erosion and sediment control structures at the conclusion of construction activity. Spread and finish grade accumulated soil.
- B. Provide permanent seeding in accordance with Section 02936.

(END OF SECTION)

SECTION 02936
SEEDING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Preparation of subsoil.
- B. Placing topsoil.

B. C. Seeding, mulching, and fertilizing

1.2 RELATED SECTIONS

- A. Section 02900 – Sediment and Erosion Control.
- B. Section 02200 – Earthwork

1.3 REFERENCES

- A. FS O-F-241 – Fertilizers, Mixed, Commercial.
- B. SCDOT - (South Carolina Department of Transportation) - Standard Specifications for Highway Construction.

1.4 SUBMITTALS FOR REVIEW

- A. See Section 01340.

1.5 QUALITY ASSURANCE

- A. Provide seed mixture in containers showing percentage of seed mix, year of production, net weight, date of packaging, and location of packaging.
- C. Provide fresh, clean, new crop seed complying with the tolerance of purity and germination established by the Official Seed Analysis of North America and certified by the Crop Pest Commission, as follows:
 - 1. Pennisetum Glaucum (Browntop Millet): Testing 98% purity and 85% germination.
 - 2. Bermuda Common: Testing 98% purity and 85% germination.
 - 3. Domestic Italian Rye: Testing 98% purity and 90% germination.

1.6 REGULATORY REQUIREMENTS

- A. Comply with regulatory agencies for fertilizer and herbicide composition.

- B. Provide certificate of compliance from authority having jurisdiction indicating approval of seed mixture

1.7 DELIVERY, STORAGE, AND PROTECTION

- A. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable.
- B. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.
- C. Seed, fertilizer, ect. shall be handled and stored in a manner that will prevent damage. Tags and labels shall be maintained secure and legible.
- D. Include the latest SCDOT schedule of seeding and temp. seeding.

PART 2 - PRODUCTS

2.1 SEED MATERIALS

- A. Conform to all State laws and to all requirements and regulations of the South Carolina Department of Agriculture.
- B. Individually package and tag different varieties of seed to show name of seed, net weight, origin and lot number.
- C. Seed mixture: In accordance with section 810.04 of the SCDOT "Standard Specifications for Highway Construction."

2.2 SOIL MATERIALS

- A. Shape and grade topsoil stockpiled on the site in accordance with Section 02900.
- B. Complete seeding operations at the earliest practical date in order to establish a grass cover sufficient to protect soil materials from wind and water erosion.

2.3 ACCESSORIES AND OTHER PLANTING MATERIALS

- A. Provide following materials, all meeting or exceeding regulations of the South Carolina State Department of Agriculture, as follows:
 - 1. Fertilizer: 10-10-10 or as indicated in analysis.
 - 2. Limestone: Ground dolomite containing not less than 85% of total carbonates; grind to fineness such that 50% will pass through a 100 mesh sieve and 90% will pass a 20 mesh sieve.

3. Emulsified asphalt: Meet the requirements of Section 406 of the SCDOT "Standard Specifications for Highway Construction." Dilute with water to provide a homogenous material satisfactory for spraying.
4. Straw mulch material: (1) wheat, rye, barley, or oat straw, or (2) timothy, pearline, alfalfa, or coastal bermuda hay. Ensure that materials are dry and reasonably free of mature seed-bearing stalks of Johnson grass, nutgrass, sandbary, wild garlic, wild onion, wild mustard, Crotonaria, pigweed, witchweed, and cocklebur.

PART 3 - EXECUTION

3.1 PREPARATION OF SOIL

- A. Prepare subsoil to eliminate uneven areas and low spots. Maintain lines, levels, profiles and contours. Make changes in grade gradual. Blend slopes into level areas.
- B. Remove foreign materials, weeds and undesirable plants and their roots. Remove contaminated subsoil.
- C. Spread stockpiled topsoil to a minimum depth of six inches. Rake until smooth.
- D. Place topsoil during dry weather and on dry unfrozen subgrade.
- E. Remove vegetable matter and foreign non-organic material from topsoil while spreading.
- F. Grade topsoil to eliminate rough, low or soft areas, and to ensure positive drainage.

3.2 FERTILIZER AND LIME APPLICATION

- A. Apply fertilizer over the area to be seeded at the rate of 250 pounds per acre.
- B. Apply lime over the area to be seeded at the rate of 500 pounds per acre.
- C. Apply after smooth raking of topsoil.
- D. Do not apply fertilizer and lime at the same time or with the same machine used to apply seed.

3.3 SEED APPLICATION

- A. On the prepared area, evenly distribute seed at the rates noted in the Seeding Schedule shown on the Drawings (Refer to Water Panel 11C).

(END OF SECTION)

SECTION 33 05 07
UTILITY BORING AND JACKING

PART 1 – GENERAL

1.01 WORK INCLUDED:

- F. This Section covers the work necessary to furnish and install steel casing carrier pipes under surface structures, where indicated, as specified herein, and as needed for a complete and proper installation.
- G. Where laws or orders of public authority prescribes a higher degree of protection than specified herein, then the higher degree so prescribed shall be deemed a part of this specification and govern the specific installation.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

Section 02200 – Earthwork

1.03 CONTRACTOR FURNISHED AND INSTALLED:

- A. All casing, casing spacers, restrained joint ductile iron carrier pipe, and accessories, which become part of the finished product.

1.04 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 of this Section.
- B. Use equipment adequate in size, capacity, and numbers to accomplish the work in a timely manner.

1.05 SUBMITTALS:

- H. Comply with pertinent provisions of Section 01 – General Requirements.
- I. Product data: Within 60 calendar days after the Contractor has received the Owner's Notice to Proceed, submit Manufacturer's specifications and other data needed to prove compliance with the specified requirements.

1.06 SAFETY:

- A. Perform all excavation and backfilling activities in accordance with the Occupational Safety and Health Act of 1970 (PL 91-597), as amended.

PART 2 - MATERIAL

2.01 CARRIER PIPE

- A. Carrier pipe shall be restrained joint PVC in accordance with specification Section 33 10 00 – Water Utility.

2.02 STEEL PIPE CASING:

- A. Steel pipe casing shall be manufactured from steel conforming to ASTM A139 for Grade B, with minimum yield strength of 35,000 psi before cold forming.
 - 1. Pipe shall be straight seam welded. A protective coat will not be required. Spacers for installation of the carrier pipe shall be installed by the Contractor.
 - 2. Minimum diameter and wall thickness of the steel piping shall be as listed in the following table.

Restrained Joint PVC Carrier Pipe Size (inches)	Minimum Casing Size (inches)	Minimum Casing Thickness (inches)
4	14	0.250
6	16	0.281
8	18	0.312
10	20	0.375
12	24	0.375

- 3. The thicknesses of the casing shown in 2.02.A.2 are minimum thicknesses. Actual thicknesses shall be determined by the casing installer based on an evaluation of the required jacking forces. Any buckling of the casing due to jacking forces shall be repaired at no additional cost to the owner.

