SP-151186
(New)

SPECIAL PROVISIONS
FOR
WATER MAIN - GENERAL

Polk County
STP-U-3827(620)--70-77

Effective Date
August 15, 2023

THE STANDARD SPECIFICATIONS, SERIES 2015, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Pipe

B. Fittings

C. Special Fittings

D. Pipeline Accessories

1.02 DESCRIPTION OF WORK

Construct water mains and building service pipes.

1.03 SUBMITTALS

Submit product information sheet for joint restraint system to be used.

1.04 DELIVERY, STORAGE, AND HANDLING

Remove pipe and fittings contaminated with mud and surface water from the site; do not use in construction unless thoroughly cleaned, inspected, and approved by the Engineer.

1.05 SPECIAL REQUIREMENTS

None

1.06 MEASUREMENT AND PAYMENT

A. Water Main:

1. Trenched:

- **a. Measurement:** Each type and size of pipe installed in an open trench will be measured in linear feet along the centerline of the pipe, including the length through the fittings.
- **b. Payment:** Payment will be made at the unit price per linear foot for each type and size of pipe.
- **c. Includes:** Unit price includes, but is not limited to, trench excavation; dewatering; furnishing and installing pipe; furnishing, placing, and compacting bedding and backfill material; tracer system; testing; disinfection; and polyethylene wrap for ductile iron pipe and for fittings.

2. Trenchless:

- **a. Measurement:** Each type and size of pipe installed by trenchless methods will be measured in linear feet along the centerline of the pipe.
- **b. Payment:** Payment will be made at the unit price per linear foot for each type and size of pipe.
- **c. Includes:** Unit price includes, but is not limited to, furnishing and installing pipe; trenchless installation materials and equipment; pit excavation; dewatering; placing and compacting backfill material; tracer system; testing; and disinfection.

B. Water Main with Casing Pipe:

1. Trenched:

- **a. Measurement:** Each type and size of pipe with a casing pipe installed in an open trench, will be measured in linear feet along the centerline of the casing pipe from end of casing to end of casing.
- **b. Payment:** Payment will be made at the unit price per linear foot for each type and size of carrier pipe.
- **c. Includes:** Unit price includes, but is not limited to, furnishing and installing both carrier pipe and casing pipe; trench excavation; dewatering; furnishing and installing pipe; furnishing, placing, and compacting bedding and backfill material; casing spacers; furnishing and installing annular space fill material; tracer system; testing; and disinfection.

2. Trenchless:

- **a. Measurement:** Each type and size of pipe installed by trenchless methods with a casing pipe will be measured in linear feet along the centerline of the casing pipe.
- **b. Payment:** Payment will be made at the unit price per linear foot for each type and size of carrier pipe.
- **c. Includes:** Unit price includes, but is not limited to, furnishing and installing both carrier pipe and casing pipe; trenchless installation materials and equipment; pit excavation; dewatering; placing and compacting backfill material; casing spacers; furnishing and installing annular space fill material; tracer system; testing; and disinfection.

C. Fittings:

1. **Measurement:** Each type and size of fitting installed as specified in the contract documents or as required for proper installation of the water main will be counted. Determine the total weight of fittings counted, in pounds, based on the standard fitting weights published in AWWA C153 for ductile iron compact fittings.

2. **Payment:** Payment will be made at the unit price per pound for each type and size of fitting.

3. **Includes:** Unit price includes, but is not limited to, restrained joints, and thrust blocks.

D. Water Service Stubs by Each:

1. **Measurement:** Each type and size of water service stub from the water main to the stop box will be counted.

2. **Payment:** Payment will be made at the unit price for each type and size of water service stub.

3. **Includes:** Unit price includes, but is not limited to, water service corporation; service pipe; curb stop; stop box; trench excavation; dewatering; furnishing and installing pipe; furnishing, placing, and compacting bedding and backfill material; and installation of tracer wire system for non-metallic service pipe.

E. Water Service Stubs by Length:

1. **Water Service Pipe:**
   a. **Measurement:** Each type and size of water service pipe will be measured in linear feet along the centerline of the pipe.
   b. **Payment:** Payment will be made at the unit price per linear foot of each type and size of water service pipe.
   c. **Includes:** Unit price includes, but is not limited to, trench excavation; dewatering; furnishing and installing pipe; furnishing, placing, and compacting bedding and backfill material; and installation of tracer wire system for non-metallic service pipe.

