

REGULATIONS FOR USERS OF THE NORTHBOROUGH WATER SUPPLY AND DISTRIBUTION SYSTEM

Adopted by the Water and Sewer Commissioners
of the
Town of Northborough, Massachusetts
November 1990
Revised August 1996
Revised September 2016
Adopted January 2023

A. AUTHORIZATION AND SCOPE

Under the authority derived from Massachusetts General Laws (MGL), Chapter 41, Section 69B, the Water and Sewer Commission of the Town of Northborough, Massachusetts, (hereinafter referred to as the “Commission”) has adopted the following rules and regulations governing the use and development of its municipal water supply and distribution system. These regulations are intended to establish policies under which the Water Department (hereinafter referred to as the “Department”) will provide water service from the system. Regulations are also adopted to provide for the extension of the distribution system by private concerns into portions of the service area, which are not currently served by the water system.

B. DEFINITIONS

Applicant: Any person, business or organization seeking water supply from the Town of Northborough’s public water system.

Approved: Accepted by the Town as meeting an applicable specification stated or cited in this regulation, or as suitable for the purpose use.

Backflow: The flow of water or other liquids, mixtures, or substances into the distributing pipes of a potable water supply system from any other source or sources other than its intended source.

Backflow Prevention Device: A device or means designed to prevent backflow or back-siphonage.

Cellar Valve: Is the main valve located immediately inside the structural wall of the premises. The cellar valve is the property of and maintenance responsibility of the Customer.

Commission: Is the Northborough Water and Sewer Commission.

Contamination: Impairment of the quality of the potable water by sewage, industrial fluids, waste liquids, compounds or other materials to a degree which creates an actual hazard to the public health through poisoning or through the spread of disease.

Contractor: The person, firm, or corporation contracting with the Applicant/Customer to provide labor, equipment, materials, and superintendence necessary for performance of work.

Cross Connection: Any physical connection or arrangement of piping or fixtures between two otherwise separate piping systems, one of which contains potable water and the other non-potable water or industrial fluids of questionable safety, through which, or because of which, backflow or back-siphonage may occur into the potable water system.

Curb Stop: A curb stop is an in-ground structure at the property line, which contains a service valve and is the connecting point between the water service line (Town's Public Water System) and service pipe (Customer's connection). The curb stop and service valve are the property of and maintenance responsibility of the Department (Town). All pipes, valves and appurtenances from the curb stop to the building are the responsibility of the Customer.

Customer: Any person, partnership, firm, corporation, trust (real estate or other body) or organization of any type in which the owner(s) is supplied with water by the Town's Public Water System. The Customer is normally the record owner of the property being supplied with water and responsible for the account.

Department: Is the Northborough Department of Public Works.

Director: Is the Director of Public Works, or his designated agent, in charge of the Northborough Water System.

Double Check Valve Assembly: An assembly of two independently operating approved check valves (mechanical one-way flow device), with tightly closing shut-off valves on each side of the check valves, plus properly located test cocks for the testing of each check valve.

Drawings: The drawings, plans, specifications, and other supporting documents submitted to the Department by the Applicant/Customer/Contractor for the work.

Hazard: Any actual or potential threat of contamination to the potable water system in a public system, which in the opinion of the Massachusetts Department of Environmental Protection, The Department or the Northborough Board of Health, which could create a danger to the health and well-being of the Town's water Customer.

MADEP: Is the Massachusetts Department of Environmental Protection.

Outdoor Water Use Meter: Outdoor water use meters are standard water meters used to measure outside water that is used for irrigation, pool filling, car washing, etc. where water is not returned to the sewer. An Outdoor Water Use Meter is also referred to as a Secondary or Deduct Meter.

Premises: The industrial, commercial, or residential property including any building or buildings being serviced with water from the Northborough Public Water System.

Public Water System: A system for the supply and delivery of potable water for public consumption and fire protection.

Reduced Pressure Principle Device: An assembly of two independently operating approved check valves, with an automatically operating differential relief valve, between the two check valves, and tightly closing shut-off valves on either side of the check valves, plus properly located test cocks for the testing of the check and relief valves.

Service Line: A service line is a pipe that connects the water supply main to the curb stop. The service line is the property of and responsibility of the Department (Town).

Service Pipe: A service pipe is a pipe running from the curb stop to the cellar valve, which is located immediately inside the structural wall of the premises. The service pipe is the property of and maintenance responsibility of the Customer.

Town: Shall include elected and appointed officials, Department of Public Works staff, Water Division Staff, Board of Water and Sewer Commissioners and Authorized agents.

Water Distribution System: Network of water supply mains, booster pumps and storage tanks, used to deliver water to the Customers.

Water Main: The water pipe that is a part of the Town water distribution system to which a service line is connected to supply water to the premises.

Water Meter: A device for measuring and recording the flow of water from the municipal supply to the premises.

Water - Non-Potable: Water which is not safe for human consumption, or which is of questionable quality and safety.

Water – Potable: Water from a source which has been approved by the MADEP.

Water – Used: Any water supplied by the Town from the Town water system to a Customer's water system after it has passed through the Customer's meter and is no longer under the sanitary control of the Town.

Water System Supervisor: The Water System Supervisor or his designated agent is the person in responsible charge for operation, maintenance, and management of the Northborough Water System.

Water and Sewer Commission: The Water and Sewer Commission consists of three members appointed by the Town Administrator. The Commission is responsible for the care, superintendence, development and management of the Town's water supply and facilities and the Town's sewerage system.

C. GENERAL REGULATIONS

1. Service Area

The Department may provide water service to any Customers located within the corporate boundaries of the Town of Northborough. Water service may be provided to Customers located wholly or partially outside of the Town of Northborough who upon approval will investigate the negotiation of an inter-municipal agreement with the affected city or town. The Department may own, operate, and maintain water mains and appurtenances located within the corporate boundaries of adjoining towns as allowed by applicable statutes. The Department may make emergency interconnections to adjacent water systems for the purpose of providing and being provided water as conditions warrant. The Department shall not be obligated to provide water service to Customers within the Town of Northborough, which are located beyond the physical limits of the existing distribution system. The service area of the water distribution system is limited to areas below elevation 350 feet (referenced to the National Geodetic Vertical Datum - NGVD) for purposes of providing adequate water pressure. Applicants for water service agree to construct at their own expense the improvements to the water distribution system necessary to provide water service so long as the design of such facilities has been approved by the Town and MADEP and so long as the construction of any improvements is acceptable to the Town.

2. Description of Service

The Department shall provide to its Customers water of a quality that is in full accordance with the requirements of the Safe Drinking Water Act (SDWA) and any additional water quality standards of the MADEP. It is also the goal of the Department to provide water without interruption to its Customers in quantities and at pressures adequate to satisfy their requirements. However, the Department reserves the right to temporarily suspend service in order to make repairs or improvements to the system. It shall be the responsibility of the Customer to notify the Department of the need for advance notice of such interruptions of service if a shutdown would cause a special hardship to the Customers.

3. Application for Service

Persons desiring to obtain water service from the Department shall request service with the Department at its Business Office at the Town Offices at 63 Main Street. The request shall be reviewed by the Director or his/her appointed representative. If the service connection can be provided in full accordance with these regulations, the Director or his/her representative shall approve the application, and the applicant may proceed with the installation of the service connection after payment of all applicable charges and fees as described in Section 5.

An Application for Water/Sewer Service shall be necessary when a new service connection is desired for a property which does not currently receive water service or when an additional service is requested, or upgrades or repairs are desired to an existing service for a property already receiving water service. No secondary (or deduction) meters will be allowed.

Where an existing service to a property is inactive, no application for service shall be necessary to reactivate it; however, any unpaid charges relative to the service shall be paid and any

changes in billing information shall be made before the service will be reactivated by the Department.

4. *Approval of Persons Authorized to Make Connections to the Public Water System*

Drain layers of established reputation and experience will be approved by the Town as Drain Layers authorized to perform work as outlined in the Application for Approved Drain Layer.

The Drain Layer shall comply with all applicable Town, State and Federal codes, rules and regulations including fees and bonds as defined in Appendix B.

All Drain Layers are required to give personal attention to all installations and shall employ only competent and courteous workers.

All Drain Layers shall be required, if, during their work, they should encounter any previous violations of this Regulation, to give a full written report to the Department within twenty-four (24) hours of the encounter.

All Drain Layers shall have the necessary equipment, tools, and material to perform this work.

5. *Establishment of Water Rates and Other Fees and Penalties*

a. Water Rates

The Commission shall establish a water rate schedule upon which Customers will be billed for water usage. The water rates shall be consistent with the costs related to the production and distribution of potable water meeting the current requirements of the SDWA regulations and the continuous provision of sufficient quantities of water to its Customers at adequate pressure. Water rates will be on file in the Business Office of the Department, and copies will be made available to Customers upon request. Water rates will be reviewed by the Commission on an as needed basis. Water system Customers will be notified of changes to water rates at least fourteen (14) days prior to the date on which they are to become effective. Notification shall be by means described in Section 6 of these regulations.

b. Betterment Charges (Water Privilege Fee)

Property owners will be assessed betterment charges in accordance with MGL Chapters 80 and 80A and Chapter 519 of the Acts of 1975. The Commission shall establish and revise these charges as necessary to offset the actual costs related to distribution system extension or construction of other facilities necessary to provide adequate water service.

c. **Application Fees**

The Commission may establish a service application fee, which shall be submitted with the Application for Water/Sewer Service. The application fee will offset costs to the Department related to the processing of the application, such as analysis of the hydraulic impact of the service on the water system.

d. **Meter Testing Fees**

Department Customers may request the testing of their water meter for accuracy if it is suspected of being registering improperly. Procedures for Customer-requested meter tests are described in Section 9. Charges related to these tests shall be established by the Commission and be on file in the Department Business Office. The cost of such testing shall be borne by the Customer following the performance of the meter test. The amount of this fee shall be established by the Commission and posted in the Department Business Office.

e. **Flow and Pump Tests**

The Town has established a fee for each flow or pump test when water is pumped or discharged to waste as shown in Appendix B. Fees must be paid in full at the Department's Business Office prior to any testing. Flow and pump tests must be approved and witnessed by the Department. It shall be the responsibility of the applicant to ensure coordination of the tests as needed with the Department.

f. **Special Fees**

The Commission has established additional fees related to special Department services. Such services may include fire services, temporary services and specially requested meter readings or reactivation of service after shutoffs due to violations of regulations. All Customers shall be notified of the adoption and amendments of special fees by the notice procedures described in Section 6 at least one month before they are to become effective. Special fees shall be on file in the Department Business Office and noted in Appendix B.

g. **Penalties**

The Commission may establish penalties to be assessed to Customers for violations of these regulations. The amounts of such penalties shall be on file in the Department Business Office and noted in Appendix B.

6. Notification

a. **Notification to Customers**

It will be necessary at times for the Department to give notification to its Customers. The manner in which this notification is given will depend on the nature of the

information to be conveyed. Notifications to Customers, which are likely to be necessary, and the manner of notification are indicated in Table 1. For each type of notification, the Department may use one or more of the notification methods listed.

Table 1

NOTIFICATION TO CUSTOMERS

Type of Notice	Permissible Method of Notification
Notice of Violation of Regulations	Certified mail, telephone or in person
Notice of Shutoff	Regular mail, certified mail
Notice of Interruption of Service for Distribution System Maintenance or Construction	Newspaper of local circulation Insert with bill for water service Telephone or in person by Department employee Regular/electronic mail Radio and/or television announcement Department Website Emergency/Community Notification System
Notice of Amount Due on Account (Invoices)	Regular mail
Notice of Non-Payment of Invoices	Telephone or in person by Department employee Regular mail
Notice of Regulation, Rate or Fee change	Newspaper of local circulation Insert with bill for water service Posting at Town Hall Regular mail Department Website
Safe Drinking Water Act Notice (SDWA)*	Refer to the SDWA for specific requirements.
Water Use Restriction Notice	Newspaper of local circulation Posting at Town Hall Radio and/ or television announcement Department Website
Maintenance Work which may affect Level of Service Provided	Newspaper of local circulation Insert with bill for water service Telephone or in person by Department employee Radio and/ or television announcement Town Website Emergency/Community Notification System
Response to Complaints, Inquiries and General Correspondence	Telephone or in person by Department employee Regular/electronic mail
Emergency Notices	Newspaper of local circulation Telephone or in person by Department employee Radio and/ or television announcement Town Website Emergency/Community Notification System

* Notification will follow the requirements of the Safe Drinking Water Act.

b. Customer Communications with the Department

Customers may contact the Department of requests for service, requests for disconnections of service, complaints, requests for meter tests, invoice inquiries, etc., during normal business hours. Customers may contact the Department to report a water emergency after normal business hours by contacting the Northborough Police Department which will notify the on-call personnel.

