

# LINCOLN WATER DEPARTMENT



## Rules & Regulations

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## TABLE OF CONTENTS

1. General.....	3
2. Meters .....	4
3. Service Connections .....	5
4. Distribution System Main Extensions .....	7
5. Design.....	8
6. Material and Construction Methods .....	10
7. Construction Methods.....	13
8. Drawings.....	16
9. Pressure and Leakage Test .....	17
10. Disinfection of Mains .....	17
11. Standard Details .....	18
12. Cross Connection Control.....	25
13. Irrigation Systems .....	26
14. Fire Protection.....	26
15. Abatement Policy.....	27
16. Rates & Fees .....	28

# Lincoln Water Department Rules & Regulations

Providing for the operation of the Town of Lincoln Water Department. Adopted by the Board of Water Commissioners pursuant to the General By-laws of the Town of Lincoln, Article IX, Section 13.

Public Hearing Date: September 26, 1991

Adopted Date: September 26, 1991

## 1. General

- 1.1. No person shall connect any service pipe to the mains or any distributing pipes of the Town except by order of the Water Commissioners or their representative.
- 1.2. Pursuant to Massachusetts General Laws Chapter 165, Section 11D, owners and/or occupants of any premise served by the Water Department shall provide access to Department personnel for the purpose of inspecting and surveying their water system for new installations or cross connections, or to remove, repair or replace any water meter, or to conduct water quality sampling and testing. When such access is refused, the water shall be shut off after proper notice has been provided until such access has been allowed and fees have been paid.
- 1.3. All locations where system apparatus is installed must be accessible at all reasonable times to the Water Department for inspection.
- 1.4. No alterations shall be made to water services, between the water main and water meter without prior knowledge and approval of the Water Department.
- 1.5. The Water Commissioners shall not, in any way nor under any circumstances, be held liable or responsible for any loss or damage from any excess or deficiency in the pressure of the system. The Water Department will undertake to use all reasonable care and diligence to avoid interruption of service but cannot and does not guarantee that such may not occur.
- 1.6. The Water Department shall not be responsible for damages caused by dirty water resulting from the opening or closing of any gate valves, repairs or maintenance to the system, or the use of hydrants.
- 1.7. The Water Department shall, when conditions allow, attempt to notify consumers, in areas expected to be affected, or any work or disruptions in

service. Emergencies and breaks cannot be anticipated and therefore notice may not always be given.

- 1.8. The Water Department reserves the right to shut off water for the purpose of making alterations or repairs.
- 1.9. A water service may be shut off from any taker for non-compliance with Water Department rules and regulations or for non-payment of bills related to said service, or violation of Massachusetts General Laws.
- 1.10. When water has been shut off because of disregard of the rules or non-payment of fees, it will not be turned on until the Commissioners are satisfied that there will be no further cause of complaint and after payment of a turn-on fee (See Section 15). This fee may be amended from time to time by the Water Commissioners.
- 1.11. The Fire Department shall have control of hydrants during a working fire and shall immediately notify the Water Department of hydrant use. In no other case will any person be allowed to handle hydrants or other water system apparatus without permission of the Water Commissioners or their representative.
- 1.12. To eliminate the possibility of cross connection, service pipes or fixtures of any description that are connected with the mains of the Water Department shall not, under any circumstances, be connected with any other source of water supply.
- 1.13. No non-emergency water construction shall be commenced between November 15<sup>th</sup> and April 1<sup>st</sup> without specific approval of the Water Commissioners.
- 1.14. Trespassing on or in Flint's Pond is prohibited. Whoever violates this provision shall be punished consistent with the fines and penalties of the General Laws of the Commonwealth of Massachusetts.
- 1.15. It is the belief of the Water Commissioners that these regulations comply with current Massachusetts Department of Environmental Protection (MADEP) guidelines for public water systems. However, should there be any conflict between said MADEP guidelines and these regulations, the more stringent regulations must be followed.

## **2. Meters**

- 2.1. All water services are required to have an operable water meter for the accurate recording of water used on the property.

- 2.2. The property owner shall provide a suitable location for water meter location. This location shall provide for ready access to the water meter for installation and servicing.
- 2.3. Water meters shall be sized by the Water Department.
- 2.4. Water meters are the property of the Water Department.
- 2.5. It shall be the responsibility of every owner of property whereon a water meter is installed to take all necessary precautions to prevent damage to such meter, including freezing. Before closing and draining off the water from any building wherein a water meter is installed, the owner shall give five days written notice to the Water Department, and arrange for the meter to be removed. The owner shall be liable for all damage to water meters and service installations on his property resulting from negligence, or failure to give the required notice as above.
- 2.6. Full-port ball valves are required on either side of the meter(s). The property owner is responsible for the installation and maintenance of those valves.
- 2.7. Installation and repair of meter pits must be approved by the Superintendent and shall be done at the customer's expense.
- 2.8. All water meters must be mounted in a horizontal plane with the register facing upwards.
- 2.9. A owner may request to opt-out of having a radio-frequency capable water meter installed in their home. The owner must submit a written application to the Department and agrees to pay any associated charges related to having the meter manually read for billing purposes. If a customer wishes to have an existing radio-frequency capable meter removed from the house, the owner must pay the appropriate fee to cover the costs of the Department employees to wire and mount an external reader. If the RF meter to be removed had been installed for less than 7 years, the fee will include a one time meter fee. See Section 15 for fees.

### **3. Service Connections**

- 3.1. The Water Department shall be responsible for the water main tap and water service construction between the water main and the property line including curb stop.
- 3.2. The applicant/owner shall be responsible for and bear all costs associated with connecting and maintaining the water service from curb stop to the facility to be served.

- 3.3. Prior to water service construction the applicant shall: complete a water service application, pay the Water Department all applicable capital and connection charges, and consult with Water Department staff to coordinate all details pertaining to water service construction. A minimum of one week's notice is required.
- 3.4. Water service piping must be installed with a minimum five (5) foot depth of cover, at least ten (10) feet from, and eighteen (18) inches above subsurface sewage disposal systems.
- 3.5. Whenever water service piping must cross sewer lines, all portions of the sewer force main / septic line within ten feet (horizontally) of the water main shall be enclosed in a continuous sleeve
- 3.6. Water service piping shall not be backfilled until inspected and approved by the Water Department.
- 3.7. A service connection shall consist of a service coupling corporation stop, curb stop, curb box, copper tubing, meter and remote reader. The corporation stop and curb stop shall have a full diameter port, with Teflon seat, bronze or brass ball, and quarter-turn open/close control. See Detail 11.5
- 3.8. Corporations stops shall be all-bronze or all-brass construction with lapped, bronze or brass ball and ground key. Outlet connections shall be compression-type, bronze or brass ball suitable for copper tubing service.
- 3.9. Service clamps shall be epoxy coated saddle with stainless steel straps and a Buna-N rubber gasket per ASTM D2000.
- 3.10. Curb stops shall be all-brass or all-bronze construction conforming to American Water Works Association (AWWA) Standard C-800 (latest version). Pack joint end connections shall consist of a Buna-N beveled gasket for watertight fit. An independent, slip-clamp locking device shall also be grooved inside for additional restraint. Stops may be either full port Ball Valves or Inverted Key.
- 3.11. The curb box shall be of the telescoping Buffalo type, designed so that vehicle loads are not transmitted to the curb stop. The box shall be tar base enamel coated inside and out.
- 3.12. Curb stop boxes must be serviceable and accessible at all times.
- 3.13. Service pipe shall be Type K annealed copper tubing meeting federal specification WWT-799 and ASTM B-88. In cases where meter pits are installed, or at the Superintendent's discretion, AWWA C901 200 PSI Black Plastic may be used between the meter pit and the residence.

