WATER DEPARTMENT
CONSTRUCTION STANDARDS

BOARD OF WATER COMMISIONERS:
Jennifer Wolowicz, Chairperson
Alfred Pinciak, Clerk
Richard Grabiec, Commissioner

Superintendent of Water
Alan Starzyk

Superintendent Department of Public Works
Jeffery Neece

REVISED & APPROVED: July 8, 2014

Jennifer Wolowicz, Chairperson Alfred Pinciak, Clerk Richard Grabiec, Commissioner

CITY OF CHICOPEE
WATER DEPARTMENT
115 Baskin Drive · Chicopee, MA 01020
Tel · 413/594-3420 Fax · 413/594-3461

Alan Starzyk
WATER SUPERINTENDENT

Table of Contents

LIST OF TABLES

LIST OF FIGURES

1) GENERAL PROVISIONS

1.1) INTRODUCTION

These Construction Standards will govern all work performed on the Chicopee Water Distribution System. This version of the construction standards shall replace previous version(s). If there is a conflict between the requirements and specifications of referenced standards, the Chicopee Water Construction Standards shall supersede those standards.

Questions regarding these standards shall be directed to the Water Superintendent and/or his designee. Failure to meet these standards may result in additional costs and/or fines that will be the sole responsibility of the contractor.

These standards shall be reviewed and revised as needed by the Chicopee Water Department with the approval of the Water Superintendent.

These standards are not all inclusive. They may be amended, altered, waived as deemed necessary by the Chicopee Water Department with approval by the Water Superintendent.

Any deviation from these standards must be approved in writing by the Water Superintendent **PRIOR** to construction and installation.

1.2) DEFINITIONS AND ACRONYMS

Unless the context specifically indicates otherwise, the meaning of terms and abbreviations used in these construction standards shall be as follows:

- **AWWA**- American Water Works Association
- **BWC**- Board of Water Commissioners
- **CFD**- Chicopee Fire Department
- **City**- shall refer to the City of Chicopee, Massachusetts
- **Contractor**- a person who contracts to furnish supplies or perform work at a certain price or rate.
- **Cut in**- is the removal of a section of pipe and/or fittings for the installation a new pipe and/or fittings
- **CWD**- Chicopee Water Department
- **Developer**- a person who invests in and develops the urban or suburban potentialities of real estate, especially by subdividing the land into home sites and then building houses and selling them.
- **DPW Superintendent**- Superintendent of the Department of Public Works
- **Hydrant**- shall mean a device connected to a Public Water Main or private water service for the purpose of extinguishing fires or other authorized purpose
- **Service pipe**- a water main that supplies water to a building or property for a purpose other than extinguishing fires
- **Water Superintendent**- Superintendent of the Chicopee Water Department

2) CONSTRUCTION STANDARDS

2.1) WATER DISTRIBUTION SYSTEM

The piping system shall meet the following minimum requirements and shall be subject to the approval of the CWD:

A. The City Water Distribution System, as maintained by the CWD, will include all distribution system water mains with all service connections within the City property (streets and right-of-ways) up to the private property line where an in-line valve (curb stop) will be installed. Any pipeline within the property line is deemed the property owner's responsibility, with the exception of the water meter. The private property owner may contact a licensed private contractor, whose work is subject to inspection by the CWD, or the CWD to affect regularly scheduled repairs or upgrades with the cost of materials, labor, and any associated fee payable to the CWD. The CWD maintains the right to make immediate repairs as necessary in the event of an emergency.

B. Hydrants shall be placed at 400 feet maximum.

C. A hydrant shall be located at every street intersection, and as directed by the CWD.

D. Hydrants along a street shall be located opposite the common property line of two lots.

E. Line valves shall be spaced at not more than 800 feet and/or as determined by the CWD.

F. In new construction, every intersection shall be valved "(3) three-ways" if a tee is used; and "(4) four-ways" if a cross is used. Connections to the existing water system shall be made by a "cut-in" and shall be valved "three-ways" whenever practical. The use of tapping sleeves may be used under certain conditions.

G. The tee or cross that once connected to the existing distribution system shall be removed immediately, or shortly after the connection of a new main or large service connection (4" or greater) to the distribution system is made.

H. Dead ends shall be avoided by the looping of all water mains whenever practical.

I. All water mains and service pipe shall be laid in a trench separate from any other utility. The horizontal distance between water mains or service pipe and any other utility (gas, electric, telephone, etc.) shall be no less than five (5) feet and no less than ten (10) feet from a sanitary sewer or surface water drain. If the water main or water service needs to cross under an existing sewer, refer to the detail in Appendix A.

J. When crossing other utilities, eighteen (18) inches of clearance from edge to edge in all directions shall be maintained between water lines and said utilities.

K. All material shall be in accordance with the "**Material Standards**" attached hereto.

L. All material shall be new and shall be of the type currently used by the CWD.

M. All construction shall be in accordance with the **"Commonwealth of Massachusetts, Department of Public Works - Standard Specifications for Highways and Bridges 1988"**, the **"AWWA Standards"** and in accordance with the current practice of the CWD.

N. New connections shall be made a minimum of (2') two ft. away from a bell joint and other fittings, from edge to edge.

O. Nipples shall be at minimum (2') two ft. in length.

P. Before installation of a fire main, a licensed Engineer shall provide the CWD with calculations, supporting necessary main sizing of the project, for review.

Q. Properties with more than one water line, shall not share a common main.

R. When deemed necessary by the CWD, air release valves and blow offs shall be installed for future bleeding and filling of water mains.

S. Any above ground installations, the thrust restraint shall be designed by a licensed engineer.

2.2) SYSTEM CONNECTIONS

Connections to the existing water distribution system will be made by CWD Personnel, unless otherwise approved by the Water Superintendent.

2.3) CONTRACTOR RESPONSIBILITIES

A. The Contractor shall not operate any hydrants, valves, curb stops or corporations, nor shall they draw any water from the system, without specific approval of the CWD. Valves, hydrants, corporations, and curb stops will be operated only by CWD personnel, after authorization by the Water Superintendent. Person(s) failing to adhere to this protocol shall open themselves to fines and/or arrest.

B. The Contractor shall notify DigSAFE, as is required by M.G.L. c. 82, §§ 40 through 40E, also known as the "Dig Safe" law and 220 CMR 99.00: PROCEDURES FOR THE DETERMINATION AND ENFORCEMENT OF VIOLATIONS OF M.G.L c. 82, §§ 40 THROUGH 40E ("DIG SAFE")

C. The CWD is a "non-member utility" of DigSAFE, and must be notified separately when requesting utility locations.

D. It is the Contractor's responsibility to follow all rules and regulations regarding safety set forth by the Massachusetts Department of Safety and the Occupational Safety and Health Administration, i.e. OSHA

E. All personnel employed by the Contractor engaging in work on the distribution system shall be experienced and skilled in water main work.

