

# Special Specification 7206

## Water Mains and Sanitary Sewers



### 1. DESCRIPTION

This Item will govern for all materials, equipment, and labor necessary for the installation of all exterior water mains, all sanitary sewer lines, drain lines, and any and all distribution lines connected to the various structures as shown on the plans. This item will supersede all other special specifications in joint-bid ventures. Special provisions or design specification shown in a given plan set will supersede this Item.

Refer to the City of Round Rock Standard Specifications Manual for the most recent specifications.  
<https://www.roundrocktexas.gov/departments/transportation/dacs/>

### 2. MATERIALS

Furnish all materials in accordance with the requirements shown on the plans or pick-up materials furnished by the City of Round Rock and deliver to the project site. Items that will conform to Department Standard and Specifications are as follows:

- Item 100, "Preparing Right of Way"
- Item 104, "Remove Concrete"
- Item 105, "Removing Treated and Untreated Base and Asphalt Pavement"
- Item 132, "Embankment"
- Item 160, "Topsoil"
- Item 164, "Seeding for Erosion Control"
- Item 166, "Fertilizer"
- Item 169, "Soil Retention Blankets"
- Item 247, "Flexible Base"
- Item 334, "Hot-Mix Cold-Laid Asphalt Concrete Pavement"
- Item 351, "Flexible Pavement Structure Repair"
- Item 400, "Excavation and Backfill for Structures"
- Item 401, "Flowable Backfill"
- Item 402, "Trench Excavation Protection"
- Item 403, "Temporary Special Shoring"
- Item 420, "Concrete Substructures"
- Item 421, "Hydraulic Cement Concrete"
- Item 432, "Riprap"
- Item 440, "Reinforcement for Concrete"
- Item 442, "Metal for Structures"

- Item 461, "Structural Plate Structures"
- Item 471, "Frames, Grates, Rings, and Covers"
- Item 528, "Colored Textured Concrete and Landscape Pavers"
- Item 530, "Intersections, Driveways, and Turn Outs"
- Item 531, "Sidewalks"
- Item 666, "Retroreflectorized Pavement Markings"

Where encroachment into Private Property is called for in the plans, the City of Round Rock will supply new water meters equal to the size and type of the existing water meter. The City of Round Rock should be contacted 1 work week before operations.

- 2.1. **Buy America Requirements.** Materials must meet the "Buy America" requirements set forth by the Federal Highway Administration (FHWA) and the Department.

Certify all materials for the entire project at once or suppliers can certify each individual step or separate production process.

Every certification should clearly reference the heat number. When reviewing certifications, compare the heat numbers or other tracing methods on delivered material to the certification document to ensure that the information is the same.

A mill certification should also be produced to prove that the raw steel or iron was smelted and formed in the United States. The certification can be a signed letter or merely included as a signed statement on the delivery tickets.

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### 3. CONSTRUCTION

- 3.1. **General Requirements.** Each system will be installed in accordance with the construction methods detailed on the plans and must adhere to any guidelines set forth in the latest version of the City of Round Rock Standard Specifications Manual and Standards Manual drawings. Unless otherwise specifically stated elsewhere, all work will be performed in accordance with the Utility Accommodation Rules as set forth in 43 Texas Administrative Codes §21.31 et. seq. adopted by the Department.

Protect all water mains, sewer lines, vaults and appurtenances at all times during the construction. Promptly repair, at no additional cost to the Owner, any damage to the existing water or sewer system and any interruption to the services such as line stoppages or breakage caused by the Contractor's operation.

The City of Round Rock facility will be placed in accordance with the Rules adopted by the Texas Commission on Environmental Quality (TCEQ) or have a variance approved by TCEQ prior submittal.

Trench excavation protection will be accomplished as required by the provisions of, Part 1926, Subpart P-Excavations, and applicable appendices of the Occupational Safety and Health Administration's Standards and Interpretations and conform to Department Standard Specification Item 402 "Trench Excavation Protection". Trench excavation protection plan submittals will be conducted by the Engineer or designated

representative. The contractor will remain solely and completely responsible for all trench excavations and for the associated means, methods, procedures, and materials.

All adjustments will be completed before the placement of the final surface.

Unless otherwise approved, connections to existing lines or reconnections of services will be performed at night or on the weekend.

