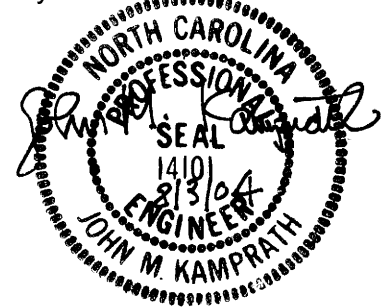


Project: R-2568B
County: Davidson

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.

Water mains shall be laid at least 3.05 m laterally from existing or proposed sanitary sewers. Water mains shall have a minimum of 0.46 m vertical separation over sewer mains. Where this separation is not possible or the water main is laid under the sewer main, both the water and sewer pipe shall be ductile iron pipe. Center pipe spans at point of intersection in order to have 3.05 m from water line joint to point of intersection.

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). The normal minimum cover for water mains shall be 0.91 m. The normal maximum cover for water mains shall be 1.21 m. Minimum trench width shall be pipe diameter plus 0.46 m.

The Contractor shall submit his proposed method of anchoring to the Engineer for review and approval prior to any applicable force main sewer construction. Such approval will not relieve the Contractor of his responsibility of properly anchoring the force main sewers.

Owner and Owner's Requirements:

The existing water utilities belong to Davidson Water Inc. The existing sewer utilities belong to Davidson County. 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. Only authorized personnel of the owner shall operate valves in the existing distribution or collection system.

PIPE LAYING:

At the start of construction, any existing valves to be used as isolation valves to the new project lines, shall be visually inspected by the inspector, contractor, and

as necessary by a Davidson Water Inc. representative. Any leaks shall be repaired or isolation construction method used.

Each joint of pipe shall be laid according to manufactures recommendations and in accordance with latest revision of AWWA C-600 for Ductile Iron and Cast Iron Pipe, and AWWA C-900 for PVC. The nominal allowable deflection for all the pipes listed shall be 1/2 of the manufacturer's recommended maximum deflection per joint. The Engineer may vary from this policy when prudent.

Competent pipe layers shall be required for pipe installation. All pipe shall be thoroughly cleaned of all earth material and rubbish before being placed in the trench. Bell holes will be dug at each joint. Pipe shall be placed on firm, smooth foundation to prevent subsequent settlement. Concrete thrust blocking shall be constructed at all bends, tees, reducers, and dead ends and where conditions warrant. All fittings and accessories shall be wrapped with polyethylene film prior to placement of blocking.

Hydrants shall be set plumb as indicated on the drawings with the pumper connection 0.46 meters above grade. The back of the hydrant, opposite the pipe connection, shall be firmly blocked against the vertical face of the trench with poured-in-place concrete to prevent the hydrant from blowing off the line. In fill areas or soils that are not solid, hydrants shall be rodded or restrained by megalug using ductile iron pipe, not PVC. Clean crushed stone or gravel shall be placed around the base of each hydrant above the supporting foundation and to within 0.30 meters of the ground line. Stone or gravel shall extend at least 0.25 meters away from the hydrant barrel in all directions. Hydrants shall be opened and flushed prior to pressure testing of the lines.

All 50mm and 75mm gate valves shall be resilient wedge gate valves and shall conform to the requirements of ANSI/AWWA C509.

Valve box assemblies shall be set plumb, true and to grade.

The Contractor shall plug all pipe ends, at the end of each days work.

Backfill along sides and immediately over the pipe by hand. Backfill material around the pipe shall be free of rocks and other debris. Trench backfill under existing or proposed paving and road shoulders shall be compacted to a density of 95 percent of maximum dry density.

Where rock is encountered, the rock shall be excavated a minimum of 150 mm below the pipe grade and the cut shall be backfilled to grade with an approved earth material. Trench excavation in rock shall be a minimum of 0.61 m wider than the nominal pipe diameter.