2. **Water Service Corporation:**
   a. **Measurement:** Each type and size of water service corporation will be counted.
   b. **Payment:** Payment will be made at the unit price for each type and size of water service corporation.

3. **Water Service Curb Stop and Box:**
   a. **Measurement:** Each type and size of water service curb stop and box will be counted.
   b. P**ayment:** Payment will be made at the unit price for each type and size of water service curb stop and box.

F. Connection to Existing System.

1. **Measurement:** Each connection will be counted.

2. **Payment:** Payment will be at the unit price for each connection.

3. **Includes:** Unit price includes but is not limited to necessary isolation of existing water main, dewatering, excavation, and backfill. This item also includes miscellaneous pieces of pipe and fittings as needed to connect to the existing system.

G. Abandon Existing Water Main.

1. **Measurement:** Lump Sum item; no measurement will be made.

2. **Payment:** Payment will be at the lump sum price for Abandon Existing Water Main.

3. **Includes:** Excavation, dewatering, disconnection from existing system, backfill, and surface restoration at the location of the disconnection.

H. Abandon Existing Water Service.

1. Measurement: Each abandonment will be counted.

2. Payment: Payment will be at the unit price for each abandonment.

3. Includes: Unit price includes, but is not limited to existing surfacing removal, excavation, dewatering, and disconnection from the existing system, installation of a Stainless Steel Full Circle Repair Clamp, backfill, and surface restoration at the location of the disconnection.

PART 2 - PRODUCTS

2.01 WATER MAIN

A. Polyvinyl Chloride (PVC) Pipe: Comply with AWWA C900 with gray iron pipe equivalent outside diameters.

1. Minimum Wall Thickness:
   a. 4 inch through 24 inch sizes: DR 18.
   b. Sizes over 24 inch: As specified in the contract documents.

2. Joint Type: Use push-on joint type, except as otherwise specified in the contract documents or as authorized by the Engineer.
   a. Push-on: According to AWWA C900.
   b. Integral Restrained Joint: AWWA C900 pipe with restraining system manufactured integrally into pipe end.
   c. Mechanical Restrained Joint: Ductile iron mechanical device designed for joint restraint of AWWA C900 pipe complying with the requirements of ASTM F 1674.

3. Markings on Pipe:
   a. Name of manufacturer.
   b. Size and class.
   c. Spigot insertion depth gauge.
   d. National Sanitation Foundation (NSF) seal.

B. Ductile Iron Pipe (DIP):

1. Minimum Thickness Class:
   a. 4 inch through 24 inch sizes: Special thickness Class 52 according to AWWA C151.
   b. Sizes over 24 inches: As specified in the contract documents.

2. Cement-mortar Lined: According to AWWA C104 with asphalt seal coat.

3. External Coating: Asphalt according to AWWA C151.

4. Joint Type: Use push-on type, unless otherwise specified in the contract documents or as authorized by the Engineer.

   a. **Push-on:** According to AWWA C111.
   b. **Mechanical:** According to AWWA C111.
   c. **Restrained, Buried:** Pipe manufacturer's standard field removable system.
   d. **Restrained, in Structures:** Restraining gland, flanged or grooved.
   e. **Flanged:** According to AWWA C111.
   f. **Grooved:** According to AWWA C606.
   g. **Gaskets:** According to AWWA C111.

5. **Markings on Pipe:**
   a. Name of manufacturer.
   b. Size and class.
   c. Spigot insertion depth gauge.

2.02 BOLTS FOR WATER MAIN AND FITTINGS

A. Use corrosion resistant bolts.

B. Tee-bolts and Hexagonal Nuts for Mechanical Joints:

1. High-strength, low-alloy steel manufactured according to AWWA C111.

2. Provide ceramic-filled, baked-on, fluorocarbon resin coating for bolts and nuts.

3. Include factory-applied lubricant that produces low coefficient of friction for ease of installation.

4. Provide Cor-Blue or Cor-Ten nuts and bolts for all bolted water main connections on valves, specialty fittings and items.

