

Rye Water District

REQUIREMENTS FOR NEW WATER MAIN INSTALLATION

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REQUIREMENTS FOR NEW WATER MAIN INSTALLATIONS

I. GENERAL

Developers of a Subdivision or extension of mains in the Rye Water District (RWD) section of the Town of Rye desiring water service shall apply to the Rye Water District Commission. At the same time, the developer must submit plans and specifications indicating the installations proposed by the developer for review.

The developer shall assume all costs for engineering and installation of water main, hydrants and associated equipment. In addition, materials, pipe size, hydrant spacing, and installation shall be in accordance with the specifications herein. Criteria on Fire Flow requirements as determined by Insurance Services Offices (ISO) most recent Public Protection Classification (PPC) survey, used in determination of pipe sizes and hydrant spacing. Gate valves shall be installed as necessary to permit isolation of sections of water mains, and where practicable, to facilitate future repairs on mains.

The developer will be provided a copy of these installation requirements and will be required to acknowledge receipt of this document using the sign-out form shown in Attachment 3.

II. DESIGN CRITERIA

A. Plans and Specifications

All plans for water main extensions or improvements shall be drafted with the following specifications:

1. Plans shall be drafted on 24" x 34" (Max.) plan and profile sheets with a horizontal scale of 1" = 20' or 1" = 40'. Detail sheets need not be on plan - profile sheets.
2. Specifications shall be type written on standard 8½" x 11" sheets.
3. RWD construction, material, installation and testing standards shall be incorporated into the plans and/or the specifications.

B. General Requirements

1. Service Pressure - Water system improvements shall be designed to provide a normal working pressure of not less than approximately 35 psi or more than 130 psi.
2. Main Size - The minimum size of all new water mains for providing fire protection and serving fire hydrants shall be 8-inch diameter. Larger size mains will be required

as necessary to allow the withdrawal of the required fire flow or peak demand while maintaining a minimum residual pressure of 20 psi. The minimum size of all hydrant branch mains shall be 6-inch diameter.

3. Bury Depth - Pipe shall be laid at a minimum of five 5 feet and at a maximum depth of 6 feet.
4. Hydrants - Unless otherwise required by the fire department the maximum spacing for fire hydrants intended to supply a fire flow requirement of 500 gallons per minute or less shall be 1000 feet and for fire flow requirements in excess of 500 gpm the maximum spacing shall be 500 feet. Closer spacing may be required in order to locate hydrant at street intersections or other points convenient to the fire department, or as required by the Town. In the case of main extensions by others, hydrants shall be paid for by the Owner and must meet the specifications of the District. Upon acceptance of the main extension, the maintenance, repair or replacement of such hydrants shall become the responsibility of the District.
5. Gate Valves - Gate valves shall be required at all main intersections and along the water main at intervals of 1000 feet. Gate valves are required on each hydrant branch and on all service mains adjacent to the hydrant branch. The District shall decide on the final number and location of all valves.
6. Dead Ends - Dead ends shall be minimized by looping all new mains whenever practical as determined by the District
7. Air Relief Valves - Air relief valves shall be installed at all high points of the new main as determined by the District. The size and design of the valve and piping shall be determined by the District.
8. Blowoffs - Blowoffs or hydrants shall be installed at the ends of all dead end lines and at low points in mains as determined by the District. The size and design of the blowoff valve and piping shall be determined by the District.
9. Separation of Water Mains and Sewers:
 - a. Parallel Installation
 - 1) NORMAL CONDITIONS- Water mains shall be laid at least 10 feet horizontally from any sanitary sewer, storm sewer or sewer manhole. The distance shall be measured edge to edge.
 - 2) UNUSUAL CONDITIONS - When local conditions (such as ledge, bridges, etc.) prevent a horizontal separation of 10 feet, a water main may be laid closer to a storm or sanitary sewer provided that:
 - a) The bottom of the water main is at least 18 inches above the top of the sewer and a minimum of 5 feet edge to edge horizontally is provided.