- 3.2. **Permits.** Acquire all necessary permits from the City of Round Rock in which the work is to be performed in. Street cuts made outside TxDOT right of way will require a street cut permit and will be directly coordinated with the City of Round Rock. The City of Round Rock will provide all right of way and utility adjustments needed for performance of work on sites not owned or to be acquired by the Department. If the City of Round Rock is the owner of any part of the project site, the City of Round Rock will permit the Department or its authorized representative access to the site to perform any activities required to execute the work.
- 3.3. **Testing.** Provide testing for water mains in conformance to the City of Round Rock requirements or as directed. Retesting charges will be deducted from payments to the Contractor for any test that fails to meet the required Standards described in the City of Round Rock Specification items. The Contractor is responsible for making appropriate repairs to those elements that do not pass any of the tests. Perform the following testing as minimum:
- For water mains: hydrostatic test, low pressure air test, leakage test, poly pigging, and sterilization test. Item 401, "Flowable Backfill"
  - Reference Specification Item No. 510 Pipe – "Quality Testing for Installed Pipe."
- 3.4. **Sterilization of Potable Water Lines.** Protect all piping materials from contamination during storage, handling and installation.
- 3.5. **Safety.** Exercise reasonable precautions for the safety of workers and the public, and will comply with applicable provisions of all Federal and State safety laws and regulations at all times. The safety precautions taken and their adequacy will be the sole responsibility of the Contractor.
- When pedestrian facilities are closed or relocated, temporary facilities will be detectable and will include accessibility features consistent with features presented in existing pedestrian facilities. Temporary facilities will be placed in accordance with the Texas Manual on Uniform Traffic Control devices (MUTCD).
- 3.6. **Inspection.** All water mains, sewer lines, and their appurtenances will be inspected by a representative of the local municipality. These representatives' decision of acceptability of the installation will be final. The local municipality will hold 2 final inspections, one at water completion and the other at roadway completion for final utility grade adjustments according to specifications.
- 3.7. **Warranty Agreement.** A warranty agreement between the City of Round Rock and Contractor must be executed to cover this item of work. The cost of the warranty agreement is subsidiary to this item of work. The warranty agreement includes the requirement of a maintenance bond for not less than 10% of this item's cost for a one-year warranty period beginning after final completion. The City of Round Rock will assume

responsibility for the maintenance of the existing and completed water and wastewater facilities during and upon completion of the construction contract.

- 3.8. **Manholes.** All manholes will have a minimum inside diameter of 48 in. (1.22 meters). Manhole base section or junction box dimension will be appropriately increased to accommodate all converging pipe. A minimum horizontal clearance of 12 in. will be maintained between adjacent pipes.

All adjustments will be completed before the placement of the final roadway surface except on pavement reconstruction projects, where castings may be adjusted after paving is completed.

Brick must not be used in making height adjustments to wastewater manholes. Mortar must not be used for any purpose on the inside of wastewater manholes.

Manhole components to be reused must be carefully removed and the contact areas must be cleaned of all mortar, concrete, grease and sealing compounds. Any items broken in the process of removal and cleaning must be replaced in kind by the Contractor at its expense.

If the adjustment involves lowering the top of a manhole, an enough depth of pre-cast concrete rings or brick courses must be removed to permit reconstruction. Existing mortar must be cleaned from the top surface remaining in place and from all brick or concrete rings to be reused and the manhole rebuilt to the required elevation. The manhole ring and cover will then be installed with the top surface conforming to the proposed grade.

If the adjustment involves raising the elevation of the top of the manhole in accordance with "Minor Manhole Height Adjustment," the top of brick or concrete ring must be cleaned and built up vertically to the new elevation, using new or salvaged concrete rings or bricks and the ring and cover installed with the top surface conforming to the proposed grade.

After rings and covers are set to grade, the inside and outside of the precast concrete grade rings will be wiped with non-shrink grout to form a durable surface and water-tight joints. The grouted surface must be smooth and even with the manhole cone section. Grout must not be placed when the atmospheric temperature is at or below 40°F. If a sudden drop in temperature below 40°F occurs or temperatures below 40°F are predicted, the grouted surfaces must be protected against freezing for at least 24 hr.

Manholes designated on the Drawings for abandonment, will be removed to a level not less than four feet below grade. Two-foot long sections of the inlet and outlet pipes must be cut and removed on the outside of the manhole, the ends of the remaining pipe and the pipe sections penetrating the manhole wall must be securely plugged, and the structure filled with material in accordance with Standard 506S-15 or as directed by the Engineer or designated representative.

- 3.9. **Pipe.** Where feasible, water and wastewater lines will be no closer to each other than 9 feet between outside diameters in all directions and will be in separate trenches.