- 3.14. A five (5) foot minimum horizontal separation shall be maintained between water service piping and all other underground utilities except sewer. See 3.4 above.
- 3.15. Abandoning Service: A property owner wishing to permanently terminate a water service to the property must cut and cap the service at the curb stop. All costs associated with cutting and capping the service are the sole responsibility of the property owner. The location of the cut and cap procedure away from the curb box may be allowed, at the discretion of the Water Department Superintendent.
- 3.16. Service Leaks: A service leak is defined as a leakage of water in the service line between the curb stop and the service meter. All services leaks are the sole responsibility of the property owner. Upon notification by the Department, the owner with a service leak shall be given two weeks to obtain a signed contract with a Department-approved contractor for the repair of the leak. The contracted work shall be completed no later than four weeks from the time the contract is signed.

An owner who does not comply with the given deadlines of this regulation shall be subject to the following penalties:

- An owner duly notified shall be subject to a service shutoff if the required work and inspection are not completed within described timeline. All fines and fees then become the sole responsibility of the specific owner.
- A \$50.00 per week fine for noncompliance.

Any request for an extension of a deadline must be submitted in writing to the Department before the deadline. The acceptable reasons for an extension may be, but not limited to; financial hardship, contractor availability, insurance issues, and/or disputed ownership of water service.

## **4. Distribution System Main Extensions**

- 4.1. The Water Commissioners shall make provision for the construction of new mains, including replacement or enlargement when in their judgment such is required to improve and or maintain system integrity. Costs incurred in pursuing this policy shall be borne by the Water Department.
- 4.2. Construction costs for all other water main extensions shall be borne by the parties to be served by and requesting such extension.
- 4.3. When upsizing of water mains, as covered by Section 4.2, is required to comply with the Water Department master plan, the Water Commissioners may

at their sole discretion elect to compensate the applicant for such difference in material cost. Cost differential shall be determined as a result of competitive bidding to provide actual cost differential between 8-inch pipe and fittings and pipe sizing as required by the Water Commissioners. No cost differential shall be allowed for construction or labor charges. The Water Department shall not pay any portion of State sales tax.

- 4.4. Upon completion of construction, testing, disinfection, receipt of as-built plans and official charging of the mains, they shall become the property of the Lincoln Water Department.
- 4.5. In the past, individual property owners have been allowed to construct private water mains providing potable water and fire protection for private estates. Permission to use and connection of additional services to these private mains has been and shall continue to be vested in the Water Commissioners. Water Department personnel will provide advice and limited assistance in servicing and maintaining such private mains.
- 4.6. Replacement and/or enlargement of private water mains when and if required shall be at the expense of the parties served. When private mains have been replaced in conformity with Water Department requirements they shall become the property of and be maintained by the Water Department.
- 4.7. No new connections or hydrant additions shall be made to any private main less than six (6) inches in diameter.

## **5. Design**

- 5.1. **Water Main Diameter:** The minimum size of water main for providing fire protection and serving fire hydrants shall be eight (8) inches in diameter. Larger size mains shall be provided where necessary to allow the withdrawal of the required fire flow while maintaining the minimum residual pressure of 20 psi at ground level at all points in the distribution system under all conditions of flow.
- 5.2. **Dead Ends:** Dead ends shall be minimized by looping of all mains whenever practical. Dead end mains in excess of 600 feet shall not be permitted.
- 5.3. **Small Mains:** Any departure from minimum pipe size requirements must be justified by hydraulic analysis, future water use, and be considered only in special circumstances with the approval of the Water Commissioners.
- 5.4. **Cross Connections and Interconnections:** There shall be no connection between a public water supply and any non-potable water source unless the public water system is protected by a method meeting the requirements of the MADEP.



- 5.5. Separation of Water Mains and Underground Utilities: Other utilities crossing water mains shall cross at or near perpendicular. There shall be an 8-inch minimum clear vertical dimension and a 5-foot minimum clear horizontal dimension each side between water mains and any other utility pipe, conduit or wire.
- 5.6. Valve Location and Spacing: Sufficient valves shall be provided on water mains so that inconvenience and sanitary hazards will be minimized during repairs. Main valves shall be located at not more than 700 foot intervals. Water main intersections shall be valved each way.
- 5.7. Hydrant Location and Spacing: Hydrants shall be provided at each street intersection and at intermediate points between intersections. Hydrant interval shall not be greater than 700 feet. Hydrants shall be located so that no structure is situated more than 500 feet from a hydrant as measured along the street and driveway. The hydrant lead shall be a minimum of six (6) inches in diameter. Auxiliary valves shall be installed in all hydrant leads. Water mains less than eight (8) inches in diameter shall not have fire hydrants connected to them unless specific approval has been given by the Water Commissioners after consideration of hydraulic analysis.
- 5.8. Where dead-end mains occur they shall be provided with a fire hydrant if flow and pressure are sufficient, or with an approved flushing device. No flushing device shall be directly connected to any sewer. No water service shall be connected beyond the end hydrant.
- 5.9. Air Relief Valves: At high points in water mains where air can accumulate, provision shall be made to remove the air by means of hydrants or air relief valves. Automatic air relief valves shall not be used in situations where flooding of the manhole or chamber may occur.
- 5.10. Surface Water Crossing: Surface water crossings whether over or under water present special problems.
- 5.10.1. Above Water Crossing: The pipe shall be adequately supported and anchored, protected from damage and freezing, and accessible for repair or replacement.
- 5.10.2. Underwater Crossing: A minimum earth cover of two (2) feet shall be provided over the pipe. When crossing water courses which are greater than fifteen (15) feet in width, the following shall be provided:
- 5.10.2.1. The pipe shall be of special construction, ductile, cement-lined, with flexible watertight joints. Pipe shall conform to the requirements of ANSI/AWWA C-151/A21.51. Joints for such pipes shall conform to

the requirements of ANSI/AWWA C-111/A21.51 and be equal to Griffin SNAP-LOC.