7. *Billing Procedures*

a. Billing

Billing for water usage shall be calculated using the meter inside the Customer's premises.

b. Billing Frequency

The Department shall issue bills for water usage on a regular basis, the frequency for which shall be established by the Commission. Bills will be mailed to the property owner. Payment for bills shall be due thirty days after the date of issuance. The Commission may alter the billing frequency for all Customers of certain classes of Customers as the needs of the Department may dictate. Customers shall be given at least three months' notice of changes in billing frequency.

c. Charges for Late Payment

The Commission may establish and assess charges for invoices, which remain unpaid after the due date. Penalty for late payments shall be in the form of a lump sum fee as indicated in Appendix B. Charges for late payment shall be based on the total amount due to the Department and shall be charged 14 percent (%) late fee annually on the outstanding balance for the period that the invoice remains unpaid. Invoices which remain unpaid one year after the billing date shall result in the placement of a lien against the property for the amount legally due to the Department.

d. Termination of Service

Unless special provisions have been made for late payment of water bills, the Department may, after adequate notice, order that the water service be shut off until payment of outstanding invoices and late payment charges have been made.

e. Estimated Bills

In the event that access to a water meter cannot be attained for reading, or if a meter has obviously stopped or otherwise malfunctioned, the Department may issue an estimated bill based on the water use history of the Customers. Regulations concerning access to premises for purposes of meter reading or inspection are included in Section 9.

The Department reserves the right to increase the estimated amount of water usage by not more than 50% of the amount of a previously estimated usage if access to a meter cannot be gained for two or more consecutive billing periods.

f. Minimum Billing Amount

The Commission may establish a base charge to be assessed to all Customers. The base charge shall be of such an amount to ensure that the account will generate sufficient revenue to offset the costs related to meter reading, billing, and other necessary functions of the Department.

g. Disputed Bills

Bills for water use or other charges may be disputed by Customers by contacting the Department in writing describing in detail the reason the disputed bill is believed to be incorrect. Correspondence must be received at the Department Business Office or postmarked within 30 days of the date of the invoice in order for an adjustment of a bill to be considered by the Department. The Department reserves the right to deny any request for adjustments to bills for which written notice has not been received within the specified period. The Customer may request a hearing before the Commission to discuss a disputed bill. Such hearings shall be held at regularly scheduled monthly meetings of the Commission.

Bills that have been formally disputed as described above shall not accrue late charges unless the Department determines that the amount billed is correct. In such cases late payment charges shall be retroactive to the date of the invoice.

h. Low Income Discount

Under the low-income discount policy eligible Customers will have the quarterly base charge waived. To be eligible for the discount the applicant must meet the following requirements.

1. The applicant is a residential Customer.
2. The applicant must be a Northborough resident who receives water directly from the Town at their primary residence.
3. The applicant must be currently enrolled in one of the following qualifying low-income programs and be able to provide proof of benefit.
 - Low Income Energy Assistance
 - Home Energy Assistance
 - Public Housing Benefit
 - Veterans' Service Benefit
 - Veterans' DIC Surviving Parent or Spouse
 - Veterans Non-Service Disability Pension
 - Women, Infants and Children

4. To receive the Low-Income Discount, the applicant must reapply and verify qualification status every year as of January 1.

i. Final Bills

1. Payment for final bills shall be made by secured means (cash, lawyer's check, bank check or similar); personal checks will not be accepted.
2. Requests for final bills shall be submitted to the Department no less than three (3) business days prior to the required date of the bill. Processing of requests received less than three (3) business days prior shall be considered an urgent request, completion of which will be at the Director's discretion, and subject to a \$50 fee which is in addition to the final bill fee defined in Appendix B.

8. Service Connections

a. Installation or Removal

Water services shall be installed at the expense of the Customers by an authorized Drain Layer approved by the Department for such installation. The installation or removal of water services shall be in full accordance with these requirements and as directed by the Department. The installation and removal shall be inspected by Department personnel. All authorized Drain Layers shall comply with current United States Department of Labor Occupational Safety and Health Administration (OSHA) regulations. The Department will require the authorized Drain Layer to repair and or restore any work within a twelve (12) month period of time should the work not remain in a suitable condition as determined by the Director.

A separate and dedicated service line shall be provided for each customer lot. Sharing of service lines by more than one customer lot is prohibited. A single meter (master meter) shall be required for each service connection. The Department shall not allow more than one municipal meter per service line without a specific exception granted by the Director.

Removal of a service connection shall include full removal of the service line and curb stop from the customer building to the corporation. The corporation shall be exposed, closed, and strapped to the main under witness of the Department.

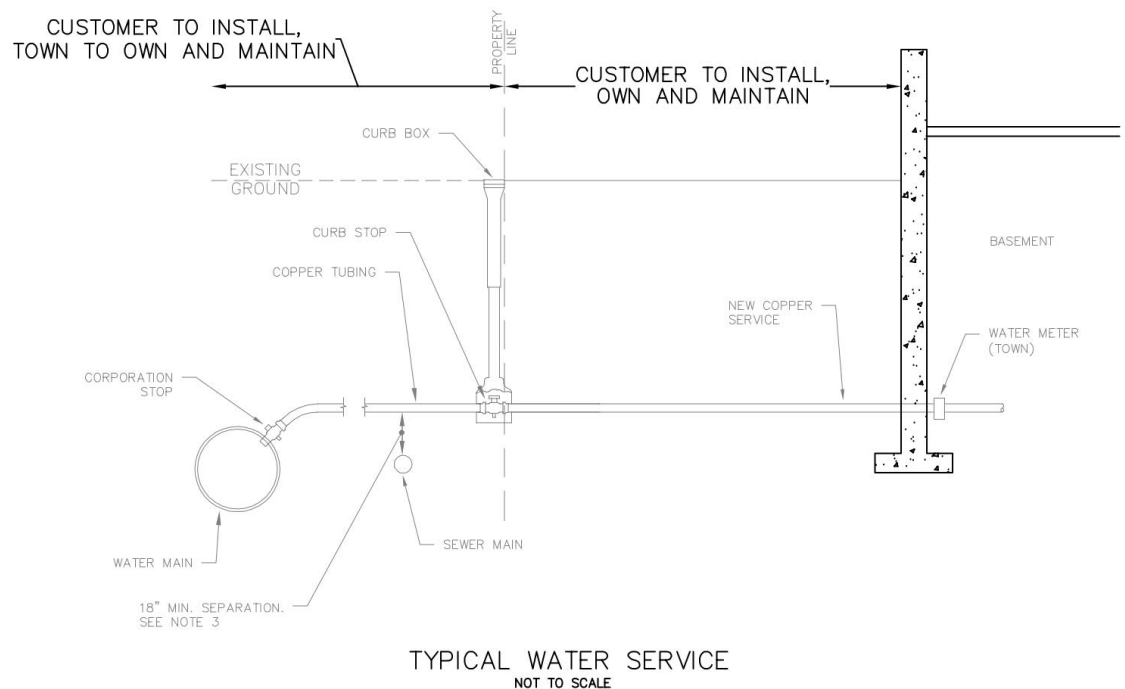
b. Ownership and Responsibilities

The portion of a water service between the water main to which the service is connected, and the Customer's side of the curb stop which is located within a public right of way, shall be owned by the Department, and the cost of any maintenance or repair of this portion of the water service shall be the responsibility of the Department.

That portion of a water service between the Customer's side of the curb stop and the inlet side of the water meter shall be considered to be the property of the Customer.

Maintenance and repairs to this portion of the water service shall be performed at the expense of the Customer by an authorized Drain Layer approved by the Department to perform such repairs. Water meters, including all appurtenances for remote reading, shall be considered to be the property of the Department. The Customers shall be responsible for the protection of the meter and its appurtenances from damage due to activities on the premises, freezing and other possible causes.

All water pipes and appurtenances on the Customer's side of the water meter shall be the property of the Customer and shall be maintained by the Customer at his own expense. The Department reserves the right to inspect such piping and appurtenances for purposes of cross connection control, or other reasons which may affect the safe and efficient operation of the water system.



- NOTES:
1. PIPING, FITTINGS, EQUIPMENT AND CONNECTIONS FROM THE CURB STOP TO THE BUILDING WILL BE INSTALLED BY THE PROPERTY OWNER. IT IS THE RESPONSIBILITY OF THE PROPERTY OWNER'S LICENSED DRAIN LAYER TO INSTALL THIS PORTION OF THE SERVICE. THE TOWN'S PORTION OF THE SERVICE IS SHOWN ONLY FOR REFERENCE PURPOSES.
 2. SAND BEDDING TO BE INSTALLED ALONG LENGTH OF SERVICE PIPE TO A DEPTH OF 6-INCHES ABOVE AND 6-INCHES BELOW THE SERVICE PIPE.
 3. WATER AND SEWER SHALL BE INSTALLED WITH MINIMUM 10-FOOT HORIZONTAL AND 18-INCH VERTICAL SEPARATION, PER DEP GUIDELINES.
 4. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.

c. Requests for Changes to Size and/or Location of Meters

The Customers may request that the size or location of existing water meters be changed to accommodate changes in activities at or uses of the property served. Such

changes will be reviewed by the Department or its representative. All work will be the responsibility of and at the expense of the Customers.

9. METERS

a. General

1. All water must be metered, and the meter and associated reading device will be furnished by the Department at the expense of the Customer. Installation of the meter is the responsibility of the Department after the installation of any required shut off valves, flanges, or pipe supports have been installed by the Customer. The Department reserves the right to specify the size and type of service and meter.
2. The Department shall test all water meters on a regular basis to assure that water produced by the system is accounted for in accordance with industry standards and to assure that production and distribution costs are fairly allocated among users of the system. All water meters of 2-inch nominal size or less shall be tested or replaced at a frequency of not less than once per 15 years. Tests of meters of less than 2-inch nominal size performed solely as a matter of routine maintenance in fulfillment of this requirement shall be at the expense of the Department.
3. The Customers must provide a minimum of 72 hours' notice for the Department to install, repair, remove or replace meters within the property. The water service must be plumbed and ready for meter installation prior to contacting the Department. The Department is not responsible for any damage done to finish surfaces as a result of the meter installation.
4. All Customers shall keep their meters and fixtures in good repair and protected from damage at their own expense and will be held liable for all damages resulting from their failure to do so.
5. The Customers shall provide a location for a meter easily available for reading and for repair, said location to be subject to the approval of the Department. A minimum 3 foot by 3 foot by 3-foot access way is required.
6. The Customers must allow access to the Department for all work related to the water meter and water service. If the meter location is inaccessible to the Department personnel, the Customers shall remove obstructions and provide a safe working environment for the Department. The Customers must provide access within 24 hours of the time it has been determined by the Department the area is inaccessible.
7. All meters shall be equipped with remote reading capability. This includes communication devices that transmit meter readings so that meters may be read remotely. The Department maintains the right of access to the premises in order to verify the consistency of the meter registration with the remote registration.

8. Meters may be removed for repairs at any reasonable time by the Department or authorized agents and may enter any property served by the Town at reasonable hours for purposes of inspection or repair.
9. No meter or reader shall be disconnected or moved except by authorized Department employees.
10. All meters must be installed to provide optimal operation. Water meters shall have a ball valve located before and after the meter for the purpose of isolating the meter for repair and replacement. Ball valves shall be furnished by the Customers and approved by the Department.
11. If a meter installed on the Customer's premises is stolen or is damaged in any way due to the act of negligence of the Customers, the cost of repairs or replacement shall be paid for by the Customers.
12. Where a Customer is supplied with more than one service, each equipped with a meter, each meter shall be considered separately in the computation of charges.

b. Meter Tampering

1. Tampering with, hindering, altering or intentionally damaging water meters are offenses subject to fines and penalties under MGL Chapter 165, Section 11, as amended by Chapter 374 of the Acts of 2010 along with the authority provided under MGL Chapter 40, Section 39G.
2. If a meter is tampered with by the Customers or a person within the water Customer's property, the Customer is responsible for notifying the Department and replacing the meter in accordance with the water regulations. If the meter becomes out of order and fails to register correctly from the tampering, the Customer shall be charged at the average consumption as shown by the meter when in order.
3. The fines for meter tampering shall be as indicated in Appendix B.
4. Water meters believed to be registering incorrectly shall be tested by the Department or its appointed representative. The Customer may request the testing of its meter with the understanding that the cost of such be borne by the Customer unless the meter is found to be over-registering more than 2% faster. If a meter for a single-family residence is found to be under registering more than 2%, the Customer may be billed for the undercharge for the period that the meter was in service, but not exceeding six months. When a meter in a non-single-family residence is found to be registering more than 5% slow, the Customer may be billed for the undercharge for the period that the meter was in service, but not exceeding six months.

