

**TOWN OF HOPKINTON
WATER DEPARTMENT**

**Construction Standards
and
Rules & Regulations
for
Public Water Mains and Services**

October 2010

SECTION 1 **GENERAL**

The following rules and regulations shall be considered a part of the Contract with every consumer supplied with water from the Town of Hopkinton Water Department herein called the HWD, and every person or property owner taking water shall be considered as having expressed their consent to be thereby bound.

All applications for the use of water must be made at the office of HWD, and state fully the purpose for which it is intended to be used. The water permit shall be void 1 year after date if not used. For renewal of water permits, there shall be a charge as contained in the billing section of these rules and regulations.

Failure to enforce or to have knowledge of violations in whole or part of these rules and regulations does not relieve property owners from liability or penalties for failing to abide by same.

These rules and regulations may be modified by the Director of the Department of Public Works.

All piping, fittings and appurtenances are to be American or North American made and shall conform to AWWA standards.

SECTION 2 **DEFINITIONS**

Unless the context clearly indicates otherwise, the following terms, as used in these Rules and Regulations, shall have the meanings indicated:

Applicant: a party seeking any HWD approval required by these rules and regulations.

Approved Backflow Prevention Device: a physical means to prevent backflow approved by the Massachusetts Department of Environmental Protection and/or the Hopkinton Water Department Manager or Designers.

Backflow: the flow of water or other liquids, mixtures or substances into the distribution pipes of a potable water supply from a source other than the intended source.

Back-Siphonage: a form of backflow due to reduced or sub-atmospheric pressure within a water system.

Contamination: or contaminant shall mean any physical chemical, biological or radiological substance or matter in water.

Cross Connection: any actual or potential connection between a distribution pipe of potable water from a public water system and any waste pipe, soil pipe, sewer drain, or other source. Without limiting the generality of the foregoing, the term "cross connection" shall also include any by-pass arrangements, jumper connections, removal section, swivel or changeover connection or other temporary or permanent connection through which backflow can occur.

Health Hazard: an actual or potential threat of contamination to the potable water system that, in the opinion of the Massachusetts Department of Environmental Protection (DEP) or the Hopkinton Water Department could endanger health.

In-Plant Protection: the location of an approved backflow prevention device in a manner that provides the protection of the potable water system within the premises.

Main Extension: any contemplated connection, or connections, to the Town's water system by a property which:

- (1) is not conforming to the applicable zoning district requirements;
- (2) is not abutting the existing distribution system regardless of the size of the conduit;
- (3) although abutting the water system, requires additional water mains or service lines because of change of use;
- (4) the addition of new units is added to an existing parcel;
- (5) although abutting the water system, is sub-divided into additional parcels.
- (6) is a vacant parcel that abuts a water main, which requires multiple connections.

Manager: the Water/Sewer Manager or any successor official having equivalent responsibility for the operations of the HWD, duly appointed in accordance with applicable law.

Owner or Occupant: any person maintaining a cross connection installation or owning or occupying premises on which cross connections can or do exist.

Pollution: the presence of any foreign substance (organic, inorganic, or biological) in water which tends to degrade it's quality so as to constitute a hazard or impair the usefulness or quality of water to a degree which does not create an actual hazard to the public health, but which does adversely and unreasonably affect such waters for domestic use.

Potable Water: water from a source which has been approved by the Massachusetts DEP for human consumption.

Public Water Supply: a system for the provision to provide the public water for human consumption.

SECTION 3 **USER RESPONSIBILITY**

Parties using water for domestic or manufacturing purposes may erect hydrants, standpipes or sprinkler systems to be used only as protection against fire, subject to inspection and approval by the Manager.

There shall be no connection between a public water supply and any non-potable water source unless the public water system is protected by a method meeting the requirements of the Department of Environmental Protection (D.E.P.), HWD Rules and Regulations, and local Building Codes and any other applicable federal, state, or local regulation relative to cross connections between public water supplies and fire and industrial water supplies. An independent source of supply shall be permitted subject to approval by the Manager.

The HWD shall not be held responsible or liable to any person or persons for any loss or damage from water service interruptions, or from any excess or deficiency in the pressure, volume or supply of water due to any causes whatsoever. Massachusetts General Law states that a minimum pressure of 20 psi be maintained under all operating conditions.

When unnecessary waste of water occurs, the occupant of any premises shall be notified in writing. If said waste is not prevented within two days of said notice, the water shall be shut off. The occupant shall be subject to all costs as determined under the billing section of these rules and regulations. Second offenders shall not have water turned on again until approved by the Manager.

No person shall operate any hydrant of the water works system without written permission from the manager or the Director of the Department of Public Works, except for the Chief of the Fire Department, or persons acting under his stead, in case of fire or practice.

Persons requesting to have a hydrant moved shall do so in writing. The cost of moving the hydrant shall be the responsibility of the requesting party.

The HWD shall not be held liable to any person or persons for any damage caused by contaminated water resulting from the opening or closing of valves, hydrants, the breaking of any pipe or fixture, heavy demand or any other cause whatsoever. Backflow prevention that satisfies Massachusetts D.E.P. and HWD requirements shall be utilized.

The HWD reserves the right to restrict, limit or shut off water in all cases when it becomes necessary to do so for repairs, non-payment of water bills, violation of the regulations, Town of Hopkinton By-Law or whenever deemed expedient.

The property owner is responsible to guard against leaks occurring whenever a house is closed for any length of time. The property owner is responsible for prevention and correction of any leakage from the curb stop onward within the property. Failure to correct leakage within 10 days notification by HWD will result in the water service being shut off. Service will not be restored until leakage has been repaired to the satisfaction of the

Manager and a fee as contained in the billing section of these regulations has been received.

No water service shall be turned on until a record has been entered at the HWD office stating that approval has been granted, an as-built plan has been provided, an inspection by the HWD's representative has been made, a meter has been installed and all monies due have been paid in full.

Mark out of water mains, services and other appurtenances will be provided with a three day minimum notice, unless it is an emergency. Markouts on private property will be done as courtesy and the HWD shall not be responsible for incorrect markings.

Inspection of a water service shall be free of charge. Additional inspection of the same service shall carry a charge as contained in the billing section of these regulations.

All persons or firms having private fire connections for sprinklers and private hydrants on the premises or in buildings are forbidden to use the water for any other purpose excepting fires, except where metered. Maintenance of fire sprinkler systems on private property shall be the responsibility of the property owner.

All service lines, connected into a fire sprinkler water main shall be tapped outside the building and provided with a rod box and shut-off in order to isolate the meter and provide fire protection if the service line is shut off.

SECTION 4 **METERS**

Every water service shall be metered and shall be of a design and size as approved by the manager. They shall read in cubic feet and have a touch pad and/or radio read unit attached.

Any new residential, commercial or industrial building, having more than one dwelling unit or business will have separate water meters for each dwelling unit or business. The water bill shall be the responsibility of the landlord pursuant to *M.G.L. c.40, §§42B-42F*. All fees and related meter costs shall be paid prior to water service being turned on in the building or tenant unit. Any requested retrofit of meters shall be at the owner's expense

All meters on new services shall be installed by the meter technician and sealed against tampering or alteration. The breaking of the seal shall result in a fine as contained in the billing section of these regulations. The routine replacement of meters up to and including 3/4- inch will be replaced by the HWD. The cost of replacement and normal repair will be borne by the HWD.

All 3/4 inch meters shall be kept in repair by the HWD, free of charge, except when damage is done through neglect or malice, by freezing, steam, frost or hot water. The cost for this repair shall be borne by the consumer.

The consumer or property owner shall be responsible for any loss of a meter that is registered to his property.

Remote water meter registers shall be installed at the expense of the property owner and connected to all privately owned meters installed in new property or new accounts.

All landlords or property owners shall be liable for billing, repair or any other charges for the use of meters and water in accordance with the billing section of these rules and regulations.

All properties that do not have an outside register or that have an old or malfunctioning register shall provide prompt access upon request of the water department, to have one installed or replaced. Failure to do so could result in fines according to the billing section of these rule and regulations.

All meters over 1 inch shall be tested annually by a testing company approved by the HWD with results furnished to the Manager.

The Water Dept. reserves the right to either increase or decrease the meter size at any time, based on flow requirements. The cost to replace all meters 1" and greater are to be borne by the property owner.

Alteration or changes in any pipe, fittings or meters shall be made by persons authorized by the HWD.