C. Other Bolts and Nuts: Only as approved by the Engineer.

2.03 FITTINGS

A. For DIP and PVC Pipe: Comply with AWWA C110 (ductile iron or gray iron) or AWWAC153 (ductile iron).

1. Joint Type:
- **a.** For all pipe sizes, use restrained mechanical joint system. Provide follower gland using breakaway torque bolts to engage thrust restraint.
  - **1)** Minimum pressure rating same as connecting pipe. For fittings between dissimilar pipes, the minimum pressure rating is the lesser of the two pipes.
  - **2)** Suitable for buried service.
  - **3)** Joint restraint system to be field installable, field removable, andre-installable.
- **b.** Restrained mechanical joint system to be:
  - **1)** MEGALUG Series 2000PV Series or STAR StarGrip 4000 Series for Polyvinyl Chloride Pipe (PVC)
  - **2)** MEGALUG Series 1100 Series or STAR StarGrip 3000 Series for Ductile Iron Pipe (DIP)
- **c.** Use of alternate restraint systems must be approved by the Water Works.

2. Lined: Cement mortar lined according to AWWA C104 with asphalt coating.

3. Wall Thickness: Comply with AWWA C153.

4. Gaskets: Comply with AWWA C111.

B. For Prestressed Concrete Cylinder Pipe: As required for prestressed concrete cylinder pipe.

C. Flange Adapter:

1. Body: Ductile iron complying with ASTM A 536.

2. End Rings (Follower Rings): Ductile iron complying with ASTM A 536.

3. **Gaskets:** New rubber compounded for water service and resistant to permanent set.

4. **Bolts and Nuts:** High strength, low alloy corrosion resistant steel or carbon steel bolts complying with ASTM A 307.

D. Pipe Coupling:

1. **Center Sleeve (Center Ring):** Steel pipe or tubing complying with ASTM A 53 or ASTM A 512 or formed carbon steel with a minimum yield of 30,000 psi.

2. **End Ring (Follower Ring):** Ductile iron complying with ASTM A 536, or steel meeting or exceeding the requirements of ASTM A 576, grade 1010-1020.

3. **Gaskets:** New rubber compounded for water service and resistant to permanent set.

4. **Bolts and Nuts:** High strength, low alloy corrosion resistant steel.

E. Stainless Steel Repair Clamp: Use for service line abandonment or as directed by the Water Works.

1. Pre-approved manufacturers: Smith Blair 261 Series or approved equal.

2. Sleeve width to be a minimum of 12 inches.

2.04 CONCRETE THRUST BLOCKS

A. Use Class C concrete meeting the Standard Specifications.

B. Comply with the contract documents for dimensions and installation of thrust blocks. Comply with Standard Road Plan WM-101. Form thrust blocks to prevent encasement of fitting bolts in concrete.

C. Use for all pipe sizes unless otherwise specified.

2.05 PIPELINE ACCESSORIES

A. Polyethylene Wrap:

1. Comply with AWWA C105.

2. Provide tubes or sheets with 8 mil minimum thickness.

B. Tracer System: Comply with Revised Standard Road Plan WM-102.

1. **Tracer Wire:**
   - **a. Open Cut:**
     - **1) Solid Single Copper Conductor:**
       - **a) Size:** No. 12 AWG
       - **b) Insulation Material:** Linear low-density polyethylene (LLDPE) insulation suitable for direct burial applications
       - **c) Insulation Thickness:** 0.030 inches, minimum
       - **d) Tensile Strength:** 150 pounds, minimum
       - **e) Operating Voltage:** Rated for 30 volts
     - **2) Bimetallic Copper Clad Steel Conductor:**
       - **a) Size:** No. 14 AWG
       - **b) Rating:** Direct burial

c) Operating Voltage: Rated for 30 volts
d) Conductivity: 21%
e) Copper Cladding: 3% of conductor diameter, minimum
f) Insulation Material: High density, high molecular weight polyethylene
g) Insulation Thickness: 0.030 inches, minimum
h) Tensile Strength: 175 pounds, minimum

b. Directional Drilling/Boring:

1) Bimetallic Copper Clad Steel Conductor:

a) Size: No. 12 AWG
b) Rating: Direct burial
c) Operating Voltage: Rated for 30 volts
d) Conductivity: 21%
e) Copper Cladding: 3% of conductor diameter, minimum
f) Insulation Material: High density, high molecular weight polyethylene
g) Insulation Thickness: 0.045 inches, minimum
h) Tensile Strength: 1100 pounds, minimum

2. Ground Rod: 3/8 inch diameter, 60 inch steel rod uniformly coated with metallically bonded electrolytic copper.

3. Ground-rod Clamp: High-strength, corrosion-resistant copper alloy.

4. Splice Kit:

a. DryConn Direct Bury Lug Aqua (SKU 90220), or approved equal.
b. Inline resin splice kit with split bolt (1 kV and 5kV) for use with single conductor and unshielded cable splices in direct bury and submersible applications.

