

# **Town of Queensbury Water Department**

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## **Design & Construction Standards**

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# **I. PREFACE**

These Design and Construction Standards are intended to compile a complete listing of requirements for work on the transmission and distribution system of the Town of Queensbury Water Department.

It is required that all plans be approved and an application filed prior to the commencement of work on any project. **It is also necessary to file an application for any connection whether it is a 3/4" service or a 24" wet tap. A tax map number is required in order to complete a tap application for a water service.**

A Pre-Construction Meeting will be held so that any problems can be resolved or avoided once work is started.

All components shall consist of approved, unused materials.

Manufacturers recommended procedures shall be employed for handling, storage and installation.

If you have any questions regarding these standards, please contact the Town of Queensbury Water Department.

Operation of all curb valves, gate valves, and hydrants under pressure shall be done by duly designated employees of the Town of Queensbury Water Department.

All installation of water mains and appurtenances must be inspected by the Town of Queensbury Water Department prior to backfilling.

Inspections will be done during normal business hours of the Town of Queensbury Water Department.

No inspections will be made after hours, holidays, or weekends.

## **II. DESIGN AND CONSTRUCTION STANDARDS**

### **A1.0 General**

**A1.1** All components of the water system shall comply with the latest edition of the Recommended Standards for Water Works as adopted by the Great Lakes - Upper Mississippi River Board of State Public Health and Environmental Managers.

**A1.2** Waterlines, valves, and hydrants shall, in addition, meet the established Water System Design and Construction Standards of the Town of Queensbury Water Department.

The design shall insure that any additions to the water system can be constructed without interrupting normal service and/or decreasing fire flows.

All components shall be designed to provide present and future service as required by the Master Plan, Official Map, and Water System plan adopted by the Town of Queensbury.

### **A2.0 Water Mains**

#### **A2.1 Material - Class**

Pipe and fittings shall be cement lined and bituminous seal coated with a rated working pressure of 250 pounds per square inch (psi). Ductile iron and pipe shall be a minimum of class 52 unless otherwise specified by the Queensbury Water Department. Pipe shall be manufactured in accordance with AWWA Specification C150 and C151, by one of the well-known and established manufacturers such as Griffin Pipe Company, United States Pipe and Foundry, Atlantic States Pipe Company or equal.

The pipe shall be in nominal 18 – 20 foot laying lengths. Joints shall be push on type conforming to the latest revision of AWWA specification C111.

#### **A2.2 Polyethylene Encasement**

In all instances where soil conditions are suspected by the Queensbury Water Department to be corrosive, the pipe, valves and fittings shall be wrapped in 8 mil polyethylene tubes or sheets. Polyethylene encasement shall comply with the latest revision of AWWA specification C105/A21.5.

Ductile Iron Pipe (DIP) installed east of I-87 shall be encased in the previously stated polyethylene sleeve (poly wrap). DIP installed west of I-87 shall be encased in the polyethylene sleeve at the discretion of the Town of Queensbury Water Department's engineers.

### **A2.3 Size**

Main size shall be as required by the Town of Queensbury in accordance with water district plans with no main less than six inch diameter except for private fire sprinklers and service lines.

### **A2.4 Dead End Mains**

Dead end mains shall be avoided whenever feasible. When dead end mains are permitted, a hydrant shall be installed at the terminating end to allow flushing.

### **A2.5 Depth of Bury**

Pipe shall be installed with a minimum of 5 ½ feet of cover and a maximum of six feet of cover below final grade unless otherwise approved by the Queensbury Water Department.

Pipe shall be installed six feet from the property line unless otherwise specified.

### **A2.6 Installation**

Pipe and accessories shall be handled in such a manner as to insure delivery on the work site in a sound, undamaged condition.

Particular care shall be taken not to damage pipe coating. Suitable slings shall be used in loading, unloading, and installation of pipe.

Before being lowered into the trench, all sections of pipe shall be inspected for defects. Defective, damaged, or unsound pipe shall be rejected and removed from the work site.

Deflections from a straight line or grade, as required by vertical curves, horizontal curves or offsets, shall not exceed that recommended by the appropriate specifications or, if not specified, then by the manufacturers recommendations. If the alignment requires deflectors in excess of these limitations, special bends shall be used.

All fittings and valves shall be installed as the pipe is installed. The installation of fittings and valves after installation of pipe will not be allowed unless approved by the Water Department.

Before joining, all lumps, blisters, excess coating material, oil and grease that will interfere with proper joining shall be removed from the ends of all pipes.

The full length of each section of pipe shall rest solidly upon the pipe bed, with adequate recesses excavated for the bells and joints. In no case should brass wedges be used without Water Department Superintendent approval.

The interior of the pipe shall be thoroughly cleaned of all foreign material before being placed in the trench and shall be kept clean during the installation operations by means of plugs or other methods approved by the Town of Queensbury Water Department.

The pipe shall not be laid in water or when trench conditions are unsuitable for the work, except by permission of the Water Department. Water shall be kept out of the trench by use of pumps or other suitable means until the joints have been completed.

When work is not in progress, open ends of the pipe shall be securely closed so that no trench water, earth, or other substances will enter the pipe or fittings. Any section of pipe found to be defective before or after laying shall be replaced with new pipe.

All joints shall be made in accordance with the manufacturer's recommendations.

### **A3.0 Valves**

#### **A3.1 Material – Class**

Valves shall be mechanical joint resilient wedge type with "O" ring packing and shall be in full conformance with the latest AWWA C-500 specification for "Valves for Water Supply Service".

All valves shall open by turning to the right (clockwise) and have a 2-inch square-operating nut painted red.

All valves shall be in full accordance with the standards of the Queensbury Water Department and shall be of Mueller, Eddy (Clow), Kennedy, American AVK or Waterous manufacturer.

Valves shall be installed on every branch of an intersection and at every stub provided for future expansion.

Valves installed on future expansion stubs shall be secured to allow extension of the water main without interruption of service.

Line valves shall be installed at intersections or adjacent to fire hydrants.

Line valves shall be installed at a distance of not more than 1200 feet unless otherwise approved by the Queensbury Water Department.

Valve boxes shall be installed on all valves.

Valve boxes shall be installed in such a manner that no shock or stress will be transmitted through the valve box to the valve. Valve boxes shall be installed with the operating nut in the center to insure easy operation of the valve. Each valve box section shall slide over the top of the preceding section.

Valves shall be set with the stems vertical. After valves have been installed and adjusted, they shall be tested for operation under maximum operating pressure, shall be water tight, and shall operate easily. All valves, upon completion of work, shall be checked to determine that they are in closed position.

Accessories to include ductile iron glands, "Blue" bolts and nuts, and plain-backed rubber gaskets with required joint lubricant.

#### **A4.0 Valve Boxes**

##### **A4.1 Material – Class**

The valve boxes shall be a minimum of two-piece cast iron, telescopic or sliding type of proper length for actual trench depth. Valve Box covers shall be cast iron and shall fit flush with the outside casting rim, shall not rattle or rack under traffic and shall be capable of removal with a bar or pick. Each cover face shall be lettered “Water”.