- b) Where this vertical separation cannot be obtained, the sewer shall be constructed of materials and with joints that are equivalent to water main standards of construction and shall be pressure tested to assure watertightness prior to backfilling.
- c) The NHDES concurs that local conditions warrant less than 10 feet horizontal separation and approves the plans and specifications of the work.

b. Crossings Installation

- 1) NORMAL CONDITIONS - Water mains shall cross over the top of house sewers, storm sewers or sanitary sewers and shall be laid to provide a separation of at least 18 inches between the bottom of the water main and the top of the sewer.
 - 2) UNUSUAL CONDITIONS - When local conditions prevent a vertical separation as described above the following construction shall be used:
 - a) Sewers passing over or under water mains should be constructed of the materials described with joints that are equivalent to the water main standards of construction and shall be pressure tested to assure watertightness prior to backfilling.
 - b) Water mains passing under sewers shall, in addition, be protected by providing a vertical separation of at least 18 inches between the bottom of the sewer and the top of the water main; adequate structural support for the sewers to prevent excessive deflection of joints and settling on and breaking the water mains; and that one full length of water pipe be centered at the point of crossing so that the joints will be equidistant and as far as possible from the sewer.
10. Services: No more than one customer shall be served from a service pipe under the control of a single curb stop or shut off. A separate meter shall be provided for each customer. Where the length of the service pipe is greater than 200 feet between the District's main and the premises to be serviced, the water meter shall be placed in a meter pit at the edge of the right-of-way. The District shall establish the size and type of construction of the meter pit. The Water District shall determine the size of the service pipe based upon the information provided by the customer. No water services shall be installed in a common trench with other underground utilities; separation from sewers shall be as outlined in paragraph II.B.9.6 above. Curb stops shall not be located in driveways or under pavement.
11. Backflow Devices: All water services shall be equipped with an approved backflow device in accordance with the District's cross connection program. The backflow device shall be installed at the meter location unless otherwise approved by the District.
12. Fire Services: A separate service shall be provided to serve a building sprinkler system and/or private fire protection system unless otherwise approved by the District.

III. REVIEW PROCESS

In addition to reviews by other state and local regulatory agencies, ALL water line extensions shall go through the District's review process in the following order:

- 1) An approved site plan and an approved subdivision plan shall be submitted to the RWD with the plans in the review process.
- 2) Plans shall be submitted to the RWD for review. The District may also require plans be forwarded to the District's engineering firm for review and comment.
- 3) Copies of all approved plans and specifications shall be submitted to the RWD.
- 4) The Contractor shall obtain trench permits from the Town of Rye and/or State of NHDOT.
- 5) The contractor shall notify Dig Safe at telephone number: 888-344-7233
- 6) The Contractor is required to pay for the services of a Clerk of the works, and/or RWD personnel, for inspection activities to ensure compliance with these regulations.
- 7) Upon completion of the installation, the District will be provided with a "Mylar" print showing the as-built installation, two paper plan sets, and one electronic copy. As-built drawings shall include "**swing ties**" to all curb stops and valves from a minimum of two points. Also, a Deed or Certificate of Title shall be furnished to the District before water service is turned on (see Attachments No. 1 & No. 2). The property owners or developers will be personally be notified of these requirements by the RWD during the review process.

IV. MATERIALS

- A. The Developer is responsible for all material from procurement, handling, storage, and installation.
- B. Ductile Iron Pipe

Pipe shall be eight inch minimum in diameter and shall be ductile iron double cement lined, with a protective coating on the exterior of the pipe, conforming to the requirements of AWWA C151 for "Ductile Iron Pipe, Centrifugally Cast". The minimum pipe thickness shall be Class 52, unless previously agreed to in writing by the Water District. **All water works iron shall be made in North America.**

Ductile iron pipe shall have push-on joints, with rubber gaskets, except where pipe is to be joined with special fittings or valves in which case pipe shall be furnished with mechanical joints.

The nominal laying length of each pipe shall be shown in Tables 51.3 and 51.4 ANSI Standard A21.51-LR, except that a maximum of 20% of the total number of each pipe size specified in the order, may be furnished as much as 24 inches shorter than the nominal laying length.

Ductile iron pipe shall be designed in strict accordance with AWWA C150 for "Thickness design of Ductile-iron Pipe".

1. MARKING PIPE – Each ductile iron pipe shall have conspicuously painted on the exterior the pressure, class, and weight of the pipe.
2. LININGS & COATINGS – The outside surface of all pipe shall be factory coated with bituminous coating of either coal tar or asphalt base approximately 1 mil thick. The inside surface of all pipe shall receive a double cement mortar lining and bituminous seal coat in strict accordance with AWWA C104 for "Cement-Mortar Lining for Ductile-Iron Pipe and Fittings".
3. MANUFACTURER’S AFFIDAVIT OF FACTORY INSPECTION AND TESTING – Upon request, the Developer shall provide a sworn affidavit of compliance that all Hydrostatic and Physical Properties Tests have been made and that the results of the same comply with the American Standard's Association (ASA) requirements.

