SECTION NO. 14

SPECIAL PROVISIONS – WATER AND SANITARY SEWER SPECIFICATIONS

NUMERICAL LISTING

SECTION NO. 14

SPECIAL PROVISIONS – WATER AND SANITARY SEWER SPECIFICATIONS

Water and Sanitary Sewer improvements shall be in accordance with the latest version of the CITY OF ARLINGTON STANDARD SPECIFICATIONS FOR WATER & SANITARY SEWER CONSTRUCTION located at the City's web page, https://www.arlingtontx.gov/city_hall/departments/public_works/engineering/standard_specifications_special_provisions, hereinafter referred to as "Standard Specifications". References in parentheses located in the heading of each section below correspond to sections of the Standard Specifications. (Rev. 6/2022)

14-01 POLY-VINYL CHLORIDE (PVC) WATER PIPE & FITTINGS (B 4A and B 4B): The poly-vinyl chloride (PVC) water pipe 4-inch through 60-inch shall in all respects comply with the latest revision of AWWA C900 (DR 18) Pressure Class 235 psi. All fittings shall be mechanical joint ductile iron fittings with polyethylene encasement. (Rev 10/2023)

14-02 EMBEDMENT REQUIREMENTS FOR WATER PIPE & FITTINGS (B 19 & C 3.14): Unless otherwise specified, all water pipes shall be in accordance with Class "C" embedment detail.

14-03 THRUST BLOCKINGS (C 4.11 and C 6.10):

A. Thrust blocking shall be placed at fire hydrants, valves, tapping sleeves, bends, tees, wyes, crosses, plugs and bends of five (5) degree or greater in the main water line. Each block, except those for upward thrusts, shall be placed so as to rest against firm undisturbed foundation of trench bottom. The supporting area shall be sufficient to withstand the thrust, including water hammer which may develop. All concrete used for thrust blocking shall conform to the section "Thrust Blocking" of the Standard Specifications. This is not a separate pay item but will be considered subsidiary to the various bid items.

B. Blocking at bends shall be computed based upon pipe thrust at bends, or tees, with internal pressure of one hundred fifty (150) psi. Where upward thrusts are to be blocked, the trust blocking shall be of sufficient weight to resist the thrust and the concrete shall be reinforced as directed by the City. Other blocking sizes shall be computed based upon a maximum safe allowable soil bearing pressure of twenty-five hundred (2,500) pounds per square foot of undisturbed earth.

C. The trust blocking shall be placed against undisturbed trench walls, with a minimum of 18-inches between trench wall and pipe. Blocking shall extend a minimum of 0.75 X pipe diameter below and above the centerline of pipe and shall not extend beyond any joints. If requested by the City, the ends of the thrust blockings shall be contained in wood or metal forms. Where upward thrusts are to be blocked, tie-down blocking shall be used in accordance with the details.

14-04 VALVE OPERATIONS NOTIFICATION: The Contractor shall provide a minimum of five (5) business days notification to the City prior to the scheduled water tie-ins that require operation of any valves. For pigging, pressure testing, and chlorinating the new water line, the

Contractor shall provide a minimum of two (2) business days notification to the City prior to any valve operation. Under no circumstances shall Contractor operate any valves without the proper approval by the City.

14-05 INTERRUPTION OF WATER SERVICE:

A. When work performed has the potential of disrupting businesses or homestead, including but not limited to water cutoff or driveway reconstruction, Contractor shall notify the business owners, occupants and residents in writing minimum forty-eight (48) hours prior to commencing work. Contractor will be responsible to provide and place door hangers by the required time. Door hangers shall be printed in English & Spanish. See Section 11-25 Owner Notification for sample of door hangers.

B. Scheduled water shut-offs that affect critical water customers (as identified by the City); that prevent the operation of a business or industry; or that are longer than eight (8) hours in duration shall require accommodations to minimize the disruption to service. All accommodations shall be coordinated with and approved by the Inspector and the Arlington Water Utilities Department. When temporary services or fire protections are deemed necessary by the City, payment shall be per linear foot of 2-inches temporary service, including connections to existing water mains, fire hydrants, and customer services. Payment for the temporary fire protection shall be per linear foot of 6-inches pipe, including connections to existing water mains, fire hydrants, and private fire lines. (Please make sure these languages match your bid items).