Pipe must be encased if it will cross under a utility structure or storm sewer and the top of the pipe is within 18 in. of the bottom of the utility structure.

Where trenches wider than 12 in. cross under existing wastewater lines, the sewer lines will be replaced with one 20 ft. joint of ductile iron.

Where nonmetallic pipe is installed longitudinally a durable metal wire will be concurrently installed or other means will be provided for detection purposes. Casings should extend a minimum five (5) feet beyond each curb or edge of shoulder.

All pipelines crossing under roadways will be encased in the type and size of encasement pipe indicated on the plans. Casings will extend a minimum three (3) feet beyond each curb or edge of shoulder.

Casing must be metal of ample strength to withstand handling stresses, the pressure of concrete, and the surrounding earth or backfill materials and must be watertight.

Inductive Tracer Detection Tape should be placed directly above the centerline of all non-metallic pipe a minimum of 12 in. below subgrade or, in areas outside the limits of pavement, a minimum of 18 in. below finished grade. The tracer tape must be encased in a protective, inert, plastic jacket and color coded according to American Public Works Association Uniform Color Code. Except for minimum depth of cover, the tracer tape must be placed according to manufacturer's recommendations. Manufacturers must be listed on SPL WW-597.

- 3.10. **Cutting and Plugging Pipes.** Where the plans call for abandoning water mains, adhere to the following general procedure:
- After constructing, disinfecting, testing, and placing the replacement main in service, and services are transferred to the replacement main, locate the main to be abandoned, trace it back to the feeder main, and at this point cut and plug it at the tee. Normally, installing a plug, clamp, and a concrete thrust block does this. In cases of 1-1/2 in. or 2 in. corporation cock or tapping sleeve and valve (TS&V) connections, remove the valve and install a cap or plug at the tee. Ensure the line to be abandoned is not valves off at the nearest valve, nor cut and plugged other than at the supply main.
  - Adequately plug the ends or openings in abandoned mains or cap them in an approved manner and replace excavation, backfill, and any street surfaces, to the Engineer's satisfaction.
  - Remove surface identification, i.e., valve boxes and fire hydrants. Where valve boxes are in improved streets (other than shell), pouring valve boxes full of concrete with the cap permanently removed is permitted.
- 3.11. **Ductile Iron Pipe Fittings.** Provide mechanical joint ductile iron pipe fittings in accordance with ANSI/AWWA C153/A21.53. Fittings must be constructed of high strength ductile iron (ASTM A536 Grade 70-50-5) and cement mortar lined in accordance with ANSI/AWWA C104/A21.4. Gaskets must be styrene butadiene rubber (SBR) in accordance with ANSI/AWWA C111/A21.11. T-bolts and nuts must be high strength low alloy steel in accordance with ANSI/AWWA C111/A21.11.
- 3.12. **Sanitary Sewer By-Pass Pumping.** The Contractor will be required to provide adequate pumping equipment and force mains to maintain reliable sanitary sewer service in all sanitary sewer lines involved. In case of equipment failure, have on-the job site backup pumps and force mains. Under no circumstances

must the flow be interrupted or stopped such that damage is done to either private or public property; or sewage flows or overflows into a storm sewer or natural waterway.

Provide by-pass pumping of sewage around each segment of pipe that is to be televised or replaced. The Contractor is responsible for all required bulkheads, pumps, equipment, piping, and other related appurtenances to accomplish the sequence of pumping. A qualified person must man the pumps, on-site, at all times during the by-pass procedure.

All piping, joints and accessories must be designed to withstand the maximum by-pass system pressure, or a minimum of 50 psi, whichever is greater. During by-pass pumping, no sewage must be leaked, dumped, or spilled in or onto any area outside of the existing sanitary sewer system. When by-pass pumping operations are complete, all piping must be drained into the sanitary sewer before disassembly.

- 3.13. **Wastewater Connections to Existing System.** Unless otherwise specified by the E/A, all connections made to existing mains should be made at manholes with the crown of the inlet pipe installed at the same elevation as the crown of the existing pipe. Service stubs installed on the existing system should be installed by use of tapping saddles unless otherwise approved by the E/A. Extreme care must be exercised to prevent material from depositing in the existing pipe as the taps are being made.

When connections to existing mains are made, a temporary plug approved by the E/A must be installed downstream in the manhole to prevent water and debris from entering the existing system before Final Completion. These plugs must be removed after the castings are adjusted to finish grade or before Final Completion.