Pipe shall be handled in such a manner as to avoid damage to the coating and lining. Detrimental abrasions to coatings, as determined by the Clerk of the Works or the RWD's Superintendent, shall be repaired by the Contractor or be cause for pipe replacement. The interior of the pipe shall be kept free of dirt and other foreign matter at all times. Material shall not be dropped or bumped.

4. DUCTILE IRON FITTINGS – Fittings for ductile iron water pipe shall be ductile or cast iron and shall meet the requirements of AWWA C153. Outside surface of all fittings shall be coated by hot coal tar dip method before lining. Inside cement lining shall be in accordance with AWWA C104. The minimum pressure rating for all fittings shall be 250 psi unless a higher pressure class is required for the specific installation. Unless otherwise required for joint restraint, joints on fittings shall be mechanical joints in accordance to AWWA C111.
5. POLYWRAP – All ductile iron water main and fittings shall meet the requirements of AWWA C105 and shall be poly wrapped in V-Bio Enhanced Polyethylene Encasement wrap manufactured solely for installation around ductile iron pipe. A minimum 8 mil material thickness is required. Tape used for installation shall be PVC tape.

B. Thrust Restraint

Thrust restraint shall be appropriate for the soil type, size, and length of pipe and shall consist of thrust blocks and one of a variety of type restrained joints (e.g.,

Megalug[®], etc.). Thrust blocks shall be cast in place concrete with a minimum compressive strength of 3000 psi at 28 days.

C. Valves

1. Gate Valves:

Gate valves should be iron body bronze mounted, resilient seat, mechanical joint, with stainless steel nuts and bolts for underground use, wrench operated, non-rising stem, and "O-ring" seal in accordance to AWWA C509. All valves shall open LEFT, and shall have the makers' initials, pressure rating, and the year of manufacturer cast on the body. The valves shall be American Flow Control, Mueller A2360-20, or Kennedy 7500 series. Valves 12 inches and smaller shall be designed for a water working pressure of 200 pounds per square inch and valves larger than 12 inches shall have a working pressure of 150 pounds per square inch. Gate valves shall have a 2 inch square nut for wrench operation and the operating nut shall have an arrow cast in metal indicating the direction of opening. Valves shall "OPEN LEFT". Valves shall have the makers' initials, pressure rating, and the year of manufacture cast on the body.

D. Valve Boxes

Valve boxes shall be heavy pattern cast or ductile iron, cast in two or three telescoping sections of sliding construction and of such lengths as will provide, without full extension, the required cover. The lower section shall be 5¼ inches minimum inside diameter and shall be valved or domed at the bottom to fit over the valve nut. The upper section shall fit over the lower section. Covers shall be at least 6 inches in diameter, shall fit flush with the top, shall be slotted for easy removal, and shall have the words "Water" and "Open" and a direction arrow plainly cast in relief on the top surface. Valve boxes shall be free from all defects in material and workmanship, and shall be coated with coal tar pitch enamel or other approved coating. Valve boxes shall be manufactured in North America.

E. Hydrants:

Hydrants shall have minimum 5½" opening, 6" hub inlet and two 2 ½ " hose and one 4½" pumper nozzles with National Standard threads. Operating nut shall open by turning to the LEFT and be five-sided, 1½ point to flat. Hydrant shall conform to the latest revision of AWWA Standard for Fire Hydrants for Ordinary Water Works Service, serial designation (C502-LR). Hydrants shall be Clow Valve CL)F2545L-514X6 Medallion Hydrant.. Hydrants shall be fitted with stainless steel nuts and bolts.

In areas of installation where ground water table is higher than that of dry barrel hydrant drains, the drains shall be plugged (per RWD discretion). A special note of this application shall be made and immediately sent to the Fire Department and Water District, noting exact location and/or number of Hydrant(s).

See Figure 1 (attached) for Hydrant Connection Details.

F. Corporation Stops

Corporation stops shall be 1" (unless otherwise required) ball type compression. INLET: AWWA taper CC thread; OUTLET: Conductive compression connection for C.T.S. O.D. corporation stops shall be Mueller CAT #B25008-N-100 or Ford CAT #FB1000-4-NL. All items in contact with potable water are to meet NSF-61 Annex G "lead free" requirements.

