

Chapter 305

Board of Water Commissioners

[HISTORY: Adopted by the Board of Water Commissioners of the Town of Norwell effective 5-1-1980. Amendments noted where applicable.]

§ 305-1 New services.

- A. The Water Department will install service piping from the water main in the street to the property line, furnishing and installing the corporation cock at the water main and a curb box and shutoff at the property line. The service piping from the property line to and into the building shall be installed by the owner, in accordance with the directions furnished by the Water Department, and under the supervision of the Water Department.
- B. No installation of work shall be started, nor shall any water be used from a service until an application is signed and approved by the Water Superintendent.
- C. The meters shall be installed and sealed by the Water Department.
- (1) Meter connections. A drain-type service valve must be installed near the point of entrance of the service pipe so a meter can be mounted in a horizontal position. An additional ball valve shall be placed on the other side of the meter location. Adequate space and proper connections shall be left for meter installation. An extra charge will be made if this work is done incorrectly and requires modification by the Water Department.
- D. Persons contracting for service shall state in the application all the purposes for which they intend to use water, and no other use thereof shall be made until a new application is made.
- E. All applications for shutting off and turning on water must be made in writing. In all cases, when a consumer requests water to be turned on, arrangements must be made for the consumer to be present when the water is turned on to avoid any accidental leakage, which would cause damage to the property, or a waste of water to the Town.
- F. The customer shall keep tight and in good condition all fixtures and pipes both inside his building and from the property line to the same and shall protect them from freezing. The user shall report to the Water Department any unusual condition in connection with the water system from the property line to and including the meter. The consumer shall have the responsibility of keeping the street shutoff located at the way line clear of obstructions, and not allow it to become buried, in order that this shutoff shall be readily accessible to the Water Department at all times. The charge for repairing any street shutoff that is damaged or buried or made inaccessible to the Water Department may be billed to the consumer, at the discretion of the Board, for the necessary material and labor to rectify the condition.
- G. The Water Department may, from time to time, shut off the water for the purpose of making repairs or changes in the system or for any other necessary purpose. It may also shut off the water upon failure of the customer to observe its rules and regulations, or failure to pay charges within the time agreed. The Town and/or its Water Department shall not be liable for any damage caused by shutting off the water for any variation in pressure, nor shall the customer be entitled to any rebate by reason thereof.
- H. The Water Commissioners and/or the employees of the Water Department may enter the premises of a customer at any reasonable time for the purpose of inspecting pipes, meters, fixtures or attachments used by the customer or to ascertain whether water is being used unreasonably or contrary to these rules and regulations.

- I. No persons, except under the supervision of the Water Commissioners and/or the employees of the Water Department and the Fire Department, shall open a hydrant or operate any other fixture or valve of the water system without the written consent of the Water Department.
- J. The owners of the property served shall be liable for all charges both for the use of water and the installation of services and connections. The Town of Norwell has accepted the Lien Act in accordance with the General Laws, and unpaid water consumption charges and any other charges, when overdue, will be committed to the Assessors as a lien upon the real estate.
- K. All customers and property owners are warned to equip plumbing, pressure tanks, etc., with proper relief valves and safety appliances. The Water Department will not be responsible for any damage which may occur through the variation of water pressure or loss of water supply.
- L. The installation of a domestic water service line must be in land which is part of the legal lot approved for the dwelling house to be serviced by the line. Easements for such a line over the land of others must be approved, in writing, in each case.
- M. The size and type of line must meet with Water Superintendent's approval, obtained prior to installation.
- N. Exceptions to the above requirements can only be obtained by written request to the Water Department prior to installation.

**§ 305-2 Water rates and standard charges.
[Amended 1-1-2001; 1-1-2004; 11-16-2006; 5-4-2017]**

Pursuant to the authority provided under MGL c. 41, § 69, the following rates shall be in effect May 4, 2017:

A. Quarterly meter/service charge.

Meter Size (inches)	Charge
5/8, 3/4 and 1	\$16
1 1/4 and 1 1/2	\$32
2 and larger	\$69

B. Quarterly water usage rates.

Gallons of Usage	Rate per 1,000 Gallons
First 15,000	\$5.14
15,000 to 30,000	\$7.71
30,000 to 50,000	\$11.57
Over 50,000 (residential)	\$16.71

C. Water connection fee. *Existing residences with certificates of occupancy as of May 1, 2017, receive a discount of 25% on connection fees.