- 3.14. **Removing Old Structures.** When out of service masonry structures or foundations are encountered in the excavation, such obstructions must be removed for the full width of the trench and to a depth of 1 ft. below the bottom of the trench. When abandoned inlets or manholes are encountered and no plan provision is made for adjustment or connection to the new sewers, such manholes and inlets within the construction limits must be removed completely to a depth 1 ft. below the bottom of the trench. In each instance, the bottom of the trench should be restored to grade by backfilling and compacting by the methods provided above. Where the trench cuts through storm or wastewater sewers which are known to be abandoned, these sewers must be cut flush with the sides of the trench and blocked with a concrete plug in a manner satisfactory to the E/A. When old structures are encountered, which are not visible from the existing surface and are still in service, they must be protected and adjusted as required to the finished grade.

The method of removing AC pipe will be to remove a complete joint(s) of pipe in order to minimize the release of asbestos fibers and will be replaced with the same diameter ductile iron or approved PVC pipe using the appropriate sleeves, adapters, or repair coupling at each end. All work associated with AC pipe removal must conform to Department Standard and Specifications Item 6, "Control of Materials".

Wet/pressure tapping may be performed on AC pipe.

Culverts, pipes, manholes and inlets must be removed in proper sequence for maintenance of traffic and drainage.

- 3.15. **Mobilization for Utilities.** Mobilization should include, but not be limited to the movement of equipment, personnel, material, supplies, etc. to the Work site; the installation of temporary facilities (when not paid for separately) and the establishment of office and other necessary facilities before the initiation of the Work. The cost of the Payment Bond and Performance Bond on the Work that is delayed due to circumstances beyond Contractor's control, a closed construction season or for the convenience of the City of Round Rock will be considered part of the mobilization item under this Contract.
- 3.16. **Sediment Containment Dikes.** Select the material for the dikes, unless otherwise indicated, conforming to the details on the Drawings and Standard Detail provided in plans.
- For filter dikes the filters must be placed with ends tightly abutting the adjacent filter. Each filter and skirt will be securely anchored in place using 6 in. (150 mm) staples at a maximum spacing of 12 in. (300 mm) on center. Anchoring on impervious areas must be accomplished with sand/gravel bags placed at 18 in. (450 mm) on center or with a nominal 1 in. by 4 in. (25 mm by 100 mm) board nailed at 18 in. (450 mm) on center.
- Silt accumulation behind triangular sediment filter dikes must be removed at a maximum depth of 6 in. (150 mm) or when, in the opinion of the Engineer or designated representative, the structure ceases to function as intended.
- Inspect all dikes at least monthly and after each rainfall. Repair or replace dikes when necessary or as directed.
- After completion of construction or when directed by the Engineer or designated representative the dike must be removed and the site re-graded to the final grades. Any depression should be filled and any accumulations of silt should be spread or removed to a permitted disposal area. After removal of the dike the area must be graded and seeded conform to Department Standard Specification Item 164, "Seeding for Erosion Control".

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#### 4. MEASUREMENT

Work and acceptable materials as prescribed by this Item will be measured as shown on the plans as follows:

- 4.1. **Hydrostatic Pressure Test.** Item will be measured by each test as the work progresses. No additional measurement or payment will be made for conditions caused by the Contractor during construction.
- 4.2. **Asbestos Abatement Support and Coordination.** Item will be measured by lump sum for the entire project. No additional measurement or payment will be made for conditions caused by the Contractor during construction.
- 4.3. **Jacking and Boring Pipe (ITEM 501S-JACKING AND BORING PIPE).** Each pipe type, size, and class specified will be measured by linear foot of pipe, complete in place. Such measurements will be made between the ends of the pipe along the central axis as installed.