All property owners shall grant access to a representative of the HWD to all buildings, and premises supplied with water for the purpose of making repairs and inspection of pipes, stopping the waste of water and for reading, repairing or changing water meters.

Whenever feasible, the water meter shall be set at a point where the service enters the building, in full cellars or utility rooms and shall be easily accessible for inspection and removal. The location is to be approved by the Manager. Sub-cellars, half-cellars or trap doors shall not be approved. Where it is not practical to set the meter in the building, the meter shall be set in a pit furnished by the property owner. If, in the opinion of the Manager, the meter location should be changed, the right is reserved to have it done at the expense of the property owner. All meter locations shall be approved by the Manager.

No valves or devices of any sort shall be set on the street side of the meter, except an approved type of shut-off.

The consumer shall be responsible for free access to the meter by the HWD at all times. Failure to remove any obstruction preventing access shall constitute a cause for shutting off the water within three days.

If, for any cause, the meter of any water taker breaks or the indicator thereon fails to record the amount of water used for any period, the quantity used shall be determined by the HWD. In determining the quantity, the HWD shall make reasonable reference to the quantity used in the corresponding period of previous years.

SECTION 5 **HOUSE PLUMBING**

All apparatus and places supplied with water by the HWD must be accessible at all times to allow for the HWD to examine the pipes and fixtures and ascertain the quantity and manner of water use.

All consumers taking water must keep water pipes and fixtures in good repair and protected from frost at their expense. Consumers shall be held liable for any damages resulting from failure to do so.

Provisions shall be made in plumbing and heating systems to prevent the return of hot water to the meter when water system pressure fails due to whatever reason. The water system must be designed and operated to provide protection against excessive plumbing pressures from steam, hot water or heating systems.

The HWD shall not be held liable or responsible for any loss or damage to any piping system due to reasons mentioned previously in these regulations.

If the water is shut off, a faucet should be left open until water is turned on. This will prevent damage to the piping and hot water tank.

All industrial air conditioning systems shall require a recirculating condenser.

Provisions shall be made to prevent back-siphonage into the Town's water system as required by the State Plumbing Code and the Town of Hopkinton Regulations. The use of water saving fixtures is strongly encouraged.

SECTION 6 **DISTRIBUTION SYSTEM**

A. GENERAL

No subdivision, multiple dwelling complexes, commercial or industrial building or parks' water supply main shall be connected to any public water supply main of the HWD except as specifically directed, inspected and approved by the Manager. Application for main extensions and construction plans must be approved in writing by the Director of the Department of Public Works.

The approval of any private subdivisions water supply system shall in no way make the HWD, their agents or the Town of Hopkinton responsible or liable for the operation, maintenance or satisfactory performance of the installation. Such responsibility shall rest with the Applicant and/or Owner until, by action of the Director of the Department of Public Works, the town accepts the system as part of the public water system of the Town of Hopkinton Water Department.

All Industrial, commercial or other business property with water mains, shall remain the responsibility of the owner to maintain.

All supply mains and appurtenances for private subdivisions, multiple dwelling complexes commercial or industrial building or parks, shall be installed strictly in conformity with the standards and specifications of the American Water Works Association and those as determined by the Manager. All work shall be performed by a licensed pipe layer.

Parties using water for domestic or manufacturing purposes may erect hydrants on their own grounds, or standpipes on their buildings to be used only as a protection against fire, subject to approval by the HWD. The entire cost shall be borne by the Owner of the premises.

Wherever the subdivision, multiple dwelling complexes commercial or industrial building or parks' water main connects to the Town's system, said connection shall be made by sleeves and valves located within the Town's boundary lines. The Owner or Occupant shall grant the HWD an easement for the inspection, maintenance and repair of all water supply mains.

Water mains at all street intersections and beginning and end of easements shall have valves installed on all sides of each tee or cross, fitted with gate boxes adjusted to the finished grade. Gate boxes shall have at least a 6-inch overlap between vertical sections.

Sectional isolating valves shall be installed in all lines of the water mains at eight hundred (800) foot intervals.

Any paving, digging, or reconstruction that involves the raising or adjusting of water gates, shall be the responsibility of the contractor. Inspections by the water department shall be done to ensure that operating nut is accessible.

Approved fire hydrants shall be installed at intervals of not more than five hundred (500) feet by way of proposed streets and where designated by the HWD and Hopkinton Fire Chief. No utilities, conduits, drains or other underground piping, may be laid within 5' of water main, hydrants, services or other water appurtenances.

Hydrants shall be 9 to 9 1/2 feet from the edge of road or berm to accommodate fire department connections. Additionally, hydrants shall be a minimum of 3 feet behind sidewalks.

No one shall operate valves in water mains except the HWD. Violators shall be prosecuted according to law.

No dead ends shall be permitted except as allowed by the Director of the Department of Public Works. On dead end streets, the full size water main shall be extended through easements to connect with existing water mains. On approved dead end water mains, a valve shall be located with a hydrant within fifteen (15) feet of the dead end. Dead ends with pipe sizes less than 6" shall have a blow off located at the end of the pipe.

If a manhole is required in place of a valve box for access to the operating nut on a valve, the expense shall be borne by the property owner.

The HWD may designate a member of the HWD or duly authorized agent to supervise, inspect or approve work in accordance with the foregoing regulations. All reasonable expenses associated with this inspection work shall be borne by the Applicant.

The minimum size for water mains shall be 8 inches in diameter. The material shall be double cement lined, Class 52 ductile iron, per AWWA/ANSI C151/A21.51 latest revision, with minimum wall thickness as follows:

8"	.33
10"	.34
12"	.37

B. PERMIT APPLICATION

An application for a Water Main Permit must be made for all subdivisions, multiple dwelling complexes, commercial and Industrial Properties, and main extensions for homes

A complete Water Main Construction Application shall be submitted at least forty-five (45) days prior to start of work. All submitted documents shall be in the form of one paper copy plus an electronic copy (on CD or DVD). All electronic files shall be in PDF format except with the prior approval of the Manager. The following information and materials shall be submitted as part of the Permit Application:

1. Full name and address of the Owner of all properties involved.
2. Names of proposed streets.
3. Length, type and size of pipe to be installed.
4. Number, distance between and type of hydrants to be installed.
5. Number of house lots to be serviced by the new water main.
6. Any such data as reasonably required by the HWD.
7. A design plan at a scale of forty (40) feet to the inch, showing the exact locations of all new roads, proposed location of the water mains, valves, hydrants, service, points of junction with the public water supply system, and any other information that may be reasonably required by the HWD.

8. Contact information for the contractor who shall install water mains and appurtenances.
9. Contact information of the manufacturer of all materials which shall conform to the specification section of these rules and regulations.

Any impact study report (paid for by the Applicant) shall accompany each set of plans. The study shall include calculations of estimated average day and maximum day water demands for the proposed development, fire flow requirements (based on Insurance Services Office (I.S.O.) guidelines, and water pipeline sizes. The report shall also address what effects these water demands would have on the existing service area, including system pressures and fire flow capabilities and the overall impact to the water supply and capacity.

The requirements of this subsection may be satisfied by the Applicant's submission of both paper and electronic copies of appropriate documentation prepared for and submitted in connection with an application made pursuant to the Town's Zoning Bylaws, provided that all required information identified is included.

C. PERMIT APPLICATION APPROVAL

No Water Main Construction Application shall be approved until it has been reviewed by the HWD's designated consulting engineer, and the engineer's fees have been fully paid directly by the Applicant .

The Applicant will ordinarily be informed, within thirty (30) days of its complete submission to the HWD, as to whether its Application has been approved or denied.

If the Application is approved, all permit fees must be paid prior to start of construction.

If the application is denied, the HWD shall inform the Applicant and shall specify what measures, if any, must be taken to obtain approval.

Under no circumstances is construction to begin before an Application has been approved. See Section 11: Penalties.

D. WORK AND MATERIAL

During construction, all contractors working on roads under the responsibility of the Hopkinton Highway Division shall comply with the Town's rules and regulations regarding permits, bonding, cross trenches, police protection and all safety requirements.

Wherever a main connects with the Town's system, connection shall be made by MJ tapping sleeves and tapping gates or line tee w/triple gates located within the Town's street lines.

E. LICENSES FOR PIPE LAYING

All work related to installation of water service pipes and public water mains shall be performed by Pipe Layers who receive a license from the Town.

Licenses to perform work related to installation of water service pipes and public water mains shall be issued only to experienced and competent Pipe Layers. All applications for licenses must be accompanied by an application fee in the amount specified in the billing section of these rules and regulations. Licenses must be renewed each calendar year.

