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# RULES AND REGULATIONS

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CHELMSFORD WATER DISTRICT



AUGUST 2023

CWD

20 Watershed Lane, Chelmsford, MA 01824

Updates to this version:

1. Definition of private ways updated in section 1.2, para. N. Clarifies ownership of water mains and services in private ways.
2. Section 5.14: Groundwater Protection added.
3. Section 2.12 para. U – Water Service Line Repair and Section 3.2 para. G – Laying Ductile Iron Pipe and Fittings. Added plain concrete as a material in addition to bituminous asphalt as the material the District will replace in kind.

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## **PART 1 GENERAL**

### **1.1 PREFACE**

- A. The intent of these rules is to provide customers, contractors, engineers, developers, and others with a uniform set of regulations and standards by which any proposed or actual water work must adhere to these standards. These specifications may be amended from time to time at the discretion of the Board of Water Commissioners or their designee. Failure to know of or conform to these specifications and rules and regulations shall not be considered reason for deviation from these standards. It is the equal responsibility of the property owner and contractor to ensure proper compliance with the specifications as prescribed at the time of the work.
- B. Property owners and contractors are encouraged to arrange for on-site pre-design and pre-construction meetings with the Superintendent or designee to determine compliance with these specifications. Exceptions to these specifications may be granted if the deviation is in the benefit of the Chelmsford Water District and upon written approval from the Board of Water Commissioners or their designee. Failure to comply with these rules may result in the termination of service. Any rule, regulation, or standard previously adopted by the Board of Water Commissioners or by the overseeing jurisdiction (Federal, State, or local) not specifically addressed in these rules shall be enforceable as if it is part of these rules.
- C. Where the phrase “or equal” is provided here within, it is intended to mean CWD approved equal.

### **1.2 DEFINITIONS**

- A. **Board or BoWC**– Board of Water Commissioners
- B. **Certificate of Acceptance** – Written verification from the Board of Water Commissioners or their designee, that all water system work is complete and without any outstanding deficiencies. Certificates of acceptance shall be issued by no sooner than one year after substantial completion of the work as determined by the CWD, and only if all deficiencies have been corrected.
- C. **Development Fees: New Service Connection and Fire Protection** – A system development fee shall be paid for each new connection to either an existing main or a new service. The fee shall be paid prior to the connection being made by

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each new water taker. The development fee shall be based on tap size as listed in the rate schedule at the time service is required.

- D. **Dig Safe®** - Dig Safe® is a not-for-profit clearinghouse that notifies participating utility companies of your plans to dig. In turn, these utilities (or their contract locating companies) respond to mark out the location of their underground facilities. Dig Safe is a free service, funded entirely by its member utility companies and can be found at <http://www.digsafe.com/> or by calling 811. Note: Dig Safe does not mark water utility lines. Participating utilities mark out utility locations. CWD is part of Dig Safe, and by calling Dig Safe initiates the CWD to perform a utility mark out.
- E. **District, Water Department, or CWD** – The Chelmsford Water District located within the Town of Chelmsford, Massachusetts ('Town') less the area of Town served by the North Chelmsford Water District and East Chelmsford Water District.
- F. **Drawings** – Documents (e.g., plans) provided by the District or provided an outside party, reviewed, and accepted by the District as plans representing the propose placement of assets.
- G. **Engineer** - An individual or set of individuals licensed by the State as practicing in the discipline they are licensed in. Typically, this will be the District Water Superintendent or the Districts' Consulting Engineer or his designated representative.
- H. **Fire Protection (District)** – Includes only those fire hydrants owned by the CWD and which are located within the public right-of-way. The water department is responsible for the repair, replacement, and maintenance of fire hydrants owned by the CWD.
- I. **Fire Protection (Private)** –CWD will maintain hydrants in the right of way of private developments for public safety and water quality, but not hydrants located after meters or master meters, or located on or within buildings. The CWD will replace hydrants at the end of life, damaged due to accidents, etc. as deemed by the Water Department.
- J. **Inspector** - The CWD Superintendent or his designated representative.
- K. **Lead Free** - The District only accepts service material, fittings, and meters which are considered "lead free." Lead free is as defined in the latest laws and regulations promulgated as well as associated amendments by the United States Environmental Protection (e.g. Lead and Copper Rule, Lead Contamination and Control Act, PART 141- National Primary Drinking Water Regulations: Part I, etc.), or Massachusetts Department of Environmental Protection.

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- L. **Looping** – refers to the elimination of a dead-end water main by constructing an additional water main from the dead-end to another water main to complete a loop. Looping a dead-end can usually be completed within a few blocks of an existing water main (500-800 feet). Looping of water main system is a major water system component and eliminates an isolated area within the existing water system where a single water main is serving the area. Where looping cannot be achieved in the opinion of the District, flushing stations can be considered upon approval by the District, or a fee can be paid for dead end looping (see ASSESSMENT FOR DEAD END MAINS IN SUBDIVISIONS).
- M. **Outside Water Sale** – Water purchased from a metered hydrant.
- N. **Private Roads** – Private Roads or Ways are access points limited to the use of the owner or a group of owners who share the use and maintain the road without help in maintaining the road from the Town, County or Commonwealth. The District considers water utility lines located in private roads as owned by the group of owners who share the use and maintains the road. Examples of private roads are manufactured housing parks, industrial parks, condominium developments, townhouses and similar uses. The owners of such developments will maintain the water lines with the ultimate replacement of the asset at the end of life.
- Excepted from this definition of Private Roads are roads, streets or routes that are maintained and/or accepted by the Commonwealth or Municipality as part of the public system. The District considers water utility lines located in these ways as owned by the District, so the District will maintain these water lines.
- O. **Project Site** – All areas where the work is being performed.
- P. **Public Road** – Common use or right of use by the public. Public Roads maintained by the Town, Municipality, or Department of Public Works. The infrastructure (electrical, gas, water, sewer, and drainage) buried within the right of way of an approved public road will be the responsibility of said utility to make repairs and maintenance in the public roadway.
- Q. **Service Call** – A service call is any customer initiated request for service. Service calls include but are not limited to, turn on/off, final readings, meter appointments, service appointments, relocating or reinstalling remote reading devices and meters, seasonal installations, inspections, and damaged meter replacements.
- R. **Specifications**- Chelmsford Water District Standard Specifications, Rules & Regulations as published and amended from time-to-time by the Board of Water Commissioners or their designee.

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- S. **Standards** - As a default position, the CWD uses American Water Works Association (AWWA) Standards and manuals of practice as the basis for products and practices. Where not specifically referenced here within, it should be understood these are the standards for materials and practices the CWD adheres to for day to day operation. The CWD also adheres to other industry standards common in the industry such as the Ductile Iron Research Association (DIPRA), National Sanitary Foundation (NSF), American National Standards Institute (ANSI) standards or as specifically reference here within. Where there is a conflict in one of these standards, the stricter standard will be adhered to for the product or practice.
- T. **Subdivision**- “Subdivision” means the division of a lot, tract, or parcel into two or more lots, plats, sites, or other divisions of land. As defined and shown on the Submitted Plans to Planning Board.
- U. **Superintendent** - The Water Superintendent of the Chelmsford Water District.
- V. **Town** – Chelmsford, Massachusetts
- W. **Water** - Potable water produced and supplied by the CWD.
- X. **Water Department or CWD** - The Chelmsford Water District.
- Y. **Water System (System)** - Any pipe, valve, meter, fixture, facility, apparatus, or appendage that is in any way associated with the production, storage, transmission, and/or use of municipal water. The water system also can be referred to as the treatment and distribution system.
- Z. **Work** - The furnishing of materials, equipment, labor, and all incidentals necessary for adherence to these specifications.

### 1.3 DESCRIPTION

- A. Provide all facilities, labor, materials, tools, equipment, applications, transportation, supervision, and related work necessary to complete the work specified in this section, and as shown on the drawings.
- B. Contractors shall contact CWD to schedule a pre-construction meeting, and an estimate of charges at least ten (10) business days before the scheduled start of work.
- C. Phased installation of water mains shall not be permitted in any new development unless specifically approved by CWD. The District reserves the right to retain water related securities until such time the installation,



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testing, and final inspection of all work is complete, and deficiencies corrected for a period of one year after substantial completion.

- D. Department personnel shall inspect water system improvements during the installation. The contractor is responsible for notifying the CWD five days (5) before any work is to take place. CWD inspectors must be on site for the following:
1. Test pits, taps, tie-ins, or the installation of mains, hydrants, and services.
  2. When crossing any culvert, drainage pipe, stream or obstacle requiring a change in pipe material, direction, elevation, or as deemed necessary by the Superintendent.
  3. Flushing, pressure testing disinfecting operations, dechlorination, and acceptance sampling 24 hours and 48 hours after dechlorination.
- E. No water shall be sold or taken from any hydrant, blowoff, corporation, or curb stop for any construction, paving, dust control, or hydro-seeding, or any other purposes without written permission of CWD. The CWD sells water through a hydrant at the District office. An account to purchase water from the hydrant is required prior to purchase water. All non-account water sold shall be through a meter and backflow owned and supplied by the CWD. The charge for water sold shall be at current water rates. Any unauthorized use of water shall be reported by the CWD to the police for prosecution.
- F. The work of this section includes but is not necessarily limited to:
1. Installation of on-site and/or off-site water distribution system consisting of piping, valves and valve boxes, hydrants, pipe fittings, anchors and/or thrust blocks and all necessary and required accessory items and operations including connections to existing facilities.
  2. Installation of water service connections and/or fire service connections including tapping into mains, furnishing, and installing all piping and appurtenances within the limits shown on the Contractors Drawings.
  3. Resetting existing hydrant and/or valve boxes to grade as required.
  4. Relocation of existing hydrants, valves or other water line appurtenances as required.
  5. Furnish all labor, material and equipment required to chlorinate and test water distribution system.

6. Resurfacing grade, including, compaction, paving, seating, loaming, and where necessary flowable fill.

#### **1.4 REFERENCE STANDARDS**

- A. References herein to any technical society, organizations, group, or body are made in accordance with the following abbreviations and unless otherwise noted or specified, all work under this section shall conform to the latest edition as applicable:

District or CWD	Chelmsford Water District
ANSI	American National Standard Institute
AWWA	American Water Works Association
Fed. Spec.	Federal Specifications
NSF	National Sanitary Foundation
FM	Factory Mutual
UL	Underwriters Laboratories

#### **1.5 COORDINATION WITH THE MUNICIPALITY**

- A. The CWD must be notified prior to starting construction of any portion of their distribution system.
- B. The closing of valves necessary for making connections with existing mains, will be done by the District employees, assisted by the contractor. Sufficient notice shall be given the CWD of planned connections. No allowance will be made for any delay in closing of valves. A 48-hour notice must be given to residents or businesses affected by the shut-down and will be done by the contractor under the direction of the CWD.

#### **1.6 SUBMITTALS**

- A. Shop Drawings
  1. Submit shop drawings or descriptive literature, or both, showing dimensions, joint and other details of all materials to be furnished under this section. Shop Drawings shall be submitted to the CWD for approval prior to ordering materials.
- B. Manufacturer's Certificate: Certify that products meet or exceed State or local requirements.

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- C. Products in contact with drinking water shall be NSF certified for use in drinking water applications.
- D. As-Built Drawings
  - 1. Submit three (3) copies of As-Built Drawings upon completion and acceptance of work to the District.
  - 2. As-Built Drawings shall be complete and shall indicate the true measurements and locations, horizontal and vertical, of all new construction. As-Built Drawings shall include a minimum of three (3) ties to each gate from fixed permanent objects as well as latitude and longitude in geographic coordination system for North America (latest version). As-Built Drawings shall also contain any additional information required by the CWD.

**1.7 DELIVERY, STORAGE AND HANDLING**

- A. Storage of pipe, fittings, valves, hydrants, and other water line appurtenances of the Project Site shall be in accordance with the manufacturer's recommendations, subject to the approval of the CWD.
- B. Care shall be taken in loading, transporting, and unloading to prevent injury to the pipe, fittings, valves, hydrants, and other water line appurtenances. Pipe or fittings shall not be dropped. All pipe or fittings shall be examined before laying and no piece shall be installed which is found to be defective. Any damage to pipe and fittings or coatings shall be repaired as directed by the CWD.
- C. Pipe, fittings, valves, hydrants and other water line appurtenances which are defective from any cause, including damage caused by handling and determined by the CWD as beyond repair, shall be unacceptable for installation and shall be replaced at no cost to the CWD.
- D. Pipe and all water line appurtenances that are damaged or disturbed through any cause prior to acceptance of the work shall be repaired, realigned, or replaced at the contractor's expense directed by the CWD.

END OF SECTION

## **PART 2 PRODUCTS**

### **2.1 GENERAL**

- A. Drawings and specifications are intended to supplement and explain each other. Materials not specifically mentioned in the specifications shall be indicated on the drawings. Where no specific kind of quality of material is given, the contractor shall supply products as directed by the District. In general, a first-class standard article shall be furnished as common in the industry.
- B. The drawings provided by the District are diagrammatic only and are intended to indicate the extent but not all details of the piping which will be supplied. All offsets and materials are not shown; however, the contractor shall furnish these items as if called for or shown.
- C. CWD has standardized on lead-free materials as well as ductile iron for pipe and fittings.
- D. When plain steel or galvanized steel studs, bolts and nuts are used, they shall be provided with a corrosion control system. When referenced in these specifications, the following shall be used as the standard.
  - a. All studs and bolts shall be provided with a sacrificial zinc end caps meeting ASTM B418-80 as manufactured by MARS (6 oz) of Ocala, Florida, Northtown Company of Huntington Beach, CA, or approved equal.

### **2.2 DUCTILE IRON PIPE**

- A. All pipe shall be manufactured in North America.
- B. All products shall be constructed of ductile iron. Cast iron products are not acceptable and only acceptable if written permission is provided by the CWD.
- C. Ductile iron pipe shall be Class 52 (or thicker) double cement lined and bitumen coated as manufactured by U.S. Pipe, Griffin Pipe., Atlantic States, or McWane Ductile manufactured in accordance with ANSI A21.51/AWWA C151.

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- a. Pressure class 350 pipe is an allowable alternative if it is provided with an external zinc coating.
- b. Exterior of pipe shall be provided with zinc coating as follows:
  - i. Consists of a layer of arc applied or paint applied, 99.99% pure zinc coating having a mass of 200g/m<sup>2</sup>.
  - ii. Has a finish layer of standard shop applied bituminous paint in accordance with AWWA C-104.
  - iii. Pipe markings shall include the word “Zinc” in the pipe markings or label required by AWWA C-151 and/or other markings as deemed appropriate by the manufacturer.
  - iv. Shall comply with all applicable parts of ISO 8179 for zinc coatings.
  - v. Minor scratches in the zinc coating will not need to be repaired due to the self-healing nature of zinc coatings but larger areas shall be repaired by field application of a zinc rich paint in accordance with ISO 8179.

D. Pipe shall meet the latest revision of the following standards:

ANSI/AWWA	C104/A21.4	Cement - Mortar Linings
ANSI/AWWA	C105-A21.5	Polyethylene Encasement for Ductile Iron Pipe
ANSI/AWWA	C110/ A21.10	Ductile-Iron and Grey-Iron Fittings, 3 Inch Through 48 Inch for Water
ANSI/AWWA	C111/A21.11	Rubber - Gasket Joints
ANSI/AWWA	C115/A21.15	Flanged Pipe
ANSI/AWWA	C150/A21.50	Design
ANSI/AWWA	C151/A21.51	Water Pipe
ANSI/AWWA	C153/A21.53	Fittings - Ductile Iron
ANSI/AWWA	C600	Installation

- E. All pipe shall be provided with a restrained joint system. Pipe using soil skin friction will not be allowed as a restraining system. Examples of acceptable restraining systems are provided.
  - a. Restrained joint piping shall be, “TR Flex”, Sure Stop 350, or equal restrained push-on joint Pipe, manufactured in accordance with the requirements of ANSI/AWWA C141 A21.51, pressure class 350
  - b. Restrained joint piping shall be “Field Lok” gasket system or equal Manufactured in accordance with requirements of ANSI-AWWA C151/A21.51 for working pressure of 250 psi.
- F. Pipes shall be cement-mortar lined in accordance with ANSI A21.4/AWWA C104, except the cement lining shall be double thickness.