F. The Contractor or Owner shall pay all applicable permit fees that have been set worth by the BWC. No water work may begin until the aforementioned fees are paid. Fees may be waived by the BWC and/or the Water Superintendent.

G. Work performed by the Contractor on the distribution system shall be inspected by the CWD. The Water Superintendent, or water engineers, shall perform the inspection. The Contractor shall call the CWD at (413) 594-3420, forty eight (48) hours in advance to schedule an inspection appointment. If multiple inspections will be required due to size and scope of project, arrangements will be made with the CWD prior to start of project. Mains of 4" or greater will require to be pressure tested and disinfected, as defined in Section 4.2 and 4.3, it is the contractors responsibility to schedule and coordinate this work with the CWD and a minimum of forty eight (48) hour notice given. **The CWD may refuse to turn on water service if an inspection is not made, scheduled, or if fees are not paid**

H. All inspections shall be made **before** any backfilling of the trench is made. The entirety of the pipe or service laid shall be left visible for inspection.

I. If the work to be performed requires the shutdown of the existing water main, the contractor shall request said shutdown three (3) business days prior and coordinate with CWD. In the likely event that residents and local businesses will be without water due to the shutdown, CWD shall provide a list of affected locations and it shall be the contractor's responsibility to notify these locations in writing with a **MINIMUM** twenty four (24) hour notification. A typical shutdown notice can be found in Appendix A. If notification is not given, or an emergency arises, the CWD may cancel the scheduled shutdown, and the contractor shall bear the costs incurred. The CWD shall coordinate shutdowns with the CFD.

J. The contractor or developer shall obtain a "Street Occupancy Permit" from the City Engineer prior to any excavations in the city right of way. The City Engineer can be reached at 594-3416 and fax of 594-3441.

K. The Contractor shall obtain any and all applicable permits required from Waste Pollution Control. Waste Pollution Control can be reached at 594-3585.

L. Contractor shall contact the Forestry Department when work will adversely affect existing tree in city streets and right of ways. Forestry Department can be reached at 594-3557

M. Contractor shall supply "ties" and measurement to valves, shut offs, bends, and hydrants by the end of the project.

3) MATERIAL STANDARDS

3.1) PIPE

A. Distribution system pipe shall be at least eight (8) inch in diameter, shall be class 52 ductile iron pipe, cement lined and tar coated per AWWA Specifications. The pipe shall be as manufactured by the U.S. Pipe and Foundry Company, Griffin Pipe Company, American Pipe and Supply Company, Atlantic States Cast Iron Pipe Company or an approved equal by the CWD. The use of Atlantic States pipe shall be limited to twelve (12) inch diameter or less.

B. If it is determined that a pipe diameter larger than eight (8) inch and/or a pipe with class greater than 52 will be needed to supply the Development, then the size shall be determined by a licensed Engineer and approved by the CWD and shall be furnished and laid at the *Developer's* expense.

C. Pipe used for hydrant branches shall be at least six (6) inches in diameter and shall meet the above specifications and shall be restrained the entire length of the branch by an approved means.

D. Pipe being installed in corrosive soils shall be installed in the method(s) described in AWWA C105. The evaluation of the corrosiveness of the soil shall be made by the DIPRA "Design Decision Model".

3.2) PIPE JOINTS

Push-on type joints are recommended on straight runs of pipe. Gaskets must be standard for pipe used and be suitable to the CWD. **A MINIMUM OF TWO BRASS WEDGES** per joint will be used to maintain conductivity and facilitate pipe location in the future. Brass wedges shall be installed at two (2) and eleven (11) o'clock. When it is deemed necessary to use "field lock gaskets", brass wedges are still required to be used.

The CWD may require, under certain terrain conditions, that restrained type joints be used. **THE METHOD OF RESTRAINING MAY EITHER BE OF AN INTERLOCKING TYPE OR MECHANICAL JOINT RESTRAINT (SEE SECTION 3.15.) OR AS SPECIFIED BY THE CWD.**

3.3) FITTINGS

Ductile iron fittings must be used and shall be cement lined. Fittings are required to be equipped with mechanical joint restraint as specified in Section 3.15, unless otherwise specified by the CWD. Mechanical joint fittings in sizes four (4) inch through twelve (12) inch shall be ductile iron compact fittings and rated for 350 psi working pressure. All nuts and bolts shall be of a type equal to ductile iron or KOR-10 steel T-bolts and nuts.

3.4) COUPLINGS

Couplings shall only be allowed when connecting standard outside diameter pipe to oversize or pit cast pipe. The coupling shall be of a type equal to Smith Blair, Style 441, Romac Style 501, or Romac Macro HP.

Couplings shall be provided with plain, Grade 27, rubber gaskets and with black, steel, track-head bolts with nuts. The CWD shall also accept the Hymax 2000 series coupling with a working pressure of 260 psig, stainless steel nuts and bolts, and a fusion-bonded epoxy coated body up to a pipe diameter of twelve (12) inches. Otherwise, the use of solid sleeves shall be used.

3.5) GATE VALVES

Gate valves shall be U.S. Pipe and Foundry Co. Manufactured Metroseal 250 Resilient Seated Gate Valve; American Flow Control Series 2500 Ductile Iron Resilient Wedge Gate Valve; or Mueller 2360 Series Resilient Wedge Gate Valve where the body, bonnet, and gate are ductile iron. All internal and external surfaces must be epoxy coated and seal between the stem and bonnet must be composed of a cartridge. Otherwise, gate valves must be approved by the CWD. The valves shall **OPEN LEFT**, COUNTER CLOCKWISE. Gate valves will be equipped with mechanical joints and mechanical joint restraints as specified in Section 3.15, alternate style valves must be approved for use by the CWD.

The contractor shall support all valve so that the pipe will not be required to carry the weight of the valve. Special car shall be taken for valves twelve (12) inch and greater.

3.6) GATE BOXES

The gate boxes shall be telescopic in design with two-piece construction, a top with a cover and a bottom. The top and bottom shall be extra grade grey iron. The top shall be twenty four (24) inches in height and the bottom shall be thirty six (36) inches in height. The top section shall have a top flange to increase the stability of the box to remain at the present height. The lower section of the box shall have a bell shaped bottom designed to enclose the operating nut and stuffing box of the valve without bearing on the valve bonnet. The gate box shall come complete with a cover on which the word **"WATER"** shall be cast. The cover of the gate box shall be close fitting and substantially dirt tight and flush with the top of the box rim. Gate boxes shall be installed for each buried valve.