If a middle section is necessary to adjust the valve box to proper elevation, the middle section should slide over the bottom section and the top section slide over the middle section.

An inspection shall be made of each valve and valve box prior to acceptance of the work and, if needed, the valve and/or valve box shall be adjusted to meet requirements and that the top of valve box is flush with finished grade. Valve boxes should be installed so that they are flush with surrounding areas. The area should not be “dished” out to avoid installing any necessary extensions. Valve box risers may not be used in non-paved areas. The valve box should be dug up and either raised or a middle section added.

#### **A5.0 Hydrants**

##### **A5.1 Material – Class**

The hydrants shall be manufactured by Eddy or Mueller and shall be break flange, true traffic type hydrants of the compression type.

Fire hydrants shall be in accordance with the latest AWWA Specification C-502 “Fire Hydrants for Ordinary Water Works Service”. Each hydrant shall be equipped with two 2 ½ inch NST thread nozzles, one 4 ½ inch pumper nozzle NST thread and 1 ½ inch pentagon operation nut and nozzle caps. All hydrants shall open by turning to the right or clockwise. An arrow indicating the direction for opening shall be cast on the head of the hydrant. The hydrants shall otherwise meet the requirements of the Town of Queensbury.

All hydrants shall have a six inch mechanical joint connection and a minimum valve opening of five inches.

Accessories to include ductile iron glands, “blue” bolts and nuts, and plain-backed rubber gaskets with required joint lubricant.

After the installation of a new hydrant or after repair, a heavy duty red and white fiberglass hydrant marker with an L bracket shall be installed. The marker shall be a minimum of 4’ long.

Please refer to the attached illustrations for Hydrant Installation details.

Hydrants shall be located in general a distance of 800 feet apart and in no case shall exceed 1000 feet measured along the street. Hydrants shall be installed on property lines and at the edge of the right of way unless otherwise pre-approved.

The hydrants furnished shall have a minimum trench length of 5 ½ feet from the ground line to the **top** of the six inch mechanical joint bell connection. The centerline of the pumper connection shall be a



minimum of 18 inches from the ground line. Hydrants must also be a minimum bury depth of six feet.

Hydrants may not be used to provide water for any construction purpose. Water is available for purchase at the Town of Queensbury Water Treatment Plant.

Hydrants shall be located as shown or as directed and in a manner to provide complete accessibility and also in such a manner that the possibility of damage from vehicles or injury to pedestrians will be minimized.

## **A5.2 Installation**

In general, hydrants will be installed on the same side of the street as the water main and as close to the property line as possible.

The laterals between the water main and the hydrant will be of six inch ductile iron pipe (DIP) and installed with a valve.

Hydrants shall be installed with the use of approved anchor fittings or Megalug restraints.

Hydrants shall stand plumb and shall be set to established grades with the bottom of pumper nozzle at least 18 inches above finished grade. When installing hydrants the final grade shall not create a “bowl” that will accumulate water and make the hydrant inaccessible during winter periods. A hydrant riser shall be used to bring the hydrant to the proper elevation.

Where hydrants are set in clay or impervious soil, drainage pits 2 feet in diameter and 3 feet deep shall be excavated below such hydrants and filled completely with crushed stone. The stone shall be placed around and under the hydrant bowl and to a height of 6 inches above the drain opening.

Hydrant nozzles shall face in a direction satisfactory to the Town of Queensbury Water Department. Any work done on a hydrant that needs the direction rotated or height adjusted shall be performed under the supervision of Town of Queensbury Water Department personnel, so they can verify that it is in satisfactory working order.

All Fire Flow tests need to be scheduled and coordinated with the Town of Queensbury Water Department. The contractor shall provide protection for roads and grassed areas during testing and repair any damaged areas after completion of all tests.

Hydrants shall be painted red with white tops in accordance with Town of Queensbury Water Department standards prior to final acceptance.

## **A6.0 Fittings**

### **A6.1 Materials – Class**

Cast iron/ductile iron fittings shall be standardized, mechanical joint, short body fittings (except for long body solid sleeves) for 250 psi water pressure, plus water hammer. “Blue” bolts shall be used on all buried mechanical joints.

Fittings shall be manufactured in full accordance with the latest AWWA C110 specifications for short body fittings and C111 for mechanical joints.

The cement mortar lining on the inside of the fittings shall be of the same thickness as is specified for the corresponding size of ductile iron pipe (DIP).

The contractor may, with Water Department approval, use push-on joint fittings in place of mechanical joint fittings.

If it becomes necessary to connect 2 pieces of plain end pipe a ductile iron mechanical joint long body solid sleeve or Romac Micro HD Sleeve (sizes 4"-12") can be used.

All tee connections, bends, and dead ends shall be securely anchored in place by means of Megalug restraints or Stargrip, anchor fittings, field locking gaskets, or concrete thrust blocks resting against undisturbed soil unless otherwise approved by the Water Department.

All bolts and nuts shall be kept free from concrete thrust blocks.

#### **A7.0 Carrier Pipes**

Carrier pipe size and material must be approved by the Water Department Superintendent prior to construction.

#### **A8.0 Tapping Sleeve**

##### **A8.1 Material – Class**

Tapping sleeves being placed on water mains can be either full body mechanical joint ductile iron or stainless steel full wrap around Mueller H-304 series (rated no less than 200 psi), or equal. If stainless steel tapping sleeves are being installed, all bolts must be tightened with a torque wrench to manufacturer's recommendations.

All wet taps shall be made by a wet tapping contractor approved by the Town of Queensbury Water Department. Contact the Queensbury Water Department for the latest list.

The tapping sleeve and valve must be installed and tested by the wet tapping contractor prior to making the wet tap. This installation and tests will be inspected and approved by the Town of Queensbury Water Department. This test will be conducted at 1 ½ times the water system pressure with a minimum of 150 psi and shall not exceed the maximum working pressure rating of the sleeve and valve.

The minimum working pressure for all sleeves is to be 200 pounds per square inch.

#### **A9.0 Services**

##### **A9.1 Materials – Class**

Services shall be ¾", 1", 1-1/2", or 2" inside diameter and shall be of K copper, annealed after coiling, conforming to the requirements of the latest ASTM Designation B-88, installed at a minimum depth of five feet on private property and minimum of six feet within the Town of Queensbury right of way. Curb boxes should be installed at the edge of the right of way.

For ¾ inch and one inch services the curb stop shall be quarter turn with check, solid tee head inlet and outlet conductive compression for type K copper service pipe for ¾ inch and one inch curb stop in compliance with the latest revision of AWWA Specification C800, Mueller 300 Ball Curb valve (B-25209) with full round port opening or equal.

For 1 ½ inch and two inch services the curb stop shall be quarter turn with check, solid tee head inlet and outlet compression or flare for type K copper service pipe for 1 ½ inch and two inch curb stop in compliance with the latest revision of AWWA Specification C800, Mueller 300 ball curb valve (B25204) with full round port opening or equal.

