

Water Service Manual

City of Rochester, New York
Department of Environmental Services
Bureau of Water



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TABLE OF CONTENTS

1. OVERVIEW	
1.1. AUTHORITY.....	1
1.2. PURPOSE.....	1
1.3. DEFINITIONS.....	1
1.4. ABBREVIATIONS.....	1
1.5. SUPPLEMENTARY INFORMATION	2
1.6. WATER PERMITS.....	2
1.6.1. New Water Service Permit	2
1.6.2. Water Service Renewal Permit.....	3
1.6.3. Hydrant Use Permit.....	4
1.7. RUN SERVICES.....	4
1.8. WATER METERS.....	4
1.9. WATER METER PITS AND VAULTS	5
1.10. FIRE SERVICES	5
1.11. COMBINATION SERVICES	6
1.12. WATER SERVICE DISCONNECTIONS.....	6
1.13. EXCAVATION, SHORING AND BORING.....	7
1.14. VALVE SHUTS.....	8
1.15. WATER SERVICE RECORDS	8
1.16. INSPECTION.....	9
1.17. BACKFLOW PREVENTION	9
1.18. HEALTH DEPARTMENT APPROVAL.....	9
1.19. SITE PLAN APPROVAL STAMP	9
2. MATERIALS	
2.1. GENERAL	9
2.2. SERVICES 2-INCHES AND SMALLER.....	10
2.2.1. Service Tubing.....	10
2.2.2. Corporation Stop and Service Saddle	10
2.2.3. Curb Stop and Box.....	11
2.3. SERVICES 4-INCHES AND LARGER.....	11
2.3.1. Pipe and Fittings	11
2.3.2. Valves and Valve Boxes.....	12
2.3.3. Tapping Sleeves	12
3. CONSTRUCTION	
3.1. GENERAL	13
3.2. NEW SERVICES 2-INCHES AND SMALLER.....	13
3.3. NEW SERVICES 4-INCHES AND LARGER.....	15

TABLE OF CONTENTS

APPENDICES

- A. Detail of New Water Service 2-Inches and Smaller (Detail S970-1)
- B. Detail of New Water Service 4-Inches and Larger (Detail S970-4)
- C. Detail Notes for New Water Service 4-Inches and Larger (Detail S970-5)
- D. List of Water Specifications (with links to docx and pdf-formatted specifications)
- E. List of Water Details (with links to dwg and pdf-formatted details)

1. OVERVIEW

1.1. AUTHORITY

Chapter 23 of the City of Rochester Municipal Code, entitled “Waterworks,” authorizes the Director of Water to promulgate waterworks specifications, governing the materials, size and design of water services, meters, valves and other fittings.

1.2. PURPOSE

This guidance manual summarizes available information, specifications and details necessary to construct or reconstruct all or parts of a water service in the City of Rochester. It was prepared primarily for the use of property owners, developers and plumbers. To obtain more comprehensive information, users of this manual will need to review all relevant codes, documents, specifications and details that are referenced within this manual. When information found in this manual conflicts with codes, specifications and details, the codes, specifications and details shall govern.

1.3. DEFINITIONS

Developer: An individual or company that subdivides property and extends public water to the subdivision and/or makes improvements to a property requiring water service.

Holly System: A pumped, high-pressure (generally between 100 psi and 120 psi) water system located primarily within the central business district that is used almost exclusively for fire protection purposes.

Plumber: A plumber who is properly licensed and registered in the City of Rochester.

1.4. ABBREVIATIONS

AWWA: American Water Works Association.

CTS: Copper Tube Size

DIP: Ductile Iron Pipe

HDPE: High Density Polyethylene

LDPE: Low Density Polyethylene

MCDPH: Monroe County Department of Public Health

PVC: Polyvinyl Chloride

PVCO: Molecularly Oriented Polyvinyl Chloride

1.5. SUPPLEMENTARY INFORMATION

Water specifications and details can be found on the City of Rochester's website at the following link: <http://www.cityofrochester.gov/waterdocuments/>. A list of all water details and specifications is included in Appendices A and B of this manual. The Water Bureau maintains a list of products approved for use in the City's water system. This [Approved Products List](#) is also available from a link on this website.

Rochester's Municipal Code, including Chapter 23 – Waterworks and Chapter 40 – Building Construction: Plumbing, can be found on the City's website at the following link: <http://www.cityofrochester.gov/citycode/>.

The Water Bureau publishes a [Directory of Water Services and Rates](#), which is available on the City's website. This Directory includes a fee schedule for the various permits that are required for water service work and hydrant use.

The Water Bureau is responsible for maintaining the section of water service from the water main connection up to and including the curb stop or curb valve (a.k.a. curb cock or operating valve). Maintenance responsibilities do not include replacement due to low flow or pressure. The property owner is responsible for maintenance of the water service immediately downstream from the curb stop or curb valve to the building. On water services 4-inch and larger, when no curb valve is present, the property owner is responsible for maintenance of the entire service from the water main connection to the building.

One water service shall not supply more than one parcel, as defined by the parcel's tax account number. Each water service must connect directly to the public water main. A new water service supplying one parcel shall not cross through another parcel unless a permanent water service easement agreement (with map) is obtained and filed in the office of the Monroe County Clerk. This easement must be at least ten feet wide and must provide the owner of the parcel that the water service supplies with the right to maintain and replace the water service located within the easement. A copy of the filed easement agreement and map must be submitted to the Water Bureau when applying for a new water service permit.

When water services are longer than normal or are located in low pressure areas, emphasis should be given to properly sizing the water service and meter to offset hydraulic restrictions imposed by these conditions.

1.6. WATER PERMITS

1.6.1. New Water Service Permit

A new water service permit is required for the following:

- The installation of a new water service (domestic and/or fire) between the water main and the building.
- The renewal or replacement of an existing water service between the water main and the curb valve.
- Procuring a new water meter.

New water service permits may be issued to, and fees paid by, the property owner, developer, contractor or plumber. Only plumbers licensed by the City

of Rochester are permitted to install new water services. The new water service permit process begins in the Water Bureau's Maps and Records Office, located at 10 Felix Street, (585) 428-7562. The office is open Monday through Friday, excluding holidays, from 7:30 AM until 4:00 PM.

When applying for a new water service permit, the applicant must provide the following information:

- Property address
- Size, type and material of proposed service (pre-submittal of plans required for all new water services, as outlined in the following paragraphs)
- Size of proposed meter(s)
- Name of licensed plumber
- Copy of filed easement agreement and map (if applicable, per Section 1.5)

All new water services, regardless of service size, require the submittal of detailed construction plans to the Water Bureau for approval prior to the issuance of a permit. At a minimum, these plans should include a site plan showing all existing and proposed features and utilities, including the proposed water service and appurtenances, such as valves, meter pit(s), meter(s) and piping upstream and downstream of meter(s), etc. and details.

Copper services having a nominal diameter of 1½ inches and larger and Polyethylene tubing water services 2 inches and larger (and in some cases water services that are smaller than 1½ (or 2) inches) also require approval of a backflow prevention device from the Water Bureau and Monroe County Department of Public Health. The water service pre-submittal application should include all documentation required for approval of a backflow preventer device, if required. Contact the Water Bureau's Backflow Prevention Inspector at (585) 428-6070 or backflow@cityofrochester.gov for additional information about backflow preventer submittal requirements.

A new water service permit application form will be completed by Water Bureau personnel in the Maps and Records Office using the information furnished by the applicant. This completed form will be forwarded to the Department of Environmental Services Permit Office located in City Hall, at 30 Church Street, where the fees will be collected. The fee may include a service disconnection fee, as described in Section 1.12. The Permit Office may also collect a road cut fee and security deposit, if appropriate. A City of Rochester Plumbing Permit must also be obtained.