The Customer may have the right to witness the testing of his meter or to have his representative witness the test. The Department will deliver to the Customer

within 14 days of the test the results of the meter test in writing. If a meter fails to register water use, the Department may bill the Customer an estimated amount based upon the Customers' consumption during the same billing period of the previous year or another comparable period.

c. Commercial and Industrial Meters

1. Commercial and Industrial meters shall be furnished by the Department at the expense of the Customer. Installation and maintenance shall be the responsibility of the Customer. Size, type, and location will be as approved by the Department based on the American Water Works Association (AWWA) Manual of Water Supply Practices M22 (Sizing Water Service Lines and Meters) and M6 (Water Meters - Selection, Installation, Testing, and Maintenance) or as amended. All meters will be remote read as required by the Department.
2. Commercial meters shall be replaced at the Customer's expense every 15 years from the date of original installation. The meter installation date is on file at the Department however, it is the Customer's responsibility to replace the meter within 60 days of the 15-year anniversary.
3. Failure to comply with replacement will result in the potential loss of service.
4. If an industrial/commercial meter appears to have gone out of order, the Customer will be notified in writing by the Department. The Customer will have 10 business days from receipt of the letter to notify the Department of what action has been taken for the repair or replacement of the meter and 20 business days to have the actual repair or replacement completed.
5. Failure to respond to the first notice will result in a second notice informing the Customer that if in 10 business days, the meter is not repaired or replaced, water service to the premise will be shut off. The billing will be based on the highest quarterly usage out of the last four billing cycles.
6. Department personnel must be present for inspection when the new or repaired meter is installed, and a new seal will be placed on the meter.
7. Meters are to be tested and calibrated on an annual basis at the Customer's expense by a qualified meter testing company and the results shall be forwarded to the Department. The Department must be notified when the meter is being removed to be tested. Meters are to be tested per AWWA Standards C700 (cold-water meters – displacement type) and C702 (cold-water meters – compound type). The Department can require that a large commercial or industrial meter be tested if there is reason to believe that said meter is not registering water accurately.
8. The Director, at his discretion, may direct a Customer of a meter larger than 1-inch to have the meter analyzed to determine whether the meter size is appropriate.

10. Discontinuance of Service

The Department may discontinue service to a Customer for reasons of nonpayment of invoices, willful waste of water, tampering with meters or meter seals, cross connecting the Northborough water system with any other supply or non-potable sources, refusal of reasonable access to property or meter or for violation of any portion of these regulations if such violations are considered by the Director to be of a serious enough nature as to affect the safe and efficient operation of the water system. Unless violation of one or more of the regulations included herein is causing or may cause an emergency condition, the Department shall provide the Customer with Notice of Discontinuance as specified in Section 6 at least 5 calendar days in advance of the actual termination of service.

In situations where a violation of any one of these regulations is causing or may cause a condition which threatens the safe operation of the water system, the Department or its designee may terminate service to a Customer after making reasonable attempt to notify occupants of the premises affected. The Department will work with the Town of Northborough Board of Health to comply with Title II.

a. Shut off procedures

1. Accounts over 30 days past the due date will be issued overdue balance notice letters informing the customer to make arrangements to pay their balance to avoid having their service shut off.
2. A Shut Off Letter is sent to the account to notify the customer that they have 5 – working days (Saturdays, Sundays and legal holidays excluded) to pay their bill or their water will be shut off.
3. Three days before the shut off, a Shut Off Notice tag will be placed on the customer's door indicating that the water will be shut off within 72 hours.
4. Once the water is shut off, an email along with the attached Shut Off Letter will be sent to the Town of Northborough Health Department.
5. Once the water supply is shut off, notification is made to the Northborough Board of Health as a lack of potable water constitutes a violation of the MA State Sanitary Housing Code regulations and it is a condition deemed to endanger or impair health or safety and is in need of immediate correction within 24 hours (see 105 CMR 410.750(E)).
6. Eligibility requirements for water shut off protection (refer to Section 7(h) for the low-income discount policy and the Department of Public Utilities Financial Hardship Guidelines).
 - a. Households with a financial hardship where someone has an illness which requires a doctor's statement about the illness.
 - b. Households with a financial hardship and a child under 1 year of age.

- c. During the winter months (November 15 through March 15), any household with a financial hardship that would be without heat if the utility service was shut off.
- d. Households in which everyone is age 65 or older, whether or not there is financial hardship (according to state guidelines).
- e. A tenant whose landlord is responsible for utilities but does not pay the bills.

Resumption of service may occur only after correction to the satisfaction of the Department (or the Director in the case of an emergency discontinuance) of the condition, which precipitated the discontinuance or when payment in full is received at the Business Office. The Department may charge the Customer a fee as discussed in Section 5.g. for work related to reactivation of a water service.

11. Materials & Installation of Water Mains and Services

All water services, mains, and other water related appurtenances connected to the Northborough water system shall be in accordance with Appendix C – Water Main and Water Service Materials, Installation, and Testing and the Town of Northborough Department of Public Works Construction Details.

12. Fire Service Connections

a. Fire Sprinkler Systems

To minimize the introduction of cross connection situations, piped fire sprinkler systems shall meet the following requirements:

1. A separate/dedicated fire service line is provided.
2. No “antifreeze” fluid systems will be allowed.
3. All piping shall be rated for potable water.
4. A line gate shall be installed within the public right of way at the property line.
5. A Massachusetts licensed registered professional fire system engineer shall stamp and submit calculations showing the required pipe sizes.
6. Backflow prevention devices shall be in accordance with Section 16 of these regulations and the MADEP drinking water regulations.
7. Non-testable backflow prevention devices shall be replaced as noted in the manufacturer’s directions or every 10 years, whichever is less.

The Department may provide fire service connections to Customers to provide a greater degree of fire protection to properties served. Fire services may include sprinkler lines and

hydrants installed on the Customer's property. Use of water from fire service connections for other than fire protection purposes is prohibited.

The Customer shall be aware that fire services are subject to shutdowns and variation in supply pressure inherent in the operation of the water system, and that the Department shall not be responsible for property damage or losses due to inadequate water pressure or volume.

All Department Customers desiring fire service for his property shall file with the Department an Application for Water/Sewer Service as described in Section 3 of these regulations.

Fire services shall be installed by the Customer and be the property of the Department between the main and the shutoff installed at the point where the service enters the Customer's property. The Department shall be responsible for the cost of maintenance or repairs to the fire service between the main and the outlet side of the shutoff valve. The Customer shall be responsible for the cost of all maintenance and repairs to portions of the fire service, which are located on the Customer side of the shutoff valve.

The Commission shall establish a fee for fire services which shall be payable with the Customer's regular bill for water usage.

Testing of fire services such as fire pumps shall be scheduled with the Department at least 48 hours in advance. The fee shall be as noted in Appendix B. A member of the Department and the Northborough Fire Department shall witness the test. It shall be the responsibility of the applicant to ensure coordination of test with both Departments referenced above. The water system pressure shall not drop below 20 pounds per square inch (psi). The test may be shut down by Department personnel at any time if necessary to protect the municipal water system.

13. Temporary Service Connections

The Department may allow temporary service connections to Customers for such purposes as construction projects and community events of relatively short duration such as fairs and athletic events. Unless the Water System Supervisor determines otherwise, temporary services shall be metered and shall be terminated after a period of six months unless a written request for extension is submitted to the Commission at least 30 days prior to the scheduled termination date of the service.

From April 1 to November 1, the Department may allow temporary services from existing fire hydrants at its discretion. The temporary service must be metered, and a backflow prevention device must be installed by the Department at the Customer's expense. The Customer shall be responsible for the cost of all water used and all fees established by the Commission pursuant to Section 5 of these regulations.

Temporary water services shall be installed at the expense of the Customers by an authorized Drain Layer approved by the Department for such installation. The installation and removal of water services shall be in full accordance with these requirements and as directed by the Department. The installation and removal shall be inspected by Department personnel. All authorized Drain Layers shall comply with current OSHA regulations. The Department will require the authorized Drain Layer to repair and or restore any work within a twelve (12)

month period of time should the work not remain in a suitable condition as determined by the Director.

The temporary service must be metered in accordance with Section 9 of these regulations. Water rates and all fees established by the Commission pursuant to Section 5 of these regulations shall apply to temporary services.

14. Permanent Underground Irrigation Systems

All underground irrigation systems connected to the Town of Northborough water system shall meet the following criteria:

- a. Backflow prevention shall be provided in accordance with Section 16 of these regulations and the MADEP drinking water regulations. Design data sheet for the backflow prevention device must be submitted for review and approval by the Department at the time of meter purchase. Said backflow prevention device shall be tested by the Department prior to putting into service and annually thereafter. Non-testable devices are not allowed.
- b. Plumbing permit must be issued for the connection work including a cross connection control survey performed by the Department.
- c. Locations with municipal water service and an on-site sewer disposal shall have irrigation system connection installed immediately after the municipal water meter.
- d. Locations with municipal water and sewer services shall have a separate water meter with two isolation valves installed immediately in advance of the existing meter.
- e. All meters and appurtenances shall be purchased from the Town of Northborough (Department). The Town (Department) shall install the meter and upstream valve (before) the meter and the plumber shall install the downstream valve (after) the meter.
- f. No connections other than irrigation shall be made to the irrigation line including all taps and hose bibs.

Non-compliance with this regulation will be deemed unauthorized use of water and the noncompliant property owner will be subject to the penalties outlined in Appendix B.

15. Swimming Pools and Large Tanks

When unusually large quantities of water are required by Customers for such purposes as filling swimming pools or storage tanks or other uses, the Customer shall notify the Department at least 24 hours in advance of the use and shall comply with all requirements imposed by the Department. Water usage for such purposes shall be billed at the usual rates established by the Commission.

16. Cross Connection Program

a. Purpose

1. To protect the public potable water supply of the Town of Northborough from the possibility of contamination or pollution by isolating such contaminants or pollutants which could backflow or back siphon into the public water system; and,
2. To promote the elimination of cross connections, actual or potential, between a Customer's in-plant potable water system and non-potable water systems, plumbing fixtures, and industrial piping systems; and,
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 from cross connections.

b. Authority

1. As provided in the Federal Safe Drinking Water Act of 1974, (Public Law 93-523), and the Commonwealth of Massachusetts Drinking Water Regulations, (310 CMR 22.22), the water purveyor has the primary responsibility for preventing water from unapproved sources or any other substances from entering the public water system.
2. The Northborough Department of Public Works Regulations for Users of the Northborough Water Supply and Distribution System.

c. Responsibility

1. The Department shall be responsible for the protection of the public potable water distribution system from contamination and pollution due to the backflow or back-siphonage of contaminants or pollutants through a potable water service connection. If, as a result of a survey of the premises, the Department determines that a cross connection exists, said connection shall be eliminated for the safety of the potable water system. The Department shall give notice in writing to said Customer to eliminate the existing cross connection. The Customer shall, within the same time frame determined by the Department, eliminate the existing cross connection at his or her own expense. Failure, refusal, or inability on the part of the Customer to eliminate the existing cross connection within the specified time frame shall constitute a ground for discontinuing water service to the premises until the existing cross connection is eliminated.

d. Definitions:

Approved - Accepted by the Reviewing Authority as meeting an applicable specification stated or cited in this regulation, or as suitable for the proposed use.

Approved Backflow Prevention Device or Device - A testable or non-testable cross connection control device that is approved by the MADEP for use in Massachusetts.

Auxiliary Water Supply - Any water supply, on or available, to the premises other than the purveyor's approved public potable water supply.

Backflow - The flow of water or other liquids, mixtures, or substances, under positive or reduced pressure in the distribution pipes of a potable water supply from any source other than its intended source.

Backflow Preventer - A device or means designed to prevent backflow or back-siphonage. Most commonly categorized as air gap, reduced pressure principle device, double check valve assembly, pressure vacuum breaker, atmospheric vacuum breaker, hose bibb vacuum breaker, residential dual check, double check with intermediate atmospheric vent, and barometric loop.

Air Gap - The method of preventing backflow through the use of an unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or faucet supplying water to a tank, plumbing fixture, or other device and the flood level rim of the receptacle. The air gap separation shall be at least twice the internal diameter of the supply pipe discharge line but in no case less than one inch.

