SPECIAL SEALED DRAINAGE SYSTEM

I. DESCRIPTION

The contractor's attention is directed to known petroleum and pesticide contaminated soil and ground water at the following Stations:

Parcel #	Stationing (Approximate)	Offset
14	-L- 168+80 to 168+93	left
15	-L- 169+12 to 169+17	left
19	-L- 169+41 to 169+53	left
	-Y- 11+31 to 11+43	left
	-L- 169+63 to 169+75	left
20	-Y- 11+66 to 11+93	left
	-L- 169+40 to 169+83	right
	-L- 170+05 to 170+53	right
47	-Y3- 11+48 to 11+94	right
	-L- 187+34 to 187+92	right
	-L- 188+03 to 188+18	right
105	-L- 211+96 to 212+48	left
107	-L- 212+68 to 213+05	right
112	-L- 213+48 to 214+11	right
148	-L- 223+17 to 223+81	right
178	-L- 230+75 to 230+87	right
	-Y21- 10+24 to 10+31	right
181	-L- 231+18 to 231+30	right
	-Y21- 10+07 to 10+21	left
196	-L- 234+31 to 234+35	right
197	-L- 234+46 to 234+52	right
199	-L- 234+66 to 234+85	right
200	-L- 234+85 to 235+08	right
201	-L- 234+97 to 235+15	left
202	-L- 235+08 to 235+52	right
	-Y23- 10+76 to 11+16	right

A sealed drainage system is required in these areas to prevent the spread of contaminated ground water down stream.

The work covered by these provisions consists of constructing a special sealed system of underground storm drainage pipes and structures through this area, in accordance with these special provisions and with the lines, grades, dimensions, locations and details as shown on the plans or established by the Engineer.

No underdrains will be allowed for any reason between the above referenced stations on –L-.

II. MATERIALS

Ductile Iron drainage pipe shall conform to ANSI A21.51 (AWWA C151). Such pipe shall be push-on joint and installed with gaskets in accordance with the applicable sections of ANSI A21.11 (AWWA C111). Gaskets for ductile iron pipe shall be made of Nitrile, Teflon, or other gasoline resistant material and shall be approved for use with Ductile Iron Pipe.

Drainage structures shall be designed for an HS 20 or greater load rating and shall be constructed of impervious, petroleum-resistant material or must be coated with an acceptable, petroleum-resistant material that will allow no inward seepage of groundwater. Drainage Structures shall be precast concrete conforming to ASTM C478 and shall be as shown on the plans. Joints between sections shall conform to ASTM C443. Joints shall be sealed with O-Ring gaskets in accordance with the applicable sections of ASTM C443. O-Ring gaskets shall be made of Nitrile, Teflon, or other gasoline resistant material and shall be approved for use with precast drainage structure sections.

Connection of pipe to drainage structure shall be by a flexible, resilient connector conforming to the applicable requirements of ASTM C923. The drainage structure to pipe connector shall be made of Nitrile, Teflon, or other gasoline resistant material.

Grout used in precast drainage structures shall meet the requirements of Article 1040-9 of the Standard Specifications except that the mixture shall consist of 1 part Portland cement to 2 parts mortar sand and it shall be impermeable.

III. CONSTRUCTION AND INSTALLATION

Trench Excavation: No more trench (30 meters ±) shall be opened in advance of the pipe laying than is necessary to expedite the work unless prior approval is given by the Engineer. Ground conditions and/or location requirements shall govern the amount of trench open at any one time as determined by the Engineer.

Trench Width: Trench width for pipe 825 mm and smaller in inside diameter shall be equal to the outside diameter (as measured at the bells) of the pipe plus 400 mm. Trench width for pipe larger than 825 mm inside diameter shall be equal to the outside diameter (as measured at the bells) of the pipe plus 600 mm. Trench width shall be measured between faces of cut at the top of the pipe bell.

All timbering in trench excavations shall be withdrawn in stages on both sides of the trenches to prevent lateral movement of the pipe as the backfilling progresses, except where the Engineer permits the timbering to be left in place at the Contractor's request. The Contractor shall cut off any sheeting left in place at least 600 mm below finished grade wherever directed and shall remove and dispose of the material cut off.