Corporation stops shall be Mueller (B-25008) or equal, inlet CC thread and outlet conductive compression connection for type K copper service pipe for ¾ inch and one inch. The outlet for 1½ inch and two inch should be compression or flare.

Curb boxes conform to the following specifications:

- Curb boxes that are ¾ inch and one inch curb stops are required to be extension type curb boxes with an arch pattern base with two-hole lid. Lid should be Mueller 89982, extension range 72 inches. Mueller H-10314 or equal.
- Curb boxes with 1 ½ inch and two inch curb stops should be extension type curb boxes with arch pattern base with lid. The lid should be Mueller 89990, extension range 72 inches. Mueller H10386-or equal.

The rod shall be stainless steel with a 5/8 inch diameter and be 48 inches to 54 long.

Three part unions for connecting copper service lines shall be either flare or Mueller type compression for ¾ inch and one inch curb boxes and must be flare type for 1 ½ inch and two inch curb boxes.

When 1-½ inch and two inch service saddles are needed to install corporation stops, double stainless steel strap, epoxy coated ductile iron or bronze saddles shall be used.

Whenever it is necessary to connect two pieces of copper together for a water service, they should be connected by a three part union (Mueller H-15403, or equal). No soldered connections are allowed below grade.

Stop and Waste valves are not permitted. The curb stop valves do not drain when turned off.

A water service for each lot must be installed prior to acceptance by the Town of Queensbury.

All service connections on existing water mains shall be made by duly designated employees of the Town of Queensbury Water Department. Service connections on newly installed water lines shall be made by the project developer. As-built drawings shall clearly indicate the location of the corporation stop, curb stop, and curb box and location of copper service in relation to corporation stop. The depth of service line should also be indicated for each line. All components of a service connection shall be installed in a manner as seen in the attached Illustration III.

Installation of service tubing shall be at a minimum depth of six feet below the finished grade within the right of way and a minimum of five feet on private property. The tubing shall be attached to the corporation and curb stop in an approved manner. Curb boxes shall be installed at the edge of the right of way.

An inspection of each installation shall be made by the Town of Queensbury Water Department prior to backfilling.

The Town of Queensbury Water Department will make a tap on an existing town road. Contractors will perform a tap on a new road not yet adopted by the town. All curb boxes are the responsibility of the contractor until the water meter is installed and the water is turned on by the Town of Queensbury Water Department.

Private curb boxes will not be operated by the Queensbury Water Department unless a release form is signed by the owner and Water Department Superintendent.

## **A10.0 Meters**

### **A10.1 Materials – Class**

All meters shall be manufactured by Badger meters and be *Orion* radio read style.

For  $\frac{3}{4}$ " and 1" meter installations install a minimum of 12 inches of copper coming out of the pressure reducing valve.

Residential (Single Family Units) – One curb box, one meter.

Residential (Townhomes and Condominiums) – One curb box, one meter for each unit. The sharing of services is prohibited.

Residential (Apartment Complex) – One curb box, one master meter per building.

Commercial (Office space) – One curb box, no more than two meters (this includes the dedicated meter).

Commercial (Strip mall) – One curb box, one master meter.

All meters two inches or less are included in the service connection fee and the Queensbury Water Department shall provide or install and maintain them.

A shut off ball valve before all meters is required. Services 1" or larger shall have a shut off valve before and after the meter.

Temporary meters are not permitted.

Hydrant meters are available for projects of public benefit that will use water from a Queensbury Water District hydrant. The hydrant meters shall be issued by the Queensbury Water Department.

Water used from a private hydrant for purposes other than firefighting require the use of a Queensbury Water Department issued hydrant meter and backflow preventer.

Meters larger than two inches may be purchased from the Town of Queensbury Water Department, installed by the developer/contractor, and inspected by the Town of Queensbury Water Department prior to turn on.

A shut off ball valve is required on all services prior to the meter installation.

The first main shut off valve shall be installed approximately 6” away from the wall where it enters the residential structure of an unfinished basement.

The first main shut off valve shall be installed approximately 6” away from the wall and approximately 18” above the floor where it enters the residential structure on a slab, or at the discretion of the Queensbury Water Department. This policy excludes mobile homes and commercial structures.

In the case of a mobile home, the first main shut of valve shall be installed approximately 6” to 12” away from the edge of the mobile home underneath and behind the skirting or at the discretion of the Queensbury Water Department.

In some locations a pressure reducing valve (PRV) is required. Check with our offices to determine exact locations. The pressure reducing valve (PRV) is to be installed upstream of the meter. These are not maintained by the Queensbury Water Department.

Meter pits should be installed approximately two feet from the curb box on private property or at the discretion of the Queensbury Water Department.

Pressure-reducing valves (PRV) are recommended inside of the structure if they have a Mueller Coil Meter Pit. A pressure-reducing valve will not fit inside this specific meter pit.

Strainers are required on two inch and larger meters unless a strainer is built into the meter. Verify with the Queensbury Water Department if a strainer is required.

Large taps with a meter must be protected by installing a strainer. The strainer is to be tight to the meter (attached at the flange) and with a length of five pipe diameters (straight run) before the strainer.

#### **A11.0 Indoor Plumbing**

Sweat, or solder, is recommended for inside valves, but is not required. Compression must be performed in an approved manner. Compression valve – Shark bite is approved.

#### **A12.0 Shopping Centers, Apartment Complexes, and Large Services**

No large service can serve more than two water meters. Each meter must have its own shut off valve and pressure-reducing valve (PRV). The water bill for all accounts will be sent to the property owner. Should the owner require more than two meters, a master meter will be installed at the owner’s expense and the owner may install, at his own expense, sub meters that he may use to bill his tenants. The Queensbury Water Department has no responsibility or involvement in the installation or maintenance of these sub meters. No water bills will be generated from any readings from these sub meters by the Queensbury Water

Department.

Any service that has a master meter must be installed in an approved manner. Such meter shall be in accordance with the Queensbury Water Department specifications and shall become the property of the Town.

Individual buildings within such complexes shall be provided with standard curb stops located outside the building for emergency use.

Large taps require plans submitted to the Town of Queensbury Water Department. A sketch of the design is accepted, but it is recommended to have the engineer involved and to submit plans. Please refer to A17.0.

Large taps with a meter must be protected by installing a strainer. The strainer is to be tight to the meter (attached at the flange) and with a length of five pipe diameters (straight run) before the strainer.

### **A13.0 Fire Systems**

Piping that only supplies a fire sprinkler system shall not be metered.

Any fire sprinkler system that only is supplied water from the Queensbury Water Department must have a check valve installed to isolate the fire system.

Any fire sprinkler system that has the capability of being supplied water from the Queensbury Water Department and another potable source must have a double-check valve installed to isolate the fire system.

Any fire sprinkler system that has any additive to prevent freezing or corrosion or connected to a non-potable source must have RPZ (Reduced-Pressure Zone) backflow prevention installed to isolate the fire system.

Twenty-four hour notice is required to the Queensbury Water Department before testing for Hydrant Fire flow.