Pipe layers doing work hereunder shall maintain minimum insurance coverage as follows:

Personal Injury Liability	\$300,000 per person/\$1,000,000 per occurrence
Property Damage Liability	\$300,000 per person/\$1,000,000 per occurrence

Certificates of Insurance reasonably acceptable to the HWD shall be filed with the HWD prior to the commencement of work. These certificates shall evidence that coverage afforded under the policies may not be canceled unless at least thirty (30) days' prior written notice has been given to the HWD.

The HWD may immediately suspend and, after notice and an opportunity for hearing, revoke the license of any Pipe Layer if, in HWD's opinion, the construction methods or materials used by the Pipe Layer do not comply with these rules and regulations.

Pipe layers are required to provide the HWD with detailed sketches and measurements for service and gate boxes, tees, elbows, caps, plugs and other pipe fittings. This requirement may be satisfied by the submission of an electronic file in a format reasonably acceptable to the Manager.

F. INSTALLATION APPROVAL

Approval of the completed installation shall not be granted until the HWD's representative has inspected installation of water mains, services, and appurtenances as in an opened trench; provided, however, that the Applicant may, with the prior approval of the Manager, arrange for such inspection to be conducted by a third party inspection service.

No installation shall be approved, occupancy permits signed by a HWD representative, or services activated unless the following have been submitted:

- a. As-built drawings, certified by a Professional Engineer, showing ties to all fittings and valves. A mylar and two additional hard copies, as well as one electronic copy of the drawings .

- b. A log of inspections performed and observations made by the inspector in either paper or electronic form.
- c. Detailed sketches and measurements to service and gate boxes, tees, elbows, caps, plugs and other pipe fittings.
- d. Written certification, signed by the Applicant or its consultants, that the installation complies in all respects to HWD rules and regulations.

Within thirty (30) days of receiving the required materials, the HWD shall notify the Applicant in writing whether or not the installation has been approved. If the installation is not approved, the HWD shall inform the Applicant what measures must be taken to obtain approval.

Water service shall be turned on only after the installation is approved and all billing charges have been paid. Water service may be turned on only by a representative of the HWD.

G. PERFORMANCE GUARANTEE DEPOSIT

Licensed Pipe Layers proposing to construct an extension to an existing water main, construction of water service piping, or any other work in relation thereto, which will be done within the limits of the Town of Hopkinton roadway takings, easements, or other land under the control of the Town of Hopkinton shall be required to submit with the application for Water Main Construction Permit, and a minimum \$5,000 Performance Bond made out to the Town of Hopkinton. Amount of performance bond required will be determined at time of plan approval. Performance bond will be released upon acceptance of the water main and appurtenances and road reconstruction. The requirements of this section may, at the discretion of the Director of the Department of Public Works, be satisfied by the performance requirements of the Hopkinton Planning Board. In no event shall the Applicant be required to bond the same scope of work more than once.

SECTION 7 **SERVICE LINES**

The property owner is responsible for the service from the property line to the house. The HWD is responsible for the repair of leaks only, from the property line to the water main on all installed services.

No one except the HWD shall tap the water main for service connections unless prior written approval is received from the Manager of the HWD. The property owner shall pay all expenses incurred for making the tap.

There shall be no water turned on to any property until a meter and outside register has been installed, along with a shut-off on the discharge side of the meter, and the hook-up approved by the Manager. Materials from the main to building shall be supplied by the Applicant. Compliance with all the HWD's rules and regulations is required.

A sketch with no less than 3 triangulated measurements of the service lines location, including the Rod box, must be provided before the water service will be turned on.

The pipe shall be installed with a minimum of 5½ feet of cover. Where the pipe cannot be reasonably installed with this cover, the Contractor shall furnish and install insulation as approved by the DPW Director. The Contractor must have permission from the HWD to install any pipe with less than 5½ feet of cover, prior to installation

One inspection of a house service shall be made by a HWD representative during normal working hours. Additional inspections of the same service or inspections requested to be performed outside normal working hours shall be chargeable according to the billing section of these rules and regulations.

The location of all water services shall be planned to avoid the placing of service valves and boxes in driveways or sidewalks. Water shall not be supplied to services located otherwise. No connections will be made to water service that is located within 20 feet of any cesspool drain lines, or lines entering cesspools. No connections will be made to water service lines located within 8 feet of, or crossing electric, gas, sewer, storm drains, cable TV lines or any other underground hazard. Domestic service lines shall be sleeved through the side of the foundation. The water trench must be inspected by the Water Department, prior to backfilling and magnetic tracer tape must be placed 18" below final grade level. Tracer wire must also be attached to the rod box and run into the house.

The service line shall have a bedding of 1 foot of sand below and 1 foot of sand above.

All expenses for new installation or replacement of an existing service from the water main to house or building shall be borne by the property owner.

The sizes of service pipes shall be approved by the Manager. The nomograph illustrated as Figure 1 shall be used to determine the required size of the service pipe.

In all cases, water mains must abut the property, or there must be an approved Application Permit for installation of a water main in an abutting property, before service connections will be approved or constructed.

Services shall be subject to all charges according to the billing section of these rules and regulations.

A system development charge shall be assessed to all new services as contained in the billing section.

All services shall be sleeved through the side of the foundation and extend 12 inches inside the house foundation. No service shall be located within 5 feet of the electrical box.

No service pipe shall be installed past curb stop and box before the building foundation has been completed or a permit obtained.

No one except the HWD's representative shall turn a service valve on or off.

There shall be only one potable supply service for each dwelling.

Multiple dwelling units shall be supplied by individual metered services to each dwelling. The connection fee as stated in the billing section shall apply to each individual unit.

A new service shall be required for multiple dwelling units with 4 or more bedrooms that are 20 or more years old.

The remodeling of a dwelling, complex or business or re-building of a demolished dwelling, complex or business, with an existing water line that is not of the type listed in Section 8, A-11, shall be replaced from the main to the structure to conform to Section 8, A-11. This will be done at the Owners' expense.

The owner of a lot, new home or existing building or home erected beyond the existing water main in any town street shall extend the main to the far end of his property before a service is supplied if a main extension is approved under the water main extension policy. Services to all abutting lots shall be installed at their cost as well.

A home owner or business may hire a licensed pipe layer for the replacement of an old service line and will bear the full expense from the water main to the structure.

Figure 1
Service Size Nomograph

Example:

Customer Requirements 50 GPM

Length of Service 60 FT.

Street Pressure 80 PSI

Draw line from 50 GPM thru 60 Ft. len. of service to Reference Line A. From Reference Line A to 80 PSI. Line will intersect Pipe size line to indicate that 1-1/4 service pipe is recommended.

SECTION 8
SPECIFICATIONS

A. VALVES, HYDRANTS AND APPURTENANCES

A-1. GENERAL

The Applicant shall furnish and install valves, hydrants and appurtenances as indicated on the details in A-2 through A-12 below and as herein specified. The drawings submitted to and approved by the HWD shall contain these details and specifications.

A-2. RESILIENT WEDGE VALVES

Resilient wedge valves shall be the products of the Waterous Co., St. Paul, Minnesota, or Kennedy Valve Manufacturing Co., Elmira, New York or approved equal.

Resilient wedge valves shall be cast iron body, resilient wedge type. The valves shall be designed for 200 psi working pressure and 400 psi test pressure. Valves are to have O-ring seals and a nonrising stem. Valves shall have a 2-inch operating nut. Valves shall open left. Valve interior and exterior shall have fusion bonded epoxy coating per AWWA C550.

Resilient wedge valves shall meet the most recent version of the AWWA standard C509. Resilient wedge valves shall have mechanical joint ends. Valves shall be connected directly to anchor tees on all hydrant branches.

A-3. BUTTERFLY VALVES

The butterfly valves shall have a cast-iron body and shall conform to the AWWA specifications for Rubber-Seated Butterfly Valves, Designation: C504 by M&H Valve Co., Pratt Valve Co., or approved equal. The valves shall have mechanical joint ends when buried and flanged ends where exposed.

The valves shall be class 150B and suitable for a nonshock shut-off pressure of 150 psi. The valves shall provide bubble-tight shut-off at 200 psi when tested for leakage in accordance with the above mentioned AWWA C504. The valve shall be rejected if it does not pass this test.

Butterfly valve designs utilizing continuous lining on the internal body surfaces and extending over the flanges, will NOT be acceptable. Valve disks shall seat at an angle of 90 degrees to the axis of the pipe.