5. Tracer Wire Station: AA Manufacturing Tracer Wire Receptacle, Model TW-18, or approved equal. Conduit pipe shall be 1/2 inch diameter galvanized steel or black iron pipe with a minimum wall thickness of 0.109 inches.

2.06 SPECIAL GASKETS

A. For soils contaminated with gasoline, use neoprene or nitrile gaskets.

B. For soils contaminated with volatile organic compounds, use nitrile or fluorocarbon gaskets.

C. For other soil contaminants, contact the Engineer for the required gasket.

2.07 WATER SERVICE PIPE AND APPURTENANCES

A. Controlling Standards: Local plumbing and fire codes.

B. Materials

1. Copper Pipe: For all service piping 2 inch diameter and smaller.
a. Comply with ASTM B 88.
b. Wall Thickness: Type K.
c. Use for water services 2 inches and smaller.
d. Minimum size: 1 inch
e. Use flared end fittings only.

2. Ductile Iron Pipe (DIP):
As specified in Section 4150 of the Standard Specifications. Polyethylene wrap is required.
a. Use for services 4 inches and larger.

3. **Other Materials:** None allowed.

C. Appurtenances: Use only “No Lead” Brass. Use the following series or approved equal.

1. **Corporation valve:** A.Y. McDonald NL Ball Style Corporation Stop with copper flare or approved equal.

2. **Curb valve (Stop):** A.Y. McDonald Mfg. Co. – 76100-22 Series

3. **Curb valve boxes (Stop Box):** A.Y. McDonald Mfg. Co. – 5601 Series

4. **Compression coupling:** A.Y. McDonald Mfg. Co. – 74758-2

5. **Water service saddles:** Smith-Blair, Inc. – 317 Service Saddle

2.08 NON-SHRINK GROUT

Comply with Materials I.M. 491.13.

2.09 CASING PIPE

Comply with Section 2553 of the Standard Specifications.

PART 3 - EXECUTION

3.01 PIPE INSTALLATION

A. General:

1. Do not use deformed, defective, gouged, or otherwise damaged pipes or fittings.

2. Keep trench free of water. Clean pipe interior prior to placement in the trench.

3. Install pipe with fittings and valves to the lines and grades specified in the contract documents.

4. Clean joint surfaces thoroughly and apply lubricant approved for use with potable water and recommended by the manufacturer.

5. Push pipe joint to the indication line on the spigot end of the pipe before making any joint deflections.

6. Limit joint deflections to one degree less than pipe manufacturer’s recommended maximum limit.

7. Tighten bolts in a joint evenly around the pipe.

8. Install restrained joints and concrete thrust blocks on all fittings.

9. Keep exposed pipe ends closed with rodent-proof end gates at all times when pipe installation is not occurring

10. Close the ends of the installed pipe with watertight plugs during nights and non-working days.

11. Do not allow any water from the new pipeline to enter the existing distribution system piping until testing and disinfection are successfully completed.

B. Trenched:

1. Excavate trench and place pipe bedding and backfill material as specified in Section 2552 of the Standard Specifications. Water Main pipe shall use bedding class P-1 per Standard Road Plan SW-104 unless otherwise specified in the contract documents.

2. Provide uniform bearing along the full length of the pipe barrel. Provide bell holes.

C. Trenchless: Comply with Section 2553 of the Standard Specifications.

3.02 ADDITIONAL REQUIREMENTS FOR DIP INSTALLATION

A. Utilize full-length gauged pipe for field cuts. Alternatively, field-gauge pipe selected for cutting to verify the outside diameter is within allowable tolerances.

B. Cut the pipe perpendicular to the pipe barrel. Do not damage the cement lining. Bevel cut the ends for push-on joints according to the manufacturer's recommendations.

C. Encase all pipe, valves, and fittings with polyethylene wrap according to Part 3.05.

D. Install pipe according to AWWA C600, except as modified herein.

3.03 ADDITIONAL REQUIREMENTS FOR PVC PIPE INSTALLATION

A. Cut the pipe perpendicular to the pipe barrel. Deburr and bevel cut spigot end of the pipe barrel to match factory bevel. Re-mark the insertion line.