When an application is submitted that only involves the procurement of a new water meter, the fee may be paid directly at the Water Bureau's Maps and Records Office.

1.6.2. Water Service Renewal Permit

A water service renewal permit is required if the water service to a parcel is being renewed or replaced only between the curb stop or curb valve and the

building. Replacement of the service between the water main and the curb stop or valve requires that a New Water Service Permit be obtained.

Water service renewal permits are obtained directly from the Department of Environmental Services Permit Office located in City Hall.

1.6.3. Hydrant Use Permit

A hydrant use permit is issued to a contractor, individual or group when there is a need for water at a specific location, but no other source is readily available. Hydrant use permits are granted only to those applicants who provide a service that benefits the public or applicants under contract to do work for the City. Hydrant use permits will not be issued for filling swimming pools, hydro-seeding, lawn irrigation or any other use that is deemed to be a potential hazard or nuisance. Applicants who are denied a permit may appeal the decision by writing to the Director of Water within twenty days of the denial. A meter, backflow preventer and appurtenances are provided to the permittee when the permit is issued.

Hydrant use permits are issued for a minimum period of one month. Permits may be renewed or extended for subsequent months by paying the consumption fee and hydrant use fee for each additional month. Permission to use a hydrant for an extended period of time will be granted at the discretion of the Water Bureau.

Additional information about hydrant use permits, including fees, is available by contacting the Water Bureau's Maps and Records Office at (585) 428-7562. A minimum of 48 hours advance notice is required before arriving to apply for a hydrant use permit so that all necessary arrangements can be made in advance.

1.7. RUN SERVICES

A run service is a water service that extends from the water main to the curb stop or curb valve, was either installed for future use but never used or was used at one time but is not currently being used, and is turned off at the curb stop or curb valve and has not been abandoned at the tap. A run service may be connected to and extended, with the approval of the Water Bureau, if it is $\frac{3}{4}$ inch or larger copper tubing, 1 inch or larger polyethylene tubing, 4 inches or larger cement-lined ductile iron pipe (DIP), or 4 inches or larger polyvinyl chloride (PVC) pipe or molecularly oriented polyvinyl chloride (PVCO) pipe. Connection to lead, lead lined and galvanized run services will not be allowed. The run service must also be in good operating condition and in the proper location for its intended use. The Water Bureau does not guarantee the serviceability of run services. Consequently, the plumber and owner assume all risks associated with using a run service.

1.8. WATER METERS

All water services are to be metered. One meter is to be installed on each water service, except for combination services, which require two meters (one for the domestic service and the other for the fire service; see Section 1.11 of this manual). No connections or taps are to be made on the service between the water main and the meter. Meters installed on by-pass lines shall supply the same location within the property as the main service line and are not to be used as a separate supply.

All meters are furnished and maintained by the Water Bureau and are to be purchased and installed by the plumber. Meter interface units are furnished, installed and maintained by the Water Bureau. Prices for meters are listed in the [Directory of Water Services and Rates](#).

A 5/8-inch meter is the standard-size meter that is to be installed on a 3/4-inch copper or 1-inch polyethylene water service, unless otherwise required by the owner. It is recommended that the Water Bureau be consulted for advice on selecting the appropriate size and type of water meter to satisfy the service demands. On water services having 1½-inch or 2-inch meters, unmetered bypasses are not permitted and will not be approved by the Water Bureau unless a continuous supply of water is required.

The preferred location of a meter is inside of a building, within 2 feet of where the service enters the building. However, in instances where the building is located farther than 100 feet from the street right-of-way line or where there is no suitable location for a meter inside of the building, the Water Bureau may require that the meter be installed in a meter pit or meter vault.

1.9. WATER METER PITS AND VAULTS

When the Water Bureau determines that a meter should not or cannot be located inside of a building, it must be located in an underground or heated and insulated above-ground (a.k.a. “Hot Box”) structure. Meter pits are underground structures generally used to house meters 2 inches and smaller. Meter vaults are larger underground structures, generally used to house meters larger than 2 inches.

Meter pits, vaults and “Hot Boxes” are to be installed on private property, as close as possible to the street right-of-way line. Meter pits located in lawn areas are generally prefabricated plastic units, less than 3 feet in diameter, having an iron cover and frost-proof inner lid. Meter vaults are generally precast concrete units with manholes or access hatches. All vaults and only those meter pits installed in paved areas subject to traffic must be designed by a New York State licensed professional engineer.

Specifications and details for water meter vaults and water meter pits are available at: <http://www.cityofrochester.gov/waterdocuments/>; and are listed as follows:

- [Specification S920-Water Meter Vault \(3-Inch to 10-Inch Domestic Meters\)](#)
- [Specification S924-Water Meter Pit \(2-Inch and Smaller\)](#)
- [Drawing S920-2 Water Meter Vault for Domestic Meter 3 Inch to 10 Inch](#)
- [Drawing S920-3 Water Meter Vault Dimensions and Notes](#)
- [Drawing S924-1 Water Meter Pit 1 Inch and Smaller in Lawn Area](#)
- [Drawing S924-2 Water Meter Pit 1½ Inch and 2 Inch in Lawn Area](#)

1.10. FIRE SERVICES

A fire service is a water service that is connected to either a domestic or Holly water main, supplies water to an individual property, and is used almost exclusively for fire-fighting/suppression purposes.

A detector check valve and a bypass meter are required on all fires services. The type of detector check assembly is determined by the type or class of fire service (as

defined by AWWA Manual M-14, Backflow Prevention and Cross-Connection Control) and summarized as follows:

- For a fire service connected to a Holly water main, a single detector check assembly of the weighted mechanical type is acceptable (see [Drawing S970-7 Typical Water Meter Installation for Holly Fire Service 4 Inch and Larger](#)).
- For a Class 1, Class 2 or Class 3 fire service connected to a domestic water main, a New York State Department of Health approved double check detector assembly is required (see [Drawing S970-8 Typical Water Meter Installation for Domestic Fire Service 4 Inch and Larger](#)).
- For a Class 4 or Class 5 fire service connected to a domestic water main, but having a Holly system fire hydrant within 1,700 feet of a pumper connection or any other non-potable auxiliary supply (i.e., river, canal, detention pond, etc.), or having private fire hydrants on the parcel, a New York State Department of Health approved reduced pressure detector assembly is required (see [Drawing S971-2 Reduced Pressure Zone \(RPZ\) Backflow Prevention Device 2½ Inch and Larger](#)).

The detector assembly, including check valves and ball valves on metered bypass, must be furnished, installed and maintained by a plumber on behalf of the property owner. The bypass ball valves and check valves must be the same size as the bypass meter. The bypass meter is furnished by the Water Bureau and installed by the plumber. The meter interface units and seal wires are furnished, installed and maintained by the Water Bureau and the ball valve(s) on the bypass line shall be sealed closed by the Water Bureau.

1.11. COMBINATION SERVICES

A combination service is a water service, generally four (4) inches or larger, that has a single connection to a domestic water main and supplies water to an individual property for domestic/commercial/industrial use and fire-fighting/suppression purposes. For this type of service, the domestic service and fire service must be metered separately and all valves, backflow prevention devices and other appurtenances are to conform to the requirements for individual domestic and fire services. Fire and domestic supplies are not to be interconnected and the fire service is to be used for fire protection only. See [Drawing S970-9 Typical Combination Fire and Domestic Service](#) for a detail of a typical combination service.

