Division VII
Section 7300
Water Service Connection

CITY OF MANHATTAN
KANSAS

PUBLIC WORKS DEPARTMENT

DIVISION VII
CONSTRUCTION AND MATERIAL SPECIFICATIONS
SECTION 7300 WATER SERVICE CONNECTION

WATER SERVICE CONNECTION

7300 SCOPE

The work to be done under these specifications consists of installing domestic water service as shown on the drawings and as herein specified. The Contractor or Owner shall furnish all materials and labor not provided by the City of Manhattan as specified herein.

7301 WATER SERVICE CONNECTIONS

The City of Manhattan Utilities Division, Water Distribution Group will install new water service less than or equal to 2" in diameter. For all installations greater than 2" diameter, the owner shall have the work completed by a responsible contractor.

A typical installation will include the tap, corporation, copper service line, meter, meter box or vault, valve(s) and fittings. The copper service line will extend 24 inches in length from the connection to a meter box.

The Contractor or Owner is responsible for contacting the City to establish new water service and pay all associated fees per Sections 32-46 and 32-52, respectively, of the City of Manhattan "Code of Ordinances."

Services	City Department	Phone Number
Schedule Tap and Installation	Finance Department - Customer Service	785-587-2480
Establish Water Service	Fire Department-Code Services	785-587-4506

All water service lines shall be Type K copper or ductile iron as specified herein. All water service lines shall be installed to provide a minimum depth of cover between the top of pipe and the finished ground surface of not less than three and one-half (3 1/2) feet. Upon completion of the work the entire area affected by the installation shall be restored to original grade, seeded and mulched, and left in a clean and neat condition.

7301.1 Submittal Information

For standard ¾" and 1" new water service, no submittal information is required.

For 2" or greater service, or when a meter vault is required per this specification, the following submittal information is required:

1. The Contractor or Owner shall furnish Plans and Specifications to the City of Manhattan, Utilities Division for review showing the proposed location, service line and size, meter(s), valves, fittings, meter pit or vault, easements, and right of ways.

2. The City of Manhattan, Utilities Division will review and make comments. Approval will be given after all comments have been addressed. After approval, any proposed

changes will need to be reviewed and approved by the City of Manhattan Utilities Division.

7301.2 Maintenance Requirements

The City is responsible for maintaining the service from the main to the meter, including the meter, on all City of Manhattan installations. All proposed new City water mains not located in existing City ROW or easements, but on private property, must be contained in easements, and will be publicly maintained. For Developers building City water infrastructure, a private developer agreement must be approved by the City to ensure that infrastructure is constructed to city standards and delineates whether infrastructure is public and private, and which party is responsible for maintenance.

Where existing meters are located indoors, the City will maintain the water service line from the main to the property line. The city will also maintain the meter. The service line from the property line to the meter will be privately maintained. For apartment buildings or equivalent, public meters in private meter rooms are not permitted. The owner may install a master meter for the apartment building, install private meters in a private meter room, or install public meters in a vault per the specifications contained herein. The City will maintain master meters and meters in vaults. Private meters shall be privately maintained.

7301.2.1 *Fire Lines*

For apartment buildings or equivalent with dedicated fire protection, domestic and fire lines shall have separate connections to the water main. For all other domestic water service, water service lines may connect to fire lines that serve fire hydrants only. Fire lines serving fire hydrants, not located in existing City ROW or easements, but on private property, must be contained in easements, and will be privately maintained. Fire lines for building sprinkler systems shall be privately maintained.

7301.2.2 *Vaults*

The property owner shall be responsible for maintaining the meter vault. The exterior and interior of all vaults shall be maintained in a clean, dry and safe condition. If a vault has water seepage, the owner be shall be responsible for maintaining a dry interior via a sump pump or equivalent. The city of Manhattan shall maintain the meters, ductile iron pipe, valve(s) and fittings contained in the vault.

7302 **MATERIAL**

Upon the request of the Assistant Director of Public Works-Utilities the Contractor or Owner shall provide three (3) copies of certified test reports confirming the material conforms to the following specifications. The manufacturer shall perform all tests in accordance with applicable standards. Testing may be witnessed by the Assistant Director of Public Works-Utilities, his designee, or an approved independent testing laboratory.

All materials shall be stored to prevent deterioration or intrusion of foreign matter. No deteriorated or damaged material shall be used.

7302.1 Copper Pipe

For service connections less than 2" diameter, Type K Copper pipe shall be used from the main up to and including the meter box. The minimum service line shall be 1" diameter, unless approved by the Utilities Department.