Water Connection

(inches)

Fee

Up to 2

\$7,000*

4

\$15,000

6

\$30,000

8

\$50,000

10

\$75,000

12

\$100,000

- D. New fire service fee. Residential sprinkler service: \$2,000; commercial sprinkler service: \$5,000 (includes two-, four-, six- and eight-inch sprinkler services).
- E. Meter pit fee: one-and-one-half-inch and two-inch pit: \$1,500 (required for services of 400 feet).
- F. Backflow device testing: \$70 per device, \$70 per survey.
- G. Hydrant flow test will be charged a fee of \$400 and will be performed at night to minimize impact to existing customers.
- H. For a service requiring water to be turned off or on at a street connection, each call: \$10.
- I. For the resealing of a meter at the request of a customer for purposes of renovations, etc.: no charge.
- J. Senior citizens shall be given a discount of 10% provided that they are a minimum of 60 years of age and that they are the resident owner of the property. This discount shall apply to the minimum charge and the water usage charge. No discounts shall apply to the water connection fees.
- K. For any meter found to be tampered with or removed without Water Department approval, the customer will be charged an amount equal to that of the average previous bills as well as a service charge of \$20.
- L. Semiannual sprinkler service fee: \$62.50 commencing with first billing after service has been installed a minimum of six months.
- M. Any installation larger than two inches shall be at the expense of the applicant, including a meter that meets the standards of the Board of Water Commissioners.
- N. All bills are payable 30 days from date of mailing. Bills unpaid after 30 days shall be subject to a penalty of 10% on the unpaid balance. All bills outstanding after due date shall be a lien upon the real estate.
- O. In case of nonpayment the Board of Water Commissioners may cause the supply to be shut off.
- P.

§ 305-3 Rules and regulations for developers or private installers.

- A. Installations.

- (1) All developers must meet with the Water Superintendent with their preliminary plans to discuss a proposed installation.
 - (2) Before any installations are started a complete plan of the proposed work must be submitted and approved by the Water Superintendent in writing.
 - (3) Plan must show location of water mains, main valves, service valves, and curb boxes.
 - (4) A Water Department representative shall be on the premises while mains and hydrants are being installed and a fee of \$10 per hour will be charged for this supervision.
 - (5) Total installation shall be made in accordance with the Town of Norwell Water Department Specification and American Water Works Association Standards.
 - (6) No meters will be installed in garages, breezeways, sheds, manholes, etc.
 - (7) Dead-end water mains will require a special hearing with the Board of Water Commissioners.
- B. Water mains. Rules and regulations for developers or private installers of new water mains designed for use as part of the Norwell system must be in accordance with the Norwell Water Department Specifications (attached).
- C. Hydrants. Shall be Mueller A-423 factory painted yellow. All work shall be done in accordance with the Norwell Water Department Specification (attached).
- D. Services. Shall be a minimum of 1-inch. Plastic pipe to be extended to meter valve inside building. All work shall be done in accordance with the Norwell Water Department Specification (attached).
- (1) Meter connections: Meters up to and including 2-inch shall be furnished and installed by the Water Department.
 - (a) One connector to be connected to house or service valve.
 - (b) A second valve must be connected to the meter outlet connection on the house side of the meter.
 - (c) The connection for the meter installation must be securely and permanently fastened not more than 12 inches from the meter.
 - (2) Curb boxes must be placed on the property line.
 - (3) All services installed in a development must be installed under the supervision of the Water Department for which the Town shall be paid a fee of \$10 per hour for the inspection of the installation of such services. No services can be installed in a development until approved and a date set for the installation by the Water Superintendent.
 - (4) No service pipe shall be installed under a driveway.
 - (5) No service pipe, water main or any part of the water system can be installed through any part of a sewage disposal system, or within 20 feet of such system.
- E. Easements. All easements for the installation of water mains in a development shall be not less than 50 feet in width to be acceptable to the Board of Water Commissioners.

Attachments:

[Attachment 1 - Procedures for Installation of Water Services](#)