1.12. WATER SERVICE DISCONNECTIONS

When a new water service is installed to replace an existing service or a building is demolished, any existing service or services that will not be used must be permanently disconnected (a.k.a. abandoned) at the water main. A water service disconnection fee is required to cover the Water Bureau's cost of permanently disconnecting the water service from the water main. For services 2 inches and smaller, the disconnection involves excavating the service where it is connected to the water main, closing the corporation stop, cutting and removing a section of the service, and removing the curb box, in accordance with [Specification S912 – Corporation Stop and Connection; Abandon Existing Water Service at Tap \(2 Inch and Smaller\)](#). If the corporation stop is leaking through the plumber is required to install a plug or cap on the outlet of the corp, replace the corporation stop with a new corporation stop, or install a wrap-around sleeve. For services larger than 2 inches, the service tee or tapping sleeve and valve must be cut out of the water main and

replaced with an insertion sleeve, which includes a new piece of water main pipe and two solid sleeves or couplings. Refer to [Specification S906 – Insertion Sleeve](#). Insertion sleeves installed on existing cast or ductile iron pipe must have joints bonded and anodes installed in accordance with [Drawing S966-7 Anode at Insertion Sleeve and Cut-In Tee on Existing Iron Pipe](#).

The Water Bureau's Maps and Records Office will confirm the quantities and sizes of all water services that will need to be disconnected and will identify the required disconnection fee. By paying the disconnection fee, the permittee assigns the Water Bureau, or its duly authorized agent, all responsibility for the excavation, disconnection and pavement restoration for each service to be abandoned. Service disconnection fees are based on contract cost plus 10%. Generally, there is a pre-established deposit for the disconnection of water services 2 inches in diameter and smaller. For water services larger than 2 inches, the fee will be estimated based on the scope of work. The Maps and Records Office should be contacted at (585) 428-7562 at least one week in advance to develop an estimate for the disconnection fee required for water services larger than 2 inches.

Water service disconnections are generally performed by the Water Bureau. However, in situations where a new service tap is located within three feet of the old tap, and upon approval of the Director of Water and inspection by the Water Bureau, the work required to permanently disconnect and abandon the old water service may be performed by a plumber. When this is done, a portion of the service disconnection fee will be refunded.

1.13. EXCAVATION, SHORING AND BORING

When excavation is required for water facility work, the plumber is responsible for ensuring that the excavation is carried out safely to protect vehicular and pedestrian traffic, construction workers, and adjacent public and private property. All applicable federal, state and local laws, regulations and standards shall be observed when excavating.

New York State law requires excavators to call Dig Safely. New York (dial 811) at least 2 full working days prior to starting work and to notify any other utilities that are not members of Dig Safely. New York. Additional information about Dig Safely. New York, is available at their website: <http://www.digsafelynewyork.com/>.

The excavation must be of sufficient size to accommodate the tapping machine and provide adequate clearance for working. [Detail S900-12 Water Service Tap Excavation](#) shows the minimum excavation dimensions required for tapping water mains.

When Water Bureau personnel must enter an excavation, the excavation must be shored. In lieu of shoring, and only with written approval from the Director of Water, the excavation may be opened with side slopes not steeper than allowed by Title 29 Code of Federal Regulations, Part 1926, Safety and Health Regulations for Construction (OSHA).

In areas where boring, drilling or tunneling of water services is desired, the plumber must receive permission from the Water Bureau's Manager of Distribution. "Washing-in" (using a concentrated stream of pressurized water to remove soil) of water services will not be allowed under any circumstances.

When boring, drilling or missilling, the plumber shall open cut and excavate both a boring and a receiving pit. The pit excavations are to be kept as small as practical, but large enough to allow for safe operations. Excavations and operations shall be to a depth to insure that the water service pipe will be installed at or below the required minimum depth. In most cases, the boring and receiving pits will be located at the curb stop and water main. Pits may be located at other areas when approved by the Water Bureau's technician. Boring and receiving pits shall be located to avoid damage to trees, tree roots and other objects located within the street right-of-way.

The plumber must also open a sight pit at any locations where an existing underground utility is in the direct path of boring, drilling or tunneling. The sight pit shall be large and deep enough to ensure that no damage occurs to the existing utility during the water service installation. New water services shall maintain a minimum vertical separation of 6 inches from existing utilities, except that when a water service crosses below a storm or sanitary sewer, a minimum vertical separation of 18 inches is required.

1.14. VALVE SHUTS

The Water Bureau's Dispatch Office at (585) 428-7500 shall be notified a minimum of ten (10) working days in advance of intent to perform work requiring the operation of valves and appurtenances; and a minimum of two (2) working days advance notice when operation of valves and appurtenances is required for the actual work. Valves are to be operated ONLY by Water Bureau personnel. In accordance with City Code, a service-resumption fee will be added to the water bill when a water service that has been shut-off is turned back on.

If a shut is required on a water main, the plumber must notify all affected customers at least 48 hours prior to the shut. The plumber shall notify by means of direct contact with residences or by door hanger notification cards available from the Water Bureau. All commercial businesses must be contacted directly. The time and duration of the shut shall be scheduled to minimize inconvenience to other customers. If necessary, the plumber must provide a temporary water supply to customers who absolutely need water while the water main is out of service.

1.15. WATER SERVICE RECORDS

The plumber must provide records of all new and renewed water services to the Water Bureau, using a standard water service card in accordance with [Drawing R913-3 Water Service Card](#). Water service cards are obtained from the Water Bureau and shall be submitted to the Water Bureau's Dispatch Office at 10 Felix Street within two (2) days of completion of the work. For situations where services are replaced as part of a City-sponsored water main replacement project, water service cards should be submitted through the City's Project Manager to the Water Bureau's Managing Engineer at 10 Felix Street.

For new water services 4 inches in diameter and larger, a Water Bureau field engineer must visit the site and record as-built information for the portion of the service located between the main and the curb valve. The plumber must call the Water Bureau's Dispatch Office at least 24 hours before the service is backfilled. If the service is backfilled before the field engineer is able to collect the as-built information, the plumber will be required to re-excavate and expose the water service.

1.16. INSPECTION

All new or renewed water services must be inspected and approved by a City of Rochester Plumbing Inspector from the City's Department of Neighborhood and Business Development, Bureau of Inspection and Compliance Services (585) 428-6520).

1.17. BACKFLOW PREVENTION

The Water Bureau requires that all copper water services with a nominal diameter of 1½ inches or larger be furnished with a backflow prevention device. For polyethylene tubing services with a nominal diameter of 2 inches or larger backflow prevention devices are required. Additionally, all services smaller than 1½ inches (2 inches for polyethylene) that are deemed to be a health hazard will also require the installation of a backflow prevention device.

Plans for a backflow prevention device must be approved by the Water Bureau and the Monroe County Department of Public Health. A water service permit will not be issued until after the backflow prevention plans have been approved by the Monroe County Department of Public Health. Detailed information about backflow prevention submissions can be obtained by contacting the Water Bureau's Backflow Prevention Inspector at (585) 428-6070 or backflow@cityofrochester.gov.

1.18. HEALTH DEPARTMENT APPROVAL

Monroe County Department of Public Health approval (MCDPH) is required for all new water domestic or combination water services larger than 4 inches in diameter. Approval from MCDPH must be obtained prior to the installation of the water service. Additionally, MCDPH requires disinfection, flushing, and pressure and bacteriological testing of water services that are greater than twenty feet in length, before the service can be activated. Flushing and disinfection shall be performed in accordance with [Specification S900 – General Water Provisions](#), Subsection 3.06 Disinfection. For additional information, contact the Environmental Health Division of the MCDPH at (585) 753-5564.

1.19. SITE PLAN APPROVAL STAMP

All improvements to the water system must be approved by the Water Bureau. This includes any new water main, water service, hydrant, and other water system appurtenances. The Water Bureau requires that the approved plans contain the Bureau's Site Plan Approval Stamp signed by an authorized representative from the Water Bureau.

2. MATERIALS

2.1. GENERAL

The Water Bureau maintains a list of products approved for use in the City's water system. This [Approved Products List](#) is updated periodically and is available on-line at: <http://www.cityofrochester.gov/waterdocuments/> or by calling the Bureau's Maps and Records Office at (585) 428-7562. The use of products other than those listed shall not be permitted.