Hydrostatic Tests

After the pipe has been laid and partially backfilled and before any service taps have been made, the newly laid pipe and appurtenances shall be subject to a hydrostatic pressure and leakage test.

The Contractor shall provide all necessary equipment and tests, including pumps, cross connect piping, valves, and backflow prevention. The Contractor shall also furnish the necessary personnel to administer the test under the inspection of the Engineer or his representative. All testing equipment and testing shall be incidental to the installation of the pipe, no separate payment shall be made.

All water mains shall be pressure tested with a test pressure at the high point of the main twice the working pressure or 1.38 MPa, whichever is greater. Test pressure shall be maintained for a minimum of 3 hours. Make up water shall not exceed the following amounts in liters per 304.8 meters of main: 100mm line - 4.20, 150mm line - 6.25, 200 mm line - 8.40.

Each section of the pipeline shall be slowly filled with water and the specified test pressure shall be applied by means of a pump connected to the pipe in a manner satisfactory to the Engineer. During the filling of the pipe and before the application of the specified test pressure, all air shall be expelled from the pipeline. Additional corporation stops/curb stops may be necessary to expel trapped air. During the test, all pipe, fittings, valves, hydrants, and couplings shall be carefully examined for leakage. Any joint or section of pipe that is not within the allowable leakage value shall be rejected and shall be replaced or repaired and the test shall then be repeated until the results are satisfactory.

All tapping sleeves and valves shall be air tested at 1.03MPa for a minimum of 15 minutes. Testing is to take place before taps are made.

Sterilization of Completed Lines

All water mains shall be flushed and disinfected prior to being put in service. Flushing shall be accomplished with sufficient velocity (minimum of 0.76 mps) to thoroughly clean the main. The mains shall be disinfected using a chlorine solution equal to or greater than 100 milligrams per liter (100 ppm). The chlorine solution shall remain in the mains for a minimum of 24 hours.

Davidson Water Inc. shall take bacteriological test samples for evaluation and line disinfectant approval. After disinfection is complete, the new lines shall be flushed sufficiently so that the chlorine concentration level in the new lines do not exceed existing line concentrations.

If the test results are not acceptable, the Contractor shall repeat sterilization and retest lines.

Temporary Plugs

The Contractor shall seal off all exposed ends of pipe before terminating work at anytime. At the end of each days work or at any time the pipe laying operation is stopped or delayed, the Contractor shall provide a watertight seal at all exposed ends of pipe or fittings.

Progress of Pipe Line Construction

The work shall proceed in a systematic manner so that a minimum of inconvenience will result to the public in the course of construction. It is therefore, necessary to confine operations to as small a length of work area per crew as is practical. Normally, the trenching equipment shall not be farther than 61 meters ahead of each pipe laying crew or such distance as necessary to provide maximum safety. Backfill the trench so no section of properly laid pipe is left uncovered longer than is absolutely necessary. The safety conditions of open excavations shall be the Contractor's responsibility. Completely backfill and cleanup after each section of pipe shall been inspected and approved.

Abandonment and Shutdown of Existing Operations of Utilities, Tie-ins, Rodding/Blocking Verification

The Contractor shall supply all necessary labor, equipment, and materials to plug and abandon in place the existing water distribution system as indicated on the project plans.

Continuous operation of the existing water system is of critical importance.

Connection to existing services or utilities, or other work that requires the temporary shutdown of any existing operations or utilities shall be planned in detail with appropriate scheduling of the work and coordinated with the Engineer. The approved schedule for shutdown or restart shall be indicated on the Contractor's Progress Schedule, and advance notice shall be given in order that the customer and the Engineer may witness the shutdown, tie-in, and start-up.

The testing, acceptance, tap and mainline tie-overs shall be coordinated so as to minimize any disruptions in service.

All materials and equipment (including emergency equipment) necessary to expedite the tie-in shall be on hand prior to the shutdown of existing services or utilities.