The gate box extension shall be twelve (12) inches to fifteen (15) inches in length. The extension shall be extra grade grey iron and shall fit on the top of the bottom section of the gate box.
The gate boxes shall be of North American manufacture and the total weight of the gate box assembly (top, cover and bottom sections) shall be one hundred five (105) pounds minimum.

3.7) HYDRANTS

Hydrants shall be of a type equal to American Flow Control Model B-62-B, Mueller Super Centurion 250, or approved equal by the CWD. Pressure ratings shall not be less than two hundred (200) psi. They shall **OPEN LEFT**, counterclockwise, and shall have one steamer connection, 4-1/2-inch diameter NST and two 2-1/2-inch diameter NST hose connections. The valve opening at the base of the hydrant shall be 5-1/4-inch minimum. Hydrant operating nut shall be 1-1/2 inch, flat to point, pentagonal.

The length of the hydrant barrel shall be such that when installed with the proper depth of cover on the branch pipeline, the hydrant will be set so that the breakaway flange is not less than two (2) inch, nor more than six (6), above the finished grade. For the most part, minimum bury length shall be 5-1/2 feet.

Connecting pipe and pipe nipples between the main line tee and hydrant shall be six (6) inch ductile iron conforming to the requirements for ductile iron pipe hereinbefore. The pipe shall be restrained the entire length of the branch by an approved means.

CWD may require hydrants to be grounded in certain areas of the distribution system.

Hydrants set in clayey or other impervious soils will have a drainage pit excavated below each hydrant. Hydrants set in loose or poor load bearing soil, shall have a concrete collar poured around the hydrant at or near grade. The collar shall be six (6) inches thick and be two (2) feet in diameter. See detail in Appendix A.

3.8) HYDRANT TEES (ANCHORING TEES)

Hydrant tees shall be anchor type and have line bells conforming to the requirements of the main pipe. The branch shall have a plain end with an integral gland and rotating mechanical joint gland and mechanical joint restraints as specified in section 3.15, to provide a restrained connection. Hydrant valve and valve box shall be a standard six (6) inch, mechanical joint, metropolitan pattern water works gate valve, **OPENING LEFT** (See specifications on Gate Valves for a complete description).

3.9) SERVICE PIPING & CONNECTIONS

Service pipe shall be type "K" copper tubing American manufactured, 1-inch minimum. All corporation taps are to be made at 12 o'clock (top) of the water main and utilize a 90-degree gooseneck to transition to the copper tubing. All services 1 ¼ "and greater must utilize **soft, type K - BAR copper** for their entirety up to the foundation. Just before entering the foundation they must transition to **BRASS** to travel under the foundation and up to the meter point. This will help support heaver meters and valves. **ROLL COPPER GREATER THAN ONE-INCH (1") IN DIAMETER WILL NOT BE ACCEPTED**. All service fittings shall be extra heavy brass, manufactured by either Mueller Water Distribution Products or Ford Meter Box Company, Inc. All pipe and fittings shall conform to the requirements of the Reduction of Lead in Drinking Water Act (Public Law 111-380). **Only** compression fittings will be used to join copper tubing together and must be a type currently used by the Chicopee Water Department or an approved equal.

For service pipe greater than two (2) inch diameter, a minimum of four (4) inch Ductile Iron shall be used. All joints must be restrained using Megalugs and thrust blocking. The actual riser pipe, in addition, must also be rodded from the flange above the slab, through the slab, to the elbow located beneath grade. This elbow must also be rodded back beyond the closest exterior pipe joint resulting in a minimum of thirty (30) feet of restrained pipe. Friction clamps may be used for an anchor to the ductile iron at this point.

Typical service details can be found in Appendix A.

3.10) CORPORATIONS

Corporations for 3/4-inch and 1-inch installations shall be heavy pattern, ball valve type, easy turning and of a type equal to the Ford FB 800 series. The inlet shall be an AWWA (CC) thread. The outlet shall be male iron pipe thread, one size larger than the inlet. The 1-1/2-inch and 2-inch corporations shall be of a ball valve type which incorporates Teflon seats to assure self-centering of a Teflon coated bronze ball similar to a style typified by the Ford FAFB - 1600 series, or an approved equal by the CWD. The corporation shall be easy turning and non-binding and designed to **OPEN LEFT**, counterclockwise. The inlet shall be an AWWA (CC) thread. The outlet shall be female iron pipe thread, the same size as the inlet. ALL corporations shall be subject to a sustained hydraulic pressure of **300 psi** and tested in both the open and closed positions for leakage and ease of turning. **All taps greater than or equal to 1-1/4 inch will require the use of a tapping saddle.** Any size tap made on asbestos cement and/or plastic pipe will require a tapping saddle.

3.11) CURB STOPS

For sizes 3/4-inch, 1-inch, 1-1/2-inch, and 2-inch, the curb stops shall be a type equal to the Ford FGB - 44 series, or approved equal. The curb stop shall have a quarter turn stop with check, solid tee head and no waste. No curb stops with plugged wastes shall be accepted. Curb stops shall **OPEN LEFT** counterclockwise. ALL curb stops shall be subject to a sustained hydraulic pressure of **300 psi** and tested in both the open and closed positions for leakage and ease of turning.

3.12) SERVICE LINE FITTINGS

The following tables indicate the brass service line fittings currently in use by the CWD.
As of January 4, 2014 all service line fitting shall meet the "lead free" requirements of the Reduction of Lead in Drinking Water Act (Public Law 111-380)

Table 1: 3/4" Service

SIZE	ITEM	TYPE	MANUFACTURER	MODEL #
3/4 INCH	CORPORATION	SEE SPECS	FORD	FAFB800-3
3/4 INCH	GOOSENECK	COMPRESSION	FORD	L 34 - 23G
3/4 INCH	CURBSTOP	COMPRESSION	FORD	FGB - 44 - 333G
3/4 INCH	MALE ADAPTER	FLARED	FORD	FJC28-33N
3/4 INCH	VALVE	SEE SPECS	WOLVERINE	52968

Table 2: 1" Service

SIZE	ITEM	TYPE	MANUFACTURER	MODEL #
1 INCH	CORPORATION	SEE SPECS	FORD	FAFB800-4
1 INCH	GOOSENECK	COMPRESSION	FORD	L 34 - 44G
1 INCH	CURBSTOP	COMPRESSION	FORD	FGB - 44 - 444G
1 INCH	MALE ADAPTER	FLARED	FORD	FJC28-44N
1 INCH	VALVE	SEE SPECS	WOLVERINE	52969