The Contractor shall take all measures necessary to keep surface water out of the trenches by diking, ditching, or otherwise avoiding it. Provisions for surface drainage shall meet the approval of the Engineer.

All excavations shall be kept free of water while the work is in progress. Water may be removed by pumps, but must be handled as required below under the heading "Contaminated Groundwater".

Where the foundation material is found to be of poor supporting value or of rock, the Engineer may make minor adjustment in the location of the structure to provide a more suitable foundation. Where this not practical, the foundation shall be conditioned by removing the existing foundation material by undercutting to the depth as directed by the Engineer and backfilling with either a suitable local material secured from unclassified excavation or borrow excavation at the nearest accessible location along the project, or foundation conditioning material as classified in Article 1016-3, consisting of crushed stone or gravel or a combination of sand and crushed stone or gravel approved by the Engineer as being suitable material for the purpose intended. The class of select material to be used for foundation conditioning will be stated on the plans or determined by the Engineer.

All backfill areas shall be graded and maintained in such a condition that erosion or saturation will not damage the pipe bed or backfill.

Heavy equipment shall not be operated over any pipe until it has been properly backfilled with a minimum 1 meter of cover. Where any part of the required cover is above the proposed finish grade, the Contractor shall place, maintain, and finally remove such material at no cost to the Department. Pipe which becomes misaligned, shows excessive settlement, or has been otherwise damaged by the Contractor's operations shall be removed and replaced by the Contractor at no cost to the Department. During the progress of the work and until the completion and final acceptance, the pipelines and drainage structures shall be kept clean throughout. Any obstructions or deposits shall be removed and disposed of properly.

If, at any time before completion of the contract, any broken pipe or any defects are found in any materials, they shall be replaced. All materials shall be carefully examined for deflects before placing, and any found deflective shall not be used.

Pipe shall not be laid upon a foundation into which frost has penetrated, or at any time, that in the opinion of the Engineer, there is danger of the formation of ice or frost at the bottom of the excavation. The Engineer may at his discretion allow construction of the pipeline to continue under freezing conditions provided the Contractor promptly backfills

the trench as directed.

Pipe and accessories shall be carefully lowered into the trench with suitable equipment. Under no circumstances shall any of the materials be dropped or dumped into the trench.

Care shall be taken to avoid abrasion of the pipe coating. Poles used as levers for removing skids across trenches shall be of wood and shall have broad flat faces to prevent damage to the pipe or pipe coating.

The full length of each section of pipe shall rest solidly upon the pipe bed with recesses excavated to accommodate bells, couplings, and joints. Pipe that has been disturbed after laying shall be taken up and relaid.

When work is not in progress, open ends of pipe shall be securely closed so that water, earth, or other foreign substances can not enter.

Pipe laying shall proceed upgrade with the spigot ends pointing in the direction of flow. Each pipe shall be laid in such a manner as necessary to form a close concentric joint with the adjoining pipe and to prevent sudden offsets of the flow line. As the work progresses, the interior of the pipe shall be cleared of all foreign materials. Where cleaning after laying is difficult because of small pipe size, a suitable swab or drag shall be kept in the pipe and pulled forward past each joint immediately after the jointing has been completed. Trenches shall be kept free from water until backfilled and pipe shall not be laid when the condition of the trench or the weather is unsuitable for such work.

Any pipeline or drainage structure which contains any silt, sedimentation or other foreign material will not be accepted. The Contractor shall at his own expense flush, or otherwise cause the line (and drainage structures) to be cleaned out.

Material removed by cleaning or flushing shall be disposed of properly. Material removed by cleaning or flushing, if determined by the Engineer to be contaminated, must be handled and disposed of as approved by the Engineer. Approval must be obtained prior to any cleaning or flushing activities.

Gasket joints for pipe and drainage structures shall be handled, lubricated where necessary, and installed in accordance with the recommendations of the manufacturer.

No precast drainage structure shall be placed until the foundation has been approved by the Engineer. The precast units shall be assembled in accordance with the manufacturer's instructions. Drainage structures over 1 meter in depth shall have steps spaced 400 mm on center, of the type shown in the Standard Drawings. Steps shall be installed as directed by the Engineer and shall be tested as required in ASTM C478.