NORWELL WATER DEPARTMENT MATERIAL SPECIFICATIONS WATER MAINS AND APPURTENANCES

1. HYDRANTS and VALVES

1.1. MATERIALS

- 1.1.1. Resilient wedge gate valves shall be iron body, resilient seated type meeting the latest edition of AWWA C509 with mechanical joint ends. The valves shall be designed for 200 psi working pressure and 400 psi test pressure. Valves shall have corrosion resistant fusion - bonded interior and exterior coatings.
- 1.1.2. Valves are to have O-ring seals and a non-rising stem. Valves shall have a 2-inch operating nut and be **OPEN RIGHT**.
- 1.1.3. Tapping valves shall be resilient gate valves as specified above with the following exceptions. Tapping valves shall be full part opening and have flanged by mechanical joint ends. Tapping sleeves shall be corrosion resistant stainless steel with high pressure sealing.
- 1.1.4. Valves shall be as manufactured by Mueller or Approved equal.
- 1.1.5. Valve boxes shall be cast iron, tar coated, sliding, heavy pattern type, consisting of three (3) pieces; a flanged bottom piece, a flanged top piece, and a cover with two (2) lifting holes and the word "water" cast on the top. A minimum 6-inch overlap is required between sliding sections. The inside diameter of boxes shall be at least 5-1/4-inches and lengths shall be as necessary to suit ground elevation. Valve boxes shall be manufactured in North America only.
- 1.1.6. Fire hydrants shall have mechanical joint inlet connections to the main, two 2-1/2-inch hose connections, and one 4-1/2-inch steamer connection with a valve opening 5-1/4-inches in diameter minimum and a standpipe with an 8-1/2-inch minimum diameter. Hydrants shall be traffic model with dual drain ports.
- 1.1.7. The hydrants shall have an oil reservoir to provide lubrication to all stem threads, bearing surfaces and O-rings each time the hydrant is operated.
- 1.1.8. The hydrants shall have mechanical joint shoes, 5'-6" bury (street level shoulder areas) or 6'-0" bury (raised sidewalk), 5-1/4-inch valve, and conform to AWWA Specification C-502. Hydrant shall be marked with an arrow and the word "open" to indicate the direction to turn the stem to open the hydrant. Hydrants shall **OPEN LEFT**.
- 1.1.9. The hydrants are to receive two coats of prime paint before shipment and once installed are to be cleaned and painted by the Contractor. Hydrants shall be factory painted **YELLOW** in accordance with the Norwell Water Department requirements.
- 1.1.10. Hydrants shall be as manufactured by Mueller type A-43 or Approved equal.
- 1.1.11. Hydrants shall have hydrant markers with reinforced fiberglass shaft heavy duty spring mounted 4' long x 3/8" diameter. One bolt mounting.

1.2. EXECUTION

1.2.1. INSPECTION AND PREPARATION

- 1.2.1.1. All valves and appurtenances shall be installed in the location shown on the drawings or where directed by the Engineer. Valves shall be true to alignment and rigidly supported. Any damaged items shall be replaced before they are installed.

- 1.2.1.2. During installation of all hydrants, valves and appurtenances, the Contractor shall verify that all the items are clean, free from defects in materials and workmanship and functioning properly. Valves and other equipment which do not operate easily, or are otherwise defective, shall be repaired or replaced.
- 1.2.1.3. All valves shall be closed and kept closed until otherwise directed by the Engineer. All hydrants shall be covered with a burlap bag until put into service.
- 1.2.1.4. Care shall be taken to avoid freezing of water in valves or hydrants.
- 1.2.2. FIELD TESTS AND ADJUSTMENTS
 - 1.2.2.1. Conduct a functional field test of each valve, including actuators and valve control equipment, if any, in the presence of the Engineer to demonstrate that each part and all components together function correctly. The Contractor shall provide all testing equipment.
- 1.2.3. MANUFACTURER'S SERVICE
 - 1.2.3.1. The Contractor shall coordinate the services of a qualified representative of the tapping equipment and/or tapping valve supplier to provide on-site support and assistance during wet tapping operations of the existing water mains as indicated on the Drawings.
- 1.2.4. SHOP PAINTING VALVES AND APPURTENANCES
 - 1.2.4.1. Interior and exterior surfaces of all valves which are not factory epoxy coated shall be given two coats of shop finish of an asphalt varnish conforming to the latest edition of AWWA C504 for Varnish Asphalt. The pipe connection openings shall be capped to prevent the entry of foreign matter prior to application.
- 1.2.5. INSTALLATION OF FIRE HYDRANTS
 - 1.2.5.1. All hydrants shall stand plumb and shall have their nozzles parallel with, or at right angles to the curb, with the nozzle facing the curb. Hydrants shall be set to the established grade, with the centerline of the lowest nozzle 18-inches above the ground. The Hydrants shall be set upon a slab of concrete not less than 4-in. thick and 15-in. square.
 - 1.2.5.2. Concrete thrust blocks shall be placed between the back of the hydrant inlet and undisturbed soil at the end of the trench. Minimum bearing area shall be 36 square inches. Felt roofing paper shall be placed around the hydrant elbow before placing concrete. **CARE SHALL BE TAKEN TO INSURE THAT CONCRETE DOES NOT PLUG THE DRAIN PORTS.**
 - 1.2.5.3. Each hydrant shall be connected to the main with a 6-inch branch controlled by an independent 6-inch valve.
 - 1.2.5.4. When a dry-barrel hydrant is set in soil that is pervious, drainage shall be provided at the base of the hydrant by placing course gravel or crushed stone mixed with course sand from the bottom of the trench to at least six (6) inches above the drain port opening in the hydrant and to a distance of one (1) foot around the elbow.
 - 1.2.5.5. When a dry-barrel hydrant with a drain opening port is set in clay or other impervious soil, a drainage pit, two (2) feet x two (2) feet x two (2) feet, shall be excavated below each hydrant and filled with course gravel or crushed stone mixed with course sand under the elbow of the hydrant and to a level of six (6) inches above the drain port.
 - 1.2.5.6. Fire hydrants shall be factory painted **YELLOW** in accordance with the Norwell Water Department requirements.