Table 3: 1 1/2" Service

SIZE	ITEM	TYPE	MANUFACTURER	MODEL #
1 ½ INCH	CORPORATION	SEE SPECS	FORD	FAFB 1600 - 6
1 ½ INCH	90 DEGREE ELBOW	SEE SPECS		
1 ½ INCH	CURBSTOP	COMPRESSION	FORD	FGB - 44 - 666G
1 ½ INCH	MALE ADAPTER	FLARED	FORD	FJC28-66
1 ½ INCH	VALVE	SEE SPECS	WOLVERINE	52971

Table 4: 2" Service

SIZE	ITEM	TYPE	MANUFACTURER	MODEL #
2 INCH	CORPORATION	SEE SPECS	FORD	FAFB 1600 - 7
2 INCH	90 DEGREE ELBOW	SEE SPECS		
2 INCH	CURBSTOP	COMPRESSION	FORD	FGB 44 - 777G
2 INCH	MALE ADAPTER	FLARED	FORD	FJC28-77
2 INCH	VALVE	SEE SPECS	WOLVERINE	52972

3.13) SERVICE BOXES

Service boxes supplied shall be Erie style, American manufactured, of an extendable type with a length from four (4) to five (5) feet. The cover shall be made of extra grade grey iron. The arch shall accommodate up to 1-inch curb stops. The upper section shall be a 1-inch extendable pipe made of steel. The cover shall be counter sunk with a brass pentagonal plug that features a course "rope" thread to enable quick and easy removal.

The service boxes supplied shall come complete with 30-inch stop rods. The stop rod shall be 5/8-inch diameter and offset for centering in the pipe. The stop rod shall have a heavy ductile iron end yoke with a brass cotter pin.

3.14) THRUST BLOCKING

Where applicable, reaction or thrust blocks of poured concrete shall be constructed at all tees, plugs, and bends as directed or as detailed on drawings with minimum 3,000 psi Cement Concrete. The blocks shall be poured against undisturbed original ground and shall be so placed that pipe joints will be accessible for any possible future repairs. **THE OTHER MEANS OF RESTRAINT (METHOD OF RESTRAINING MAY EITHER BE OF AN INTERLOCKING TYPE OR MECHANICAL JOINT RESTRAINT AS IN SECTION 3.15.), AS SPECIFIED BY THE CWD, SHALL BE INSTALLED IN ADDITION TO THRUST BLOCKS AS DIRECTED BY THE CWD.** Pipe anchors shall be used when and as directed. Typical thrust block details can be found in Appendix A.

3.15) MECHANICAL JOINT RESTRAINT

Mechanical joint restraint shall be incorporated into the design of the follower gland. The restraining mechanism shall consist of individually actuated wedges that increase their resistance to pullout as pressure or external forces increase. The device shall be capable of full mechanical joint deflection during assembly and the flexibility of the joint shall be maintained after burial. The joint restraint ring and its wedging components shall be made of grade 60-42-10 ductile iron conforming to ASTM A536-84. The wedges shall be ductile iron heat treated to a minimum hardness of 370 BHN. Dimensions of the gland shall be such that it can be used with the standardized mechanical joint bell conforming to ANSI/AWWA C111/A21.11 and ANSI/AWWA C153/A21.53 of the latest revision. Torque limiting twist-off nuts shall be used to insure proper actuation of the restraining wedges. The mechanical joint restraint shall be available in the three through forty-eight inch sizes. They shall have a rated working pressures of 350 psi in sizes sixteen inches and smaller and 250 psi in sizes eighteen inch through forty-eight inch. The devices shall be listed by Underwriters Laboratories up through the twenty-four inch size and Approved by Factory Mutual up through the twelve-inch size. The restraint shall be the Series 1100 MEGALUG restraint as produced by EBAA Iron, Inc. or approved equal.

4) OTHER REQUIREMENTS

4.1) ELECTRICAL GROUNDING

Metal water piping systems shall be grounded according to the Massachusetts Electric Code, CMR 527, Article 250 grounding.

4.2) PRESSURE & LEAKAGE TEST

A. The pressure and leakage tests shall be as specified in **AWWA C-600**

B. **An independent 3rd party authorized by the CWD and paid for by the Developer/Contractor shall conduct the Pressure Test(s). Both a representative of the Chicopee Water Department and the Developer/Contractor shall witness it. A written report shall be submitted to the CWD for review prior to acceptance of said test.**

C. In general, the water pipe shall be given a pressure and leakage test in sections of approved length. For these tests, the 3rd Party Contractor shall provide a method of determining the exact amount of water being pumped into the test section and a pressure gauge. The 3rd Party Contractor shall also furnish and install suitable temporary testing plugs or caps for the pipeline; all necessary pressure pumping, pipe connections and other similar equipment; and all labor required. Prices for the appropriate pipe items shall include compensation for testing. The test equipment shall be installed by the 3rd Party Contractor in such a manner that all water entering the section under test will be measured and the pressure in the section indicated, and they shall be kept in use during all tests.

D. The scheduling of pressure and leakage tests shall be approved by the Superintendent of the CWD and shall be attended by him or a representative of the CWD.

E. The section of pipe to be tested shall be filled with water of approved quality, and all air shall be expelled from the pipe. If air release assemblies are not available at high points for releasing air, the Developer/Contractor shall make the necessary excavations, taps, and do the necessary backfilling. If the section fails to pass the pressure and leakage test, the Developer/Contractor shall do everything necessary to locate, uncover, even to the extent of uncovering the entire section, and repair or replace the defective pipe, fitting, or joint all at his/her own expense and without extension of time for completion of the work.

F. A report containing calculations and documentation pertaining to the pressure and leakage testing shall be submitted to the CWD.

G. All visible leaks are to be repaired regardless of allowance used for testing.

H. The 3rd Party Contractor shall test the approved length(s) at a static pressure of 1.25 times the stated working pressure of the pipeline at the highest elevation along the test section and not less than 1.5 times the stated working pressure at the lowest elevation of the test section or two hundred (200) psi, whichever is greater. The section shall be tested for duration no less than two (2) hours. The pipeline

shall be allowed to stabilize at the test pressure before conducting the hydrostatic test. **The tested length(s) shall maintain test pressure for the whole duration of the test with no loss in pressure and with no makeup water added during the test.** The test allowance for makeup water shall be determined by the following formula:

$$L = \frac{SD\sqrt{P}}{148{,}000}$$

I. If, in the judgment of the Superintendent, it is impractical to follow the fore-going procedure exactly, for any reason, modification in the procedures may be made as required or approved, but in any event the Developer/Contractor shall be responsible for the ultimate tightness of the line within the above leakage requirements.

J. Copper services ranging in size from over one (1) inch up to and including two (2) inch shall be pressure tested at static street pressure for duration no less than one (1) hour. All fittings shall be exposed during the test to visually inspect for leaks.

