

Murray City Corporation
4646 South 500 West
Murray, Utah 84123
Phone 801.270.2440
Fax 801.270.2450



MURRAY

CITY
WATER

Water Specifications & Requirements

Murray City Water Division

Aron Frisk, Water Superintendent
Joe Goodman, Water Distribution Supervisor
Chad Anderson, Water Construction Supervisor
Landon St Clair, System Inspections
Steve Davis, Service Inspections
Dean Mair, Backflow Requirements
Phone 801.270.2440

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Murray City Water Division reserves the right to change these specifications at any time when deemed appropriate.

Pre Construction

- Prior to installation, all extensions or connections to water mains must be approved in advance by the public services director or designee in accordance with Murray City Code 13.08.190 (Ord. 02-35 § 5).
- Water connection impact fees must be paid prior to new development which includes remodeling, building enlargement, or any other construction or improvement which will place an increased burden on the city water system in accordance with Murray City Code 13.08.050 (Ord. 02-35 § 5).
- Obtain all street cut permits and any other permits applicable to the work being preformed.
- On mainline pipe jobs a pre construction meeting shall be set up by the developer. The meeting should include the developer, contractors and Murray City personnel who will be involved in the project. This meeting is generally beneficial for all parties involved.

Construction

- Murray City will be given advance notification of when work is to begin.
- It is unlawful for any person, without authority, to open any valve or other fixture attached to the city waterworks system in accordance with Murray City Code 13.08.040 (Ord. 02-35 § 5).
- Murray City personnel will inspect all work being performed and **nothing shall be buried** until approved by an authorized inspector. Murray City maps all new construction with a global positioning system (GPS) and if water features are buried before they are documented or inspected you will be required to uncover them.
- Murray personnel may also require extended range ball markers be installed to help with future locating. These ball markers will be provided by Murray City Water.
- All testing shall be overseen by Murray City personnel, no waterline will be accepted into the system until all tests have been completed. A complete disinfection and testing requirements checklist has been provided in this manual.
- Any time water will be shut off, it is the contractors job to give a minimum of 24 hours advanced notification to all those who will be affected. This notification should include: Contractors name and telephone number, the date the water will be shut off, and approximate time that the water will be shut off and turned back on.

- **Minimum Water Main Size**

- * Murray City requires that all new water main lines be a minimum of eight inches in diameter. Larger diameter main lines may be required based on flow demands, minimum flow requirements of the user and pressure requirements in accordance with the Murray City Water Master Plan.