5.10.2.2. Valves shall be provided at both ends of water crossing so that the section can be isolated for testing or repair; the valves shall be easily accessible, and not subject to flooding; the valve closer to the supply source shall be in a manhole.

5.10.2.3. Permanent taps shall be made on each side of the valve within the manhole to allow insertion of a gauge for testing to determine leakage and for sampling purposes.

5.11. Cover: All water mains shall have a minimum of five (5) feet of cover.

5.12. Easements: Water main easements shall have a minimum permanent width of twenty (20) feet. There shall also be a work easement of an additional twenty (20) foot width.

## **6. Material and Construction Methods**

6.1. Pipe for Water Mains

6.1.1. All proposed water main and water service piping plans shall have been approved by the Water Department prior to construction.

6.1.2. The Water Department must be advised at least two (2) weeks prior to commencing construction.

6.1.3. The contractor shall furnish, lay, joint, test and disinfect all pressure pipe, fittings (including special castings), and appurtenant materials and equipment, all as indicated on the drawings and as herein specified.

6.1.4. All joints in buried exterior pipelines shall be either push-on joints or mechanical joints, except as indicated otherwise on the drawings and approved by the Water Commissioners.

6.1.5. All joints on bends, gates and castings shall be mechanical joints.

6.1.6. Pipe shall be Ductile Iron Super Bell-Tite joint, Class 52, double cement lined, bituminous coated, 18-20 foot lengths. Pipe shall be manufactured in full conformance with ANSI/AWWA C-151/A21.51, ANSI/AWWA C-111/A21.11 for push-on joints and ANSI/AWWA C-104/A21.4 for cement mortar lining and seal coating.

6.1.7. Unless otherwise indicated or specified, ductile-iron pipe shall be at least thickness Class 52 for pipe twelve (12) inches in diameter and smaller and at least thickness Class 50 for pipe larger than twelve (12) inches in diameter.

6.1.8. Pipe for use with sleeve-type couplings shall be as specified above except that the ends shall be plain (without bells or beads). The ends shall be cast or machined at right angles to the axis.

6.1.9. All pipe and fittings shall be tested at the foundry as required by the standard specifications to which the material is manufactured. The contractor shall furnish upon request to the Water Department sworn certificates of such tests.

6.2. Valves – Note: Gate valves open right.

6.2.1. Gate valves for pipe up to and including eight (8) inch diameter may be either:

6.2.1.1. Double disc “Metropolitan” pattern meeting or exceeding AWWA C-500 (latest revision).

6.2.1.2. Resilient wedge valve meeting or exceeding AWWA C-509, standard for resilient gate valves.

6.2.2. Valves for all pipe over eight (8) inches in diameter shall be butterfly valves meeting or exceeding AWWA C-504 (latest version).

6.2.3. Each buried valve shall be provided with a valve box. Valve boxes shall be of rough, even-grained cast iron and of adjustable, slip, heavy-pattern type. They shall be designed and constructed to prevent the direct transmission of traffic loads to the pipe or valve. The upper or sliding section of the box shall be provided with a flange having sufficient bearing area to prevent undue settlement. The lower section of the box shall be designed to enclose the operating nut and stuffing box of the valve and fit over the gate valve bonnet or butterfly valve operator. The boxes shall be adjustable through at least six (6) inches vertically without reduction of the lap between section to less than four (4) inches.

6.3. Fire Hydrants – Note: Hydrants open left.

6.3.1. Hydrants shall meet or exceed all requirements of AWWA C-502 for dry-barrel fire hydrants in its latest revision.

6.3.2. Hydrant shall open left, with open direction arrow cast on bonnet.

6.3.3. Hydrants shall be American Flow Control Waterous Pacer WB-27 style, or hydrant of Superintendent’s discretion.

6.3.4. Hydrant bury shall be 5.5 feet below grade.

- 6.3.5. Hydrant paint and color shall be Rustoleum Industrial Enamel Regal Red #7765.
- 6.3.6. Main valve shall be 5.25 inches diameter minimum.
- 6.3.7. Hydrant shall have two (2) 2.5-inch diameter hose nozzles 180-degrees apart and one (1) 4.5-inch diameter steamer nozzle all national standard thread. Operating nut shall be a 1.5-inch #7 pentagon.
- 6.3.8. Hydrant shall be traffic type connected at groundline by frangible cast two piece coupling. Breakable bolts are unacceptable.
- 6.3.9. Hydrant shall have two (2) drains 180-degrees apart and shall be bronze bushed.
- 6.3.10. Main valve seat ring shall be threaded into bronze subseat of bushing. Two (2) O-rings, located above and below drain channel shall seal against bronze or epoxy coated iron. Bronze subseat shall be an integral part of elbow and attach independent of low standpipe to elbow flange connection.
- 6.3.11. Elbow shall have 6-inch mechanical joint with accessories.
- 6.3.12. Hydrant extensions shall be able to be installed without need for excavation.
- 6.3.13. Operating nut shall be ductile iron; bronze operating nuts are unacceptable.
- 6.3.14. There shall be a relatively level area to a 4-foot radius around the hydrant. This is to provide stable footing for maintenance and connecting fire lines to the hydrant.
- 6.3.15. Two full sets of disassembly tools shall be supplied by manufacturer at no cost to the Town of Lincoln with the acceptance of any hydrant that is not currently in the system.
- 6.4. Fittings: Shall be compact, ductile iron, Class 350, mechanical joint cement lines. Fittings shall be manufactured in full conformance with ANSI/AWWA D-153/A21-553. Cement lining shall conform to ANSI/AWWA C-104/A21.4. Mechanical joint nuts and bolts shall be high strength, low alloy steel conforming to AWWA/ANSI C-111/A21.11.
- 6.5. Couplings: Shall be made of ductile iron meeting or exceeding ASTM A536-80, Grade 65-45-12 or high quality gray iron conforming to ASTM A48. Gaskets shall be virgin SBR compounded for water and sewer service, meeting

or exceeding ASTM D2000 3 BA715. Nuts and bolts shall be high strength, low alloy steel conforming to ANSI/AWWA C-111/A21.11.

6.6. Tapping Sleeve and Valve: Tapping sleeve shall be a mechanical joint with outlet flange conforming to AWWA C-110 Sect 10-14 with drilling recessed for tapping bivalve. Must be cast or ductile iron and must include a test plug so that valve and sleeve may be pressure tested before tap is made. Rated working pressure for sizes 4x4 through 12x12 shall be 200 psi, 16-inch sizes shall be rated at 150 psi.

