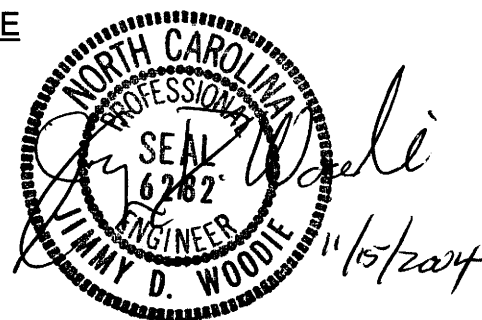


Project: R-977A County: CHEROKEE

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.

Water lines and Valves:

The owners (Town of Murphy) 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. Contractor shall be aware that the shut down times allowed for the 400mm water main will be 6 hours maximum and need approval from the Town of Murphy one week prior to shut down.

The Contractor shall make the connections with a tapping sleeve and valve as shown on the construction drawings. The new water lines shall be installed, bacteriologically tested and pressure tested before being tied into existing lines. The contractor shall then dewater and dechlorinate the water pipe prior to removal. The above process is incidental to the cost of the new 400mm water pipe.

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 (Town of Murphy) shall be notified two weeks in advance before Contractor begins work and one week in advance of any interruptions of sewer service with ample time to make arrangements. Contractor shall be aware that there will be no shut downs allowed for the 200mm force sewer main which is being relocated.

The Contractor shall make the connections with a tapping sleeve and valve. The new sewer lines shall be installed and pressure tested before being tied into the existing lines. The contractor shall then dewater and dispose of existing sewage at a treatment facility. The above process is incidental to the cost of the new 200mm force sewer pipe.

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 Town of Murphy. 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. The Contractor shall reimburse the Town for all water consumption by the Contractor for testing and cleaning the new water and sewer lines.

Contacts:

Town of Murphy: Ralph Hudson – (828) 837-2510 office
(828) 361-1129 cell phone

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 Air Release Valve and Manhole:

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 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 1.03MPa 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 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.

4. Line Stop Assembly:

All fittings, equipment and labor will be supplied by the Contractor. It is the intention of this section of the specifications to clearly outline the use of materials, methods and procedures to be employed by the Contractor for the

connection of a new line to the existing primary pipe system while it remains in service and under pressure. The accepted process will use hot tapping as the means to perform a branch connection from the existing primary system to the system. At no time is the primary system permitted to be shut down for this portion of the project. The plans and documents indicate the location of the existing primary pipe systems and where the work is to be performed. The Contractor will be responsible for all aspects of the pipe alteration process without service interruption.

Prior to the placement of material orders for this portion of the project, the contractor will be required to obtain certain jobsite data to facilitate the proper manufacture of components needed to complete the alterations under pressure. The Contractor will determine type, class and size of pipe and be responsible for correct fittings and appurtenances. Prior to fabrication of materials required for hot tapping process, the Contractor will determine, in the field, the actual site conditions of the pipe at the location where the work is to take place. Should the existing pipe be encased in concrete or other protective material, the encasement will be removed down to the factory supplied pipe outside diameter or the location for the work changed to an area where the factory supplied pipe is accessible. If the site conditions preclude the complete operation from taking place at the designated location, NCDOT is to be advised. Cast/ Ductile iron pipes will be circumferentially tape measured and callipered at a minimum of four points.

The Contractor shall be responsible for all thrust design calculations and placement of support required for this portion of the project. This will include all lateral pipe thrust restraint that will be encountered as a result of the hot tapping and pipe plugging process. It will also include all pipe support based upon the size and weight of the equipment to be utilized.

MATERIALS:

All fittings used under this section of the bid require shop drawings be submitted and approved prior to the start of fabrication. The hot tap pipe plugging fitting to be used for this type of work shall be manufactured in two sections. The back (bottom) section will be of the full encirclement type and conform to the measured pipe diameter. The front (top) section will also be full encirclement type with a factory installed nozzle and flange outlet. Fittings for line stops shall be fabricated from approved carbon steel materials. The body run sections (top and bottom) shall be made of ASTM A-283 grade steel as a minimum. ASTM A-285 and ASTM A 36 grade steels may also be utilized with proof of acceptability. Steel run sections will conform to and re-enforce the existing pipe. Fittings will have a minimum 21.875mm wide recess for installation of a Buna-n rubber gasket around the hot tapping outlet. Bolts and nuts shall be stainless steel 18-8 type 404. a 18.75mm test outlet will be placed into the nozzle branch outlet, at the factory, for purposes of site pressure testing after the fitting has been

installed around the pipe. Service rating for all fittings and materials shall be 1.03MPa.

BODY:

ASTM A 283 grade C, A-285 or ASTM A-36. Saddle plate thickness shall be in accordance with the design criteria for the entire fitting. The minimum wall thickness for saddle plates shall be 9.375mm. All welding of materials shall be in accordance with applicable code standards and all welds shall be stress relieved when code standards so specify. Saddle plates shall be designed to permit longitudinal bolting of top and bottom halves around the pipe.