- **Fire Protection**

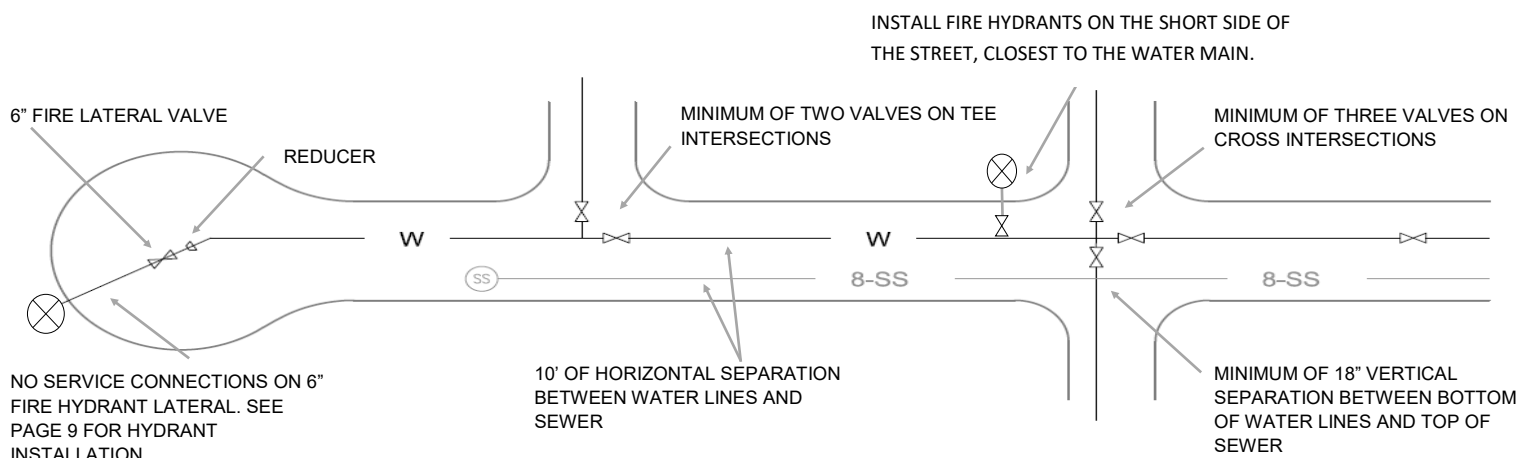
- * Fire hydrants shall be installed at locations determined by the City Fire and Public Works Departments.
- * Hydrant spacing shall meet the requirements of appendix C of the International Fire Code (IFC).
- * No dwelling unit shall be located farther than 250' from a fire hydrant, measured along the curb. Murray City Code 13.16.020.
- * Consideration should be taken to place fire hydrants at high points in water system to remove trapped air. If this is not feasible an air relief valve should be installed. Air Relief Valves to follow UAC R309-550-6 (6)
- * Hydrants should be installed on the short side of the street closest to the water main.
- * Fire hydrant laterals shall be six inches in diameter.
- * Fire hydrant design to follow UAC R309-550-6 (5)

- **Dead Ends**

- * All dead-end water mains shall be equipped with a fire hydrant.
- * If thrust blocks are unable to be installed, field lock gaskets / joint restraints must be installed for a minimum of 60' or three joints. Water Department Inspector must witness the installation of locking gaskets.

- **Valves**

- * A sufficient number of isolation valves shall be provided on mains to minimize inconvenience, sanitary hazards and loss of service during repairs. No more than four valves should be needed to isolate a section of main line.
- * One valve shall be placed at each branch off of main. A minimum of two valves shall be installed at every tee-intersection and a minimum of three valves at every cross-intersection.
- * Valves shall be located at not more than 500-foot intervals in commercial districts and not more than 800-foot intervals in other districts. UAC R309-550-5 (8). Valve spacing on transmission mains shall not exceed one mile.
- * More valves may be required at Murray City's discretion.



- **Separation of Water and Sewer Lines**

- * Water lines and sewer lines must have a horizontal separation of at least 10 feet, this distance shall be measured edge-to-edge.
- * Where local conditions prevent 10 feet of separation, or when water and sewer lines must cross, the bottom of the water line shall be at least 18 inches above the top of the sewer line.
- * If the separation requirements listed above cannot be met, the following construction standards shall be used:
 1. Sewer lines passing over or under water lines shall be constructed with a solid length of new ductile iron pipe or SD R35 pipe, extending at least 6 feet in both directions of the water line;
 2. Approved stainless-steel shear band couplings;
 3. Adequate structural support for sewer line to prevent deflection of joints and settling on water line (concrete cradle may be required).
- * Anything deviating from these requirements must be approved by Murray City Public Works and the City Engineer.

- **Separation of Water lines and all utilities**

- * Separation of at least 6 inches must be maintained between all utilities when crossing, and at least 4 feet with parallel installation.

