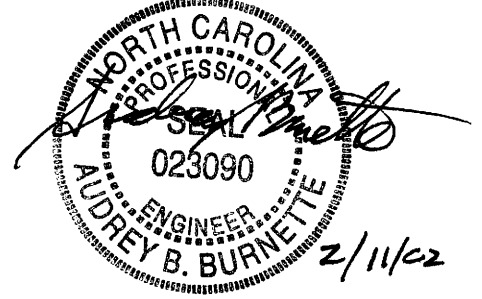


Project: 8.2663103 (B-3424)
 County: Cabarrus

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 is herein forewarned as to the possibility of having to vary the depth of pipeline installation to achieve minimum clearance of existing or proposed utilities or storm drainage while maintaining minimum cover specified (whether existing or proposed pipelines, conduits, cables, mains, and storm drainage are shown on the plans or not).

Owner and Owner's Requirements:

The existing water & sewer lines belong to The City of Kannapolis. The phone number is (704) 920-4200. The Contractor shall provide access for the owner's representatives to all phases of construction. The owners shall be notified according to procedures noted elsewhere in these provisions.

In addition to the requirements outlined in the NCDOT Standard Specifications, the Contractor shall submit an additional set of product specifications to the City of Kannapolis for review.

Utility Locations Shown on the Plans:

The location, size, and type material of the existing utilities shown on the plans is from the best available information. The Contractor will be responsible for determining the exact location, size, and type material of the existing facilities necessary for the construction of the proposed utilities and to avoid damage to existing facilities.

Service Interruptions, Weekend, Night and Holiday Work:

The owner shall be notified in advance of any interruptions of water service with ample time to make arrangements. Interruption of water service shall be limited to a maximum of 4 hours unless approved by the Engineer.

During the course of the work, connections between existing and proposed utilities shall be made when and as directed by the Engineer. The connections

shall be made at times most convenient to the public and when the service will be the least endangered by the work. The connections shall be made on weekends, at night, and on holidays if required by the Engineer.

Waterline Installation

All water pipe, fittings, and appurtenances shown on the plans shall be installed in accordance with Section 1510 of the Standard Specifications or as otherwise directed by the Engineer.

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 200 psi for a period of 2 hours, by pumping the section full of clean water using an approved pressure pump. Cross connection for flushing and chlorination shall be made by means of a temporary connection from the supply pipe with an approved backflow prevention device. Taps for the cross connection piping shall be made to the portion of the existing water main that will be removed from service. The proposed water main shall be laid to within one pipe length of the point of final connection prior to flushing and testing. All flushing and chlorination work shall be performed in accordance with AWWA C651-99. All fittings, valves, backflow prevention devices required for chlorination and testing shall be incidental to the cost of the proposed pipe being tested.

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. 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 200 psi. To be acceptable the leakage must not exceed the amount determined by the following formula:

$$Q = 0.0075 \text{ DLN}$$

Where: Q = allowable leakage in gallons per hour
 D = nominal diameter of pipe in inches
 L = length of section tested in thousand feet
 N = square root of average test pressure in

Measurement of leakage shall not be attempted until all trapped air has been vented and a constant test pressure has been established. After the pressure has stabilized, line leakage shall be measured by means of a suitable water meter installed in the pressure supply piping on the pipeline side of the force pump.

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 and chlorine content. Test results shall be provided to The City of Kannapolis.

All butterfly valves and gate valves shall conform to the requirements of ANSI/AWWA 504 and/or 509. The direction of rotation of the handwheel or wrench nut to open the valve shall be to the left or counterclockwise.

Each valve buried to a depth of 4 feet or less shall be provided with a slide type valve box. Valve boxes shall be cast iron, extension sleeve type, suitable for the depth of cover required by the Drawings. Not more than one extension will be allowed with each slide type valve box. Valve boxes shall be not less than 5 inches in inside diameter, shall have a minimum thickness at any point of 3/16 inch, and shall be provided with suitable cast iron bases and covers.