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- G. The exterior of all pipes shall be factory coated, with a double coat of coal tar enamel conforming to ANSI A21.4/AWWA C104. The interior of all pipe shall have (a double coat) of asphaltic material applied in accordance with ANSI A214/AWWA C104.
- H. **Minimum Length:** Pipe length for water mains shall be no less than 18 feet. In specific instances pipe can be cut or fabricated to meet short connection points or tight spaces.
- I. **Minimum Diameter:** Minimum diameter shall be 8-inches, unless provided otherwise in writing from the Chelmsford Water District.
- J. **Pipe Protection from Corrosion:** Where there is possible excessive corrosion due to corrosive soil conditions, a polyethylene encasement for ductile iron pipe shall be implemented per ANSI/AWWA C105/A21.5 or ASTM A674. Soil corrosivity testing shall be performed by N.A.C.E. International certified personnel. All contractors installing pipe are required to perform this test and provide the results to the CWD.
- K. **Water Body Crossing:** When it is necessary to cross a body of water requiring only a small deflection in the joints, restrained standard push-on or mechanical joint pipe can be used, as approved by CWD. If the water is deep and the angle of deflection in the joint necessary to follow the contour of the riverbed is great, ball and socket pipe—with a deflection up to 15 degrees shall be used, as determined by CWD. A combination of restrained and ball and socket joints shall be used.
- L. **Gaskets:** Gaskets shall be used for appropriate application and contaminants present and meet AWWA standards. Nitrile gaskets shall be used where petroleum contamination exists. Manufacture recommended joint lubricants shall be used during assembly.
- M. **Electrical Grounding:** No electrical grounds shall be made on water pipes, water services, fitting, water meters, or any other appurtenance. Electrical grounding shall be provided in accordance with the Massachusetts Electric Code using a grounding rod.
- N. **Electrical Continuity:** Pipe shall be installed to maintain electrical continuity. Several methods are available for conducting current across joints when necessary to electrically thaw a pipe. These methods include gaskets containing metal contact strips, wedges inserted at the joints, conductive cables and metal strips applied at the foundry, or cables applied in the field. To prevent future problems, the correct number of wedges to be inserted at the joint or conductive strip or cable sizing should be calculated using an adequate safety factor with regard to electrical current needs for thawing.

Likewise, strips and connections to the pipes should be electrically insulated from the backfill.

- O. **Looping:** Dead ends shall be minimized by looping of all mains when practical, from one part of the system to another. When dead end mains are allowed by CWD in writing, they shall be equipped with the means to provide adequate flushing which will give a velocity of 3.0 feet per second or greater in the main being flushed or provided with an automatic flushing unit at the discretion of the CWD. The CWD may also require a meter pit and meter associated with the automatic flushing unit. Looping within the same public or private way is not an acceptable practice and will not be approved by CWD.

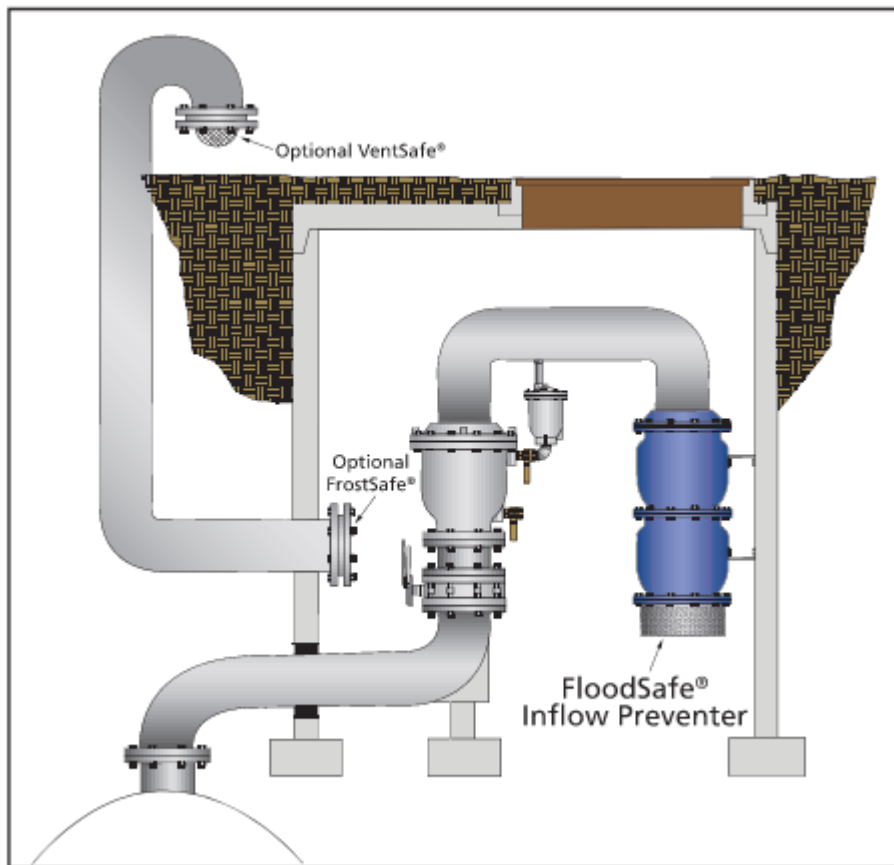
### **2.3 FITTINGS**

- A. All fittings shall be manufactured in North America.
- B. All fittings shall be provided with a joint restraining system.
- C. All products shall be constructed of ductile iron.
- D. All fittings shall conform to AWWA C153, ductile iron, compact and mechanical joint.
- E. All fittings shall be double cement-mortar lined in accordance with ANSI/AWWA C104/A21.4 and given a seal coat of asphaltic material.
- F. In general, the District prefers the use of fittings in lieu of deflecting pipe joints to make necessary direction changes (horizontal and vertical) in the pipe. Deflecting pipe in accordance with manufacturers' written recommendations will be considered by CWD on a case by case basis.

### **2.4 AIR RELEASE VALVES**

- A. Air release valves are not permitted for use in the CWD system unless specifically approved or required in writing by CWD. In such cases a vault will be required to allow access to service the valve. Depending on depth, the vault may require a ladder, and safety requirements for a confined space.
- B. Air release valves shall be coupled with a flood safe inflow preventor by Valvmatic or equal. The figure below provides diagram of typical layout.

### Typical Layout for Air Release Vault



## 2.5 SLEEVE COUPLINGS

- A. All couplings shall be manufactured in North America.
- B. Sleeve couplings and accessories shall be pressure rated at least equal to that of the pipe. Couplings shall be Dresser style 153, Smith Blair 441, Solid Sleeve, and Hymax or approved equal. The couplings shall be provided with stainless steel series 300 nuts and bolts or better. Galvanized steel is acceptable alternative if zinc sacrificial caps are provided.
- C. Transition couplings for joining pipe of different diameters shall be Dresser Style 162 or approved equal. Coupling shall be provided with stainless steel series 300 nuts and bolts or better. Galvanized steel is acceptable alternative if zinc sacrificial caps are provided.
- D. After assembly, all exterior surfaces including the bolts and nuts shall be thoroughly coated with two (2) coats of heavy duty protective asphaltic



coating. The interior of the coupling shall be epoxy coated. Epoxy coating shall conform to AWWA C550.

## 2.6 JOINTS

- A. All joints shall be restrained.
- B. Joints shall be either push-on or mechanical joints conforming to ANSI A21.11/AWWA C111. Push-on and mechanical joints shall be provided with sufficient quantities of accessories conforming to ANSI A21.11 AWWA C111.

## 2.7 GATE VALVES

- A. All gate valves shall be restrained.
- B. Gate valves larger than 12 inches shall be provided with a by-pass line (size to be determined by CWD) to equalize the pressure on either side of the valve, or alternatively a butterfly valve can be provided as a substitute, as approved by CWD. See specifications later in Section 2.
- C. Gate valves shall be resilient seated conforming to the requirements of AWWA C509 equal to the type used by the CWD.
- D. Gate valves shall be ductile iron body, bronze mounted, R.S. (resilient seat), non-rising stem, O-ring type stuffing box. Bolts for the valve bonnet as well as flanges etc. shall be 300 series stainless steel.
- E. Gate valves shall **open to the right** [clockwise] and have mechanical joint ends and O-ring stem seals.
- F. Valves shall have fusion bonded epoxy coated housings inside and outside, rated to NSF 61 standards.
- G. Gate valve wedge shall be encapsulated in rubber and manufactured by Clow Valve Company or equal.

## 2.8 VALVE BOXES

- A. Unless otherwise specified, each gate valve shall be provided with a valve box and cover.

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- B. Valve boxes shall be of the adjustable, telescoping, heavy-pattern type and shall be so designed and constructed as to prevent the direct transmission of traffic loads to the pipe or valve.
- C. Valve boxes shall be provided with a top flange to withstand surface loading. Valve boxes without a flange will not be acceptable.
- D. Valve boxes shall be cast iron, tar coated with cast iron covers. The smallest inside diameter of the shaft shall be no less than 5-1/4". The lower section of the box shall be designed to enclose the operating nut and stuffing box of the valve. Provisions shall be made for adjustment through at least 6" vertical without reduction of lap between sections.
- E. Valve boxes will be provided with a centering ring to keep the box square on top of the operating nut. The Valve Box Alignment Device shall be manufactured by Trumbull Manufacturing Inc. or CWD approved equal.
- F. Covers shall be close fitting and substantially dirt tight. The top cover shall be flush with top of the box rim. The word WATER shall be cast in the top cover.
- G. Valve boxes shall be provided with a foam mud and debris cap plug, or debris cap with friction fit turning handle as determined by CWD. If required, the debris cap will be lockable.

## 2.9 HYDRANTS

- A. The contractor shall furnish hydrants of the make and the type specified hereinafter of approved equal.

Make and Model (Dry Barrel):

- 1 American Darling B62B (Traffic Model), **open right**
- 2 Clow Medallion (Traffic Model), **open right**

Type of thread: National Standard

Number of Outlets:

Two 2-1/2 inch hose connections

One 4-1/2 inch steamer connection

Direction of opening: **open right**

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Depth of bury: 6-foot hydrants only

- B. Hydrants shall conform to the requirements of ANSI/AWWA C502, latest issue and be FM and/or UL rated.
- C. Color per CWD requirements: Red with aluminum colored caps and bonnet.
- D. The steamer port invert shall be 18 inches above final grade. Extensions where required will be purchased from the manufacturer or their representative to provide sufficient out of ground height of the steamer to allow operation, as determined by CWD.
- E. Hydrant flags
  - a. Hydrants shall be provided with highly reflective fiberglass hydrant marker with Spring and 2-1/2 inch loop for side mount, 4-1/2 for steamer mount, or flat bracket for mounting on hydrant.
  - b. Marker pole shall be 3/8-inch diameter and 5 to 6 feet tall.
  - c. Pole shall be provided integral with flag.
  - d. Flag shall be provided in or painted with the following colors. Coordinate with the District for flow ranges.
    - i. BLUE: 1500 GPM or more
    - ii. GREEN: 1000-1499 GPM
    - iii. ORANGE: 500-999 GPM
    - iv. RED: Below 500 GPM

## **2.10 TAPPING SLEEVE AND VALVE**

- A. Tapping sleeves shall meet the requirements of AWWA and shall be a full sleeve type with a mechanical joint connection to the existing water main. The tapping sleeves shall be capable of containing pressure within the full volume of the sleeve. The tapping sleeve shall be manufactured by Mueller Company, U.S. Pipe or American Flow Control or equal.

Sleeve shall be stainless steel body with stainless steel 300 series nuts and bolts.

- B. The gate valves furnished with the tapping sleeves shall be as manufactured by Mueller Company or approved equal. Valves shall conform to AWWA C-500, shall have mechanical joint and **open right**.

**2.11 THRUST RESTRAINTS**

- A. Thrust restraints shall be installed in accordance with the relevant provisions of the standard details shown on the drawings and the directions of the CWD.
- B. The contractor shall discuss with the CWD the method[s] to be utilized to restrain thrust prior to installing bends, tees, hydrants, and the like. Test pits may be required in areas of existing utilities to determine the exact location and dimensions of thrust restraints to be installed by the contractor. Anchor tee shall be provided for all hydrant branches.
- C. Cement concrete thrust blocks may be required by CWD in certain locations where the new piping is constructed by Contractor in conjunction with the existing distribution system. Thrust blocks shall be constructed in place using Portland cement concrete, having a 28-day compressive strength of at least 3,000 psi. The bearing area and configuration of each thrust block shall be as detailed and approved by the CWD.
- D. Restrained joint assemblies shall be used in all areas where thrust blocks cannot be constructed to bear on undisturbed earth and or where sufficient area is not available. Restrained joint assemblies shall be EBAA Iron Sales Mega-lug, or equal.

**2.12 WATER SERVICE INSTALLATION AND IDENTIFICATION**

- A. All new water services will be tapped 1-inch, 1.5-inch, or 2-inch in size. Plastic service lines only. 1-1/4-inch shall not be allowed.
  - a. All domestic services will be Polyethylene Poly Plastic; AWWA certified 200 PSI or better service line, "Copper Tube Size" or CTS water tubing. CTS shall be manufactured in accordance with ASTM D2737 standard.
  - b. Plastic will be blue in color.
  - c. Stainless Steel insert stiffeners are required when compression connections are made to ensure a leak-free installation.
- B. All 1-inch services will be sleeved in plastic pipe two (2) times the size of the service line that is being installed. This allows easy replacement of the service line. Greater than 1-inch size can be direct bury.
- C. Service brass will be manufactured by Ford, Mueller, or Cambridge. Brass will have CTS compression fittings, no set screws on the brass, rated for 200 psig or greater.

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- D. Erie's style curb boxes will be used on service installation. Erie boxes will be brought up to grade and stainless-steel rods will be used.
- E. If an existing service line is to be abandoned for a new service line, the abandoned line must be shut off at the corporation and work inspected by District personnel.
- F. The District will tap the main, lay the service line, and when ready at site, install meter.
- G. The District's will perform the work during normal business hours.
- H. The service line shall be a continuous run from corporation to curb stop and from curb stop to structure being served (no couplings).
- I. Service lines shall enter the structure being served through the foundation, not under footings.
- J. Sand is to be used to bury service lines (1 foot above and 1 foot below service line including service line) meeting Type 4 laying conditions (see Execution).
- K. Plastic line marker tape with location wire. Nomenclature "Caution, Buried Water Line Below."
- L. District personnel will inspect the installation of new service line before allowing contractor to backfill the trench.
- M. No service taps shall be allowed after the last hydrant gate on a dead-end water main.
- N. Service line tap shall be installed a minimum of 8 feet away from an isolated gate.
- O. **SERVICE SADDLES:** All water services greater than 1-inch diameter shall be saddled. One (1) inch diameter service or blowoff direct taps are permitted. Saddles shall be CC threads with double anodized steel bands, and high strength ductile iron body sized to properly fit DI, PVC, or AC pipe. Zinc caps shall be provided to protect steel bands.
- P. **CORPORATION STOP:** Corporation stops shall be an open left Mueller style compression ball stops with a tapered CC thread and a compression pack joint (CPPJ) for CTS tubing conforming to AWWA C-800 standards. Corporation stops shall be as manufactured by Mueller, Ford, Cambridge, or approved equal.

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- Q. **STAINLESS STEEL INSERTS:** Stainless steel inserts shall be compatible for use with 200 psi CTS HDPE flexible water service tubing and shall be used with all compression fittings.
- R. **CURB STOP:** Curb stops shall be open left ball valve with Mueller style compression type pack joints (CCPJ) on both ends and shall be compatible for use with CTS HDPE tubing. Curb stop shall be manufactured by Mueller or approved equal.
- S. **THREE PART UNION:** This service fitting has a Mueller style compression type pack joints (CCPJ) on both ends and is compatible for use with CTS HDPE tubing.
- T. **MALE and FEMALE CPPJ X IP ADAPTERS:** Adapters are to be used with CTS HDPE tubing having a Mueller style compression type pack joint on one end, and iron pipe thread on the other.
- U. **Water Service Line Repair:** The CWD will own the service line from the main to the curb stop. The CWD will repair or replace this section in kind of the service line at no cost to the homeowner/landowner, with the following exception. Should the home or landowner install a surface which is more costly than CWD paving with bituminous asphalt or installing plain concrete (e.g., brickwork, decorative concrete, etc.), the owner shall be responsible for the cost of repairing the surface back to its original state.

**2.13 METERS**

- A. Meters shall be Neptune Mach 10 ultrasonic meters. Other meters shall not be allowed without written permission from the District.
- B. Double check devices with meter spud shall be purchased from the CWD.

**2.14 METER SETUP**

- A. The property owner shall pay for meters in accordance with the rate schedule at the time of service application.
- B. All meters shall be supplied and installed by the CWD. All meters shall be the sole property of the CWD and register in gallons.
- C. All services shall be fitted with a 5/8-inch meter. Requests for larger meters will be considered if documented by a fixture analysis per AWWA M-22 and/or State Statutes and Regulations.

- D. All meter set-ups shall include a quarter turn ball valve before and after the meter, meter couplings, meter, suitable backflow device, and a pressure-reducing valve if required.
- E. The District shall own the service line from the main to the curb stop. All fixtures, fittings, couplings, and piping from the curb stop connecting fitting (except the meter) shall be owned and maintained by the property owner. Meters shall be owned and maintained by the CWD.
- F. The property owner must always keep the meter on his/her premises easily accessible for reading and servicing.
- G. The Water Department reserves the right to read, inspect or service the meter at any time (M.G.L. 165, paragraph 11D).

#### **2.15 METERS REQUIRED**

- A. Meters shall be required to any building or parcel which takes water from the CWD for any use. All single-family residential properties shall meter individually with a 5/8-inch meter.
- B. Managed residential multi-unit rental properties (i.e. apartments, and multi-family) shall have each building metered as one. Multi-unit non-managed, non-rental residential properties (i.e. condominiums, townhouses, dual owner duplex units) shall be metered individually. Commercial properties, other than manufactured housing, shall have individual meters for each building served with water for any use other than fire protection. Manufactured housing parks shall be master metered. The District owns the sole right to determine when a building or unit requires an individual water meter.
- C. CWD owns to the service curb stop as well as the water meter itself. All other service material (e.g. isolation valves etc.) is owned by the property owner.
- D. CWD retains the right to replace the water meter on a periodic basis (typically every 10-15 years), when the meter fails, or operating improperly. CWD retains the right to turn off the water service if reasonable access is not provided to read or service the meter.