Where pipes enter drainage structures they shall be placed as the work is built up, properly connected, and accurately spaced and aligned. Pipe connections shall be made so that the pipe does not project farther than is necessary beyond the inside wall of the drainage structure. Pipe connections shall be grouted to make a smooth and uniform

surface on the inside of the drainage structure.

After the drainage structure has been completed, including all pipe connections, the excavation shall be backfilled. The backfilling shall not be done until masonry has cured for at least 7 curing days, unless otherwise permitted by the Engineer. A curing day shall be as defined in Article 825-9 of the Standard Specifications for concrete or Article 830-5 for brick or block masonry. Backfill for drainage structure shall be of a type, placed, and compacted as required for ductile iron drainage pipe.

Maintenance shall be in accordance with Article 300-7 of the Standard Specifications.

IV. CONTAMINATED MATERIALS HANDLING

Approximately 2,000 metric tons of petroleum contaminated soil are expected to be encountered from the ground surface to the bottom of the excavation. The petroleum contaminated soils are to be loaded directly into trucks and hauled to a certified disposal facility. The Contractor must obtain the Engineer's approval for use of the selected disposal facility prior to removal of excavated soil from the project limits. The Contractor shall submit waste disposal manifests and weigh tickets for each load of petroleum-contaminated soil leaving the project limits.

An indefinite amount of petroleum contaminated groundwater may be encountered during installation of the special sealed drainage system. Any groundwater removed from this area during dewatering shall be deemed petroleum contaminated unless otherwise cleared by appropriate laboratory analysis (as established in the Department of Environment and Natural Resources, Division of Waste Management Underground Storage Tank Section's publication entitled Underground Storage Tanks Section Guidelines for Sampling, (Version 1.2 September 1, 2003). This water must be pumped into containers for disposal by the Contractor. Documentation of proper disposal shall be provided to the Department once completed. If no petroleum contamination is detected, then normal dewatering procedures can be followed. It is estimated that approximately 600,000 liters of contaminated groundwater may be removed from this area.

The Contractor on this project shall cooperate with the Environmental Consultant selected to screen the excavated soil and collect the soil samples to the extent that the work can be performed to the best advantage of all concerned, according to Article 105-7 of the Standard Specifications.

The contractor is entirely responsible for compliance with all OSHA, EPA, DOT, DENR and local rules and regulations pertaining to excavation, transportation and disposal of the contaminated soil. Examples of such rules and regulations include, but are not limited to, 29 CFR 1910 and 1926, 40 CFR 260 - 265, 49 CFR 173 and 178, 15A NCAC 13A North Carolina Hazardous Waste Management Rules, NCGS 130A - 310 Inactive Hazardous Sites, the Federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and the Federal Resource Conservation and Recovery Act (RCRA). It

must be noted that inclusion of this paragraph is meant to highlight the Contractor's responsibility for regulatory compliance in all phases of work on this project.

V. METHOD OF MEASUREMENT

Trenching, excavation and backfilling for special sealed drainage system will be considered as included in the contract price for the applicable pay item and no separate measurement will be made therefore. Such work as shoring, sheeting and dewatering of the excavation will also be considered as included in the contract price for the applicable pay item and no separate measurement will be made.

The quantity of sealed drainage system lines of the various sizes which has been incorporated into the completed and accepted work will be measured from end to end by the linear meters in place with no deduction for length through drainage structures. Where two different sizes enter or go from a drainage structure, each size will be measured to the center of the drainage structure. Unless otherwise shown on the plans, branch connections, ells, or other fixtures will be included in the length measurement.

The quantities of contaminated soil disposal to be paid for will be based upon the actual number of metric tons of soil delivered to an accepted disposal facility.

The quantities of contaminated ground water disposal to be paid for will be based upon the actual number of liters of water receiving disposal, documented by disposal manifests from the treatment facility.

Precast drainage structures for the special sealed drainage system will be measured on a "per each" basis as provided below.