4.3) DISINFECTION & FLUSHING

A. After a section of the main has been pressure tested and found acceptable, it shall be flushed thoroughly by the Developer/Contractor in conjunction with the CWD. Flushing the completed main is to be followed by disinfection in accordance with **AWWA C651** for duration no less than twenty four (24) hours. Test results for chlorine residuals for times as specified in the method of disinfection, must be submitted to the CWD. All valves and hydrants should be operated during treatment to insure their thorough contact with the disinfecting solution.

B. The pipe line shall then be dechlorinated by means of flushing the super chlorinated water through a dechlorinating device to remove the chlorine residual before releasing the water to the drainage system. The CWD must **PREAPPROVE** the dechlorination method and type of dechlorination chemicals to be used. Full documentation of this process must be presented to the CWD along with all pertinent calculations.

C. Following flushing, two (2) consecutive sets of acceptable samples taken at least 24 hours apart shall be collected at 1,200 foot intervals, plus one set from the end of the line and at least one set from each branch, or points deemed necessary by the Superintendent. Samples shall be tested chemically for residual chlorine and bacteriologically for Coliform group bacteria. Testing must be done by a Massachusetts state certified laboratory and the results of all tests must be submitted to the CWD.

D. **THE DEVELOPER/CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH THE AFORESAID TESTS AND PROCEDURES.**

E. A report containing the amount of water flushed, amount of chlorine used for disinfection, amount of dechlorination chemical used, chlorine residuals after the test, and an official copy of the lab results

must be **SUBMITTED TO THE CWD FOR APPROVAL PRIOR TO THE LINE(S) BEING ACTIVATED**

F. If the initial treatment fails to produce the desired result, the chlorination procedure must be repeated.

G. This work shall be done under the direction and supervision of a representative of the CWD. For this work, the Developer/Contractor shall furnish all equipment, material and labor required.

4.4) CROSS-CONNECTION/BACKFLOW PREVENTION

A. No backflow prevention device may be installed until the backflow permit application is approved in writing by the CWD.

B. Backflow permit applications may be obtained at the CWD or online at www.chicopeema.gov (documents and forms section of the Water Department page).

C. Any related permits required by the Chicopee Plumbing Inspector must be obtained prior to construction and installation.

D. All Fire Sprinkler Contractors must obtain a permit from the CFD prior to construction and installation. A copy of this permit must be submitted to the CWD before any backflow prevention device is installed.

E. All backflow Prevention Devices must be approved for use in the Commonwealth of Massachusetts.

F. All materials, valves, tees, elbows, water piping, etc., must meet or exceed the CWD Construction Standards. Any deviation from these standards must be approved in writing by the CWD Superintendent, prior to construction and installation.

G. All piping up to the meter and/or backflow preventer shall be ductile iron.

APPENDIX A

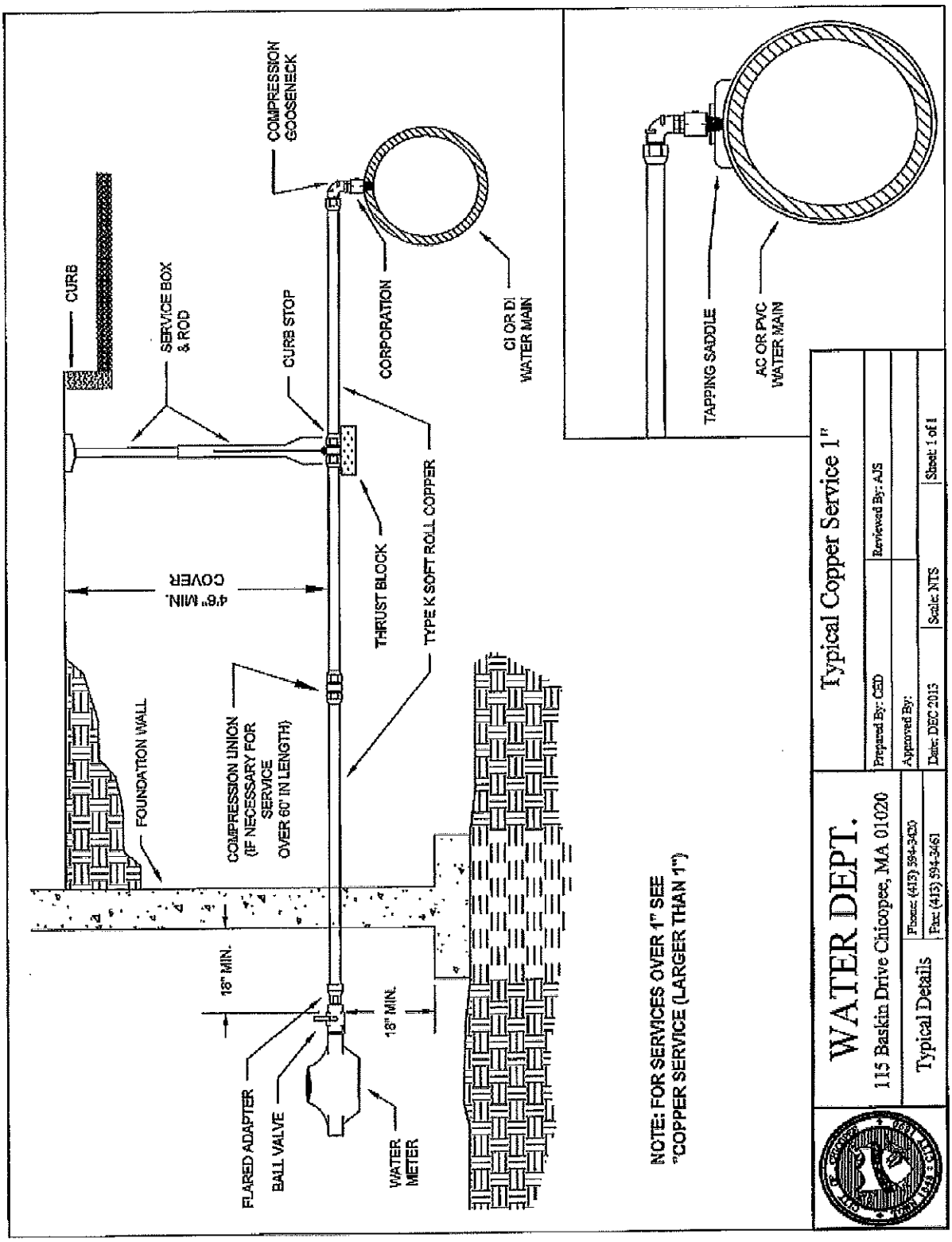

Figure 1 TYPICAL COPPER SERVICE 1"