2.03 CASING SPACERS:

- A. Casing spacers shall be flanged, bolt-on style with a two-section stainless steel shell lined with a PVC liner, minimum 0.09-inch thick, also having a hardness of 85-90 durometer. Runners shall be attached to stainless steel risers which shall be properly welded to the shell. The height of the runners and risers shall be manufactured such that the pipe does not float in the casing. Casing spacers shall be as manufactured by Cascade Waterworks Manufacturing Company, Contractors Manufacturing, Inc., or approved equal.

PART 3 - EXECUTION

3.01 INSTALLATION OF STEEL PIPE CASING:

Installation of steel pipe casing shall be by the dry bore method at locations as shown on the Contract Drawings and approved by the applicable permits. Installation of steel pipe

casing shall be in accordance with applicable regulations, the Contract Drawings, these specifications, and any permits required with respect to the particular boring

A. Boring Pit and Receiving Pit

The boring pit shall be solid sheeted, braced, and shored as necessary to provide a safe operation. The Contractor shall take all precautions, and comply with all local, state and federal requirements as may be necessary to protect private property, public property and/or existing utilities. Maintain in dry condition by use of pumps, drains or other approved method.

The receiving pit shall be constructed in accordance with the Contract Drawings and applicable permit.

B. Line and Grade

The Contractor shall set the boring rig so that after the casing is complete, and the carrier pipe is installed, the invert of the pipe shall conform to grade and alignment as shown on the Contract Drawings. As the casing is installed, Contractor shall check the horizontal and vertical alignment frequently. Contractor shall install the boring at a 90-degree angle to the crossing unless permitting authority approves a different specific angle of crossing. The depth shall be a minimum depth as prescribed by the governing authority unless a deeper depth is dictated by design.

C. Boring

In all cases, boring and jacking of the casing pipe shall be accomplished by the dry jack and bore method without jetting, sluicing, or wet boring. For casing pipes 48-inch in diameter and larger, a closed face shield bore head shall be utilized in front of the casing. For casing pipes less than 48-inches in diameter, the casing may be installed via open face method whereby the hole shall be bored and cased through the soil by a cutting head on a continuous auger mounted inside the casing pipe. The distance between the leading end of the first auger section and the leading end of the casing shall be as necessary to maintain a solid plug of spoil material inside the forward portion of the casing. At no time during the boring and jacking operation shall the auger head be allowed to extend out in front of the casing being installed. The boring of the hole and jacking of the casing pipe shall be done simultaneously, with continuous installation, until the casing pipe is in final position

D. Dewatering

Contractor shall fully investigate the locations of all jack and bores for the project and determine required dewatering methodologies for each location in order to provide for and conduct a dry jack and bore. Contractor shall submit plans and specifications for dewatering to the Engineer for approval prior to beginning the process (for railways, railway authority must also approve). Pumps of sufficient capacity to handle the flow shall be maintained at the site,

provided the Contractor has received approval from the engineer to operate them. Pumps in operation shall be constantly attended on a 24-hour basis until, in the sole judgement of the DOT or railway authority; the operation can be safely halted. When dewatering, a process for monitoring any settlement of tracks, roads, or structures must be in place. Prior to commencing boring, the Contractor shall verify, with acceptance by the Engineer, the absence of groundwater to below the lowest elevation of the casing at each entry/exit pit and as necessary along the casing route.

E. Diameter of Hole

Bored installations shall have a bored hole no more than 1-inch greater than outside diameter of the casing pipe to be installed. In the event that voids are detected, the voids shall be grouted.

F. Casing Pipe Length

Lengths of casing pipe shall be as long as practical for site conditions. Joints between lengths shall be completely welded in accordance with American Welding Society recommended procedures. Prior to welding joints, the Contractor shall ensure that both ends of the casing sections being welded are square. The length of the casing shall be such that each end of the casing shall extend a minimum of 6' beyond the edge of pavement/back of curb or a paved roadway, or if railway installation, in accordance with requirements of the railway authority.

G. Lubricant

The Contractor shall plan to use a casing lubricant, such as bentonite, in the event excessive frictional forces jeopardize the successful completion of the casing installation.

H. Jacking

Once the jacking procedure has begun, it shall be continued without stopping until the boring and jacking operation is complete.

I. Installation of the Carrier Pipe

1. Inspect carefully, insuring that all foreign material is removed from the casing and the casing meets alignment criteria for the type of carrier pie being used.
2. For pressure systems, the casing deflection shall not exceed the maximum deflection recommended by the carrier pipe.
3. Install casing spacers on the carrier pipe per the manufacturer's instructions.
4. Provide a minimum of one spacer per ten linear feet of pipe.
5. Install the carrier pipe in the casing ensuring each joint is pushed "home" before the joint is installed into the casing.
6. Provide centered and restrained configuration.

J. End Seals

Grout each end of the casing with concrete brick and Type II concrete in such a manner to prevent the infiltration of foreign materials into the casing pipe, but allowing leakage to pass in the event of a carrier pipe break

3.02 RIGHTS-OF-WAY, EASEMENTS, AND PERMITS

- A. Prior to the beginning of the Work, consult with the Owner to determine that all rights-of-way, easements, permits or other legalities are in order and become familiar with the requirements thereof. Confine the Work as required to comply with such requirements. Any encroachment beyond such limits shall be the Contractor's responsibility.

3.03 CONFLICTS OF SPECIFICATIONS:

- A. Where laws or orders of public authority prescribes a higher degree of protection than specified herein, then the higher degree so prescribed shall be deemed a part of this specification and govern the specific installation.

(END OF SECTION)

SECTION 331000
WATER UTILITY

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: Provide water distribution system as shown 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.

1.2 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 of this Section.

1.3 SUBMITTALS

- A. Comply with pertinent provisions of Division 01.

1.4 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 01640.
- B. Shipment of pipe:
 - 1. Protect pipe with tarp or other means during shipment to prevent truck exhaust from damaging pipe.
- C. Avoid severe impact blows, gouging or cutting by metal surfaces or rocks.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Use any pipe material and associated fittings as specified herein, except where use of a particular material is indicated on the plans, or specified herein.

2.2 PIPE AND FITTINGS

- A. General:
 - 1. Pipe size 3" and larger use plastic pipe unless otherwise indicated. No asbestos cement pipe allowed. Pipe less than 3" use plastic pipe.

2. Any pipe, solder, or flux used shall be lead free (lead free is defined as less than 0.2% lead in solder or flux and less than 8.0% lead in pipes and fittings).
3. Gaskets are to be factory-installed and integral with the pipe.
4. All pipe 4" and larger shall be National Sanitary Foundation (NSF) approved and shall be third party certified as meeting the specifications of ANSI/NSF Standard 61.
5. All materials and products that contact potable water shall be third party certified as meeting the specifications of ANSI/NSF Standard 61.
6. All chemical or products added to the public water supply must be third party certified as meeting the specifications of ANSI/NSF Standard 60.
7. For valves cast all markings integral on the valve body with the size of valve, year of manufacture and the class working pressure.
 - a. Certifications to rate a 150B valve body to a Class 250 valve will not be acceptable.
8. For valves spray coat all interior wetted ferrous surfaces with two-component epoxy applied to a nominal thickness of 3 to 4 mils.
 - a. Coating material to be AWWA and U.S. Food and Drug Administration approved for use with potable water.