- 4.4. **Adjusting Structures (ITEM 504S-ADJUSTING STRUCTURES).** Each pipe type specified will be measured as each adjustment, complete in place. When a pay item is included in the contract for service pipe to the structure to be adjusted, the service pipe will be measured as "Pipe" below. When a pay item is not included in the contract for service pipes this pipe will be considered subsidiary to "Adjusting Structures".
- 4.5. **Manholes (ITEM 506-MANHOLES).** Each diameter and type specified will be measured as follows:
- When a pay item is included in the contract for "Vertical Extension (Manhole)", "Manholes" will be measured as each manhole complete in place, from the flowline to eight (8) feet above the flowline. The remainder, including ring and cover, will be measured as "Vertical Extension (Manhole)".
  - When a pay item is not included in the contract for "Vertical Extension (Manhole)", "Manholes" will be measured as each manhole complete in place.
- 4.6. **Vertical Extension (Manhole).** Each diameter and type specified will be measured by the linear foot, complete in place. Measurement will be made from a point six (6) feet above the flowline of the manhole to the top the ring and cover.
- 4.7. **Manhole Rehabilitation.** All pipe sizes will be measured as each manhole, complete in place.
- 4.8. **Pipe (ITEM 510- PIPE).** Each pipe diameter and type specified will be measured as follows:
- When a pay item for "Fittings" is included in the contract, "Pipe" will be measured by the linear foot along the flowline, complete in place. This measurement for "Pipe" will not include the length of fittings, valves or other items included in the contract for separate pay.
  - When a pay item for "Fittings" is not included in the contract, "Pipe" of the diameter and type specified will be measured by the linear foot horizontally along the centerline of the pipe, complete in place. This measurement for "Pipe" will include the length of fittings, valves, vertical stacks for wastewater services or other items included in the contract. Other items will not include manholes or junction boxes. Where manholes or junction boxes are included in lines of pipe, that length of pipe tying into the structure wall will be included for measurement, but no other portion of the structure length or width will be so included.
  - For pay item "By-Pass Pumping", where called for on drawings, will be measured as lump sum for all distances, depths, amount of flow to be pumped, and time needed for by-pass pumping operations.

Where the pipe is to connect to an existing pipe, measurement of "Pipe" will be made to the visible end of the existing pipe or the outside surface of the fitting flange to which the "Pipe" connects.

- 4.9. **Cutting and Plugging Pipes.** Each pipe size and type specified on the plans will be measured by each location a water main is cut and plugged, of the size indicated on the plans.
- 4.10. **Abandon Pipe.** Each pipe size and type specified on the plans will be measured by the linear foot, along the centerline of existing pipe when included in the plans as a pay item. Only those pipes designated on the plans to be abandoned and Engineer will be measured for payment under this item.
- 4.11. **By-Pass Pumping.** Item will be measured by lump sum as the work progresses. No additional measurement or payment will be made for conditions caused by the Contractor during construction.



- 4.12. **Ductile Iron Pipe Fittings.** Each assembly type will be measured by each as shown on the plans.
- 4.13. **Cement-Stabilized Backfill (ITEM 401S- STRUCTURAL EXCAVATION AND BACKFILL)** . Item will be measured by the cubic yard as dimensioned on the plans. Quantities for "Cement-Stabilized Backfill" as shown on the plans and in the proposal will be considered as final quantities and no further measurement will be required, unless the alignment, grades or sewer and water line locations are revised by the Engineer during construction. In addition, final determination of cement-stabilized backfill quantities for individual pipe mains and laterals will be made, if, in the option of the Engineer or upon evidence furnished by the Contractor, substantial variations exist between quantities shown on the plans and actual quantities due to changes in cross sections or apparent errors
- 4.14. **Concrete Trench Cap (ITEM 509S- EXCAVATION SAFETY SYSTEM).** Item will be measured by the linear foot, complete in place.
- 4.15. **Wet Connections.** Item will be measured as each connection, complete in place.
- 4.16. **Pressure Taps.** Item will be measured as each tap, complete in place, including valves.
- 4.17. **Cast Iron or Ductile Iron Fittings.** Item will be measured by the ton, complete in place when included in the plans as a pay item. Fittings for pipe sizes larger than 24 in. are subsidiary to the pipe and no measurement or payment will be made.
- 4.18. **Valves (ITEM 511S- WATER VALVES).** Item will be measured by each unit, complete in place.
- 4.19. **Fire Hydrants/Drain Valve Assemblies.** Item will be measured per each, complete in place.
- 4.20. **Manual and Automatic Air Release Assemblies.** Item will be measured per each, complete in place.
- 4.21. **Concrete Retards (ITEM 593S- P.C. CONCRETE).** Item will be measured by the cubic yard or by each, complete in place.
- 4.22. **Tunneling.** Item will be measured by linear foot along the centerline of completed tunnel for the various sizes of lining in accordance with these specifications complete in place and accepted by the Engineer including all excavation, blasting, ventilation, supports, primary and final lining, grouting, survey monuments, portal and backfilling, unless otherwise specified on the plans. Transitions will be measured by the linear foot along the centerline of the completed tunnel for the largest size of lining.
- 4.23. **Adjusting or Relocation of Water Meters (ITEM 504S- ADJUSTING STRUCTURES).** Item will be measured per each, complete in place, including new meter boxes, traffic bearing boxes and lids, where called for on the plans.
- 4.24. **Lateral Services.** Item will be measured per each, complete in places, of the existing service line pipe size or minimum of one (1) in. diameter. New pipe will be installed between the meter and the new or existing water main.