G. Copper Water Service Tube

Copper tube shall be 1" (unless otherwise required) Soft temper, type "K" conforming to ASTM B-88. No splices will be allowed from the corporation stop to the curb box stop. Service lines shall be installed through a 4" PVC pipe when crossing under the roadway. All items in contact with potable water are to meet NSF-61 Annex G "lead free" requirements.

H. Plastic Water Service Tube

Plastic tube shall be 1" (unless otherwise required) copper tubing size polyethylene tubing. Polyethylene tubing is to be rated for a minimum working pressure of 250 psi. All tubing must meet the requirements of NSF Standard 61 and AWWA C901-17: Standard for Polyethylene (PE) Pressure Pipe and Tubing, 3/4" (19 mm) through 3" (76 mm) for Water Service. All plastic water tube installation must be accompanied by installation of a 10 gauge minimum copper clad steel wire (CCS) with thermoplastic Stainless steel inserts are to be used when connecting plastic tubing to compression fittings.

I. Curb Stops and Boxes

Curb stops shall be 1" (unless otherwise required) ball type compression conductive compression connections for C.T.S. O.D. both ends. Curb stops shall be Mueller Cat. #B25209-N-100 or Ford Cat. #B44-444-NL. All items in contact with potable water are to meet NSF-61 Annex G "lead free" requirements.

Curb boxes shall conform to the specifications for Valve Boxes except that for curb boxes for curb stops 2 inches and smaller shall have a one-piece cast or ductile iron arch base, a steel pipe extension upper section, cast iron lid and thread bronze plug with pentagon nut (rope thread). A stationary 5/8" minimum diameter by 24-30 inches minimum stainless steel long rod shall be installed in each curb box.

Curb boxes shall be set plumb and flush with finish grade. In addition, no obstruction shall be placed to obstruct use of shut-off valve wrench within a 6 foot circumference from center of curb box. Curb boxes shall be manufactured in North America.

J. Backfill

- 1) Common Fill Mineral soil substantially free from organic materials, loam, wood, trash, and other objectionable materials which may be compressible, or which cannot be properly compacted. Common fill shall contain no stones larger than 6 inches in diameter. Common fill shall have properties such that it can be readily spread and compacted. Snow, ice and frozen material shall not be permitted in backfill materials.

- 2) Screened Gravel shall be well graded in size from 1/4 inch to 3/4 inch and shall consist of clean, hard, and durable particles or fragments. It shall be free from dirt, vegetable, or other objectionable matter, and excess of soft, thin elongated, laminated or disintegrated pieces. The grading shall conform to the following requirements:

Sieve Designation % Passing by Weight

Square Opening	1"	3/4"	3/8"	No. 4	No. 8
% Passing by Weight	100	96-100	20-55	0-10	0-5

- 3) Granular fill shall consist of hard, durable stone and coarse sand, free from frost, frozen lumps, loam and clay, well graded, and containing no stone having any dimension greater than 1 inch. The grading of sizes and material shall be such that the gravel may be thoroughly consolidated. The grading shall conform to the following requirements:

Sieve Designation % Passing Weight

Square Opening	3/4"	No. 4	No. 40	No. 200
% Passing by Weight	95-100	50-95	5-50	0-10

K. Pavement

Provide all materials in accordance with the applicable sections of the latest edition of the Standard Specification for Highways and Bridges of the New Hampshire Department of Transportation (D.O.T.).

- 1) AGGREGATE SUBBASE AND BASE - Division 700 - Material Details, Section 703 - Aggregates, Subsection 703.06 - type A and Type B for Aggregate Base.
- 2) BITUMINOUS TACK COAT - Provide AE90 Asphalt Emulsion Material, Division 700 Material Details, Section 702 Bituminous Material, Subsection 702.04 Emulsified Asphalts.
- 3) BITUMINOUS CONCRETE BINDER AND SURFACE COURSES – Division 700 Materials Details, Section 702 Bituminous Material and Section 703 Aggregates Subsection 703.09, Grading B and Grading C for roadways; Grading C and D for sidewalks, islands and drives.
- 4) SIDEWALKS (When Applicable): Division 700 Material Details and (When Applicable) Section 608 Sidewalks.