Atmospheric Vacuum Breaker - A device which prevents back-siphonage by creating an atmospheric vent when there is either a negative pressure or sub-atmospheric pressure in a water system.

Barometric Loop - A fabricated piping arrangement rising at least thirty-five (35) feet at its topmost point above the highest fixture it supplies. It is utilized in water supply systems to protect against back-siphonage.

Double Check Valve Assembly - An assembly of two (2) independently operating spring-loaded check valves with tightly closing shut off valves on each side of the check valves, plus properly located test cocks for the testing of each check valve.

Double Check Valve with Intermediate Atmospheric Vent - A device having two (2) spring loaded check valves separated by an atmospheric vent chamber.

Hose Bibb Vacuum Breaker - A device which is permanently attached to a hose bibb, and which acts as an atmospheric vacuum breaker.

Pressure Vacuum Breaker - A device containing one or two independently operated spring-loaded check valves and an independently operated spring loaded air inlet valve located on the discharge side of the check or checks. Device includes tightly closing shut-off valves on each side of the check valves and properly located test cocks for the testing of the check valve(s).

Reduced Pressure Principle Backflow Preventer - An assembly consisting of two (2) independently operating approved check valves with an automatically operating differential relief valve located between the two (2) check valves, tightly closing shut-off valves on each side of the check valves plus properly located test cocks for the testing of the check valves and the relief valve.

Residential Dual Check - An assembly of two (2) spring loaded, independently operating check valves without tightly closing shut-off valves and test cocks. Generally employed immediately downstream of the water meter to act as a containment device.

Backpressure - A condition in which the owner's system pressure is greater than the supplier's system pressure.

Back-siphonage - The flow of water or other liquids, mixtures, or substances into the distribution pipes of a potable water supply system from any source other than its intended source caused by the sudden reduction of pressure in the potable water supply system.

Containment - A method of backflow prevention which requires a reduced pressure backflow preventer or an air gap separation at the meter or property line.

Contaminant - A substance that will impair the quality of the water to a degree that it creates a serious health hazard to the public leading to poisoning or the spread of disease.

Cross Connection - Any actual or potential connection between the public water supply and a source of contamination or pollution.

Cross Connection Violation Form - A violation form designated by MADEP, which is sent to the owner by the water supplier with copies sent to the plumbing inspectors and Board of Health delineating cross connection violations found on the owner's premises and a procedure for corrective action.

Design Data Sheet - A report form submitted to the supplier of water along with plans for each installation of a reduced pressure backflow preventer or double check valve assembly, or for each change to any such device already installed, describing, and showing the details of the specific installation.

Health Hazard - An actual or potential threat of contamination to the potable water in a public water system, which, in the opinion of the supplier of water would endanger health.

In-Plant Protection - The location of approved backflow prevention devices in a manner, which provides protection of the consumers of water and the potable water system within the premises.

Inspection - An on-site inspection and survey by a qualified individual to determine the existence and location of cross connections and/or the physical examination

and testing of an installed backflow prevention device to verify that the backflow prevention device is functioning properly.

Inspection and Maintenance Report Form - A report form which is to be used by certified testers to record all pertinent testing information

Owner - Any person maintaining a cross connection installation or owning or occupying premises on which cross connections can or do exist.

Owner's Agent - Any person or body designated in writing by the owner to act as his or her representative.

Person - Any individual, corporation, company, association, trust, partnership, the Commonwealth, a municipality, district, or other subdivision or instrumentality of the United States, except that nothing herein shall be constructed to refer to or to include any American Indian tribe or the United States Secretary of the Interior in his capacity as trustee of Indian lands.

Pollutant - A foreign substance, that if permitted to get into the public water system, will degrade its quality so as to constitute a moderate hazard, or impair the usefulness or quality of the water to a degree which does not create an actual hazard to the public health but which does adversely and unreasonably effect such water for domestic use.

Potable Water - Water from any source that has been approved by MADEP for human consumption.

Reviewing Authority - The supplier of water, or the local plumbing inspector, authorized by MGL Chapter 142 and licensed by the Board of State Examiners of Plumbers and Gas Fitters, whichever is responsible for the review and approval of the installation of an approved backflow prevention device.

Supplier of Public Water - Any person who owns or operates a public water supply system.

Unapproved Source - The source or distribution system for any water or other liquid or substance which has not been approved by the MADEP as being of safe and sanitary quality for human consumption, including but not limited to any waste pipe, soil pipe, sewer, drain, or non-acceptable potable water system material.

e. Administration

1. The Northborough Department of Public Works will operate an active cross connection control program, to include the keeping of necessary records, which fulfills the requirements of the MADEP's cross connection Regulations and is approved by the MADEP.

2. The Owner shall allow his property to be inspected for possible cross connections and shall follow the provision of the Department's program and MADEP Regulations.

f. Standards

1. There shall be no connection permitted between the public water supply and any other source. No water service connection to any premises shall be installed or maintained by the Department unless the water distribution system is protected as required by Massachusetts State Law (310 CMR 22.22) and the Department's Rules and Regulations. Service of water to any premises shall be discontinued by the Department if a connection with any other source is found or if a backflow prevention device required by this regulation for commercial, industrial and residential or other non-residential applications, is not installed and properly maintained, or if it is found that a backflow prevention device has been removed, by-passed, or if an unprotected cross connection exist on the premises. Service will not be restored until such conditions or defects are corrected.
2. All industrial and commercial establishments attached to the Northborough public water supply system will be required to install at the service entrance, either a State approved reduced pressure backflow preventer or a State approved double check valve assembly.
3. An approved backflow prevention device required by paragraph 16 (f) 2 of this Regulation, shall be installed on the service line to an Owners' water system at or near the property line, immediately inside the building being served, or immediately downstream from the water meter; but, in all cases before the first draw-off or branch line leading off the service line.
4. The Department requires that all new and retrofit installations of reduced pressure principle devices and double check valve backflow preventers include the installation of strainers located immediately upstream of the backflow device.
5. All backflow prevention devices required by the Massachusetts Drinking Water Regulation shall be tested and maintained as required in 310 CMR 22.22, Section 9; and Paragraph 16 g of these Rules and Regulations.
6. Any existing backflow preventer shall only be allowed by the Department to continue in service while the degree of hazard will not supersede the effectiveness of the present backflow preventer or result in an unreasonable risk to the public health. Where the degree of hazard has increased, as in the case of a residential installation converting to a business establishment, any existing backflow preventer must be upgraded to a reduced pressure backflow preventer, or a reduced pressure backflow preventer must be installed in the event that no backflow device was present.
7. The Owner shall be responsible for the elimination or protection of all cross connections on his premises including applying for and obtaining all necessary

approvals and permits for the maintenance of cross connections and installation of backflow prevention devices.

8. All backflow prevention devices required by paragraph 16 (f) 2 of this Regulation, shall be tested by the Department Employees or its delegated agent, a minimum of once per year.
9. All decisions relating to the determination of backflow devices with regard to the said Cross Connection Control program will be made by the Director or his designee. Failure to comply with any directive from the Department will result in termination of water service.
10. All costs, resulting from the implementation and operation of said Cross Connections Control Program, shall be the responsibility of the Owner.

g. Periodic Testing

1. The Department shall have the responsibility for testing reduced pressure backflow preventers, double check valve assembly, and pressure vacuum breaker devices. Reduced pressure principle backflow devices shall be tested and inspected semi-annually. Double check valve assembly, and pressure vacuum breaker devices shall be tested and inspected annually
2. All backflow device testing and inspection must be performed by a MADEP certified/licensed backflow tester.
3. The testing shall be conducted during the Department's regular business hours. Exceptions to this, when at the request of the Owner, will result in additional charges to cover the increased costs to the Department.
4. All fees for tests performed on backflow devices by the Department or its delegated agent will be assessed to the owner of the device as prescribed in Appendix B.
5. Any backflow preventer which fails during a periodic test must be repaired or replaced by a licensed plumber. When repairs are necessary, upon completion of the repair, the device will be retested at the Owner's expense to insure proper operation. High hazard situations will not be allowed to continue unprotected if the backflow preventer fails the test and cannot be repaired immediately. In other situations, a compliance date of not more than fourteen calendar days after the test date will be established. The Owner is responsible for maintaining a spare parts kit for each device or replacement device on-site, all repair/replacement tools.
6. Backflow prevention devices will be tested more frequently than specified in Paragraph g(1) above in cases where there is a history of test failures and the Department feels that due to the degree of hazard involved, additional testing is warranted. Cost of the additional tests will be borne by the Owner.

h. Residential Cross Connection Control

1. Lawn Sprinklers and Irrigation Systems. – Where a single or multi-family residential Customer served by the water distribution system has a lawn sprinkler or irrigation system, the minimum required backflow protection to prevent back-siphonage shall be the pressure vacuum breaker (PVB).
2. Pressure vacuum breakers shall be located, specified, installed, maintained and accessible for inspection in a manner acceptable to the Department and the Northborough plumbing inspector.
3. The minimum height of the PVB shall be twelve (12) inches higher than the highest downstream sprinkler head.
4. If the irrigation system has provisions for chemical injection a reduced pressure backflow preventer must be installed in lieu of a PVB.
5. Any activity, situation, or use of water which establishes a degree of hazard within a single or multi-family residence equivalent to that of a commercial user shall be required to have the appropriate backflow prevention devices.
6. Residential properties connected to the water system are required to have hose bibb vacuum breaker backflow prevention on all threaded hose connections.

i. Enforcement

1. Whoever maintains a cross connection without an approved permit, or after revocation of the permit or whoever maintains a cross connection without installing a backflow device required by the MADEP may be subject to civil penalty and fines not to exceed \$25,000 in accordance with the Commonwealth of Massachusetts Drinking Water Regulations, 310 CMR 22.22(16), for each day that such violations occur or continue.
2. Upon due notice to the Owner maintaining a cross connection, the MADEP may revoke any permit, if in its opinion the cross connection no longer complies with 310 CMR 22.00
3. All owners of commercial, industrial, agricultural, institutional or residential premises served by the Northborough public water system shall authorize agents or employees of the Department to enter their premises without warrant for the purpose of inspecting, testing and surveying their water system for cross connections.

17. Waste of Water

It shall be the responsibility of all Customers of the Department to prevent the waste of water on their own premises. As described in Section 18, the Department shall have the right to enter the premises of any Customer to inspect water pipes and plumbing for the purpose of determining whether leakage or waste of water is occurring.

18. Access to Premises

The Department shall have the right of access to all premises served by the water system at all reasonable times. All Department personnel will show proper photo identification prior to entering the premise. Department personnel may require access to a Customer's property in order to (1) inspect, maintain, repair or replace any of the Department's property located thereon, (2) read water meters, (3) check for any conditions which may adversely affect the quality of service or water supplied to other Customers. (4) Check for conditions which may present dangerous or unsafe conditions for water system workers, or (5) perform any other work properly connected with the service of water to the Customers.

19. Ground Wire Attachments

Because the grounding of telephone and electric circuits to water plumbing connected to the water system may contribute to the corrosion of the Department's and the Customer's underground piping and may present a serious safety hazard for water system workers, this practice shall be prohibited within the Northborough Water System.

20. Damage to Water Department Property

Any cost related to the repair of damage to Department piping, meters, valves, and any other appurtenances located on the Customers' premises which is caused by the actions or neglect of the Customers may be billed to the Customers and penalties imposed. Damage to Department facilities located within public rights-of-way or easements shall be repaired at the expense of the party responsible for the damage.

21. Responsibility for Property of Customer

The Customers shall be aware that the Department shall not be liable for damage to Customer's property caused by water delivered through the Customer's facilities. Also, the Department shall not be responsible for damage to property caused by spigots, faucets, valves, water heaters, and other equipment, which may be open when water is turned on at the meter, either initially or after a temporary shutdown.

22. Leaking Service Connections

Customers of the Department are requested to notify the Department of any known or suspected leakage from water service pipes either on the Customer's property or within public ways, rights of way or easements. Depending on the location of the leakage of a water service line the Customers or the Department may be responsible for the costs related to its repair.

a. Repairs for which the Department shall be responsible:

Leakage of water service pipes and appurtenances between the water main and the Customer's side of the curb stop shall be repaired at the expense of the Department.

The Department shall not be responsible for the restoration of the repair trench or the surrounding area when a leak occurs in a facility which is defined in these regulations to be the property of the Department beyond loaming and seeding of the backfilled trench in landscaped areas, or the replacement of bituminous concrete in paved areas.