6.6.1. A stainless steel full body tapping sleeve may be allowed at the discretion of the Water Department Superintendent. Valves shall be as specified under 6.2 above.

## **7. Construction Methods**

7.1. Trenches shall be excavated to the necessary width and depth for proper laying of pipe. Minimum widths of trenches shall provide at least twelve (12) inch clearance between the sides of the trench and the outside face of the pipe. The depth of trench shall be six (6) inches below the bottom of the pipe barrel.

7.2. If the existing soil below the bottom of the pipe barrel bedding depth is found to be unsuitable the Water Department may order extra excavation below the bedding grade.

7.3. Whenever unstable soil that is incapable of properly supporting the pipe or structure is encountered below a depth of six (6) inches below the bottom of the pipe barrel or below the bottom of a structure, as determined by the Water Department, such soil shall be removed to the full width of the trench and refilled with bank-run gravel containing no stone over four (4) inches in diameter, placed in six (6) inch lifts and thoroughly compacted to 95% maximum dry density. Crushed rock or screened gravel passing a ½-inch sieve may also be used to replace unstable soil. No excavation shall be made below the limits of the excavation called for on the Plans or herein specified without prior approval by the Water Department.

7.4. Pipe and fittings shall be laid accurately to the lines and grades indicated on the drawings. The deflection of alignment at a joint shall not exceed the appropriate deflection as specified in the following tabulation.

**Pipe Deflection Allowances**  
 Maximum permissible deflection for full-length pipe.\*

<b>Size of Pipe</b>	<b>Push on Joint</b>	<b>Mechanical Joint</b>
4-inches	10 inches	16 inches
6-inches	10 inches	14 inches
8-inches	10 inches	10 inches
10-inches	10 inches	10 inches
12-inches	10 inches	10 inches
14-inches	7 inches	8 inches
16-inches	7 inches	8 inches

\*= Maximum permissible deflection for 18-foot length; maximum permissible deflections for other lengths shall be in proportion of such lengths as 18 feet.

NOTE: The above tabulated allowances are more stringent than those allowed by pipe manufacturers.

- 7.5. At all times when pipe laying is not actually in progress, the open ends of pipe shall be closed by temporary watertight plugs or by other approved means. If water is in the trench when work is resumed, the plug shall not be removed until all danger of water entering the pipe has been eliminated.
- 7.6. Push-on joints shall be made up by first inserting the gasket into the groove of the bell and applying a thin film of special non-toxic gasket lubricant uniformly over the inner surface of the gasket which will be in contact with the spigot end of the pipe. The chamfered end of the plain pipe shall be inserted into the gasket and forced past it until it seats against the bottom of the socket.
- 7.7. With mechanical joints, surfaces against which the gasket will come into contact shall be thoroughly brushed with a wire brush prior to assembly of the joint. The gasket shall be cleaned. The gasket, bell and spigot shall be lubricated by being washed with soapy water. The gland and gasket, in that order, shall be slipped over the spigot and the spigot shall be inserted in the bell until it is correctly seated. The gasket shall then be seated evenly in the bell at all points, centering the spigot, and the gland shall be pressed firmly against the gasket. After all bolts have been inserted and the nuts have been made up finger tight, diametrically opposite nuts shall be progressively and uniformly tightened all around the joint to the proper torque by means of a torque wrench.
- 7.8. Prior to the installation of sleeve-type couplings, the pipe ends shall be cleaned thoroughly for a distance of eight (8) inches. Soapy water may be used as a gasket lubricant. A follower and gasket, in that order, shall be slipped over each pipe to a distance of about six (6) inches from the end, and the middle ring shall be placed on the already laid pipe end until it is properly centered over the joint. The other pipe end shall be inserted into the middle ring and brought to proper position in relation to the pipe already laid. The gaskets and followers

shall then be pressed evenly and firmly into the middle ring flares. After the bolts have been inserted and all nuts have been made up finger tight, diametrically opposite nuts shall be progressively and uniformly tightened around the joint by use of a torque wrench of the appropriate size and torque for the bolts.

- 7.9. The correct torque as indicated by a torque wrench shall not exceed the values indicated in the following tabulation:

**Torque**

Nominal pipe size (in.)	Bolt diameter (in.)	Max.torque (ft.-lb.)
3-12	5/8	75
12-24	3/4	90

- 7.10. If effective sealing of the joint is not attained at the maximum torque indicated above, the joint shall be disassembled and thoroughly cleaned, then reassembled. Bolts shall not be overstressed to tighten a leaking joint.

- 7.11. All valves, fittings and appurtenances shall be set and jointed as indicated on the drawings. Where indicated or necessary to prevent joints or sleeve couplings from pulling apart under pressure, anchoring and joint restraint methods shall be utilized. Methods shall be restrained joint systems unless existing pipe material (i.e. asbestos cement pipe) is unsuitable for use with restrained joint systems. The number of joints to be restrained within a certain length of an un-wrapped ductile iron shall be determined by the table below, or the Superintendent.

**Required Length of Restrained Joints from Fittings (feet)**

Pipe Size	90° Bend	45° Bend or Wye Branch	22.5° Bend	11.25° Bend	In-line Valve, Plug or Cap	Tee (Branch)
6"	25	10.5	5	2.5	43	34
8"	33	13.5	6.5	3	55	47
10"	40	16.5	8	4	67	58
12"	47	19.5	9.5	4.5	79	70
16"	59.5	24.5	12	6	101	92

- 7.12. The Contractor shall furnish and install all support necessary to hold the piping and appurtenances in a firm substantial manner at the lines and grades indicated on the drawings or specified.
- 7.13. All fittings shall be backed up with concrete thrust blocks as indicated on the standard details. Where adequate backing cannot be obtained, a suitable joint

restraint system shall be used. Thrust block sides shall be formed with plywood and bearing areas shall not be less than indicated in the standard detail.

- 7.14. Processed sand and ½ -inch stone shall be used for bedding pipes and fittings. A depth of six (6) inches of sand is required below pipes in earth and eight (8) inches depth of ½ -inch stone below pipes in a ledge or rock zone. Processed sand or stone bedding shall be placed to the full width of the trench and continue to an elevation of one (1) foot above the top of the water main and fittings. Above this point backfill shall be suitable material from excavation, or if directed by the Water Department, it may be required to be bank run gravel containing no stones over six (6) inches in diameter. This material shall be thoroughly compacted in twelve (12) inch lifts and carried up to the bottom of materials specified to be placed for paving surfacing.
- 7.15. Minimum cover over water pipe shall be five (5) feet, maximum cover shall be seven (7) feet unless otherwise approved or directed by the Water Department.
- 7.16. Except where otherwise directed, one (1) foot minimum horizontal and vertical clearance shall be provided between the exterior of water mains and other structures. Where a new main passes under or over utilities, it shall cross without use of bends.