- 4.25. **Encasement Pipe (ITEM 505S CONCRETE ENCASEMENT AND ENCASEMENT PIPE).** Item will be measured by the type and size of encasement installed, complete in place, per linear foot, between the ends of encasement. The measurement will be made between the ends of the pipe, along the central axis installed.
- 4.26. **Removing Old Structures (ITEM 101S- PREPARING RIGHT OF WAY).** Item will be measured by the each. Only the structures shown on the plans and/or directed to be removed will be measured for payment under this item.
- 4.27. **Sediment Containment Dikes (ITEM 628S- SEDIMENT CONTAINMENT DIKES).** The work performed and the materials furnished as prescribed by this item will be measured by the lineal foot (lineal meter: 1 lineal meter equals 3.281 lineal feet) of "Sediment Containment Dikes", complete in place.
- 4.28. **Mobilization for Utilities (ITEM 700S- MOBILIZATION).** Item will measured by the lump sum. Mobilization is calculated on the base bid only and will not be paid for separately on any additive alternate items added.
- 4.29. **Wastewater Connections to Existing System.** Item will be measured as one-time fee determined by the City of Round Rock based on pipe type and size.

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## 5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided by under "Measurement," will be paid for at the unit prices bid for the items hereinafter described.

Payment will be full compensation for all staking and engineering work, testing, disinfection, furnishing and installing all materials, accessories and incidentals necessary to complete the work prescribed in this specification and as detailed on the plans. Said payment will also be full compensation for all excavation and backfilling, all freight, loading, unloading, handling of materials, labor, tools and equipment and incidentals necessary to complete work.

- 5.1. **Hydrostatic Pressure Test.** The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid for "Hydrostatic Pressure Test".
- 5.2. **Asbestos Abatement Support and Coordination.** The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Asbestos Abatement Supt & Coordination." This price is full compensation for related support and coordination work associated with asbestos abatement performed by the Contractor; field locating and identifying Asbestos Cement (AC) pipe, excavating and shoring to expose AC pipe to allow for cutting, plugging, and removal of AC pipe by the Contractor as required; backfilling, grading, labor, tools, equipment and incidentals. Provide notifications as required to perform proposed water main work for project.

Cutting, plugging, grouting, removing, handling, cleanup, and disposal of AC pipe will be performed by the Contractor.

- 5.3. **Jacking and Boring Pipe.** The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid for "Jacking or Boring Pipe" of the type, size and class specified. This price will be full compensation for furnishing all materials, pipe and liner materials required, for all preparation, hauling and installing of same, and for all labor, tools, equipment and incidentals necessary to complete the work, including excavation, backfilling and disposal for surplus materials.
- 5.4. **Adjusting Structures.** The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid for "Adjusting Structures" of the type specified. This price will be full compensation for furnishing all materials, handling, placing, labor, tools, taps, equipment and incidentals necessary to complete the work.
- 5.5. **Manholes.** The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid for "Manholes" of the diameter and type specified. This price will be full compensation for furnishing all concrete, reinforcing steel, brick, mortar, aluminum and castings, frames, grates, rings and covers and for all other materials, tools, equipment and incidentals required to complete the work. This bid item price will also cover all labor, equipment, materials, time, and incidentals for abandoning all manholes that will be retired as a result of this project.
- 5.6. **Vertical Extension (Manhole).** The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid for "Vertical Extension (Manhole)". This price will be full compensation for furnishing all concrete, reinforcing steel, brick, mortar, aluminum and castings, frames, grates, ring and covers and for all other materials, tools, equipment and incidentals required to complete the work.
- 5.7. **Manhole Rehabilitation.** The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid for "Manhole Rehabilitation" of all types and sizes. This price will be full compensation for furnishing all concrete, reinforcing steel, brick, mortar, aluminum and castings, frames, grates, rings and covers and for all other materials, labor, tools, equipment and incidental required to complete the work.
- 5.8. **Pipe.** The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid for "Pipe" of the type, size and class specified. This price will be full compensation for all bedding materials, fittings, (except for cast iron or ductile iron fittings smaller than 24 in. in size), concrete encasement, caps, bulkheads, joints, wyes, vertical stacks, clean-outs, connections, plugs, lugs, pipe coatings, connection to the existing system (when not included in the contract as a separate pay item), disposal of surplus materials, laying of pipe, excavation, backfilling, installation of tree protection fence and soil retention blankets and all labor, tools and incidentals necessary to complete the work. The bid item price will also include any and all steel plates required, pot-holing for existing utility elevations, and plugging and abandoning utilities that will be retired as a result of this project.
- When a pay item for "Fittings" is included in the contract, "Pipe" will be measured by the linear foot along the flowline, complete in place. This measurement for "Pipe" will not include the length of fittings, valves or other items included in the contract for separate pay.
  - When a pay item for "Fittings" is not included in the contract, "Pipe" of the diameter and type specified will be measured by the linear foot horizontally along the centerline of the pipe,