C. Temporary water lines must be chlorinated and receive a good sample before temporary tie-ins are performed. No additional payment shall be made for afterhours work or other accommodations.

14-06 CLEANING OF NEW WATER MAIN (C 20.6):

A. The Contractor shall "run" the poly pigs prior to pressure testing of the new main, chlorinating the line, the obtaining of the safe water sample, and the final tie-in being made. The locations for inserting and exiting the poly pigs may be decided during the Pre-construction meeting. This work will be considered subsidiary to various bid items. The Contractor will also be required to pull a swab through the water pipe. As each joint of pipe is being laid, it shall be swabbed with a clean and effective cleaning tool as approved by the City.

B. Contractor shall include in the pipe installation with appropriate cleaning wyes and associated appurtenances required to successfully complete the “pigging” operations. All poly pigs, cleaning wyes, and associated appurtenances shall be subsidiary to the linear foot unit price for each size and class of water line.

14-07 FIRE HYDRANTS (B 9): Refer to the latest fire hydrant specifications and detail at http://www.arlingtontx.gov/details. (Rev. 4/2019)

14-08 RELOCATION OF EXISTING FIRE HYDRANTS (C 12): The unit price bid for relocating existing fire hydrants shall include the cost of the necessary fittings and extensions to

relocate the fire hydrants as specified on the plans and to adjust them to the finished top of curb grade.

14-09 REMOVE/SALVAGE EXISTING FIRE HYDRANT: The unit price bid shall include cost of removing and cleaning the excess concrete from the exterior of the existing fire hydrants and delivery to the City of Arlington South Services Center, 1100 SW Green Oaks Boulevard. (Rev. 4/2019)

14-10 GATE VALVES (B 10):

A. Refer to the latest gate valve specifications and detail at http://www.arlingtontx.gov/details. (Rev. 4/2019)

B. No bypass valves shall be installed for all resilient-seated gate valves, unless otherwise specified on the plans or bid PROPOSAL.

C. All sizes of valves shall be furnished and installed by Contractor, unless otherwise noted in the PROPOSAL. (Rev. 10/2023)

14-11 WATER SERVICES:

A. Refer to the latest water services details at http://www.arlingtontx.gov/details. (Rev. 4/2019)

B. The cost of the water service shall include trench and trench safety at various depths.

C. The contractor shall furnish, install & maintain temporary trench repair in accordance with Section 12-36 Temporary Street Repair immediately after service line installation. (Rev. 10/2019)

14-12 WATER METER REPLACEMENT:

A. NEW METER:

AMI meters required for this project will be furnished by the City. The new AMI meter sizes shall match the existing meter sizes unless called out differently on the plans. The unit price in the PROPOSAL for installation of the meters shall include cost for pickup and loading at the South Service Center Warehouse (1100 SW Green Oaks Boulevard) and transporting to the job site. The Contractor will be responsible for inspecting the meters and ensuring good working condition of the entire meter assembly prior to transporting it to the jobsite. Any damage or repairs needed to the meter once it leaves the warehouse will be the responsibility of the Contractor.

B. METER REPLACEMENT SCHEDULING:

Contractor shall coordinate with Inspector to ensure City Meter Services Representative will be available to pick up the old meters and take final readings. Contractor to verify size of meter prior to installation. New or replacement meters shall not be installed until after concrete flatwork is complete. (Rev. 4/2019)