## **8. Drawings**

- 8.1. Prior to preparation of drawings pertaining to water main construction, a pre-design conference with the Water Superintendent is recommended.
- 8.2. Three copies of design drawings shall be provided to the Water Department for review and approval prior to commencement of construction.
- 8.3. Drawings shall show:
  - 8.3.1. Location within street layout, easement lines and or property lines.
  - 8.3.2. Piping, fittings, gate valves, hydrants, thrust blocking, corporation and curb stops.
  - 8.3.3. Location of all other existing or proposed utilities.
  - 8.3.4. Elevations and topographical data
  - 8.3.5. Stationing
  - 8.3.6. Radius of turns
  - 8.3.7. Detail cuts of both typical and unusual situations
  - 8.3.8. Service connections in their approximate location
  - 8.3.9. Materials of construction.
- 8.4. As-built drawings: Upon completion of water main construction, a wash-off mylar (4-mil minimum thickness film) as-built plan showing the actual location of the water main and appurtenances as constructed shall be prepared and provided to the Water Department. In addition to the data required to be shown



under 8.3 (above) the drawing shall also show three (3) tie dimensions to all gate valves and curb stops. Water detail shall be highlighted on the plan for ease of visibility. Electronic copies of the as-built plans are also acceptable, if the plans are easily accessible and viewable by standard software applications (e.g. PDF format). Submittal and approval of final as-built plans must be received and approved by the Superintendent prior to acceptance by the Department.

## **9. Pressure and Leakage Test**

- 9.1. This test shall be performed in accordance with AWWA's most recent recommended procedure. Such testing must be witnessed by Water Department personnel.
- 9.2. The pressure and leakage test shall consist of first raising the water pressure to a pressure equal to the rating of the pipe. While maintaining this pressure, the Contractor shall make a leakage test by metering the flow of water into the pipe. If the average leakage during a two (2) hour period exceeds a rate of 10 gallons per inch of pipe per 24-hours per mile of pipeline, the section shall be considered as having failed the test. If a given piece of water main fails after the first attempt, all subsequent inspections by the Water Department will be charged at the prevailing rates.
- 9.3. If the section fails to pass the pressure and leakage test, the Contractor shall do everything necessary to locate, uncover, and repair or replace the defective pipe, fitting or joint, all at his own expense and without extension of time for completion of the work. Additional tests and repairs shall be made until the section passes the specified test.
- 9.4. If, in the judgment of the Water Department, it is impracticable to follow the foregoing procedure exactly for any reason, modifications in the procedure shall be made as required and approved, but in any event the Contractor shall be responsible for the ultimate tightness of the line within the above leakage and pressure requirements.
- 9.5. Under no circumstances shall the contractor responsible for installation perform the pressure and leakage test.

## **10. Disinfection of Mains**

- 10.1. The Contractor shall disinfect all lines carrying potable water.
- 10.2. The Contractor shall furnish all equipment and materials necessary to do the work of disinfecting, and shall perform the work in accordance with the procedure outlined in the AWWA Standard for Disinfecting Water Mains, Designation C-601 (latest revision).

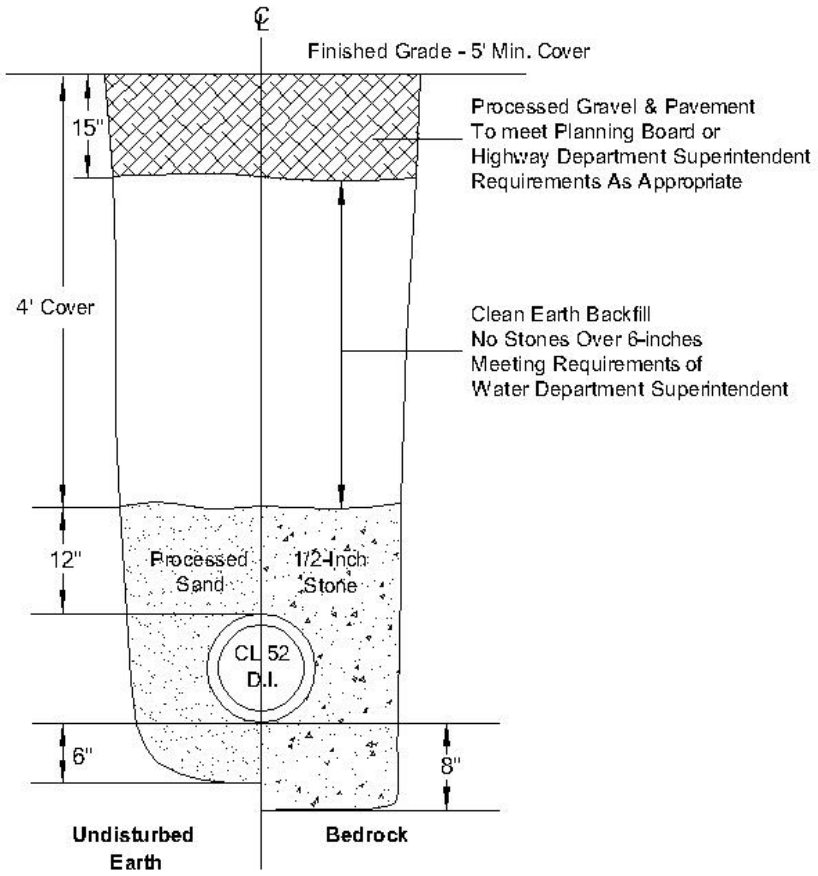
- 10.3. The chlorine dosage shall be not less than 10 ppm after a contact period of not less than 24 hours. Calculations of the required dosage shall be submitted for approval to the Superintendent of the Lincoln Water Department prior to chlorine injection. Injected chlorine shall remain in the mains less than 48 hours.
- 10.4. After treatment, the main shall be flushed with clean water until the residual, reaches current system chlorine level.
- 10.5. During the disinfection period, care shall be exercised to prevent contamination of water in existing mains. No valves shall be operated without the knowledge and permission of the Water Department.
- 10.6. The Contractor shall dispose of the water used in disinfecting and flushing in an approved manner.
- 10.7. The Water Department shall collect, as an affidavit of compliance by the Contractor, bacteriological test results certifying water sampled from the water main to be free from coliform and background bacteria contamination and to have a standard plate count of less than 100. A sampling and analysis fee shall be charged to the Contractor (see Rates & Fee).