1.2.6. FIELD TESTS AND ADJUSTMENTS

1.2.6.1. Conduct a functional field test of each valve, including actuators and valve control equipment, if any, in the presence of the Engineer to demonstrate that each part and all components together function correctly. The Contractor shall provide all testing equipment.

1.2.7. INSTALLATION OF BURIED VALVES AND VALVE BOXES

1.2.7.1. Valves shall be cleaned and manually operated before installation. When tapping valves are installed, it is imperative that the shell cutting is removed and discarded. Valves shall be set on a firm foundation and supported by tamping pipe-bedding material under the sides of the valve. The valve box shall be supported during backfilling and maintained in vertical alignment with the top flush with the finished grade. Buried valves and valve boxes shall be set with the stem vertically aligned in the center of the valve box. The valve box shall be set so as not to transmit loads to the valve.

1.2.7.2. Where ductile iron tapping sleeves are used, the split end flanges shall be rotated off center of the flange body to insure the gasket seams are not aligned.

1.2.7.3. Tapping valves shall be thoroughly flushed after the tapping operation has been completed.

1.2.7.4. Before backfilling, all exposed portions of any bolts shall be coated with two coats of bituminous paint comparable to Bitumastic No. 50 by Koppers Co., Inc. or equal.

2. DUCTILE IRON PIPE

2.1. MATERIALS

2.1.1. Ductile iron pipe shall be that of a manufacturer who can demonstrate at least 5 years of successful experience in manufacturing ductile iron pipe. The pipe shall be equipped with push-on type, restrained joint, or mechanical joint, as required.

2.1.2. Ductile iron pipe shall conform to the latest edition of AWWA C150 and C151, Class 52.

2.1.3. Gaskets shall meet the material requirements of ANSI/AWWA C111 for mechanical joint gaskets.

2.1.4. Fittings shall be compact ductile iron Class 350 Mechanical Joint, conforming to ANSI Specification A21.53 (AWWA C153), latest edition. Fittings shall be suitable for use with restraints as specified hereinafter. Fittings shall be manufactured in the United States. Fittings shall be made of the same material and have the same lining and coating as the pipe specified above. All fittings shall be marked with the weight and shall have distinctly cast upon them the pressure rating, the manufacturer's identification, nominal diameter of openings and the number of degrees or fraction of the circle on all bends.

2.1.4.1.1. Hydrant tees shall have a rotatable mechanical joint gland on the 6-inch plain end branch to provide positive valve restraint, unless otherwise allowed by the Engineer.

2.1.4.1.2. Caps and plugs, installed in all new work as indicated on the drawings, shall be provided with a threaded corporation or bleeder valve

so that air and water pressure can be relieved prior to a future connection.

- 2.1.5. All pipe and fittings shall have a bituminous outside coating in accordance with AWWA C151 and C110, respectively, latest edition. All pipe and fittings shall be cement-mortar lined and seal coated in accordance with AWWA C104, latest edition. Cement mortar lining shall be double thickness.
- 2.1.6. Joints for pipe and fittings shall be push-on or mechanical joints conforming to AWWA C111, latest edition.
- 2.1.7. Restraint joints shall be furnished for thrust restraint for installation on all fittings and valves, where indicated on the drawings, or where required by the Engineer. Restraints for mechanical joints shall be Series 1100 Megalug as manufactured by EBAA Iron, Stargrip Series 3000 as manufactured by Star Pipe Products, or approved equal.
- 2.1.8. Restraints for push-on joints shall be Stargrip Series 3100P as manufactured by Star Pipe Products, Series 1700 as manufactured by EBAA Iron, or approved equal.
- 2.1.9. Sleeve type couplings shall be of steel and shall be Style 38 by Dresser Mfg. Div.; Smith-Blair or approved equal. Couplings shall be furnished with black steel bolts and nuts and with pipe stop removed. Gaskets shall be of a material suitable for exposure to liquid within the pipe.
- 2.1.10. Polyethylene pipe encasement shall conform to requirements of AWWA C105, latest edition. Virgin polyethylene shall conform to ANSI/ASTM D1248. Minimum nominal thickness shall be 8 mils.
- 2.1.11. Where pipe cover is less than 4.5 feet, provide 2-inch thick "Foamglass Pipe insulation with jacketing as manufactured by Pittsburgh Corning Corporation, Pittsburgh, PA, or an approved equal.