B. PVC Pipe:

1. Plastic pipe, 4" and 12" (PVC):
 - a. General:
 - 1) Marked with National Sanitation Foundation approval at 18" intervals.
 - 2) Gaskets to comply with ASTM F 477.
 - a) Natural rubber gaskets are not acceptable.
 - b. 4" - 12": Comply with ANSI/AWWA C900, Table 2, Pressure Class 150 (DR18).
 - c. Color of pipe to be blue.
2. Plastic Service Pipe, 1-1/2" in diameter and larger
 - a. Provide PVC pipe complying with ASTM D2241 for PVC 1120, SDR 26, with NSF approval marked at 18" intervals. PVC, SDR 21 for pipe sizes under 4"
 1. Use integral bell or coupling type joints with elastomeric gaskets.
 - 1) Integral bells to comply with ASTM D2672.
 - 2) Couplings to comply with ANSI/AWWA C900.
 - 3) Gaskets to comply with ASTM F477.
 - 4) Lubricants shall be compatible with pipe and gasket materials, shall not support bacteria growth and shall not adversely affect potable quality of line contents.
 2. Use PVC fittings, 160 psi at 73⁺ pressure rating, joint design to conform to pipe joints.
 - b. Provide pipe complying with ASTM D1785 for PVC 1120. Schedule 80, dark gray color NSF approved solvent weld coupling joints, unless otherwise indicated.
 - c. Provide standard weight, hot-dip galvanized steel pipe complying with ASTM A53, ends threaded and coupling on one end.

C. Joints:

1. Plastic pipe:
 - a. Use integral bell or coupling type with elastomeric gaskets.
 - b. Integral bells to comply with ASTM D2672.
 - c. Couplings to comply with ANSI/AWWA C900.

- d. Gaskets to comply with ASTM F477.
 - 1) Natural rubber gaskets are not acceptable.
 - e. Lubricants shall be compatible with pipe and gasket materials, shall not support bacteria growth and shall not adversely affect potable quality of line contents. Vegetable shortening shall not be used to lubricate joints.
 - 1) NSF approved.
3. Polyethylene pipe joining:
- a. Sections of polyethylene pipe should be joined into continuous lengths on the job site above ground. The joining method shall be the butt fusion method and shall be performed by the manufacturer's recommendations. The butt fusion equipment used in the joining procedures should be capable of meeting all conditions recommended by the pipe manufacturer, including, but not limited to, temperature requirements, alignment, and fusion pressures. Prior approval of equipment and personnel shall be obtained before fusion begins. The completed pipe joints shall be guaranteed for five years in writing to the Owner and its Contractor.
 - b. End connections: Special restrained joint mechanical joint adapters may be required for each end of the P.E. pipeline. The price quoted shall include any special end configuration and polyethylene ring to hold a standard mechanical joint.
- D. Fittings and specials:
- 1. Plastic pipe:
 - a. Use 150 psi pressure rated ductile iron fittings or specials unless otherwise indicated, complying with ANSI/AWWA C110/A21.10.
 - b. Compact fittings for piping 3" - 16" may be provided in accordance with ANSI/AWWA C153/A21.53.88.b.
 - c. Fittings for use with push-on joint pipe, comply with ANSI/AWWA C111/A21.11.
 - d. Provide adapter glands, gaskets, etc. as required to accommodate any differences in pipe and fitting dimensions.
 - e. Use cement mortar lining complying with ANSI/AWWA C104/A21.4, standard thickness.
 - f. The maximum phosphorous level in the casting will be 0.08%.
 - g. The fitting surface finish will conform to MSS SP-112 Quality Standard for Evaluation of Cast Surface Finishes.
 - h. The manufacturer shall be ISO 9000 certified.
 - i. Markings
 - * Each fitting shall have the following markings cast integrally to the fitting:
 - 1. Manufacturer's Name or Logo
 - 2. "MJ"
 - 3. Country of origin
 - 4. Manufacturer's Foundry Mark
 - 5. AWWA C-153 or C110
 - 6. Pressure Rating
 - 7. Nominal Diameter (each leg)
 - 8. "DI" or "Ductile"
 - 9. No. of Degrees (bends)
 - 2. Plastic pipe 3" and smaller: Use PVC fittings, 160 psi at 73°F pressure rating, joint design to conform to pipe joints.

E. DIP Pipe:

1. Ductile iron pipe (DIP):
 - a. Comply with ANSI/AWWA C150/A21.50 or AWWA C151/A21.51, latest revision.
 - b. The class or nominal thickness, net weight without lining, and casting period shall be clearly marked on each length of pipe. Additionally, the manufacturer's mark, country where cast, year in which the pipe was produced, and the letters "DI" or "Ductile" shall be cast or stamped on the pipe.
 - c. Wall thickness in accordance with Table 50.5 of ANSI/AWWA C150/A21.50, depth of cover indicated and Type 3 bedding conditions, minimum Pressure Class (Choose pressure rating) as follows:
4" – 12" Pressure Class 350.
 - d. Use cement mortar lining complying with ANSI/AWWA C104/A21.4, standard thickness.

F. Joints:

1. Ductile iron pipe:
 - a. Use mechanical or push-on joints complying with ANSI/AWWA C111/A21.11 as modified by ANSI/AWWA C151/A21.51.
 - b. Use gaskets and lubricant complying with ANSI/AWWA C111/A21.11. Natural rubber gaskets are not acceptable.
 - c. Lubricants shall be compatible with pipe and gasket materials, shall not support bacteria growth and shall not adversely affect potable quality of line contents. Vegetable shortening shall not be used to lubricate joints.
 - 1) NSF approved.
 - d. Exposed pipe:
 - 1) Class 53 minimum.
 - 2) Use flanged joints complying with ANSI/AWWA C115/A21.11, latest revision; and
 - i) Provide solid type flanges with country where cast stamped or cast into the flange."
 - ii) Use full face, red rubber, factory cut, 1/16" thick for pipe up to 10" diameter and 1/8" thick for larger sizes.
 - iii) Bolts and nuts shall be standard carbon steel machine bolts, hex head complying with ANSI A21.11/AWWA C111.

G. Fittings and specials:

1. Ductile iron pipe:
 - a. Provide 250 psi rated ductile iron fittings or specials unless otherwise indicated, complying with ANSI/AWWA C110/A21.10 and in accordance with ANSI/AWWA C111/A21.11.
 - b. Clearly cast the manufacturer's mark, country where cast, year in which the fitting was produced, and the letters "DI" or "Ductile" on the fitting."
 - c. Compact fittings for piping 3" - 16" may be provided in accordance with ANSI/AWWA C153/A21.53.88.b.
 - d. Fittings for use with push-on joint pipe, comply with ANSI/AWWA C111/A21.11.
 - e. Use cement mortar lining complying with ANSI/AWWA C104/A21.4, standard thickness.
 - f. The maximum phosphorous level in the casting will be 0.08%.