V. CONSTRUCTION METHODS

A. General

In unloading, storing, stacking and handling of pipe, fittings, valves or appurtenances, the contractor shall take special care to ensure that his methods are consistent with methods employed by the manufacturer in the manufacture and shipping of the product. Insofar as possible, all heavy materials shall be carefully handled by the use of hoists or skidways to avoid shock or damage. Pipe handled on skidways shall not be skidded or rolled against pipe already on the ground. It shall be the contractor's responsibility to inspect all shipments, and to replace or repair at his own expense any materials which have been damaged through his own negligence. Whenever possible, pipe shall be strung along the routes with the bell ends facing in the direction in which the work is to proceed.

B. Trench Evacuation

The contractor shall be responsible to excavate trench/trenches in a manner consistent with all safety requirements prescribed by OSHA and/or State regulations for the soil type(s) involved. However, The District does reserve the right to request trench adjustment (for safety reasons) prior to District Personnel performing in-trench inspections or tapping. Special care shall be taken to protect existing underground utilities and support the sides of the trench to prevent movement, to include the use of sheeting, shoring and bracing. The contractor shall also be required to do all dewatering of the trench which may be necessary to ensure that the trench bottom is firm and dry. If, in the opinion of the District, unsatisfactory soil conditions exist at the required trench grade, the contractor may be required to excavate below normal trench grade until suitable foundation material is encountered. The excavation shall then be backfilled with screened gravel in 6-inch layers. Each layer shall be properly tamped and compacted until normal trench grade is obtained. The contractor shall make such additional excavations as may be necessary to provide for proper placement of concrete thrust blocks, valves, hydrants, services and other appurtenances as shown on the plans or as required by the Water District.

C. Cover

All water main trenches shall be such that a minimum cover of 5 feet is provided over the pipe, except at gate valves where a minimum of 3 feet of cover shall be provided at the top of the valve bonnet. The maximum depth of cover shall be 7 feet unless approved otherwise by the District.

D. Bedding the Pipe and Fittings

All pipe and fittings shall be placed on a layer of bedding material consisting of compacted screened gravel or granular fill. The depth of the bedding shall be 6 inches minimum or equal to one half the diameter of the pipe whichever is greater. Any voids under the pipe shall be filled and thoroughly tamped.

E. Laying the Pipe and Fittings

The pipe shall be placed in the trench in accordance with the manufacturer's recommendations or by an approved method in such a manner as to ensure that the pipe is not damaged. All pipes shall be thoroughly sound, dry and clean, before laying and the utmost of care shall be taken to insure that its condition is not altered when it is placed on the bed. A watertight plug shall be installed once the pipe is in place to keep out ground water and dirt. All work associated with laying the pipe shall conform to AWWA Standard Specification C600-17 wherever applicable and not in conflict with the provisions contained in these specifications.

All ductile iron water main, fittings, valves and hydrants shall be polywrapped in accordance with one of the three recommended methods as outlined in AWWA C105. Methods A and B use polyethylene tubes, and method C uses polyethylene sheets.

When the pipe is in place, screened gravel or granular fill, whichever is applicable, shall be placed in the trench and thoroughly compacted in 6-inch lifts to 12 inches above the top of the pipe.

1. VALVES: The contractor shall install all valves and tapping sleeves and valves together with valve boxes, at the locations shown on the plans or as directed by the District. In general, valves shall be installed as close as possible to plumb and in accordance with the applicable subsections 4(c) and 4(d) of this article, and in accordance with the manufacturer's recommendations. Valve boxes shall be installed at every valve location and shall be adjusted to the proper finish grade and set plumb and centered over the operating nut of the valve. The contractor shall exercise special care that the valve box is free of dirt and other obstructions and that the base does not rest on the valve bonnet. An earth cushion shall be provided between the bonnet and the base. After installation is completed, all valves shall be operated and then left in the closed position.
2. TAPPING SLEEVES AND VALVES: Shall be installed with the outlet flange set vertically and the sleeve squarely centered on the main. Concrete or granite blocking shall be placed beneath the sleeve and valve to provide support. Concrete thrust blocking shall be placed behind and under the sleeve and valve after the tap is completed. The valve shall be flushed after completing the taps to ensure the valve seat is clean. Bituminous coating shall be applied to the bolts and nuts holding the sleeve together.
3. HYDRANTS: The hydrant shall be set plumb and at the proper elevation with respect to final finished grade. The break away flange shall be set two inches above finish grade. The hydrant base shall be set on fine material. The hydrant branch valve and hydrant tee shall be adequately anchored together by mechanical means (anchor tee) and by concrete thrust blocks. Hydrant locations shall be such that no part of the hydrant is within one foot of the curb line and no less than twenty feet from an intersecting street. The final location of the hydrant shall be approved by the District. Prior to any hydrant being tested under pressure, all hydrant laterals and mains shall be flushed to remove dirt, rocks, and foreign matter. Each nozzle and pumper outlet shall be at least 18 inches above grade on the installed hydrant. Steamer connection

shall face the traveled way. Each hydrant shall be provided with an approved gate valve at an easily accessible location, located off the traveled way. Hydrants shall be painted to meet District requirements for color.