The Contractor shall be responsible to verify any and all rodding/blocking prior to the removal of items including but not limited to plugs, caps, and fire hydrants.

The valves isolating these appurtenances are to be rodded to the associated tee/deadman, or temporary blocking will be required prior to removal of the items so mentioned. When necessary or expedient, the Contractor shall provide such temporary blocking. Temporary blocking is limited in scope and should be used for only short periods, normally less than one (1) day.

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.

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 metric ton for "Bedding Material, Utilities Class _____". 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. 50MM BLOW OFF ASSEMBLY

Install blow off assemblies in accordance with the applicable utility provisions herein, as shown on the utility plans, and/or as directed by the Engineer.

Blow off assemblies shall include mechanical joint plug with 50mm tap, 50mm gate valve, 50mm piping, valve boxes, concrete blocking, concrete pads for valve boxes, and the necessary pipe fittings and adapters.

Gate valves shall be of all bronze construction with iron pipe thread, screw ends, wedge gates and non-rising stem. Gate valve shall open by turning to the right or clockwise using a tee head operating nut and shall be in accordance with the most recent edition of AWWA C-500 and such ASTM designations as apply with

reference to chemical requirements as set forth in Table I of ASTM B-62. The working pressure of all valves shall be 1.38 MPa.

Valve boxes shall be of the screw or slip type, with a base to fit the valve yoke and a removable plug cap with the word "WATER" cast therein. Valve boxes shall be cast iron conforming to ASTM A48, Class 30, unless otherwise shown on the utility plans and/or as directed by the Engineer.

Blow off assemblies installed in accordance with the plans and provisions herein and accepted, will be measured and paid for at the contract unit price per each for "50MM Blow Off Assembly". Such prices and payments shall be full compensation for all materials, including mechanical joint plug with tap, gate valve, piping, valve boxes, concrete blocking, concrete pads for valve boxes, and the necessary pipe fittings and adapters, labor, equipment, excavation, installation, sterilization, pressure testing, valve box installation with the necessary extension pieces, backfilling, and incidentals necessary to complete the work as required.

3. RELOCATE EXISTING 50MM WATER METER & METER VAULT

The existing water meters with new meter vaults that are to be relocated shall be installed at the locations shown on the utility plans, and/or as directed by the Engineer.

The relocation of water meters shall consist of the removal and installation of the existing water meter, valves, and bypass at the appropriate location with a new meter vault. Any pipe or fittings necessary to complete the work will be considered incidental.

All work shall be in accordance with the applicable plumbing codes, as shown on the plans, and as directed by the Engineer.

The vault shall be precast concrete and shall meet the requirements of Section 1077 of the Standard Specifications. The vault shall be HS-20 traffic bearing. Plans shall be submitted as required by Section 1077 with all calculations and drawings signed by a registered Professional Engineer. The vault shall be provided with double leaf access door. The access door and frame shall be aluminum with anchor flange, drain channels, and neoprene gasket. The door leaf shall be 6.25mm thick diamond plate, HS-20 load rated, open to 90° and lock automatically in this position, and the door shall be equipped with recessed locking capability.

Vault steps shall be in accordance with Standard 840.66, ASTM C-478 and

current OSHA regulations. In addition to the testing requirements of ASTM C-478 each step installed in precast vaults will be tested to resist a 454 kg

pullout. The vault manufacturer will furnish certification of the test, date of test, and results.

After the existing water meter assemblies are relocated to new meter vaults, the existing meter vaults to be abandoned shall be removed and disposed of properly.

The water meter assembly with new meter vault, installed in accordance with plans and provisions herein and accepted, will be measured and paid for at the contract unit price per each for "Relocate Existing 50MM Water Meter & Meter Vault". Such prices and payments will be full compensation for all materials, relocation of existing water meter, new meter vault, equipment, excavation, pressure testing, labor, installation, backfilling, and incidentals necessary to complete the work as required.