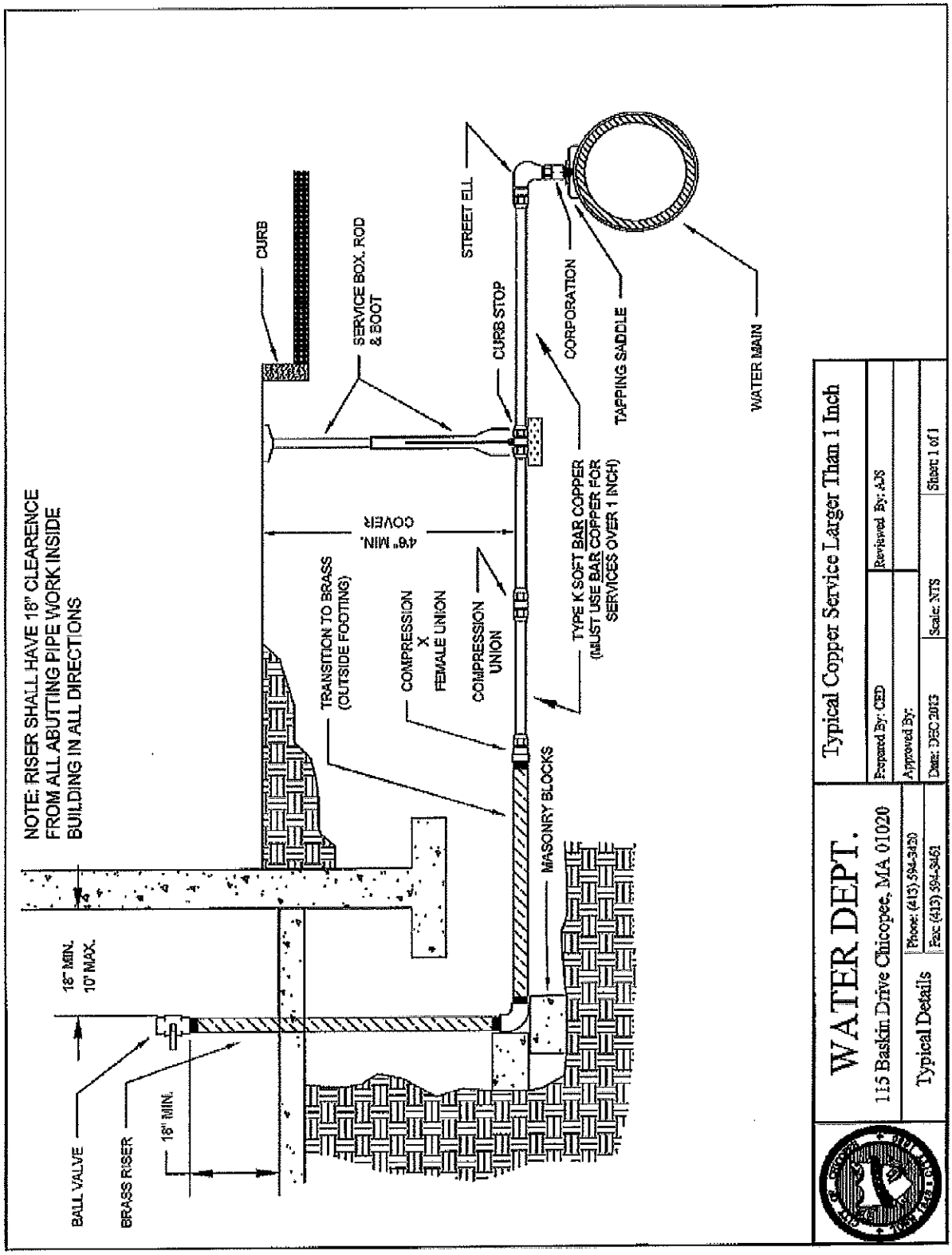

Figure 2 TYPICAL COPPER SERVICE GREATER THAN 1"