F. Thrust Restraint

Concrete thrust blocks and joint restraint shall be installed at all bends, fittings, dead ends and hydrants as shown on the plans or as directed by the District. The bearing area of the thrust blocks shall be determined for each installation based on soil type and system design pressure. The thrust block shall be formed in such a way that as much of the undisturbed earth on the trench wall and bottom will be incorporated into the forming as is possible. In making both the forms and the pour, special care shall be taken to ensure that concrete is not poured in and around the joints of the pipes and fittings. Fittings and joints shall be wrapped in plastic prior to pouring concrete. In the event that other utilities or local conditions prohibit the use of thrust blocks, the contractor shall furnish and install additional mechanical thrust resisting devices, upon the approval of such devices by the District.

G. Service Connections

Services shall be constructed in accordance with the most recent revision of the BOCA, CABO, and International Plumbing Codes.

1. CORPORATION STOPS: The contractor shall furnish and install all corporation stops at the locations as shown on the plans or as directed by the District. A tapping machine shall be used which will permit tapping of water mains under pressure. The tapping machine shall be rigidly fastened to the pipe and the tap shall be made in the upper one-half of the pipe. The length of travel of the tap shall be so established that when the stop is inserted and tightened with a 14-inch wrench, not more than one to three threads will be exposed on the outside. When the wet tap is made, the corporation shall be inserted with the machine still in place.
2. COPPER TUBING: The contractor shall furnish and install copper tubing at the locations as shown on the plans or as directed by the District. Excavation for services shall be to a minimum depth of 5 feet and the contractor shall exercise special care to insure that the bottom is free from sharp rocks or ledge outcroppings. In placing the service in the trench, the contractor shall be careful that the copper tubing has no kinks or sharp bends and that the screened gravel (or granular fill) placed to a depth of six inches over and around the service is free from large or sharp stones which may come in contact with the service. Service lines shall be installed through a 4" PVC pipe when crossing under the roadway. Splicing or installation of union(s) on services will not be allowed between the main and the curb stop.

3. **PLASTIC TUBING:** The contractor has the option of installing plastic tubing for use as service from the curb stop to the building foundation. Excavation for services shall be to a minimum depth of 5 feet and the contractor shall exercise special care to insure that the bottom is free from sharp rocks or ledge outcroppings. In placing the service in the trench, the contractor shall be careful that the plastic tubing has no kinks or sharp bends and that the screened gravel (or granular fill) placed to a depth of six inches over and around the service is free from large or sharp stones which may come in contact with the service. Splicing or installation of union(s) on services will not be allowed between the curb stop and the house foundation. Stainless steel inserts are to be used on all compression fittings connected to plastic services. All plastic water tube installation must be accompanied by installation of a 10-gauge minimum copper clad steel wire (CCS) with thermoplastic insulation.
4. **CURB STOPS AND BOXES:** Curb stops and boxes shall be furnished and installed by the contractor where noted on the plans or as directed by the District. The contractor shall place compacted gravel around and below the curb stop. The curb box shall be set flush with the finish grade and at or near the property line.

H. Pressure and Leakage Testing

The Contractor shall furnish the necessary equipment and labor for carrying out a pressure test and leakage test, as specified in AWWA C600, on the completed pipes. The pressure and leakage test shall be conducted concurrently. Prior to leakage and chlorination, the mains shall be flushed to remove dirt and other foreign substances. Tests shall be performed in the presence of, and results witnessed by, the RWD Superintendent or his agent.

1. **LEAKAGE TEST:** (Refer to AWWA C600) All air in the pipeline to be tested shall be expelled.

The newly laid pipe shall be tested in valved or plugged sections as determined in the field. Water shall be slowly introduced by means of an approved power-driven pump. The pressure shall be raised to 150 PSI measured at the lowest point (if practical) of the section being tested as determined by RWD Superintendent; when reached, the time of test shall begin.