The Department shall repair at its own expense leakage, which occurs at the water meter.

b. Repairs for which the Customer shall be responsible:

That portion of a water service between the Customer's side of the curb stop and the inlet side of the water meter shall be considered to be the property of the Customer. Maintenance and repairs to this portion of the water service shall be performed at the expense of the Customer by an authorized Drain Layer approved by the Department to perform such repairs. The Department must be notified prior to any service repairs. It is the responsibility of the Customer to obtain all required permits prior to performing the repair.

Repair of leakage, which is the responsibility of the Customer, shall be performed within seven (7) calendar days. Known leakage, which goes unrepaired for more than seven (7) calendar days, will be considered to be willful wasting of water. The Customer will be subject to termination of service and penalties in accordance with Appendix B.

23. Temporary Restriction of Use

The Department shall have the right to restrict the use of water for purposes of conservation during periods of low water supply and/or high demand or for any other reason which in the opinion of the Director necessitates such action. Notification to Customers of temporary restriction of use shall be as described in Section 6. Restrictions on water use may be made either voluntary or mandatory at the discretion of the Director.

The Commission is authorized by Chapter 148, Section 16 of the Northborough Municipal Code to declare water emergencies as may be necessary to conserve the supply of water and to ensure the safe and efficient operation of the water system. During such emergencies, outside use of water drawn from the Town's water system shall be prohibited for such purposes as irrigation of lawns, gardens, shrubs and trees; washing of vehicles; recreational or any other outdoor use.

The Commission has established fines as per Section 5 for violation of the water emergency use prohibitions. Fees shall be on file in the Department Business Office and noted in Appendix B.

24. Unoccupied Buildings

If a building is unoccupied, it does not relieve the Customer of the responsibility to protect the fire sprinklers, or water meters and plumbing from damage due to freezing. It is the

responsibility of the Customer to inform the Department if a building will be vacant, so that the department may be aware of any possible leaks. If a leak does occur the Department will shut off the water at the source, and notify the property owner. However, the Department will not be responsible for any subsequent damage from fire or other causes because of this action.

**APPENDIX A
LIST OF CHARGES**

WATER BETTERMENT (Single Family) as of 11/1/1998	\$4,200
Subdivision Rate: 1/3 of \$4,200	\$1,400
APPLICATION FOR WATER SERVICE	\$ 50
WATER METER WITH ISOLATION VALVE ⁽¹⁾	
3/4"	\$710
1"	\$770
1 1/2"	\$1,010
2"	\$1,290
2" Compound	\$2,750
3" Compound	\$3,320
4" Compound	\$5,310
6" Compound	\$7,600

WATER RATE per 1000 cubic feet

As Amended Each Year

WATER SERVICE BASE FEE

As Amended Each Year

FROZEN METER ⁽¹⁾

3/4"	\$710
1"	\$770
1 1/2"	1,010
2"	\$1,290
2" Compound	\$2,750
3" Compound	\$3,320
4" Compound	\$5,310
6" Compound	\$7,600

⁽¹⁾ Valves supplied for 3/4" and 1" meters only. For 1 1/2" meters and larger the isolation valve is supplied and installed by the customer.

APPENDIX B SPECIAL FEES

DRAINLAYERS YEARLY FEE	\$ 150
Requirements:	
Bond	\$5,000
Liability Insurance	\$1,000,000/\$2,000,000
Bodily Injury	\$1,000,000/\$2,000,000
Automobile Liability Insurance	\$1,000,000 per accident
AUTHORIZED USE OF HYDRANT	\$ 100 ⁽¹⁾
DEPOSIT FOR HYDRANT METER AND BACKFLOW DEVICE	\$3,950 ⁽⁴⁾
FLOW TEST (HYDRANT, PUMP, OR FIRE)	\$150 ⁽²⁾
DEPOSIT FOR FLOW_TEST RESULTS	\$ 250 ⁽⁴⁾
BACKFLOW DEVICE TEST	\$ 75
CROSS CONNECTION CONTROL SURVEY AND ASSOCIATED DESIGN DATA SHEET REVIEW	\$ 50
TEMPORARY SERVICE	
¾" Meter	\$710
1" Meter	\$770
FINAL METER READING Fee	\$50
An additional \$50 fee will be applied for requests made with less than 3 days notice.	
SAMPLING AND TESTING	\$ 150
SHUT OFF	\$ 50 ⁽³⁾
TURN ON	\$ 50 ⁽³⁾

- (1) Plus the cost of any water used. Includes hydrant meter and backflow device. Hydrant use is at the Director's discretion.
- (2) Plus the cost of water used or estimated.
- (3) Plus any direct costs incurred by the Department.
- (4) Deposit shall only be returned to the customer upon return of equipment and/or test results, where found by the Department to be in acceptable and functional condition. A new deposit check shall be provided after every 60-days of assembly use.

PENALTY FEES

METER TAMPERING*	\$500 ⁽¹⁾ plus cost of repairs
UNAUTHORIZED USE OF WATER*	\$500
UNAUTHORIZED USE OF HYDRANT*	\$500
DESTRUCTION OF EQUIPMENT*	\$500 plus loss of deposit and/or cost of repairs
WATER EMERGENCY USE RESTRICTION VIOLATION*	\$50

⁽¹⁾ Plus the cost of any water used or estimated.

*** EACH REPEAT OF A VIOLATION WILL RESULT IN A DOUBLING OF THE
PREVIOUSLY ASSESSED PENALTY FEE**

APPENDIX C

WATER MAIN AND WATER SERVICE MATERIALS, INSTALLATION AND TESTING

PART 1: - GENERAL

1.01 – General Requirements

- A. Attention is directed to the Regulations for Users of the Northborough Water Supply and Distribution System and is hereby made a part of these specifications.
- B. The Contractor shall be responsible for a working knowledge of the requirements and Rules and Regulations of the Department prior to beginning any work.
- C. All applications and fees to the Department shall have been completed and submitted to and approved by the Department prior to beginning any work. A properly prepared, up-to date scaled Drawing of the proposed work shall be submitted to the Department for review and comment.
- D. It shall be the responsibility of the Contractor to contact DIG SAFE and the Department and all other applicable utilities at least 72 hours in advance of the beginning of construction.
- E. It shall be the responsibility of the Applicant/Contractor to obtain and comply with all the requirements of the applicable road opening permits.
- F. All work shall be completed in accordance with these specifications, the Massachusetts Department of Environmental Protection Guidelines for Public Water Systems, and standard industry practices and methods. All materials to be used as part of the water distribution system or connections thereto, shall meet the requirements of the applicable American Water Works Association (AWWA) Standards. All service line materials must be lead free.
- G. No work shall be backfilled without being inspected by the Department or its designee.
- H. Any materials damaged during unloading, storage or installation shall be immediately removed from the site and replaced at the Applicant/Contractor's expense.
- I. All surface restoration of disturbed areas shall be the responsibility of the Applicant and authorized agent thereof (Contractor). Upon completion of the work, all surfaces and surface features, (including pavements, walks, drives, fences, walls, lights, lawns, landscaping, etc.) shall be left in a condition that is at least equal to or better than that which existed prior to construction. All pavements within the Town of Northborough or State Right of Way shall be restored in accordance with the applicable road opening permit and or established standards.
- J. No water main or service will be accepted by the Department and or activated until such time as the Department has received all outstanding documentation (shop drawings, as-built drawings, etc.) and fees and outstanding charges.

- K. The Department reserves the right to periodically modify these standards and to waive parts or requirements thereof should it be in the best interest of the Department to do so.
- L. No person other than Department personnel shall operate any valve, hydrant or other components of the Department's water distribution system.

1.02 – References

- A. The following standards, latest revision or successor thereof, shall form a part of this specification as referenced:
 - a. American National Standards Institute/American Water Works Association (ANSI/AWWA)
 - i. ANSI/AWWA C104/A21.4 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings
 - ii. ANSI/AWWA C111/A21.11 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
 - iii. ANSI/AWWA C150/A21.50 - Thickness Design of Ductile-Iron Pipe
 - iv. ANSI/AWWA C151/A21.51 - Ductile-Iron Pipe, Centrifugally Cast
 - v. ANSI/AWWA C153/A21.53 - Ductile-Iron Compact Fittings
 - vi. ANSI/AWWA C502 - Dry-Barrel Fire Hydrants
 - vii. ANSI/AWWA C504 - Rubber-Seated Butterfly Valves
 - viii. ANSI/AWWA C509 - Resilient-Seated Gate Valves for Water Supply Service
 - ix. ANSI/AWWA C515 - Reduced-Wall, Resilient-Seated Gate Valves for Water Supply Service
 - x. ANSI/AWWA C550 - Protective Inner Coating for Valves and Hydrants
 - xi. ANSI/AWWA C651 - Disinfecting Water Mains
 - xii. ANSI/AWWA C700 - Cold-Water Meters - Displacement Type, Bronze Main Case
 - xiii. ANSI/AWWA C702 - Cold-Water Meters - Compound Type
 - xiv. AWWA M6 - Water Meters - Selection, Installation, Testing, and Maintenance
 - xv. AWWA M22 - Manual of Water Supply Practices M22 - Sizing Water Service Lines and Meters

- b. American Society of Mechanical Engineers/American National Standards Institute (ASME/ANSI)
 - i. ASME/ANSI B16.1 - Cast Iron Pipe Flanges and Flanged Fittings
- c. American Society for Testing and Materials (ASTM)
 - i. ASTM B-68 - Standard Specification for Seamless Copper Tube, Bright Annealed
 - ii. ASTM B-75 - Standard Specification for Seamless Copper Tube
 - iii. ASTM B-88 - Standard Specification for Seamless Copper Water Tube
- d. National Fire Protection Association (NFPA)
 - i. NFPA 24 - Standard for the Installation of Private Fire Service Mains and Their Appurtenances
 - ii. NSF International/American National Standards Institute (NSF/ANSI)
 - iii. NSF/ANSI 61 - Drinking Water System Components - Health Effects

1.03 – Submittals Requirements

- A. The decision of the equality of materials, products, assembly or system, other than those named or described in these specifications shall be made by the Department based upon the information provided by the applicant. All costs relating to providing said information (samples, testing, etc.) shall be the responsibility of the applicant or authorized agent thereof (i.e., Contractor).
- B. The Contractor shall submit the following products (if used) to the Northborough Water Department or its Engineer for approval:
 - a. Pipes
 - b. Fittings
 - c. Valves
 - d. Hydrants
 - e. Service Materials
 - f. Road Boxes
- C. An accurate, scaled, “As-Built” drawing shall be prepared by the Contractor using measurements and dimensions taken by the Contractor during installation of the water system components. Distances from permanent surface features (building corners, utility poles, edge of curbs, etc.) to buried valves, pipe bends and fittings etc. shall be shown on the drawings as well as any other pertinent information such as pipe size and material, depth of bury and

clearances between the water lines and other crossing utilities such as gas, electrical, sewer and drain.

PART 2: - PRODUCTS

2.1– General

- A. The following information pertaining to products is included for the Contractor's information.
- B. The Contractor shall install all ductile-iron pressure pipe, fittings (including special castings), service connections and appurtenant materials and equipment, as herein specified and in accordance with the submitted Drawings.
- C. Wherever a pressure classification (e.g., Class 150) is indicated or specified, it shall mean that working pressure for ANSI/AWWA C150/A21.50 laying condition B under five (5) feet of cover as defined by the applicable standard specification for the type of pipe to which it permits.
- D. Joints in buried exterior pipelines shall be push-on joints. Buried valves and fittings shall be mechanical joint. Joints, valves and fittings in exposed pipelines shall be flanged joints. Joints in service connections shall be compression type.

2.3 – Ductile-Iron Pipe

- A. All ductile-iron pipe shall be designed in accordance with ANSI/AWWA C151/A21.51.
- B. Unless otherwise indicated or specified, double thickness, cement-lined ductile-iron (CLDI) pipe shall be at least thickness Class 52.
- C. Prior to delivery to the site, each piece of ductile-iron pipe shall be individually tested to insure 100 percent ductility by the ball impression method or an approved equal.
- D. Buried joints (pipe to pipe) shall be of the push-on type.
- E. All pipes and fittings shall have no less than five (5) and no more than six (6) feet of cover unless otherwise approved by the Department. No pipe shall be laid in the same trench with gas pipes, sewer pipes, or any other facility of a public service company, nor within five (5) feet of any open excavation or vault, nor within ten (10) feet of any septic structure or leaching field.

2.4 – Fittings

- A. Fittings shall conform to the requirements of ANSI/AWWA C153/A21.53 and be a minimum pressure class of 350.
- B. All buried fittings shall be mechanical joint.
- C. Fittings must be of compact design and ductile-iron.