## **11. Standard Details**

- 11.1. Trench Detail
- 11.2. Typical Hydrant Installation.
- 11.3. Tapping Sleeve and Valve Detail
- 11.4. Thrust Block Detail
- 11.5. Typical Water Service
- 11.6. Typical Residential Meter Installation

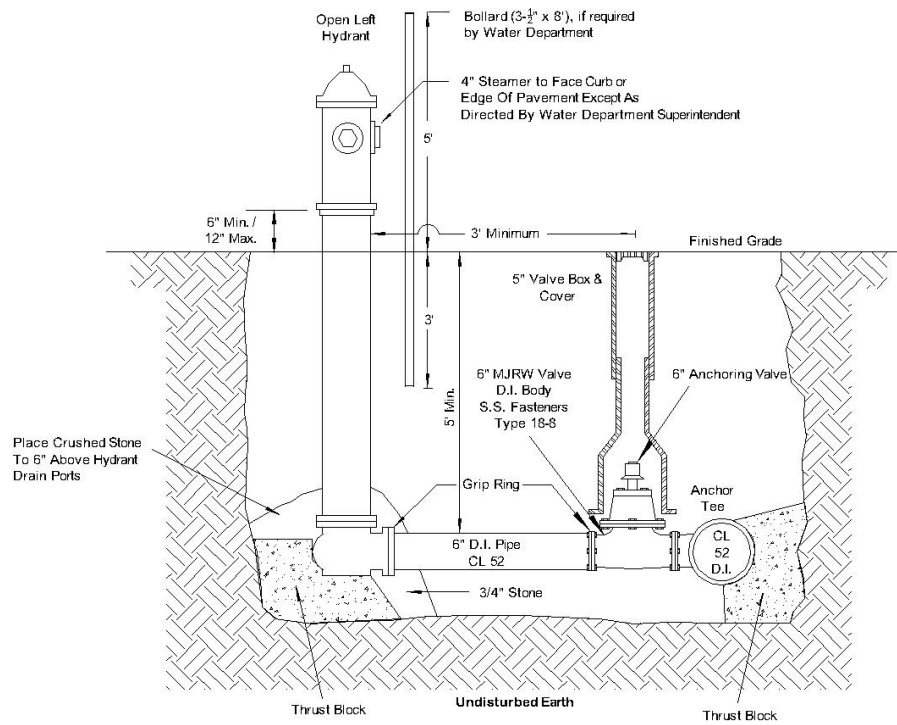
# 11.1 TRENCH DETAIL

NOT TO SCALE



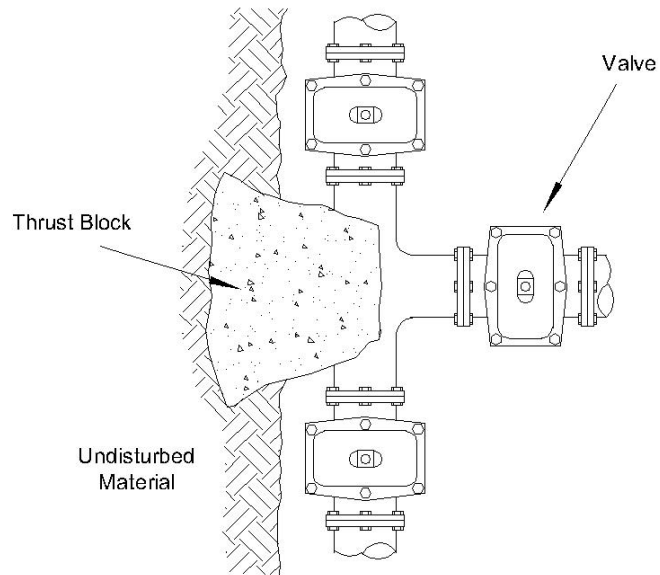
## 11.2 TYPICAL HYDRANT INSTALLATION

NOT TO SCALE



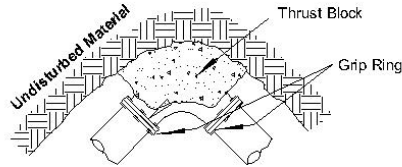
# 11.1 VALVE DETAIL

NOT TO SCALE

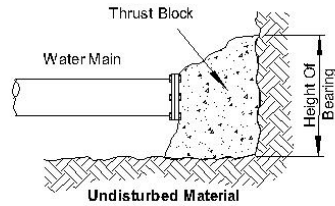


## 11.4 THRUST BLOCK DETAIL

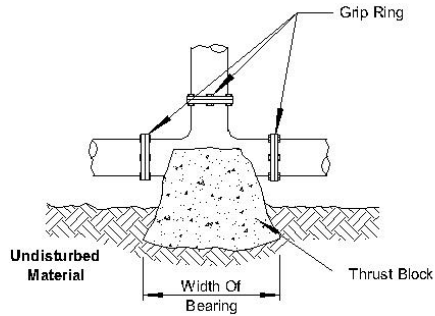
NOT TO SCALE



BEND PLAN



PLUG ELEVATION



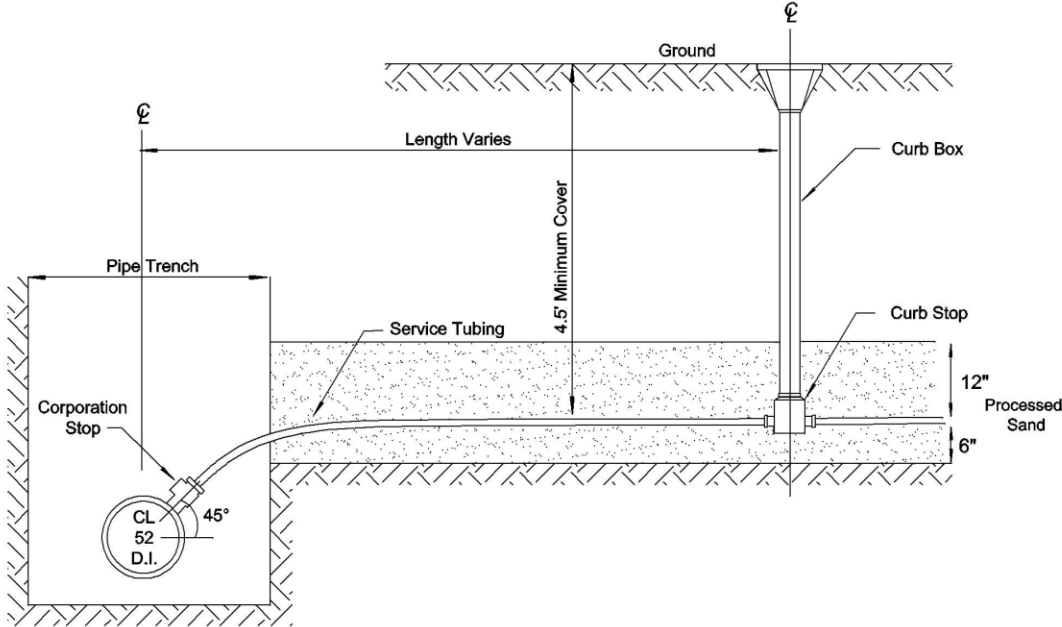
Thrust block bearing areas to be in accordance with table below, unless determined otherwise by the Superintendent because of soil conditions.