Valve seats shall be of molded natural rubber. Rubber seats may be attached to the body of the disk. If the rubber seat is attached to the disk, the seat ring on the body shall be of stainless steel. The valve disk shall be of either cast Ni-Resist or cast iron Class 40 conforming to ASTM A48-Specification for Gray Iron Castings.

Rubber seats mounted on the disk shall be securely clamped to the disk. All clamps, retaining rings, and their fasteners shall be Series 304 stainless steel.

The valve shaft shall be Type 304 stainless steel or carbon steel with stainless steel joints. The valve disk and shaft connection shall be by means of mechanically secured taper pins extending through the disk and shaft. Taper pins, lockwashers and nuts shall be 18-8 stainless steel. The shaft seals shall be designed for the use of standard chevron type packing or standard O-ring seals.

The manual operating mechanism shall be firmly fixed to the valve body. The operator shall be permanently lubricated, shall be totally enclosed with a cast iron case, and the hand wheel or 2-inch nut for buried valves shall turn counter-clockwise to open. The operator shall be traveling nut type designed to withstand 300 foot pounds of input torque at full open or closed positions without damage to the valve or operator.

A-4. INSTALLATION

All valves shall be carefully erected and supported in their respective positions free from all distortion and strain. Care shall be taken to prevent damage or injury to the valves or appurtenances during handling and installation.

All valves shall be secured by Megalugs or equal.

All material shall be carefully inspected for defects in workmanship and materials, all debris and foreign material cleaned out of valve openings and seats, all operating mechanisms operated to check their proper functioning, and all nuts and bolts checked for tightness. Valves and other equipment which do not operate easily or are otherwise defective shall be repaired or replaced at the Contractor's expense. Mechanical joints shall be torqued to manufacturer's specifications.

Buried valves and valve boxes shall be set plumb and centered with the valve boxes directly over the valves. Earth fill shall be carefully tamped around the valve box to a distance of 4 feet on all sides of the box or to undisturbed trench face, if less than 4 feet.

A-5. VALVE BOXES

Each valve shall be provided with a box. Covers shall have two (2) lifting holes, and the word "WATER" cast on the top. The top of the cover shall be flush with the top of the box rim.

Valve boxes shall be tar coated cast iron and of the adjustable sliding, heavy pattern type. They shall be so designed and constructed as to prevent the direct transmission of traffic loads to the pipe or valve. The upper or sliding section of the box shall be provided with a flange having sufficient bearing area to prevent undue settlement. The lower section of the box shall be designed to enclose the operating nut and stuffing box of the valve and rest on the backfill. The boxes shall be adjustable through at least 6 inches vertically without reduction of lap between sections to less than 6 inches.

The inside diameter of boxes shall be at least 4-1/2 inches and the lengths shall be as necessary to suit the ground elevation (normal pipe cover 5.0 feet).

A-6. TAPPING SLEEVE AND VALVE

The tapping sleeve and valve shall consist of a split ductile iron sleeve tee with joint ends on the main and a flange on the branch, and a tapping-type resilient wedge valve with one flanged and one mechanical joint end. The valve shall conform to the requirements hereinbefore specified for resilient wedge valves. The Contractor shall be responsible for verifying the outside diameter of the pipe to be tapped.

Before backfilling, all exposed portions of any bolts used to hold the two halves of the sleeve together shall be heavily coated with two coats of bituminous paint comparable to Inertol No. 66 Special Heavy. Sleeves shall be of ductile iron conforming to ASTM A-126 Class B, furnished with rubber gaskets. Gaskets shall cover the entire area of flange surfaces.

Tapping sleeves and valves shall be made by The Waterous Co., St. Paul, MN or an approved equal product.

A-7. HYDRANTS

The hydrants shall conform to the requirements of AWWA Standard for Dry Barrel Fire Hydrants for Ordinary Water Works Service, Designation C502-80, or latest revision.

The hydrants shall have one 4-1/2 inch pumper and two 2-1/2 inch hose connections, NST, with a 6 inch mechanical joint shoe. The hydrant shall be equipped with a 5-1/4 inch main valve, shall have bronze to bronze seatings, and open left. Hydrants shall also have an 8 inch ductile iron lower barrel and a fusion bonded epoxy coated shoe. There will be a travel-stop nut located on the upper stem to prevent damage due to excessive force. Upper stem threads will be lubricated by the use of an all-temperature grease and sealed by double "O" rings.

For the purpose of standardization, hydrants will be the Waterous Pacer-WB 67 with the "Boston operating Nut" or the Kennedy K81D, or approved equal.

The hydrants shall be thoroughly cleaned and given two shop coats of paint in accordance with the above-mentioned AWWA Specification C502, latest edition. Paint color shall be Federal Safety Red as manufactured by Hydrant Hyde Paint with white bonnet and white caps.

The hydrants with its buried valve and valve box shall be set plumb and centered with the valve box directly over the valve. Backfill around the hydrant and valve shall be thoroughly compacted to a distance of 4 feet on all sides of the box, or to the undisturbed trench face, if less than 4 feet. The hydrant connecting pipe shall have at least 5½ feet of cover. The hydrant shall be set upon a slab of stone or concrete not less than 4 inches thick and 15

inches square. The side of the hydrant opposite the pipe connections shall be firmly wedged against the vertical face of the trench with a poured concrete thrust block as indicated on the standard details. No less than 5 cu. feet of broken stone shall be placed around the base of the hydrant at the location of the drain holes. Strict attention shall be given to insure drainage holes are kept free of any concrete. Fifteen pound roofing felt shall be placed between the concrete thrust block, and the hydrant and drainage gravel. Backfill around the hydrant shall be thoroughly compacted to the grade line in a satisfactory manner. Hydrant and valve shall have the interiors cleaned of all foreign matter before installation, and shall be inspected in both the open and closed position.

The bury of the hydrant shall be of sufficient length to allow the hydrant to be set at the proper elevation, as shown on the standard details. Extensions shall be furnished and installed at the Owner's expense, when required for greater depths.

All hydrants shall be mechanically connected to the water mains using a main anchoring tee, fitted to take a 6 inch resilient wedge valve mechanically connected on the side outlet, and a 6 inch mechanical joint cement lined ductile iron pipe to the hydrant. Retaining glands shall be used at all joints between the shut-off valve up to and including the hydrant. Retaining glands should be a Megalug by EBAA iron or equal. Retainer glands w/cup screws will not be allowed. All bolts shall be torqued to manufacturer's specification.

Before exposure to the weather and after thorough cleaning to remove all rust, dirt, grease and other foreign matter, the equipment and appurtenances specified herein shall be painted in the shop as specified hereinafter. Ferrous surfaces which will be submerged shall be cleaned by sand-blasting to remove all foreign matter. Following cleaning, the surfaces shall be painted in the shop as follows: interior and exterior surfaces of valves and valve appurtenances shall be given a shop finish of an asphalt varnish conforming to Federal Specification TT-V-51C, for Varnish Asphalt. Ferrous surfaces obviously not to be painted shall be given a shop coat of grease or other suitable protective coating.

After installation and until acceptance, hydrants shall be covered to signify their inactiveness. All hydrants will be fitted with a permanent hydrant marker. Please check with the Water Department for marker specifications.

A-8. CORPORATION COCKS

Corporation cocks shall be bronze plug style and shall be the approved equal of Mueller Valve Co., Decatur, Ill. #15008, for plastic service tube. End joints shall be compression fittings. A.V. McDonald, Dubuque, Iowa #4701, or approved equal.

A-9. TAPPING SADDLES

Tapping saddles shall be required on all polyvinyl chloride (PVC), and asbestos-cement (A.C.) pipe. Tapping saddles as recommended by pipe manufacturer or equal.

A-10. CURB STOPS

Curb stops shall be bronze, with Teflon coated ball valve, and shall be the approved equal of Mueller #B25209 Valve Co., Decatur, Ill. for plastic pipe compression joint. The will be open left.-1-9. Service boxes shall be ERIE style, with 4½-5½ maximum extension, pentagon plug style cover, with the work "WATER" cast into the cover. The service box will be reinforced at the arch and pipe ring and will accommodate up to a 1 inch Curb Stop. Service Box Rod will have a heavy Ductile Iron Yoke and Brass Cotter Pin.

A-11. PLASTIC TUBING

1 inch polyethylene 200 P.S.I., SD129, copper tube size, spec #PE3408 shall be required from water main to curb stop and to meter connection for all service connections.