The contractor shall supply all equipment and materials required for testing hydrant fire flow.

If required, the contractor shall be responsible for all clean up related to testing the hydrants fire flow.

### **A14.0 Water & Sewer Lines Separation**

Water and sewer lines shall be separated to comply with the New York State Department of Health regulations.

### **A15.0 Water & Storm Drainage Separation**

A minimum of three feet horizontal and twelve inch vertical separation shall be maintained between any component of the storm drainage system and the water line. Sufficient polystyrene foam insulation with a minimum R-Value of 10 must be added to protect the water line from freezing.

#### **A16.0 Right of Way**

The installation of water mains and appurtenances which will become a part of the municipal water system must be installed within the boundaries of land to be dedicated to the Town of Queensbury. Easements will be required for water mains and apparatuses outside of the Town of Queensbury borders.

#### **A17.0 Plans**

The developer and/or engineer shall provide the Town of Queensbury Water Department with a complete set of plans showing the plan and profile of the water mains and appurtenances, finished grade of road plan, location of drainage facilities in relation to water mains, polyethylene encasement if necessary, and any special bedding requirements.

These plans shall be approved by the Town of Queensbury Water Superintendent and shall be the same plans used by the contractor in construction of the water mains and appurtenances.

The contractor and/or engineer shall have a set of approved construction plans on site at all times during construction.

Failure to have approved plans on site will cause the work to stop until a copy of the approved plans are on site.

Large taps require plans submitted to the Town of Queensbury Water Department. A sketch of the design is accepted, but it is recommended to have the engineer involved and to submit plans.

#### **A18.0 Control**

It shall be the responsibility of the developer and his contractor/engineer to determine property lines, establish center line of pipe and grade of pipe.

The developer, his contractor and/or engineer shall establish, set and maintain all necessary control stakes showing:

1. Finish grade of center line of the right of way.
2. Center line of the right of way.
3. Location of any fittings, valves or hydrants.

#### **A19.0 Excavation**

Please refer to the attached illustrations for typical Ditch Sections and excavation details.

All necessary arrangements shall be made by the developer, his contractor and/or engineer with all persons, firms, or corporations using any poles, pipes, tracks, conduits, or other facilities affected by his construction to maintain and protect such facilities during construction.

In the event any existing gas mains, water mains, conduits, sewers, services, drains, poles or any

other such facilities are blocked or interfered with by the excavation required, the developer and/or his contractor shall maintain said facilities in continuous operation and restore said facilities to the same condition as they were prior to the start of construction.

Sidewalks and pavements shall be in no case blocked or obstructed by excavated material except with prior approval of the Town of Queensbury and then only when adequate provisions have been made for a satisfactory temporary passage of vehicles and pedestrians.

Adequate bridging and planked crossings must be provided and maintained across all open trenches for pedestrians and vehicles when so ordered by the Town of Queensbury.

Sufficient barriers, flagman, watchman, signs, lights, and/or flares shall be provided and maintained by the developer and/or his contractor at all trenches, excavations, obstructions, and embankments as required by the Town of Queensbury.

The excavation of the trench shall not advance more than 200 feet ahead of the pipe installation except where it is necessary to drain wet ground.

The width of the trench in which pipe is to be installed shall be such as to provide adequate space for workmen to place and join the pipe properly and shall be in accordance with the following:

Maximum Trench Widths

<u>Pipe Size</u>	<u>Trench Width</u>
8"-12"	36"
15"-18"	36"
21"-27"	OD + 18"
30"-36"	OD + 24"

NOTE: OD is outside diameter of pipe.

Trench bottoms shall conform to the type of bedding specified for the project.

## **A20.0 Sheeting**

The developer and/or his contractor shall install such additional sheeting and bracing as may be required by Occupational Safety and Health Administration (OSHA), the State of New York Department of Labor, by adverse soil conditions, or by the Town of Queensbury but compliance with such orders or failure on the part of the Town of Queensbury to exercise its right to give such order shall in no way release the developer, his contractor, and/or engineer from liability for damages caused by weak or insufficient sheeting nor from his responsibility to protect the work and adjacent property.

Voids appearing outside the sheeting shall be immediately filled and compacted with suitable material to the satisfaction of the Town.

All sheeting and bracing shall be in accordance with the Industrial Code Rule No. 23 of the State of New York Department of Labor, Board of Standards and Appeals or any applicable OSHA standards.



Where excavations are open and in the opinion of the Town of Queensbury, the materials in place are not adequate for structure stability of the completed work, the Town of Queensbury may order the developer, his engineer, and/or contractor to carry the excavation to an additional depth, furnish, and place concrete cradles, sand, or gravel fill and/or timber and piling foundations.

#### **A21.0 Rock Excavation**

Excavation and trenches in rock shall be carried to a distance no less than twelve inches below the pipe bottom and twelve inches on each side of the pipe, and shall be made by any acceptable method, including use of explosives.

When blasting is necessary, it shall be done by contractors experienced and licensed and insured to do such work. All blast shall be well covered, and provisions made to protect pipes, conduits, sewers, structures, persons, and property adjacent to the site of the work. Prior to the blast, all persons in the vicinity shall be given ample warning as required by the governing authority.

Blasting will not be permitted between the hours of 6:30 p.m. and 6:30 a.m. except with special permission, nor within 25 feet of the completed work.

All handling and use of explosives shall be in accordance with Industrial Code Rules No. 23 and 39 of the New York State Department of Labor, Board of Standards and Appeals, and Article 16 of the New York State Labor Law or the latest revisions thereof.

#### **A22.0 Bedding**

Please refer to the attached illustrations for Ditch Sections and Bedding details.

The class of bedding to be used shall be specified in the final submission drawings. There shall be excavation for bells and flanges in all classes of bedding. Bedding for pipe shall conform to one or more of the following:

a. First Class Bedding (Whenever existing bedding is acceptable)

First class bedding is the method of laying pipe in which the pipe is carefully bedded in compacted granular materials placed on a flat trench bottom. The granular material shall be crushed stone, pea gravel or sand and maximum particle size shall be  $\frac{3}{4}$  inch. The depth of the granular bedding below the bottom of the pipe shall be no less than twelve inches below the pipe bottom and shall extend to a point four inches over the top of the pipe. If mechanically tamped, material may be placed in six inch layers; three inch layers if tamped by hand. If a clean, dry free flowing sand is used, no compaction will be required.

#### **A23.0 Backfilling**

Please refer to the attached illustrations for Ditch Sections and Bedding details.

The trench and other excavations above pipe grade shall be refilled carefully and as soon as

possible after approval has been given. No portion of a trench or other excavation shall be backfilled until the structure contained in it has been examined and approved. When so ordered by the Town of Queensbury Water Department, trenches and other excavations containing unfinished work shall be filled in and the roadways and sidewalks left unobstructed with their surfaces in a safe and satisfactory condition.