B. When connecting to shallow-depth bells, such as on some cast iron fittings or valves, cut the spigot end square to remove factory bevel. Deburr the end and form a partial bevel on the end.

C. Install pipe according to AWWA C600, except as modified herein.

3.04 ADDITIONAL REQUIREMENTS FOR PRESTRESSED CONCRETE CYLINDER PIPE INSTALLATION

A. Install according to AWWA M9.

B. Relieve gasket tension by inserting a small rod between the gasket and the gasket groove and running the tool around the pipe twice.

C. Check gasket position using a metal feeler gauge after the joint has been assembled.

D. Complete joint exterior grouting after pipe has been properly positioned using non-shrink grout.

3.05 POLYETHYLENE ENCASEMENT INSTALLATION

A. Apply polyethylene encasement to buried ductile iron pipe and to buried fittings, fire hydrants, and appurtenances. The polyethylene encasement is used to prevent contact between the pipe and the bedding material but need not be airtight or watertight.

B. Install polyethylene encasement according to AWWA C105, using tubes or flat sheets, and pipe manufacturer's recommendations.

C. Do not expose the polyethylene encasement to sunlight for long periods before installation.

D. Remove all lumps of clay, mud, cinders, etc. on the pipe surface before encasing the pipe. Take care to prevent soil or bedding material from becoming trapped between the pipe and polyethylene.

E. Lift polyethylene-encased pipe with a fabric-type sling or padded cable.

F. Secure and repair encasement material using polyethylene tape or replace as necessary.

3.06 TRACER SYSTEM INSTALLATION

A. Install with all buried water main piping. Comply with Revised Standard Road Plan WM-102 for tracer wire installation.

B. Begin and terminate the system at all connections to existing mains.

C. Install wire continuously along the lower quadrant of the pipe. Do not install wire along the bottom of the pipe. Attach wire to the pipe at the midpoint of each pipe length; use 2 inch wide, 10 mil thickness polyethylene pressure sensitive tape.

D. Install splices only as authorized by the Engineer. Allow the Engineer to inspect all below grade splices of tracer wire prior to placing the backfill material. Wrap all splices in 10 mil thickness polyethylene pressure tape.

E. Install ground rods adjacent to connections to existing piping and at locations specified in the contract documents or as directed by the Engineer.

F. Bring two wires to the surface at each fire hydrant location and mainline valve location and terminate with a tracer wire station.

3.07 CONFLICTS

A. Horizontal Separation of Gravity Sewers from Water Mains:

1. Separate gravity sewer mains from water mains by a horizontal distance of at least10 feet unless:
- The top of a sewer main is at least 18 inches below the bottom of the watermain, and
- The sewer is placed in a separate trench or in the same trench on a bench of undisturbed earth at a minimum horizontal separation of 3 feet from the watermain.

2. When it is impossible to obtain the required horizontal clearance of 3 feet and a vertical clearance of 18 inches between sewers and water mains, the sewers must be constructed of water main materials meeting the requirements of Part 2.01. However, provide a linear separation of at least 2 feet.

B. Separation of Sewer Force Mains from Water Mains: Separate sewer force mains and water mains by a horizontal distance of at least 10 feet unless:

1. The force main is constructed of water main materials meeting a minimum pressure rating of 150 psi and the requirements of Part 2.01 and

2. The sewer force main is laid at least 4 linear feet from the water main.

C. Separation of Sewer and Water Main Crossovers:

1. Vertical separation of sanitary and storm sewers crossing under any water main should be at least 18 inches when measured from the top of the sewer to the bottom of the water main. If physical conditions prohibit the separation, the sewer may be placed not closer than 6 inches below a water main or 18 inches above a water main. Maintain the maximum feasible separation distance in all cases. The sewer and water pipes must be

adequately supported and have watertight joints. Use a low permeability soil for backfill material within 10 feet of the point of crossing.

2. Where the sanitary sewer crosses over or less than 18 inches below a water main, locate one full length of sewer pipe of water main material so both joints are as far as possible from the water main.
3. Where the storm sewer crosses over or less than 18 inches below a water main, locate one full length of sewer pipe of water main material or RCP with flexible gasket joints meeting ASTM C 443 so both joints are as far as possible from the water main.