4. 200MM DUCTILE IRON RESTRAINED JOINT WATER PIPE, PC 2.41 MPa WP, BY TRENCHLESS METHOD

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

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

Drilling fluid shall consist of a bentonite slurry or approved equivalent. Admixtures may be added which are suitable to the site conditions encountered.

Ductile iron water line shall be flexible restrained joint which allows lateral but not longitudinal movement of the pipe at the mechanical joint. Ductile iron restrained joint pipe shall be of the pressure class noted on the utility construction plans.

After installation, the water pipe string shall be tested under the stream to a hydrostatic pressure of 1.38 MPa in accordance with the testing procedures outlined in Section 1520 of the Standard Specifications.

Ductile iron restrained joint water pipe shall be installed beneath the stream by boring or drilling a small pilot hole along a parabolic arc beneath the stream as

indicated on the water line profile shown on the utility construction plans. A minimum cover of one meter shall be maintained over the water pipe at all times.

The profile referenced on the plans is from the best available information. The pilot hole shall be enlarged by use of a reamer or reamers of the desired diameter. When the bored hole is of the diameter recommended by the pipe manufacturer for the diameter of water line shown on the utility construction plans, the Contractor shall pull the pipe string through the hole by the drill string. The end of the pipe shall be capped during the pulling operation. The pulling operation shall incorporate a swivel connection to minimize torsional stresses imposed upon the pipe string. Fully support the pipe string before and during pull back so that the pipe string will move freely without damage.

The Contractor may elect to conduct reaming and pulling of the pipe string in one operation at the discretion of the Engineer. The reamer head shall be fitted with a sleeve to prevent possible spalling that may become lodged and prohibit the pull back of the pipe string.

Drilling fluid shall re-circulate through the use of a solid control system to remove spoil from drilling fluid surface returns. After cleaning, return the drilling fluid to the system.

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 or couplings, and paid for at the contract unit price per linear meter for "____mm DI RJ Water Pipe, ____MPa WP by Trenchless Method". Such prices and payments will be full compensation for furnishing all labor, equipment, material, couplings and fittings, excavation, installation, chlorination, testing, backfilling, and incidentals necessary to complete the work as required.

5. REMOVE EXISTING WATER METER

The existing water meters shall be removed at the connection to the existing service piping and stockpiled in an area accessible by truck or as directed by the Engineer.

After the water meters are removed and stockpiled, the Contractor shall contact the owner and arrange for maintenance forces to receive and remove the water meters from the jobsite.

The quantity of water meters removed, stockpiled, and accepted, will be measured and paid for at the contract unit price per each for "Remove Existing Water Meter". Such price and payment will be full compensation for all labor, excavation, removal, stockpiling, and incidentals necessary to complete the work as required.

County: Davidson
Project: R-2568B

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 Energy Corporation (Distribution)
- B) North State Telephone
- C) Time Warner (CATV)
- D) Plantation Pipe Line Company (Gas)

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) Duke Energy Corporation (Distribution)

- 1) See Utilities by Others Plans.

NOTE: The Duke Energy Corporation will complete relocations of their existing power distribution facilities to the new locations as shown on the utilities by others plans by January 1, 2005.

- B) North State Telephone

- 1) See Utilities by Others Plans.

NOTE: North State Telephone will complete relocations of their existing telephone facilities to the new locations as shown on the utilities by others by February 28, 2005.

C) Time Warner (CATV)

- 1) See Utilities by Others Plans.

NOTE: Time Warner will relocate aerial CATV lines in joint use with proposed power and telephone throughout the project.

Time Warner will complete relocations of their existing CATV facilities to the new locations as shown on the utilities by others plans by February 15, 2005.

D) Plantation Pipe Line Company (Gas)

- 1) See Utilities by Others Plans.

NOTE: Plantation Pipe Line will complete work on their existing gas facilities as shown on the utilities by others plan sheet UO-6 by February 28, 2005.

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