C. METER REPLACEMENT:

Contractor shall check for running water prior to commencing meter change-out. Contractor shall notify customer prior to water service disruption. Contractor will be responsible for turning off the water to the building. Contractor shall then replace the meter, using new gaskets or washers. Contractor shall put plastic caps on the inlet and outlet of

the old meter and handle the meter with care in the event of post-removal testing. All meter adapters, bushings, or other hardware necessary to install the new water meter in the customer's existing meter setup must be furnished by the Contractor. Contractor is required to install standard connections (meter couplings) for all 5/8-inch through 2-inches meters if none exist currently. These couplings must receive prior approval from the City. Contractor shall be responsible for bringing meter to the final grade based on the latest details with all necessary pipe and fittings. Contractor shall ensure meter wire is left in neat, working, and accessible condition. **All work on the customer side shall be completed by a licensed plumber and considered as subsidiary to the bid item for meter replacement.** (Rev. 4/2019)

D. EXISTING METER:
Contractor shall leave the old meter inside the new meter box for City Meter Services Representative to pick up and to take final readings. Contractor shall complete new meter tag information legibly written, and attach to old meter. (Rev. 4/2019)

E. DIRT OR WATER AROUND METER:
Contractor shall ensure the meter in the meter box has proper access, including removing and disposing any excess dirt. Dirt shall be removed such that there is a minimum of 2-inches clearance below the meter. If the water meter is fully or partially submerged, the Contractor shall remove the water prior to changing the meter. Contractor must ensure that the water service is not contaminated in any way, including intermittently by standing water in the meter box.

14-13 WATER METER RELOCATION OR ADJUSTMENT:

A. If no meter replacement is required, the Contractor shall be responsible for relocating or adjusting (horizontal and vertical) water services, water meters to finished grade. This shall include the relocation or adjustment of the service line on the City's side of meter (from main to the meter), the quarter bend, the curb stop or angle valve, depending on service size, and the meter. The meter with curb stop or angle valve shall be adjusted accordingly with the water service detail. Relocation or adjustment of the customer's service line shall be performed by a licensed plumber. The Contractor shall also be responsible for disconnection and reconnection of antenna for AMI meters. It will be the Contractor's responsibility to notify the Inspector of any pre-existing damages prior to the relocation or adjustments.

B. The Contractor shall also endeavor to keep meters accessible during the project construction for reading purposes. In the event the meters are covered during construction, the Contractor shall mark their locations with stakes and shall uncover the meters within twenty-four (24) hours when notified to do so by the Inspector.

14-14 WATER METER BOX REPLACEMENT:

A. Water meter boxes shall be furnished and installed by the Contractor. The approved water meter box list (inside **Water Approved Products List**) is available in the link below:
https://www.arlingtontx.gov/city_hall/departments/public_works/engineering/standard_specifications_special_provisions (Rev. 10/2023)

B. The Contractor shall also be responsible for disconnection and reconnection of antenna used for AMI meters. All meter boxes shall be set to the finished grade. All work related to meter boxes and antenna shall be considered subsidiary to the various bid items unless otherwise indicated in the bid PROPOSAL as a pay item. It will be the Contractor's responsibility to notify the Inspector of any pre-existing damages prior to the replacement.

14-15 ABANDONING EXISTING VALVE BOX AND MANHOLE: (Rev. 10/2018)

A. The unit price for abandoning existing valve boxes shall include removing the top 10-inches or top section, fill void area with sand or approved material, backfill and compact per backfill specifications, and repair pavement if located in street, or replace with 2-inches of topsoil including hydromulch or sod if located at back of curb.

B. The unit price for abandoning existing manholes shall include removing the cone or top section, plugging all penetrations with concrete, fill void with sand or an approved material, backfill and compact per backfill specifications from top of manhole section to subgrade if within pavement limits or to 2-inches below grade if outside pavement limits. Repair pavement per permanent or temporary pavement repair specifications or install 2-inches of topsoil including hydromulch or sod to match existing grade if located at back of curb.

14-16 POLY-VINYL CHLORIDE (PVC) SEWER PIPE & FITTINGS (B 7):

A. SCOPE:

This specification designates general requirements for unplasticized, poly-vinyl chloride (PVC), plastic gravity sewer pipe with integral wall bell and spigot joints for the conveyance of domestic sewage. The pipe and fittings shall be in accordance with the latest ASTM D3034 or F679 SDR 26 pipe, or as specified in the bid PROPOSAL.