2.2. EXECUTION

2.2.1. HANDLING PIPE

- 2.2.1.1. The Contractor shall take care not to damage pipe by impact, bending, compression, or abrasion during handling, and installation. Joint ends of pipe shall be kept especially clean.
- 2.2.1.2. Pipe shall be stored above ground at a height no greater than 5 feet, and with even support for the pipe barrel.
- 2.2.1.3. Only nylon protected slings shall be used for handling the pipe. No hooks, chains or bare cables will be permitted.
- 2.2.1.4. Gaskets shall be shipped in cartons and stored in a clean area, away from grease, oil, heat, direct sunlight and ozone producing electric motors.

2.2.2. LAYING DUCTILE IRON PIPE AND FITTINGS

- 2.2.2.1. Care shall be taken in loading, transporting and unloading to prevent injury to the pipe, lining or coatings. Pipe or fittings shall not be dropped. The Town shall examine all pipes and fittings prior to installation. Any pipe or fittings found defective shall not be installed and immediately removed from the site. Any damage to pipe linings or coatings may be repaired as directed by the Town, or removed from the site. Handling and installation of pipe and fittings shall be in accordance with the manufacturer's instruction and as specified herein. Any materials damaged during loading, transporting or unloading shall be replaced at the Contractor's expense.
- 2.2.2.2. Jointing of ductile iron pipe and fittings shall be done in accordance with the printed recommendations of the manufacturer and as specified. All pipe and fittings shall be thoroughly cleaned before laying; shall be kept clean until they are used in the work; and when installed, shall conform to the lines and grades required. Special care is required in cleaning the ends of the pipe; wipe the outside of the spigot end with a clean rag prior to applying lubricant; brush clean the inside of the bell end, paying special attention to the rubber joint area, prior to installing the gasket and lubricant; and check inside the pipe for overall cleanliness.
- 2.2.2.3. Ductile iron pipe and fittings shall be installed in accordance with requirements of AWWA C600, latest edition, except as otherwise provided herein. The joint surfaces and the gasket shall be painted with a lubricant just prior to making up the joint. The spigot end shall then be gently pushed home into the bell. The position of the gasket shall be checked to insure that the joint has been properly made and is watertight. Care shall be taken not to exceed the manufacturer's recommended maximum deflection allowed for each joint. A firm, even bearing throughout the length of the pipe shall be constructed by tamping Sand Borrow for Subdrains (M1.04.1) along the sides of the pipe forming a cradle under the pipe. Tamping shall continue until the fill is 6-inches over the top of the pipe. Pipe installation in rock shall be constructed as shown on the drawings. (See Detail Sheet/Drawings). A 4.5-foot minimum cover shall be maintained over the top of the pipe. If any defective pipe is discovered after it has been installed, it shall be removed and replaced with a sound pipe in a satisfactory manner by the Contractor, at his/her own expense.
- 2.2.2.4. All pipe shall be sound and clean before laying. During pipe installation, care should be taken to protect the open end of the pipe. When installation is not in progress, including lunch time, the open ends of the pipe shall be closed with watertight plugs or other approved means. Good alignment shall be preserved during installation. Fittings, in addition to those shown on the Drawings, shall be provided, when required, for crossing utilities which are encountered during trench excavation. Solid sleeves shall be used only where approved by the Town.
- 2.2.2.5. When pipe cutting is required, cutting shall be done by machine, leaving a smooth cut at right angles to the axis of the pipe. Cut ends of pipe to be jointed with a bell shall be beveled to conform to the manufactured spigot end. Cement lining shall remain undamaged.

2.2.2.6. The Contractor shall provide and have on hand at the start of the job, the following additional bends for each size of pipe to be installed: two 1/32 bends, two 1/16 bends and two 1/8 bends. These bends shall be replaced each time job conditions require their use.

2.2.2.7. Existing Utilities. To the extent possible, the Contractor shall maintain a minimum 10 ft. lateral separation between the new water mains and existing sanitary sewers, unless otherwise directed by the Engineer.

2.2.2.8. When crossing an existing sanitary sewer, the water main is preferred to cross above the sewer. The Contractor shall maintain an 18-inch clearance between the bottom of the water main and crown of the sanitary sewer. At crossing, the center of a full length of water pipe shall be located above the sewer so that both joints will be located as far from the sewer as possible. The engineer may direct this full length of main to be concrete encased when the 18-inch clearance is not possible, or when the water main is placed below the sanitary sewer.