- g. The fitting surface finish will conform to MSS SP-112 Quality Standard for Evaluation of Cast Surface Finishes.
- h. The manufacturer shall be ISO 9000 certified.
- i. Markings
 - * Each fitting shall have the following markings cast integrally to the fitting:
 1. Manufacturer's Name or Logo
 2. "MJ"
 3. Country of origin
 4. Manufacturer's Foundry Mark
 5. AWWA C-153 or C110
 6. Pressure Rating
 7. Nominal Diameter (each leg)
 8. "DI" or "Ductile"
 9. No. of Degrees (bends)

H. Couplings:

1. Provide couplings where needed to make piping connections and where located on the plans.
2. Provide mechanical joint ductile iron sleeve, full length, minimum 12".
3. Provide cutting-in sleeve where installing fittings in an existing line.
 - a. Provide ductile iron with mechanical joint.
4. Provide restrained joint couplings where restrained joints are indicated on the plans.

I. Restrained joint pipe and fittings:

1. Provide restrained joint pipe and fittings where indicated on the plans
 - a. Provide one of the following:
 - 1) Snap-Lok by Griffin Pipe.
 - 2) American Cast Iron Pipe Company.
 - a) Flex-Ring (4" - 48").
 - 3) U. S. Pipe.
 - a) TR-Flex (4" - 36")
 - 4) Super-Lock by Clow (4" - 30").
 - 5) Fast Grip Gasket by American Cast Iron Pipe Company.
 - 6) Field Lok by U.S. Pipe.
 - b. Provide restraint for C900 PVC by mechanical means separate from the mechanical joint gasket sealing gland.
 - 1) Provide wide, supportive contact around full pipe circumference as follows:

<u>Size</u>	<u>Restraint Width</u>
4", 6"	1-1/2"
8", 10", 12"	1-3/4"

- 2) Provide means of restraint by machined serrations on inside surface of restraint device designed to provide circumferential loading over the entire restrainer.
 - a) Design to be such that restraint increases with increased in-line pressure.
 - b) Provide a minimum of 8 serrations per inch of restraint width.
- 3) Restraint device to be pressure rated at 350 psi, or equal to the pipe on which it is used and capable of withstanding test pressures of 2 times pressured rating.

- 4) Fusion applied epoxy coating finish per AWWA C-213.
 - 5) Provide series 1600 as manufactured by EBAA Iron, Inc. of Eastland, Texas, or approved equal.
- c. Provide restraint for PVC pipe 3" and smaller by split serrated ring.
- 1) Restraint device to be a two-piece configuration with plurality of individually actuating gripping services.
 - 2) Restraint device body to be manufactured from ductile iron conforming with ASTM A536.
 - 4) Pressure rating to match PVC pipe on which it is used with capability to withstand test pressure of 2 times rated pressure.
 - 5) Fusion applied epoxy coating finish per AWWA C-213.
 - 6) Provide series 6500 as manufactured by EBAA Iron, Inc. of Eastland, Texas, or approved equal.
- d. Provide restraint between PVC and mechanical joint ductile iron fitting where indicated on the plans.
- 1) Provide device consisting of multiple gripping wedges incorporated into a follower gland meeting the applicable requirements of ANSI/AWWA C111/A21.11.
 - 2) The device will have a working pressure rating equal to the pipe on which it is used and include a minimum design pressure safety factor of 2:1.
 - 3) Gland body, wedges and wedge actuating components will be cast from grade 65-45-12 ductile iron material in accordance with ASTM A536.
 - 4) An identification number consisting of year, day, plant and shift will be cast into each gland body.
 - 5) Proper actuation of the gripping wedges shall be ensured with torque limiting twist off nuts.
 - 6) Provide series 2000 PV by EBBA Iron, Inc. or equal.

2.3 LINE DETECTION TAPE

A. Provide the following:

1. Provide 2" wide metallic detection tape on all buried PVC piping.
 - a. Provide 5.0 mil overall thickness with no less than a 50 gauge solid aluminum foil core.
 - b. Foil to be visible from both sides.
 - c. No inks or printing extended to the edges of the tape.
 - d. Encase printing to avoid ink rub-off.
 - e. Tensile strength - 28 lbs/inch.
 - f. Use heat set mylar inks.
 - g. Locate 12" below ground surface in pipe trench.
 - h. Color to be Safety Precaution Blue.
 - i. Wording on tape to indicate "Potable Water" at no greater than 24" on center.

2.4 COPPER TRACER WIRE

- A. Provide a continuous 12 gauge blue insulated copper tracer wire when PVC or polyethylene pipe is used.
- B. Approved for direct burial by the manufacturer.

- C. Locate tracer wire a minimum of 6" above top of water main.
- D. Terminate tracer wire at each valve and meter and make provisions to allow for connection of testing apparatus without interfering with the proper operation of valves and meters.
- E. Connect to the water line with duct tape at every bell connection or every 20' to ensure that the wire is directly over the top of the pipe.
- F. Place in the trench with all service lines.
- G. Splice at each service lateral and tee connection with an approved copper compression lug.
- H. Test all tracer wire for conductivity in accordance with Part 3.

2.5 VALVES

A. General:

- 1. Use gate valves.
- 2. Open by turning clockwise.
- 3. End connections as required for the piping in which they are installed.
- 4. Two-inch metal operating nut with arrow indicating direction of opening.
- 5. Use valves designed for a working pressure of not less than 250 psi.
- 6. Provide stem extensions on all valves where the top of the operator nut is located greater than 36" below the top of the valve box.
- 7. Fully coat all internal ferrous metal surfaces with two part thermosetting epoxy.
- 8. Design for external stem failure when excessive closing torque is applied with no failure of the pressure retaining parts.
- 9. Provide double disc gate valves with bevel gears, grease case, and other necessary appurtenances for horizontal installation.
- 10. Provide two-part thermosetting epoxy coating on valve exterior.
- 11. Provide stainless steel bolting.
- 12. Valves to be manufactured in the United States.
- 13. Provide all wetted rubber compounds of synthetic rubber.

B. Gate valves:

- 1. Use double disc valves complying with ANSI/AWWA C500 or resilient seated wedge valves complying with ANSI/AWWA C509.
- 2. Provide integrally cast bronze stem nut on resilient seated wedge valves.
- 3. Suitable for working pressure of not less than 250 psi.
- 4. Design for external stem failure outside of the valve body or bonnet when excessive closing torque is applied with no failure of the pressure retaining parts per AWWA Section 3.2.
 - a. Factory test with no leakage from either side of the disc.
 - b. Test shell to 500 psig.
- 5. Provide certified to NSF 61.
- 6. Resilient wedge valves:
 - a. Completely encapsulate resilient iron wedge by an elastomer, without thin spots or voids.

- b. Provide polymer wedge guide bearing caps bearing surface between the encapsulated wedge and the interior epoxy coating, lowering operation torque and extending service life of the valve.
- c. The manufacturing plant to have ISO9001 certification.

1. Acceptable Products:

- a. Mueller Square Nut for 2" and up
- b. Hammond for under 2"
- c. Valves shall have an adjustable cast iron valve box. Valves outside of the pavement shall have a concrete collar installed.