A-12. METERS

For the purposes of standardization, water meters shall be provided with an external reader (touch Pad) and radio unit and 40 feet of cable. Each meter shall be supplied with appropriate meter connections. Meter connection nuts will have a hole in nut for purposes of sealing. Model # to be approved by Manager upon application of permit. For Meters over 1" the Water Department requires a compound meter with touch pad and radio read unit, to be purchased by the owner or contractor. The touch pad shall be run outside and be a minimum of 3 feet off the ground.

B. CEMENT-LINED DUCTILE IRON PIPE AND FITTINGS

B-1. GENERAL

The Contractor shall furnish, handle, haul, lay, joint, test and disinfect all cement-lined Class 52 ductile iron pipe, including fittings and appurtenant work.

The pipe shall be installed with a minimum of 5½ feet of cover. Where the pipe cannot be reasonably installed with this cover, the Contractor shall furnish and install insulation as approved by the Water Manager. The Contractor must have permission from the HWD to install any pipe with less than 5½ feet of cover, prior to installation.

For buried ductile-iron pipelines, the Contractor shall use push-on-joint type pipe. All fittings for push-on-joint pipe shall have mechanical joint ends. The pipe and fittings shall be cement lined and coated. The pipe joints shall have rubber gaskets.

Water mains shall be installed 12 feet from the property line on proposed streets or location approved by Water Manager.

B-2. STANDARD SPECIFICATIONS

Class 52 ductile iron pipe shall conform to ANSI A21.50 (AWWA H3) and ANSI A21.51 (AWWA C151)

Short Bodied Class 350 ductile iron fittings shall conform to ANSI A21.53 (AWWA C153)

B-3. PIPE JOINTS

Where required, pipe and fittings shall be furnished with restraining glands, approved lugs or hooks cast integrally for use with bolts or bridle rods and socket clamps to keep the piping from pulling apart under pressure. They shall be Megalug or equal.

- a. Flange joints shall conform to AND-A21.11 except that special drilling or tapping shall be as necessary to ensure 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.
- b. Mechanical joints shall conform to AND-A21.11.
- c. Push-on joints shall conform to ASN-A21.11.

B-4. FITTINGS

Fittings shall be Class 350 compact ductile iron. Class 350 short-bodied fittings may be used at the Contractor's option. Unless otherwise indicated, fittings shall have mechanical joint ends.

Flanged fittings shall be faced and drilled in accordance with ANSI-A21.10 except that special drilling or trapping shall be provided as necessary to ensure correct alignment and bolting.

B-5. PIPE FOR USE WITH COUPLINGS

Pipe for use with sleeve-type couplings shall be as specified above except that the ends will be plain (without bells or beads).

B-6. SLEEVE-TYPE COUPLINGS

To ensure correct fitting of pipe and couplings, all solid sleeve-type couplings and accessories shall be furnished by the supplier of the pipe and shall be Class 350, ductile iron through 12 inch diameter and Class 250 ductile iron for greater than 12 inch diameter.

Couplings for buried pipe shall be iron and shall be solid, mechanical joint sleeve.

All couplings shall be provided with gaskets.

B-7. SPLIT COUPLINGS

For connecting cast iron pipe, split couplings may be used instead of sleeve-type couplings. Split Couplings shall be made of malleable iron and shall be suitable for use with grooved-end or shouldered-end cast iron pipe. They shall be Victaulic Couplings

made by the Victaulic Co. of America, Elizabeth, N.J.; Gruvagrip couplings made by Gustin-Bacon Mfg. Co., Kansas City, MO; Groove couplings made by Eastern Malleable Iron Co., Pittsburgh, P.A.; or approved equal products.

B-8. LINING AND COATING

All pipe and fittings shall be lined and coated as specified below. The inside of pipes and fittings shall be given a cement lining and bituminous coating specified under the appropriate AN Standard Specification for the pipe fittings.

Machined surfaces shall be cleaned and coated with a suitable rust-preventative coating at the shop immediately after being machined.

B-9. INSPECTION AND TESTING

All pipe and fittings shall be inspected and tested at the foundry as required by the standard specifications to which the material is manufactured. The Contractor shall furnish in duplicate to the HWD certified reports of such tests.

In addition, the HWD reserves the right to have any or all pipe, fittings, and special castings inspected and/or tested by an independent service at either the manufacturer's plant or elsewhere. Such inspection and/or tests shall be at the HWD expense unless the test discovers out of specification material, then the expense will be borne by the property owner.

Pipes and fittings shall be subjected to a careful inspection and a hammer test just before laid or installed.

B-10. HANDLING AND CUTTING PIPE

The Contractor's attention is directed to the fact that cast iron fittings and cement linings are comparatively brittle. Every care shall be taken in handling and laying pipe and fittings to avoid damaging the pipe and linings, scratching or marring machined surfaces, and abrasion of the pipe coating or lining.

Any fitting or pipe showing a crack, or 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.

In any pipe showing a distinct crack or deformity and in which it is believed there is no incipient deformity beyond the limits of the visible deformity, the deformed portions, if so approved, may be cut off by and at the expense of the Contractor before the pipe is laid so that the pipe used may be perfectly sound. The cut shall be made in the sound barrel at a point at least 12 inches from the visible limits of the deformity. Edges of pipe at the cut shall be beveled to eliminate all sharp edges.

Except as otherwise approved, all cutting shall be done with a machine suitable for cutting ductile iron pipe.

Hydraulic squeeze cutters are not acceptable for cutting ductile iron pipe. Travel type cutters and guillotine or rotary type abrasive saws may be used. All cut ends shall be examined for possible defects caused by cutting.

The contractor's attention is directed to the fact that damage to the lining or pipe or fittings will render them unfit for use; he shall use the utmost care in handling and installing lined and coated pipe and fittings to prevent damage. Protective guards shall not be removed until the pipe is to be installed.

Lined and coated pipe and fittings shall be laid or placed in the trench, and any piece discovered to be defective after having been laid or placed shall be removed and replaced by a sound and satisfactory piece.

B-11. INSTALLING PIPE AND FITTINGS

No defective pipe or fittings shall be laid or placed in the trench, and any piece discovered to be defective after having been laid or placed shall be removed and replaced by a sound and satisfactory piece.

Each pipe and fitting shall be cleared of all debris, dirt, etc., before being laid and shall be kept clean until accepted in the complete work.

Pipe and fittings shall be laid accurately to the lines and grades indicated on the drawings or as required. Care shall be taken to ensure a good alignment both horizontally and vertically. The pipe shall be laid on wood blocks, with two required for each length of pipe for support. Woodblocks must be removed during backfill.

In buried pipelines, each pipe shall have a firm bearing along its entire length. Requirements include: one foot sand below and one foot of sand cover above tamped under the pipe and connected above in 2 foot layers.

The deflection of alignment at a joint shall not exceed the appropriate permissible deflection as specified in the tabulation entitled PIPE DEFLECTION ALLOWANCES

PIPE DEFLECTION ALLOWANCES

Maximum permissible deflection, inches*

<u>Size of Pipe</u>	<u>Push-On Joint</u>
8"	19
10"	19
12"	19
16"	15

* Maximum permissible deflection for 18-foot length. Maximum permissible deflections for other lengths shall be in proportion of such lengths.

Castings to be encased in masonry shall be accurately set with the bolt holes, if any, carefully aligned.

Immediately prior to being set, castings shall be thoroughly cleaned of all rust, scale and other foreign material.

B-12. ASSEMBLING PUSH-ON JOINT PIPE

Assembling of fittings with mechanical joint ends shall conform to American Water Works Association AWWA Standard Specifications, Designation: C600, latest revision.

If effective sealing of the joint is not attained, the joint shall be disassembled, thoroughly cleaned, a new gasket inserted and the joint reassembled.

B-13. ASSEMBLING MECHANICAL JOINT FITTINGS

Assembling of fittings with mechanical joint ends shall conform to AWWA Standard Specification: C600, latest revision. Thrust blocks and retainer glands (Megalug or equal) shall be used at all valves, hydrants, fittings and bends in excess of 45° and shall be of the size and type as shown on the Hydrant Setting Detail and the Thrust Block Detail in the Standard Details. Precast concrete blocks may be used as thrust blocks provided they meet the same criteria as cast-in-place concrete and are acceptable to the HWD.