complete in place. This measurement for "Pipe" will include the length of fittings, valves, vertical stacks for wastewater services or other items included in the contract. Other items will not include manholes or junction boxes. Where manholes or junction boxes are included in lines of pipe, that length of pipe tying into the structure wall will be included for measurement, but no other portion of the structure length or width will be so included.

- For pay item "By-Pass Pumping", where called for on drawings, will be measured as lump sum for all distances, depths, amount of flow to be pumped, and time needed for by-pass pumping operations.

5.9. **Cutting and Plugging Pipes.** The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid for "Cut and Plug" of the type and size specified. This price is full compensation for performing excavation, backfill, finish grading, and other incidental items required to abandon or cut and plug the water main as set forth this specification. Where grout is required, as shown on the plans, it is subsidiary to this bid Item.

5.10. **Abandon Pipe.** The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid for "Abandon Pipe" of the type and size specified. This price will be full compensation for furnishing all materials, tools, labor, equipment and incidentals necessary to complete the work will conform to Department Standard and Specifications Item 100., "Preparing Right of Way".

5.11. **By-Pass Pumping.** The work performed and material furnished in accordance with this Item and measured as provided under "Measurement" will be paid for the unit price bid for "San Swr Bypass Pumping". Partial payments of this "Lump Sum" bid will be as follows:

- When initial set-up and operation of the by-pass system begins, 40% of the line item will be paid.
- The remaining portion of the line item will be paid when the by-pass pumping operations for the entire job are completed.

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the various unit prices. These prices are full compensation for furnishing materials and for equipment, labor, tools, and incidentals.

5.12. **Ductile Iron Pipe Fittings.** The work performed and material furnished in accordance with this Item and measured as provided under "Measurement" will be paid for the unit price bid for "Fittings" of the type specified. Fitting item includes all installation and assembly including restraints.

5.13. **Cement-Stabilized Backfill.** The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid for "Cement-Stabilized Backfill". This price will be full compensation for all excavation and backfill including placing, sprinkling and compaction of material; all soundings; constructing all cofferdams; all dewatering; and for furnishing all materials, hauling, labor equipment, tools; for sheathing and bracing, if required for support of walls of trenches less than five (5) feet in depth; for cofferdams; pumps, drills, explosives, disposition of surplus material; for cutting and restoration of pavement and base to neat lines; and for incidentals necessary to complete the work.

This is a plans quantity measurement item and the quantity to be paid for will be that quantity shown in the plans, except as may be modified by Article 9.8. If no adjustment of quantities is required, additional measurements or calculations will not be required.