The duration of each leakage test shall be two hours, and during the test water will be introduced into the main by pumps. Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe to maintain pressure within 5 PSI of the test pressure.

Approved pressure gauge and flow meters shall be installed to indicate pressure in line and amount of water being introduced into the pipeline. Gauges must show that they have been calibrated within one year of testing.

No pipe installation will be accepted if the leakage is greater than that determined by the following formula (refer to AWWA C600-LR Section 5):

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

Where: L = allowable leakage, in gallons per hour
S = length of pipe tested, in feet
D = nominal diameter of pipe, in inches
P = average test pressure during the leakage test, in pounds per square inch (gauge).

At the end of the test period if the amount of water added to the main is less than the allowable leakage, and if no visible leaks or other failures, the portion of the main tested will be approved by the RWD Superintendent. If any test of pipe laid discloses leakage greater than that specified, the contractor shall, at his own expense, locate and repair the defective material until the leakage is within the specified allowance.

2. **DISINFECTION:** Following satisfactory pressure and leakage test, a newly installed main shall be disinfected by the contractor and under the direction of the RWD Superintendent. A modified "slug" method (AWWA C651-14) shall be used. The form of chlorine used for disinfection shall be liquid sodium hypochlorite. Common household bleach containing approximately 5% sodium hypochlorite (vol. %) or industrial bleach containing 15% sodium hypochlorite (vol. %) may be used. A concentration of approximately 50 mg/l free chlorine shall be achieved throughout the main, at which time the main shall be sealed off for a period of 24 hours. At the end of the retention period, sufficient residual chlorine (approximately 10 mg/l) as determined by the RWD Superintendent shall be present.

NOTE: The modification of the "slug" method (lower concentration hypochlorite, longer retention time) assures proper disinfection while reducing the amount of free chlorine discharge to the environment.

3. **FLUSHING:** Following disinfection the chlorinated water shall be flushed until the replacement water throughout the system is equal to the quality of the RWD water as determined by the RWD Superintendent. This flushing shall be done as soon as possible (within 24 hours of satisfactory disinfection) since prolonged exposure to highly chlorinated water might damage the asphalt seal coating of the pipe.

Additionally, the environment into which the heavily chlorinated water is to be discharged shall be inspected to assure discharge shall cause no damage to the environment.

4. SANITARY SAMPLING: After satisfactory flushing, samples of the new main shall be taken by the RWD Superintendent and submitted to a qualified laboratory for coliform testing. Two consecutive samples shall be taken at least 24 hours apart from each 1200 feet of new main. The new water main shall not be put in service until satisfactory sample results are achieved, as-built drawings and deed or certificate of title have been received by RWD. (See para III A.7)

VI. ELECTRIC POWER AND TELEPHONE LINES

Underground Electric and Telephone line installation shall NOT be installed in the same trench as the proposed or existing water main or service.

Wherever possible, the electric and telephone lines shall be installed on the opposite side of the street from the water main. However, if it is necessary to install underground power and telephone lines on the same side of the street as the water main, the approval of the RWD Commissioners shall be required.

Wherever the electric or telephone lines must cross either mains or service branches, the installation shall be in conduit encased in concrete. The concrete shall extend laterally for a minimum distance of five feet each side of the water installation.

If the lines are laid parallel to mains or service branches, including those between street shut-off and house, there must be a lateral separation of a minimum of six feet.

There shall be NO installation of any electric or telephone line within ten feet of a hydrant or house service street shut-off.

A. Warning Tape

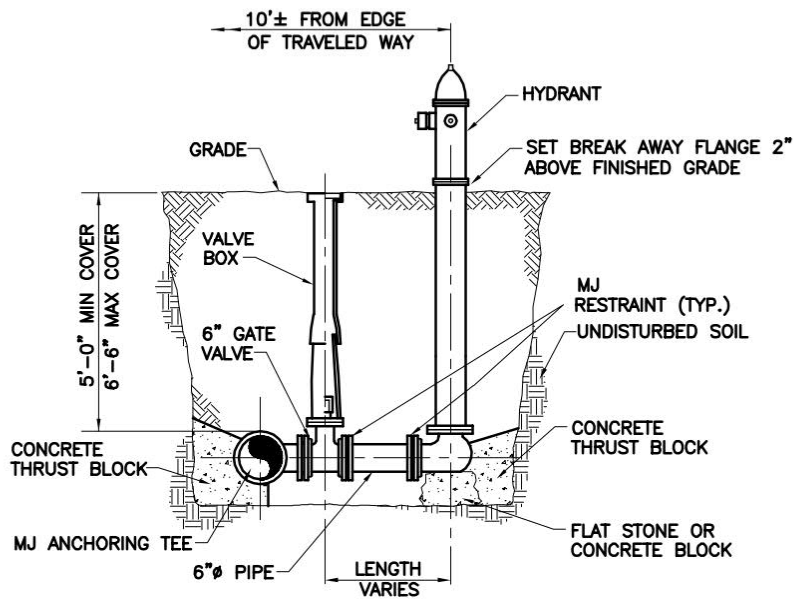
All water, electric, cable, and telephone lines must be marked with underground warning tape located a minimum of 1'-6" above the utility or as required by local utility.