2.2.2.9. The Contractor shall maintain a minimum clearance between the new water main and all other existing utilities of at least 12 inches.

2.2.2.10. New water mains shall pass under all existing utilities, except sewers unless otherwise noted on the Drawings or directed by the Engineer or Town.

2.2.2.11. Ductile iron pipe installed within 5 feet of gas lines shall be fully encased with polyethylene material. Polyethylene shall be 8-millimeters thick and comply with AWWA C105, latest edition.

2.2.2.12. Ductile iron pipe shall be wrapped in polyethylene encasement where pipe depth is at or below normal groundwater level.

2.2.2.13. Water pipe, to be installed with less than 4.5-foot cover, shall be insulated with 2-inch thick "Foamglass" pipe insulation with jacketing as manufactured by Pittsburgh Corning Corporation, Pittsburgh, PA, or an approved equal.

2.2.3. PUSH-ON JOINTS

2.2.3.1. Push-on joints shall be made in accordance with the manufacturer's instructions. Pipe shall be laid with bell ends looking ahead. A rubber gasket shall be inserted in the groove of the bell end of the pipe, and the joint surfaces cleaned and lubricated. Apply thin film of nontoxic gasket lubricant over inner surface of gasket in contact with spigot end. The plain end of the pipe being installed shall be aligned and inserted into the bell end of the pipe previously installed. It can then be pushed home with a jack or by other means. After joining the pipe, a metal feeler shall be used to make certain that the rubber gasket is correctly located.

2.2.4. MECHANICAL JOINTS

2.2.4.1. Mechanical joints shall be made in accordance with Appendix A of AWWA C111 and the manufacturer's instructions. Wire brush surfaces to be in contact

with the gasket and thoroughly clean and lubricate the joint surfaces and rubber gasket with soapy water before assembly. Check that the gasket has been seated in fitting before placing flange against gasket. With bolts inserted and nuts finger-tight, tighten diametrically opposite nuts progressively and uniformly around joint with a torque wrench. Bolts shall all be tightened to the specified torque. When using pneumatic or electric impact wrenches to make up fittings, complete tightening using a torque wrench to the specified torque. Under no conditions shall extension wrenches or pipe over handle of ordinary ratchet wrench be used to secure greater leverage.

2.2.5.RESTRAINED JOINTS

2.2.5.1.Mechanical joint restraints shall be installed in full accordance with the manufacturer's instructions. All bolt heads on Megalug restraints shall be tightened sufficiently so that they shear off to indicate the proper tightening torque was achieved.

2.2.5.2.Push-on joint restraints shall be installed in full accordance with the manufacturer's instructions where directed by the Engineer.

2.2.6.SLEEVE TYPE COUPLINGS

2.2.6.1.Couplings shall be installed where shown. Couplings shall not be assembled until adjoining push-on joints have been assembled. Clean pipe ends for a distance of 8 inches. Mark each end six inches from the end. Use soapy water as gasket lubricant. Slip follower and gasket over each pipe to the 6-inch marks. Place the middle ring on the pipe end until centered over joint. Insert other pipe end into middle ring and bring to the proper position in relationship to the pipe installation. Press gaskets and followers into middle ring flares. Check gaskets have been seated into middle ring flares correctly. With bolts inserted and nuts made finger-tight, tighten diametrically opposite nuts sequentially with a torque wrench to the specified torque as per manufacturer's recommendation. After installation, apply a heavy bitumastic coating to bolts and nuts.

2.2.7.CONNECTIONS TO WATER MAIN

2.2.7.1.The Contractor shall make all connections to the existing mains as indicated in the Contract Documents.

2.2.7.2.The Contractor shall develop a program for the construction and putting into service of the new work subject to the approval of the Engineer. All work involving cutting into and connecting to the existing water mains shall be planned so as to interfere with the operation of the existing facilities for the shortest possible time.

2.2.7.3.The Contractor shall have all preparatory work done prior to making the connection and shall provide all labor, tools, material, and equipment required to do the work in one continuous operation.

2.2.7.4. The Contractor shall have no claim for additional compensation, by reason of delay or inconvenience, for adapting his operations to the requirements of the Owner.

2.2.7.5. Under no circumstances shall any customer be without water for a period of more than 4 hours without prior written approval of the Owner. Should it appear that any customer will be without water for more than 4 hours, the Contractor shall install a temporary water service at no additional cost to the Owner.