TEE PLAN

<b>TABLE OF BEARING AREAS (S.F)</b>			
<b>MAIN SIZE</b>	<b>30° BEND</b>	<b>45° BEND</b>	<b>TEES &amp; PLUGS</b>
< 8-inch	6	3	4
12-inch	12	6	9

# 11.5 TYPICAL WATER SERVICE

NOT TO SCALE



11.6 Typical Residential Meter Installation  
**RESERVED**



## 12. Cross Connection Control

### 12.1. Purpose of Cross Connection Control:

12.1.1. To protect the public potable water supply of the area served by the Water Department from the possibility of contamination or pollution by isolating within its customer(s)' internal distribution system(s) or its customer(s)' private water system(s), such contaminants or pollutants which could backflow or back-siphon into the public water supply system; and

12.1.2. To promote the elimination or control of existing cross-connections, actual or potential, between its customer's in-plant potable water system(s) and non-potable systems, plumbing fixtures and industrial piping systems; and

12.1.3. To provide for the maintenance of a continuing program of cross connection control which will systematically and effectively prevent the contamination or pollution of all potable water systems by cross connection.

12.2. The Water Department shall be responsible for the protection of the public potable water distribution system from contamination or pollution due to the backflow or back-siphonage of contaminants or pollutants, through the water service connection. If, in the judgment of the Water Department, an approved backflow prevention device is required at the Town's water service connection to any customer's premises for the safety of the water system, the Superintendent or his designated agent shall give notice in writing to said customer to install such an approved backflow prevention device. The customer shall, within thirty (30) days, install such approved device or devices at his/her own expense; failure, refusal or inability on the part of the customer to install said device or devices within thirty (30) days shall constitute a ground for discontinuing water service to the premises until such device or devices have been properly installed.

12.3. All industrial and commercial establishments connected to the Lincoln Water System will be required to install, at the service entrance and immediately downstream of the meter and before the first pipe line, a Reduced Pressure Backflow Preventer (RPBP). The back-flow device must be inspected by a certified inspector. The Water Department shall be provided with a copy of the inspection report.

12.4. The design and installation of backflow prevention devices shall be approved by the Superintendent and, if testable, shall be tested by the method prescribed in MADEP Regulations.

12.5. The property owner shall be responsible for applying for and obtaining all necessary approvals and permits for the installation of the backflow prevention devices.

- 12.6. Service of water to any premises will be disconnected by the Water Department if a backflow prevention device required by this regulation is not installed, tested and maintained, or if it is found that a backflow prevention device has been removed or by-passed, or if an unprotected cross connection exists on the premises. Service will not be restored until such conditions or defects are corrected.
- 12.7. The Water Department will conduct testing on these devices twice a year. The owners of the device will be charged for these tests. The Water Department may have these tests performed by a designated certified tester approved by the State of Massachusetts. These devices shall be repaired or replaced at the expense of the customer/user whenever said devices are found to be defective. Records of such tests shall be kept by the Water Department.

### **13. Irrigation Systems**

- 13.1. Moisture Sensing Devices: By December 31, 2014, all irrigation systems, except drip irrigation, shall be equipped with a moisture sensor tied directly into a timing device or controller that will automatically prevent the irrigation system from operating in response to rainfall.
- 13.2. Timing Devices: Irrigation systems shall be equipped with an automatic timing device that can be programmed to automatically limit operation to prescribed schedules and restrictions imposed by the Water Department. Timing operation should include the capability of programming for odd or even numbered days, specific day of the week scheduling, and time of day scheduling.
- 13.3. Backflow prevention device: All lawn irrigation systems connected to the municipal water system shall be provided with a MADEP-approved backflow device. The backflow device must be inspected by a certified inspector and the inspection report retained by the homeowner.
- 13.4. All new lawn irrigation installations must be connected to a separate water meter.
- 13.5. All industrial and commercial establishments are prohibited from the use of in-ground lawn irrigation systems.
- 13.6. No new lawn installations that require irrigation will be permitted in June, July or August, without special permit from the Superintendent.

### **14. Fire Protection**

- 14.1. A combined water service for domestic and fire protection is permissible, however lines must be separated outside the building and be valved such that

each may be turned off without disrupting the service to the other, unless the Superintendent specifically authorizes otherwise.

- 14.2. Prior to fire protection service construction the applicant shall: complete a fire protection service application, pay the Water Department all applicable capital and connection charges, and consult with Water Department staff to coordinate all details pertaining to connection. A minimum of one week notice is required.
- 14.3. Water services and appurtenances that are to be used for fire protection shall have appropriate backflow prevention devices.
- 14.4. Fire protection piping and equipment must be easily accessible for inspection by the Department.
- 14.5. The installation and upkeep of the fire protection system and equipment shall be at the customer's expense.
- 14.6. No water shall be taken or used through private fire systems for testing unless the Superintendent issues written permission. Such test must be conducted in the presence of a representative of the Department.
- 14.7. A water meter is not required on the fire protection piping.

## **15. Abatement Policy**

The Water Department recognizes that a high water bill resulting from an accidental, unpreventable water release can present financial hardship to a customer. While most water releases are preventable, there are certain circumstances when an accidental water release cannot be prevented.

The intent of this policy is to allow consideration of a one-time abatement per account due to accidental, unpreventable water leakage. This policy only applies to leaks that have occurred within any previous, immediate three (3) month period. All water that passes through the meter will be charged to the property owner.

In the event the abnormally high consumption has occurred due to accidental, unpreventable water leakage not caused by customer negligence, ignorance or unfortunate circumstances, as determined by the Department, the Department shall consider on a case-by-case basis, a one-time abatement, per account, using either of the following criteria:

- the charge for the excess water used shall be billed at the lowest tiered billing rate, or

- the amount of water used above the average of at least the previous three years' consumption history (for similar billing periods), billed at the previously achieved tiered billing rate.

Pursuant to the Lincoln Water Departments Rules & Regulations, all appeals to water bills must be submitted in writing within 30 calendar days of the utility bill date. Failure to make a timely request shall be a waiver of the customer's right to seek abatement. The request must state the reason for the abatement request and the burden of proof for the abatement shall rest upon the applicant. Customers seeking an abatement of charges due to a leak must submit repair invoices and proof of payment with their application.