B-14. TEMPORARY PLUGS

At all times when pipe laying is not actually in progress, the open ends of pipe shall be closed by temporary water-tight plugs or other approved means. If water is in the trench when work is resumed, the plug shall not be removed until all danger of water entering the pipe has passed.

B-15. BOLTED JOINTS

Materials for bolted joints shall be as hereinbefore specified.

Before the pieces are assembled, rust preventative coatings shall be removed from machined surfaces. Pipe ends, sockets, sleeves, housings, and gaskets shall be thoroughly cleaned and all burrs and other defects shall be carefully smoothed.

If effective sealing of the joint is not attained at the recommended maximum torque, the joint shall be disassembled and thoroughly cleaned, then reassembled. Bolts shall not be overstressed to tighten a leaking joint. A torque wrench shall be used.

B-16. PRESSURE AND LEAKAGE TESTS

Except as otherwise directed, all pipelines shall be given combined pressure and leakage tests in sections of approved length. The Contractor shall furnish and install suitable temporary testing plugs or caps; all necessary equipment; and all labor required. The HWD shall have the privilege of their own gages.

Subject to approval and provided that the tests are made within a reasonable time considering the progress of the project as a whole, and the need to put the section into service, the Contractor may make the tests when he desires, utilizing a testing company approved by HWD. However, pipelines in excavation or embedded in concrete shall be tested prior to the backfilling of the excavation or placing of the concrete and exposed piping shall be tested prior to field painting.

Unless it has already been done, the section of pipe to be tested shall be filled with water of approved quality and all air shall be expelled from the pipe. If hydrants or blowoffs are not available at high points for the necessary backfilling and make the necessary taps at such joints and shall plug said holes after completion of the test.

The section under test shall be maintained full of water for a period of 24 hours prior to the combined pressure and leakage test being applied.

The pressure and leakage test shall consist of first raising the water pressure (based on the elevation of the lowest point of the section under test and corrected to the gage location) to a pressure of 200 pounds per square inch. If the Contractor cannot achieve the specified pressure and maintain it for a period of one hour, the section shall be considered as having failed to pass the pressure test.

Following or during the pressure test, the Contractor shall make a two hour leakage test by metering the flow of water into the pipe while maintaining in the section being tested a pressure of 150 pounds per square inch. If the average leakage is equal to or less than that allowed under AWWA Standard C600, last revision, for installation of that specific pipe, the section shall be considered as having passed the leakage test.

If the section fails to pass the pressure and leakage tests, the contractor shall do everything necessary to locate, uncover, and repair or replace the defective pipe, fitting, or joint, all at his own expense. Additional tests and repairs shall be made until the section passes the leakage test.

B-17. DISINFECTING AND FLUSHING

The Contractor shall disinfect all pipelines he has installed.

The Contractor shall furnish all equipment and materials necessary to do the work disinfecting, and shall perform the work in accordance with the procedure outlined in the AWWA Standard for Disinfecting Water Mains, Designation: C651, latest revision, as approved by the HWD's representative.

The chlorine dosage shall be such as to produce not less than 10 mg/l residual after a contact time of 24 hours. During the disinfection period, care shall be exercised to prevent contamination of water in existing mains.

After disinfecting treatment, the main shall be flushed with clean water until the residual chlorine content does not exceed 0.2 mg/l.

The Contractor shall dispose of the water used in disinfecting and flushing in an approved manner.

Bacteriological samples shall be taken and submitted to laboratory approved by HWD's representative with all costs borne by Contractor. Test results from the laboratory are to be sent directly to the Hopkinton Water Department, P.O. Box 171, Hopkinton, Massachusetts 01748 by the laboratory.

B-18. FAILURE OF SYSTEMS

Any contractor, whose excavation results in the failure of any water system component, shall work to restore service in the shortest possible time, the Contractor working around the clock, if necessary. He shall cooperate with the HWD in notifying the customers or supplying emergency water.

The Contractor will be required to make test excavations to ascertain that the proposed position of the connections to existing mains will be clear of joints, fittings, or other obstructions.

If any failure occurs in connecting to existing mains, service shall be restored in the shortest possible time, the Contractor working around the clock, if necessary. He shall cooperate with the HWD in notifying the customers or supplying emergency water. If required by the HWD, the Contractor shall make connections to water mains during the night hours, on Sunday or at another off-peak time for the demand of water. The Contractor shall be responsible for maintaining all existing services and repairing any damages to existing utilities.

C. BACKFILLING, PAVING AND MATERIALS

C-1. BACKFILLING PIPE TRENCHES

As soon as practicable after the pipes have been laid and inspected, backfilling shall be started. The Applicant's attention is directed to backfilling trenches at pipe joints. At his own risk the Applicant may backfill the entire trench including backfill at joints. He shall, however, be responsible for removing and replacing such backfill, at his own expense, in order to locate, repair or replace leaking or defective joints or pipe.

Tree stumps or roots 12-inches or longer will be considered unsuitable material for backfilling trenches. No stone, rock or pieces of bituminous pavement larger than 12 inches in greater dimension shall be placed in backfill nor shall large masses of backfill be dropped into the trench in such a manner as to endanger the pipeline.

Should a sufficient quantity of excavated material be classified by the HWD as suitable backfilling such that backfilling of the trench cannot be completed with the excavated material, the Contractor shall supply gravel borrow to complete the backfilling.

Backfill of the trench up to a level of 12 inches above the top of the pipe shall be done by hand shovel with sand fill free from stones having any dimension greater than 3 inches.

This area of backfill is considered the zone around the pipe and shall be thoroughly compacted before the remainder of the trench is backfilled. Compaction of the zone around the pipe shall be done by use of power-driven tampers weighing at least 20 pounds. Care shall be taken that material close to the bank, as well as in all other portions of the trench, is thoroughly compacted to a density of 95 percent.

The remainder of the trench above around the pipe shall be backfilled and compacted. Compaction of backfill in the remainder of the trench shall be done in layers not exceeding 12 inches in depth and by use of power driven tampers weighing at least 20 pounds. Water jetting may be used only when approved by the HWD.

Any trench subject to the Department of Public Safety's Excavation and Trench Safety Regulation at 520 CMR 14.00 shall comply at all times with the requirements of those regulations.

C-2. RESTORING TRENCH SERVICE

Where the trench occurs adjacent to paved streets in shoulders, sidewalks, or in cross-country areas. The Contractor shall thoroughly consolidate the backfill and shall maintain the surface as the work progresses. If settlement takes place he shall immediately deposit additional fill to restore the level of the ground. Adjacent to the streets and highways, the top 12 inch layer is unsuitable for use as subgrade or shoulder material, he may order the Contractor to remove this layer and to provide gravel subbase. The Applicant shall maintain repair of the trench for one year from the date of substantial completion of work

pursuant to a road opening permit, or until the road has been accepted by the town in a vote of Town Meeting, whichever is sooner.

C-3. STATE HIGHWAY PAVING

Work to be done on the roads designated as State Highways shall conform to the following paragraphs. References are made to sections and terms of the state highway specifications.

1. The gravel subbase shall conform to that as specified under Section 2E-8 Gravel Subbase of the State specifications. The subbase shall be a minimum of twenty inches compacted measure, and shall be entirely new gravel subbase.
2. After backfilling has been completed and sub-grades reestablished, a two inch (2") bituminous concrete Type I-1 temporary pavement shall be installed and maintained by the Contractor. Permanent pavement shall not be placed until a period of at least ninety (90) days has elapsed from the time of trench backfilling.
3. When directed by the HWD Manager or the Massachusetts Highway Department, the Contractor shall remove the temporary pavement and regrade the gravel subbase for installation of permanent pavement. The permanent pavement shall consist of a six inch (6") cement concrete slab, a two inch (2") binder course and a half inch (1/2") to three quarter (3/4") top course.

The concrete slab shall be cast-in-place conforming to Massachusetts Standard Specifications for Class F Cement Concrete and shall be High Early Strength. The slab shall be reinforced as required.

The binder course shall be Class I Bituminous Concrete Pavement, Type I-1 and shall be in accordance with Section 460 of the Standard Specifications.

Upon completion of the binder course the Contractor shall install the surface treatment or top course which shall consist of Class I Dense Bituminous Concrete, Type ST, machine laid. In the case of transverse trench, the top course shall extend thirty feet (30') beyond the limits or each edge of the trench and vary in depth from three quarter inch (3/4") to half inch (1/2").