Detailed material specifications for water services and appurtenances are listed in the Bureau's Water Specifications, which are available on-line at: <http://www.cityofrochester.gov/waterdocuments/>.

Polyvinyl chloride (PVC and PVCO) pipe and polyethylene (PE) tubing are not to be used within 200 feet of parcels where soils are known to or have the potential to be contaminated with chlorinated solvents or petroleum hydrocarbons (gas stations, dry cleaning operations, etc.). For these situations, ductile iron pipe with nitrile gaskets and copper tubing with nitrile-gasketed service saddles (when a saddle is required) shall be used.

Sections 2.2 and 2.3 briefly summarize materials required for new water services. Detailed material specifications are available within each referenced specification.

2.2. SERVICES 2 INCHES AND SMALLER

Refer to Appendix A of this manual for an overall detail for a new water service 2-inches in diameter and smaller.

2.2.1. Service Tubing - [Specification S913 – Water Service \(2 Inch and Smaller\)](#)

- Copper tubing, Type K, ASTM B88, sizes ¾ inch, 1 inch, 1½ inches and 2 inches, flared fittings; or
- Polyethylene (PE) tubing, copper tube size (CTS), DR 9, PE 3408/3608 pressure class 200 psi or PE 4710 pressure class 250 psi, blue outer layer or blue striping, sizes 1 inch, 1½ inches and 2 inches, quick joint type compression fittings with stainless steel internal stiffeners furnished on ends of tubing at all joints.
- Cross-Linked Polyethylene (PEX) water service tubing, shall be copper size (CTS), DR 9, PEXa, pressure class 200psi/73.4°F @ 0.63 design factor, material designation 3306, with blue outer layer, in conformance with the requirements of ANSI/AWWA C904, in sizes 1 inch, 1-1/2 inch, and 2 inches.

Tracer wire is required whenever PE tubing is installed. For open-cut service installation use 12 AWG solid copper wire with 30 mil blue high molecular weight polyethylene (HMWPE) insulation (HDPE or LDPE). For trenchless installation use 12 AWG solid copper clad steel core wire with 45 mil blue HMWPE insulation.

Warning tape must be installed with all open-cut trenched water services.

2.2.2. Corporation Stop and Service Saddle – [Specification S912 – Corporation Stop and Connection; Abandon Existing Water Service at Tap \(2 Inch and Smaller\)](#)

Corporation stop is to be cast brass ball valve with AWWA taper inlet. Use flared fitting outlet for copper service and quick joint compression fitting outlet for polyethylene service.

A double strap all brass tapping saddle with Buna-N (Nitrile) or EPDM rubber gaskets and AWWA tapered thread is to be used when a water service is connected to a ductile or cast iron water main, depending on the sizes of the main and service. A wide strap all brass tapping saddle with Buna-N or EPDM rubber gaskets is to be used whenever a water service is connected to a plastic water main (PVC or PVCO), regardless of the size of the main or service.

2.2.3. Curb Stop and Box – [Specification S914 – Curb Stop and Box](#)

Curb stop is to be ball valve type with cast brass body. Flared fittings are required for use on copper services and quick joint compression fittings are required for use on polyethylene services. On copper services, a nylon dielectric insulator is to be furnished on the outlet of the curb stop.

Curb box is to be two piece 2½-inch screw type. Box can be all cast iron or can have a cast iron lid and top section with ABS plastic bottom section. The lid is to be cast with the word “WATER” into the top. An enlarged base is required for 1½-inch and 2-inch services.

2.3. SERVICES 4 INCHES AND LARGER

Refer to Appendix B and Appendix C of this manual for an overall detail and associated notes for a new water service 4 inches in diameter and larger.

2.3.1. Pipe and Fittings – [Specification S901 – Water Main Pipe and Fittings](#) and [Specification S900 – General Water Provisions](#)

- Ductile iron pipe with double thickness of cement-mortar lining and push-on or mechanical joints - use Class 52 for water services connected to domestic water mains and Class 56 for water services connected to Holly water mains. Ductile iron full body or compact fittings shall have double thickness of cement mortar lining or epoxy lining and shall have mechanical joint ends. Polyethylene tube encasement is to be furnished on all ductile iron pipe and fittings. Mechanical joint gland bolts and nuts shall be cold formed high strength low-alloy steel with fluorocarbon coating. High potential magnesium anodes must be connected to each metallic fitting and each section of DI pipe.

Ductile Iron Pipe Size	Magnesium Anode Size
4' and 6"	17 pound
8"	32 pound
12" and larger	48 pound

- DR 14 pressure class 305 polyvinyl chloride (PVC) pipe with push-on joints may be used for service pipe connected to domestic water mains only.

- Pressure classes 235 molecularly oriented polyvinyl chloride (PVCO) pipe with push-on joints may be used for service pipe connected to domestic and Holly water mains.
- Fittings on PVC or PVCO pipe shall be either PVC injection molded fittings or ductile iron fittings. Mechanical joint ductile iron fittings shall be supplied with fluorocarbon coated hardware. Non-epoxy coated ductile iron fittings used on PVC or PVCO service pipe shall have a field applied petrolatum wax tape coating system. In addition, a 9 pound magnesium anode must be connected to the ductile iron fitting.

All pipe, valve and fitting joints on service pipe shall be mechanically restrained. Additionally, concrete thrust blocks are to be furnished at all bends, tees and reducers. Types of approved mechanical restraint devices vary depending on the pipe and fitting material being used.

Tracer wire is required whenever PVC or PVCO service pipe is installed. For open-cut service installation use 12 AWG solid copper wire with 30 mil blue high molecular weight polyethylene (HMWPE) insulation (HDPE or LDPE). For trenchless installation use 12 AWG solid copper clad steel core wire with 45 mil blue HMWPE insulation.

Warning tape is required on all water services installed by open-cut trenching methods.

2.3.2. **Valves and Valve Boxes** – [Specification S903 - Resilient Seat Gate Valve with Valve Box](#) and [Specification S904 - Tapping Sleeve with Valve and Valve Box](#)

Guard valve, tapping valve and curb valve shall be resilient seat gate valves with non-rising stems, standard 2-inch square AWWA operating nut, and shall be open right (clockwise). Valves are to have mechanical joint ends. Tapping valves have one special flanged end that connects directly to the flanged end of a tapping sleeve. Mechanical joint bolts and nuts shall be cold formed high strength low-alloy steel with fluorocarbon coating.

Valve box shall be a two piece cast iron box with slip type extension with flange located 2 to 3 inches below the top of the top section. The lid is to be cast with the word "WATER."

2.3.3. **Tapping Sleeves** – [Specification S904 - Tapping Sleeve with Valve and Valve Box](#)

- Cast or ductile iron tapping sleeves are to be split body with mechanical joint ends, machined recess flanged outlet to accommodate tapping valve and 3/4-inch tapped outlet with brass plug for testing. Flange and mechanical joint bolts and nuts shall be cold formed high strength low-alloy steel with fluorocarbon coating.

- Stainless steel tapping sleeves are not permitted on Holly water mains but may be used when connecting a new service to a domestic water main in which the nominal size of the tap is at least one pipe diameter smaller than the nominal size of the water main being tapped. Stainless steel tapping sleeves shall be fabricated two piece shell Type 304 stainless steel with gridded rubber shell, stainless steel flange recessed to accommodate tapping valve and shall have a 3/4-inch tapped outlet with stainless steel plug for testing. Nuts, bolts and washers shall be stainless steel.

3. CONSTRUCTION

3.1. GENERAL

This section briefly summarizes construction information related to water services. Detailed construction related information and construction drawings are found in the Bureau's water specifications and details, available on-line at: <http://www.cityofrochester.gov/waterdocuments/> and are listed in Appendices D and E of this manual.