- **Control Valve Stations**

- * Any waterline construction involving pressure reducing stations or more than one pressure zone must have an engineered plan taking into consideration the Water System's hydraulic grade line.
- * Follow UAC R309-550-6 (8)

- **Surface Water Crossings**

- * All surface water crossings must have engineered plans, approved by Murray City, that meet the standards of UAC R309-550-8 (8)

- **Murray City Water System does not allow the use of individual home booster pumps.**

- **Fire Line Installation**

- * New fire lines must be fed from an 8" water main at a minimum. Fire lines must be poly bagged class 52 ductile iron to the in-building riser. The City allows Stainless Steel in-building risers.
- * Contractor is responsible for performing all flushing requirements. Must flush the line with hoses that are at least half the diameter of the new fire line lateral. Fire line must meet all other Murray City flushing and sampling requirements.
- * When a fire line lateral has multiple branches (i.e. fire hydrants, fire lines) The main lateral must be 8" to the last end of source. At each branch there must be a resilient seat gate valve for isolation purposes. After the gate valve on each branch the fire line lateral can reduce down to the desired size.
- * No service laterals allowed to be connected to a fire line.

- **Footings & Other Permanent Structures**

- * Water mains running parallel with buildings, must have a minimum separation of 4' from building footings or other permanent structures.
- * Anything deviating from these requirements must be approved by Murray City Public Works and City Engineer

Material Specifications

PIPE
<p>Special thickness Class 52 Ductile Iron Pipe</p> <p>AWWA C151--09</p> <p>(AWWA C104./ANSI A21.4)</p> <p>Pipe size shall be approved by the Murray City Water Department.</p> <p>Ductile Iron must be domestic:</p> <p>Made in U.S.A</p>
MECHANICAL JOINT FOLLOWER
<p>All followers must be restraint style followers. Megalug, Stargrip or the use of a suitable equivalent with the approval by Murray City Water Department prior to installation.</p> <p>ANSI/NSF Standard 61</p>
ONE BOLT RESTRAINT COUPLING
<p>Romac Alpha, Hymax Grip or an approved equivalent.</p> <p>Fitting bolts must be greased and the fitting must be wrapped after installation.</p>
ONE BOLT WIDE RANGE COUPLING
<p>Hymax 2, Romac Macro HP or an approved equivalent.</p> <p>Fitting bolts must be greased and the fitting must be wrapped after installation</p>
FIELD LOCK GASKETS
<p>Murray City may call out for Field Lock gaskets to be installed in Tyton Joints for restraint purposes</p>

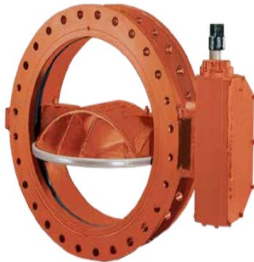


FITTINGS
<p>Ductile Iron</p> <p>Cement Lining and Asphalt seal coat in accordance with</p> <p>(AWWA C104./ANSI A21.4)</p>
PIPE WRAP
<p>V-Bio Enhanced Polyethylene Encasement</p> <p>ANSI/AWWA C105/A21.5</p> <p>ASTM A674</p> <p>All new piping and fittings shall be wrapped with AWWA approved V-Bio enhanced polyethylene encasement</p> <p>Pipe repairs can use AWWA approved polyethylene encasement..</p>
TAPE
<p>2" Wide 20 Mill Tape</p> <p>No other type of tape will be allowed.</p>
GREASE
<p>FM Food Quality Grease</p> <p>Applied to all nuts and bolts</p>



Material Specifications

GATE VALVES
<p>Resilient—seated gate valves</p> <p>AWWA C509-15 / AWWA C515-20</p>
BUTTERFLY VALVES
<p>Class 205B Lineaseal Butterfly Valve or Equivalent type of valve that is approved by Murray City Staff.</p> <p>Rubber—seated butterfly valves</p> <p>AWWA C504-15</p>
VALVE BOXES
<p>Sliding adjustable type, cast iron, with cast iron cover with the word “WATER” cast into it.</p>
VALVE ALIGNERS
<p>Posi-Cap valve box aligners.</p>