C. Valve operator:

- 1. Provide one T-handle operator for each ten buried valves with nut operator.
- 2. Provide one stainless steel T-handle operator for each four buried valves with "T" head.

D. Provide valve boxes and position indicators for all buried service valves and operators.

- 1. Hermetically sealed for installation in a C.I. valve box.
- 2. Show valve disc position, direction of rotation and number of turns from full open to full close.
- 3. Shaft extension and pins to be stainless steel.
- 4. Base plate and housing to be aluminum.
- 5. Provide all bronze gearing.
- 6. Provide 2" AWWA square nut.
- 7. Locate top of indicator no more than 6" below grade.
- 8. Approved manufacturer: Valcom or approved equal.

2.6 HYDRANTS

A. Fire hydrants:

- 1. Comply with the standard fire hydrant approved by the City of Georgetown.
- 2. Comply with ANSI/AWWA C502.
- 3. Waterway valve opening, 5-1/4".
- 4. Six inch bell connection, two 2-1/2" hose connections, one 4-1/2" steamer connection with cap chain on all connections.
- 5. National Standard screw threads on outlet nozzles. Open by turning clockwise (left), with arrow cast in top indicating direction of opening Hydrants shall have Storz pumper nozzle
- 6. Two part breakable safety flange shall be an integral part of barrel casting.
- 7. Depth of bury, 3'6".
- 8. Finish coat with industrial enamel, Painted Red
- 9. Provide one hydrant wrench for each ten hydrants.
- 10. Acceptable products:
 - Fire Hydrant - Mueller 423 (5 1/4")
 - Post Hydrant - Mueller 411
 - Flush Hydrants - Mueller

B. Reflector:

- 1. Provide industry standard blue hydrant reflector for paved roadway.

C. Offset fitting:

1. Provide an offset fitting at sloped areas where required for the hydrant connections to be located 1'4" above finished grade.
2. Locate between the shut-off valve and each hydrant with a 12" offset.
3. Provide ductile iron per AWWA C153, compact design, coated per AWWA C104.
4. Provide Grade Lok as manufactured by Assured Flow Sales, Inc., or approved equal.

2.7 VALVE BOXES

- A. Provide at each buried valve.
- B. Cast iron extension type, suitable for minimum cover of 3'6" over the pipe.
- C. Minimum inside diameter at the top of 5", minimum riser wall thickness 1/4" and thickness at the top of 11/16".
- D. Have the word "WATER" cast into the cover.
- E. Provide Tyler Series 6850 or Bingham Taylor #4905.
- F. Where depth requires more than a two piece box use adjustable cast iron extensions.
- G. Coat box and cover with two (2) shop coats of bitumastic paint.

2.8 METER BOXES

- A. Provide 3/4" – Ford Long Yokebox
- B. Provide 1" – Ford Long Yokebox for 1" Meters

2.9 VALVE BOX PROTECTION RING

- A. Provide at each valve box a precast concrete protection ring.
- B. Provide two rings of No. 3 reinforcing steel, one 14" in diameter, and one 23" in diameter.
- C. Inside dimensions to be 9-1/4".
- D. Outside diameter to be 27".
- E. Provide 5" thickness at interior with a continuous slope to 2" thickness at the outside.
- F. Minimum weight of 110 lbs.

2.10 SERVICE SADDLE

- A. Provide of the following materials:

Body	Type 304 Stainless Steel
Bales and Strips	Type 304 Stainless Steel
Studs	Type 304 Stainless Steel
Hardware	Type 304 Stainless Steel

- B. Provide double-strap for all sizes.

- C. Provide Romac 202 or approved equal.
- D. Connect to pipeline using a 6" stainless steel nipple.
 - 1. Do not use a threaded PVC connection.

2.11 TAPPING SLEEVE AND VALVE

- A. Tapping sleeve:
 - 1. Provide stainless steel tapping sleeve and saddles
 - 2. Provide bolts, follower rings and gaskets on each end of the sleeve.
 - 3. Provide for maximum working pressure of 150 psi.
 - 4. Provide square head bolts with hexagonal nuts.
 - 5. Provide 3/4" NPT test plug.
 - 6. Service saddles shall be double strap, stainless steel. Case iron body shall be nylon coated.
- B. Tapping valve:
 - 1. Construct of material compatible with tapping sleeve.
 - 2. Valve to conform to Paragraph 2.3 above.
 - 3. Joints - Flange to tapping sleeve for pipe end.

2.12 SERVICE LINE

- A. Type K, soft copper or CTS HDPE 200 psi tubing
- B. Single Services shall be a minimum 3/4". Double services shall be a minimum of 1" trunk and 2/3" branches.

2.13 CORPORATION STOP AND FITTINGS

- A. Ford

2.14 MISCELLANEOUS PARTS AND ACCESSORIES

- A. Use standard commercial grade suitable for the type of installation or system involved, and conforming to the applicable standards and specifications of the AWWA.

PART 3 - EXECUTION

3.1 HANDLING

- A. Handle pipe accessories so as to ensure delivery to the trench in sound, undamaged condition:
 - 1. Carry pipe into position - do not drag.
 - 2. Use pinch bars or tongs for aligning or turning the pipe only on the bare end of the pipe.
 - 3. Use care not to injure pipe linings.
 - 4. Do not damage pipe with chokers or lifting equipment.

- B. Thoroughly clean interior of pipe and accessories before lowering pipe into trench. Keep clean during laying operations by plugging or other method approved by the Engineer.
- C. Before installation, inspect each piece of pipe and each fitting for defects.
 - 1. Material found to be defective before or after laying: Replace with sound material meeting the specified requirements, and without additional cost to the Owner.
- D. Gaskets: Store in a cool dark place until just prior to time of installation.

3.2 PIPE CUTTING

- A. Cut pipe neatly and without damage to the pipe.
- B. Unless otherwise recommended by the pipe manufacturer, and authorized by the Engineer, cut pipe with mechanical cutter only.
 - 1. Use wheel cutters when practicable.
 - 2. Cut plastic pipe square, remove all burrs, and grind bevel on end.

3.3 LOCATING

- A. Water mains shall be laid at least 10' edge-to-edge horizontally distanced from any existing or proposed sewer pipes.
- B. Should a 10' separation not be practical, then the water main may be located closer with South Carolina Department of Health and Environmental Control (SCDHEC) approval provided:
 - 1. It is laid in a separate trench.
 - 2. It is laid in the same trench with the water main located at one side on a bench of undisturbed earth.
 - 3. In either of the above cases, crown elevation of the sewer shall be at least 18" below invert elevation of water line.
- C. Where water lines cross over sewers, maintain 18" vertical separation between the outside of the sewer and the outside of the water line.
- D. Where water lines cross under sewers, each line shall be cast iron or ductile iron.
 - 1. A full length of water line shall be located over an existing sewer so that joints of each line will be as far from each other as possible.
 - 2. 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.
- E. No water pipe shall pass through or come in contact with any part of a sewer manhole.
- F. Water lines shall not be laid within 25' horizontally from any portion of a wastewater tile or spray field.
- G. Water lines shall be located outside all contaminated areas, unless using pipe materials that will protect the water supply.