- D. Fittings shall be cement lined in accordance with ANSI/AWWA C104/A21.4.
- E. Tapping sleeves, if used, shall be made of stainless steel with a full circumferential waffle or grid style gasket.
- F. Sleeve type couplings shall only be used with the prior approval of the Department. If allowed, sleeves shall be of the solid type ductile-iron with mechanical joint ends.
- G. The use of “Dresser” style ductile couplings shall only be used with the approval of the Department.

2.5 – Types of Joints

- A. Joints for push-on and mechanical joint pipe shall conform to ANSI/AWWA C111/A21.11.
- B. The plain end of push-on pipe shall be factory machined to a true circle and chamfered to facilitate fitting the gasket.
- C. The plain ends of field cut pipe shall be chamfered to prevent damage to the gasket.
- D. Push-on and mechanical joint pipe and fittings shall be provided with sufficient quantities of accessories conforming to ANSI/AWWA C111/A21.11.
- E. Flanges for flanged pipe shall conform to ASME/ANSI B16.1, except that special drilling or tapping shall be as necessary to insure correct alignment and bolting. Flanged pipe shall use long-hub flanges which shall be screwed on tight at the foundry by machine before they are faced and drilled.
- F. Gaskets shall be of a composition suitable for exposure to the liquid with the pipe.

2.6 – Lining and Coating

- A. All pipe and fittings shall be lined and coated as specified below.
- B. The inside of pipe and fittings carrying potable water shall be given a double thickness cement lining and bituminous seal coat in accordance with ANSI/AWWA C104/A21.4.
- C. The outside of pipe and fittings shall be given the standard bituminous coating in accordance with the appropriate AWWA Standard Specification for pipe and fittings.
- D. Machined surfaces shall be cleaned and coated with an NSF/ANSI Chapter 61 approved non-toxic rust preventative coating at the shop immediately after being machined.

2.7 – Water Service Materials

- A. Water service pipe shall be at least one (1) inch diameter. One (1) inch Type K Copper Tubing shall be in accordance with ASTM B-75, B-88, and B-68. Water service pipe over 2 (two) inch diameter shall be ductile-iron.
- B. Water service tubing between the corporation and the curb stop shall be one (1) piece.
- C. Water service tubing between the curb stop and the house/meter setup shall be one (1) piece, unless otherwise authorized by the Department.
- D. Corporation stops for all water main service pipe connections shall be of solid lead-free brass construction suitable for compression type connections for the indicated service pipe. The corporation stops shall have AWWA (tapered) thread on the inlet side of the stop. The size of the corporation shall be matched to the size of the service pipe or tubing. Service clamps shall be installed with all corporation stops two (2) inch and larger in size. Corporations shall be as manufactured by Ford FB1000-4Q-NL 1-inCC x 1-in Quick Joint (Q) Ball type, McDonald Ball Corporation 4701BQ, or approved equal. Where corporations are installed on an asbestos-cement (AC) main, bronze saddle with two stainless steel straps shall be provided.
- E. All curb stops for service pipe connections shall be of solid brass or bronze material and open left. The inlet and outlet shall be as required to suit the types of pipe or tubing connected. The curb stops shall be non-draining. Curb stops shall be as manufactured by Ford B44-444 Q-NL 1-in Quick x 1-in Quick, Ball type w/ Stop or McDonald Ball Curb Stop 6100Q, or approved equal.
- F. Erie style Service Curb Box slide type, lock type cover threads on to the top of service box, and has a brass pentagon nut for access to Box Rod. Service Box is two-piece slide type with a one-inch top section and enlarged base section with arch pattern to accommodate the curb stop. Service box shall be able to be adjustable up to 12 inches with a standard depth of bury from 4½ to 5½ feet. Inner permanent rod shall be stainless steel. Curb box shall be centered over curb stop operating valve and be plumb.
- G. All adapters and miscellaneous fittings to connect to existing or proposed water service materials shall provide an adequate seal at the working pressure of the water main and be approved by the Department.
- H. The installation of an approved backflow device shall be installed immediately after the meter.
- I. The water service must enter the basement within one (1) foot of the inside of the foundation wall. The meter shall be set between twelve (12) inches and eighteen (18) inches from the floor and between three (3) inches and twelve (12) inches from the wall. The meter fittings shall be anchored to either the concrete floor or the concrete wall. The meter shall be set in a protected area to prevent any type of damage and in a location to allow easy accessibility at all times for reading and repairs. The location of the meter within a confined space is prohibited. The Department reserves the right to determine the final meter location.
- J. The curb stop shall be installed at the property line running adjacent to the Town owned roadway. The service line, from the main to the curb stop, shall be installed at a right angle perpendicular to the water main. The Department must inspect the service tap, in the street

main, and the entire service installation, prior to back filling. All service pipes and fittings shall have no less than five (5) and no more than six (6) feet of cover unless otherwise approved by the Department. The service pipes and fittings shall have a suitable bed of sand and a minimum of one (1) foot of sand above and below covering the pipe and fittings. No service pipe shall be laid in the same trench with gas pipes, sewer pipes, or any other facility of a public service company, nor within five (5) feet of any open excavation or vault, nor within ten (10) feet of any septic structure or leaching field. All water service lines shall have an approved metal detectable tape, clearly printed with the word "WATER", placed at two (2) feet below the finished grade.

2.8 – Gate Valves

- A. Valves three (3) to twelve (12) inches in size, inclusive, shall be designed for a working water pressure of 250 psi.
- B. All valves shall meet current AWWA turn count standards and shall open right (clockwise) in accordance with the Department Standards.
- C. The valves shall be designed so that parts subject to wear may be easily replaced and shall be constructed of wear-resistant material.
- D. Valves shall be ductile-iron, non-rising stem resilient seated, wedge type gate valves conforming to the most recent edition of ANSI/AWWA C509 or ANSI/AWWA C515. and shall open right (clockwise). The valves shall, in addition, meet the following requirements:
 - a. The valve waterway shall be smooth and unobstructed without depression or cavities where foreign material can accumulate.
 - b. All interior and exterior ferrous parts shall be coated with fusion-bonded epoxy. Said coating shall be non-toxic, impart no taste to water and shall conform to ANSI/AWWA C550 and NSF/ANSI 61.
 - c. The gate shall be totally encapsulated with rubber coating that utilizes a rubber seating edge at the bottom, which will eliminate the possibility of entrapment of foreign material.
 - d. The valve shall utilize a rubber encapsulated disk. The valve shall close bubble tight.
 - e. The valve shall be designed so no metal fasteners or screws other than the stem and stem nut are exposed to water.
 - f. The stem shall be bronze with an integral thrust flange, o-rings and anti-friction devices to reduce operating torque.
 - g. When used as a tapping valve, the valve shall be constructed to permit the use of standard full-size cutters.
- E. Buried valves shall have mechanical joint ends and a 2-inch square operating nut colored RED.

- F. Buried valves (Post Indicator Valve) controlling water supplies for fire protection system shall carry the Underwriters Laboratories (UL)/Factory Mutual System (FM) rating as appropriate and be supervised per applicable codes.
- G. Bonnet bolts/nuts shall be stainless steel.
- H. Valve shall be installed plumb.

2.9 – Butterfly Valves

- A. Valves 16 inches and larger shall be the butterfly type, Class 150, cast iron with mechanical joint ends and a 2-inch square operating nut and comply with the most recent edition of ANSI/AWWA C504 for butterfly valves.
- B. The butterfly valve shall be designed for a working pressure of 250 psi unless otherwise indicated.
- C. The valve seat shall have a constant uninterrupted 360-degree seating.
- D. The valve operator shall be designed for 300 foot-pounds of torque.
- E. The valve shall have a fusion bonded epoxy coating inside and out.
- F. Valves disks shall seat at an angle of 90 degrees to the axis of the pipe.
- G. Valve shall be installed plumb.
- H. Butterfly Valves shall have ductile-iron bodies and Type 630 stainless steel shafts
- I. All valves shall meet current AWWA turn count standards and shall open right (clockwise) in accordance with the Department Standards.

2.10 – Tie rods, Clamps, Thrust Restraint

- A. The Contractor shall furnish and install tie-rods, clamps, couplings, concrete and accessories to prevent the movement of branch valves and/or fittings.
- B. Thrust blocks shall be cement concrete and installed firmly against undisturbed soils. Size shall be as required for protected pipe size with an operating pressure of 250 psi.
- C. The clamps and tie-rods shall be of the size, materials and shall be constructed as indicated by the latest edition of the National Fire Protection Association's National Fire Codes, Publication: NFPA 24.
- D. The use of lug style retainer glands is allowed as an alternative to rods provided the gland used meets the following:

- a. The restraining devices shall not damage the pipe wall or lining, and should provide 360 degrees of restraint around the pipe.
- b. A device to indicate proper tightening of setscrews shall be used; torque screws should twist off at 80 to 90 foot-pounds.
- c. Retainer glands shall be FORD Uni Flange Style 1400 or approved equal.

2.11 – Valve Boxes

- A. Unless otherwise specified or required, each buried valve shall be provided with a valve box. Valve boxes shall be cast iron and of the adjustable, slip, heavy-pattern type. They shall be so designed and constructed as to prevent the direct transmission of traffic loads to the pipe or valve.
- B. 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 valve bonnet. The boxes shall be adjustable through at least six (6) inches vertically without reduction of the lap between sections to less than eight (8) inches. Valve box shall be centered over operating nut and be plumb.
- C. The inside diameter of the boxes shall be at least 5¼-inches and the lengths shall be as necessary for the depth of the valves with which the boxes are to be used. Top section shall be 26-inch valve box top. Bottom section at no time shall be less than 48-inches. Valve box base shall be belled.
- D. Covers shall be close fitting and substantially dirt-tight. The top of the cover shall be flush with the top of the box rim. The word “WATER” shall be cast in the top of the cover. Cover should be heavy-duty weighing at least 10 pounds. Overall weight of 3-piece valve box is to exceed 100 pounds.
- E. Castings for the valve boxes shall be made in the United States, Tyler or Bibby, tough even grained, and without defects.

2.12 – Hydrants

- A. Hydrants shall be manufactured in accordance with the most recent edition of ANSI/AWWA C502, designed for a minimum of 250 psi working pressure, and tested to a minimum of 500 psi hydrostatic pressure. Hydrant shall be UL listed and FM approved.
- B. The hydrant shall open right (clockwise).
- C. The hydrant shall be center stem compression type.
- D. An automatic drain is to be provided to permit draining the hydrant barrel.
- E. Hydrants shall be designed with the following features.

- a. Permit removal of all working parts through the top without the use of any special tools or wrenches. All working parts shall be bronze and interchangeable, with similar parts of same size and type.
 - b. In the event of accident, damage or breaking of hydrant, the main valve will remain closed by mechanical means.
 - c. The direction of the nozzles can be changed 360 degrees by rotating the hydrant without digging up the hydrant.
 - d. Extensions may be added without the necessity of closing off the water or digging up the fire hydrant.
- F. Inlet connection shall be six (6) inches and mechanical type joint.
- G. Hydrants will have a valve opening of 5¼-inches. Hydrants shall have two (2) 2½-inch hose nozzles and one (1) 4½-inch pumper nozzle. Nozzle threads to be National Standard Thread (NST). Provide pentagon operating nuts on the caps and operating nut. Operating nuts shall be National Standard, pentagon shape, 1½-inch point to flat.
- H. Hydrants shall be suitable for installation with a minimum of five (5) and no more than six (6) foot depth of cover at the inlet connection without the hydrant being significantly higher or lower than as indicated on the Drawings.
- I. Hydrants manufactured for a greater depth of bury shall be provided where depth of coverage over the water main is greater than the standard five (5) and no more than six (6) foot of cover. Said hydrant shall be prominently marked with the depth of bury.
- J. Hydrants shall be furnished with a frangible break flange at the ground line and a cast iron or stainless steel break coupling on the stem at the ground line, which shall be so designed so that in case of breakage, only the flange and coupling need be replaced to effect complete repair.
- K. Hydrants shall be painted according to specifications of the Department, red for municipally owned and yellow with blue caps for privately owned. If needed, (rough up any existing paint surfaces with sandpaper. Thoroughly clean hydrant with mineral spirit-soaked rag. Apply rust converter on all areas. The hydrant must be scraped and primed). Two coats of rust inhibitive safety red paint shall be applied to the barrel down to the ground level, bonnet, nozzle/hose caps. Apply Never Seize to all nipple threads.
- L. Each hydrant shall also have a “Heavy-Duty Fiberglass Hydrant Marker w/Optional Mini Flag” installed. Marker shall be resilient 3/8-inch diameter white laminar fiberglass shaft, 57-inches-long (5-feet nominal), attached to a heavy-duty MIL Spec FT3482 plated carbon steel spring. Red and white reflective bands shall be provided on the shaft. Mini flag shall be 4-inch high by 5-inch wide white polyvinyl chloride exterior grade ultraviolet ray resistant material, with red reflective striping.