#### **2.16 CUSTOMER REQUEST FOR METER TESTING**

- A. Customers may request that their water meter be tested. The request shall be in writing and state the reason for the test. If a customer believes a meter is over

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- registering consumption, the period to which the over registering claim is made must be stated in the correspondence requesting the test. Failure to specify the period to which the claim is made, shall limit the claim to the last consumption billing period.
- B. Meters found to be operating within two percent (2%) of the manufacture's specifications for accuracy shall be deemed accurate. If a meter tests either above or below the accuracy parameters by greater than two percent (2%) an adjustment to the bill will be made for the period stated in the request for the meter test.
  - C. The CWD, for a fee of \$200 for each test, shall test all meters. However, a customer may request that an independent testing company test the meter provided the customer pay for the independent test plus the service fee. A chain of custody shall accompany all meters to be tested.
  - D. Any customer requesting a replacement meter in lieu of testing may have a new meter of equal size for the cost of the new meter. A service fee as described in the rate schedule shall be assessed for the installation of the new meter. Meters replaced at the customer's request under this section, will not constitute a basis for an adjustment to charges.

**2.17 METER PITS AND MASTER METERS**

- A. The policy of the CWD is to discourage the use of meter pits. However, where deemed necessary by the District, meter pits will be paid for, owned, installed, and maintained by the property owner. Meter pits will only be required if, in the opinion of the CWD, it is in the best interest of the CWD (i.e. high ground water tables, excessive service length, lateral connections, seasonal services, no suitable inside meter location). All meter pits shall require the installation of a dual spring-check valve and ball valve.
- B. Meter pits shall be required when the service line is greater than 200 feet, or at the discretion of the CWD. In these cases, the meter pit shall be installed as close to the start of the service line as possible to limit the amount of non-revenue water lost.
- C. Master Meters will be required at the discretion of CWD when there is significant private infrastructure prior to the traditional meter location at the building or other situations demand appropriate by the CWD.
- D. In cases where a meter pit/vault (or backflow prevention pit/vault) is considered by OSHA regulations to be confined space, the owner will provide a positive air flow system (e.g. fan) meeting OSHA requirements to allow entry as a remediated



confined space entry. Owner will be responsible to maintaining the system in working order as well as providing any ladder and associated safety equipment.

## **2.18 WATER SERVICE APPLICATION PROCEDURE**

- A. An application for water service can be picked up from the CWD and completed and returned.
- B. Pay the necessary connection fee(s).
- C. Provide the preliminary drawings showing proposed layout.
- D. District, at applicant request, can provide cost for installing the service line. If the District is not utilized, the applicant can utilize an approved private installer. A list of installers can be provided by CWD.
- E. Once the installation is complete, the District will inspect the installation prior to backfilling service line. The installation will be pressure tested and/or tested for sanitary conditions. Any deficiencies determined by CWD will be addressed prior to water being turned on.
- F. The contractor shall provide as-built drawings showing water main (if installed) and service lines tied to known fixed long-term objects (e.g. curb box tied to corners of house).
- G. Water shall not be turned on until accurate as-built documents are provided to CWD as well as pressure testing and disinfection documentation and payment of all fees or costs associated with work performed by the District.

## **2.19 BUTTERFLY VALVES**

- A. General
  - 1. Butterfly valves shall be designed and manufactured in accordance with AWWA C504 with the following additional requirements or exceptions.
  - 2. Valve sizes beyond the scope of AWWA C504 shall be based on the maximum service conditions with minimum safety factors of 3:1 on yield strength and 5:1 on ultimate strength. All BFV shall have Ductile Iron bodies with flange dimensions and drilling in accordance with ANSI B16.1, Class 125.
- B. Service
  - 1. Valves shall be suitable for throttling service, frequent operation, and long periods of inactivity. Valves shall be capable of operating

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satisfactorily with flows in either direction and suitable for use in potable service. Components shall be suitable for exposure to chlorinated water.

C. Installation

1. Valves shall be installed in horizontal waterlines with the valve shaft positioned horizontally and the operating nut shaft positioned vertically. The body of valves shall be buried and the actuators installed in manholes.

D. Shut off Pressure

1. At rated pressure, the valve shall be bubble tight for flows in either direction.

E. Class of Valve

1. The class of valves shall be Class 250B.

F. Valve Bodies

1. Valve bodies shall be short body. Disc stops on the body are not allowed.

G. Valve Discs

1. The valve disc shall seat at 90 degrees to the pipe axis. Discs having hollow chambers that can entrap water are not allowed. Class 250B valve discs shall be Ductile Iron.

H. Valve Seat

1. Rubber seats may be applied to the body or the disc. In either case, the mating seat surface shall be stainless steel or sprayed in accordance with AWWA C504.
2. Rubber seats shall be constructed of natural or synthetic rubber and may be reinforced by the manufacturer.
3. Rubber seats that are mounted on the disc shall be a continuous, full circle 360 degree seal clamped on with corrosion-resistant retaining rings and threaded fasteners.
4. Rubber seats that are mounted in the groove of the valve body on 24-inch and smaller valves may be bonded to the body. Bonded seats shall withstand a 75 pound pull in accordance to the 90 degree stripping test procedure, Method B of ASTM D 429.
5. Rubber seats that are mounted in the valve body on valves larger than 24-inches shall be full circle 360 degree and shall be retained in the valve body by mechanical means in such a manner that the seat can be adjusted to provide a tight shutoff. The valve shaft shall not penetrate the rubber seat.

I. Valve Shaft

1. The valve shaft shall be stainless steel and through or stub type. Shafts for Class 250B valves shall be ASTM A 564, UNS Designation S17400, condition H1150.

J. Shaft Seal

1. Where the valve shaft projects through the valve body for the actuator connection, a shaft seal that is designed for positive pressure within the valve shall be provided for 24-inch and smaller and 30-inch and larger valve sizes. For 24-inch and smaller valves, the seal shall be self-compensating V-type packing or an O-ring type contained in a corrosion resistant cartridge. For 30-inch and larger valves, the seal shall be self-compensating V-type packing or adjustable packing type with bronze or stainless-steel pull-down packing gland follower.
2. The shaft seal area and exposed valve shaft shall be completely enclosed to prevent the infiltration of material around the shaft and the shaft seal during backfilling. Adjustable packing glands shall be accessible through the bonnet or by removing the enclosure around the packing gland.

K. Valve Bearing

1. Valves furnished with an externally adjustable thrust bearing shall have the external adjusting mechanism enclosed in a substantial watertight housing.

L. Type of Valve Ends

1. Valves shall be furnished with flanged ends. Dimensions and drilling shall be in accordance with ANSI B16.1, Class 125. Flanges shall be finished to the true plane surfaces within a tolerance limit of 0.005 inch. The finished face shall be normal to the longitudinal axis with a maximum angular variation tolerance of 0.002 inch per foot (0.017%) of flange diameter. Flanges shall be machined to a flat surface with a serrated finish in accordance with AWWA C207 and shall have full-sized bolt holes through the flanges. Drilled and tapped holes will be acceptable only in areas where the shaft passes through the body; flanges with all holes tapped are not allowed.
2. Mechanical Joint is acceptable option upon written approval of CWD.

M. Valve Actuators

1. Valves shall be furnished with manual actuators designed and sized to develop output torques for the specified operating service; they shall be sufficient to seat, unseat, and rigidly hold the disc in any position. The maximum velocity through the valve for actuator design shall be 16 fps.
2. The gearing of the actuator shall be totally enclosed and sealed with a lubricant for a temperature range of minus 10°F to 150°F.
3. Worm-gear actuators shall have worm-gear of high tensile bronze and a worm of hardened alloy steel with ground and polished threads that are supplemented by a spur gear attachment, as required.

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4. The diameter of the output shaft or spline of the actuator shall be equal or greater in size than the turned-down section of the valve shaft.
5. Actuators shall have a position indicator.
6. Actuators shall be Auma Model GS, EIM Type WD, Rotork IW, or Limatorque Type HBC that are designed to operate temporarily in a submerged condition (i.e., 10 feet of water).
7. Actuators shall be equipped with 2-inch square wrench nuts in accordance with AWWA C509. The valve shall open with a clockwise rotation of the nut.
8. For the complete opening or closing of the valve, the minimum number of turns shall be at least 40.

N. Extension of Bonnet

1. Valves shall be furnished with a separate one-piece cast iron or fabricated steel extension bonnet with access openings fitted with removable covers and located to permit access to the stuffing box for tightening the packing, if applicable. The extension bonnet shall be 24 inches in length and of a single diameter over the entire length. The minimum thickness of the removable cover shall be 14 gauge (0.0747 inches); it shall be attached to an extension sleeve with a minimum of four 1/4-inch diameter cap screws. Gasketing of the opening is not required.

O. Nameplates

1. Corrosion-resistant nameplates shall be provided. A valve nameplate shall be attached to the valve body and an actuator nameplate attached to the valve actuator. Valve nameplates shall include the normal valve data and the serial number.

P. Coatings

1. Exterior and interior metallic surfaces of each valve shall be painted per the latest revision of ANSI/AWWA C504
2. Flange faces shall be shop coated with a rust preventive compound.
3. Rubber Seal: After coating is complete, a lubricant compatible with the rubber seal shall be applied to the seal surface and the mating metal surface to prevent bonding during shipment and storage. Following the application of the seal lubricant, the valve disk shall be placed in a slightly open position for shipment.

Q. Valve Assembly

1. Valves shall be shipped fully assembled. The assembled valves shall be performance tested in accordance with AWWA C504.

R. Certification

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1. The manufacturer shall furnish a sworn statement that the inspection and all specified tests have been completed and that results comply with the requirements of these Standards. A copy of the Certification, including compliance with NSF/ANSI 61, shall be provided.

S. Acceptable Manufacturers

- 1) Dezurik
- 2) M&H Valve Company
- 3) Mueller
- 4) Pratt
- 5) Rodney Hunt
- 6) Val-Matic
- 7) GA Industries

END OF SECTION

## **PART 3 EXECUTION**

### **3.1 GENERAL**

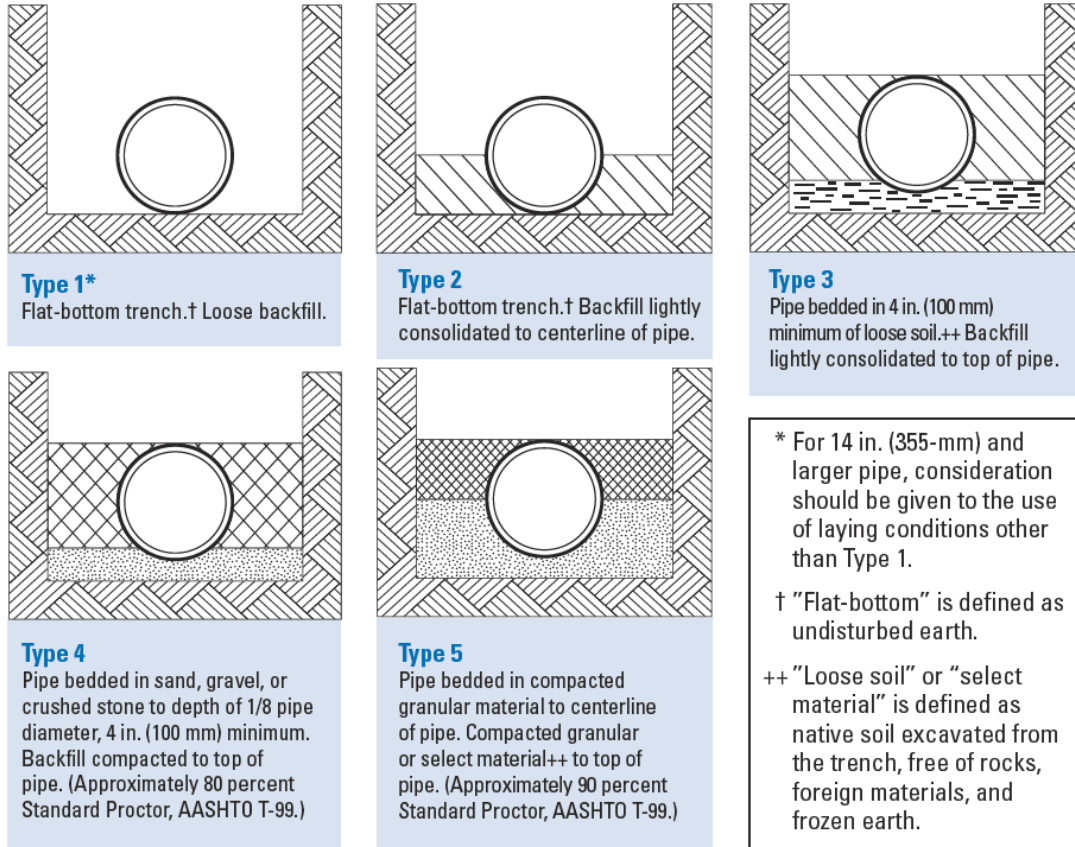
- A. All water pipes, fittings, valves, hydrant, and other water line appurtenances shall be installed as shown on the Drawing. Back fill materials shall be shown on the Drawings and as approved by the CWD.

### **3.2 LAYING DUCTILE IRON PIPE AND FITTINGS**

- A. Ductile iron pipe and fittings shall be installed in accordance with the requirements of ANSI/AWWA C600, except as otherwise provided herein.
- B. Each length of pipe shall be laid with firm, full and even bearing throughout its entire length, shall be Type 5 (Table 1) pipe laying conditions. The type of materials to be used in bedding and back filling and method of placement shall conform to the requirement of the CWD and as indicated on the drawings.
- C. All pipes shall be sound and clean before lying. When laying is not in progress, including lunch time, the open ends of the pipe shall be closed by watertight plugs or other approved means. If water is in the trench when work is resumed, the plug shall not be removed until the trench has pumped dry and all danger of water entering the pipe has been eliminated. Fittings, in addition to those shown in the drawings, shall be provided if required in crossing utilities which may be encountered upon opening the trench.
- D. When cutting of pipe is required, the cutting shall be done by machine, leaving a smooth cut at right angles to the axis of the pipe. Cut ends of pipe to be used with a push-on bell shall be beveled to conform to the manufactured spigot end. Cement lining shall be undamaged.

**Table 1: Pipe Laying Conditions (Source: McWane Ductile)**

**LAYING CONDITIONS**



**Notes:**

Consideration of the pipe-zone embedment conditions included in this figure may be influenced by factors other than pipe strength. For additional information on pipe bedding and backfill, see ANSI/AWWA C600.

American Association of State Highway and Transportation Officials, 444 N. Capitol St. N.W., Suite 225, Washington, DC 20001.

- E. In general, CWD prefers the use of fittings over the use of deflecting the pipe. When allowed by CWD, the maximum allowable deflection for pipe laid without fittings shall not exceed allowable established by the pipe manufacturer and shall not exceed those shown in AWWA C600.
- F. Water mains shall be laid so as to provide a minimum cover of 5 feet below finish grade. In cases where a minimum of 5 feet of cover cannot be provided and with written permission of CWD, insulation can be provided to reduce the depth.

- G. Water Main Repairs on Private Ways or Similar: The CWD will own the service line from the main to the curb stop. The CWD will repair or replace this section in kind of the service line at no cost to the homeowner/landowner, with the following exception. Should the home or landowner install a surface which is more costly than CWD paving with bituminous asphalt or installing plain concrete (e.g., brickwork, decorative concrete, etc.), the owner shall be responsible for the cost of repairing the surface back to its original state.

### 3.3 JOINTING DUCTILE IRON PIPE (PUSH-ON TYPE)

- A. Push-on joints shall be made in strict accordance with the manufacturer's instructions. A rubber gasket shall be inserted in the groove of the bell end of the pipe and the joint surface cleaned and lubricated using the pipe manufacturer's suggested methods and materials. The plain end of the pipe to be laid shall then be inserted in alignment with the bell of the pipe to which is to be jointed and pushed home with a jack or by other means. After joining the pipe, a metal feeler gauge shall be used to make certain that the rubber gasket is correctly located. Not that all joints shall be restrained. Using soil skin friction shall not be acceptable. Pipe also shall be electrically connected as described in Section 2.2 – Ductile Iron Pipe.

### 3.4 JOINTING MECHANICAL JOINT PIPE AND FITTINGS

- A. Mechanical joints shall be made by first cleaning the surfaces against which the gaskets will come in contact with a wire brush. The gasket, bell and spigot shall be lubricated by washing with soapy water just prior to assembling the joint. After the nuts have been made up finger tight, the bottom nut, the top and then diametrically opposite nuts shall be progressively tightened, bolts shall be tightened to the torques listed:

<u>BOLT SIZE</u> <u>(Inches)</u>	<u>RANGE OF TORQUE</u> <u>(Feet-Pounds)</u>
5/8	45-50
3/4	75-90
1 inch	85-100

- B. Under no circumstances shall extension wrenches or a pipe over the handle of an ordinary ratchet wrench be used to secure leverage. After installation a heavy anti corrosive coating shall be applied to all bolts and nuts when stainless steel 300 series equipment is not used.



- C. Restraining device shall be ductile iron and shall have dimensions such that it can be used with the standardized mechanical joint bell and tee-head bolts conforming to ANSI/AWWA Z21.11 and ANSI/AWWA C153 latest revisions. Sacrificial zinc anode caps shall be added to the bolt ends.