- H. No flushing device or drain directly connected to any type of sewer is allowed.
- I. No cross connections between water lines and any pipes, valves, tanks or pumps that are not part of the potable water system are allowed.
- J. Water lines may come in contact with storm sewers or catch basins if there are no other practical alternatives provided that ductile iron is used and no joints of the water line are within the storm sewer or catch basin, and, provided that the joints are located as far as possible from the storm sewer or catch basin.
- K. Structures containing valves, blowoffs, meters, air release valves, etc., shall not be connected directly to any storm drainage or sewer system.

3.4 EXCAVATION AND BACKFILLING

- A. Comply with pertinent provisions of Section 02200 of these Specifications.

3.5 ALIGNMENT OF PIPE

- A. Pipe lines intended to be straight shall be so laid.
- B. Where vertical or horizontal alignment requires deflection from straight line or grade, such deflection shall not exceed maximum deflection recommended by the pipe manufacturer.
- C. If alignment requires deflection exceeding recommended limits, furnish special bends or a sufficient number of shorter lengths of pipe to provide angular deflections within the allowable limits.

3.6 PLACING AND LAYING

- A. General:
 - 1. Lower pipe and accessories into trench by means of derrick, ropes, belt slings, or other equipment approved by the Engineer.
 - 2. Do not dump or drop any of the materials of this Section into the trench.
 - 3. Except where necessary in making connections to other lines, lay pipe with the bells facing in the direction of laying.
 - 4. Rest the full length of each section of pipe solidly on the pipe bed, with recesses excavated to accommodate bells, couplings, and joints.
 - 5. Take up and relay pipe that has the grade or joint disturbed after laying.
 - 6. Do not lay pipe in water, or when trench conditions are unsuitable for the work; keep water out of the trench until jointing is completed.
 - 7. Securely close open ends of pipe, fittings, and valves when work is not in progress.
 - 8. Where any part of coating or lining is damaged, repair to the approval of the Engineer and at no additional cost to the Owner.
 - 9. Structures containing valves, blowoffs, meters, air release valves, etc., shall not be connected to any storm drain or sewer system.
- B. Ductile iron pipe:
 - 1. Mechanical, push on and flanged joints, install in accordance with ANSI/AWWA C600.
 - 2. Gaskets: Handle, lubricate where necessary and install in strict accordance with manufacturer's recommendations.

C. Flanged joints:

1. Provide true face flanges, field clean and fit with one full face gasket and make bolts up finger tight.
2. Use torque wrench to alternately tighten bolts 180° apart until full gasket flow and seal are secured.
3. Bias cut or unusual refacing of any flange will not be acceptable.

D. Restrained joints:

1. Install in accordance with manufacturer's instructions.
2. Tighten set screws to the manufacturer's rated torque using a torque wrench. If twist-off nuts are provided, tighten screws until nut breaks loose.

3.7 SETTING VALVES AND VALVE BOXES

A. General:

1. Center valve boxes on the valves, setting plumb.
2. Tamp earth fill around each valve box to a distance of 4' on all sides, or to the undisturbed trench face if less than 4'.
3. Install shaft extensions plumb without any binding.
4. Fully open and close each valve to assure that all parts are in working condition.
5. Place valve box protection ring around top of valve box as indicated on the plans.
 - a. Install ring level with top 1" above finished grade.
 - b. Top of ring to be level with or no more than 1" above the top of the valve box.
 - c. Valves shall have an adjustable cast iron valve box. Valves outside of the pavement shall have concrete collar (18" or 24").
6. Mueller square nut for valves 2" and up
7. Hammond for valves under 2"

3.8 INSTALLATION OF REDUCE PRESSURE PRINCIPLE BACKFLOW PREVENTER

A. General:

1. Minimum clearance of 12" maximum clearance of 30" between port and floor or grade.
2. Install where no discharge is objectionable and can be positively drained away.
3. Must be easily accessible for testing and maintenance and protected from freezing.
4. Eliminate excessive pressure situations to avoid possible damage to system and assemblies.
5. Provide conduit and grounding wire connection per NEC, IBC, and any local applicable electrical code.
6. Install horizontally unless otherwise shown on the plans or Engineer's approval is obtained.

3.9 HYDROSTATIC TESTING

A. General:

1. Pressure and leakage testing must be conducted in accordance with AWWA Standards C600.
2. Clean and flush line of air, dirt and foreign material.
3. Do not perform hydrostatic tests until at least five days after installation of concrete thrust blocking.
4. Test pump, pipe connection, pressure gauges, measuring devices and all other necessary appurtenances to conduct tests are to be provided by the Contractor.
5. Install brass corporation cocks at all high points that do not have permanent air vents. Corporation cocks are to be left in place and all costs for providing such cocks are to be borne by the Contractor.
6. Conduct tests on each line or valved section of line.
7. Test pressures to be 150 psi, or 1.5 times the maximum working pressure, whichever is greater, based on the elevation of the lowest point of the section under test and corrected to the elevation of the test gauge.
8. Do not test pipe at pressures exceeding manufacturer's recommendations.
9. The Contractor must provide documentation of the pressure and leakage tests. Documentation must include length of lines, diameter of pipe(s), amount of water required to fill line after test was performed, and amount of allowable leakage.
10. The witness to the hydrostatic testing is to be someone other than the Contractor or the utility installing the lines.

B. Pressure tests:

1. After the pipe is laid, the joints completed, and the trench backfilled, subject the newly laid piping and valved sections of the piping to the test pressure specified in Part A above.
2. Open and close each valve within the section being tested several times during the test period.
3. Conduct the pressure test using a 4" dia. glycerin filled gauge w/ a snubber attached prior to the gauge to remove pulsations.
 - a. Obtain prior approval of the testing gauge approved by the Engineer prior to its use.
 - b. Provide a range of no greater than twice the test pressure and not less than 50% greater than the test pressure.
 - c. Calibrate with cal sticker on gauge face or provide appropriate supporting paper work.
4. Replace or remake joints showing leakage.
 - a. Remove cracked pipe, defective pipe, and cracked or defective joints, fittings and valves. Replace with sound material and repeat the test until results are satisfactory.
 - b. Make repair and replacement without additional cost to the Owner.

C. Leakage test:

1. Conduct leakage test after the pressure test has been completed satisfactorily.
2. Duration of each leakage test: At least two hours.
3. During the test, subject water lines to the test pressure specified in Part A above.
4. Leakage is defined as the quantity of water to be supplied into the newly laid pipe, or any valved or approved section thereof, necessary to maintain the specified leakage test pressure after the pipe has been filled with water and the air expelled.
 - a. No piping installation will be accepted until the leakage is less than the number of gallons per hour as determined by the formula(s):

$$L = S \times D \times \sqrt{P} / 148,000; \text{ where}$$

L = allowable leakage in gallons per hour;
S = length of pipe tested in feet;
D = nominal diameter of pipe in inches; and
P = average test pressure psi gauge.

- b. When testing against closed metal-seated valves, an additional leakage per closed valve of 0.0078 gallons per hour per inch of nominal valve size will be allowed.
 - 1) Should any test of pipe disclose leakage greater than that specified above, locate and repair the defective joint or joints until the leakage is within the specified allowance, and at no additional cost to the Owner.
 - 2) Repair all visible leaks regardless of test results.