B. MATERIALS:

Pipe shall be made from clean, virgin, approved Class 12454 BC PVC compound conforming to ASTM resin specification D 1784. Clean reworked material generated from the manufacturer's own production may be used.

C. PIPE:

All pipe shall be suitable for use as a gravity sewer conduit. Provisions must be made for contraction and expansion at each joint with a rubber ring. The rings shall securely lock the solid cross section rubber ring into position. Standard lengths shall be 20-feet and 13-feet, +/- 1-inch.

D. FITTINGS:

All fittings and accessories shall be as manufactured and furnished by the pipe supplier or approved equal and have bell and spigot configurations identical to that of the pipe. Adapters appropriate for the existing pipe material shall be used to tie into existing pipe for the service lines and laterals. No separate payment will be made for adapters, tees, bends or other necessary fittings used in the installation of this line but shall be considered to be subsidiary to the unit prices for pipe and services.

E. PHYSICAL AND CHEMICAL REQUIREMENTS:

Pipe shall be designated to pass all tests at seventy-three (73) degrees F (+/- three (3) degrees F).

F. PIPE STIFFNESS:
Minimum "pipe stiffness" (F/Y at 5% deflection) shall be calculated in accordance with ASTM Designation D 2412, External Loading Properties of Plastic Pipe by Parallel-Plate Loading.

G. JOINT TIGHTNESS:
Assemble two sections of pipe in accordance with the manufacturer's recommendations. Subject the joint to an internal hydrostatic pressure of twenty-five (25) psi for one hour. Consider any leakage failure of the test requirements.

H. FLATTENING:
There shall be no evidence of splitting, cracking, or breaking when the pipe is tested as follows:

Flatten specimen of pipe, 6-inches long between parallel plates in a suitable press until the distance between the plates is forty percent (40%) of the outside diameter of the pipe. The rate of loading shall be uniform and such that the compression is completed within two (2) to five (5) minutes.

I. DROP IMPACT TEST:
Pipe (6-inches (long section) shall be subjected to impact from a free falling tup (20 lb.Tup A) in accordance with ASTM method D 2444. No shattering or splitting (denting is not a failure) shall be evident when the following energy is impacted:

Nominal Size	4"	6"	8"	10"	12"
Ft. - Lbs.	150	210	210	220	220

J. ACETONE IMMERSION TEST:
After two (2) hours immersion in a sealed container of anhydrous (99.5% pure) acetone, a 1-inch long sample ring shall show no visible spalling or cracking. (Swelling or softening is not a failure when tested in accordance with ASTM D 2152.)

K. PAYMENT:
The price bid per linear foot for PVC pipe at the various depths shall be full compensation for all material, labor, equipment, and incidental work required to complete the line ready for use, including embedment and seepage collars. The cost of trenching, embedment, seepage collars, backfill, compaction of backfill and exfiltration testing should be included in the unit price bid per linear foot, complete in place.

14-17 EMBEDMENT REQUIREMENTS FOR SANITARY SEWER PIPE & FITTINGS (B 19 & C 3.14): Unless otherwise specified, all sanitary sewer pipes shall be in accordance with Class "B" embedment detail.

14-18 LOW PRESSURE AIR TEST OF SANITARY SEWER LINES (C 29):

A. After completing backfill of a section of sanitary sewer line, the Contractor shall, at his/her expense, conduct a Line Acceptance Test using low-pressure air. The test shall be performed using the below stated equipment according to stated procedures and under the supervision of the City.

1. EQUIPMENT: The equipment used shall meet the following minimum requirements:

   a. Pneumatic plugs shall have a sealing length equal to or greater then the diameter of the pipe to be inspected.

   b. Pneumatic plugs shall resist internal test pressures without requiring external bracing or blocking.

   c. All air used shall pass through a single control panel.

   d. Three individual hoses shall be used for the following connections:

      i. From the control panel to pneumatic plugs for inflation.

      ii. From the control panel to a sealed line for introducing the low-pressure air.

      iii. From a sealed line to control panel for continually monitoring the air pressure rise in the sealed line.