Each valve buried to a depth greater than 4 feet shall be provided with a valve box consisting of a cast iron cover and a 6-inch cast iron pipe section. The pipe shaft shall be sized to extend from the valve to 5 inches inside the valve box cover. Covers shall have cast thereon designation of the service for which the valve is used.

All parts of valve boxes, bases, and covers shall be shop coated by dipping in asphalt varnish. All covers shall be provided with a removable plug cap with the word "WATER" cast therein.

Cleaning and flushing of Pipelines.

All water and sewer lines installed under this contract, including all associated valves and fittings, shall be flushed or cleaned to the satisfaction of the Engineer. Cleaning of water lines shall be completed prior to disinfection.

All 12 inch and smaller pipelines shall be flushed with water at the maximum velocity, which can be developed, but not less than 2.5 feet per second, unless otherwise permitted by the Engineer. Flushing shall be accomplished through the installed valves or fittings, or through corporation cocks furnished and installed for the purpose.

Booster pumps shall be used if required to obtain the necessary volume or velocity of water.

Disinfection of Mains.

All of the water mains installed shall be thoroughly flushed and disinfected before being placed in service. All disinfection work shall conform to the requirements of ANSI/AWWA C651-92 and the requirements of the North Carolina Department of Environment, Health, and Natural Resources. This work shall be observed by the Engineer. The Contractor shall supply all labor, equipment, and materials necessary for carrying out this work. After a thorough flushing and cleaning out, sufficient chlorine compounds shall be introduced in the lines to produce a chlorine concentration of at least 50 parts per million. The chlorine solution shall be retained in the lines for at least twenty-four (24) hours. At the end of this period, the chlorine residual shall be at least 20 parts per million. The lines will then be flushed sufficiently to clear them of chlorine exceeding two parts per million. At least two samples of water from the mains will then be taken by the Owner and analyzed for bacteriological purity by a certified testing lab. If the initial bacterial tests fail, Contractor shall reimburse Owner for all additional sampling. Contractor shall pay for all cost associated with testing. If the mains fail to meet the bacteriological standard for purity, disinfecting and flushing will be repeated until such standards have been met.

Drainage of mains and disposal of chlorinated water shall be in accordance with all Federal, State, and local laws, ordinances, and regulations. Mains shall be drained to sanitary sewers, where available. If highly chlorinated water is discharged to the sanitary sewer, the Contractor shall notify the operations manager at the Rocky River Regional Wastewater Treatment Plant prior to discharging. The chief operator will stipulate time and rate of discharge into the sanitary sewer. Drainage directly to surface waters (creeks, rivers, streams, lakes, ponds, etc.) will not be allowed. Drainage branches, blow-offs, air vents and appurtenances shall be provided with valves and shall be located and installed as shown on the Plans and Standard Details. Drainage of mains will be accomplished in such a manner as to minimize erosion and siltation to adjoining properties. Water velocity from drainage and/or blow-off will be dissipated as necessary to prevent erosion.

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.

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 and the detail sheets, which are part of the Utility Construction Plans.

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 VI". 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. CONCRETE ARCH ENCASUREMENT FOR SEWER PIPE:

Concrete arch encasement for proposed or existing sanitary sewer lines shall be installed in accordance with the applicable utility provisions herein and in lieu of Section 1505-5 of the Standard Specifications, as shown on the utility plans, and/or as directed by the Engineer.

Class B concrete for encasing proposed or existing sanitary sewer lines shall meet the requirements of Section 1000 of the Standard Specifications.

Excavation and backfilling operations for concrete arch encasements shall comply with Sections 235, 300, and 1505-3 of the Standard Specifications.

The quantity of concrete arch encasement, installed in accordance with the plans and provisions herein and accepted will be measured and paid for at the contract unit price per linear foot for "Concrete Arch Encasement for Sewer Pipe". Such prices and payments will be full compensation for all materials, labor, excavation, backfilling, and incidentals necessary to complete the work as required.

3. DUCTILE IRON RESTRAINED JOINT WATER PIPE FITTINGS:

Ductile Iron Restrained Joint Water Pipe Fittings shall be installed in accordance with the applicable utility provisions herein, as shown on the utility plans and/or as directed by the Engineer.