Backfilling shall be done with due care to avoid injury to the pipe or alignment. Suitable material approved by the Town of Queensbury Water Department shall be placed evenly and carefully around and over the pipe in layers consisting of a maximum of six inches. Each layer shall be thoroughly and carefully rammed until one foot of cover exists over pipe. Additional suitable material shall be used to completely fill the ditch.

#### **A24.0 Trench within Highway Right of Way**

Trench shall be backfilled to comply with Highway Permit requirements.

Each layer shall be compacted to a density equal to that of adjacent material so that pavement can be placed immediately.

#### **A25.0 Replacing Pavements**

Pavement replacement shall be to the satisfaction of the agency having jurisdiction.

#### **A26.0 Clean-Up**

The contractor shall clean up and dispose of all excess material, trash, and other debris.

#### **A27.0 Thrust Blocking**

Please refer to the attached illustrations for Thrust Blocking details.

Poured concrete thrust blocking shall be provided at all dead ends, bends, and tees as required by the Town of Queensbury Water.

All bolts and nuts shall be kept free from concrete thrust blocks.

In the case of a fire line going into a building, this piping and attaching appurtenances subjected to system working pressure shall be hydrostatically tested at 200psi or 50psi in excess of the system working pressure, whichever is greater, and shall maintain that pressure is within 5psi of the pressure for two hours. Please refer to the NYS Fire Code Book 10.10.2.2.1 for further clarification.

#### **A28.0 Testing and Disinfection**

Please refer to the attached illustrations for Disinfection Guidelines.

All water mains will be pressure tested in compliance with AWWA C600 by the contractor and certified by his engineer. This test will be at 1 ½ times the water system pressure with a minimum

pressure of 150 psi and shall not exceed the maximum rated capacity of the pipe or fittings attached.

Certification of the pressure testing will be supplied to the Town of Queensbury Water Department prior to disinfection.

Disinfection with conformance with AWWA C651 will be the responsibility of the contractor. The cost of all tests and disinfection will be borne by the contractor and/or developer. The contractor and /or developer shall coordinate and schedule their testing and disinfection with the Town of Queensbury Water Department.

Contractor is to consult with Department of Health office on bacteriological testing requirements. Copies of the bacteriological test results shall be furnished to the Queensbury Water Department.

The contractor shall restore disturbed earth and/or pavement at his cost.

All corporation stops that were installed solely for the purpose of testing or disinfection will be removed at the completion of those tests. They will be replaced with the appropriate plug and inspected by the Town of Queensbury Water Department.

### **III. APPROVALS – MAINTENANCE RESPONSIBILITY**

## **B1.0 Approvals**

All completed work must be approved by the Town of Queensbury Water Department prior to dedication to the Town of Queensbury.

## **B2.0 Completed Work Approval**

The developer and/or his engineer shall provide one set of completed plans including plan and profile (as-built plans) to the Water Department prior to issuance of completed work approval. The as-built plans should include tie in measurements for each curb box. These plans shall be submitted in both digital (autocad.dwg) compatible format and one paper copy.

## **B3.0 Maintenance Responsibility**

The developer and/or his contractor shall be responsible for the maintenance of the water mains and appurtenances (hydrant(s), valve boxes, etc.) and guarantee all material and workmanship for a period of one year after the date of written acceptance by the Town of Queensbury Water Department and the Queensbury Town Board.

The developer/property owner shall be responsible for maintenance of the curb boxes until the water service account is activated. Any damages that occur during the period between installation of the service and account activation are the developer's responsibility. This applies to both labor and materials to make repairs or adjustments.

Maintenance on private water lines from the valve to the building is the responsibility of the owner. The Town of Queensbury Water Department is responsible for the maintenance of the valve after the one year guarantee period.

## **IV. ILLUSTRATIONS**

Thrust Block (Typical) – Illustration I

Rodded Thrust Restraint – Illustration II

Ditch Sections (Typical) – Illustration III

Detail of Hydrant Installation (Typical) – Illustration IV

Disinfection Guidelines – Illustration V

Meter Pit Details for 3/4" to 1" – Illustration VI

Meter Pit Details for 1-1/2" – 2" – Illustration VII

Meter Pit Details for 4"+ – Illustration VIII

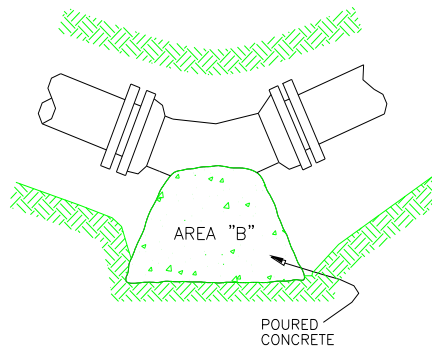
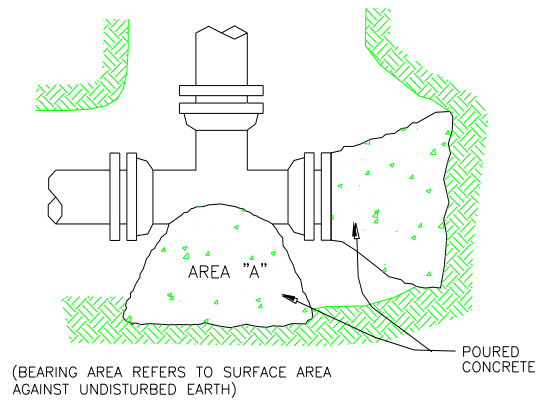
Installation Detail of Two Meters from One Service – Illustration IX

Installation Detail of a Dedicated Meter – Illustration X

Water Meter Detail – Illustration XI

## **Thrust Block (Typical)** **(Illustration #I)**

THRUST BLOCK DETAILS  
(ILLUSTRATION #I)



CONCRETE THRUST BLOCK AREAS  
(IN SQUARE FEET)

SIZE OF PIPE	BEARING AREA IN SQUARE FEET	
	TEES, 90° BENDS & HYDRANTS AREA "A"	45° & 22 1/2° BENDS AREA "B"
4" & 6"	3	2
8"	3	2
10"	4	2
12"	5	3
16"	8	4
20"	12	6
24"	16	8

**NOTE:**

BASED ON 150 PSI INTERNAL PIPE & 4000 +/- ALLOWABLE SOIL BEARING PRESSURE. SPECIAL THRUST & REACTION BLOCKS WILL BE REQUIRED IN SOFT SAND, CLAY OR RECENTLY PLACED FILL.