### **3.5 CONCRETE THRUST BLOCKS**

- A. Where pipes change horizontal and vertical directions, at hydrants, tees and other fittings, and wherever abnormal thrust forces may be developed, the contractor shall construct thrust and anchor blocks as detailed on the drawings. They shall be concrete, of minimum dimensions as detailed on the plans or of adequate additional size to suit actual conditions to withstand pressures anticipated and shall be founded in virgin soil.
- B. Concrete for thrust blocks shall have a minimum 28 day's compressive strength of 3,000 psi. Transit mix concrete may be used subject to CWD approval.

### **3.6 RESTRAINED JOINTS**

- A. Pipe with restrained joints shall be installed at all locations, except when other restraining mechanisms are implemented. Using skin friction to restrain pipe is not acceptable method. Bends, reducers, tees, valves, dead ends, and hydrants are among the places where thrust forces create unbalanced forces in the piping and where the pipe and fittings shall be restrained.
- B. Restrained joint assemblies for push-on pipe and fittings shall be made in strict accordance with the manufacturer's recommended installation procedures.
- C. Restrained joint assemblies for mechanical joint pipe shall be EBAA Iron Sales or Mega-Lug, or equal.

### **3.7 GATE VALVES, BUTTERFLY VALVES, AND BOXES**

- A. Generally, valves shall be laid on native soil, with the trench bottom being firmly compacted and shaped to accept the valve. Where the soil is the sub-grade is found to be soft, loose, freshly filled earth, unstable or unsuitable as a base, the CWD may, at its discretion, order it excavated to such additional depth and width as the CWD may deem necessary and replace the unsuitable foundation with gravel bedding.

- B. Valve boxes shall be centered and plumb over the operating nuts of all direct burial valves. The top of each valve box shall be set to finished grade with at least 10 inches of overlap remaining between the upper sections for future vertical adjustment. Minimum overlap for lower, extension pieces shall be 4 inches.
- D. Boxes shall be provided with a centering ring to keep box square with valve nut.
- E. Boxes shall be adequately supported during back-filling to maintain vertical alignment.
- F. Isolation gate valves shall be installed on each intersection on each leg of the intersection (e.g., triple gate).
- G. Butterfly valves shall be installed in a manhole.

### **3.8 TAPPING SLEEVES AND GATE VALVES**

- A. Before back-filling, all exposed portions of any bolts used to hold the two (2) halves of the sleeve together shall be heavily coated with two (2) coats of bituminous paint comparable to Bitumastic No. 50, by Kopper Company, Inc. if not stainless steel 300 series or better. Steel bolts shall be provided with sacrificial zinc caps.
- B. Installation shall be made under pressure and the flow of water through the existing main shall always be maintained. The diameter of the tap shall be a minimum of ¼ inch less than the inside diameter of the branch line.
- C. The entire operation shall be conducted by workmen thoroughly experienced in the installation of tapping sleeves and valves, and under supervision of qualified personnel.
- D. The contractor shall determine the location of the existing main to be tapped to confirm the fact that the proposed position for the tapping sleeve will be satisfactory and no interference will be encountered such as the occurrence of existing utilities or of a joint or fitting at the location proposed for the connection. No tap will be made closer than 3 feet from a pipe joint.
- E. Pipe upon which tapping sleeve is to be installed shall be thoroughly cleaned of all foreign matter with scrapping tools and wire brushes as to a minimum of six [6] inches beyond each side of the sleeve. This area shall be washed

with a hypochlorite solution. The interior of tapping valve shall also be washed with a hypochlorite solution.

- F. Tapping valves shall be set in vertical position and be supplied with a 2-inch square opening nut. The valve shall be provided with an oversized seat to permit the use of full-size cutters.
- G. Tapping sleeves and valves with boxes shall be vertically and squarely centered on the main to be tapped. Adequate support shall be provided under the sleeve and valve during the tapping operation. Thrust blocks shall be provided behind all tapping sleeves. Proper tamping of supporting earth around and under the valve and sleeve is mandatory. After completing the tap, the valve will be flushed to ensure that the valve is set clean.

### **3.9 HYDRANTS**

- A. Hydrants shall be installed as detailed on the drawings and shall be set at the locations shown on the drawings or designated by the CWD.
- B. Each hydrant shall be set in true vertical alignment and shall be properly braced. Concrete thrust blocks shall be placed between the back of the hydrant inlet and undisturbed soil at the end of the trench. Minimum bearing area shall be as shown on the plans. Care shall be taken to ensure that concrete does not block the drain ports.
- C. Crushed stone shall be provided around the base and bleeder to allow proper drainage of the hydrant. The stone shall extend to a 12 inch radius around the hydrant and to a 12 inch depth. Filter fabric shall be provided to support the gravel and prevent the migration of soil to clog the bleeder.
- D. Hydrants installed in flood areas or areas that are perennially wet shall have the drain plugged. Contact CWD prior to plugging the hydrant.

### **3.10 INSPECTIONS, TESTS, PERMITS, AND RECORDS**

- A. Contractor shall coordinate with the CWD for inspections and the calculation of the inspection services fee (including fire flow test – see appendices). The contractor shall arrange and pay for all required tests. CWD must be present on-site at the initiation of the test for it to be validated by the Superintendent. The contractor is responsible for obtaining and having on site, excavation permits to include Dig safe, Chelmsford Department of Public Works or Mass DOT excavation road cut permits. No water work shall take place without the proper permits and or details in place. The property owner is responsible for keeping

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accurate records to produce "as-built" plans. Any fees required for obtaining permits are the responsibility of the contractor.

- B. Inspection services provided by the CWD do not guarantee the quality of workmanship or the functionality of the improvement at the time of installation or thereafter. Inspections provided by the CWD are to determine that materials used, and the installation procedure complies with these specifications. No District approval of the work, design, materials, or installation is expressed or implied with an inspection.

### **3.11 EXCAVATIONS**

- A. Excavations shall follow all local, State, and Federal safety regulations. The following are specific rules and requirements for excavations within the CWD. Where there is a conflict here with the Chelmsford Public Works Department rules and regulations for road work, the guidelines from the Chelmsford Public Works Department rules and regulations shall apply over the Water Department rules and regulations for road repairs.

- a) Excavation Permits: Contractor is responsible for obtaining necessary permits from the Town and/or State.
- b) No excavation shall remain open after working hours (7:00 a.m. to 3:30 p.m.) unless provided in writing by the CWD. All excavations shall be backfilled and paved or covered with steel plates as approved by DPW at the end of work each day. During working hours, open excavations shall be attended to help prevent falls in unauthorized access.
- c) The maximum length of open trench permissible at any time shall be two hundred (200) feet, and no greater length shall be opened for pavement removal excavation, construction, backfilling, repairing, or any other operation without the express written permission of the CWD.
- d) Excavations across major Town or State roadways will require the utilization of "trenchless technology" and/or the use of a "flowable fill" type material as discussed below. Deviations from this will be required in writing from the CWD.
  - 1. A minimum of 12 inches of gravel shall be placed on top of the pipe prior to placement of flowable fill. The pipe shall not be encased in flowable fill but must be placed in the laying conditions specified prior to the additional of flowable fill.
- e) Workmanship:

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1. The Contractor shall furnish all materials and conduct the Work in an orderly, timely, quality-controlled manner.
  2. The Contractor shall keep a competent foreman and sufficient competent employees to carry on the work with proper speed and in accordance with the requirements of law and other public authorities and to the reasonable satisfaction of the CWD
  3. The Contractor shall conduct the work in a manner that will not unreasonably interfere with other work being done by the Town or CWD, by contract or otherwise. If deemed necessary by the CWD, the work done under these standards shall conform to the progress of said other work. The Contractor shall cooperate with the contractors or employees who may be doing work for the Town or CWD, and with public service corporations affected by the work in arranging for storage places, temporary support for structures, repairs, etc.
  4. All temporary repairs shall be properly maintained by the Contractor to assure good rideability conditions until the end of the guarantee period or until permanent restoration has been made, whichever first occurs.
  5. Permanent pavement restoration accomplished by utility companies shall be properly maintained to assure good rideability conditions until acceptance by the CWD and Town.
- f) Removal of asphalt pavement:
1. All initial excavations into paved roadway surfaces shall be precut in a neat line with pavement breakers or saws.
  2. Saw cutting is the preferred method for work done for the CWD. The use of hydro-hammers or heavy-duty pavement breakers for breaking pavement are limited on all roadways unless written permission is granted by the CWD for their use after due consideration of the location, the condition of the roadway, and the depth of saw cutting required ahead of the use of the hammers.
  3. No irregular pavement cut shapes will be allowed. No shape will be allowed that would prevent compaction equipment from adequately compacting all of the area.
  4. The shape of pavement cutouts shall be rectangular, or a combination of rectangular and square shapes unless otherwise agreed to by the CWD and Contractor.
  5. Pavement edges shall be trimmed to a neat vertical face free of loose materials and neatly aligned with the centerline of the trench.
  6. Unstable pavement shall be removed over cave outs and overbreaks and the subgrade shall be treated as the main trench.
  7. The Contractor shall make every effort to avoid damage to existing pavement to remain. Any damage shall be promptly repaired by the Contractor.

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- g) Removal of concrete pavement:
  - 1. Saw cutting of reinforced Portland cement concrete is required with the depth of the cut being the full depth of the pavement unless otherwise directed by the CWD to retain reinforcement.
  - 2. Saw cutting may be required by the CWD outside of the limits of the excavation over cave-outs, overbreaks and small floating sections.
  - 3. Reinforced concrete pavement, to the extent possible, shall be removed without cutting the reinforcement. The bars or mesh, when cut, shall be severed as close to the center of the trench as practicable and bent back to permit accomplishment of the work. When the pavement is ready to be permanently replaced, the reinforcement shall be bent back into position and reinforced with other bars or mesh which shall overlap the ends of existing reinforcement not less than twelve (12) inches and be securely wired together.
  - 4. Contact faces between new and existing concrete pavement shall be bonded using an approved epoxy binding agent installed and applied in accordance with the manufacturer's instructions, unless otherwise directed by the CWD.
  
- h) All material excavated from trenches and piled adjacent to the trench or in any roadway shall be piled and maintained in a manner that will not endanger those working in the trench, pedestrians or users of the streets, and so that as little inconvenience and obstruction as possible is caused to those using streets and adjoining property. The excavated material shall be hauled away from the site by the end of each working day.
  
- i) The Contractor shall secure the necessary permission and make all necessary arrangements for all required storage and disposal sites.
  
- j) When excavated material is laid along the side of the trench, it shall be kept trimmed. Whenever necessary in order to expedite the flow of traffic or to abate the dirt or dust nuisance, toe boards or bins may be required by the CWD to prevent the spreading of dirt into traffic lanes. If any portion of the excavated material is allowed to be used as backfill, it shall be stockpiled separately from all other materials.
  
- k) Sections of sidewalks and curbs shall be removed to the nearest real joint or score line.
  
- l) Tunneling, boring or other methods may be required by the CWD to avoid or minimize pavement removal.
  
- m) Special Condition(s)
  - 1. Traffic Management Plan

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- i. The Contractor shall prepare, and submit to the CWD, a plan that shows the routing of traffic during construction. The plan shall show the area and dimensions of the roadway pavement available for traffic during each stage of the work. The plan shall include all temporary barriers, signs, pavement markings, drums and other traffic control devices required to maintain traffic together with the limits of temporary pavement and necessary steel plates. The plan shall include all the requirements by the Chelmsford Department of Public Works for road openings, or Mass DOT requirements.
2. Steel Plates
- i. Design Requirements:
    1. The Contractor shall select and design the temporary steel plate and supporting system. The design calculations and Drawings shall be prepared, signed, and stamped by a Professional Engineer registered in the Commonwealth of Massachusetts experienced in design of temporary traffic decking.
    2. Design shall be in accordance with Loads and Design Criteria standard to the industry for this type of work, and with the following requirements:
      - a. For vehicular ramps, limit maximum grade to 5 percent (5%).
      - b. For pedestrian ramps, limit maximum grade to 8 percent (8%).
      - c. Conform with Americans with Disabilities Act Accessibility Guidelines (ADAAG) at all pedestrian traffic locations.
      - d. Design of support members shall allow clearances for existing and relocated utilities.
      - e. Provide access to utilities, fire hydrants, and other facilities requiring unique access. Requirements at each site shall be obtained from the respective agencies affected.
      - f. Plates shall overlap the trench width by at least 2 feet on each side.
  - ii. Construction Methods:
    1. Install and maintain the temporary steel plate systems only with express CWD approval.
    2. Not more than two (2) steel plates shall be used at any time.
    3. Steel plates shall not be used between November 15 and April 15 or at any time when snow is forecasted.

4. Place 48" x 48" orange and black construction sign, stating "Steel Plates 100 feet" to provide drivers with advanced notice.
  5. Provide wood wedges under plate edges at uneven surfaces to minimize movement.
  6. Provide temporary asphalt at the plate edges to provide lessen impact to vehicle traffic or trip hazard to pedestrian traffic and to assist in holder plate in place.
- iii. Maintenance:
1. Inspect the condition of temporary steel plates at least once a day. Continuously maintain plates to conform to design requirements and construction requirements. Immediately repair defects such as broken, bent, or loose plate members, and protruding fasteners. Patch adjacent paving as potholes develop, and immediately re-secure and bed loose transition members, plates, and ramps to the existing pavement.
  2. Maintain steel plates free of accumulations of snow, ice, water, mud, and debris.
  3. Perform maintenance, repair, or replacement whenever there is noticeable deterioration of any material or component from its original conditions

### **3.12 TRENCHING, BACKFILLING, and PAVING**

- A. The minimum depth of cover over the spring line, crown, or top of the pipe shall not be less than 5 feet and no more than 6 feet to the bottom of the pipe at the time of installation, unless written permission is provided by CWD. In such cases where 5 feet of cover is not possible, the piping shall be appropriately insulated upon written permission by CWD.
- B. Where there is a conflict here with the Chelmsford Department of Public Works rules and regulations for road repair (temporary and permanent), the guidelines from the Chelmsford Department of Public Works rules and regulations shall apply over the Water Department rules and regulations for road repairs.
- C. The trench bottom and sidewalls shall be free of boulders, protruding ledge, stones larger than four inches, roots, trash, asphalt, debris, or other unsuitable materials. Backfill shall likewise be free of boulders, ledge, stones larger than four inches, roots, trash, asphalt, debris, clay, fine sand, or other unsuitable materials. Pipe laying shall be type 5 for water mains and type 3 for service lines (See Table 1).



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D. The following are the rules and requirements for trenching, backfilling, and paving:

a) Trenching

1. Any trench or backfill that is unsuitable in the opinion of the CWD due to depth, stability, wetness, or clay content shall be rejected for use.
2. Trench bottoms shall be at a uniform depth to grade at installation. Irregular trench bottoms may be made uniform using a bedding material six inches in depth. Bedding material shall meet the same standards as the backfill previously described. Pipes shall be installed only in dry trenches. All open ends of pipe shall be closed off to prevent water, dirt, animals, or other foreign substances from entering the pipe.

b) Backfill

1. Before backfilling, the Contractor shall notify the CWD for inspection. Backfilling shall not occur without CWD approval.
2. In unpaved areas, excavations shall be backfilled as directed by the CWD with approved material thoroughly compacted in layers not to exceed twelve inches (12 inches) in thickness until flush with the surrounding ground surface. If the backfilled material settles, additional approved materials shall be installed by the Contractor, as required, to keep the surface even. After settlement is completed, the excavated area shall be left by the Contractor in as good a condition as before the work was started. Loam and seed shall be applied with general 10-10-10 fertilizer as well as lime if the area is not an egress area (road, path, etc.).
3. Temporary sheeting and bracing used to support the side walls shall be removed, unless otherwise directed by the CWD, as backfilling progresses. When backfilling has reached the bottom of a brace, the latter and its horizontal rafter shall be removed, and this procedure shall be repeated throughout the backfilling operation. The sheeting shall be pulled in short increments, care being taken to avoid significant lateral movements of the sides of the trench. During and after pulling the sheeting, the backfill in the space formerly occupied by the sheeting shall be compacted.
4. Whenever water is found standing in the excavation area, the water shall be removed by pump or other means before backfilling operations may commence.
5. Backfilling shall be performed as soon as practicable so that the least possible subsequent settling will occur. In most cases backfilling shall occur on the same day as the excavation was begun. If this is not feasible due to the complex nature of work, emergency, or unpreventable conditions, the Contractor shall notify the CWD that

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same day, if not sooner, and take appropriate measures to protect public safety and infrastructure until work commences again the following day.