3.10 DISINFECTION OF POTABLE WATER MAINS

- A. Disinfect per Section 02675 in these specification, and per the requirements of SCDHEC and City of Georgetown Water Utilities Department.

3.11 DECHLORINATION OF CHLORINATED STERILIZATION WATER

- A. Dechlorinate per Section 02675 in these specification, and the requirements of SCDHEC and City of Georgetown Public Works

3.12 NW CONSTRUCTION WATER USAGE

- A. See Section 02676 of these specifications.

(END OF SECTION)

SCDOT ENCROACHMENT PERMIT

**SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
Encroachment Permit**

Permit No : 274484

Permit Decision Date :
12/13/2023

Expiration Date : 12/13/2024

Type Permit : WATER

Location:

<u>District</u>	<u>Work County</u>	<u>Type</u>	<u>Route</u>	<u>Aux</u>	<u>Begin MP</u>	<u>End MP</u>
5	Georgetown, SC	S-	282	None	0.133	0.000
5	Georgetown, SC	S-	115	None	0.220	0.000
5	Georgetown, SC	S-	283	None	0.150	0.150
5	Georgetown, SC	S-	283	None	0.020	0.150
5	Georgetown, SC	S-	649	None	0.003	0.200

Contact
Information

Applicant: CityofGeorgetown

Phone:

Contact: Orlando Arteaga

Address: P.O. Box 939,

City: Georgetown

State: SC

Zip: 29442

Comments

23042-City of Georgetown Maryville Water Distribution Upgrade-
Locations across 5 different streets

Special Provisions:

0004 - SCDOT SHALL BE NOTIFIED WHEN WORK DEFINED IN THE PERMIT STARTS AS WELL AS WHEN THE WORK IS COMPLETED. REFERENCE SHALL BE MADE BY PERMIT NUMBER.

0101 - SHOULDER SOD DESTROYED BY THIS INSTALLATION TO BE REPLACED FOR THE ENTIRE AREA. THE AREA SHALL BE RE-SHAPED AND ROLLED TO THE CROSS SECTION EXISTING PRIOR TO THIS WORK.

0102 - BORE PITS SHALL BE CLOSED IMMEDIATELY AFTER INSTALLATION.

0103 - THE PROPOSED ENCROACHMENT SHALL BE TRENCHED TO A MINIMUM DEPTH OF 42" BELOW THE CROSS SECTION AS ORIGINALLY CONSTRUCTED.

0107 - TRENCH TO BE PROPERLY BACK-FILLED AND THOROUGHLY TAMPED. THE ENTIRE DISTURBED AREA SHALL BE RE-SHAPED AND DRESSED OUT IN A WORKMANSHIP LIKE MANNER.

0109 - THE BORE SHALL BE MADE BY THE DRY BORE METHOD IN SUCH A MANNER AS NOT TO DISTURB THE PAVEMENT. THE BORE PIT MUST NOT BE CLOSER THAN FIVE (5) FEET FROM THE EDGE OF PAVEMENT. THE BORE DEPTH SHALL BE NOT LESS THAN 48" DEEP AT ANY POINT IN THE BORE.

NOTICE SHALL BE GIVEN TO THE DEPARTMENT IMMEDIATELY IF THE BORE TURNS AND DAMANGES THE ROAD.

0112 - ALL WATER METERS, AIR VALVES, ELECTRIC TRANSFORMERS, CATV CONNECTION BOXES, TELEPHONE PEDESTALS, AND/OR OTHER UTILITY/SPLICE BOXES SHALL BE PLACED AT THE RIGHT-OF-WAY LINE.

0120 - RESTORATION OF PAVEMENT, SHOULDERS, DITCHES, ETC., TO BE PERFORMED AS SOON AS POSSIBLE AFTER CONSTRUCTION, OR SCHEDULED SO THAT THE CONSTRUCTION IS NO FURTHER THAN 2,000 L.F. AHEAD OF COMPLETE RESTORATION.

0123 - ALL WORK PERFORMED IN CONNECTION WITH THIS PERMIT SHALL CONFORM TO THE SCDOT "A POLICY FOR ACCOMODATING UTILITIES ON HIGHWAY RIGHT-OF-WAY" MOST CURRENT EDITION.

0125 - ALL CROSSLINE PIPES ARE TO BE LOCATED AND FLAGGED PRIOR TO BEGINNING OPERATION.

0209 - DISTURBED VEGETATION SHALL BE RESEDED ACCORDING TO THE SPECIFICAION FOR HIGHWAY CONSTRUCTION.

0301 - THE DITCHES AND/OR SHOULDERS DISTURBED DURING THE INSTALLATION SHALL BE RE-ESTABLISHED TO PROPER GRADE, ORIGINAL CROSS SECTION, STABILIZED, AND ALL DRAIN PIPES CLEARED.

0302 - NO EXCAVATION SHALL BE LEFT OPEN ALONG HIGHWAY.

0306 - TRAFFIC CONTROL, LIGHTS, SIGNS AND FLAG-MEN WILL BE FURNISHED BY APPLICANT AND WILL CONFORM TO PART VI OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

0310 - FIELD CHANGES, IF NECESSARY, MUST BE APPROVED IN WRITING BEFORE ACTUAL CONSTRUCTION OF PROPOSED CHANGES.

0311 - SEDIMENT AND EROSION CONTROL DEVICES SHALL BE USED TO MINIMIZE THE MOVEMENT OF SEDIMENT.

0312 - THE PERMITTEE SHALL HOLD THE DEPARTMENT HARMLESS FOR DAMAGES TO BOTH UPSTREAM AND DOWNSTREAM PROPERTIES.

0318 - THE APPLICANT SHALL BE RESPONSIBLE FOR IMMEDIATE REMOVAL OF SUCH TRAFFIC HAZARDS AS MUD, DEBRIS, LOOSE STONE, AND TRASH AS MAY BE WASHED OR SPILLED ON THE TRAVELED ROADWAY AS A RESULT OF THE PROPOSED WORK.

SCDHEC WATER PERMIT

Water Supply Construction Permit

Bureau of Water



Permission is Hereby Granted To: **GEORGETOWN CITY OF**
PO BOX 939
GEORGETOWN SC 29442-0939

for the construction of a distribution system in accordance with the construction plans, specifications, design calculations and the SCDHEC Construction Permit Application signed by David Gantt, Professional Engineer, S.C. Registration Number: 20387.

Project Name: **MARYVILLE WATER DISTRIBUTION IMPROVEMENTS PH 1** **County:** Georgetown
Location: POPLAR STREET, HILL STREET, SASANQUA DRIVE, ASBURY STREET & GLENWOOD ST

Project Description: Approximately 3100 LF of 6" PVC water line, 5 fire hydrants and all associated appurtenances

Service By: Water will be provided by the Georgetown City Of (System Number: 2210001).