HOT TAP NOZZLE:

Nozzles attached to the saddle plates and used for hot tapping shall be constructed of A-106 grade B steel or ASTM A-234 or ASTM-283 steel. All welds will be suitably stresses relieved when required by code or by common practice. Nozzle thickness will be as a minimum standard steel pipe wall thickness (6.250mm minimum in size 150mm and above) and in compliance with the maximum working pressure of the system.

NOZZLE TO PIPE SEALING GASKET:

Shall be molded from elastomer compounds that resist compression set and are compatible with potable water in the temperature range of 32 to 140 degrees Fahrenheit with National Sanitation Foundation approval.

FLANGES USED FOR PIPE PLUGGING:

All flanges used for line plugging will be manufactured from ASTM- A-105 grade steel only. Flanges will comply with ASME B16.5. These special flanges facilitate the removal of the temporary control valve utilized for pipe plugging operations. Completion plugs used for line stops shall be threaded and manufactured from steel plate, ASTM A-516 GR 50 or 70 steel as a minimum. Completion plugs shall be constructed in such a manner that will permit sealing the completion plug to the flange bore thus permitting the safe recovery of the temporary control valve utilized for the pipe plugging operation.

BLIND FLANGES:

Will be provide in ASTM A-181 or ASTM A-105 grade steel and will mate with the line plugging flanges listed above. Minimum blind flange thickness shall comply with AWWA C-207.

FLANGE GASKETS:

All gaskets will be of non-asbestos composition and will be designed to mate to the inner bore and inner bolt circle of the line plugging flange. All gaskets will be at least 3.125mm minimum thickness.

FASTENERS:

All external bolting, studs and nuts shall become a permanent part of the fitting installation shall be corrosion resistant, high strength stainless steel 18-8 type 304.

TEST PLUG:

Each fitting will be furnished with a factory supplied 18.75mm threaded test outlet and plug attached to the hot tap nozzle to facilitate field testing of the installed fitting.

FINISH:

After completion of fabrication, all fittings shall be coated both internally and externally with an epoxy coating per AWWA specifications C-213. Coatings will be applied to 10-20 mil thickness minimum.

MARKING:

All pipe plugging fittings will be clearly marked to permit proper alignment in the field and to insure ends are properly matched when installed around the pipe. The use of paint strips and/or matched serial numbers at one end of the fitting will be required.

FITTING INSTALLATION:**GENERAL:**

Fitting will be installed in accordance with the manufactures recommendation. In no case will the fitting be retro- fitted while it is on the pipe. Any mis-match in fitting installation will require the contractor to remove the fitting from the pipe and replace with new fittings.

PIPE PREPARATION:

The pipe will be excavated at the location indicated on the plans and specifications. Excavation will be in accordance with current O.S.H.A. safety standards. Excavation will include necessary sheeting and shoring, gravel base and site de-watering. Proper pipe support and thrust restraint will be in place prior to the start of hot tapping saddle installation. The pipe will be thoroughly

cleaned down to the factory supplied outside diameter. The pipe will be carefully inspected, especially at the point where the fitting "O" ring must seal to the pipe surface. Any surface pitting will be filled in with an engineer approved epoxy or the site moved to an acceptable location. The excavated pipe will be properly supported by the contractor in accordance with sound engineering practices and based upon the length of pipe exposed to permit saddle installation.

The bottom half of the fitting will be placed around the pipe first, and properly supported from the bottom of the pipe with wood cribbing. The top half of the fitting will have the "o" ring seal lightly lubricated with vegetable base grease and then placed upon top of the pipe. Side seam draw bolts will be installed and the fitting halves will be uniformly drawn together, in a loose fashion, starting from the center and working out to each end. Once the fitting is snug to the pipe, it will be rotated with the flanges in the top horizontal position to the flange in a vertical position. The flanges will be plumbed using a spirit level. Once the outlet flange is plumb the sides of the fittings should be drawn together until the "o" ring is compressed against the pipe surface. The use of a feeler gauge may be used to determine "o" ring compression. Saddle bolts will be torqued to a stress value as recommended by the manufactures.

FIELD PRESSURE TESTING:

A blind flange should now be attached to the fitting flange outlet and a suitable pressure test applied to check the contoured elastometric "O" ring seal. After successful pressure test, the blind flange is to be removed. The field pressure test will not exceed 15% above actual pipe system operating conditions. Duration and method of pressure testing will be approved by the engineer prior to field implementation.

CONCRETE ENCASEMENT / THRUST RESTRAINT:

After acceptance of the pressure test, concrete support and thrust restraint should be placed around the fitting and pipe joints to properly support the pipe, including equipment weights, and to prevent lateral movement of the pipe joints when the system is altered down stream of the pipe plugging. The size, length and depth of the concrete support and thrust restraint will be in accordance with NCDOT standards and based upon existing geophysical conditions at the work site, as well as the pressure under which the pipe system is operating and the type of joints that connect the pipe system.