The quantity of drainage structures for the sealed drainage system to be paid for will be actual number of drainage structures which have been completed and accepted. In addition, that portion of a drainage structure exceeding a height of 1.5 meters will be measured and paid for on a linear meter basis. The quantity of drainage structures above a height of 1.5 meters to be paid for will be the number of linear meters which, the height of the drainage structure exceeds 1.5 meters. The height will be measured vertically to the nearest millimeter from the top of the bottom slab to the top of the wall.

VI. BASIS OF PAYMENT

The quantity of ductile iron drainage line for the sealed drainage system measured as provided above and accepted will be paid for at the contract unit prices per linear meters for the various sizes.

The quantity of precast drainage structures for the sealed drainage system measured as provided above and accepted will be paid for at the contract unit price per each for the various diameters and at the contract unit price per linear meter of depth for that portion of the drainage structure from a height of 1.5 meters to .3 meters. For that portion of the

drainage structure above a height of 3 meters, payment will be made at 1.3 times the contract unit price per linear meter.

Such prices and payments will be full compensation for all work covered by these special provisions, including, but not limited to: materials, labor, equipment, backfilling, compaction, testing, pumping and incidentals necessary to complete the work as required.

The quantities of contaminated ground water disposal, measured as provided above, will be paid for at the contract unit price per liter for "Contaminated Ground Water Disposal"

The quantities of contaminated soil disposed of will be paid at the contract unit price per metric ton for "Contaminated Soils Disposal", documented by a certified weight certificate issued by a North Carolina public weighmaster, licensed in accordance with Chapter 81A of the General Statutes of North Carolina. The certificate shall be in the form of a ticket furnished by the Contractor and shall contain the following information:

1. Division of Highways project number
2. Date
3. Time issued
4. Gross weight
6. Tare weight
7. Net weight of material
8. Scale location
9. Truck number
10. Contractor's name
11. Public weighmaster's stamp or number
12. Public weighmaster's signature in ink or initials in ink

Such prices and payments will be full compensation for all work covered by these special provisions, including, but not limited to: materials, labor, equipment, backfilling, compaction, testing, pumping and incidentals necessary to complete the work as required.

Pay Items:

Excavation, Hauling and Disposal of Contaminated Soil	Metric Ton
Contaminated Groundwater Disposal	Liter
MM Ductile Iron Drainage Pipe, Class 50	Linear Meter
Masonry Drainage Structures (Sealed System)	
Structure 26-27	Each
Structure 60-63	Each
Structure 66	Each
Structure 177-178	Each
Structure 181-183	Each
Structure 189-191	Each
Structure 201-202	Each
Structure 206-205	Each
Structure 209	Each
Structure 302-304	Each
Structure 308-309	Each

Municipal Services Engineering Company

Garner, NC Boone, NC

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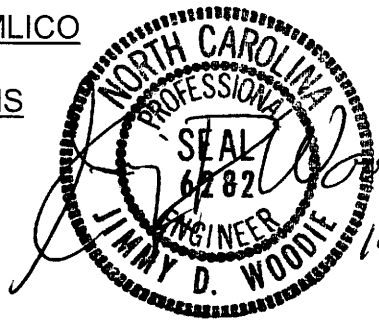
Project: R-2539C County: PAMLICO



10/25/2014

PROJECT SPECIAL PROVISIONS
Utility Construction

I. GENERAL CONSTRUCTION REQUIREMENTS:

Specifications:

The proposed utility construction shall meet the applicable requirements of the NC Department of Transportation's "Standard Specifications for Roads and Structures" dated January 2002, and the following provisions.

The Contractor shall be responsible for field verifying location, size, type and elevation of all underground utilities. As well as reconnecting any water and/or sanitary sewer services disturbed during construction which are not shown on the plans. The water line shall be installed as to provide a minimum of 0.914 meters of coverage above the top of pipe from finished grade.

Contractor shall be aware that between approximately Sta. 208+00 and Sta. 237+00 of the -L- line the proposed storm drainage drop inlets shall be a maximum depth invert of 0.686 meters. The Contractor shall wrap the existing 200mm and 400mm force sewer pipe right of line –L- with class B concrete to all minimum clearances with the proposed drainage. In cases where there are direct conflicts with the proposed storm drainage, the Contractor shall lower or relocate the existing 200mm and 400mm force sewer lines. The necessary quantities have been added to the contract to facilitate these procedures.