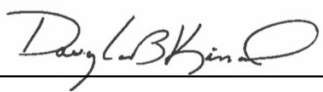
Special Conditions:

1. All construction and materials for this project must conform to the Standard Specifications for G3 ENGINEERING & SURVEYING LLC.
2. See attached (to original construction permit) DHEC Office of Ocean and Coastal Resource Management (DHEC-OCRM) certification for additional conditions related to the Coastal Zone Consistency determination.

In accepting this permit, the owner agrees to the admission of properly authorized persons at all reasonable hours for the purpose of sampling and inspection.

NOTE: This is a permit for construction only and does not constitute State Department of Health and Environmental Control approval, temporary or otherwise, to place the system in operation. No written approval shall be issued to place a drinking water project into operation until approval is obtained to place any associated wastewater project into operation. An Approval to Place in Operation is required and can be obtained following the completion of construction by contacting the MYRTLE BEACH EQC OFFICE at 843-238-4378. Additional permits may be required prior to construction (e.g., stormwater).

Permit Number: 37208-WS
Date of Issue: December 05, 2023
Expiration Date: Construction must be completed and the Approval to Place in Operation granted prior to **December 05, 2026** or this permit will expire.



Douglas B. Kinard P.E, Director
Drinking Water and Recreational Waters
Protection Division

MTH


MARYVILLE WATER DISTRIBUTION
IMPROVEMENTS

CITY OF GEORGETOWN
SOUTH CAROLINA

SCDHEC LAND DISTURBANCE PERMIT



Coastal Zone Consistency Determination

To: Orlando Arteaga, City of Georgetown
From: Holli D Martin, OCRM Coastal Zone Consistency Section 
Project Name: Maryville Water Distribution Improvements Ph 1
Site Location: Poplar Street, Hill Street, Sasanqua Drive, Asbury Street & Glenwood Street
Georgetown, Georgetown County, SC
Ref #: HPY-WMHE-S17WH
Date: December 4, 2023

The staff of the Office of Ocean and Coastal Resource Management (OCRM) reviewed the above referenced Coastal Zone Consistency project request for NPDES Stormwater Land Disturbance and Water permits associated with the installation of approx 3100 LF of PVC waterline to upgrade existing water system for Stormwater and Water permits. No wetland impacts.

We hereby certify the above referenced project is Conditionally Consistent with the Guidelines for the Evaluation of All Projects as well as the Transportation Facilities (*Roads and Highways, Parking Facilities*), Commercial Development, Public Services and Facilities (*Sewage Treatment and Water Supply*), and Stormwater Management (*Runoff*) policies contained in the S.C. Coastal Zone Management Program provided the provided the following conditions are included in the permit and adhered to by the applicant.

Conditions for Minor Impact Projects

1. The Coastal Zone Consistency certification does not alleviate the applicant's responsibility for obtaining any other necessary local, state and/or federal approvals for the development of the residential lot prior to work beginning.
2. All construction BMPs must be installed, inspected and maintained to hold sediment onsite and to protect any adjacent or downstream critical area, wetlands and waters through the life of the project. Upon completion of construction activities, all disturbed (includes undeveloped) areas, including those impacted for access, must be immediately stabilized.
3. Projects that are part of a LCP are authorized/granted coverage provided the consistency determination review for the development including its stormwater management drainage system has been approved under a previously authorized NPDES CGP Land Disturbance Permit (clearing and grading or site development). The development infrastructure, and site layout deemed consistent under the referenced NPDES Land Disturbance Permit's Stormwater Pollution Prevention Plan (SWPPP) remains unchanged from the time of

approval as referenced under Section 2.2.2.A of the current NPDES General Permit For Stormwater Discharges From Construction Activities, as well as, compliant with the S.C. Stormwater Management and Sediment Reduction Regulations (26 S.C. Code Ann. Regs. 72-300) and Chapter III, Section XIII, A, E, and D of the SCCZMP.

4. For all projects with a permanent water quality pond having a permanent pool, regardless of size, which are located within one-half (1/2) mile of a receiving water body in the coastal zone, the applicant must demonstrate storage of the first ½ inch of runoff from the entire site or storage of the first one (1) inch of runoff from the built-upon portion of the property, whichever is greater. Storage may be accomplished through retention, detention or infiltration systems as appropriate for the specific site. Additionally, if the project is in close proximity to shellfish beds (within 1000' of the project), the applicant must demonstrate that the first one and half (1½) inches of runoff from the built upon portion of the property is retained onsite.
5. The project, as applicable, must be compliant with any MOA or Restrictive Covenants/Recorded plats for the project associated with previous Coastal Zone Consistency Determinations of any respective Bureau Permit. Proof of compliance must be included with the request narrative and shown on the lot construction plan sheet.
6. In the event that any historic or cultural resources and/or archaeological materials are found during the course of work, the applicant must notify the State Historic Preservation Office (SHPO) and the South Carolina Institute of Archaeology and Anthropology. Historic or cultural resources consist of those sites listed in the National Register of Historic Places and those sites that are eligible for the National Register. Archaeological materials consist of any items, fifty years old or older, which were made or used by man. These items include, but are not limited to, stone projectile points (arrowheads), ceramic sherds, bricks, worked wood, bone and stone, metal and glass objects, and human skeletal materials.
7. The applicant must continue to adhere to all conditions of any Coastal Zone Consistency Determinations of respective Bureau permits.
8. Project development must not result in adverse impacts through nonpoint stormwater runoff and/or point source water discharge on adjacent lands.
9. The project must adhere to sediment, erosion and water quality controls required by the current NPDES General Permit for Stormwater Discharges from Large and Small Construction Activities and the S.C. Stormwater Management and Sediment Reduction Regulations (26 S.C. Code Ann. Regs. 72-300, as amended, are satisfied by the project design and are correctly installed and maintained.
10. The proposed activity is not located in areas identified as "Areas of Special Resource Significance" as detailed in Chapter III, Section XII of the SCCZMP, as refined. Areas of Special Resource Significance includes (1) Barrier Islands, (2) Dune Areas (outside of the critical area), (3) Navigation Channels, (4) Public Open Spaces, and (5) Wetlands.

11. The proposed activity is not located in areas identified as GAPCs as detailed in Chapter IV of the SCCZMP; Areas of Unique Natural Resource Value: (1) Heritage Trust Sites, (2) State Wildlife Preserves, (3) State Parks, (4) Scenic Rivers, (5) Marine and Estuarine Sanctuaries, (6) Shellfish Areas, (7) Groundwater Resources, and (8) Threatened and Endangered Species; Activities or Facilities Dependent on Coastal Location: (1) State Ports, (2) Navigation Channels, and (3) Mining Operations; Areas of Special Historic, Archaeological or Cultural Significance: (1) special historic, (2) archaeological, or (3) culturally significant sites. For those projects adjacent to or that may significantly affect a priority of use for any GAPC, DHEC OCRM will determine a project's affects during individual review of application for coverage under this GCZC. Those projects which are likely to adversely affect the priority of use for a GAPC will require an individual certification.

This determination shall serve as the DHEC OCRM State/Federal Coastal Zone Consistency Determination for the work described above. This determination **does not** serve as the final permitting decision and **does not** alleviate the applicant's responsibility to obtain final authorizing State or Federal permit(s). Local government authorizations **may also** be required.