C-4. TEMPORARY PAVEMENT (non State Highways)

Where directed by the HWD and immediately after backfilling, the Contractor shall place temporary bituminous pavement, between the edges of the existing pavement. It shall consist of Class I Bituminous Concrete Pavement, Type I-1, 2 inch thick, in accordance

with the Massachusetts Highway Department's most recent Standard Specifications for Highways and Bridges and all amendments thereto.

The temporary pavement shall be repaired as necessary to maintain the surface of the pavement until replaced by the permanent pavement. When so directed by the HWD the Contractor shall remove the temporary pavement and regrade the subbase for installation or permanent pavement.

C-5. PERMANENT PAVEMENT (non State Highways)

The bituminous paving mixture, equipment, methods of mixing and placing, and the precautions to be observed as to weather condition of base etc., shall be in accordance with Massachusetts Highway Department's most recent Standard Specifications for Highways and Bridges.

The bituminous concrete pavements shall consist of Class I Bituminous Concrete Type I-1 as shown in Massachusetts Highway Department's most recent Standard Specifications for Highways and Bridges.

The edges of the existing pavement shall be trimmed back to reasonably smooth line subject to the approval of the Hopkinton Highway Division. Immediately prior to installing the binder course, the trimmed edges shall be stable and unyielding, free of loose or broken pieces and all the edges shall be thoroughly broom cleaned. The contact surfaces of bridge curbings, manholes, catch basins or other appurtenant structures in pavement shall be painted thoroughly with a thin uniform coating of bitumen (Specifications C-8) just before any mixture is placed against them.

The binder course shall be 2-1/2 inches thick or more when compacted as required by the Director of the Department of Public Works. The mixture shall be within the composition limits of binder course as shown in the Massachusetts Highway Department's most recent Standard Specifications for Highways and Bridges. It shall be placed only between the edges of the existing pavement. The top course of the pavement shall be 1-1/2 inch thick or more when compacted as required by the Director of the Department of Public Works. The mixture shall be within the composition limits of top course as shown in the Massachusetts Highway Department's Standards.

C-6. PAVEMENT MAINTENANCE REPAIR

If points of settlement or holes appear in the temporary pavement, binder course pavement, or top course pavement, the Contractor shall repair the same within 24 hours of notification by HWD. In emergency situations, the Contractor shall make repairs immediately.

C-7. SIDEWALK AND CURBING REPLACEMENT

Where the replacement of sidewalks is required, the Contractor shall construct either bituminous concrete sidewalks or Portland concrete sidewalks, as determined in the field, to the required lines and grades and in accordance with these specifications.

If applicable, the Contractor shall restore gravel sidewalks to a condition at least equal to that before the work started.

C-8. UNSUITABLE MATERIAL

If material unsuitable for use in trenches is found, (peat, muck, wood, tree stumps, roots, etc.), the Contractor shall remove such material to the required width and depth and replace it with thoroughly compacted bank run gravel as directed.

Material shall be sand, small stone gravel or, in the case of installation below the water table, bedding shall be 1/4 X 3/4 inch approximate sized stone from a depth of 6 inches below the bottom of the water main to a point equal to the top of the water main and the full width of the trench. The trench shall be dewatered to allow the bedding stone to be placed on a firm bottom and the pipe to be installed without allowing trench water in the pipe.

SECTION 9
BILLING

Consumers shall be responsible for furnishing the HWD with the correct billing address and names. All changes in billing addresses shall be in writing.

Failure to receive bills shall not constitute a reason for extension of time for payment.

SECTION 10
POWERS AND AUTHORITY OF INSPECTORS

The HWD and other duly authorized employees of the Town bearing proper credentials and identification shall be permitted to enter all properties for the purposes of inspection, observation and meter reading in accordance with provisions of this ordinance.

While performing the necessary work on private properties referred to above, the HWD or duly authorized employees of the Town shall observe all safety rules applicable to the premises established by the property owner and the property owner shall be held harmless for injury or death the Town employees and the Town shall indemnify the property owner against loss or damage to its property by Town employees and against liability claims and demands for personal injury or property damage asserted against the property owner and growing out of inspection or meter reading operations, except as such may be caused by negligence or failure of the property owner to maintain safe conditions.

SECTION 11
PENALTIES

Any person to be found in violation of any provision of this regulation shall be served by the Town with written notice stating the nature of the violation and providing a reasonable time limit for the satisfactory correction thereof. The offender shall, within the period of time stated in such notice, permanently cease all violations.

Each day in which any such violation shall continue shall be deemed a separate offense.

Any person violating any of the provisions of this ordinance shall become liable to the Town for any expense, loss, or damage occasioned by Town by reason of such violation.

Any Schedule of Values associated with this Section may be reasonably amended by the actions of the HWD at any time, without notice.

SECTION 12
CROSS CONNECTION CONTROL REGULATIONS

1.0 **Purpose**

- 1.1 To protect the public potable water supply of the Town of Hopkinton from the possibility of contamination or pollution by isolating such contaminants or pollutants which could backflow or backsiphon into the public water system: and,
- 1.2 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,
- 1.3 To provide for the maintenance of a continuing program of Cross Connection Control which will systematically and effectively prevent the contamination or pollution of all potable water systems form cross connections.

2.0 **Authority**

- 2.1 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.

3.0 **Responsibility**

- 3.1 The Hopkinton Water Department shall be responsible for the protection of the public potable water distribution system from contamination and pollution due to the backflow or backsiphonage of contaminants or pollutants through a potable water service connection. If, as a result of a survey of the premises, the Water Department determines that a cross connection exists, said connection shall be eliminated for the safety of a potable water system. The Water 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 Water 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.

4.0 **Standards**

- 4.1 **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 Water Department unless the water distribution system is protected as required by Massachusetts State law 310 CMR 22.22 and the Water Department Rules and Regulations. Service of water to any premises shall be discontinued by the Water and Sewer Division if a connection with any other source is found or if backflow prevention device required by this regulation for commercial, industrial 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.
- 4.2 All industrial and commercial establishments attached to the Hopkinton public water supply system will be required to install at the service entrance, either at a State approved reduced pressure backflow preventer or a State approved double check valve assembly.
- 4.3 An approved backflow prevention device required by Section 4.2 of this Regulation, shall be installed on the service line to a customer's 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.

- 4.4 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,
- 4.5 All backflow prevention devices required by section 4.2 of this Regulation, shall be tested by the Hopkinton Water Department Employees or its delegated agent, at a minimum of once per year.
- 4.6 All decisions relating to the determination of backflow devices with regard to the said Cross Connection Control program will be made by the manager of the Hopkinton Water Department. Failure to comply with any directive from this office will result in termination of water service.
- 4.7 All costs, resulting from the implementation and operation of said Cross Connections Control Program, shall be the responsibility of the customer; and,
- 4.8 All fees for tests performed on backflow devices by the Hopkinton Water Department or its delegated agent will be assessed to the owner of the device.

SECTION 13
WATER MAIN EXTENSION POLICY

A. POLICY

1. Hardship – The Water Manager will evaluate case-by-case hardship circumstances of existing legally occupied properties that can generally resolve a water related difficulty with a 1-inch service connection within 100 ft. of the existing distribution main.
2. Water Supply Emergency – If circumstances warrant, it may become necessary to restrict water main extensions and/or connections to the system until such time that the emergency declaration has been rescinded.
3. All costs of the extension including service lines to existing and vacant lots are to be borne by the Applicant.

B. All other applicable requirements by the DPW and those stated elsewhere in these rules and regulations shall also be adhered to.

C. All associated costs for proposed extensions shall be paid for by the Applicant or if the extensions are for existing homes, a vote at town meeting shall be required to establish betterment fees for the project. All other fees in the rules and regulations will also apply. Including additional connection fees for the change in use of existing serviced properties.

F: The distance, the proposed use and the number of connections along with all other mitigating circumstances shall all be taken into consideration when deciding if an extension should be granted.

G: All proposed plans, impacts, fire flows and all other requirements stated in these rules and regulations or requested by the Director shall be submitted for review to the Director's designated consultant. All costs shall be borne by the Applicant.

H. Priority shall be given to those requests which meet the goals of the town's people as stated in the Town's master plan or improve the distribution system as determined by the Director.

I. An existing water main or service to a property shall not constitute an automatic approval for increased water capacity to the site, service to additional units, or an extension of the lines or mains. If approval to increase the service size is granted, the appropriate connection fee will be charged for the new connection size.