D. Surface Water Crossings:

1. Above-water Crossings: Use only where specifically allowed by the Water Works.
   - **a.** Adequately support and anchor pipe used for above-water crossings.
   - **b.** Protect pipe from damage and freezing.
   - **c.** Ensure pipe is accessible for repair or replacement.

2. Underwater Crossings:
   - **a.** Use restrained joint, ductile iron, pipe for water mains entering or crossing streams that are 15 feet in width or larger.
     - **i.** Place the top of the water main a minimum of 7 feet below the natural bottom of the streambed.
     - **ii.** Securely anchor the water main to prevent movement of the pipe and provide easily accessible shutoff valves located outside the floodway at each end of the water crossing.
     - **iii.** Provide hydrant assembly on the creek side of one of the accessible valves.
     - **iv.** Ensure ductile iron pipe extends completely from accessible valve to accessible valve.
     - **v.** For open cut excavations, backfill the trench with crushed rock or gravel.
     - **vi.** Seed, sod, or otherwise protect the streambank from erosion upon completion of the Project.
   - **b.** For smaller streams, the same requirements shall apply except that shutoff valves do not need to be located immediately adjacent to the water crossing.
   - **c.** Water crossings, in areas where no evidence of erosion exists, are excluded from these requirements.
   - **d.** The Water Works will electronically pinpoint leaks in lieu of inserting a small meter to determine leakage and obtain water samples on each side of shutoff valve

3.08 TRANSITIONS IN PIPING SYSTEMS

Where the specified material of a piping system entering or exiting a structure changes, make the change at the outside of the structure wall, beyond any wall pipe or wall fitting required, unless otherwise specified.

3.09 STRUCTURE PENETRATIONS

A. Wall Pipes:

1. Install where pipes penetrate and terminate at a wall or floor surface of a concrete structure, or where the pipe protrudes through the concrete wall or floor and the protrusion is otherwise unsupported.
2. Provide a waterstop flange near the center of the embedment length. The waterstop is to be cast integrally with the wall pipe, or fully welded to it around the pipe circumference.

B. Wall Sleeves:

1. Install where a pipe passes through a structure wall.

2. Sleeves in concrete walls are to be supplied with a waterstop collar, fully welded, and cast-in-place in the concrete.

3.10 WATER SERVICE STUB

A. Maximum service length to building shall be 100 feet (as measured from the property line) or 150 feet (as measured from the water main) – whichever is more restrictive. Services exceeding this length require a meter pit.

B. Install 1 inch and smaller corporation valves tapped at 45 degrees above horizontal at a minimum distance of 24 inches from pipe bell or other corporation. Install 1 1/2 inch and 2 inch corporation valves tapped horizontal a minimum distance of 24 inches from pipe bell or other corporation.

C. Construct trench and place backfill material according to Section 2552 of the Standard Specifications.

D. Water Works will provide corporation valves and water service saddles for all projects. The Water Works will make all water main service taps. Water Works will provide curb valve, box and rod for installation by Contractor. Applicable Water Works fees shall apply. Contact Water Works to schedule a minimum of 1 working day prior to requested installation.

1. Manufactured tees may be allowed in lieu of service taps, if approved by the Water Works. Applicable fees for Water Works supplied materials still apply.

2. Water Works Reconstruction Projects.

a. The Water Works may allow contractor tapping of the watermain.

b. The Water Service Connection fees shall not apply.

E. Special Requirements for City of Johnston Reconstruction Projects

1. Coordinate all water service pipe reconstruction work with City of Johnston and impacted property owner.

2. Provide new copper water service pipe as required; connect to new corporation valve in main and to new curb valve; connect to existing water service pipe with compression coupling.

a. The point of connection between existing pipes and new pipes shall be as close as practical to the existing curb valve box.

b. Contractor responsible for finding usable existing pipe within 10 feet of initial excavation for connection; if usable pipe cannot be found within 10 feet, contact the City of Johnston for further direction

3.11 TESTING AND DISINFECTION

Test and disinfect according to Special Provisions for Testing and Disinfection.

3.12 WATER SERVICE RELOCATIONS

A. Water Service Stop Box Relocation

1. Relocate Stop Box from its existing location to is new location as shown on the plans or as designated by the Engineer.

2. When Stop Boxes are not as indicated, the relocation shall be verified by the Engineer before relocating.

B. Water Service Depth Check

1. Measure and assure that existing water service is a minimum of 60 inches below the finished grade and not in conflict with proposed sewers, walls and other structures.
2. If the depth of the service is not adequate, the service shall be lowered in accordance with the following.