2. GENERAL PROCEDURE:
   a. All pipe shall be backfilled prior to air testing.

   b. Air tests shall be made by the pressure drop versus time method. The air test shall be performed by testing sections of pipe of various lengths. The Contractor shall furnish all material, equipment and labor necessary to perform the air test. Air gauges shall be recently calibrated and shall be stamped showing the date of calibration. Should the sanitary sewer system fail air tests, the Contractor shall repair the leaks and retest at his/her own expense.

3. TESTING PIPE LESS THAN 36 INCHES IN DIAMETER:
   a. Pneumatic plugs shall have a sealing length equal to or greater than the diameter of the pipe to be inspected. Pneumatic plugs shall resist internal test pressures without requiring external bracing or blocking. All air used shall pass through a single control panel.

   b. Three individual hoses shall be used for the following connections: from the control panel to pneumatic plugs for inflation; from the control panel to a sealed line for introducing the low-pressure air; and from a sealed line to the control panel for continually monitoring the air pressure rise in the sealed line.

   c. The air compressor shall be of adequate capacity for charging the system.

d. The following procedure shall be used for air testing a sewer system: all pneumatic plugs shall be seal-tested before being used in the actual test installation; one length of pipe shall be laid on the ground and sealed at both ends with the pneumatic plugs to be checked; air shall be introduced into the plugs to twenty-five (25) psig; the sealed pipe shall be pressurized to five (5) psig; the plugs shall hold against this pressure without bracing and without movement of the plugs out of this pipe.

e. After a manhole-to-manhole reach of pipe has been backfilled and the pneumatic plugs checked, the plugs shall be placed in the line and inflated to twenty-five (25) psig. Low pressure air shall be injected into the line until the internal pressure reaches four (4) psig. Two (2) minutes shall then be allowed for the pressure to stabilize.

f. In areas where ground water is known to exist, the Contractor shall install a ½-inch diameter capped pipe nipple, approximately 10-inches long, through the manhole. This shall be done at the time the sewer line is installed. Immediately prior to the performance of the Line Acceptance Test, the ground water shall be determined by removing the pipe cap, blowing air through the pipe nipple into the ground so as to clean it, and then connecting a clear plastic tube to the pipe nipple. The hose shall be held vertically and a measurement of the height (in feet) of water over the invert of the pipe shall be taken after the water has stopped rising in this plastic tube. The height shall be divided by 2.3-feet to establish the pounds of pressure that will be added to all readings.

g. After the pipe pressure has stabilized at three and a half (3.5) psig or the adjusted pressure due to ground water submergence, a stop watch shall be started and the time required for the internal pressure to reach two and a half (2.5) psig determined. Minimum permissible holding time for runs of single pipe diameter are indicated in the table under Section C 29.

4. EXAMPLE: If the height of water is 11½-feet, then the added pressure will be psig. This will increase the three and a half (3.5) psig to eight and a half (8.5) psig and the two and a half (2.5) psig to seven and a half (7.5) psig. The allowable drop and the timing remain the same. Refer to the City's Standard Specification for Water and Sanitary Sewer Construction, Section C 29 for air test tables.

5. TESTING PIPE 36 INCHES AND LARGER IN DIAMETER: For pipes 36-inches in diameter and over, the air test may be performed by testing each joint connection individually utilizing a joint tester similar to the Cherne Joint Tester. No joint shall be air tested until the pipe has been backfilled. At no time shall pipe installation exceed 100-feet from the latest joint tested. The method of testing shall be described in this section. The time allowed for the pressure drop for three and a half (3.5) psig to two and a half (2.5) psig shall be ten (10) seconds. Failure to pass the air test shall be cause for rejection. Rejected pipe shall be removed. Reinstallation and/or repairs may be made at the option of the City.

6. MEASUREMENT AND PAYMENT: No separate payment will be made for the tests specified herein, but the cost thereof shall be subsidiary to the various bid items.