2.2.7.6. The Owner does not guarantee a tight shut-off for existing local community water valves. The Contractor shall not submit a claim for damages due to delays in dewatering pipelines caused by water leaking through an existing closed valve, or having to dewater the excavation while making the connection. It is the Contractor's responsibility to provide the means to dewater the excavation while making the connection.

2.2.8. TESTING AND DISINFECTION

2.2.8.1. Prior to pressure and leakage tests, the piping shall be thoroughly flushed clean of all dirt, dust, oil, grease and other foreign materials. This work shall be done with care to avoid damage to lining and coatings.

2.2.8.2. The Contractor shall submit a plan on the method of testing and chlorinating the mains for review. The plan shall include all equipment proposed for use during the work, or the name of the qualified testing company, which will perform the work. Testing of the water main shall not begin until the Engineer has approved the Contractor's plan. All testing shall be done in the presence of the Engineer.

2.2.8.3. Testing of Water Main:

2.2.8.3.1. The Contractor, in accordance with ANSI/AWWA C600 specifications or latest revision thereof, will make all pressure and leakage tests to determine that the ductile iron pipe is structurally safe and free of excess leakage. The Contractor shall furnish all the equipment, materials and labor required for testing. The Town may furnish the water needed for all water main testing.

2.2.8.3.2. Testing shall be done in sections of the main not to exceed a 3,000-foot maximum length. Valves shall be placed in the off position at the ends of the sections to be tested. The Contractor shall provide means to prevent water from entering other parts of the pipeline not subject to testing at all times. Contractor will ensure that air release valves and other venting devices are properly installed and placed in open position when filling pipe with water.

2.2.8.3.3. After all entrapped air has been removed from the section; fill the main to the normal static pressure. The Contractor is allowed to let the main rest for up to 48 hours with static pressure. Using a special pressure pump, the Contractor shall raise the pressure to 150 pounds per square

inch. The pump will then be shut off and separated from the test section by a globe valve. A fluid filled pressure gage, with a maximum reading of 250 psi, shall have been placed beyond the globe valve. The test section will then be monitored for a 2-hour period

2.2.8.3.4. This pressure shall be maintained, within 5 psi, for a minimum of 2 hours during which time the line checked for leaks by the Engineer. Based on an average test pressure of 150 psi, the measured rate of water leakage shall not exceed the following rates in the section under test:

$$L = \frac{12.25SD}{133,200}$$

Where: L = Allowable leakage, gallons per hour
S = Length of pipe section tested, feet
D = Nominal pipe diameter, inches

2.2.8.3.5. Should leakage exceed this rate, the Contractor shall immediately locate the leak or leaks and repair same at his expense. Pipe shall be flushed and chlorinated when leakage does not exceed above standard. Approval does not absolve the Contractor from his responsibility if leaks develop within the new main or water services (to curb box) later within the warranty period.

2.2.9. Chlorinating and Flushing:

2.2.9.1. The Contractor, in accordance with the latest edition of ANSI/AWWA 651 Standard for Disinfecting Water Mains, shall chlorinate and flush the new water main. Chlorinated water to be flushed from the pipeline shall be de-chlorinated as shown on detail drawings or as approved by the Engineer. It shall then be discharged to the nearest storm drain. Chlorinated water shall not be discharged to any natural water body.

2.2.9.2. Prior to chlorination, the Contractor shall properly flush the water mains. In general, flushing shall be performed at a flow rate required to achieve a minimum velocity of 2.5 feet per second, which is approximately 400 GPM in an 8-inch diameter main, 600 GPM in a 10-inch main, 900 GPM in a 12-inch main and 1,600 GPM in a 16-inch main. Flushing of the water main, at the above rates, for approximately 20-minutes per 1,000-foot section, will allow for three volume changes. This is a sufficient period of time for successfully cleaning the water main.

2.2.9.3. The Contractor shall chlorinate the water main until the main contains a solution containing 25 mg/L available chlorine. The valves shall then be closed and the chlorinated water allowed to sit in the mains for 24 hours. The main will then be checked to assure the chlorine residual shall be at least 10 mg/L. If less than 10 mg/L is measured, the Contractor shall flush and re-chlorinate the mains at no cost to the Owner. All valves and hydrants shall be operated to insure their proper disinfection. Valves shall be operated to prevent super chlorinated water from entering the existing distribution system. The

Contractor shall then flush the mains until clear, clean water is being discharged.