- 5.14. **Concrete Trench Cap.** The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid for "Concrete Trench Cap" of the type specified. This price will be full compensation for furnishing all materials, handling, placing, labor, tools, equipment and incidentals necessary to complete the work.
- 5.15. **Wet Connections.** The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid for "Wet Connections" of the type and size specified. This price will be full compensation for furnishing all materials, handling, placing, labor, tools, equipment, and for all work required to make the connection and place the pipe in service, except that cast iron or ductile iron fittings will be paid for as a separate item.
- 5.16. **Pressure Taps.** The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid for "Pressure Taps" of the type and size. This price will be full compensation for furnishing all materials, including valves, handling, placing, labor, tools, equipment and for all necessary excavation, backfill, blocking, anchoring and for all work required to make the tap and keep the pipe in service.
- 5.17. **Cast Iron or Ductile Iron Fittings.** The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid for "Cast Iron or Ductile Iron Fittings" of the type specified for fitting sizes smaller than 16 in. Fitting sizes 16 in. and larger will not be paid for directly but will be considered subsidiary to the pipe. This price will be full compensation for furnishing all materials, handling, placing, labor, tools, equipment and incidentals necessary to complete the work according to ANSI A 21.10 (AWWA C/110) and ANSI A 2153-88 (AWWA C153) scheduled weights for mechanical joint fittings furnished. These scheduled weights will be considered as final and no compensation will be made for amounts over these. Steel cylinder pipe fittings will not be paid for separately but will be considered subsidiary to the item "Pipe". Glands, bolts and gaskets will be subsidiary to the fittings and will not be paid for directly.
- 5.18. **Valves.** The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid for "Valves" of the type and size specified. This price will be full compensation for furnishing all materials, handling, placing, concrete bearing pads, labor, tools, equipment and incidentals including, valve stem casing and cover, excavation, setting and adjusting to proper grade and anchoring in place.
- 5.19. **Fire Hydrants/Drain Valve Assemblies.** The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid for "Fire Hydrants/Drain Valve Assemblies". This price will be full compensation for fittings, between the main line and the fire hydrant, setting, adjusting to grade, anchoring in place, and other appurtenances necessary for proper operation; but will not include pipe and valve between the main line and fire hydrant/drain valve. The unit price bid will be full compensation for furnishing and installing all materials, labor, tools, equipment, and incidentals necessary to complete the work. Payment will also include all labor and other incidentals for removal of newly abandoned fire hydrants specified in the plans within limits of construction.

- 5.20. **Manual and Automatic Air Release Assemblies.** The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid for "Manual and Automatic Air Release Assemblies". This price will include the main line tap or outlet, all pipes, valves, fittings, box or vault and cover, and other appurtenances necessary for proper operation. The unit price bid will be full compensation for furnishing and installing all materials, labor, tools, equipment, and incidentals necessary to complete the work.
- 5.21. **Concrete Retards.** The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid for "Concrete Retards", for the type specified. This price will be full compensation for all excavation, reinforcing, and furnishing, hauling and placing all materials required in the construction, disposal of excavated material and for all manipulation, labor tools, equipment and incidentals necessary to complete the work.
- 5.22. **Tunneling.** The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid for "Tunneling" of the type specified. This price will be full compensation for furnishing all materials, pipe, liner materials required for tunnel operations, for all preparation, hauling and installing of same and for all labor, tools, equipment and incidentals necessary to complete the work, including excavation, backfilling and disposal of surplus material.
- 5.23. **Adjusting or Relocation of Water Meters.** The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid for "Adjusting or Relocation of Water Meters" for all sizes, complete in place. This price will be full compensation for furnishing all materials, handling, placing, labor, tools, equipment and incidentals necessary to complete the work.
- 5.24. **Lateral Services.** The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid for "Lateral Services". This price will be full compensation for furnishing all materials, handling, placing, labor, tools, and incidentals necessary for the installation or reconnection of the service line between the meter and the new or existing water main.
- 5.25. **Encasement Pipe.** The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid for "Encasement Pipe" of the type and size specified. This price will be full compensation for furnishing all materials, pipe for all preparation, hauling, and installation and for all labor, tools, equipment and incidentals necessary to complete the work, including bench excavation and disposal of surplus material.
- 5.26. **Removing Old Structures.** The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid for "Remove Old Str" of type and size specified. This price will be full compensation for furnishing all labor, tools, equipment, excavation, backfilling, stockpiling materials, transportation, disposal and incidentals necessary to complete the work.
- 5.27. **Sediment Containment Dikes.** The work performed and materials furnished and measured as provided under "Measurement" will be paid for at the unit bid price per lineal foot of "Sediment Containment Dikes" indicated on the Drawings. The Unit bid price must include full compensation for: (a) furnishing, hauling and placing all materials including all labor, tools, equipment and incidentals needed to complete the work, (b) the repair and/or replacement of materials, (c) the removal and disposal of all silt and debris and (d) the removal of

all dikes, silt and debris after completion of construction or when directed by the Engineer or designated representative.

- 5.28. **Mobilization for Utilities.** The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid for "Mobilization". Item will include and not be limited to the cost to mobilize and demobilize equipment to the project site, sediment control, construction staking, the cost of bonds and insurance, and all other incidental costs associated with this work.
- 5.29. **Wastewater Connections to Existing System.** The work performed and materials furnished in accordance with this item and measure as provided under "Measurement" will be paid for at the unit price bid for "Connect to Exist San Swr" of the size or type specified.