DUCTILE IRON TAPPING SLEEVE
<p>It is Murray City policy to use ductile tapping sleeves on poly wrapped ductile iron mains. However, because of our larger water mains an exception may be considered if it can be demonstrated that efforts have been made, or the timing of a project is critical to keep a roadway open or project on schedule. Specific details will be reviewed on a case by case basis.</p>
STAINLESS STEEL TAPPING SLEEVE
<p>PowerSeal stainless steel sleeve (model 3490) or the use of a suitable equivalent with the approval by Murray City Water Department prior to install.</p> <p>Shall not be installed on poly wrapped ductile iron mains unless given approval beforehand. It can be installed on every other type of water main within our system</p>
FIRE HYDRANTS
<p>Mueller—Super Centurion, A-423</p> <p>Clow—Medallion</p>
SAMPLE STATIONS
<p>Kupferle Eclipse #88-SS</p>
CURB STOP / STOP & WASTE BOX
<p>All Curb Stops and Stop & Waste boxes shall be Cast Iron .Shall arch around the water lateral or thread onto the Valve.</p> <p>Inside diameter shall not be larger then 2”.</p>



Material Specifications

COPPER TUBING

Type K Soft Copper Tubing

Required from City main line to meter setter.

Recommended from meter setter to point of use.



FLARE FITTINGS

The preferred fitting for service lateral connections.

No Lead—Brass Fittings Only



COMPRESSION FITTINGS

CTS Compression Only

No Lead—Brass Fittings Only

Stainless steel inserts required when used to make connection on Poly Tubing.



PRESS FITTINGS

Viega ProPress fittings or approved equivalent.

Copper or Bronze fittings only.

Can use in Meter Setter connections. Follow Utah plumbing code for direct bury press connections.



WATER METERS

Murray City provides water meters based on planned flow (Badger Meters 3/4" & 1").

Ultrasonic meters are not exclusive to a particular make. Murray City will determine which meter to install.

Note: Murray does not stock larger meters 3" and up, please give Murray City two weeks advance notification to make sure it is available when needed.

POLY TUBING

PE 4710 CTS

Poly tubing is only allowed from the meter setter to the point of use.

Must have an SDR rating of 9 with a 200 psi rating or higher.

Must meet or exceed NSF/ANSI Standards 14 and 61 and meet AWWA C901-17.

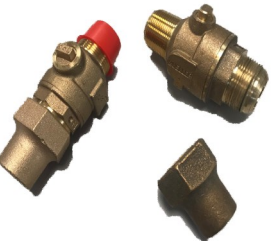


3/4"-1" CORPORATION STOPS

AWWA tapered C.C. thread for direct connection onto the main.

All corporation stops to be ball valve.

Preferred flared connection. Can use CTS compression.



1"1/2 - 2" CORPORATION STOPS

I.P. threads ball valve style corporation stop,

Preferred flared connection. Can use CTS compression.



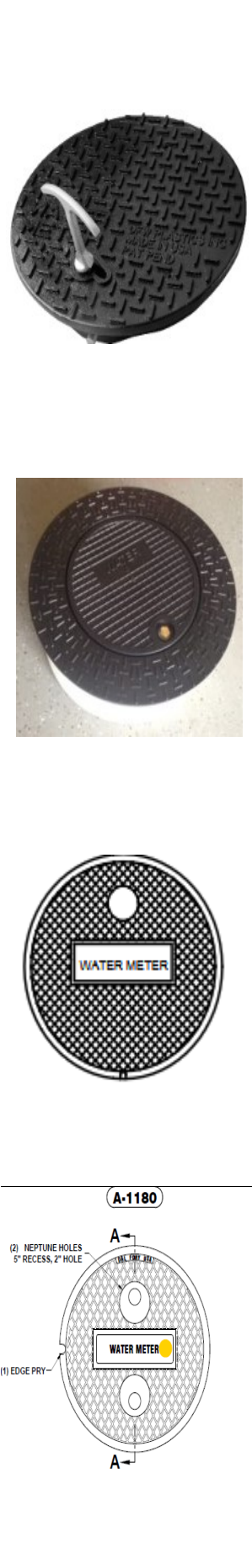
SADDLES

Double Strap Brass Saddles for all 1 1/2" and 2" connections.