Construction of a water service cannot commence until all necessary approvals have been received, permits issued and Dig Safely New York and any other non-member utilities have been properly notified by the plumber. Excavations required for the Water Bureau to tap the water main shall provide sufficient clearances and be properly shored or otherwise prepared, as described in Section 1.13 of this manual.

A service connection cannot be larger than the water main that the service is connected to. No service connections are permitted on water mains larger than 16-inches diameter without the prior authorization of the Director of Water.

Domestic water services are to be installed with 4.5 feet minimum depth of cover. Holly services are to be installed with 5.0 feet minimum depth of cover. Sand bedding and backfill are required for all services within the street right-of-way. Warning tape must be installed 12 inches above the service. Tracer wire must be installed on all plastic water service tubing and pipe.

All new water services are to be inspected and approved by the City's Plumbing Inspector prior to backfilling of the service. Water services 4 inches in diameter and larger must also have as-built information recorded by a Water Bureau field engineer, as described in Section 1.15 of this manual.

When a backflow prevention device is required, it shall be installed in accordance with plans approved by the Water Bureau and the Health Department.

3.2. NEW SERVICES 2 INCHES AND SMALLER

PE service tubing has a smaller inside diameter than copper tubing for the same nominal outside diameter. For this reason, if PE tubing is to be installed, its nominal diameter should be one size larger than the size required if copper tubing were to be installed. Table 3.1 shows hydraulically equivalent sizes of copper and PE service tubing.

**Table 3.1
New Service Tubing Sizes (Minimum Nominal Diameter)
Copper vs. Polyethylene**

Existing Water Service	New Copper Tubing	Polyethylene Tubing
1/2, 5/8 and 3/4-inch	3/4-inch	1-inch
1-inch	1-inch	1½-inch
1½-inch	1½-inch	2-inch
2-inch	2-inch	N/A

In areas where the normal operating pressure is 30 pounds per square inch (psi) or less and/or where the service length may be longer than normal, consideration should be given to increasing the nominal size of the tubing to the next larger size for both copper and polyethylene service tubing.

When making a service connection to PVC and PVCO water mains, service saddles are always required for both copper and polyethylene services. Saddle tap and corporation stop sizes for copper services shall be the same nominal size as the service. Saddle tap and corporation stop sizes for PE services on PVC/PVCO water mains are shown in table 3.2.

**Table 3.2
Service Saddle Tap and Corporation Stop Sizes for PE Services
on PVC/PVCO Water Mains**

PE Water Service Size	Saddle Tap Size	Corporation Stop Size
1 inch	1 inch	1 inch
1½ inches	1 inch	1 inch (w/1-inch inlet x 1½-inch outlet)
2 inches	2 inches	2 inches

When making a service connection to a cast iron or ductile iron water main, the need for a service saddle is dependent upon the size of the water main and the size of the service, as summarized in Table 3.3.

**Table 3.3
Maximum Tap Size Allowed on Cast or Ductile Iron Water Main Pipe Without
Service Saddle**

Water Main Pipe Size	Maximum Tap Size Allowed on Cast or Ductile Pipe Without Service Saddle
4 to 6 inches	All taps require saddle
8 to 10 inches	3/4 inch
12 inches	1 inch
16 inches or larger	1½ inches

It is the responsibility of the plumber to excavate the water main at the location of the service tap, prepare the surface of the water main for the tap, and furnish and install a service saddle on the water main (when a saddle is required). All service tap preparation work is to be performed in accordance with [Specification S912 - Corporation Stop and Connection; Abandon Existing Water Service at Tap \(2 Inch and Smaller\)](#). For services 3/4 inch thru 2 inch the Water Bureau will furnish the

corporation stop as part of the Service Connection Fee paid by the Plumber. The service tap will be performed by the Water Bureau.

Upon completion of the tap, the plumber shall connect the new water service tubing to the corporation stop and install the new service tubing and curb stop and box, all in accordance with the following specifications and details:

- [Specification S913 - Water Service \(2 Inch and Larger\)](#)
- [Specification S914 - Curb Stop and Box](#)
- [Drawing S970-1 New Water Service 2 Inch and Smaller](#)
- [Drawing R913-1 Water Service Pipe 2 Inch and Smaller](#)
- [Drawing S900-2 Water Trench Pavement Rehabilitation](#)

and all other specifications and details referenced therein.

When a new copper water service is installed on a plastic water main, a 5-pound high potential magnesium anode shall be installed on the water service at or near the corporation stop, in accordance with the following specification and detail:

- [Specification S966 – Magnesium Anode](#)
- [Drawing S966-3 Anode at New Copper Water Service on Plastic Water Main.](#)

Service tubing shall be installed in a single piece without joints between the corporation stop and curb stop. The curb stop is to be located between 2 and 3 feet behind the street curb (in tree lawn or sidewalk area).

When the water meter is to be located in a meter pit, the meter pit shall be installed in accordance with the following specification and details:

- [Specification S924 – Water Meter Pit \(2-Inch and Larger\)](#)
- [Drawing S924-1 Water Meter Pit 1 Inch and Smaller in Lawn Area](#), or
- [Drawing S924-2 Water Meter Pit 1½ Inch and 2 Inch in Lawn Area](#)

If the meter pit will be located in a paved area subject to vehicular traffic, a detail drawing, prepared by a NYS-registered Professional Engineer, must be submitted and approved by the Water Bureau. When the meter is to be located inside of a building, it shall be installed by the plumber in accordance with the following details:

- [Drawing S970-2 Indoor Installation of Water Meter 1 Inch and Smaller](#), or
- [Drawing S970-3 Indoor Installation of Water Meter 1½ Inch and 2 Inch](#)

After the meter is installed, the Water Bureau will inspect it, install seal wire and meter interface unit. Where applicable the Bureau will install a seal wire on the bypass valve.

When an existing water service is replaced between the curb stop and the building, the Water Bureau will furnish a new curb box for the plumber to install.

3.3. NEW SERVICES 4 INCHES AND LARGER

It is recommended that a test pit be excavated at the location of the proposed water service to measure the outside diameter and depth of the water main and to confirm that there are no other utilities nearby that will conflict with the installation of the

service. In cases where there is not sufficient clearance available to tap a water main, it may become necessary to cut a new service tee fitting into the water main.

It is the responsibility of the plumber to excavate the water main at the location of the service tap, prepare the surface of the water main and install the tapping sleeve and tapping valve, in accordance with [Specification S904 – Tapping Sleeve with Valve and Valve Box](#). The Water Bureau will perform a pressure test on the tapping sleeve and valve assembly and will tap the water main for the required fee.

Appropriate measures are to be taken to prevent dirt, debris and groundwater from contaminating the water main and service. The ground water level is never to be less than 12 inches below the invert of the pipe. When open pipe ends will be left unattended, they must be covered in a water-tight manner.

Upon completion of the tap, the plumber shall install service pipe and appurtenances from the water main to the building in accordance with the following specifications:

- [S900 – General Water Provisions](#)
- [S901 – Water Main Pipe and Fittings](#)
- [S903 – Resilient Seat Gate Valve with Valve Box](#)

and the following detail drawings, when applicable:

- [S900-2 Water Trench Pavement Rehabilitation](#)
- [S900-4 Horizontal Thrust Block Domestic System](#)
- [S900-5 Vertical Thrust Block Domestic System](#)
- [S900-6 Disinfection Sampling Tap](#)
- [S900-7 Water Main Pipe Restraint Domestic System](#)
- [S900-8 Water Main Pipe Restraint Holly System](#)
- [S900-9 Horizontal Thrust Block Holly System](#)
- [S900-10 Vertical Thrust Block Holly System](#)
- [S901-9 Plastic Water Service Tracer Wire Installation](#)
- [S901-11 Plastic Water Service Tracer Wire Tap Splice Connection](#)
- [S966-7 Anode at Insertion Sleeve and Cut-In Tee on Existing Iron Pipe](#)
- [S970-4 New Water Service 4 Inch and Larger on Existing Water Main](#)
- [S970-5 New Water Service 4 Inch and Larger on Existing Water Main - Notes](#)

and all other specifications and details referenced therein.