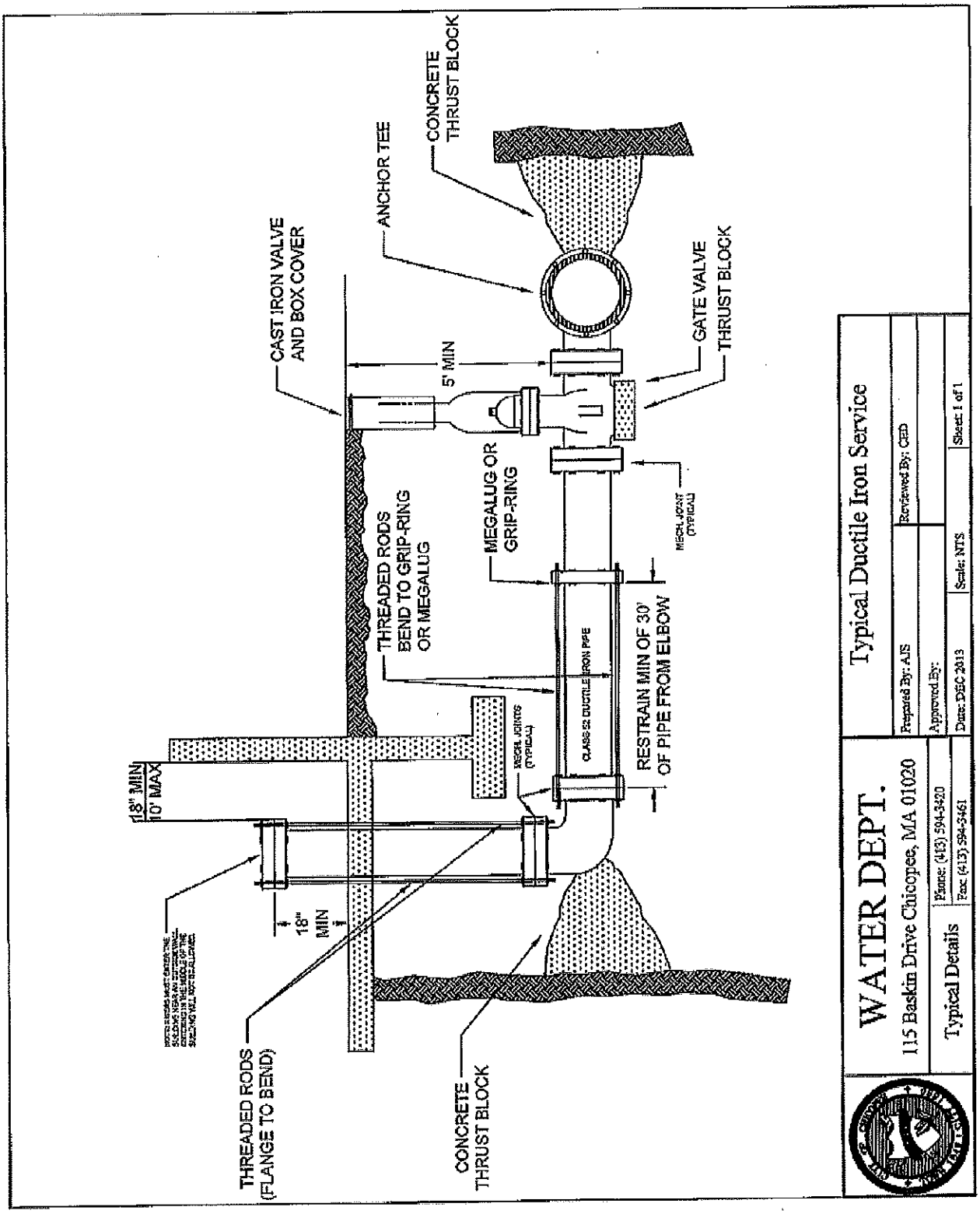

Figure 3 TYPICAL DUCTILE IRON SERVICE

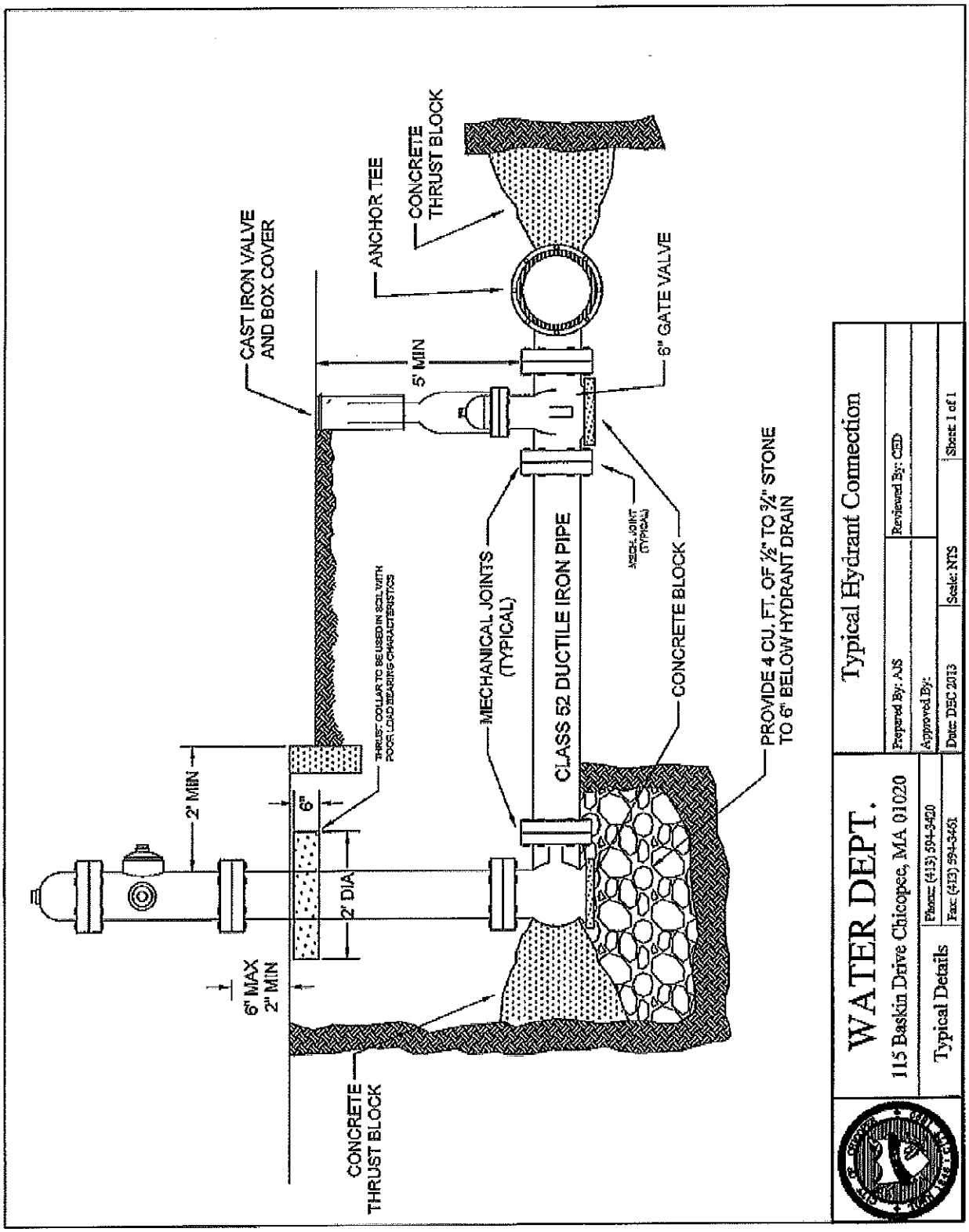

Figure 4 TYPICAL FIRE HYDRANT CONNECTION

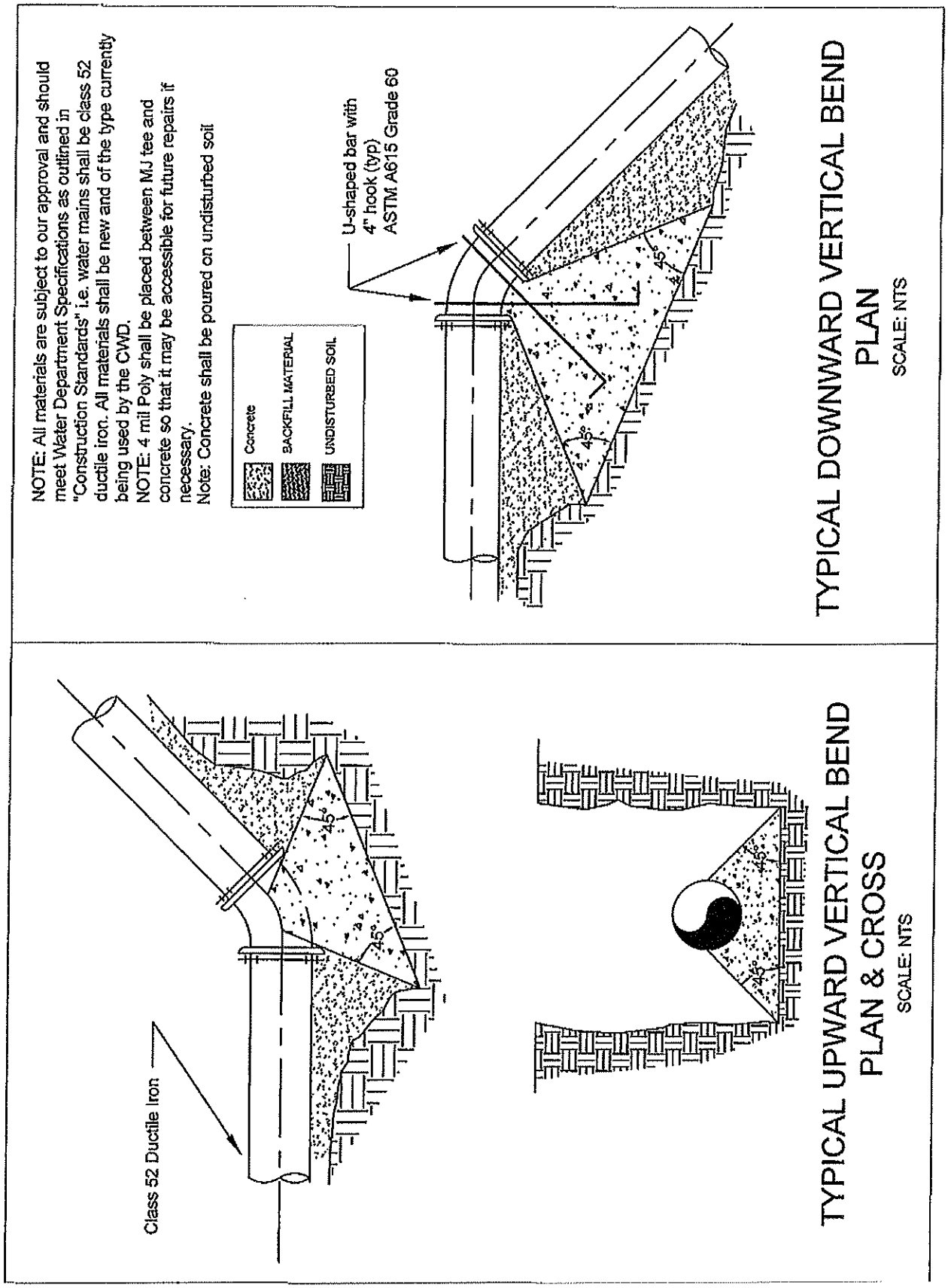

Figure 5 TYPICAL VERTICAL BEND DETAIL

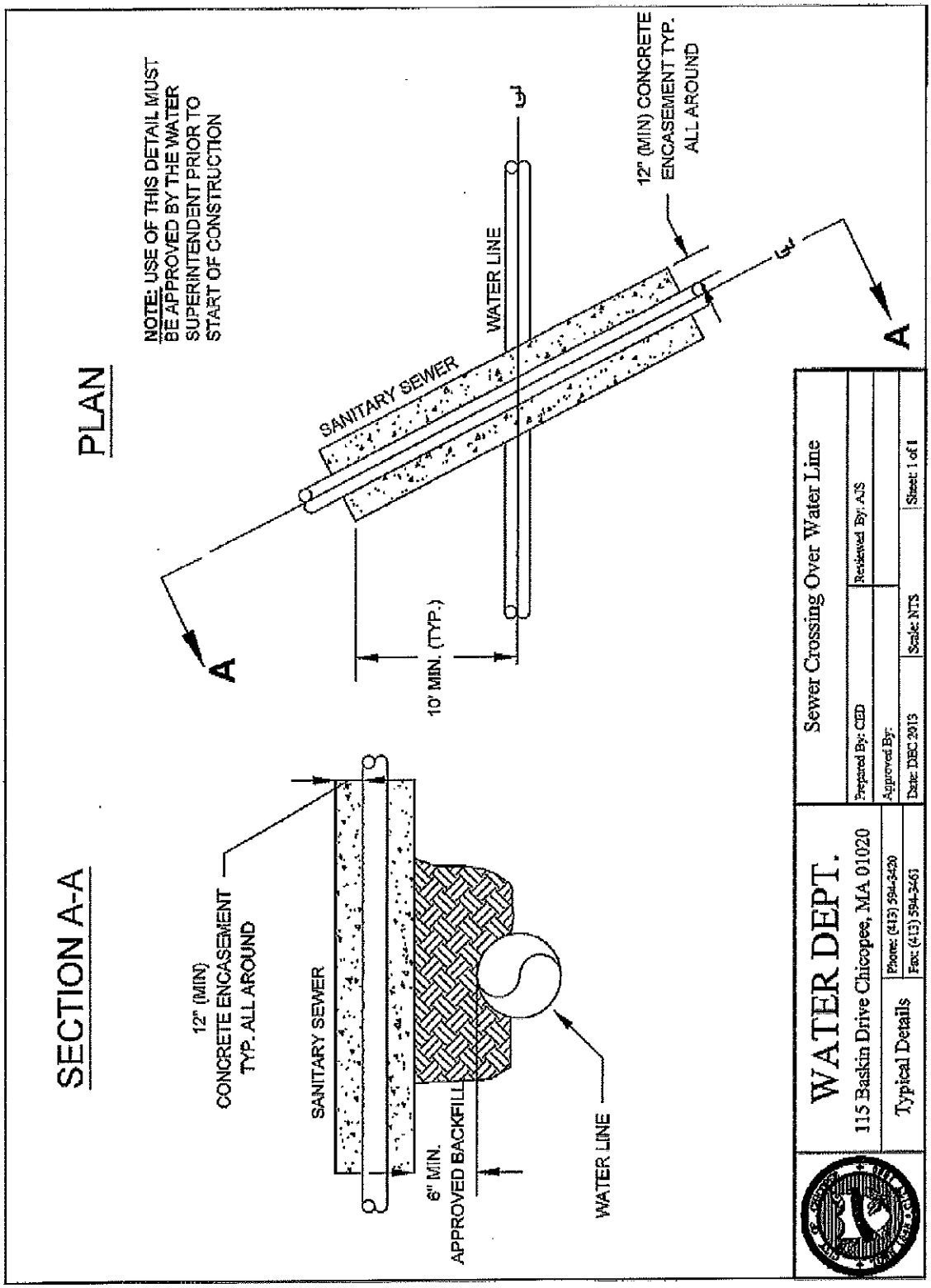

Figure 6: SEWER CROSSING OVER WATER LINE

Contractor's Company Letter Head

Address
Telephone
Fax
Date

Date of Shutdown:

Expected time of shutdown:

From: ***** AM
To: ***** PM

A short description of what is to be done on the distribution system as to inform residents and businesses as to why there water is being temporarily shut off.

State that if the resident or business has questions, that **BOTH** the contractor **AND** the CWD can be reached at (contractor's phone number) and the CWD at (413) 594-3420.

It would be advised that the contractor add a small disclaimer stating that the above times vary do to unforeseen circumstances.

The name of a person of contact for the project
regarding project

Figure 7: TYPICAL SHUT DOWN NOTICE