Material Specifications

3/4" - 1" METER RING & LID
<p>LID—12.25" OD Polymer Solid Meter Lid. Must be black, large pentagon bolt, polymer worm gear, Water stamped on lid. Fit the below required rings</p> <p>DFW or NICOR</p> <p>RING— D&L SUPPLY L-2240 or L2242 Ring. Dependent on diameter of Meter Box.</p>
3/4" - 1" FULL RING & LID
<p><u>POLYMER METER RING & LID ORDER TO SIZE OF BOX</u></p> <p>Must be used in hardscape and concreted areas. Must be set to grade.</p> <p>Ring</p> <p>B5018 through B5022</p> <p>Lid</p> <p>DFW5018-1MWLT LID BLK</p> <p>DFW5020 LID BLK</p> <p>NICOR 21.75"X16.375" LID</p>
1"1/2 & 2" METER BOX RING & LID
<p>30" Manhole Lid and Ring. Lid must have a 2" recessed universal hole for AMI equipment installation.</p> <p>LID-D& L Supply A-1180-71i</p> <p>RING-D&L Supply A-1180-R3</p>
3" & LARGER METER BOX RING & LID
<p>Murray City will provide the Ring & Lid for these Meter Boxes after FEE is paid. Murray must alter the lid by enlarging the hole within the recess of the D&L A-1180-S47 lid. To allow installation of our AMI equipment.</p> <p>RING—D&L Supply A-1180-R3</p>

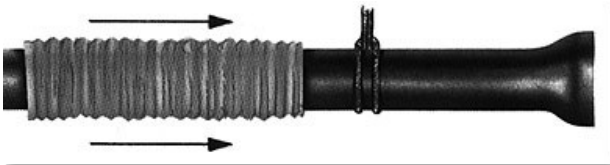


3/4" - 1" METER SETTERS
<p>3/4" - 1" meters must have an 18" copper setter with a ball valve style angle valve. (no backflow).</p> <p>MIP with Universal fitting connections</p>
1"1/2 - 2" METER SETTERS
<p>1 1/2" and 2" meters must have an 18" copper setter.</p> <p>Double valve, ball valve style, inlet and outlet with lockable bypass valve (no backflow).</p>
3/4" - 1" METER BOX
<p>20" Inside Diameter (Round Wall) 30" Deep</p> <p>Raven Meter box must be used when in concrete or hardscape RMP2030-SW-W 20 x 30</p> <p>ADS Meter box—Can be used in landscaped area—21" X 36" (Cut down to 30")</p>
1"1/2 - 2" METER BOX
<p>4 x 4 x 4 Dura-Crete Concrete Meter Box</p> <p>Removable Top, without a floor.</p> <p>Suitable equivalent can be approved by Murray Water prior to installation</p> <p>Meet UAC R330—550-6 (7)</p>
3" & LARGER METER VAULTS
<p>Must be engineered and approved by Murray Water.</p> <p>Designs must have adequate room for service and maintenance</p> <p>Meet UAC R330—550-6 (7)</p> <p>(See Pages: 19, 20, 21, & 22)</p>



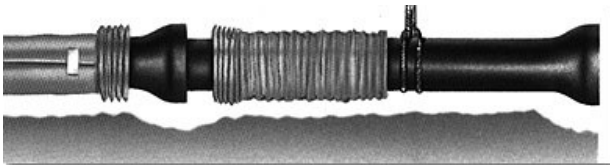


Murray City's Required Method of Pipe Installation



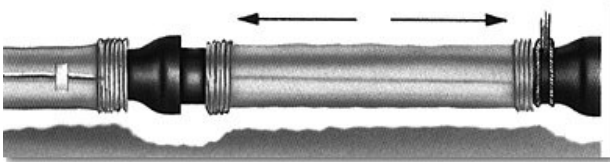
STEP 1

Cut a section of polyethylene tube approximately two feet longer than the pipe section. Remove all lumps of clay mud, cinders or other material that might have accumulated on the pipe surface during storage. Slip the poly tube around the pipe, starting at the spigot end. Bunch the tube accordion-fashion on the end of the pipe. Pull back the overhanging end of the tube until it clears the pipe end.