## **Rodded Thrust Restraint** **(Illustration #II)**

### **USING THREADED ROD & EYE BOLTS OR DUC LUGS**

Assumptions: A36 Steel, F.S. 1.5, Maximum Load 7,500#/Restraint, 225 PSI Pressure

<b>Dia.</b>	<b>Area of Pipe</b>	<b>End Cap<sup>1</sup> Total Load</b>	<b>90° Bend<sup>2</sup> Total Load</b>	<b># ¾" Rod Less Than 90°</b>	<b># ¾" Rod 90° Bend</b>
6"	37.3	8393#	11,868	2	2
8"	64.3	14,468#	20,458	2	4
10"	96.7	21,758#	30,766	4	6
12"	136.8	30,780#	43,523	6	6
16"	237.7	53,483#	75,625	8	12
20"	366.4	82,440#	116,570	12	16
24"	522.7	117,608#	166,298	16	24

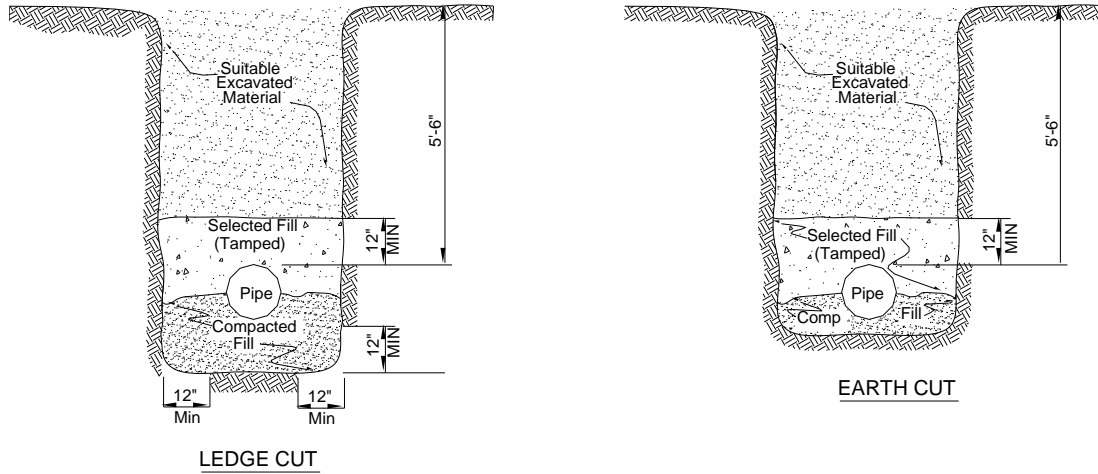
\* Allowable load for ¾" A36 Rod = 10,500#  
 Allowable load for duc lug or eye bolt = 7,500#  
 Duc lug controls

\* FS = 1.5

1. Loads shown are for an end cap or plug.
2. Worst case is 90° bend which is 1.414 times the product of the pressure and the area.

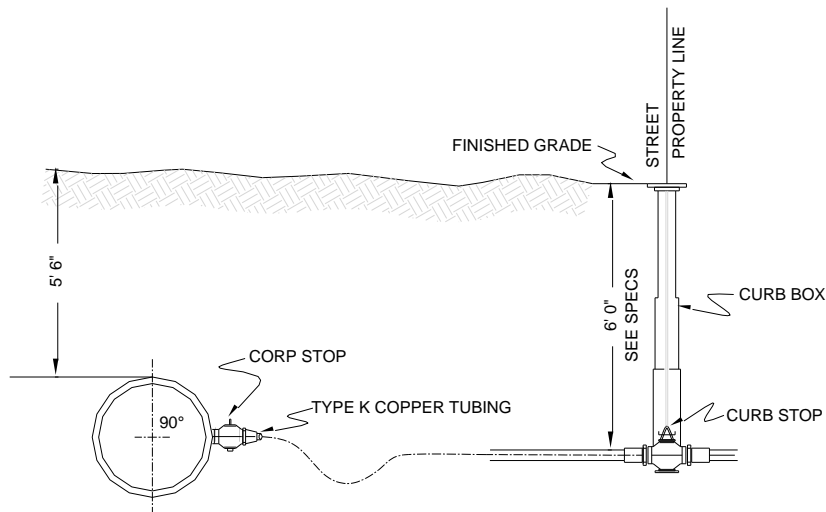
## Excavation Sections (Typical)

### Illustration III



## SERVICE CONNECTION DETAILS

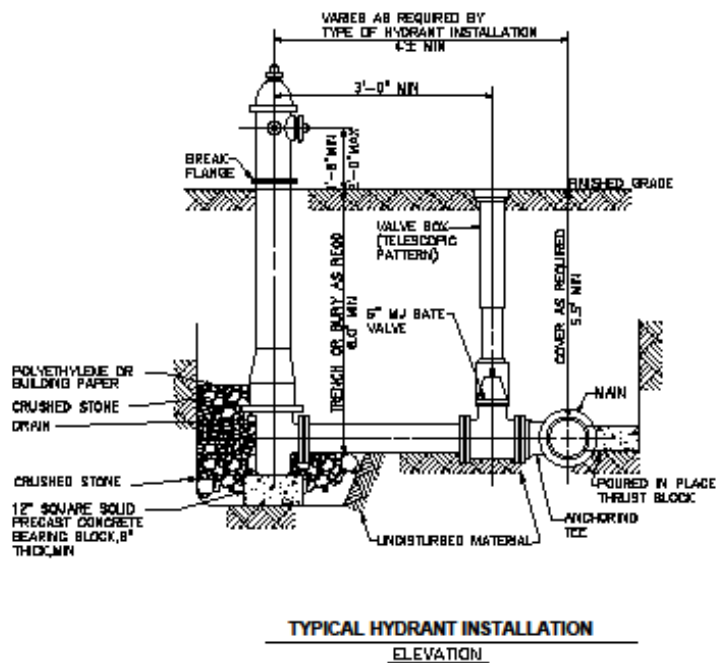
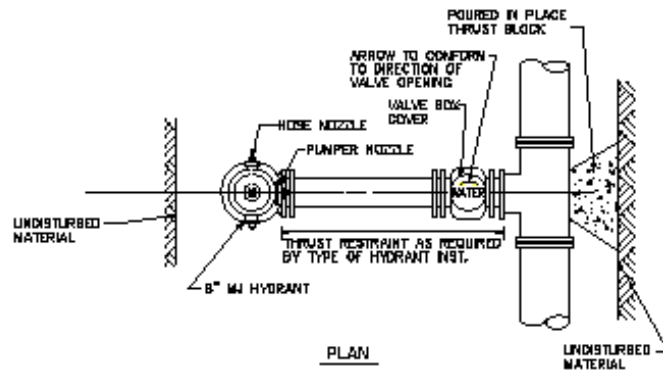
### N.T.S. (ILLUSTRATION #III A)





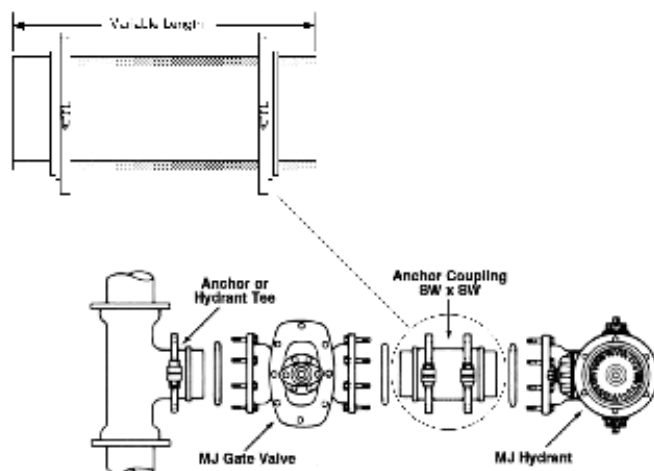
## Detail of Hydrant Installation (Typical)