Ductile Iron Restrained Joint Bends and Tees shall be in accordance with applicable requirements of ANSI A21.10 (AWWA C110). Joints for such bends and tees shall be in accordance with ANSI A21.11 (AWWA C111) and be cement mortar lined with a seal coat in accordance with ANSI A21.4 (AWWA C104). All Restrained Joint Water Pipe Fittings shall have a minimum working pressure of 250 psi.

The quantity of Ductile Iron Restrained Joint Water Pipe Fittings, installed in accordance with the plans and provisions herein and accepted, will be measured and paid for at the contract unit price per pound for "Ductile Iron Restrained Joint Water Pipe Fittings, 250 psi Min. WP". Such price and payment will be full compensation for all materials, including pipe accessories, labor, installation, backfilling, and incidentals necessary to complete the work as required.

4. DUCTILE IRON "RESTRAINED JOINT" WATER PIPE:

Ductile Iron Restrained Joint Water Pipe shall be installed in accordance with the applicable utility provisions herein, as shown on the utility plans and/or as directed by the Engineer. All restrained retainer glands necessary to connect the new water pipe to the existing water pipe will be considered incidental.

Ductile Iron Restrained Joint Water Pipe shall be of the thickness class and pressure rating shown on the utility plans and shall conform to ANSI A21.51 (AWWA C151) Push-on joints for such pipe shall be in accordance with ANSI A21.11 (AWWA C111). Pipe thickness shall be designed in accordance with ANSI A21.50 (AWWA C150) and based on laying conditions and internal pressures as stated on the plans.

Cement mortar lining and seal coating for pipe shall be in accordance with ANSI A21.4 (AWWA C104). Bituminous outside coating shall be in accordance with ANSI A21.51 (AWWA C151).

All Ductile Iron Restrained Joint Water Pipe shall be installed in accordance with laying condition Type 2 as stated in ANSI A21.51 (AWWA C151) unless otherwise shown on the plans.

Restrained retainer glands shall be high strength ductile iron conforming to ASTM A536. . Restrained Retainer glands shall meet the specifications for ANSI A21.11 (AWWA C111). Restrained retainer glands shall be capable of restraining mechanical joints for a minimum working pressure of 250 psi. The restrained retainer glands shall have a series of machined serration on the inside diameter of the retainer, which provides a grip on the pipe surface, with 360° contact and support of the barrel. Wedges that bear against pipe wall shall not be used on bell and spigot type installations. Twist-off nuts shall be used to insure proper torturing of retaining devices. The split design allows use on both new and existing pipe installations.

Retainer glands shall restrain the required restrained length. The Contractor shall be responsible for determining the necessary lengths to be restrained. Design of the restrained portion of the new water piping system shall be approved by a registered professional engineer, and submitted to the Utility Section, Design Services Unit for approval prior to installation.

Ductile Iron Restrained Joint Water Pipe, 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 and valves, and paid for at the contract unit price per linear foot for, "____" DI Restrained Joint Water Pipe, PC ____". Such prices and payments will be full compensation for all materials, including pipe accessories, restrained retainer glands, excavation, labor, pressure testing, sterilization, backfilling, and incidentals necessary to complete the work as required.

PROJECT: B-3424
 COUNTY: Cabarrus

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. Duke Power (Distribution)
- B. Concord Telephone Company
- C. PSNC Energy
- D. Time Warner (CATV)

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 and shown on the Utilities By Others for the benefit of the Contractor. All utility work listed herein will be done by the utility owners. All utilities are shown on the plans from the best available information. For utility relocations see the Utilities By Others Plans.

The Contractor's attention is directed to Article 105.8 of the Standard Specifications. Utilities Requiring Adjustment:

- A. Duke Power**
(See Utilities By Others Plans for relocation details)
- B. Concord Telephone Company**
(See Utilities By Others Plans for relocation details)
- C. PSNC Energy**
(See Utilities By Others Plans for relocation details)
- D. Time Warner (CATV)**
(See Utilities By Others Plans for relocation details)