2.2.9.4. Twenty-four hours after the main has been flushed of chlorinated water, bacteriological samples (total coliforms and heterotrophic plate count) shall be taken. Water samples shall be taken from corporation stops along the length of the water main as designated by the Engineer. A minimum of two (2) samples shall be taken on each street, or two per 3000 feet of pipe, whichever is greater. Each sample shall be taken in duplicate, in sterile bottles and sent to a State approved private laboratory for analysis. The Contractor shall perform all necessary work including delivery of samples to a certified laboratory, and shall include the cost for sampling and analysis in his bid price. The results of the tests on these samples will determine the acceptance of the work and allow these new mains to be connected to the Town's system. The failure of any sample to pass the laboratory tests shall require the Contractor to reflush and re-chlorinate the mains and resample and test the water until acceptable results are obtained, all at no additional cost to the Owner.

2.2.9.5. If, during construction, trench water has entered the main, or if in the opinion of the Owner's Engineer, excessive quantities of dirt or debris have entered the main, bacteriological samples shall be taken at 200-foot intervals and shall be identified as to location. Additional sample taps shall be installed and removed at the Contractor's expense.

2.2.9.6. Contractor shall note that work under this Contract shall not be considered complete until the satisfactory installation and testing of the water mains have been completed.

3. METALLIC INDICATOR TAPE

3.1. Metallic indicator tape with "CAUTION WATER MAIN BURIED BELOW" shall be placed in trench 1' from final grade.

4. WATER SERVICE CONNECTIONS

4.1. MATERIALS

4.1.1. SERVICES

4.1.1.1. Unless otherwise specified, all pipe for services shall be BLUE HDPE and meet the specifications of NSF-14 & 61, AWWA C901.

4.1.1.2. Tubing shall be EndoPure Tubing and HDPE coated tracer wire form the system or equivalent.

4.1.2. CORPORATIONS, CURB STOPS AND SADDLES

4.1.2.1. The corporation stops shall meet the most recent revision of the AWWA standard "Threads for Underground Service Line Fittings" (AWWA C800). Corporation stops shall be manufactured by Mueller Company, Ford Meter Box Company or approved equal. Corporations larger than one inch shall be installed with saddles.

4.1.2.2. The curb stops shall meet the most recent revision of the AWWA standard "Threads for Underground Service Line Fittings" (AWWA C800). Curb stops

shall be manufactured by Mueller Company or The Ford Meter Box Company or approved equal. Curb Stops shall open **LEFT**.

- 4.1.2.3. Curb stop boxes shall be cast iron Buffalo type with recessed lid with pentagon bolt and the word "water" cast on top, and adjustable sliding type. Curb stop boxes shall be manufactured in North America only.

4.2. EXECUTION

4.2.1. INSTALLATION

- 4.2.1.1. No service pipe shall be installed under a driveway.
- 4.2.1.2. After successful testing and chlorination, water services shall be installed as a "wet" tap. Exact locations of services shall be located in the field by the Town and Contractor. All services shall be installed to a minimum depth of 4'-6" unless specifically shown or directed otherwise by the Town.
- 4.2.1.3. Corporation stops. The tapping machine shall be rigidly fastened to the pipe. The length of travel of the tap should be so established that when the stop is inserted and tightened with a 14-in wrench, not more than one to three threads will be exposed on the outside. When a wet tapping machine is used, the corporation cock shall be inserted with the machine while it is still in place. Stops shall be tightened only sufficiently to give watertightness and care must be constantly exercised not to overtighten them.
- 4.2.1.4. Saddle taps shall only be used when transite (asbestos cement) pipe, PVC pipe, or HDPE pipe is encountered or under the direction of the Town and Engineer.
- 4.2.1.5. Curb stops will installed in a location approved by Town. The Contractor shall install the curb stops and boxes in a workmanlike manner as described herein and as directed by the Town.
- 4.2.1.6. The boxes shall be set in a true vertical position and if they are within the limits of the roadway or within limits where the plowing of snow will take place in the winter, the tops of the boxes shall be set about 1/4-in below the top of the finished grade. In locations where these boxes are not likely to be disturbed, the tops shall be set flush with the adjoining ground.
- 4.2.1.7. Care shall be exercised in the placing and laying of water service tubing to be sure that the pipe does not have kinks or sharp bends and to assure against it being in contact with sharp stones or ledge which would cause damage to the pipe. At least 6-inches of sand shall be placed adjacent to and above the pipe and no stone shall be placed over the pipe until the depth of backfill is in excess of 1-ft.

4.2.1.8. For existing service connections that are less than 1-inch, the change over to the new service shall occur at the property-owner side of the curb stop. If any extensions are required to reach the existing water service, they shall match diameter in kind, except be no less than 1-inch. Water service tubing as specified herein shall be used to make connections between new corporation stops and new curb stops at the property line. If the service connection is greater than 1-inch, the same size water service tubing connection shall be installed.

5. TESTING

5.1. All work shall be tested to conform with current AWWA standards.