7302.2 Ductile Iron Pipe

For installations greater than 2" diameter, a minimum of 4" ductile iron pipe meeting City of Manhattan Standard Specifications, Waterlines Division II, Section 2301.1 shall be used from the main up to and including the meter box or vault.

7302.3 Conduit

For water service lines crossing under roadways a conduit shall be installed. The conduit shall be a minimum of 4" diameter schedule 40 PVC pipe. The conduit shall extend a minimum of 2 feet past the curb on the other side of street from water main. After installation, blue PVC caps shall be placed on both ends of the conduit. The conduit ends shall be marked by a 2" by 4" stake painted with blue permanent paint that extends 4 feet above grade. Developer plans shall show the conduits on the Utility Plan of their design plans, and final plats as applicable. Developer shall be responsible for designing and constructing the conduits, including all costs associated with the work.

7302.4 Joints

All joints shall conform to ANSI 21.11.

7302.5 Isolation Valves

Two inch and larger water service lines shall have a by-pass installed with no less than one properly designed valve on the by-pass line. The bypass line and valve may be one size smaller than the meter. Valves shall have the standard operating nut as specified on a City of Manhattan approved gate valve or butterfly valve, per Waterlines Division II, Section 2301.3. There shall be above ground access to all valves.

7302.6 Tapping Sleeve

All tapping sleeves shall be Mueller ductile iron, mechanical joint or equivalent and be pressure tested per manufacturer's recommendations prior to back filling the location. A representative of the City shall be contacted prior to the test being conducted

7302.7 Meter Box

The following table contains specifications for using the correct size meter box, based on the number and size of service meters.

Meter Size and Number	Recommended Meter Box
Single ¾" or 1" meter	21x36 SDR51 box
Two ¾" meters	21x36 SDR51 box
3-4, ¾" meters	36" Contech A2000 box
2, 1" meters	2-21x36 SDR51 boxes or 1-36" Contech A2000 box
1, 2" meter	36" Contech A2000 box
More than 4, ¾" or 4, 1" or 4, 2", or > 2" meters	VAULT REQUIRED See Section 7302.9
3-4, 1" or 2" meters	multiple 36" Contech A2000 box

7302.8 Meter Lid and Ring

The ring for a 21x36 SDR51 box shall be Clay and Bailey or equivalent, non recessed lid frame, part # 02355-01-1050/4" depth with centering lugs. The lid shall be Mid States Plastic with radio read 00004003 or Carson Plastic part # 00004005/11.5" diameter.

The ring and lid for a 36" Contech A2000 box shall be Clay and Bailey 18x36" meter box adapter for 36" tile. Coating will be black bituminous paint. The material shall meet ASTM A48 Class 30.

7302.9 Meter Vault

For meters larger than 2" or where 4 or more meters are needed, a meter vault shall be provided. All precast vaults shall be designed for the project requirements, be installed with top flush with finished grade, and be in accordance with City of Manhattan Drawing No. 2320. Vault details, including location, dimensions, ladder access, access door, ductile iron piping, meter locations, fittings, and clearances must be submitted to the City of Manhattan Utilities Division for approval prior to construction. Two inch and larger water service lines shall have a by-pass installed with no less than one properly designed valve on the by-pass line. The bypass and valve may be one size smaller than the meter. The vault shall be provided with steps to provide access into the vault. Meter vaults should be located in green space, where possible, to avoid traffic applications and facilitate maintenance access. The meter vault shall be Monarch Products Company Pre-Cast Meter Vault or approved equal. The vault door shall be Bilco aluminum single leaf access door, type JD-2AL for non-traffic applications or JD-2AL H20 for traffic applications, or approved equal, and be located at the center of the vault and placed to the side nearest to the vault stairs. A removable, square key wrench and handle shall be provided to the City of Manhattan. Where required, a dual access door will be permitted. Round cast iron frames are not permitted.

7302.10 Meters

All City of Manhattan water meters shall be a Badger Water Meter with a RTR register wired for Itron radio read system or the Hexagram fixed network. The register must read in 100 cubic feet. All meters shall be of AWWA meter specifications and standards. Meters shall be of the right size type and specifications that it which it is designed. Selection of the type and size of meter shall be based only on the flow requirement (GPM) and the type of application, and not the head

pressure loss through the meter. Over sizing the meter to make up for head pressure loss can result in unregistered water during low flow periods.

1. For residential applications a Badger Meter M35 3/4" shall be used, with a piston or positive displacement disc capable of a maximum flow of 35 gpm.
   a. Note: Normal flows should not be more than approximately one half of the maximum capacity, if long life and meter accuracy is to be achieved.
   b. Types of use include: residences, small apartments, small business, etc.
   c. Demand flow rates: 3/8 to 35 gpm. For long meter life, maximum continuous demand shall be no more than 25 gpm.