- M. For the purpose of standardization, hydrants shall be either Clow Medallion hydrant or the Kennedy Guardian K-81D hydrant. Hydrants shall come from the factory fully primed and painted as specified herein.
- N. With the exception of the hydrant at the end of the line, hydrants shall be installed using mechanical joint hydrant anchoring tees, six (6) inch valves and six (6) inch ductile-iron stubs. For hydrants at the end of the line, hydrants shall be installed using an 8-inch by 6-inch increaser, a six (6) inch valve and a six (6) inch CLDI hydrant stub with the hydrant being located at the direct end of the line and in the planting strip. Restraining rods or other restraining devices must be used between the six (6) inch valves and the hydrants. (The hydrant placement in the grass strip shall allow for a minimum of twenty-four (24) inches between the face of the curb and the hydrant steamer cap at its furthest extremity). The grade of the hydrant shall be set so that there is three (3) inches from the finished grade to the break flange. Hydrants shall be set plumb. Place 1 cubic yard (cu. yd.) of $\frac{3}{4}$ -inch crushed stone around the base of the hydrant at the location of the drain hole, and backfill around hydrant shall be thoroughly compacted to the grade line.
- O. Hydrants installed at locations which, in the opinion of the Department, may be subject to possible damage from vehicles, said hydrant shall be protected by a minimum of two (2) 6-inch diameter concrete filled steel bollards placed to facilitate full unrestricted access to the hydrant.
- P. Hydrant thrust blocks: Concrete for the thrust blocks securing hydrants shall be sized and installed to provide adequate thrust restraint for the soil type encountered.

PART 3: - EXECUTION

3.1 – Water Distribution Main

- A. The Contractor's attention is directed to the fact that the cement pipe lining is relatively brittle. Every care shall be taken in handling and laying pipe and fittings to avoid damaging the pipe or lining, scratching or marring machined surfaces, and abrasion of the pipe coating or lining.
- B. Any filling or pipe showing a crack and any fitting or pipe which has received a severe blow that may have caused an incipient fracture, even though no such fracture can be seen, shall be marked as rejected and removed at once from the work site.
- C. In any pipe showing a distinct crack and in which it is believed there is no incipient fracture beyond the limits of the visible crack, the cracked portion, if so approved by the Department, may be cut off by and at the expense of the Contractor before the pipe is laid so that the pipe used is perfectly sound. The cut shall be made in the sound barrel at a point at least twelve (12) inches from the visible limits of the crack.
- D. Unless otherwise approved, all cutting of ductile-iron pipe shall be done with an approved power operated cutter. Hammer and chisel shall not be used to cut pipe. All ends shall be examined for possible cracks caused by cutting and chamfered to prevent damage to the gasket.

- E. Pipe shall be installed as to maintain the required minimum earth cover of five (5) foot vertically over and horizontally from the sides of the pipe. With approval from the Department only, piping not having the necessary vertical or horizontal cover shall be restrained against movement and protected from freezing.
- F. Before any length of pipe is lowered into the trench it shall be inspected for damage and the inside of the pipe shall be cleared of any loose dust and foreign objects. No defective pipe or fittings shall be laid or placed in the piping, and any piece discovered to be defective after having been laid shall be removed and replaced by a sound and satisfactory piece at the Contractor's expense.
- G. Each pipe and fitting shall carefully cleared of all debris, dirt, etc., before being laid and shall be kept clean until accepted in the complete work.
- H. Pipe Location. All pipes and fittings shall have no less than five (5) and no more than six (6) feet of cover unless otherwise approved by the Department. Exterior pipelines will be located substantially as indicated on the approved Drawings, but the right is reserved to the Department, to make such modifications in locations as may be found desirable to avoid interference with existing structures or for other reasons. Where fittings, etc., are noted on the approved Drawings, such notation is for the Contractor's convenience and does not relieve him from laying and jointing different additional or different fittings, where required, without additional compensation. (Care shall be taken to ensure a good alignment both horizontally and vertically, and, in the case of buried lines, to give the pipe a firm bearing along its entire length).
- I. When mechanical joint pipe or similar pipe is laid, the bell of the pipe shall be cleaned of excess tar or other debris and wiped out before the cleaned and prepared end of the next pipe is inserted into it. The new pipe shall be set and held firmly in place until properly seated and held securely until the joint has been completed.
- J. Before any section of pipe is joined with another with a push-on type joint, it shall be inspected for damage and the inside of the pipe shall be wiped clean and clear of any debris. Surfaces against which the gaskets will come into contact shall be thoroughly wire brushed and washed with clean water, care being taken that no sand or grit be allowed to remain on these surfaces. The gasket shall then be cleaned and inserted in the groove provided in the bell of the previously laid pipe, making sure the gasket is inserted in the proper manner and securely seated. The gasket and the plain pipe end shall be lubricated with an approved lubricant in accordance with the pipe manufacturer's literature. The ends of cut pipe should be checked before assembly to ensure that they have been chamfered to facilitate assembly and prevent tearing of the gasket.
- K. Special care must be given by the Contractor to use the proper gaskets designed and manufactured for the brand of pipe being installed or connected to. Avoid mixing different gaskets together.
- L. The plain end of the pipe shall then be aligned to be in line with the previously set length of pipe and inserted into the gasket, and pushed through the gasket until seated in the bell. If the joint cannot be assembled with a reasonable amount of force, the plain end shall be removed

from the bell and the gasket shall be checked for proper positioning before reassembly. If an effective seal is not obtained at the joint, the joint shall be disassembled, cleaned, and reassembled, utilizing a new gasket.

- M. Pipe shall be deflected after the plain end has been fully seated within the bell. The amount of deflection shall not exceed the maximum allowable deflection indicated by the pipe manufacturer and accepted standards.
- N. Before any section of pipe is joined with another with a mechanical type joint, it shall be inspected for damage and the inside of the pipe shall be wiped clean. Any excess coating in the bell section shall be removed to prevent an improper fit.
- O. The plain end, bell socket, and gasket shall be wiped clean, and washed with a soap solution to improve seating of the gasket and provide lubrication. The gland shall be placed on the plain end with the lip extension towards the plain end of the pipe followed by the gasket with the narrow edge towards the plain end of the pipe.
- P. The plain end of the pipe shall then be centered and pushed into the bell socket and the gasket pressed firmly and evenly around the socket. The gland shall be pushed up to the bell and centered with the gland bolts being inserted and evenly tightened until “finger tight”.
- Q. The tightening of the bolts shall be completed with diametrically opposite bolts being tightened in sequence so as to keep the gland square with the socket and produce even bolt stresses.
- R. The correct range of torque to be obtained is shown below, preferably by means of a torque wrench:

Bolt Size (Inches)	Range of Torque (Foot-Pounds)
5/8	45-60
3/4	75-90
1	85-100

If an effective seal is not obtained at the joint at the maximum torque indicated above, the joint shall be disassembled, thoroughly cleaned and reassembled with a new gasket. Bolts shall not be over-torqued to tighten leaking joints.

- S. Flanged ductile-iron pipe and fittings shall be assembled in accordance with the manufacturer’s literature.
- T. In laying ductile-iron pipe, the following deflections, which reflect the manufacturer’s allowable recommended maximum deflection, shall not be exceeded.

Nominal Size of Pipe - Inches	Deflection – Inches(?) / Pipe Radius – Feet (?) For 18 Foot Pipe Length	
	<u>PUSH-ON JOINT</u>	<u>MECHANICAL JOINT</u>
4	19" / 205'	31" / 125'
6	19" / 205'	27" / 145'
8	19" / 205'	20" / 195'
10	19" / 205'	20" / 195'
12	19" / 205'	20" / 195'
16	11" / 340'	13.5" / 285'

Deflections shall be made after the joint is made. For mechanical joint pipe, the bolts shall be partially tightened before the length of pipe is deflected.

- U. 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 is eliminated. In the event that pipe is installed by transporting the underwater section as a unit through the water, the ends of the pipe shall be closed with suitable temporary plugs.
- V. Prior to the installation of sleeve-type couplings, the pipe ends shall be cleaned thoroughly for a distance of eight 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 inches from the end, and the middle ring shall be placed on the previously laid pipe end until it reaches the pipe stop or is properly centered over the joint. The other pipe end shall be inserted into the middle ring and brought to proper position against the pipe stop or 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 all around the joint, by the use of a torque wrench of the appropriate size and torque for the bolts.
- W. All valves, fittings, and appurtenances installed shall be set and jointed by the Contractor as indicated on the Drawings.
- X. The Contractor shall furnish and install all supports necessary to hold the piping and appurtenances in a firm, substantial manner at the lines and grades indicated on the Drawings or specified. Unless approved otherwise, all bends, tees, dead-end plugs/caps, and other fittings in ductile-iron pipelines buried in the ground shall be restrained to resist thrust with concrete placed in an approved manner against undisturbed earth where firm support can be obtained. If the soil does not provide firm support, then suitable bridle rods, clamps, and accessories to brace the fitting properly shall be provided. Such bridle rods, etc., shall be coated thoroughly and heavily with an approved bituminous paint after assembly or, if necessary, before assembly.
- Y. All backfill around installed pipe and appurtenances shall be clean, dry material free of frozen material, mud, organics, bituminous concrete, debris, etc. All pipes and fittings shall have no less than five (5) and no more than six (6) feet of cover unless otherwise approved by the Department. No stone larger than 3 inches shall be placed within 12 inches of the installed

pipe. The remaining backfill shall not contain any rock, stone or pieces larger than 6 inches. Proper compaction shall be performed with vibratory compactors in lifts not exceeding one foot. Compaction shall be at least 90% under non-paved areas and 95% under pavements.

- Z. The ductile-iron pipe shall be given pressure and leakage tests in sections of approved lengths. For these tests, the Contractor shall furnish all labor and materials including an approved pump, tanks, hoses, meters and pressure gauges. The Contractor shall furnish, install and remove (after testing) suitable temporary testing taps, plugs or caps for testing the pipeline; and other similar equipment; and all labor required all without additional compensation. The meter and gauges shall be installed by the Contractor in such a manner that all water entering the section under test will be measured and the pressure in the section indicated, and they shall be kept in use during both tests.

The scheduling of pressure and leakage tests shall be as allowed by the Department.

Unless it has already been done, the section of pipe to be tested shall be slowly filled with water of approved quality, and all air shall be expelled from the pipe by flushing and the test section of pipe be allowed to stabilize preferably for 24 hours. If hydrants or blow-offs are not available at high points for releasing air or for isolating sections of the mains to be tested, the Contractor shall be responsible to make the necessary excavations, backfilling, compaction, and the necessary taps at such points and shall remove the taps and plug said holes with brass or bronze plugs after completion of the test and to restore the surface.

For the pressure test, the Contractor shall, by pumping, raise the water pressure (based on the elevation of the section under test and corrected to the gauge location) to a minimum of 200 psi or to a pressure equal to 150% of the normal static pressure, at the highest point of the section being tested, whichever is larger*. If the Contractor cannot achieve the specific pressure and maintain it for a period of two (2) hours, the section under tests shall be considered as having failed to pass the pressure test.

**Higher test pressures may be required by the Department, but not to exceed the rated pressure ratings of the valves or hydrants.*

Only upon completion of a successful pressure test, the Contractor shall make a leakage test by metering the flow of water into the pipe while maintaining in the section being tested a pressure within $5 \pm$ psi of the pressure to which the pipe will be subjected under the pressure test for at least one hour. This shall be done by placing the section under pressure by pumping. No pipe installation will be accepted if the leakage is greater than that determined by the formula:

$$L = \frac{SD(P) 0.5}{133,320}$$

For mechanical joints and push-on joints, in which L is the allowable leakage, in gallons per hour (gph); S is the length of pipeline tested in feet (ft); D is the nominal diameter of the pipe, in inches (in); and P is the average test pressure during the leakage test, in pounds per square inch (psi) gauge.

ALLOWABLE LEAKAGE (GPH) PER 1,000 FEET OF PIPELINE

NOMINAL PIPE DIAMETER (IN)

Avg. Test Pressure (psi)	3	4	6	8	10	12	14	16
200	0.32	0.43	0.64	0.85	1.06	1.28	1.48	1.70
175	0.30	0.40	0.59	0.80	0.99	1.19	1.39	1.59
150	0.28	0.37	0.55	0.74	0.92	1.10	1.29	1.47
125	0.25	0.34	0.50	0.67	0.84	1.01	1.18	1.34
100	0.23	0.30	0.45	0.60	0.75	0.90	1.05	1.20

Note:

If testing against closed metal-seated valves, an additional leakage per closed valve of 0.0078 gph per inch of nominal valve size shall be allowed for the leakage test only.