B. Private Fire Protection

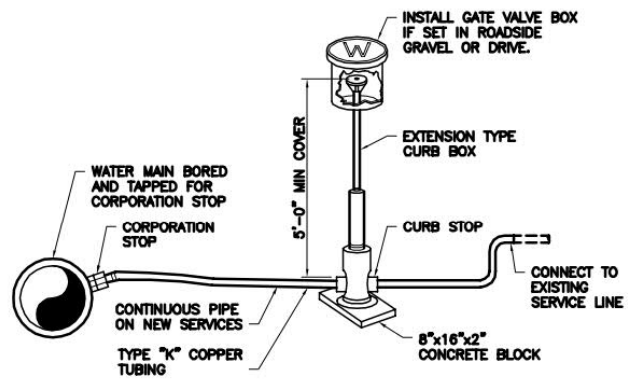
There shall be a separate pipe, valved on Municipal property (e.g. within roadway right-of-way), for private fire protection. In no case shall the fire service pipe be used for anything other than fire protection.

VII. ADDITIONAL REQUIREMENTS

Subdivision developer will be responsible for latent defects of the water line and materials for two (2) years after being deeded to the RWD.



HYDRANT CONNECTION
SCALE: NTS



NOTE: SERVICE SIZE
PER OWNER STANDARDS

WATER SERVICE CONNECTION

SCALE: NTS

KNOW ALL MEN BY THESE PRESENTS

That I, _____ of _____, Rockingham County and said State of New Hampshire, hereinafter called the "Grantor", for and in consideration of the sum of One Dollar (\$1.00) to it in hand before the delivery hereof well and truly paid by Rye Water District, a municipal corporation situate at 60 Sagamore Road, within the Town of Rye, in the county of Rockingham and State of New Hampshire, hereinafter called the "District", does hereby sell and convey unto said District, its successors and assigns, the perpetual and exclusive right and easement to enter upon and to repair, replace, maintain, operate, inspect and patrol and at its pleasure, remove a water pipeline already laid over, in and across _____, situate in said Rye, said land being more particularly described as follows:

It is agreed that said water pipeline shall be and remain the property of the District, its successor and assigns.

TO HAVE AND TO HOLD the same to said District, its successors and assigns, forever and the Grantor covenants and agrees that he has full right, title and authority to convey the foregoing rights and privileges and will defend the same against the claims or demands of all persons whomsoever.

IN WITNESS WHEREOF, I have hereunto set my hand and seal this ____ day of _____, 20____.

Singed, sealed and delivered
in the presence of

STATE OF NEW HAMPSHIRE
Rockingham, ss.

Personally appeared the above named _____ and acknowledged the foregoing to be his voluntary act and deed, before me.

Justice of the Peace/Notary Public

TITLE CERTIFICATE

This will certify that I, as attorney for the developer hereinafter mentioned, have made a careful examination of the records in Rockingham County Registry of Deeds and Registry of Probate insofar as they relate to the property of _____ as set forth in the Warranty Deed from _____ dated _____, 20____ and recorded in _____ County Registry of Deeds on _____, 20____ at _____ a.m./p.m. in Book _____ Page _____, and I further certify that the water system laid over and in said real estate is presently owned by the grantee/developer and that said grantee/developer is able, upon request of the Rye Water District, to deliver a good and sufficient deed to same to said District.

Attorney for the above developer

Date: _____

SIGN-OUT FORM
RYE WATER DISTRICT
REQUIREMENTS FOR NEW WATER MAIN INSTALLATIONS

I, _____, representing, _____,
have received a copy of the Rye Water District Requirements for new water main installations
dated _____.

Signature: _____

Date: _____