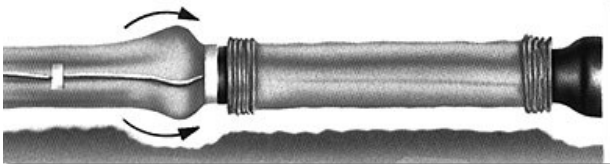
STEP 2

Dig a shallow bell hole in the trench bottom at the joint location to facilitate installation of polyethylene tube. Lower the pipe into the trench and make up the pipe joint with the preceding section of pipe.



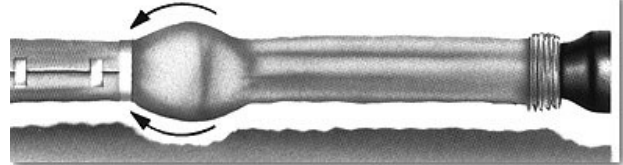
STEP 3

Move the cable to the bell end of the pipe and lift the pipe slightly to provide enough clearance to easily slide the tube. Spread the tube over the entire barrel of the pipe. Make sure that no dirt or other bedding material becomes trapped between the wrap and the pipe.



STEP 4

Make the overlap of the polyethylene tube by pulling back the bunched polyethylene from the preceding length of pipe and securing it in place. Murray City requires that polyethylene be secured in place using 2" 20 mill tape.



STEP 5

Overlap the secured tube end with the tube end of the new pipe section. Secure the new tube end in place using 2" 20 mill tape.



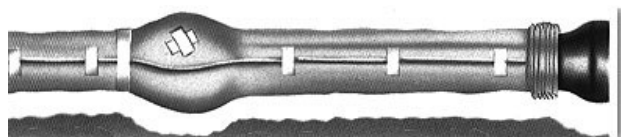
STEP 6

Take up the slack in the tube along the barrel of the pipe to make a snug, but not tight, fit. Fold excess polyethylene back over the top of the pipe.



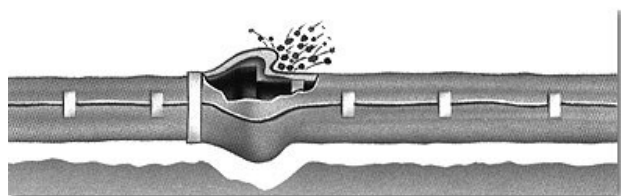
STEP 7

Secure the folds every three feet along the pipe barrel using 2" 20 mill tape.



STEP 8

Repair all small rips, tears, or other tube damage with 2" 20 mill tape. If the polyethylene is badly damaged, repair the damaged area with a sheet of polyethylene and seal the edges of the repair with 2" 20 mill tape.



STEP 9

Carefully backfill the pipe according to the AWWA C600 standard for backfill procedure. To prevent damage during backfilling, allow adequate slack in the tube at the joint.