6. Backfill in paved areas shall be granular gravel borrow, processed gravel, sand, or crushed stone material (dependent on the specific utility) placed to a depth of 1 foot over the utility. In paved areas, trenches shall be backfilled in 12-inch lifts. **Each lift shall be thoroughly compacted by means of a vibratory or mechanical compactor before the next lift is laid in place.** The backfill shall be placed up to the pavement subgrade surface. If requested by CWD, the Contractor will be required to provide compaction testing. Compaction must be greater than ninety-five percent (95%).
7. Broken pavement, large stones, roots, and other debris shall not be used in backfill. Unused excavated material shall be removed from the Project Site and disposed of in a manner that will minimize interference and obstruction with pedestrian and vehicular traffic. No material shall be left within the right-of-way once the repair and/or installation is complete.
8. CWD may require the use of Excavatable Controlled Density Fill (CDF or Flowable Fill) during backfilling. Within the limits of the pavement, the trench shall be backfilled with Flowable Fill to an elevation of four (4) inches below the top of the paved surface. The following additional conditions must be met:
  - a. Only Type IE, Excavatable Fill will be allowed.
  - b. This material shall not be used for bedding material or in situations that will cause floating of the utility lines, or in the presence of cast iron or steel pipes.
  - c. CDF placement in trenches shall be fully barricaded or police protected for a minimum of three (3) hours after the pour or until a set is reached that will prevent a hazard to animals or humans.
  - d. CDF shall be separated from gas lines with a minimum of six (6) inches of sand cover over the lines.
  - e. Excavations that cross or extend into the public right-of-way shall be saw cut and backfilled with a “flowable fill” type material to grade and allowed to cure for at least 24 hours before the application of the binder coat. Contractor is responsible for maintaining at least one lane of traffic flow using road plates or barricades as well as meeting all State and Federal safety requirements.

c) Temporary Pavement

1. Upon the completion of proper backfilling, the Contractor shall install temporary pavement. The Contractor shall take all reasonable measures to complete temporary pavement on the same day excavation

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work was begun. If same day paving is not achievable due to complexity of work, emergency, or unpreventable conditions, the Contractor must notify the CWD as soon as practicable that same day, if not sooner, and take appropriate measures to protect the public safety and infrastructure until work commences again the following day. The most stringent measures will be required on primary roadways. Same day paving will typically be required if work is not expected to be continued the next day, regardless of location.

2. The Contractor shall notify the CWD 24 hours prior to beginning paving operations for inspection. All hot mixed asphalt paving must first be approved by the CWD as to depth and materials; this applies to both temporary and permanent paving activities.
  - a. Notification of the anticipated timing of all paving activity must be acknowledged by the CWD. Any notification delivered by facsimile machine must be preceded or followed up by a telephone conversation to assure its proper and timely receipt.
  - b. Contractors shall endeavor to make a follow-up notification by 9:00 a.m. of each workday that paving is still anticipated. In the event of schedule changes or emergencies, the Contractor shall provide a minimum of one-hour notification to assure inspection availability.
  - c. If a CWD inspector is not able to be on site within 24 hours of the acknowledged anticipated start time of paving activity, the Contractor may be allowed to commence paving. Inspector may sample in-place material for specification compliance.
  - d. Contractors who do not provide proper notification of paving activities may be subject to required removal and replacement of pavement for the purpose of inspection.
3. All temporary pavement shall be hot mixed asphalt, conforming to Mass DOT Standard Section 460, placed in one and a half (1.5) inch compacted courses to a total depth of three (3) inches. If a layer of concrete, cobblestone, granite pavers, or other supporting material also exists, the Contractor shall install concrete to match that depth prior to installing temporary pavement.
4. If excavation (or pavement damage) occurs at or within twenty-four (24) inches of the edge of trench, the Contractor shall place temporary pavement to the edge of existing sound pavement.
5. Hot mixed asphalt paving of trenches deemed by the CWD to be major excavation shall be paver applied, unless otherwise authorized by the CWD.
6. The Contractor shall maintain the temporary pavement and shall keep the temporary pavement in acceptable condition until the end of the guarantee period, or until permanent pavement is installed. At this

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time, the temporary pavement shall be excavated to the required grade in order to place the permanent bituminous concrete pavement.

7. The Contractor shall perform any necessary restoration beyond the limits of the street pavement, including lawns, esplanades, shrubs, gardens, curbing, sidewalks, underdrains, separations fabrics, fences, walls, etc. if they have been damaged during their construction work. Upon completion of the permanent repairs outside the limits of the street pavement, the Contractor shall notify the CWD in writing that the permanent repairs and/or replacements have been completed, setting forth the date of completion. The Contractor shall maintain the repaired area outside of the pavement for a period of one (1) year after completion, with the exception that once proper horticultural growth has been established, no further horticultural maintenance will be required.
8. Refilling of bar holes made in the street or sidewalk shall immediately, upon completion of the work, be filled with compacted, granular material up to three (3) inches below the paved surface and the remaining three (3) inches filled with an approved asphalt plug.
9. All traffic control signs (i.e. STOP, YIELD, DO NOT ENTER, ONE WAY, NO PARKING, SPEED LIMIT, CURVE WARNINGS, etc.) approved by the CWD via the Municipal Maintenance Department for removal, relocation, replacement, etc. shall be immediately replaced by the Contractor, unless otherwise directed by the CWD. No such traffic control sign shall be removed, relocated, or replaced without the express approval of the CWD.
10. All traffic devices, signs, pavement markings or traffic loops disturbed, damaged, altered or removed by the Contractor shall be promptly replaced by the Contractor, unless otherwise directed by the CWD, in accordance with Town and State of Massachusetts rules and regulations at the expense of the Contractor. The Contractor shall promptly repair all other damage caused by the work or activities. Roadway markings (centerlines, crosswalks, stop bars, lane markings, etc.) and traffic loops shall be replaced no later than thirty (30) days after completion of work or as may be directed by the CWD. If work disturbs centerlines or lane markings on primary roadways, the Contractor shall place temporary reflective markers immediately after the pavement is placed.

d) Permanent Pavement

1. The existing pavement shall be sawcut a minimum of six (6) inches beyond the initial excavation limits to expose a six (6) inch width of undisturbed soil.
2. The temporary pavement backfills, and undisturbed soil shall be removed to the depth of the proposed pavement and disposed of off the site.

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3. The permanent pavement shall be:
  - i. Binder coat shall be a minimum of three (3) inches in-depth set-in place as to accommodate a minimum of two (2) inches of finished topcoat. Finished asphalt shall be rolled to a flat uniform surface. The Chelmsford Department of Public Works shall issue a road cut permit which may include additional conditions or requirements.
  - ii. Binder shall be founded on 4 inches of Dense Graded Crushed Stone on 8 inches of Processed Gravel or Dense Graded Crushed Stone. This pavement structure shall be placed on the backfill.
  - iii. If pavement depth is greater than 5 inches, the Contractor will be required to match the existing pavement thickness. Increased depths of pavement may be considered on a case by case basis.
4. Trench backfill shall be checked for compliance with 95 percent compaction requirement. If compaction is found to be less than 95 percent, trench shall be re- compacted before paving will be allowed.
5. Permanent pavement restorations shall not be allowed to commence until at least one freeze/thaw season has passed since the installation of approved temporary hot-mixed asphalt pavement.
6. In cases where the existing pavement adjoining a proposed excavation needs rehabilitation, the CWD and Contractor may enter into a mutual agreement such that the Contractor undertakes the pavement rehabilitation as part of their pavement restoration.
7. Contractor will not be required to repair or replace damaged pavement existing prior to commencement of the work unless excavation operations result in small, unstable sections. These shall be removed and replaced as part of the work.
8. Each course of hot-mixed asphalt shall be compacted separately, meeting the requirement of 92 percent minimum compaction of standard laboratory theoretical maximum density for the specific material.
9. Mechanical compactors will be permitted for repairs less than 10 square yards. Repairs exceeding 10 square yards shall be rolled with an appropriately sized, power-driven, steel-wheeled roller to obtain specification density.
10. Hot-mixed asphalt materials shall be laid upon an approved clean, dry, compacted surface, spread, and struck off to the established grade and elevation, giving regard to the loss in depth between loose and compacted mixtures. Immediately after the hot mix asphalt mixture has been spread, struck off, and surface irregularities adjusted, it shall be thoroughly and uniformly compacted.
11. All sawcut vertical faces of existing pavement shall be neat, free of loose materials, and tack coated with an approved asphalt emulsion by

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applying the emulsion material in conformance with Mass DOT Standard Specifications Section 460.62, to fully cover the surfaces prior to pavement installation.

12. A tack coat shall be applied to the sub-base surface, or previous course surface.
13. If two or more excavations are made for the same utility or client in the same construction season and are within six (6) feet of each other, edge to edge, they shall be permanently restored as one trench, including the pavement between excavations.
  - i. Same requirement shall apply, if in a future season, an excavation for the same utility or client occurs within six (6) feet and the first has not yet been permanently restored.
14. If an excavation for the same utility or client falls within six (6) feet of another excavation already permanently restored, the permanent pavement of the second excavation shall include all surface pavement between both excavations.

e) Material Specification

1. Granular gravel borrow and processed gravel material backfill shall conform to Mass DOT Spec. M1.03.0, Gravel Borrow Type (b) and Mass DOT Spec. 1.03.1, respectively or as amended.
2. Sand borrow shall conform to Mass DOT Spec. 1.04.0 or as amended.
3. Controlled Density Fill (CDF) Type IE Excavatable shall conform to Mass DOT Spec. 4.08.0.
4. Pavement structure subbase material shall be either Mass DOT M1.03.1 Processed Gravel for Subbase or Mass DOT M2.01.7 Dense Graded Crushed Stone for Subbase. The material shall be spread in layers not exceeding eight (8) inches in loose depth and compacted to no less than 95 percent of the maximum dry density of the material, ASTM D1557.
5. Temporary pavement shall be hot-mixed asphalt Mass DOT Type I top course material conforming to Mass DOT M3.01.0 and M3.11.07.
6. Steel Plates.
  - i. Plates and supporting members shall be steel, either new or used.
    1. All materials shall be sound and free of damage or deterioration that would adversely affect functions.
    2. Load and deflection calculations shall be used on ASTM A36 / A36M steel unless Contractor provides evidence that all steel used for the plate systems will be a higher strength grade.
  - ii. Steel plates in vehicular and pedestrian traffic areas shall be coated with an approved skid-resistant coating. Preparation of the surface and application of the coating shall be in accordance with all of the manufacturer's guidelines. Coatings

shall be maintained on 100 percent of the surface of plates carrying vehicular and pedestrian traffic. Repairs shall be made to worn or deficient areas.

7. Permanent pavement materials shall conform to the same Mass DOT Standard Specifications as required for temporary pavement.
8. Portland Cement Concrete shall conform to the requirements of Section M4 of the Mass DOT Standard Specifications.
9. Reinforcing shall be FIBERMESH fibers (100 percent virgin polypropylene, collated, fibrillated fibers) at a rate of 1.5 lbs. per cubic yard of concrete will be allowed for non-structural reinforcement. Installation shall be per manufacturer's recommendations.
10. Loam shall conform to Mass DOT Standard Specification Section 1.05, Loam Borrow. Loam shall have a finished depth of six (6) inches (minimum).
11. Seeding shall conform to Mass DOT Specification Section M6.03. Contractors shall be required to continually seed and water areas of loam until a satisfactory growth of grass is established.
12. Filter fabric for underdrain shall be equivalent to Mirafi 140 by Fiber Industries.

f) References

1. All materials and execution shall conform to the highest applicable standards. If there is a conflict between other standards and these Design standards, then the most stringent criteria shall be used.
2. These standards draw and refer to the Commonwealth of Massachusetts Highway Department: Standard Specifications for Highways and Bridges (1995 et seq.) and the Commonwealth of Massachusetts - Massachusetts Highway Department: Construction and Traffic Standard Details (1996 et seq.). These two documents are referred to collectively as the Mass DOT Standards. The latest revision of each standard shall be referenced.

### **3.13 WATER SERVICE CONFLICTS WITH SEPTIC OR SEWER**

- A. Water mains and services should have a lateral separation of ten (10) feet. Should local conditions prevent a lateral separation of ten feet, a sewer may be laid closer than ten feet from a water main if:
  - a. The elevation of the top (crown) of the sewer will be at least 18 inches lower than the bottom (invert) of the water main. If the CWD has information or believes that the groundwater is elevated in the area of the sewer and water pipe such that a possible cross contamination could exist, the CWD reserves the right to have the water main sleeved or concrete encased.

- B. Water services that fall within the minimum ten (10) foot setback from septic systems or the minimum ten (10) foot sewer setback that do not fall in the above categories must be sleeved or encased in concrete using the following guidelines:
1. Sleeve shall be at least twice the diameter of the water service pipe.
  2. Sleeve shall be either SDR35 pipe with push on joints, or a continuous length of 200-psi HDPE tubing.
  3. Any portion of the service installed within the ten-foot separation limit shall be sleeved to a point at least five feet beyond the setback limit.
  4. The sleeve shall extend through the building foundation to the curb stop if the above requirement cannot meet.
  5. Sleeve shall be sealed at either end using an expanding foam type insulation sealant.
  6. A backflow device on the service is required. In certain applications (i.e. high groundwater), the CWD may require the installation of a meter/backflow pit.
  7. The installation must be inspected by the CWD before backfilling. One-day prior notice is required.

### **3.14 PRESSURE TESTING**

- A. All new water mains shall be pressure tested in strict accordance with AWWA C-600, Section 4. Pressure and leakage tests will be conducted concurrently. A successful pressure test shall be performed prior to disinfection.
- B. Pressure testing of new water mains shall be conducted by a private company specializing in this field who has been approved by the CWD. Pressure testing companies will not operate any valve or hydrant. This will only be done by CWD personnel.
- C. Prior to testing, the contractor shall inform the CWD of the date and time of the test. The testing procedure must be approved by the CWD in advance.
- D. The test pressure shall be 150 PSI. Test duration shall be 1.5 hours.
- E. Hydrant branch gate valves shall remain open during pressure testing.
- F. Leakage, if any, shall be equal to or less than the amount as determined in AWWA C-600, Section 4.2. Any segment of new water main shall be considered unsuitable if the leakage is greater than the amount determined in AWWA C-600, Section 4.2, unless otherwise approved by the CWD in writing. Any segment of new water main considered unsuitable must be repaired and re-pressure tested.



- G. Following a pressure test, successful or otherwise, the contractor shall supply the CWD and the engineer with a typewritten report describing the results.

### **3.15 DISINFECTION OF COMPLETED LINES**

- A. All new water mains shall be disinfected in strict accordance with AWWA C-651. Disinfection must be performed using Calcium Hypochlorite granules dissolved in water or a sodium hypochlorite solution. The chlorine solution shall be continuously fed from the existing distribution system and into the new water main.
- B. Chlorination of new water mains shall be conducted by the installing contractor. The installing contractor may operate hydrants or valves with the approval and supervision of the CWD.
- C. Before being chlorinated, new water mains must be flushed at a rate of 2.5 feet/sec until all dirty or discolored water has been removed from the new pipeline. Only one (1) hydrant at a time may be used for flushing.
- D. TESTING AND BLOWOFF ASSEMBLIES:
  - a. Blowoff assemblies for air purging, pressure testing, and disinfection shall be temporary installations. The CWD requires a one (1) inch assembly consisting only of a tapping saddle, one-inch corporation, and copper tubing. Ten feet of tubing should remain above grade for pressure testing and disinfection purposes. Assemblies should be installed as close to the main line tap as possible yet be safely out of the travel way. Consideration should be given to the need to re-excavate the corporation once testing is complete. Upon successful completion of required testing, the tubing will be removed from the corporation, and the corporation closed at the saddle. Hydrants located "in-line" at the end of any main may be used for flushing instead of a blowoff assembly.
  - b. Sampling and Chlorination taps shall consist of corporation installed in the main with copper tubing and curb stop assembly. No hose or fire hydrant shall be used in the chlorination or collection of samples. Sampling and chlorination points must be reviewed and approved by the CWD prior to disinfection.

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- E. Prior to disinfection the contractor shall inform the CWD and the treatment plant chemist of the date and time of the test. The procedure must be approved by the CWD in advance.
- F. The company performing the test must notify the CWD directly at 978-256-2931 at least 24 hours prior to flushing the water main and schedule a time to take samples. If the scheduled time must be changed, the CWD must be directly notified as soon as possible. The chlorine dosage must be sufficient to produce a minimum chlorination residual in the water of 50 PPM. Following a 24-hour chlorination contact period all treated water shall be flushed from the main. The chlorine residual after flushing shall be that prevailing in the existing system.
- G. At least one sample shall be collected for each 2,500 linear feet of water main and from each dead end. After chlorination and flushing, all new water mains must be tested for the presence of total coli form bacteria and background bacteria.
- H. The contractor shall have the laboratory provide a copy of the results to CWD as well as to the contractor.
- I. Any segment of new water main shall be considered unsuitable for service until a non-detection of coliform (Total and E. Coli) and a heterotrophic plate count (HPC) background bacteria less than 500 CFU/mL is obtained from the sample and in possession of the CWD.
- J. Any segment of new water main considered unsuitable because of coliform bacteria detection or high HPC values must be re-disinfected and re-tested until such time the pipe samples meet the water quality requirements.