B. IF THE INSTALLATION FAILS TO MEET THIS REQUIREMENT, THE CONTRACTOR SHALL DETERMINE, AT HIS/HER OWN EXPENSE, THE SOURCE OF LEAKAGE. CONTRATOR SHALL REPLACE ALL DEFECTIVE MATERIALS AND/OR WORKMANSHIP UNTIL RETEST(S) IS IN COMPLIANT.

14-19 DEFLECTION TESTING OF FLEXIBLE SANITARY SEWER (C 27):

A. PVC and any other flexible sewer pipe shall pass a deflection test conducted under the inspection of the City. A rigid mandrel shall be used to measure deflection. The rigid mandrel shall have an outside diameter (OD) equal to ninety-five percent (95%) of the inside diameter (ID) of the pipe. The inside diameter of the pipe, for the purpose of determining the outside diameter of the mandrel, shall be the average outside diameter minus two (2) minimum wall thicknesses for an OD controlled pipe and the average inside diameter for an ID controlled pipe. Statistical or other tolerance packages shall not be considered in mandrel sizing.

B. Deflection tests shall be conducted after the final backfill has been in place at least thirty (30) days. No pipe shall exceed a deflection of five percent (5%). If a pipe fails to pass the deflection test, the Contractor, at his/her own expense, shall replace one complete length of pipe at the point of failure.

C. No separate payment will be made for the tests specified herein, but the cost thereof shall be included and considered subsidiary to the various other items.

14-20 SANITARY SEWER SERVICE:

A. The cost of the 4-inch or larger sanitary sewer service shall include connecting into the main and existing service, embedment, trench and trench safety, and other materials and labor for the installation at various depths.

B. The contractor shall furnish, install & maintain temporary trench repair in accordance with Section 12-36 Temporary Street Repair immediately after service line installation.

(Rev. 10/2019)

14-21 BYPASS PUMPING: Bypass pumping required for performance of the project will be considered subsidiary to the unit prices bid on this project unless otherwise indicated in the bid PROPOSAL as a pay item.

14-22 CAST-IN-PLACE MANHOLES (C 18.3):

A. Cast-in-place concrete manholes shall have a minimum inside diameter at the base of 4-feet or 5-feet. The Contractor shall not remove any forms until twenty-four (24) hours after the concrete is placed. No backfill shall begin until ninety-six (96) hours after the concrete is placed.

B. Rim elevation of manholes shall be adjusted to match existing grade.

C. A fiberglass manhole marker shall be installed 3-feet from the edge of the concrete pad. The marker shall be embedded at least 6-inches into the ground and shall extend at least 72-inches above the top of the concrete pad. The marker shall be white with a white on green, ultra-violet light resistant label indicating SANITARY SEWER MANHOLE.

14-23 CCTV INSPECTION OF SANITARY SEWER MAINS (C 28):

A. SCOPE

This section of the specifications covers the City inspection of sanitary sewer mains by closed circuit television (CCTV).

B. GENERAL

The final inspection on all projects shall include a CCTV inspection of the completed sanitary sewer main installation, exclusive of services. The CCTV inspection, including furnishing of necessary personnel, equipment and materials, shall be performed by the Contractor. All defects in the installed facility revealed by the CCTV inspection shall be remedied by the Contractor prior to the acceptance of the project.

C. CONTRACTOR'S RESPONSIBILITIES

1. Prior to pavement placement (if sanitary sewer is under pavement) or prior to sanitary sewer main acceptance (if sanitary sewer is in parkway), the Contractor shall inspect all newly constructed mains, excluding services, by CCTV in accordance to the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment & Certification Program (PACP) standards, latest edition. The Contractor shall provide the City a CCTV inspection video and a PACP inspection report summarizing the inspection with all PACP observation codes with their corresponding Structural Grade and O&M condition grades clearly marked. The inspection shall be performed by a NASSCO PACP Certified Inspector, and the report shall clearly show the CCTV Inspector's name and registration number. In addition to defects noted for NASSCO PACP sanitary sewer standards, the CCTV Inspector shall note any defects that meet the NASSCO PACP definition of 'Joint Offset Small (JOS)', Joint Separated Small (JSS)', or 'Joint Angular Small (JAS)'. Such defects shall be clearly highlighted, embolden, circled or marked in a way to distinguish them from the other observation codes.