Water services shall be pressure tested and disinfected in accordance with Notes 5 and 6 in detail [Drawing S970-5](#).

When a new ductile iron water service is installed, the service and appurtenances shall be encased with polyethylene wrap and high potential magnesium anodes shall be installed in accordance with Notes 8 and 9 in detail [Drawing S970-5](#) and the following specification and detail:

- [Specification S966 – Magnesium Anode](#)
- [Drawing S966-1 Anode at New Ductile Iron Water Main or Ductile Iron Fitting on New Plastic Water Main](#)

When a tap is made on an existing cast or ductile iron water main, a magnesium anode is to be installed on the existing water main, adjacent to the tapping sleeve. Refer to Table 2-1 for required anode size.

All pipe, fitting and valve joints on the new service shall be mechanically restrained and thrust blocks installed at all fittings. The curb valve is to be located between 2 and 3 feet behind the street curb (in tree lawn or sidewalk area).

When the water meter is to be located in a meter vault, the meter vault shall be installed in accordance with the following specification and details:

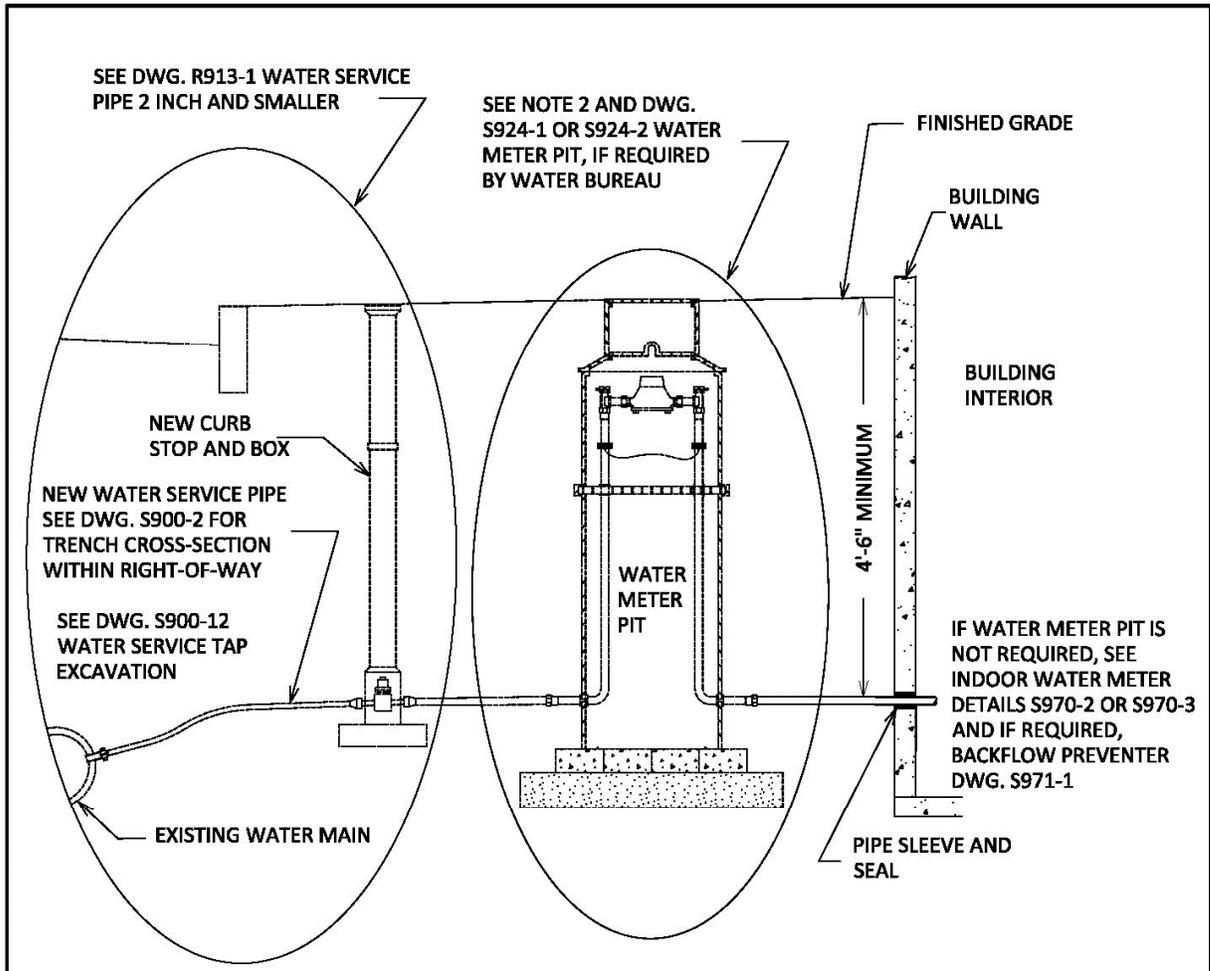
- [Specification S920 – Water Meter Vault for Domestic Meters \(3 Inch to 10 Inch\)](#)
- [Drawing S920-2 Water Meter Vault \(3 Inch to 10 Inch\)](#)
- [Drawing S920-3 Water Meter Vault Dimensions and Notes](#)

When the meter is to be located inside of a building, it shall be installed by the plumber in accordance with the following details, when applicable:

- [Drawing S970-6 Typical Indoor Installation of Domestic Meter 3 Inch to 10 Inch](#) or,
- [Drawing S970-7 Typical Meter Installation for Holly Fire Service 4 Inch and Larger](#) or,
- [Drawing S970-8 Typical Meter Installation for Domestic Fire Service 4 Inch and Larger](#) or,
- [Drawing S970-9 Typical Combination Fire and Domestic Service](#)

After the meter is installed, the Water Bureau will inspect it, install a meter interface unit and, if the meter has a bypass, install a seal on the bypass valve..
When an existing water service is replaced between the curb valve and the building, the Water Bureau will furnish a new valve box for the plumber to install.

APPENDIX A



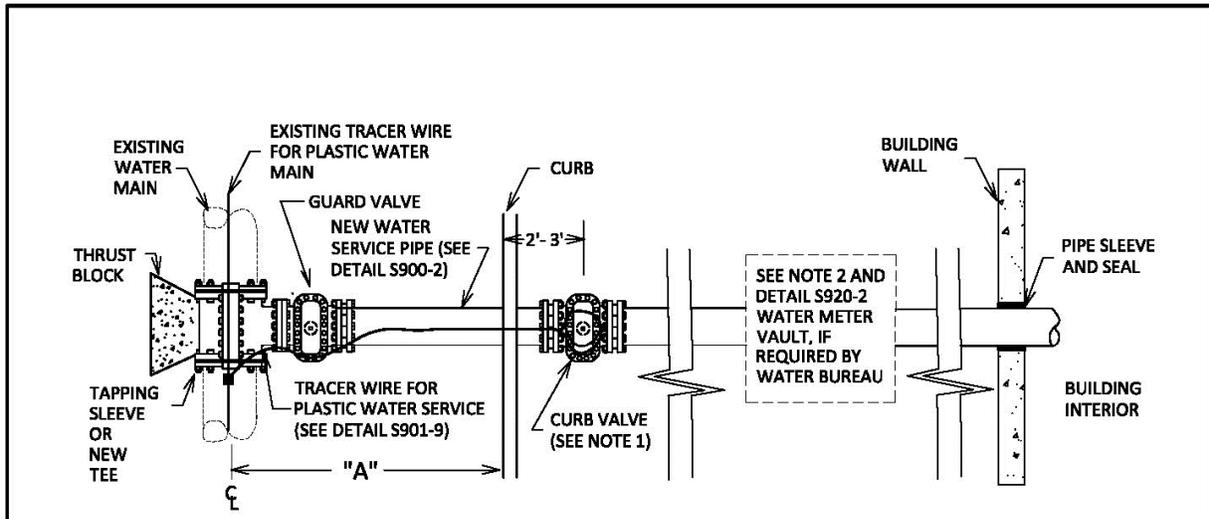
ELEVATION

NOTES:

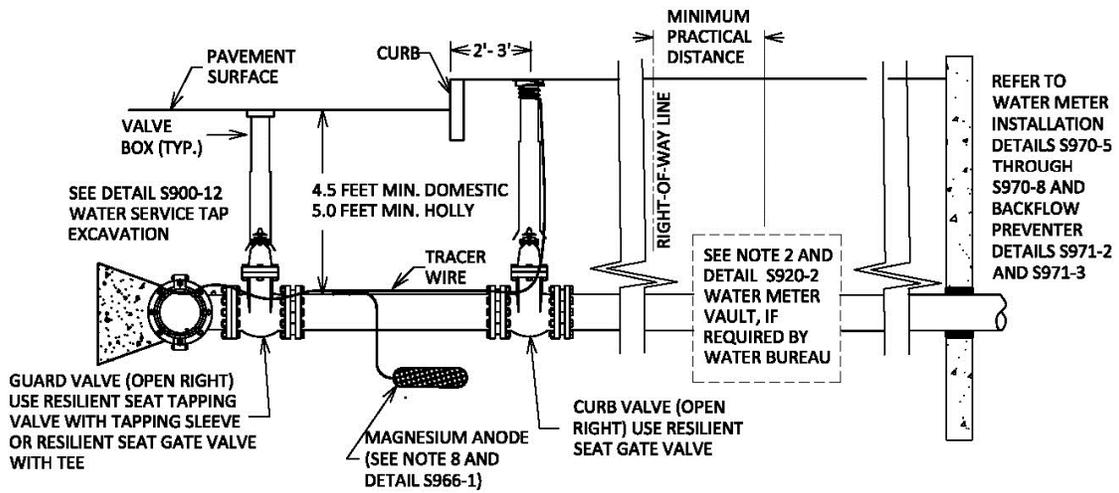
1. ONE CONTINUOUS PIECE OF WATER SERVICE PIPE IS TO BE INSTALLED BETWEEN THE CORPORATION STOP AND CURB STOP AND BETWEEN THE CURB STOP AND METER PIT (IF REQUIRED) OR BUILDING WALL.
2. A METER PIT MAY BE REQUIRED WHEN THE WATER SERVICE LENGTH, AS MEASURED FROM THE STREET RIGHT-OF-WAY LINE TO THE BUILDING WALL, EXCEEDS 100 FEET. WHEN THE WATER SERVICE LENGTH EXCEEDS 100 FEET, THE WATER BUREAU WILL REVIEW EACH NEW WATER SERVICE PLAN TO DETERMINE IF THE METER SHOULD EITHER BE PLACED; INSIDE OF THE HEATED BUILDING, IN A METER PIT OUTSIDE OF THE BUILDING NEAR THE RIGHT-OF-WAY LINE OR IN A HEATED ABOVE GROUND ENCLOSURE NEAR THE RIGHT-OF-WAY LINE.
3. A BACKFLOW PREVENTION DEVICE IS REQUIRED ON ALL DOMESTIC WATER SERVICES 1½" AND LARGER AND MAY BE REQUIRED ON SOME WATER SERVICES SMALLER THAN 1½", AS DETERMINED BY THE WATER BUREAU.

CITY OF ROCHESTER		
NEW WATER SERVICE 2 INCH AND SMALLER		
ISSUED	7-13-11	NON-STANDARD DWG.NO.S970-1
REVISED		

APPENDIX B



PLAN



ELEVATION

NOTE:

FOR NEW WATER SERVICE NOTES, SEE DETAIL S970-5

CITY OF ROCHESTER		
NEW WATER SERVICE		
4 INCH AND LARGER		
ON EXISTING		
WATER MAIN		
ISSUED	8-8-11	NON-STANDARD DWG. NO. S970-4
REVISED		

APPENDIX C

NOTES:

1. IF DIMENSION "A" BETWEEN THE CENTERLINE OF THE WATER MAIN AND THE FACE OF CURB IS 6 FEET OR LESS, THE CURB VALVE IS NOT REQUIRED. CURB VALVE IS REQUIRED WHEN DIMENSION "A" EXCEEDS 6 FEET.
2. A METER VAULT MAY BE REQUIRED FOR A DOMESTIC SERVICE, WHEN THE WATER SERVICE LENGTH, AS MEASURED FROM THE STREET RIGHT-OF-WAY LINE TO THE BUILDING WALL, EXCEEDS 100 FEET. WHEN THE WATER SERVICE LENGTH EXCEEDS 100 FEET, THE WATER BUREAU WILL REVIEW EACH NEW WATER SERVICE PLAN TO DETERMINE IF THE METER SHOULD EITHER BE PLACED; INSIDE OF THE HEATED BUILDING; IN A METER VAULT OUTSIDE OF THE BUILDING NEAR THE RIGHT-OF-WAY LINE OR IN A HEATED ABOVE GROUND ENCLOSURE NEAR THE RIGHT-OF-WAY LINE.
3. ALL JOINTS ON NEW WATER SERVICE PIPE, FITTINGS AND VALVES SHALL BE MECHANICALLY RESTRAINED. CONCRETE THRUST BLOCKS ARE ALSO REQUIRED AT FITTINGS PER DETAIL DRAWINGS S900-4, S900-5, S900-9 AND S900-10.
4. A BACKFLOW PREVENTION DEVICE IS REQUIRED ON ALL DOMESTIC WATER SERVICES 1½ AND LARGER.
5. NEW WATER SERVICE SHALL BE PRESSURE TESTED FROM GUARD VALVE TO WITHIN 5 FEET OF EXTERIOR BUILDING WALL. PRESSURE TESTING SHALL BE PERFORMED IN ACCORDANCE WITH SPECIFICATION S900-3.05. PIPE, FITTING AND VALVE JOINTS ON PORTION OF SERVICE NOT SUBJECT TO PRESSURE TEST SHALL BE LEAK TESTED AT NORMAL OPERATING PRESSURE.
6. WHEN THE LENGTH OF THE NEW WATER SERVICE EXCEEDS 50 FEET, WATER SERVICE SHALL BE DISINFECTED USING THE CONTINUOUS FEED METHOD IN ACCORDANCE WITH SPECIFICATION S900-3.06. FOR WATER SERVICES LESS THAN 50 FEET, ALL WATER SERVICE PIPE, FITTINGS AND VALVES SHALL BE SPRAY OR SWAB DISINFECTED WITH 1%-5% CHLORINE SOLUTION.
7. ON PLASTIC WATER SERVICES, WHEN DIMENSION "A" IS 6 FEET OR LESS AND THE CURB VALVE IS NOT REQUIRED, EXTEND TRACER WIRE ALONG SERVICE TO RIGHT-OF-WAY LINE AND INSTALL TRACER WIRE TERMINATION BOX AT RIGHT-OF-WAY.
8. ONE MAGNESIUM ANODE IS TO BE INSTALLED ON EACH PIECE OF NEW DUCTILE IRON WATER SERVICE PIPE BETWEEN THE WATER MAIN AND RIGHT-OF-WAY LINE. SEE DETAIL S966-2. USE 17 POUND ANODE ON 4 INCH AND 6 INCH PIPE, 32 POUND ANODE ON 8 INCH AND 10 INCH PIPE AND 48 POUND ANODE ON 12 INCH PIPE.
9. ALL DUCTILE IRON WATER SERVICE PIPE, FITTINGS AND VALVES LOCATED WITHIN THE STREET RIGHT-OF-WAY ARE TO BE INSTALLED IN POLYETHYLENE ENCASEMENT.
10. IF PLANS CALL FOR THE INSTALLATION OF A TAPPING SLEEVE AND VALVE, BUT THE WATER MAIN CAN NOT BE TAPPED DUE TO SPATIAL LIMITATIONS , A NEW SERVICE TEE WITH A SERVICE VALVE MAY NEED TO BE CUT INTO THE EXISTING WATER MAIN.
11. PROPOSED DEVIATIONS TO THE APPROVED PLANS REQUIRE WATER BUREAU AUTHORIZATION BEFORE BEGINNING THE WORK.