Water lines and Valves:

The owners (Pamlico County) shall be notified two weeks in advance before Contractor begins work and one week in advance of any interruptions of water service with ample time to make arrangements. Interruption of water service on main lines shall be limited and Contractor shall coordinate with owner.

All valves shall be Ductile Iron Resilient Seat Gate Valves and shall meet the specification as shown in the NCDOT Standard Specifications for Roads and Structures, Section 1036-7.

After the installed pipe, fittings, valves, hydrants, corporation stops and end plugs are inserted and secured, the pipeline shall be subjected to a hydrostatic pressure of 1035 kilopascals for a period of 2 hours, by pumping the section full of clean water using an approved pressure pump.

Any cracked, damaged, or defective pipe, fittings, valves, hydrants, or other attachments discovered as a result of the pressure test, shall be removed and replaced with sound material and be approved by Owners. The tests shall be repeated until test results are satisfactory.

After the pressure test is complete, the Contractor shall make a leakage test. Such leakage test shall last at least 2 hours at a pressure of 1035 kilopascals.

The pressure test and leakage test may be performed concurrently.

All valves on the lines being sterilized shall be opened and closed several times during the chlorinating period. The pipeline shall then be flushed with clean water until the residual chlorine is reduced to less than 1.0 ppm or at the same level as in the existing water mains. Samples of water shall be taken at representative points along the pipeline by the contractor, in approved containers and submitted to a certified testing laboratory for bacterial.

The Contractor shall be responsible for field verifying location, size, type and elevation of all underground utilities.

Force Sewer lines and Valves:

The owners (Bay Metro Sewerage District) shall be notified two weeks in advance before Contractor begins work and one week in advance of any interruptions of water service with ample time to make arrangements. Interruption of sewer service on main lines shall be limited and Contractor shall coordinate with owner.

All valves shall be Ductile Iron Resilient Seat Gate Valves and shall meet the specification as shown in the NCDOT Standard Specifications for Roads and Structures, Section 1036-7.

After the installed pipe, fittings, valves and end plugs are inserted and secured, the pipeline shall be subjected to a hydrostatic pressure of 1380 kilopascals for a period of 2 hours, by pumping the section full of clean water using an approved pressure pump.

Any cracked, damaged, or defective pipe, fittings, valves, or other attachments discovered as a result of the pressure test, shall be removed and replaced with sound material and be approved by the Owner. The tests shall be repeated until test results are satisfactory.

After the pressure test is complete, the Contractor shall make a leakage test. Such leakage test shall last at least 2 hours at a pressure of 1380 kilopascals.

The pressure test and leakage test may be performed concurrently.

The Contractor shall be responsible for field verifying location, size, type and elevation of all underground utilities.

II. COMPENSATION:

No direct payment will be made for utility construction work required by the preceding provisions, which are general requirements applying to utility construction, and all of the requirements stated will be considered incidental work, paid for at the contract unit prices of the various utility items included in the contract.

Owner and Owner's Requirements:

The existing utilities belong to the Pamlico County and the Bay River Metro Sewerage District. The Contractor shall provide access for the owner's representatives to all phases of construction. The owners shall be notified two weeks prior to commencement of any work and one week prior to service interruption.

Contacts:
Bay River Metro Sewerage District: James Krauss – Superintendent
(252) 745-4812
Pamlico County : Tom Beasly – Field Operations (252) 745-5453

1. Bedding Material:

Bedding material for utility lines shall be installed in accordance with the applicable utility provisions herein, as shown on the utility construction plans, and/or as directed by the Engineer.

Bedding material shall meet the requirements of Article 1016-3 of the Standard Specifications. Bedding material shall be installed in accordance with Articles 300-6 and 300-7 of the Standard Specifications.

Bedding material installed in accordance with the plans and provisions herein and accepted, will be measured and paid for at the contract unit price per ton for "Bedding Material, Utilities Class IV". Such prices and payments shall be full compensation for all materials, labor, equipment, compaction and shaping the bedding material in accordance with Article 300-4 of the Standard Specifications, and incidentals necessary to complete the work as required.