No application for abatement will be accepted on any account unless all amounts due on that account, including interest and penalties, for all billing periods prior to the contested period covered by the abatement application have been paid in full. Customers are encouraged to pay the contested bill on or before the due date to avoid interest charges. A customer's inability to pay a water bill shall not be grounds for abatement under this policy.

Should all or part of an abatement application be granted, any reimbursement to the customers, at the customer's option, would be credited against future bills or refunded.

## 16. Rates & Fees

### 16.1. Capital Charges

16.1.1. The following schedule of capital charges shall be made for all new services connecting to the water system:

<u>Pipe Size</u>	<u>Charge</u>
1-inch.....	\$2,500
1.5-inch.....	\$3,750
2-inch.....	\$5,000
4-inch .....	\$10,400
6-inch .....	\$20,000
8-inch .....	\$40,000

16.1.2. In the case of apartment, condominium or multi-unit building (nursing homes and the like), connections when more than one unit is connected to a service, each unit shall be assessed the prevailing minimum capital charge. The minimum charge shall prevail regardless of the metering arrangement.

16.1.3. Fire Suppression Lines whose service is solely to provide water for indoor fire suppression system will be charged \$1,000 per diameter inch:

<u>Pipe Size</u>	<u>Charge</u>
4-inch.....	\$4,000
6-inch.....	\$6,000
8-inch.....	\$8,000

16.2. Tapping Charges

16.2.1. Work performed by the Water Department in tapping a new service to a water main and extension of the new service to the property line (i.e. Street right-of-way line) shall be charged at the prevailing rate.

<u>Service Pipe Size</u>	<u>Cost</u>
1-inch.....	\$2,000*

\*Or actual cost if exceeded.

16.2.2. When a developer installs water service in conjunction with a water main extension and the Water Department does not participate in performing such service construction, the tapping charge shall be waived.

16.2.3. It is the responsibility of, and at the cost of, the applicant and/or his contractor to install water service mains greater than 1-inch, from the existing main to the building.

16.2.4. Road cut permit application and all costs associated with meeting Highway Department regulations are to be borne by the applicant.

16.2.5. All fees shall have been paid prior to connecting any water service to a water main.

16.3. Water Usage Rates

16.3.1. Base Charge: A minimum base charge per billing period shall be assessed for water service from the date the water is turned on, regardless of the amount of water used, according to the following schedule.

<b>Base Charge</b>	
<u>Meter Size</u>	<u>Charge</u>
5/8", 3/4"	\$30.00
1", 1 1/2", 2", 3"	\$30.00

16.3.2. Usage Charge: The customer shall be charged for water usage in accordance with the following schedule:

<b>Usage Charges</b>	
<u>Gallons</u>	<u>Per Unit Rate</u>
0 - 20,000	\$4.06 per 1,000 gallons
20,001 - 40,000	\$8.57 per 1,000 gallons

40,001 + over

\$20.02 per 1,000 gallons

16.3.3. A flat rate of \$4.06 per 1,000 gallons of usage will be applied to meters serving more than two (2) dwellings and public buildings.

16.3.4. A flat rate of \$20.02 per 1,000 gallons of usage or the highest tiered rate, whichever is greater, will be applied to irrigation meters.

16.3.5. In accordance to Chapter 40, Section 42A-C of the General Laws of the Commonwealth of Massachusetts, water bills and charges in arrears of 45 days (or greater) shall be subject to 1.5% per month late charge. If such overdue water bills or water charges are placed in lien, an additional filing fee of \$25.00 shall be charged to the lien amount.

#### 16.4. Miscellaneous Charges

16.4.1. Special services such as, but not limited to, thawing frozen water services, or water shut off or turn on by Stand-by Personnel (outside of regular working hours) shall be billed at the Water Department employee's applicable overtime wage rate and hours.

16.4.2. After Hours Work: Work scheduled outside of regular working hours will be billed at a rate of \$200 per staff member for the first four hours. Services beyond the four (4) hour duration will be charged at \$50 per hour per person.

16.4.3. Water Service Operation: Turning on of water service during normal Water Department work hours subsequent to shut off under Section 1.10 is \$40.00.

16.4.4. Unlawful Water Use. Unlawful use of water, including but not limited to meter tampering or hydrant opening, shall incur a fine of \$1,000 or triple the amount of damages, whichever is greater.

16.4.5. Backflow Devices: Backflow testing will be charged at a rate of \$50.00 per test, regardless if the device passes or fails.

16.4.6. Bacteria Sampling: A bacterial sampling and analysis fee of \$30 per sample shall be charged to the Contractor.

16.4.7. Claims for Adjustments: All claims for adjustments of water bills shall be made to the Department in writing within 30 days of receipt of the bill.

16.4.8. Broken Meters: If a meter fails to work, the customer shall be charged a user fee based on the average daily consumption of water as shown by the meter when it was working, for the corresponding billing period of the preceding year.

16.4.9. Real Estate Transfers: The buyer's attorney must contact the Department to schedule the final meter reading appointment at least three days prior to closing and provide the billing information for the new owner. Final readings will be conducted on Tuesday and Thursday, with the interim water bill available the following day after 12:00 PM. The interim bill must be picked up in person at 80 Sandy Pond Road. A fee of \$30 will be charged for each real estate transfer reading.

16.4.10. Hydrant Use: It is unlawful to operate a hydrant without the prior approval of the Superintendent. Filling of tanker trucks will be supervised by Department staff and charged the following fees:

<1,000 gallons:	\$25.00 per fill
1,000 – 2,000 gallons:	\$40.00 per fill
>2,000 gallons:	\$60.00 per fill

16.4.11. Fire flow test: Fire flow locations must be approved by the Superintendent prior to the start of the test. Tests will only be conducted after 8:00 PM. The Department will provide one staff member to operate the hydrant(s) and assist in collecting test information. The contractor is responsible for providing necessary gauges, meters, etc. for the test. The test fee is \$100 and After Hours Work fees apply (see 15.4.2).

16.4.12. RF Meter Opt-out fee: A \$15 per billing cycle fee will be added to the water bill for those analog meters that must be read manually by Department staff.

16.4.13. Installation of a Non-RF Meter: A one-time fee of \$50 will be charged to the customer to cover the costs of Department staff time and materials needed to install a non-RF meter and wire an external reader. If the RF meter to be removed has been installed for less than 7 years, a \$200 meter fee will be assessed in addition to the installation fee.

16.4.14. Meter Replacement: Water meters that are lost, damaged or otherwise rendered inoperable, including but not limited to negligence, tampering with or vandalizing, will be replaced by the Department and the customer will be charged the market rate for the purchase of an equal-sized meter.

16.4.15. The preceding usage rates and charges may be amended from time to time by the Water Commissioners and shall become effective upon the Commissioners vote to so adopt.