J. All other State and Federal requirements may apply.

APPENDIX A
STANDARD DETAILS

THRUST BLOCK BEARING AREAS FOR PIPE

TABLE OF BEARING AREAS IN SQ. FT. AGAINST
UNDISTURBED MATERIAL FOR PIPE FITTINGS*

SIZE OF MAIN, (IN.)	90° BEND	45° BEND
6	4	2
8	6	3
12	12	7
16	21	12

- * THIS TABLE IS BASED ON A TYPE OF SOIL THAT IS MEDIUM CLAYEY 6 OR MORE BLOWS/FOOT, OR LOOSE GRANULAR, 9 OR MORE BLOWS/FOOT. SOIL CONDITIONS OTHER THAN THOSE GIVEN WILL REQUIRE LARGER BEARING AREAS.

NOTES:

1. FOR FITTINGS WITH LESS THAN 45° DEFLECTION USE BEARING AREAS FOR 45° BEND.
2. BEARING AREAS BASED ON HORIZONTAL PASSIVE SOIL PRESSURE OF 2000 P.S.F. AND INTERNAL WATER PRESSURE OF 150 P.S.I.G. JOINTS SHALL NOT BE ENCASED IN CONCRETE, BEARING AREAS MAY BE DISREGARDED FOR TRENCHES IN ROCK WHERE THE TOP OF THE ROCK FACE IS AT OR ABOVE THE CROWN OF THE PIPE. HOWEVER, CONCRETE BACKING SHALL BE PLACED BETWEEN THE PIPE AND ROCK FACE.
3. THE CONTRACTOR SHALL SUBMIT 2 WEEKS IN ADVANCE OF PLACEMENT, WORKING DRAWINGS FOR EACH THRUST BLOCK TO THE WATER DEPARTMENT FOR APPROVAL PRIOR TO INSTALLATION.

HYDRANT SETTING DETAIL
NOT TO SCALE

APPENDIX B
Schedule of Values

The index below and the referenced fees associated with certain services performed by the Hopkinton Water Department.

<u>Services</u>	<u>Fees Reference</u>
1. New house services and secondary branch connection fees	A, B
2. Water rates	B
3. New subdivisions	A, C
4. New sprinkler systems, entry fee plus yearly charge	D
5. Testing meter	E
6. Resealing meter	F
7. Frozen meter reset	G
8. Turn water on and off	H
9. Cross connection device test	I
10. Final meter readings	J
11. Replace water meter valves	K
12. Fine for second estimated bill	L
13. Inspection charges	M
14. License fees	N
15. Road reconstruction	O
16. Service renewal	P
17. Equipment costs and personnel	Q
18. Renewal of water service application	T

Domestic water Service, PRIVATE FIRE SERVICE

A. New water service, entry charge into building or dwelling.

<u>Pipe Size</u>	<u>Entry fee to dwelling for potable water</u>
1"	\$4,000.00
2"	\$ 4,000.00
4"	\$ 8,000.00

Secondary branch

Any connection 6" or more into distribution main by means of a subdivision or industrial park, condos, etc. must pay an entry fee of \$600.00 for each connection prior to those connections.

B. Water Rates

Base Charge

First	1,000 cu.ft.	\$ 20.00 every 6 mos.
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Next	7,000 cu.ft.	\$ 2.17 per 100 cu.ft.
Over	8,000 cu.ft.	\$ 4.47 per 100 cu.ft.

C. Water Main Tapping Fees

Main Size

1 inch	\$100.00
2 inch	\$200.00
Over 2 inches	Owner must hire own contractor at his own expense.

For new services and service renewals there will be a cost of \$14 dollars per foot for installation by the Water Department.

D. Hydrant testing for insurance companies	\$100.00
Municipal hydrant fee	\$434.00/hydrant/year
Hydrant Use Fee	\$50 + water used

E. Test Meter at Customer's Request

1-Inch and smaller:
 If found to be within recommended Accuracy range \$50.00
 If found to be defective no charge
 Larger than 1- inch must pay testing company costs.

Service Renewals

All service renewals upon request of owner will be at owner's expense including material and labor. Police details will be billed separately @ a 4hr. minimum. The cost will be \$14 per foot not including hot top.

All water charges will be the responsibility of the owner MGL C-39-S-1, regardless of lease agreement with tenant. The owner of the property has right of appeal

F. Resealing Meter that has been tampered with.	\$100.00
G. Frozen Meter Reset up to 3/4-inch (over 3/4-inch is property owners responsibility). During regular hours	\$ 27.00/hour
H. Turning on or off water	\$ 27.00
I. Cross Connection Test Fee - Per Device	\$ 50.00
J. Final Meter Readings	
2 day notice	\$ 15.00
No notice	\$ 25.00
K. Replace water meter valves within homes	\$ 100.00

- L. Fine for second Estimated Water & Sewer Bill \$ 10.00
- M. Any unauthorized use of Fire Hydrant or un-metered Water service (Plus cost of water used). \$ 200.00
- N. Inspection Charges:
 - First Inspection (during normal hours) No Charge
 - Subsequent inspections \$ 27.00/hour
 - Service call after hours and Weekends; four hour minimum \$ 27.00/hour

Other Charges

- O. Pipe layers license (including 1 copy of HWD Rules) \$ 125.00

This license fee is separate and distinct from any other application fees (or entrance fees) provided in these rules and regulations, as well as from license fees associated with sewer construction in the Town of Hopkinton.

- P. Road reconstruction: To be determined by D.P.W. Director on a per foot basis according to current prices of materials.
- Q. Any customer requesting a Service renewal will receive an estimate prior to construction and will assume all costs including Police Officer where needed. Police Detail will be billed by the Water Dept. with a 4hr. minimum.
- R. Backhoe with operator \$ 60.00/hour
Compressor \$ 15.00/hour
Individual employees at \$ 27.00/hour
- S. Rates for private fire service

Availability

These rates are available to customers on the mains of the Town inside the corporate limits of the Town Of Hopkinton for private fire service (sprinkler service and private hydrant service) subject to the rules and regulations of the Hopkinton Water Department. The total cost of installing fire service connections shall be borne by the customer.

<u>Rates</u>	<u>per Year</u>
For each 4" service connection	\$ 88.20
For each 6" service connection	\$ 195.60
For each 8" service connection	\$ 352.20
For each 10" service connection	\$ 547.80

For each 12" service connection \$ 793.80

Special Provisions:

- a). All water shall be used for fire protection purposes only
- b). The water department reserves the right, if water used in violation of (a) above, to install a meter on the connection at any time which will meet the requirements of the Fire insurance Companies. In the event a meter is installed, the established meter rates including both water and minimum charges, will apply in addition to the above rates for private fire protection. Cost of the meter will be borne by the property owner.
- c). A charge of \$200.00 will be made for each unauthorized use of private fire facilities.

T: Service Application Renewal \$250

Standard Charges for 1" tap

\$125 Tap
\$35 Corporation
\$22 Rod Box and Rod
\$30 Curb
\$1.25/ft Pipe
Police Detail \$28.05 hr. (4hr. min.)
\$50 Hot Top

Schedule of Values associated with this Appendix may be reasonably amended by the actions of the HWD at any time, without notice.

Penalties under Section 11

U: Any person who shall continue any violation beyond the time limit provided for in the notice from the Town shall be fined in the amount not exceeding one hundred (\$100.00) for each violation.

APPENDIX C

Water meter standard for sewer users with private wells. Adopted January 31, 1995

Water meters shall be of a design and size as approved by the HWD manager. Meters shall read in cubic feet and have a touch pad and/or radio read unit attached.

Meters shall be purchased from the HWD.

Meters will be installed and maintained by the HWD.

Customers with well are subject to all HWD meter rules and regulations.

Customers with a water meter will be billed for sewer at the sewer rates per 100 cubic feet of water as defined in the Hopkinton Sewer Regulations.

Customers without a water meter will be billed a fixed charge of 6,000 cubic feet each billing period at prevailing sewer rates.

APPENDIX D

Waiver of Compliance

Strict compliance with the requirements of these rules and regulations may be waived upon application by any party using or proposing to use water supplied by the HWD when, in the judgment of the Director of the Department of Public Works, such action is in the public interest and not inconsistent with the intent of these rules and regulations. In making this determination, the Director of the Department Public Works shall consider whether:

1. The public health, safety, and the environment will be protected;
2. Strict application of the requirement to be waived would undermine the public interest;
3. Specific substitute requirements can be adopted that will result in substantial protection of the Town's public water mains and services; and
4. The action made possible by the waiver will not violate the provisions of any state or federal law or local bylaw.