END OF SECTION

## **PART 4 PLAN REVIEW**

### **4.1 PLANS**

- A. **SINGLE SERVICES** - Plans for a single residential service shall be required. The proposed location of the water service shall be shown on plan in relation to the dwelling and roadway. The precise location of the water service may be altered in the field with the approval of CWD. A detail plan may be required for installations >150 feet in length, that cross wet or wooded lots, are within 10 feet of a septic system, require a meter pit, or where a plan would benefit the CWD. No water service will be permitted to any building connected to a well and obtain water service from the well. Buildings on properties with wells may be serviced provided there is no physical connection between the well and the plumbing serviced by District water. If deemed necessary, the CWD may require a water model be run by the CWD's engineering firm to confirm water availability and pressure. Cost for this model shall be covered by the property owner.
- B. **WATER MAINS** - The minimum diameter for watermain extensions for sub-division greater than ten units shall be eight (8)-inch. The pre-approval of water mains requires the submission of plans prepared by a professional engineer. All plans shall contain the note: "Installation of all mains, valves, hydrants and services shall be in accordance with the latest published CWD Rules and Regulations and Rate Schedules". The CWD requires the submission of the following plans for approval.
- a. **WATER MODEL PLANS** – Water availability models are required for all developments, unless chosen by CWD to do otherwise. Two (2) copies of modeling plans shall be provided directly to the Superintendent or his designee during the planning phase of the development. Modeling plans are conceptual in nature used to determine the District's ability to provide adequate fire flow (750 gpm or better) while maintaining residual system pressure (25 psi) under peak demand conditions. Modeling plans shall be prepared on one (1) sheet and contain both a plan and profile view of the proposed extension. The plan view shall include lot lines, and the pipe layout. The profile view shall show pipe depth in relation to existing and final grades. Both the plan and profile views shall depict stations at 100-foot intervals. Plans should clearly delineate water assets. Plans, which contain excessive topographical, drainage, landscaping, roadway, or other non-water, related notes, details, or drawings, will be rejected

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without review. A data block shall include sub-division name, developer and engineer contacts, lot numbers, average lot and dwelling sizes, type of development, connecting and proposed street names, pipe size and type and other necessary information.

- b. **The technical review (TR)** plan shall be similar to the model plan only in greater detail and without the profile view. TR plans shall indicate the general layout of the water improvements in relation to other underground utilities and lots. In place of the profile view will be the notes and details necessary for the Superintendent or his designee to review the plan. TR plans should be prepared on one (1) sheet. TR plans, which contain excessive topographical, landscaping, or other non-water related notes, details, or drawings, will be rejected without review. Two copies of the TR plan will be supplied directly to the CWD.
- c. **FIELD PLANS** - Field plans are the TR plans except they contain the revisions noted during the review process. Field plans are used by the CWD during pre-construction and construction activities for planning and inspection purposes. Construction plans are not acceptable for use as field plans. During pre-construction and construction activities, the Superintendent or his designee may agree to, or require, minor modifications to the field plan if the revision benefits the District. Field plans shall be prepared on **one (1) sheet** and contain no non-water related information. Two copies of the field plan will be supplied directly to the CWD before the pre-construction site meeting.
- d. **AS BUILT PLANS** - As-Built plans shall be submitted to the District upon completion of the work. As-built plans shall accurately reflect the installation of the water main. As-built plans shall be clearly marked as such. As-built plans will be used in retainage reduction inspections of the completed work. Submission of as-built plans to the CWD is required before the water is turned on by the District. As built plans shall be similar to field plans, but include the measurements, swing ties, depths and other information relating to the installation. As-built plans shall be prepared and stamped by a professional engineer or land surveyor in accordance with the requirements of the Superintendent.

**4.2 INSPECTIONS, TESTS, PERMITS, AND RECORDS**

- A. Contractor shall coordinate with the Superintendent or his designee for inspections and the calculation of the inspection services fee. The contractor shall arrange and pay for all required tests. CWD must be present on-site at the initiation of the test for it to be validated by the Superintendent. The contractor is responsible for obtaining and having on site, excavation permits to include Dig Safe®, Chelmsford Department of Public Works, or Mass DOT excavation road cut permits. No water work shall take place without the proper permits and or details in place. The property owner is responsible for keeping accurate records to produce "as-built" plans. Any fees required for obtaining permits are the responsibility of the contractor.
- B. Inspection services provided by the CWD do not guarantee the quality of workmanship or the functionality of the improvement at the time of installation or thereafter. Inspections provided by the CWD are to determine that materials used and the installation procedure complies with these specifications. No District approval of the work, design, materials, or installation is expressed or implied with an inspection.

END OF SECTION

## **PART 5 SPECIAL RULES AND CONDITIONS**

### **5.1 CONTRACT FOR WATER USE**

The following rules and regulations shall be considered a part of the contract with every person using water.

- A. All applications for use of water are available at the Chelmsford Water District located at 20 Watershed Lane, Chelmsford, MA 01824.
- B. All demand charges are payable prior to service connection. The Water Commissioner or their agents will determine pipe size and type of any installation. Costs of installation service will be charged to the applicant separate of the demand charge. Estimated costs will be paid before the water service is installed.
- C. The owner or applicant will pay for costs of new service installations from the water main into the house, including meter, before water will be turned on.
- D. No person will connect, or cause to be connected, any service pipe with the main or any distributing pipes except by order of the Water Commissioners made on such application for new service. No permanent outside sprinkler system shall be allowed unless approved by the CWD.
- E. The Water District personnel may make periodic inspection of the pipes to the meter. When equipment, including piping and connections, is found defective, the property owner/water taker shall be responsible for undertaking the necessary repairs between the property line and the meter and payment for all work and materials necessary for these repairs. Unless contractors previously approved by the District are used in undertaking such repairs, Water District personnel must be present for and perform all testing and inspections of such repairs, and costs for such District personnel shall be assessed and paid by the property owner or water taker. Persons allowing their meter to be damaged by frost or otherwise will be responsible therefore and be charged and assessed by the District for any repairs or replacement. The District will keep meters in repair from ordinary wear and tear or damage not caused by the property owner or water taker.
- F. All apparatus and all places supplied with water must be accessible at all reasonable times, for inspection by the Commissioners or their agents.

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- G. No alterations will be made to the service installed by the District except by authorized agents of the District.
- H. The District will not in any way nor under any circumstances, be held liable or responsible to any person or persons for any loss or damage from any excess or deficiency in the pressure, volume of supply of water, due to any cause whatsoever. The District will undertake to use all reasonable care and diligence to avoid interruption and fluctuations in the service but cannot and does not guarantee that such will not occur.
- I. The District will not be responsible for damages caused by dirty water resulting from the opening or closing of any gates for repairs, the use of hydrants, or breaking of any supply lines, or any other reasons.
- J. The District will endeavor to give due notice to as many of the consumers affected as time and character of the work permits whenever it may be necessary to shut off the supply from any section of the District to make repairs or changes or because of broken mains. Consumers will not involve the District in any responsibility or liability for damage arising from the shutting off of any supply or subsequent conditions arising there from.
- K. The District reserves the right at any time, without notice, to shut off the water supply for purpose of making repairs, extensions, or other reasons, and all consumers having boilers or other appliances on their premises are hereby warned against danger of collapse from these sources and are urged to provide safety devices for their own protection. In any event the District expressly stipulated that there should be no liability for damages resulting there from.
- L. The District will not assume liability for conditions in the consumer's plumbing or appliances, which may be the cause of trouble, coincident with the following repairs made to any part for the supply system by the District.
- M. Service pipes or fixtures of any description that are connected with the mains of the District will not under any circumstances be connected with any other sources of water supply.
- N. The Water Commissioners reserve the right to shut off water for the purpose of making alterations or repairs. A water service may be shut off from any taker for non-compliance with the rules and regulations for non-payment of the water rates and violation of Massachusetts General Laws relating to water supply. When water has been shut off because of disregard of rules or non-payment of rates it will be turned on again when the Commissioners are satisfied that there will be no further cause of complaint and or the reconnection fee has been paid. With the approval of the Department of Environmental Protection (Chapter 40, Section

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- 41A of the MA General Laws), the commissioners reserve the right to restrict the use of water if necessary, in any manner deemed appropriate.
- O. The fire department will have control of the hydrants in the case of fires and for necessary practice. In no other case will any persons be allowed to handle hydrants or other waste apparatus without permission of the Water Commissioners or their agents.
  - P. No water taker will be allowed to supply water to others except by special permit from the Water Commissioners or their agents and if found doing so without a permit; the supply will be shut off.
  - Q. Owners should notify the CWD to shut off water if the building becomes vacant. A shut off fee will be charged. Water will be turned on again with the owner notifies the District, and upon payment of the turn on fee.
  - R. Water bills and repairs of existing services must be paid in full within 30 days of the billing date. All bills for new installations, including supplies and labor must be paid in full prior to the water service installation.
  - S. The water may be turned off without notice when bills for water remain unpaid for fifteen days after they become due, which is thirty days from the date of issue. Owners of premises will be held responsible for the water bills for their tenants. Unpaid water bills become lien of real estate and collections may be made upon the sale of property: Massachusetts Legislature, Acts of 1923, Chapter 391.
  - T. Any persons who shall remove, change, alter or willfully damage or injure any meter will be liable for all damages, as stated in the Bylaws and under MGL Chapter 165, Section 11. Shall be punishable by a fine of triple the damages or sustained thereby or by \$1,000; whichever is greater or by imprisonment for not more than one year, or both. The Damages shall include the value of the water and cost of labor and equipment repair and replacement. Any change in meter location will be done under the direction of a District agent.
  - U. Any persons violating any order restricting water use imposed by vote of the Commissioners will be fined not more than \$200.00 for each offense, which will inure to the District for such uses as the Commissioners may direct. Fines will be recovered by indictment or on a complaint before the District Court, or by non-criminal disposition in accordance with Section 21-D of Chapter 10 of the General Laws. Every day that such violation continues constitutes a separate offense.
  - V. Water users will be billed every three months for water used according to the current schedule of fees.



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- W. There is a charge for closing costs on property transfers. Unpaid charges will be remitted at the time of the closing.
- X. The owner of property supplied will be charged for all water furnished to the premises during ownership of the premises. When ownership changes, the name and mailing address of the new owner will be given to the District, at once, so that bills may be properly rendered.

The property owner must keep the water meter on the premises easily accessible for reading at all times and will not tamper with the meter in any way. Each unit must be separately serviced and metered so that each water user can be denied water service without disrupting service to other owners.

- Y. The District authorizes the Commissioners to establish quarterly due dates for payment of water charges and bills, and authorizes the Commissioners to fix a rate of interest which shall accrue if such charges or bills remain unpaid after such due dates, provided, however, such rate of interest shall not exceed the rate of interest which may be charged on tax bills under the provision of Section 57 of Chapter 59, Massachusetts General Laws, or 14%, whichever is higher, as amended.
- Z. If a meter is out of order and fails to register, the consumer will be charged at the average quarterly consumption as shown by the meter when in order. An average will be taken of the last three corresponding readings.
- AA. Any and all penalties for violations of these regulations or arrearages for non-payment of water rates or charges may be collected, as authorized by law, in a civil action.
- BB. The Commissioners will regulate the use of water in such manner as they deem for the best interest of the District, fix and collect prices and rates for the use thereof and prescribe the time and manner of the payment of such prices and rates. The Commissioners will have exclusive charge and control of the Water District and water system, subject to all lawful by-laws, and subject to such instructions as the District may from time to time impose by its vote.
- CC. The District will have any inspector on sites where new water main and necessary fittings are installed in new developments, private roads, business, and commercial sites. The District will charge an hourly fee, which will be paid to the District by the owner, contractor, or developer. All material used will meet the specifications of the CWD.
- DD. No person will turn on or tamper with water main or hydrant or other device used for water supply or install a bypass around a water meter without first producing a written permit to do so from the Superintendent of the

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District. Any person violating said section will be fined triple the damages or sustained thereby or by \$1,000, whichever is greater or by imprisonment for not more than one year for each offense, which will insure to the District for recovered by indictment or on complaint before the District Court of by non-criminal disposition in accordance with Section 21-D of Chapter 10 of the General Laws. Every day that such violation continues constitutes a separate offense. This section will not curtail the fire department or Water District in the normal course of providing fire protection or water supply.

- EE. Any person, company, firm, etc. taking application for water use having a design demand in excess of 5,000 gallons per day, will submit a concept plan with sufficient information so that a Water Impact Report can be generated. This report will: 1) define the plans impact on the District's current/future water demand and existing water supply system, and 2) stipulate conditions what the applicant will meet to mitigate the effects of this impact. The Water Impact Report will be reviewed and, if acceptable, approved by the Water Commissioners. Costs associated with generating the Water Impact Report will be borne by the applicant. All new construction will require separate service lines and meters.
- FF. All new industrial and commercial establishments attached to CWD will be required to install, at the service entrance and immediately downstream of the meter, a backflow device. The device must be approved by the CWD and the owner and or the person/s to which the bills are so assigned will pay all costs.
- GG. The Board of Commissioners may vote to place a moratorium on allowing any underground lawn sprinkler system to be tapped off public water mains or service.
- HH. Any new water service or fire line from the water main to a dwelling, building or structure will be in a separate underground trench. No other utility (i.e. gas, electric, telephone, cable TV) will be in the same trench unless the District Superintendent determines that the ground conditions prevent a separate trench. In such cases, a suitable plan prepared by a registered professional engineer will be submitted to the District Superintendent and Dig Safe for approval to ensure safety and accessibility for repair, replacement or inspection of the lines located in the same trench.
- a. Service line will come into building separately but may come in off the fire line from the water main. Note the service connection fee will be charged based on the largest line into the building, most cases this will be the fire line

- II. Insufficient fund checks will be charged as provided by Section 44 of Chapter 69 MGL. The District does not re-deposit returned checks. Bank check or cash may be required thereafter.

## **5.2 CONTROL OF BACKFLOW AND CROSS-CONNECTIONS**

### **A. Cross-Connection Control Authority**

- a. As provided in the Federal Safe Drinking Water Act of 1974 (Public Law 93-523) and under the provisions of Massachusetts General Laws, Chapter 41, Section 69B: Massachusetts Drinking Water Regulation, 310 C.M.R., Section 22.22 and section 13, of the By-Laws of the Chelmsford Water District, the water purveyor has the primary control and responsibility for preventing water from unapproved sources, or any substances, from entering the public potable water system. The Chelmsford Water District, upon written request to the Department of Environmental Protection, is acting as the Department's designee as provided in 310 C.M.R., Section 22.22.

### **B. Cross-connection Control – General Policy**

- a. Purpose The purpose of this regulation is:
- i. To protect the public potable water supply of the area served by the Chelmsford Water District from the possibility of contamination or pollution by isolating within its customer's internal distribution system (s) or its customer's private water system (s) such contaminants or pollutants which could backflow or back siphon into the public water supply system: and
  - ii. To promote the elimination or control of existing cross-connections, actual and potential, between its customer's in-plant potable water system(s) and nonpotable systems, plumbing fixtures, and industrial piping systems; and
  - iii. To Provide for maintenance of a continuing program of cross-connection control which will systematically and effectively prevent the contamination or pollution of al potable water systems by cross-connection.
- b. Responsibility: The Superintendent of the CWD will be responsible for the protection of the public potable water distribution system from contamination or pollution due to the backflow or back siphonage of contaminants or pollutants through the water service connection, if, in the judgment of said Superintendent and approved backflow prevention device is required, at the District's water service connection to any customers promises, for the safety of the water system, the Superintendent or his designated agent will give notice in writing to said

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customer to install such an approved backflow prevention device at each service connection to his premises. The customer will, within 30 days, install such approved device or devices at his own expense, and failure, refusal or inability on the part of the customer to install said device or devices within 30 days constitutes grounds for discontinuing water service to the premises until such device or devices have been installed.

C. Definitions

- a. Superintendent: Or his/her designated agent, in charge of the Water District is invested with the authority and responsibility for the implementation of an effective cross-connection control program and for the enforcement of the provisions of this ordinance.
- b. Approved: Accepted by the District Superintendent as meeting an applicable specification stated or cited in the regulation, or as suitable for the proposed use.
- c. Auxiliary Water Supply: Any water supply on or available to the premises other than the purveyor's approved public potable water supply.
- d. Backflow: The flow of water or other liquids, mixtures, or substances under pressure into the distributing pipes of a potable water supply system from any source or sources other than its intended source.
- e. 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.
- f. Backflow Preventer: A device or means designated to prevent backflow or siphonage.
  - i. Air-Gap: The 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 rim or said vessel. Approved air-gap shall be as required by Water District standards.
  - ii. Reduced Pressure Principle Device: An assembly or two independently operating approved check valves with an automatically operating differential relief valve between the two check valves, 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.
  - iii. Double Check Valve Assembly: An assembly of two independently operating approved 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.
  - iv. Pressure Vacuum Breaker: A device containing one or two independently leaded check valves and an independently operating

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loaded air inlet valve located on the discharge side of the check or checks.

- g. Contamination: Impairment of the quality of the potable water by sewage, industrial fluids or waste liquids, compounds or other materials to a degree which creates an actual hazard to the public health through poisoning or other serious health effects or otherwise be hazardous to the health and safety, or through the spread of disease.
- h. 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.
- i. Cross-Connections – Controlled: A connection between a potable water system and non-potable water system with an approved backflow prevention device properly installed that will continuously afford the protection commensurate with the degree of hazard.
- j. Cross-Connection Control by Containment: The installation of any approved backflow prevention device at the water service connection to any customer's premises, or the installation of an approved backflow prevention device on the service line leading to and supplying a portion of a customer's water system where there are actual or potential cross-connections which cannot be effectively eliminated or controlled at the point of cross-connection.
- k. Hazard, Degree of: The term derived from an evaluation of the potential risk to public health and the adverse effect of the hazard upon the potable water system.
  - i. Hazard - Health (High Hazard): Any condition, device, or practice in the water supply system and its operation which could create, or, in the judgment of the Superintendent, may create a danger to the health and well-being of the water consumer.
  - ii. Hazard - Plumbing (high Hazard): A plumbing type cross-connection in a consumer's potable water system that has not been properly protected by a vacuum breaker, air gap separation or backflow prevention device. Unprotected plumbing type cross-connections are considered to be a health hazard.
  - iii. Hazard - Pollution (Low Hazard): An actual or potential threat to physical properties of the water system or to the potability of the public or the consumer's potable water system, but which would constitute a nuisance or be aesthetically objectionable, or could cause damage to the system or its appurtenances, but wouldn't be dangerous to health.
- l. Industrial Fluids System: Any system containing a fluid or solution which may be chemically biologically or otherwise contaminated or polluted in a form or concentration such as would constitute a health, system, pollution, or plumbing hazard if introduced into an approved water supply.