### Illustration IV

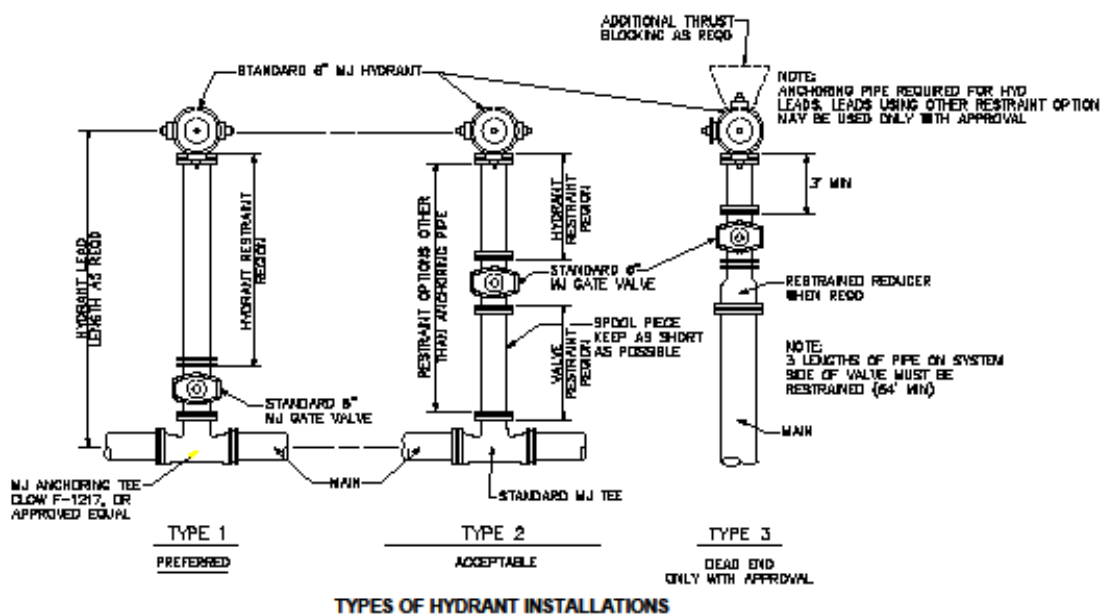


## Detail of Hydrant Installation (Typical)

### Illustration IV



Typical Hydrant Connection Using a Hydrant Tee and Anchor Coupling to Restrain the Hydrant Gate Valve and the Hydrant to the Water Main



## **Disinfection Guidelines**

(Illustration #V)

Quantity of Hypochlorite Required for 50 mg/l  
Of Available Chlorine per 100 feet of Pipe

Pipe Diameter (Inches)	Ounces 14.7 %	Quarts 14.7%
2	0.7	0.1
4	3.0	0.1
6	6.7	0.2
8	11.8	0.4
10	18.5	0.6
12	26.7	0.8
16	60	1.9
24	107	3.4

Time for Disinfectant to Flow  
Through 100 Feet of Pipe in Minutes

Pipe Diameter (inches)	@ 25 gpm	@ 100 gpm	@ 500 gpm	@ 1000 gpm
2	1	0.25	0.05	0.025
4	3	0.75	0.15	0.075
6	6	1.5	0.3	0.15
8	10	2.5	0.5	0.25
10	16	4.0	0.8	0.4
12	24	6.0	1.2	0.6
16	53	13.25	2.6	1.3
24	94	28.0	5.2	2.6

## Meter Pit Detail for 3/4" to 1" Meters (Illustration VI)

Meter Pit requirements for lawn sprinklers or residential use:

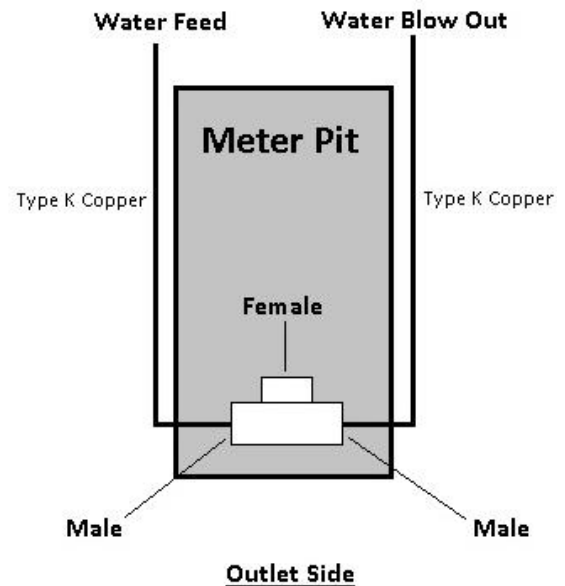
Pits must be as listed below.

### 3/4" Service – Mueller part # (For 5/8" x 3/4" meter)

<u>Quantity</u>	<u>Description</u>	<u>Mueller Part Number</u>
1	Pit	203-CS-15-72-L-B-B-L
1	Locking Cover	780068
1	4" Insulation Pad	790022
1	3/4" Adaptors (Female)	H15451
1	3/4" Adaptors (Male)	H15428
1	3/4" Brass IPT Tee	
20'	3/4" Type K Copper	