2. The sanitary sewer main shall be thoroughly cleaned and flushed with water, by the Contractor, prior to CCTV inspection. The pipe shall have flow depth less than a quarter (1/4) pipe full unless approved by the City in writing.

3. The Contractor will be held liable for all damages to the public and private property caused directly and/or indirectly by the CCTV inspection or by surcharging of sanitary sewer mains. The Contractor is responsible for any fines, penalties or other costs imposed upon the City by any agency or private party as a result of the CCTV inspection or improper discharges by the Contractor. The Contractor shall ensure no equipment or other obstructions remain in the line after inspection. All costs associated with retrieving any lodged equipment, shall be incidental to the inspection.

D. BASIS FOR CCTV REPORT ACCEPTANCE

CCTV inspection report must indicate under C 28.3 has a PACP Overall Pipe Structural and O&M Rating of 0, and contains no defects meeting the NASSCO PACP definition of JOS, JSS, or JAS. Any defects observed shall be corrected and re-inspected by the Contractor prior to completion at the Contractor's expense.

E. MEASUREMENT AND PAYMENT

Payment will be at the unit price bid per linear foot of CCTV inspection of sanitary sewer mains.

14-24 DISPOSAL OF EXCESS MATERIAL (C 3.12): The disposal of excess material resulting from construction **including asbestos-cement pipe** shall be removed and disposed of by the Contractor. Removal and disposal of **asbestos-cement pipe** shall be in accordance with the latest Federal and State regulations. The location of suitable disposal sites is solely the responsibility of the Contractor; the City shall in no way be responsible for the actions of the Contractor. Unless otherwise indicated in the bid PROPOSAL, this work will be considered subsidiary to various bid items.

14-25 PIPE HANDLING:

A. Pipe, fittings, valves and other accessories shall at all times be handled with care to avoid damage. In loading and unloading they shall be lifted by hoists, cranes or rolled on skidways in a manner which avoids sudden shock. Under no circumstance shall pipe be dropped. Pipe handled on skidways must not be skidded or rolled against pipe already on the ground. Pipe shall be placed on the site of the work parallel with the trench alignment and with the bell ends facing the direction in which the work will proceed.

B. Proper implements, tools, equipment and facilities shall be provided and used by the Contractor for the correct and safe execution of the work. All pipe, fittings, specials, valves, etc. shall be lowered into the trench by means of a suitable machine and shall not be rolled or dumped into the trench. The equipment shall have sufficient capacity to handle the pipe. The method of construction shall be subject to the City's approval. Before being lowered into the trench, each joint of pipe shall be inspected and any unsound or damaged pipe shall be repaired or rejected.

C. Pipe shall be kept free of all debris during the laying operation. The pipe shall be swept or swabbed prior to installation. At the close of each operating day, the open end of the pipe shall be effectively sealed with an approved water tight plug. The swab and plug shall be of a design acceptable to the City. No pipe shall be laid in water or when the trench conditions or the weather are unsuitable for such work, except in an emergency and then only upon permission of the City.

D. All pipe shall be laid accurately to established lines and grades with valves and fittings at the required locations and with joints centered and spigots pushed home. Where it becomes necessary to make deflections in the line of the pipe, sections of pipe beveled ends or fabricated fittings shall be used. Minor deflection of the line of the pipe may be obtained in standard pipe joints; however, the maximum joint opening caused by such deflection shall

not exceed the recommendations of the pipe manufacturer. Random length pipe and/or grade adapters may be used to make unforeseen changes in the field.