EQUIPMENT:

All equipment utilized for the hot tapping and pipe plugging operation will be designed and manufactured to meet the maximum working pressures of the system onto which they are to be used. All equipment that will come in contact with potable water will be suitably CHLORINATED at the jobsite, prior to mounting to the valve used for hot tapping or pipe plugging. All equipment

utilized for the pipe plugging operation will be designed and manufactured to meet the maximum working pressure of the system onto which it is placed.

All equipment will be pressure rated for a minimum of 0.69Mpa working pressure. The pressure ratings will include a suitable safety factor above the operating pressures in the equipment design calculations.

Pipe plugging on potable water systems will require that the equipment be steam cleaned prior to use on this project. All equipment that is to be installed on the potable water system will be field cleaned with a suitable bacterial protectant prior to mounting to the tapping saddle.

FIELD PROCEDURES:

The Contractor will excavate, expose and clean the outer surface of the main so that the pipe to be tapped / plugged, can be tape measured and callipered prior to manufacture of the required fitting. The Contractor will properly install the fitting in accordance with the manufacturer's recommendations. After installation, the fitting will be suitably pressure tested. After fitting installation and testing the Contractor will provide sufficient concrete support under and around each fitting based upon existing soil conditions, the size and weight of the equipment to be mounted to the fitting, and anticipated lateral thrust that will be placed on the fittings and pipe sections at the time of the pipe plugging operations and main alterations. Lateral thrust restraint is required. The Contractor will also take into consideration the lateral thrust that will be placed on the pipe and plugging fitting at the time work is to be performed down stream of the line stops. Concrete shall reach minimum cure strength prior to the mounting of any plugging machinery. The use of concrete additives to speed the cure time will be used with the approval of the engineer.

The hot tapping machine will be field chlorinated and mounted to the temporary control valve. The hot tap will be performed and the cut out pipe section (coupon) will be retracted into the tapping machine's pressure housing. The temporary control valve will be closed, the tapping machine de-pressurized and removed from the temporary control valve. The plugging machine will be field chlorinated and mounted to the temporary control valve. The plugging sealing element will be lubricated with vegetable base grease only and prior to retraction into the pressure housing. No petroleum base grease will be permitted.

The temporary control valve will be removed from the plugging fitting. A new gasket and blind flange will be installed on the plugging fitting.

The quantity of line stop assemblies furnished, installed and accepted, shall be measured and paid for at the contract unit price per each for “__mm Line Stop Assembly”. 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.

PROJECT: R-977A
 COUNTY: CHEROKEE

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. TENNESSEE VALLEY AUTHORITY (TVA)
- B. MURPHY POWER
- C. VERIZON
- D. CHEROKEE/MURPHY CABLE

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. The utility owners will do all utility work listed herein. 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. TVA
 - 1-From (Sta.10+00 to Sta. 24+00, line -LC1B-) the existing 69 KV and 161 KV aerial line will be relocated by April 15, 2006
 - 2-From (Sta. 39+00 Line -L REV- to end of project) the existing 69 KV aerial line will be relocated by December 1, 2006

See Utilities by Others Plans for details.

The contact Person of Tennessee Valley Authority is Mr. Ronald D. Skelton Sr. Project Manager.

- B. Murphy Power
 - Removal of the existing facilities and the proposed installation of power lines and the 6" conduit crossing line -LC1B- at Sta. 17+60 will be completed by June 15, 2006. See Utilities by Others Plans for details.

The contact person of Murphy power board is Leroy Coker superintendent

C. Verizon

1-From (Sta. 10+00 to Sta. 17+35, line –LC1B-), the removal of existing facilities and the proposed installation of the under ground duct system will be completed 8 months after rough grading. The direct buried cable will be completed 12 months after rough grading.

2-From (Sta. 17+35 to Sta. 20+50 line –LC1B-) the removal of existing facilities and the installation of proposed aerial and buried telephone lines will be completed 90 days after rough grading.

3-From (Sta. 39+45 to Sta. 50+85 line –LREV-), (Sta. 72+70 to Sta. 75+70 line –LREV-) and (Sta. 9+55 to Sta. 12+28 line-Y4-), the removal of existing facilities and the proposed installation of buried and aerial lines will be completed by August 31, 2005.

4-From (Sta. 75+70 to Sta. 86+00 line –LREV-), (Sta.8+00 to Sta.18+04 line - Y6-rev.)
the removal of existing facilities and the proposed installation of buried and aerial lines will be completed by December 31, 2005
See Utilities by Others Plans for details.

D. Cherokee/Murphy Cable

1-Cherokee / Murphy cable will be relocated to proposed Murphy power poles, and completed by June 15, 2006. See Utilities by Others Plans for details.