### 1" Service – Mueller part # (For 1" meter)

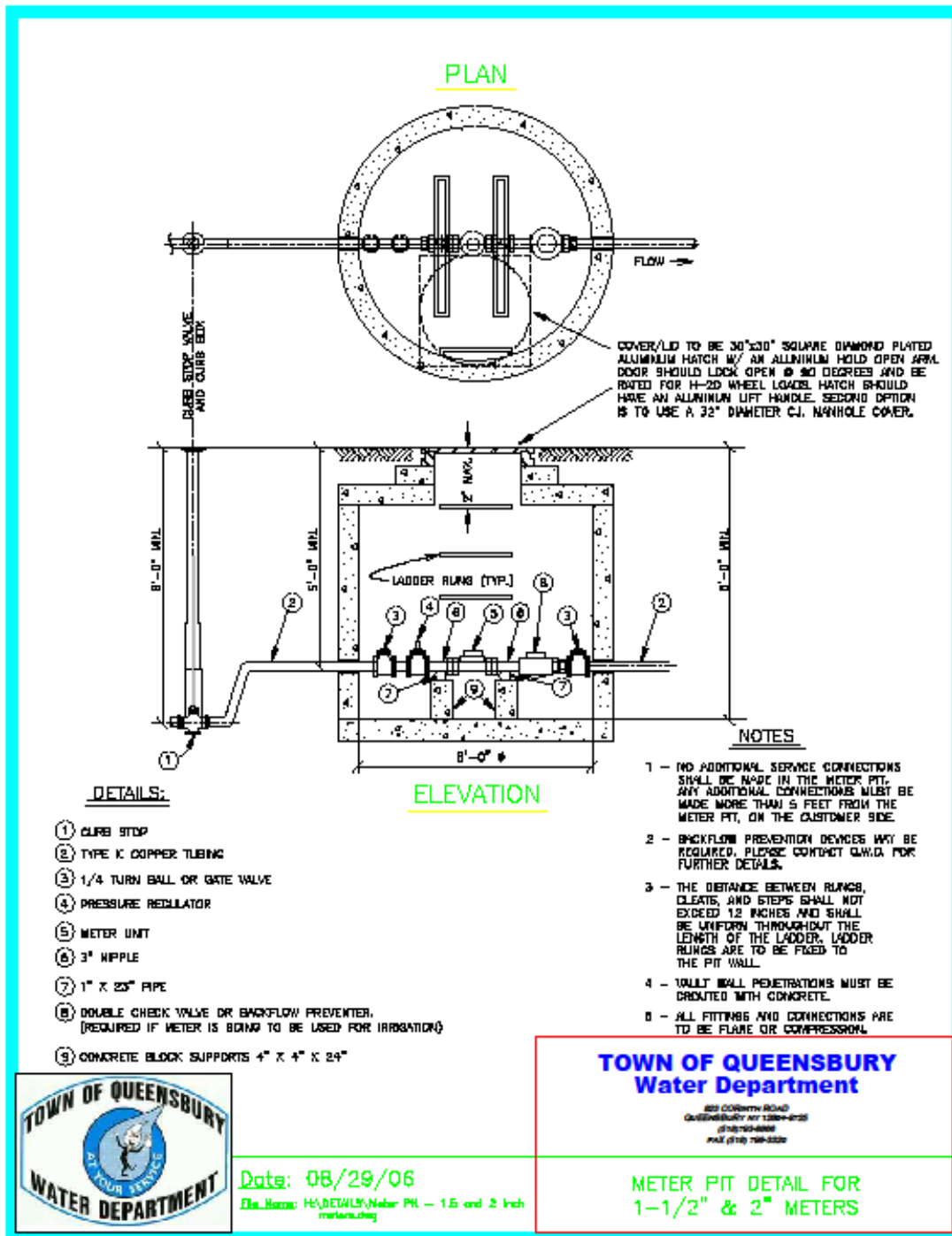
<u>Quantity</u>	<u>Description</u>	<u>Mueller Part Number</u>
1	Pit	330-CS-18-72-L-B-B-L
1	Locking Cover	780069
1	4" Insulation Pad	790153
1	1" Adaptors (Female)	H15451
2	1" Adaptors (Male)	H15428
1	1" Brass IPT Tee	
20'	1" Type K Copper	



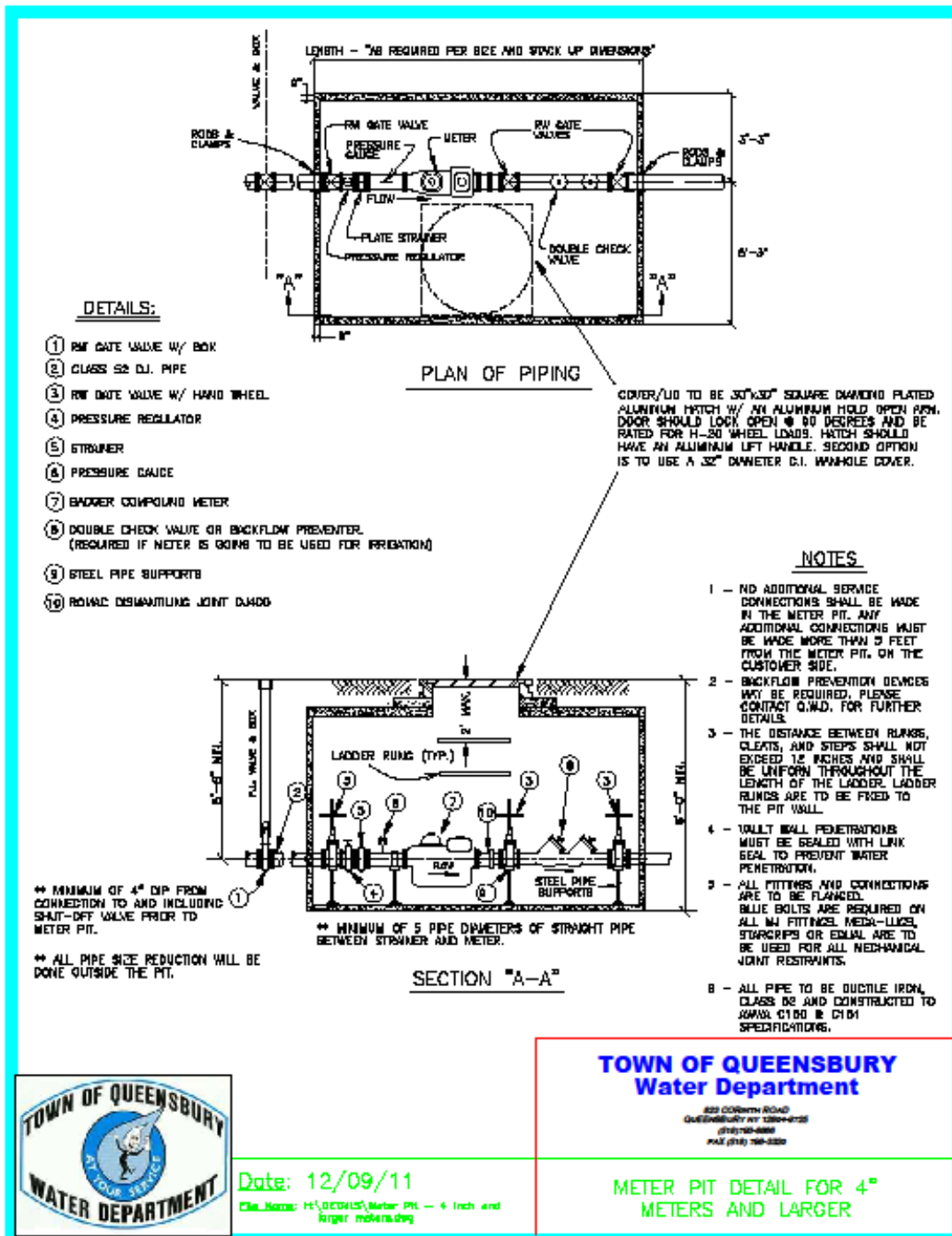
Vellano Brothers 1 (800) 342-9855

NOTE: Estimated delivery is five to six weeks. Alternatives may be submitted and approved by the Superintendent. All submitted alternatives may require a review period of up to thirty days.

## Meter Pit Detail for 1-1/2" to 2" Meters (Illustration VII)



## Meter Pit Detail for 4"+ Meters (Illustration VIII)



## Installation Detail of Two Meters from One Service (Illustration IX)



## Installation Detail of a Dedicated Meter (Illustration X)





## Water Meter Detail (Illustration XI)