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- m. Pollution: The presence of any foreign substance (organic, inorganic, or biological) in the water which tends to degrade its quality so as to constitute a 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 affect such waters for domestic use.
- n. Water-Potable: Water from a source which has been approved by the MassDEP for human consumption.
- o. Water - Non-Potable: Water which is not safe for human consumption, or which is of questionable potability.
- p. Water – Service Connections: The terminal end of a service connection from the public potable water system; i.e. where the water purveyor loses jurisdiction and sanitary control over the water at its point of delivery to the customer’s water system.
  - i. Districts responsibility of water service ends at curb stop.
  - ii. District owns the water meter, but not the service line from the curb stop to the meter, the isolation valves to the meter, or the service lines after the meter.
  - iii. Service connection shall also include water service connection from fire hydrant and all other temporary or emergency water service connections from the public potable water system.
  - iv. Note: District, for a fee noted in schedule of fees, will attempt to clean service line to the water meter should issue be found to be related to a blocked service line between curb box and water meter.
- q. Water – Used: Any water supplied by a water purveyor from a public potable water system to a consumer’s water system after it has passed through the point of delivery and is no longer under the sanitary control of the water purveyor.

D. Requirements

- a. Water System
  - i. The water system will be considered as made up of two parts: the utility system and the customer system.
  - ii. Utility system shall consist of the source facilities and the distribution system; and will include all those facilities of the water system under the complete control of the utility, up to the point where the customer’s system begins.
  - iii. The source will include all components of the facilities utilized in the production treatment, storage, and delivery of water to the distribution system.
  - iv. The distribution system will include the network of conduits used for the delivery of water from the source to the customer’s system.
  - v. The customer’s system will include those parts of the distribution system which provide domestic drinking water to all internal areas

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of the customer's facilities. The customer's system begins at the end of the Water District's distribution providing potable water.

b. Policy

- i. No Water service connection to any premises will be installed or maintained by the Water District unless the water supply is protected as required by Massachusetts State Law, and this regulation. Service of water to any premises will be discontinued by the Water District if a backflow prevention device required by this regulation is not installed, tested and maintained, or if it is found that a backflow prevention device has been removed, by-passed, or if an unprotected cross-connection exists on the premises. Service will not be restored until such conditions or defects are corrected.
- ii. The customer's system should be open for inspection at all reasonable times to authorized representatives of the CWD to determine whether cross-connections or other structural or sanitary hazards, including violations of this regulation exist. When such a condition becomes known, the CWD Superintendent shall deny or immediately discontinue service to the premises by providing for a physical break in the service line until the customer has corrected the condition (s) in conformance with the state and local statutes relating to plumbing and water supplies and the regulations adopted pursuant thereto. All expenses relating to the disconnection and reconnection will be at the customer's expense.
- iii. An approved backflow prevention device where required in accordance with above, will be installed on each service line to a customer's water system at or near the property line or immediately inside the building being served; but, in all cases, before the first branch line leading off the service line wherever the following conditions exist.
  1. In the case of premises having an auxiliary water supply which is not or may be of safe bacteriological or chemical quality and which is not acceptable as an additional source by the CWD or Department of Environmental Protection, or the Board of Health, the Public water system will be protected against backflow from the premises by installing a backflow prevention device in the service line appropriate to the degree of hazard.
  2. In the case of premises on which any industrial fluids or any other objectionable substance is handled in such a fashion as to create an actual or potential hazard to the public water system, the public water system will be protected against backflow from the premises by installing a backflow prevention device in the service line appropriate to the degree of hazard.

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3. In the case of premises having (1) internal cross-connection that can't be permanently corrected and controlled or (2) intricate plumbing and piping arrangements, or where entry to all portions or the premises is not readily accessible for inspection purposes, making it impracticable or impossible to ascertain whether or not dangerous cross-connections exist, the public water system will be protected against backflow from the premises by installing a backflow device in the service line.
- iv. The type or protective device required will depend upon the degree of hazard which exists as follows:
    1. In the case of any premises where there is an auxiliary water supply as stated in subsection 4.2.3.1 of this section; or
    2. Where there is any material dangerous to health which is handled in a fashion as to create an actual or potential hazard to the water system; or
    3. Where there are "uncontrolled" cross-connections, either actual or potential, the public water system will be protected by an approved air-gap separation or an approved reducer pressure principal backflow prevention device connector.
    4. In the case of any premises where there is water or substance that would be objectionable but not hazardous to health, if introduced into the public water system, the public water system will be protected by an approved double check valve assembly.
    5. In the case of any premises where, because of security requirements of other prohibitions or restrictions, it is impossible to make a complete implant cross-connection survey, the public water system will be protected against backflow or back-siphonage from the premises by the installation of a backflow prevention device in the service line. In this case, maximum protection will be required; that is; an approved air-gap separation or an approved reduced pressure principle backflow prevention device will be installed in each service to the premises.
  - v. Any backflow prevention device required herein will be of a mode and size approved by the CWD Superintendent. The term "approved backflow prevention device" will mean a device which is on the "approved list of backflow preventors and double check valves" as described in the Drinking Water Regulations of Mass (310 C.M.R., 22.22) Department of Environmental Protection, as the same may be amended from time to time. Said approval lists have been adopted by the CWD Superintendent.



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- vi. It will be the duty of the customer-user at any premise where backflow prevention devices are installed to have certified inspection and operational tests made at least once per year as required under Mass. Regulations and this regulation. The owner of the device will be charged for these tests. The CWD may have these tests performed by a designated representative. In those instances where the CWD Superintendent deems the hazard to be great enough, he may require certified inspections at more frequent intervals. These inspections and tests will be at the expense of the water user and will be performed by CWD Personnel. or by a certified tester approved by the CWD Superintendent and approved by the State of Massachusetts. It will be the duty of the CWD Superintendent to see that these timely tests are made. The CWD Superintendent will notify the customer-user in advance when the tests are to be undertaken so that he/she or his/her representatives may witness the test if so desired. These devices will be repaired, overhauled, or replaced at the expense of the customer-user whenever said devices are found to be defective. Records of such tests shall be kept by the CWD Superintendent.
- vii. All presently installed backflow prevention devices which do not meet the requirements of this section, but were approved devices for the purpose described herein at the time of installation and which have been properly maintained, will, except for the inspection and maintenance requirements be excluded from the requirements of these rules, so long as the CWD Superintendent is assured that they will satisfactorily protect the utility system Whenever the existing device is moved from the present location or requires more than the maintenance, or when the CWD Superintendent finds that the maintenance constitutes a hazard to health, the unit will be replaced by a backflow prevention device meeting the requirements of this section.
- viii. All industrial and commercial establishments attached to the CWD are required to install, at the service entrance immediately downstream of the meter, a backflow device.
- ix. All decisions relating to determination of backflow devices will be made by the CWD Commissioners or CWD Superintendent. Failure to comply with any directive from this office will result in termination of service.

E. General

- a. All testing and or maintenance performed on backflow devices by the CWD or its agent will be charged to the owners of the device.
- b. Any person violating any order restricting water use imposed by vote of the CWD Commissioners will be fined not more than \$1,000.00 for each offense, which shall inure to the District for such uses as the CWD

Commissioners may direct. Fines shall be recovered by indictment or on a complaint before a District court, or by non-criminal disposition in accordance with Section 21-D of Chapter 40 of the General Laws. Every day that such violation continues shall constitute a separate offense.

- c. No person will turn on or tamper with a water main or hydrant or other devices used for water supply or install a bypass around a water meter without first procuring a written permit to do so from the Superintendent of the CWD. Any person violating said section will be fined not more than \$1,000.00 for each offense, which shall inure to the CWD for such uses as the commissioners may direct. Fines will be recovered by the indictment of the complaint before the District Court or by non-criminal disposition in accordance with Section 21D of Chapter 40 of the General Laws. Every day that such violation continues will constitute a separate offense; this section will not curtail the fire department of the CWD in the normal course of providing for protection of water supply.
- d. No person shall maintain upon premises which the owner occupy, a physical cross-connection between the distribution system of a public water supply, the water of which is being used for drinking, domestic, of culinary purposes, and the distribution system of any unapproved water supply, unless the installation has been reviewed and approved by the CWD and permits have been issued in accordance with the Drinking Water Regulations of the Department of Environmental Quality Engineering.
- e. CWD shall have the authority to terminate any water source to any facility where cross-connections are maintained without required backflow prevention devices which have been approved by the CWD.
- f. The CWD Commissioners shall enact such Cross Connection Control Program and Regulations as are necessary to protect the public potable water supply served by the CWD from the possibility of contamination or pollution by isolating within its customer's internal distribution system, such contaminants or pollutants which could backflow or back-siphon into the public water system; and to promote the elimination or control of existing cross-connections between its customers; in-plant potable water system, and non-potable water system; and to provide maintenance of a continuing program of cross-connection control which will effectively prevent the contamination or polluting of all potable water systems by cross-connection.

### **5.3 ASSESSMENT FOR DEAD END MAINS IN SUBDIVISIONS**

- A. The CWD discourages developments with dead-ends due to the water quality and safety issues they cause.

- B. Developers of sub-divisions are encouraged to exhaust all means of looping a water main to service a sub-division, and preventing a dead-ended main. .
- C. Developers who exhaust options for looping, at the direction of the District, shall be required to install a metered automatic flushing unit. All costs for installing the unit including proper disposal of the flushed water (e.g. dry wells, drain to sewer, etc.) shall be at the Developers expense.

#### **5.4 AUTOMATED SPRINKLER RULES AND REGULATIONS**

- A. All Automated Underground Sprinkler Systems connected to the Chelmsford Water District Water Supply and Distribution System must be permitted with and inspected by personnel of the Chelmsford Water District in accordance with the following provisions:
- B. Definition: For the purposes of these rules and regulations, an Automated Underground Sprinkler System is defined as any irrigation system comprised of one or more irrigation outlets or sprinkler heads connected to a subterranean network of hoses or pipes, and capable of unsupervised, automatic or cycling operation, whether or not such system is activated manually or by operation of a timing devices.
- C. Permitting: There are three forms of District accepted permitting.
  - a. Any resident owning an Automated Irrigation System currently connected to the District must have on record with the District office either a copy of the Irrigation Permit or a copy of the Irrigation Inspection Form.
  - b. Any resident installing a system to be connected to the District Water Supply and Distribution System must apply for an Irrigation Permit with the District at the Operations Office and then have the system inspected by District personnel within 30 days of installation.
  - c. Any resident owning or installing a private well for the purposes of operating an Automated Underground Irrigation System must apply for or have on record the same documents with the District so as to prove no cross connection exists between the water takers private well and the District's Water Supply and Distribution System.
  - d. At the time of permitting each applicant will be given:
    - i. Written information regarding minimum system requirements for system permitting
    - ii. A Permit Form (or have an Irrigation Inspection performed)
    - iii. Written information and guidelines concerning water efficient landscaping and efficient operation of the Automated System.
    - iv. A copy of the Chelmsford Water District Rules and Regulations

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- D. Minimum System requirements: Backflow Prevention: All Systems must be properly connected to the District Water System via an independent plumbing connection incorporating a Massachusetts State Plumbing Code approved backflow prevention device. See 310 CMR 22.22, Table 22-1.
- a. System Control: All Systems must be operated by a device that allows operation whether manually or automated.
  - b. Rain Sensor: all Systems must incorporate a fully functioning rain sensor, sufficient to automatically shut down the System in the event of rain.
- E. Inspection by the Water District: Pursuant to the Rules and Regulations, authorized agents of the Water District shall have the right to inspect, for cause or at random, any Permitted Automatic System, to confirm the proper operation and installation of said System.
- F. Right to Reject: The Chelmsford Water District reserves the right to reject any Permit Form, for cause to be specifically stated at the time of such rejection, and/or to require an additional or alternate Inspection by District personnel or by an alternate District designated Inspector.
- G. Installation Violations/Penalties: As of May 1st, 2009, any resident discovered to be using an Automated Irrigation System not properly permitted according to Paragraph 2 of these Rules and Regulations shall be:
- a. On the initial violation: Advised of the permitting requirements, provided a copy thereof, and given a thirty-day period to comply with its provisions.
  - b. On second violation (following expiration of the thirty-day compliance period): fined \$200
  - c. On subsequent violations or failure to remit the \$200 fine: subject to increasing fines in \$100 increments, and/or disconnection from the District's Distribution System, at the sole discretion of the Chelmsford Water District. Fines shall be recovered
  - d. Upon discovery of an illicit connection of an Automated Irrigation System: The District will try within reasonable limits to find and hold the plumber and/or installer responsible for:
    - i. All plumbing repairs.
    - ii. A surcharge for lost water to be calculated from the average District irrigation usage from the time of installation to the time of discovery and charged at the current rate schedule at the time of discovery using best engineering practices. If a responsible party cannot be found the water taker of said property then becomes liable for all repairs, surcharges and/or fines.
- H. Operational Violations/Penalties: This section refers to the usage of an automated sprinkler system in violation of the District's Summer Water Management Policy.

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Any person violating this regulation will be fined not more than \$300.00 for each offense, which shall inure to the District for such uses as the Commissioners may direct. Fines will be recovered by indictment or on complaint before the District court or by non-criminal disposition in accordance with Section 21D of Chapter 40 of the General Laws, as amended, which provisions are hereby incorporated by reference.

- a. Upon the initial violation a warning notice shall be mailed using regular and certified mail, with a copy of the District's Summer Water Management Plan.
- b. Upon continued daily violations the water taker shall be liable for fines incrementally increasing in the amounts of:
  - i. First Offense \$50.00
  - ii. Second Offense \$100.00
  - iii. Third Offense \$300.00
  - iv. Everyday there after the violation continues the amount shall be \$300.00, unabated.

- I. Temporary Restrictions or Bans: Any and all temporary restrictions of or bans on irrigation as may from time to time be implemented by the Chelmsford Water District shall apply equally and with the same force to users of Automated Sprinkler Systems as to users of any and all other means of residential irrigation.

## 5.5 EXPEDITIOUS REPAIR OF SERVICE LEAKS

- A. Summary: This regulation is for the District to adequately comply with Water Withdrawal Permit requirements concerning water loss. It will state the timeframe for repairs, District procedures and penalties.
- B. Defining a Service Leak: A service leak is defined as a leakage of water in the service line leaving the distribution main and entering an owner's property, after the specific curb stop but before the service meter. All services leaks are the sole responsibility of that specific owner.
- C. Notification: Upon detection of a service leak, the owner shall be notified in person by a District staff member. The notification shall consist of a Chelmsford Water District Service Leak Form Letter with a list of licensed contractors.
- D. The Time Frame for Repair:
  - a. The owner identified with a service leak shall be given upon notification by a District representative of the leak, two weeks to obtain the services of a licensed contractor.
    - i. District shall supply a list of licensed contractors but shall not recommend one specific contractor.

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- ii. For the District to have considered this requirement fulfilled, the owner must have submitted to the District office a copy of the signed contract before the expiration of the two weeks.
    - b. The contracted work shall be completed no later than four weeks from the time of District notification of the service leak to the owner.
      - i. For the District to have considered the service leak repaired and completed within the terms of this regulation, the owner and the Contractor must have the work inspected by a District staff member.
      - ii. All scheduling of work and inspections is the sole responsibility of the specific owner.
- E. Penalties: An owner who does not comply with the given times of this regulation shall be subject to the following penalties:
  - a. Water Shut Off: An owner duly notified as defined by this regulation shall be subject to a service shutoff if the required work and inspection are not completed within described timeline. All fines and fees then become the sole responsibility of the specific owner.
  - b. Monetary Penalties:
    - i. An owner shall be considered in noncompliance of this rule, if a breach of the two-week deadline, for submittal of signed contract with a fifty dollar (\$50) a week fine for noncompliance.
    - ii. An owner fine shall become a daily accrued fine should the four-week time be breached. Additionally, any fees associated with District required work in relation to noncompliance shall also become the responsibility of the specific owner.
- F. Extensions of Timelines or Implementation of Penalties:
  - a. It is not the intention of the District to create undue hardships upon its water takers. However, the District must comply with state mandated requirements of the Water Management Act and specific requirements of its Withdrawal Registrations and Permits.
  - b. The discretion for the issuance of an extension shall be the responsibility of the Board of Water Commissioners and the Chelmsford Water District Superintendent. Any request for an extension must be submitted in writing to the District before the defined timeline of noncompliance. The responsibility for the written request for an extension is solely the specific owner of record.
  - c. The acceptable reasons for an extension maybe, but limited to:
    - i. Financial Hardship
    - ii. Contractor Availability
    - iii. Insurance Issues
    - iv. Disputed Responsibility of Leak
  - d. All extensions shall be denied in the event of concerns over public safety.