14-26 TYING INTO EXISTING LINES (C 25): The unit price bid for tying into existing lines shall include all labor and material necessary to tie the old main into the new main. The Contractor shall furnish all labor, material, equipment, and services required for the locating and uncovering of the existing line, the making of cuts in the line, the removal, relocation, and lowering or raising of existing lines as required, de-watering of the trench, connecting of the existing line into the new main and all appurtenant work required for a complete connection. This shall include the cost of offset bends as necessary for vertical and/or horizontal alignment. The new water lines will have to be tested, chlorinated, and a good sample received before the old lines can be plugged or abandoned and the new line tied in.

14-27 PLUGGING EXISTING LINES TO BE ABANDONED: All dead ends and abandoned lines shall be capped or plugged accordingly. Bell ends shall be plugged whereas spigot ends and plain ends shall be capped. Unit price for plugging existing lines shall include the cost of all labor and material necessary to perform this work.

14-28 DUCTILE IRON PIPE (B 5):

A. Where ductile iron pipe is chosen for use on this project, it shall be furnished and installed in accordance with the applicable provisions of the Standard Specifications, the details shown on the plans and as hereinafter specified.

B. All ductile iron pipe shall conform to the requirements of the latest revision of ANSI/AWWA C151/A21.51 and ANSI/AWWA C150/A21.50 for the minimum thickness.

C. All ductile iron pipe shall be asphaltic coated outside in accordance with the latest revision of ANSI/AWWA C151/A21.51.

D. Ductile iron pipe for water line shall have a cement-mortar lining in accordance with latest revision of ANSI/AWWA C104/A21.4.

E. Ductile iron pipe for sanitary sewer line shall be lined with Protecto 401 Ceramic Epoxy lining.

F. All ductile iron pipe joints shall be "Push On" Type and shall conform to the latest revision of ANSI/AWWA C111/A21.11.

G. All ductile iron pipe shall be wrapped by polyethylene encasement in accordance with latest revision of ANSI/AWWA C105/A21.5.

H. Restrained joint shall be mechanically interlocking joint and used at the locations indicated on the plans. Restrained joints shall be U.S. Pipe "TR Flex", American Ductile Iron Pipe "Flex Ring", Clow Corporation "Super-Lock", or approved equal. Field welding will not be allowed.

I. The price bid per linear foot for ductile iron pipe at the various depths shall be full compensation for all material, labor, equipment, and incidental work required to complete the line ready for use, including trenching, embedment, backfill, and testing.

14-29 DUCTILE IRON FITTINGS (B 15):

A. All fittings shall comply with the latest revision of ANSI/AWWA C110/A21.10 or ANSI/AWWA C153/A21.53, and designed for a working pressure of not less than one hundred fifty (150) psi.

B. Ductile iron fittings for water lines shall have a "Standard Thickness" cement mortar lining and bituminous seal coat over the cement mortar lining in accordance with the latest revision of ANSI/AWWA C104/A21.4 and ANSI/AWWA C110/A21.10,

C. Ductile iron fittings for sanitary sewer shall be lined with Protecto 401 Ceramic Epoxy coating of 40 mils nominal thickness.

D. All fittings shall be installed with a double layer of polyethylene wrap in compliance with A.W.W.A Standard C105 (ANSI A21.5).

E. Only those manufacturers whose ductile iron fittings have been specifically approved by Arlington Water Utilities Department can be used in the City's water and sanitary sewer system.

F. Ductile iron fittings, including polywrap, blocking, bolts, gaskets, or any other joint accessories, shall be subsidiary to the price bid for pipe.

14-30 GPS DATA ON WATER & SANITARY SEWER INSTALLATION: (Rev. 6/2020)

City crew will collect the GPS data on the water and sanitary sewer attributes installed with this project, including construction of new or adjustment and relocation of existing water and sanitary attributes. Examples of water and sewer attributes includes: Gate Valves, Blow-off Valves, Air Release Valves, Fire Hydrants, Meter Boxes, Pig Wye Vaults, Manhole Lids and Flowlines, and Cleanout Lids.

Contractor shall notify the Project Inspector prior to the final walk through that all the attributes are ready for GPS data collections.

The final payment will not be processed until any missing attributes are exposed and brought to the final grades.

END OF SECTION