2. Polyethylene (PE) Water Tubing:

Polyethylene (PE) water tubing shall be installed in accordance with the applicable utility provisions herein, as shown on the utility plans and/or as directed by the Engineer.

PE water tubing shall conform to ASTM D2737 or AWWA – C901. PE water tubing materials shall be either PE 2406, PE 3406 or PE 3408 depending upon the required pressure class and dimension ratio (SDR) specified on the plans. Polyethylene water tubing shall meet the requirements of the National Sanitation Seal of Approval for potable water.

The ends of the (PE) water tubing shall be connected using approved compression type couplings and/or compression type fittings. Such couplings and fittings shall be approved by the Engineer.

Polyethylene (PE) water tubing, installed in accordance with the plans and provisions herein and accepted, will be measured along the pipe from end to end, with no deductions for fittings or couplings, and paid for at the contract unit price per linear meter for "__mm PE Water Tubing, SDR 9, 1.38MPa WP". Such prices and payments will be full compensation for furnishing all labor, equipment, material, compression couplings and fittings, excavation, chlorinating, backfilling and all incidentals necessary to complete the work as required.

3. 50mm Sewer Air Release Valve and Manhole:

Sewer Air Release Valve and Manhole shall be installed as shown on the plans, as required by these provisions, and/or as directed by the Engineer or Owner.

The Sewer Air Release valve shall be 50mm Crispin Pressure Air Valves. Model PL20, with vacuum check unit, or 50mm Val-Matic, Model VM-45, with a vacuum check unit or equal as approved by the Engineer. The air release valves shall be suitable for 150psi working pressure and designed to allow air to escape automatically while the main is in service or under repair.

The quantity of air release valves furnished, installed and accepted, shall be measured and paid for at the contract unit price per each for "50mm Sewer Air Release Valve and Manhole". Such prices and payments will be full compensation for all materials, labor, excavation, fittings, stone, installation, backfilling and incidentals necessary to complete the work as required.

County: Pamlico
Project: R-2539C

PROJECT SPECIAL PROVISIONS
Utility

UTILITIES BY OTHERS:

General:

The following utility companies have facilities that will be in conflict with the construction of this project.

A) Progress Energy - Power (Distribution)
B) Tideland EMC - Power (Distribution)
C) Sprint - Telephone
D) Eastern North Carolina Natural Gas - Gas
E) Time Warner - CATV
F) Pamlico Board of Education

The conflicting facilities of these concerns will be adjusted prior to the date of availability, unless otherwise noted and are therefore listed in these special provisions for the benefit of the Contractor. All utility work listed herein will be done by the utility owner. All utilities are shown on the plans from the best available information.

The Contractor's attention is directed to Article 105.8 of the Standard Specifications.

Utilities Requiring Adjustment:

A) Progress Energy - Power (Distribution)

1) See Utilities by Others Plans.

NOTE: Progress Energy will relocate its facilities as clearing and grubbing and Right of Way become available, and be finished in sixteen (16) weeks after these procedures.

B) Tideland EMC - Power (Distribution)

1) See Utilities by Others Plans.

NOTE: Tideland EMC will complete its work by May 28, 2005.

C) Sprint - Telephone

1) See Utilities by Others Plans.

NOTE: Sprint will follow Contractor's grubbing and clearing for relocation of its facilities. Sprint will complete its relocations sixteen (16) weeks after clearing and grubbing by the Contractor.

D) Eastern North Carolina Natural Gas - Gas

1) See Utilities by Others Plans.

NOTE: Eastern North Carolina Natural Gas will complete the relocation of its facilities by April 30, 2005. Contractor shall clear and grub left of –L- from Sta. 218+30 to Sta. 219+30 and advise ENCNG to begin its work in this vicinity. ENCNG will need seven (7) working days to complete this installation.

E) Time Warner Cable - CATV

1) See Utilities by Others Plans.

NOTE: Time Warner will complete relocation of its facilities by May 28, 2005.

F) Pamlico Board of Education

1) See Utilities by Others Plans

NOTE: Existing cables are attached to Progress Energy poles and will be relocated to Progress Energy's new power poles.

NOTE: All other utilities shall remain in place and will be adjusted as necessary.