## **5.6 EXPEDITIOUS REPAIR OF FAILED BACKFLOW DEVICES**

- A. Summary: This regulation is for the District to adequately comply with the State Cross Connection Protection requirements as defined in 310 CMR 22.22. This specific portion of the CMR is design to protect the public from the contamination of the drinking water in distribution until the last free flowing customer tap. It will state the timeframe for repairs, District procedures and penalties.
- B. Defining a Cross Connection: A Cross Connection is defined as any connection where water is being used for drinking domestic or culinary purposes and any water being used for any purpose not approved by MassDEP as being safe or sanitary in quality. All Cross-Connection protection devices are the sole responsibility of that specific property owner.
- C. Notification: Upon detection of a Cross Connection Device failure by a certified inspector, the Owner shall be informed by written notification from the Chelmsford Water District. The Notification shall consist of a copy of the failed test from the inspector, a written notice from the Chelmsford Water District and a copy of the regulation.
- D. The Time Frame for Repair:
- a. The owner identified with a failed cross connection device shall be given two weeks (14 days) to repair/replace said device by a licensed plumber.
    - i. For the District to have considered the failed device repaired/replaced and the work completed within the terms of this regulation, the owner and the Contractor must have the device re-tested and signed off by a District staff member or representative.
    - ii. All scheduling of work and inspections is the sole responsibility of the specific owner.
- E. Penalties: The owner of the device who does not comply with the given times of this regulation shall be subject to the following penalties:
- a. Monetary Penalties:
    - i. The owner shall be considered in noncompliance of this rule, if a breach of the two-week (14 Day) deadline and thereby be fined \$200.00, initially. The owner's fine shall become a daily accrued fine should the two-week timeline be breached. Additionally, any fees associated with District required work in relation to noncompliance shall also become the responsibility of the specific owner.
  - b. Water Shut Off:
    - i. The device owner, duly notified as defined by this regulation, shall be subject to a service shutoff within 30 days if the required work

and inspection are not completed within the described timeline. All fines and fees then become the sole responsibility of the specific owner.

## **5.7 ANTENNA AND/OR APPURTENANCE POLICY**

- A. Purpose: The stated purpose of the antenna policy of the Chelmsford Water District is for the District to comply with the Massachusetts Department of Environmental Protection policy regarding the installation, operation and inspection of antennas directly on a water storage tank or on the water storage tank ground. This Policy, in conjunction with the stated MassDEP policy DWP98-01 and later amendments to this document, is meant to ensure the safety and longevity of the distribution system of the District.
- B. Applicability: This policy pertains to any and all District personnel or installers and/or proponent of the installation of antenna or other appurtenances to the public drinking water storage tanks or on District water supply land. This shall also cover any additions to existing appurtenances.
- C. Procedures: The purpose of this section is to outline the requirements under which the District can accept the installation of any antenna and/or appurtenance on public drinking water storage tanks or on District water supply land.
- a. Application: This section defines the responsible parties and conditions for the District to consider relative to an application by an installer or proponent of an installation completed.
- i. The installer must complete the following standards:
- a. A map or drawing showing the location of the storage tank and the proposed installation.
  - b. A written specification of where the antenna or appurtenance is to be installed with a description of the method of attachment.
  - c. The installer must submit documentation from the tank manufacturer or tank construction contractor indicating that the method of attachment or construction will not affect or interfere with the provision of safe water and will not result in or cause structural damage.
  - d. Any operator of the said antenna and/or appurtenance must submit in writing a maintenance and access schedule and agree to follow the District's stated procedure for such access.
- ii. The Chelmsford Water District will review and determine its acceptability and will use best efforts to approve or disapprove the



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application in writing within seven calendar (7) days based upon the following criteria:

- a. That the project will have no adverse impact on the safety of the water supply.
  - b. That the project and its proponent have complied with the specifications laid out by the tank manufacturer or tank construction contractor.
  - c. That project will not in way interfere with future operations or present any sanitary, safety or personnel hazards due to the size and/or location of any supporting attachments or mounting devices.
- b. Operation: The Chelmsford Water District upon completion of the project shall perform or have performed a final inspection to ensure that the construction complies with all plans and specifications. Additionally, the District shall perform routine inspections to ensure that the water storage tank and the installation continue to present no impact to the safety of the drinking water supply or distribution.
- D. Access: To comply with the Massachusetts Department of Environmental requirements under MassDEP Policy DWP98-01 and later amendments or additions, the Chelmsford Water District sets these requirements for access to District property for maintenance and inspection by the operator and/or proponents of any antenna or appurtenance. Further these requirements should be considered the District's access procedure.
- a. Maintenance Access: The District will require a written submittal to the District office of its expected maintenance schedule and a list of the operators' personnel that are expected to perform these duties. These maintenance duties shall only be performed by these personnel and the operator agrees to use best efforts to notify the District in advance of staffing changes. By maintaining this list, the District considers the MassDEP's requirement of supervision met under the following parameters:
    - i. Notice of any non-emergency visit not on the maintenance schedule must be submitted two (2) weeks prior to the actual visit
    - ii. The notice shall contain the date of these unscheduled non-emergency visits for the work to be performed. The District will require the name of the technician performing the work.
  - b. Emergency Access: The District recognizes the need for emergency access to any installation and so sets forth this procedure as an allowance for such situations under the following conditions:
    - i. Verbal notice will be given to the District two hours prior, or as soon as possible, to access with the following information:
      - a. Problem encountered and the known or expected scope of work to be performed.

- b. Expected timeframe of such work.
  - c. List of technicians expected to be present.
  - ii. If due to the emergency situation, a listed technician is not available, the operator shall also supply the emergency technician's information along with the verbal notification.
  - iii. Upon completion, the District requires a report on the work completed during the event.*
  - iv. The District shall thereafter inspect the Facility so as to ensure the Facility's operational integrity has not been adversely impacted.
- E. Existing and Operational Antennas and Appurtenance: Any antenna and/or appurtenance currently under contract or constructed will be considered grandfathered from the certification process but not the access and notification procedures. However, the addition of additional devices shall require the District's review as above set forth before emplacement.

## **5.8 SUBDIVISIONS AND PRIVATE DEVELOPMENTS**

- A. The rules and regulations as outlined here in this document apply. In addition to these, the following apply to subdivisions and private developments that are served by the District.

Water Mains must be extended (including hydrants and appurtenances) to the furthest limit of the property (lot line).

- B. The developer or owners will be required to provide a 20-foot water only easement on the lot that is to the nearest adjacent existing water main, that is not back on to itself. In the event, the developer does not complete the looping requirement, a gate valve with one full length of pipe and restrained end cap will be left at the farthest point of the end of the lot for the future needs of the district to complete the loop.
- C. A hydrant and if required at the direction of District, a flushing/sampling station will be installed at the very end of the project and after the last service tap for flushing purposes.
- D. The contractor or developer shall pay for the cost of inspection by the District in accordance with the schedule of fees.
- E. All fees shall be paid in advance.

- F. Developer or owner(s) of private roads and ways shall provide a Private Road Covert to all for a 20 foot- wide water easement (Appendix A) prior to supply of water.

#### **5.9 POLICY EXTENSION OF EXISTING WATER MAINS**

- A. All such water main extensions shall be constructed by applicants at their expense under the supervision of District personnel and in accordance with its specifications. The main must be extended (including necessary hydrants and appurtenances) to the furthest limit of the property to be served by water. The applicant shall pay for the cost of inspection by the district in accordance with the schedule of fees.
- B. An applicant requesting extension of water mains on a private road must comply with the same rules as water main extended in public roads. The customer shall complete an application form prior to any connections made to the water system. The customer shall be charged fees pertaining to the installation of service lines in accordance with the schedule of fees. The applicant is responsible for all fees in advance of any connection to our water system. The applicant must convey to the District an easement and shown on the as-built plans necessary to maintain the pipe and appurtenances in the private road.

#### **5.10 POLICY SERVICE CONNECTIONS**

- A. The District shall furnish and install the service tap from the water main to the property line, unless the Distribution Manager or Superintendent has specifically authorized another party to do so. It is the responsibility of the customers or their contractors to install at their expenses the water service from the property line to the building, according to the District's specifications. The customer shall complete an application form prior to any connections made to the water system. The customer shall be charged fees pertaining to the installation of service lines in accordance with the schedule of fees.
- B. Installation of services extending beyond the last hydrant of an existing water main shall not be allowed. The District shall approve all service materials and installation activities. New service lines must be inspected by the District before backfilling the associated trench.
- C. That portion of a service connection installed within a public way and terminating at the outside shut-off valve shall be considered the property of

the District upon its construction and acceptance. The District shall be responsible for its maintenance. That portion of a service connection not lying within the public way or within an easement of a private roadway shall remain the property of the customer, who shall be responsible for its maintenance.

- D. The applicant shall be responsible for the cost of a new meter on a service connection including the cost of its installation by the District. The meter shall remain the property of the District.

#### **5.11 ONE SERVICE CONNECTION PER PREMISES**

- A. Only one service connection shall be made to each building except for a service intended to provide fire protection or under special conditions and with the approval of the Superintendent and /or Distribution Manager. Each service connection shall be provided with an individual shut off.
- B. New service connection fees will be charged based on the size of the largest domestic water service line into the building in accordance with the Districts schedule of fees.
- C. If a property is subdivided, then each of the resulting properties must have its own water service connection. This may require replacing an existing service connection with a water main.

#### **5.12 PLUMBING FAILURE POLICY**

- A. Based on the costs associated with pumping, treating, and delivering water to each customer, it is the policy of the Chelmsford Water District that all water usage that has registered through the meter is the responsibility of the account owner.
- B. Through consumer outreach (bill messages, website, new customer accounts, etc.) the District educates its customers on ways to identify leaks and conserve water. In addition, when reading your meter and unusually high usage is registered, the District will do it's best to contact the account owner before quarterly billing to communicate the higher than normal reading and see if owner has justifiable reason for higher usage. If the account owner does not understand higher usage, the District will educate the account owner on ways to find a leak and will also offer a meter reader appointment to evaluate higher usage by potential data download, if possible, that will indicate if it is a consistent leak or intermittent leak.

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- C. Abatements shall be given at the discretion of the Board of Water Commissioner's through the Business Director based on the following criteria:
- 1) The water leak must be repaired. Evidence that the repair has been fixed must be provided.
  - 2) An abatement will not be provided if an insurance company has or can or will cover the water bill.
  - 3) A written request must be submitted within 30 days of receiving high usage water bill. An abatement request will be sent to the attention of the Business Director at 20 Watershed Lane, Chelmsford, MA 01824. Abatement requests will generally be reviewed and responded to within 14 days and if abatements are approved by Treasurer, details of the abatement will be included in the Treasurer's monthly report to the Board of Water Commissioners.
  - 4) Requests should include the following information:
    - i. Owner Name,
    - ii. Property Location,
    - iii. Water Account Number,
    - iv. Reason for abatement request and receipts for material and service to fix leak.
    - v. Certification that the owner's insurance has been contacted and the insurance company will not be paying the water bill.
  - 5) One abatement will be provided per property owner for the period of ownership of the house. The owner will be determined by the name on which the water service is assigned to in the billing software.
  - 6) Abatements are generally NOT granted for the following reasons:
    - i. Filling a pool.
    - ii. New lawn watering.
    - iii. A burst pipe (check your insurance company).
- D. Calculation of the abatement will be as follows: If leak is found AND repaired AND the customer is in good standing with the District, if justified; a one- time rate abatement to account may be approved by the Treasurer that reduces the water rate of the bill to account owner's normal quarterly billing rate at the registered usage on the meter.
- E. All account owners that believe they have an exception to this policy and would like to present their case for abatement to the Water Commissioners, please contact the District Office to be placed on the next Commission Meeting agenda.
- F. This policy can be changed or revoked by the Board of Water Commissioners by an affirmative vote.

### **5.13 INSURANCE AND SURETY**

- A. All contractors shall carry the proper bonding and insurance required by the District when working on District assets. Contact the District for details on required insurance and bonds at current levels.
- B. Depending on the type of project, the District will require the following types of sureties. The District will have ultimate say in the type of surety required for the water supply portion of the project and the order of preference is provided below.
  - 1) Developer projects associated with building permit should water mains and similar not be available and contractor has to extend the main line.
    - i. Cash in bank.
    - ii. Letter of credit with a local bank.
    - iii. Secured interest in the property.
  - 2) Large Projects Associated with District Development.
    - i. Bonds. Bonds shall be obtained from companies located within the state of Massachusetts and name the Chelmsford Water District as the bond holder. Bonds shall be enforced for the whole timeline of the water supply portion of the project and cannot be cancelled while the project proceeds. Cancellation notice shall be provided to the District when project is complete. Bonds shall be for the whole dollar value of the water supply portion of the project unless directed otherwise in writing.
      - 1. Typical for large construction projects for the District:
        - a. Performance Bond
        - b. Payment Bond
        - c. Other bonds as deemed appropriate.
      - 2. Typical for installation projects (e.g., service line, etc.), for the District:
        - a. License and Permit Bond
        - b. Other bonds as deemed appropriate.

### **5.14 GROUNDWATER PROTECTION**

- A. If the Chelmsford Board of Health under the provisions of Chapter 201, Board of Health Article VII, “Groundwater Projection Zone” requests a review by the Chelmsford Water District of a site located in the “Groundwater Projection Zone,” then the Water District will do the following:
  - 1) Review the site application, plans, and material included therewith,

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- 2) Decide what, if anything, the Chelmsford Water District will require for hydrogeologic investigations before it can make its review. Upon receipt of the required study, it will send its review to the Chelmsford Board of Health.
- B. The Chelmsford Water Commission Board reserves the right to request more information, if needed, and to waive any and all of the above requirements, so long as the water quality at the well site in its opinion will not be impaired.

END OF SECTION

**APPENDIX A: PRIVATE ROAD DEVELOPMENT  
COVENANT**



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The Undersigned, (name, company, company address, county, city, state, zip) (hereinafter collectively referred to as "Declarant"), is the owner of land shown as (address shown on plans) on a Definitive Subdivision Plan entitled, "Plan Title" prepared by (company that prepared plans), prepared for (property owner), dated (plan date) which Plan is recorded on (record date) at Middlesex North County Registry of Deeds at Plan Book \_\_\_\_ Plan \_\_\_\_ said Plan hereinafter referred to as the "Subdivision Plan". This Subdivision Plan includes a private road that is not recognized by the Town of Chelmsford.

In consideration of the approval of the Subdivision Plan according to the Rules, Regulations and By-Laws of the Chelmsford Water District, the Declarant hereby makes this Declaration of Covenants and Restrictions as follows:

The Declarant covenants and agrees to provide a 20-foot wide water easement on the private road, to be shown on the subdivision plan submitted for approval by the Chelmsford Planning Board and recorded with the Middlesex North District Registry of Deeds.

The Declarant shall cause this covenant to be recorded within the chain of title of the property prior to installation of meters to said subdivision. A certified copy of the recorded covenant shall be filed with the Chelmsford Water District Superintendent/Distribution Manager before water service will be turned on.

Witness my hand and seal this \_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_

By: \_\_\_\_\_

Declarant, Title

Company Name

COMMONWEALTH OF MASSACHUSETTS

Middlesex, ss.

On this \_\_\_\_ day of \_\_\_\_\_, before me, the undersigned notary public, personally appeared \_\_\_\_\_, proved to me through satisfactory evidence of identification, \_\_\_\_\_ to be the person whose name is signed on the preceding/attached document, and acknowledges to me that he/she signed it voluntarily for its stated purpose.

\_\_\_\_\_  
Notary Public  
My Commission Expires:

## **APPENDIX B: CONDUCTING A HYDRANT FLOW TEST**

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This document has been created to call attention to responsibilities prior to, during, and after a fire flow test.

1. The District shall be present to oversee the fire flow test.
2. The District will open and shut hydrants during the fire flow test.
3. The contractor is responsible for payment at the time the test is being taken. Current rates for a flow test can be found in the District's Schedule of Fees. **A Check should be made payable to the Chelmsford Water District and not the Town of Chelmsford.**
4. If the flow test needs to be conducted after hours, outside of 7:00 am-3:30 pm, then the price for the test will be based on the off hours fee. The District will decide if the location needs to be flushed off hours.
5. Contractor is responsible to take all readings during the fire flow test and have instruments calibrated and ready for the test.
6. Contractor is responsible to notify the Chelmsford Fire Department with location, date, and time the test is to be performed. The Chelmsford Fire Department should be contacted at 978-251-4288 well in advance of test.
7. **Contractor should fax the results of the test to the Chelmsford Water District at 978-244-1434 and the Chelmsford Fire Depart. at 978-251-1708.**
8. Contractor is responsible to notify the customer(s) for the location(s) to be tested as well as the date and time(s) the fire flow test(s) will be conducted.
9. The District will notify other customers in the area that may experience discoloration due to the flow test.
10. The contractor is responsible for providing all necessary safety equipment and procedures to meet all Federal, State, and local ordinances or laws. If a police detail is required, the contractor shall cover the cost for providing the detail. In colder weather if there is a chance of the water freezing, sanding and where allowed, salting the area will be provided.

By signing this document, the contractor acknowledges their responsibilities before the fire flow test is conducted. This document should minimize the problems in the field.

Signed \_\_\_\_\_

Company \_\_\_\_\_