At the specified system pressure, no leakage will be allowed at flanged joints.

If the section shall fail to pass the pressure test, the leakage test, or both, the Contractor shall do everything necessary to locate, uncover, (even to the extent of uncovering the entire section), isolation of pipe sections by capping or installing valves, 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.

If in the judgment of the Department, it is impracticable to follow the foregoing procedure exactly for any reason, modifications in the procedure shall be made as required or approved, but in any event the Contractor shall be responsible for the ultimate tightness of the line within the above leakage requirements.

- AA. All water mains, after passing the leakage and pressure tests shall be flushed, disinfected, and flushed again as follows, prior to being put into service. The Contractor shall furnish the necessary labor and pumps, hoses, barrels, taps for proper chlorine distribution, and chlorine test kits for the disinfection procedure.

All water mains shall be thoroughly flushed to clear the pipe of debris and sediment prior to disinfection. The flushing rate, measured in gallons per minute (gpm), shall be such to provide a water velocity of at least 2½ feet per second (fps) for mains smaller than twenty (20) inches in diameter. The flushing velocity in pipes greater than twenty (20) inches in diameter may be at a lower rate, as approved. The following table lists the required opening to flush pipelines to obtain a velocity of 2½ fps and is taken from ANSI/AWWA Standard C651.

**REQUIRED OPENINGS TO FLUSH PIPELINES*
TO PRODUCE 2½ FPS VELOCITY**

PIPE SIZE (IN)	REQUIRED FLUSHING RATE (GPM)	ORIFICE SIZE	HYDRANT OUTLETS REQUIRED TO BE OPENED		
			(INCH)	(NUMBER)	(SIZE)
4	100		15/16	1	2-1/2
6	220		1-3/8	1	2-1/2
8	390		1-7/8	1	2-1/2
10	610		2-5/16	1	2-1/2
12	880		2-13/16	1	2-1/2
14	1,200		3-1/4	2	2-1/2
16	1,565		3-5/8	2	2-1/2
18	1,980		4-3/16	2	2-1/2

*With 40 psi residual pressure, a 2½-inch hydrant outlet nozzle will discharge approximately 1,000 gpm and a 4½-inch hydrant nozzle will discharge approximately 2,500 gpm.

The disinfection of water mains shall be accomplished in accordance with ANSI/AWWA Standard C651, and/or the MADEP Water Supply Guidelines for Public Water Systems, whichever of the two is more stringent. The following descriptions may be used as a guide:

- a. Disinfection of mains should be accomplished only by workmen who have had experience with chlorine or other disinfecting agents. Liquid chlorine (gas at atmospheric and sodium hypochlorite solutions are the most common disinfectants used). Chlorine gas and water solutions are fed into the main being disinfected to a concentration of at least 50 milligrams per liter (mg/L) or 50 parts per million (ppm) available chlorine. To ensure that the required concentration is maintained, chlorine residuals are obtained. This chlorinated water solution should remain in the pipe for at least 24 hours, at the end of which period the chlorine concentration should be at least 25 mg/L or ppm. If this is achieved, final flushing can be accomplished and chlorine residuals checked to determine that the heavily chlorinated water has been removed from the pipeline. Said chlorinated water shall be disposed of in a safe, proper and legal manner.

**CHLORINE REQUIRED TO PRODUCE 50 mg/L
CONCENTRATION IN 100 FEET OF PIPE – BY DIAMETER**

Pipe Size (inch)	100 percent Chlorine (pounds)	1 percent Chlorine Solutions (gallons)
4	0.027	0.33
6	0.061	0.73
8	0.108	1.30
10	0.170	2.04
12	0.240	2.88

- b. The Slug Method of Chlorination, which is used for large diameter water mains consists of moving a column of highly concentrated chlorine water solution (at least 300 ppm) along the interior of the pipe with a contact time of at least three hours with the pipe wall. (See ANSI/AWWA Standard C651 Section 7.2 for further information).
- BB. After the applicable retention period, the heavily chlorinated water shall be disposed of or neutralized and the main flushed until the chlorine concentration in the water leaving the main is equal or less than that of the prevailing system or less than 1 mg/L.
- CC. After final flushing and before the water main is placed in service, a sample or samples shall be collected from the water main at locations approved by the Department and tested for bacteriological quality. Samples shall be analyzed for the presence of Coliform bacteria and heterotrophic plate count (HPC) bacteria. Samples shall show an absence of Coliform bacteria and heterotrophic plate count (HPC) bacteria are less than 500 colony forming units per milliliter (cfu/ml). In the case of extremely long mains several samples shall be collected along its length, as well as the end. The Department will obtain suitable sample containers, take samples, submit samples to a MADEP certified laboratory for analysis, and see that analysis reports are sent to the Contractor. The Contractor shall bear the costs for said sampling, delivery, and tests.

If the initial disinfection fails to produce satisfactory samples, the disinfection process shall be repeated at the Contractor's expense.

Upon receipt of acceptable test results, the Contractor shall remove and properly plug and secure the chlorination tap.

- DD. The Contractor shall submit a program for the construction and putting into service of the new works subject to the approval of the Department. All work involving cutting into and connecting to the existing work shall be planned so as to interfere with operation of the existing facilities for the shortest possible time and when the demands on the system best permit such interference even to the extent of working outside the normal working hours to meet these requirements. For all proposed interruptions of water supplies or work to be performed on any component of the existing water distribution system, the Department shall

be notified forty-eight (48) hours (weekends and holidays excluded) in advance. The Contractor is responsible for notifying all customers within the shutdown area of the time and duration of shutdown at least twenty-four (24) hours in advance of the shutdown.

The Contractor shall have all possible preparatory work done and shall provide all labor, tools, materials, and equipment required to do the work in one continuous operation. Disinfection of affected mains shall be done as part of this operation, in accordance with procedures specified elsewhere.

The Contractor shall have no claim, by reason of delay or inconvenience, for adapting his operations to the needs of the Department.

- EE. The Contractor shall make joint connections similar to those on the existing pipe or adaptable to such pipe unless specifically otherwise shown on the Drawings or directed. These joints shall be made as specified under the appropriate headings.
- FF. Existing pipeline(s), other utilities, and surface features (pavements, lawns, fences, walls, etc.) damaged by the Contractor shall be replaced by him at his own expense in a manner approved by the Department and the owner of said damaged items. All replication shall result in the restored work being of a condition equal to or better than that has existed before construction.
- GG. The Contractor shall apply for and refer to “Regulations for Street Excavations, Northborough Public Works Department” for all fees and requirements concerning any road openings.
- HH. The Contractor shall be responsible for all disturbed lawn areas and shall be restored with a minimum of 4 inches of good quality loam, limed, fertilized and seeded with a lawn seed mixture.

3.2 – Water Services

- A. The Contractor shall furnish and install all services to the new main as indicated on the Drawings. All work shall be performed by craftsman experienced in the installation of water services. The Contractor shall have the option of installing service wet or dry.
- B. Curb stops should be installed within the road right of way as close to the property line as possible. Curb stops shall be provided with a box as specified and shall be set plumb and be supported and protected during backfill. Prior to acceptance of the work, the Contractor shall demonstrate that all buried valves are accessible and fully operable with standard valve wrenches and clean out.
- C. All openings in foundations for water service piping shall be patched on both the interior and exterior of the foundation.
- D. Services shall be located to facilitate the ease of installation and maintenance of meter and appurtenances and approved by the Department.

- E. Abandoned services shall have service line removed from structure to corporation. Corporations on CLDI main shall be closed and capped with Ford corporation cap. Corporations on AC main shall be removed and wrapped with stainless steel solid sleeve.
- F. Surface restoration shall be as described under Section 3.1, Paragraphs R through T.

3.3 – Buried Valves and Appurtenances

- A. All valves shall be carefully erected and set plumb and supported in their respective positions and free from all distortion and strain. Care shall be taken to prevent damage or injury to the valve or appurtenances during handling and installation. Valves, valve boxes and valve box covers shall be installed in such a manner as to ensure that the cover is parallel to the ground surface and that the operating wrench will fit squarely on the operating nut. Equipment which does not operate easily or is otherwise defective shall be repaired or replaced at the Contractor's own expense. Special care shall be taken not to displace the valve box during backfilling, compaction and surface restoration. The Contractor shall demonstrate that all buried valves are accessible and fully operable with standard valve wrenches and clean out.
- B. The Contractor shall furnish and install tie rods, clamps, couplings, concrete thrust blocks and accessories to prevent the movement of branch valves, as indicated on the Drawings or as directed. All valves at tees shall be restrained back to tee with retainer glands or asphalt coated rods.
- C. All buried valves controlling water services should be installed within the road right of way as close to the property line as possible. All buried valves shall be provided with a box as specified and shall be set plumb and be supported and protected during backfill. Prior to acceptance of the work, the Contractor shall demonstrate that all buried valves are accessible fully operable with standard valve wrenches and clean out.

3.4 – Hydrants

- A. The exact field location of each hydrant shall be determined by the Department and the Northborough Fire Department prior to excavation for hydrant installation. The hydrant shall be installed as indicated on the Drawings and as per manufacturers' recommendations for the proper installation of the hydrant. The hydrant shall be set as to not bury the traffic flange to facilitate repairs without having to excavate around the hydrant. The area around the hydrant shall be graded to permit a 3-foot-wide level area all around the hydrant and to provide adequate cover and support on all sides.
- B. The Contractor shall furnish hydrants manufactured for the depth of cover over the mains at the hydrant connection and the actual ground elevation at the hydrant location. A minimum of 5 and no more than 6 feet of cover at the inlet connection to the hydrant shall be maintained at all locations.
- C. Hydrants to be set above any potential groundwater table shall include an automatic drain feature. This shall include the necessary drain ring, seat and valve mechanism to automatically

allow drainage of the hydrant barrel when the hydrant valve is fully closed. The drain ports shall be automatically closed when the operating rod is turned no more than two full turns.

- D. The installation of those hydrants with an automatic drain feature shall include approximately 1/3 cu. yd. of clean crushed stone placed around the hydrant base to a level several inches above the drain openings.
- E. There shall be twenty-four (24) inches between the face of the curb and the hydrant steamer cap at its furthest extremity. The steamer nozzle shall face the street unless otherwise directed by the Department. Hydrants shall be connected to water mains by six (6) inch ductile-iron pipe. Each hydrant installation shall include buried gate valve between the hydrant and its supply main to permit isolation of the hydrant for maintenance purposes. The auxiliary valve shall be connected to the anchoring tee unless directed otherwise by the Department. The distance between the auxiliary valve and the hydrant body varies for each installation. All connections at hydrant installations shall be mechanical joint connections with plain rubber gaskets. All joints between and including the anchoring tee on the distribution main and the hydrant shall be restrained by retainer glands or rods.

The hydrant shall be set upon a slab of concrete not less than four (4) inches thick and fifteen (15) inches square. Each hydrant shall be thrust blocked against the undisturbed vertical face of the trench with a concrete thrust block as indicated on the Drawings.

Should soil and/or trench conditions preclude the use of a concrete thrust block, additional tie rods, installed as indicated on the Drawings may be used. Tie rods shall be of the number and orientation, size, material and construction as specified by the National Fire Protection Association Codes. All the rods and accessories shall be field coated with an asphalt-type material prior to backfilling.

The Contractor shall take special care to ensure that all hydrants are set plumb. When the hydrant installation has been completed (including surface restoration of the area immediately surrounding the hydrant), the hydrant shall be painted according to specifications of the Department. Rough up any existing paint surfaces with sandpaper. Thoroughly clean the hydrant with mineral spirit-soaked rag. Apply rust converter on all areas. The hydrant must be scraped and primed. Two coats of rust inhibitive safety yellow paint shall be applied to the barrel, down to the ground level. Two coats of rust inhibitive white paint shall be applied to the bonnet and caps. Apply Never Seize to all nipple threads.

3.5 – Temporary By-Pass Piping (if required)

- A. The Contractor shall provide temporary by pass piping in such a manner that adequate pressure shall be available to all affected residences should his work require that the water service to Customer(s) be interrupted for more than a four-hour-long period. The determination of the need for temporary piping and the size of the piping and service connections is the responsibility of the Department. The Contractor shall submit his plan to the Department for approval.

WATER DISTRIBUTION MAP