CITY OF ROCHESTER	
NEW WATER SERVICE	
4 INCH AND LARGER	
ON EXISTING	
WATER MAIN – NOTES	
ISSUED	8-11-11
REVISED	NON-STANDARD DWG.NO.S970-5

APPENDIX D
LIST OF WATER SPECIFICATIONS
(with links to pdf-formatted specifications)

[S900 – General Water Provisions](#)

[S901 – Water Main Pipe and Fittings](#)

[S902 – Salvage Existing Water Valve](#)

[S903 – Resilient Seat Gate Valve with Valve Box](#)

[S904 – Tapping Sleeve with Valve and Valve Box](#)

[S905 – Cutting-In Valve with Valve Box and Sleeve](#)

[S906 – Insertion Sleeve](#)

[S907 – Connect New Water Main to Existing Water Main](#)

[S908 – Cut and Plug Existing Water Main](#)

[S909 – Water Valve Box](#)

[S910 – Temporary Cut and Plug Existing Water Main](#)

[S911 – Pitometer Tap and Connection](#)

[S912 – Corporation Stop and Connection; Abandon Existing Water Service at Tap \(2 Inch and Smaller\)](#)

[S913 – Water Service \(2-Inch and Smaller\)](#)

[S914 – Curb Stop and Box](#)

[S915 – Relocate Water Service Meter \(1-Inch and Smaller\)](#)

[S916 – Temporary Bypass](#)

[S917 – Hydrant](#)

[S918 – Water Manhole](#)

[S919 – Abandon Existing Water Valve Vault; Install Direct Burial Valve\(s\)](#)

[S920 – Water Meter Vault for Domestic Meters \(3-Inch to 10-Inch\)](#)

[S922 – Permanent Blowoff Assembly](#)

[S923 – Bell Joint Leak Clamp](#)

[S924 – Water Meter Pit \(2-Inch and Smaller\)](#)

[S925 – Yard Hydrant](#)

[S926 – Abandon Existing Water Main at Railroad or Highway Crossing](#)

[S930 – Cleaning and Lining of Water Mains](#)

[S931 – Removal and Replacement or Reinstallation of Water Main Obstruction](#)

[S935 – Televising Water Mains](#)

[S962 – Joint Bonds](#)

[S966 – Magnesium Anode](#)

[S968 – Cathodic Protection Test Station](#)

APPENDIX D

APPENDIX E
LIST OF WATER DETAILS
(with links to pdf-formatted details)

- [S900-1 Water Trench Pavement Reconstruction](#)
- [S900-2 Water Trench Pavement Rehabilitation](#)
- [S900-3 Water Main Crossing Below Sewer](#)
- [S900-4 Horizontal Thrust Block Domestic System](#)
- [S900-5 Vertical Thrust Block Domestic System](#)
- [S900-6 Disinfection Sampling Tap](#)
- [S900-7 Water Main Pipe Restraint Domestic System](#)
- [S900-8 Water Main Pipe Restraint Holly System](#)
- [S900-9 Horizontal Thrust Block Holly System](#)
- [S900-10 Vertical Thrust Block Holly System](#)
- [S900-11 Replacement of 4-Inch and Larger Water Service on New Water Main](#)
- [S900-12 Water Service Tap Excavation](#)
- [S901-8 Plastic Water Main Tracer Wire Installation](#)
- [S901-9 Plastic Water Service Tracer Wire Installation](#)
- [S901-10 Plastic Water Main Tracer Wire End to End Splice Connection](#)
- [S901-11 Plastic Water Service Tracer Wire Tap Splice Connection](#)
- [S901-12 Impervious Clay Water Main Trench Plug](#)
- [R905-1 Cutting-In Valve Installation](#)
- [S909-1 Water Valve Box Adjustment or Replacement](#)
- [S911-1 Pitometer Tap](#)
- [R913-1 Water Service Pipe 2-Inch and Smaller](#)
- [R913-2 Existing Copper Water Service Pipe Extension 2-Inch and Smaller](#)
- [R913-3 Water Service Card](#)
- [S916-1 Bypass Pipe Crossing at Driveway, Sidewalk and Street](#)
- [S916-2 Bypass Pipe at Sidewalk Access Ramp](#)
- [R917-1 Hydrant and Valve with New Branch](#)
- [R917-2 Hydrant at Existing Branch](#)
- [S920-2 Water Meter Vault for Domestic Meter 3-Inch to 10-Inch](#)
- [S920-3 Water Meter Vault Dimensions and Notes](#)
- [S924-1 Water Meter Pit 1-Inch and Smaller in Lawn Area](#)
- [S924-2 Water Meter Pit 1½-Inch and 2-Inch in Lawn Area](#)

(Continued on next page)

LIST OF WATER DETAILS *(Continued)*

APPENDIX E
(with links to pdf-formatted details)

- [S925-1 Yard Hydrant](#)
- [S962-1 Joint Bond for Metallic Water Main Pipe/Fitting](#)
- [S966-1 Anode at New Ductile Iron Water Main or Ductile Iron Fitting on New Plastic Water Main](#)
- [S966-2 Thermite Weld Details](#)
- [S966-3 Anode at New Copper Water Service on Plastic Water Main](#)
- [S966-4 Anode at New Water Service on Existing Cast/Ductile Iron Water Main](#)
- [S966-5 Anode at Existing Ductile/Cast Iron Pipe Joint \(Reconstruction\)](#)
- [S966-6 Anode at Existing Ductile/Cast Iron Pipe Joint \(Rehabilitation\)](#)
- [S966-7 Anode at Insertion Sleeve and Cut-In Tee on Existing Iron Pipe](#)
- [S968-1 Cathodic Protection Test Station for Metallic Water Pipe or Fitting \(1 of 2\)](#)
- [S968-2 Cathodic Protection Test Station for Metallic Water Pipe or Fitting \(2 of 2\)](#)
- [S970-1 New Water Service 2-Inch and Smaller](#)
- [S970-2 Indoor Installation of Water Meter 1-Inch and Smaller](#)
- [S970-3 Indoor Installation of Water Meter 1½-Inch and 2 Inch](#)
- [S970-4 New Water Service 4-Inch and Larger on Existing Water Main](#)
- [S970-5 New Water Service 4-Inch and Larger on Existing Water Main – Notes](#)
- [S970-6 Typical Indoor Installation of Domestic Water Meter 3-Inch to 10-Inch](#)
- [S970-7 Typical Water Meter Installation for Holly Fire Service 4-Inch and Larger](#)
- [S970-8 Typical Water Meter Installation for Domestic Fire Service 4-Inch and Larger](#)
- [S970-9 Typical Combination Fire and Domestic Service](#)
- [S971-1 Reduced Pressure Zone \(RPZ\) Backflow Prevention Device 2-Inch and Smaller](#)
- [S971-2 Reduced Pressure Zone \(RPZ\) Backflow Prevention Device 2½-Inch and Larger](#)
- [S971-3 Reduced Pressure Zone \(RPZ\) Air Gap and Drain Line Installations](#)