C. Water Service Lowering

1. The existing water service shall be lowered to provide a minimum of 60 inches of earth cover.
2. Replace Stop Box and pipe and fittings if required.
3. For all copper water service lines located under portland cement concrete pavement, wrap service line with suitable protective wrap to prevent contact with potentially corrosive slurry from portland cement concrete pavement. Wrap materials shall be approved by the Engineer.
4. Install a manufactured cast iron curb box receptacle to prevent stop box from bonding to portland cement concrete sidewalk or driveway. A.Y. McDonald Co. Model 5639.
5. Install a 12 inch by 12 inch portland cement concrete pad with a minimum depth of 4inches for any stop box located outside of pavement (example: sidewalk or approach).

D. Lower Water Service with New Copper

1. Replace services that do not meet plumbing code standards with new 1 inch copper tubing.
2. Lower to provide a minimum of 60 inches earth cover and to minimum clearance at proposed sewers, walls, and structures.
3. Replace stop box, if required.
4. For all copper water service lines located under portland cement concrete pavement, wrap service line with suitable protective wrap to prevent contact with potentially corrosive slurry from portland cement concrete pavement. Wrap materials shall be approved by the Engineer.
5. Install a manufactured cast iron curb box receptacle to prevent stop box from bonding to portland cement concrete sidewalk or driveway. A.Y. McDonald Co. Model 5639.
6. Install a 12 inch by 12 inch portland cement concrete pad with a minimum depth of 4 inches for any stop box located outside of pavement (example: sidewalk or approach).

E. New Water Service

1. At locations where plumbing code enforcement dictates that the existing water service must be reconstructed in conjunction with relocating water services or relocating stop boxes, the existing water service must be reconstructed from the water main to and including the stop box.
2. The new service shall be constructed to provide a minimum of 60 inches of earth cover to minimum clearances at proposed sewers, walls, and structures.
3. Utilize the existing corporation tap on the water main and provide all new materials required.
4. For all copper water service lines located under portland cement concrete pavement, wrap service line with suitable protective wrap to prevent contact with potentially corrosive slurry from portland cement concrete pavement. Wrap materials shall be approved by the Engineer.

5. Install a manufactured cast iron curb box receptacle to prevent stop box from bonding to portland cement concrete sidewalk or driveway. A.Y. McDonald Co. Model 5639.
6. Install a 12 inch by 12 inch portland cement concrete pad with a minimum depth of 4 inches for any stop box located outside of pavement (example: sidewalk or approach.

F. Water Service Relocation

1. Relocate the existing water service when there is a conflict with sewer construction.
2. Relocate Stop Box if required.
3. For all copper water service lines located under portland cement concrete pavement, wrap service line with suitable protective wrap to prevent contact with potentially corrosive slurry from portland cement concrete pavement. Wrap materials shall be approved by the Engineer.
4. Install a manufactured cast iron curb box receptacle to prevent stop box from bonding to portland cement concrete sidewalk or driveway. A.Y. McDonald Co. Model 5639.
5. Install a 12 inch by 12 inch portland cement concrete pad with a minimum depth of 4 inches for any stop box located outside of pavement (example: sidewalk or approach).

G. Water Service Disconnection

1. Water services and stubs within the project area or demolition site, or sites, and any other water service approved by the Engineer shall be disconnected. The water services shall be cut at the corporation stop and the stop closed by a licensed plumber registered in the City of Johnston. The stop box consisting of the stem and casing shall be completely removed. Abandonment shall be in accordance with the City of Johnston Water Department procedures. Water service disconnections shall be inspected and approved by the Engineer.

H. Water Main Abandonment

1. Plug:
   a. Prior to placing the sewer plug, the Engineer will verify the sewer line is not in use.
   b. Construct sewer plug by completely filling the end of the pipe with concrete. Force concrete into the end of the pipe for a distance of 16 inches, or one-half the pipe diameter, whichever is greater.
2. Fill:
   a. Prior to filling the sewer, the Engineer will verify the sewer line is not in use.
   b. If specified in the contract documents, fill the line to be abandoned with flowable mortar, foamed cellular concrete, or CLSM by gravity flow or pumping.
3. Batching, mixing, and placing may be started when temperature is 34°F and rising. Cease mixing and placing when temperature is 38°F or less and falling.