2. 1" Badger Meter M70, piston or positive displacement disc capable of a maximum flow of 70 gpm.
   a. Types of use include: medium sized apartments, beauty salons, barber shops, filling stations, small businesses, irrigation systems etc.
   b. Maximum continuous demand to 25 gpm.

3. 1 ½" Badger Meter M120, piston or positive displacement disc capable of a maximum flow of a 120 gpm. The Badger M120 shall have Elliptical Flanges and a 1" test plug so that the meter can be tested in place. This meter shall be installed in a meter setter with a by-pass.
   a. Types of use include: Medium motels, hotels, large apartments, small industry, small processing plants etc.
   b. Demand flow rates: 5/8 to 120 gpm. Maximum continuous demand no more than 50gpm.

4. 2" Badger Meter M170, piston or positive displacement disc capable of a maximum flow of 170 gpm. The Badger M170 shall have Elliptical flanges and a 1" test plug so that the meter can be tested in place. This meter shall also be installed in a meter setter with a by-pass.
   a. Types of use include: Larger motels, hotels, large apartments complexes, industrial plants.
   b. Demand flow rates: 1 ¼ to 170gpm. Maximum continuous demand no more than 80gpm.

5. Badger Turbo Meters 2"- 20" – A turbo meter shall be used with a bar screen ahead of it to insure optimum flow conditioning and protection for the turbo measuring element. Turbo meters with strainer require a minimum of five (5) pipe diameters of straight pipe upstream of the meter. Pressure reducing devices and weighted check valves must be located at least five (5) pipe diameters downstream of the meter. Do not install a pressure reducer or a check valve upstream of the meter.
   a. A turbo meter will have a test plug or a test tee installed for in-line meter testing.
   b. Each meter 2" and larger shall have a by-pass installed with no less than one valve on the by-pass line.
   c. Turbo meters are good for medium size hotels to large hotels, apartment complexes, industrial manufacturing, processing plants, large public buildings, irrigation pump discharge, etc. These meters are used where flow demand is from

200gpm – 19,800gpm. Low flow accuracy is reduced with Turbo meters. For example, a 2" Turbo meter is only 98% accurate at a low flow of 4 gpm. Turbo meters are known for permitting a significant amount of unregistered low flow, so Contractor or Owner must ensure that the Turbo meter is right for the application.

6. Badger Compound Meters 2" – 10" – Hotels, motels, schools, public buildings, apartment buildings, hospitals, special customers needing both high and low flow demands. These meters have a good low flow pickup for the size.
   a. Any compound meter 2" and above shall have a strainer installed to insure optimum flow conditioning and protection for the meter measuring element. It shall be installed with a minimum of five (5) pipe diameters of straight pipe upstream of the meter. Pressure reducing devices and check valves shall be five (5) pipe diameters downstream of the meter.
   b. A compound meter shall have a test plug or a test tee installed for in-line meter testing.
   c. Each meter 2" and larger shall have a by-pass installed with no less than one valve on the by-pass line.
   d. These meters are capable of up to 2000 gpm maximum output depending on size, and can measure a low flow of ½ gpm depending on meter size.

7. Badger FMUL Approved Fire Series Meter Assembly, 4"-10"meters. These meters come with a detector check valve hooked to a turbo meter. The check valve is a spring loaded clapper that sends water through a smaller by-pass into a 2" meter to register low flows. When a major flow is required the water pressure will overcome the spring loaded clapper and push it open, permitting full pipe capacity flow during a fire emergency.
   a. Typical use is a housing addition that already has water infrastructure in place along with fire hydrants, but needs to connect to a different water system which has to be metered.

7302.11 Concrete

All concrete used in association with water main installation shall be the standard City mix as described in City of Manhattan Standard Specifications, Paving Divison II Section 2600 "PAVING" Section 1.2.

7302.12 Plugs

Plugs at the end of water lines shall be push in or mechanical joint type plugs.

7303 **INSTALLATION**

Pipe, fittings, and valves shall be installed according to City of Manhattan Standard Specifications, Waterlines Division II, Section 2300 "INSTALLATION" Section 2.

7304 INSPECTION AND TESTING

Pressure and leakage test and water line disinfection procedures shall be completed in accordance with City of Manhattan Standard Specifications, Waterlines Division II, Section 2300 “INSPECTION AND TESTING” Section 3.

7305 TIES AND RECORDS

The Contractor shall provide GPS coordinates and address of the new water service to the City of Manhattan, Utilities Division, upon completion of the installation. The GPS coordinates shall be either in Longitude or Latitude or Northing and Easting, and accurately describe the location of the center of the meter box(s) or vault.