Installation

Ductile Iron & Pipe Fittings



MURRAY
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1. The contractor shall have all the proper tools to handle the pipe, on the job site with each pipe laying crew.
2. Lay pipe and fittings in accordance with the requirements of AWWA C600, except when noted otherwise herein.
3. All materials that come in contact with drinking water shall meet ANSI/NSF Standard 61, Drinking Water System Components - Health Effects.
4. All pipe and fittings shall comply with AWWA C104-A21.4-08 through C550-05.
5. All pipe and fittings shall be thoroughly cleaned before being laid and shall be kept clean until installed.
6. Pre-used materials must be approved by Murray personnel and have only been previously used for drinking water. Used materials shall meet all standards, be cleaned and restored to their original condition.
7. Pipe should be laid in the dry trench conditions. At no time should water in the trench be allowed to flow into the pipe. At any time that work is not in progress, or the trench is unattended, the end of the pipe shall be suitably closed to prevent the entry of animals, earth, water, etc. using a water tight expandable plug. The expandable plug will always be kept at a close proximity to the end of the pipe incase of an emergency.
8. Murray City has a minimum bury depth of 42 inches but prefers pipe to be laid at a depth of 48 inches. Once the excavation has been completed to the proper depth the pipe bed should be prepared as follows:
 - Pipe that is to be laid on undisturbed sub grade should be manually excavated around the pipe bells assuring a uniform surface along the pipe barrel. This practice will also assist in applying required tape around the bell.
 - Murray City can require that pipe be laid on a bedding material if the native soil is not in ideal condition. The bedding material will be sand with no rocks that could puncture the polyethylene wrap.

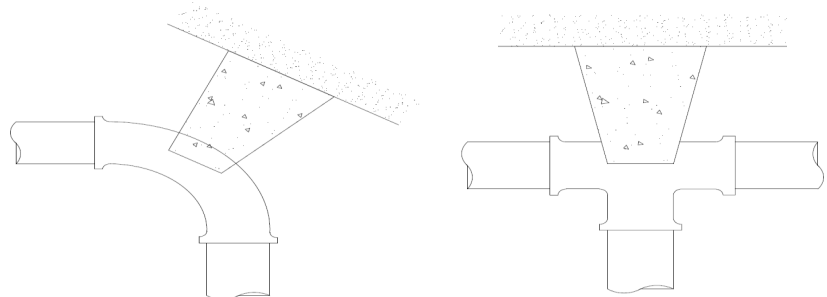
8. Jointing shall conform to manufacturer's instructions and appropriate AWWA standards. Apply lubricant to the exposed surface of the gasket and plain end of the pipe in accordance with the pipe manufacturer's recommendations. Lubricant is furnished in sterile containers, and every effort should be made to protect against contamination.

9. All fitting installations should conform to the manufacturer's instructions.

10. Murray City requires the use of Mechanical Joint Restraint followers (Megalug, Stargrip or the use of a suitable equivalent with the approval of the Murray City Water Department prior to construction).

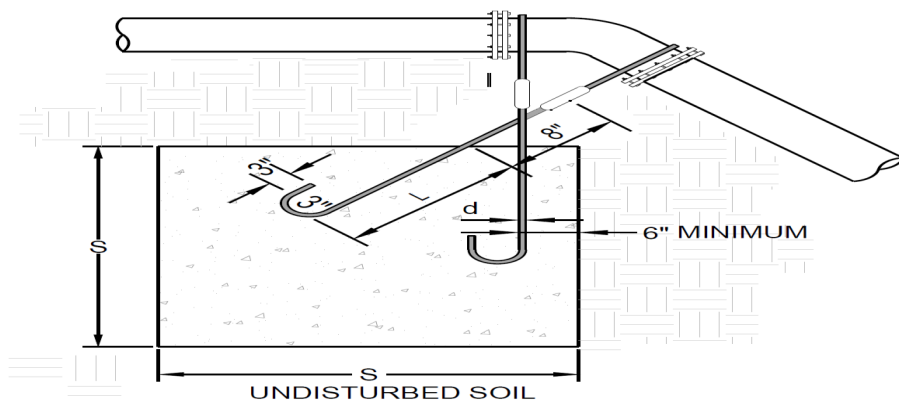
11. All encasement should be installed according to AWWA C105/A21.5-99 (See attached Murray City Required Method of Pipe Installation page 8). Care should be taken to not puncture or tear the wrap. All small rips, tears, and other damage should be repaired using 2" wide 20 mill tape.

12. Install concrete thrust blocks at all fittings and other locations, as directed by Murray City Water Department. 6 1/2 Bag Class 4000 is the minimum requirement for all concrete.



THRUST BLOCKING

A MINIMUM OF 6 SQ FEET OF BEARING ON UNDISTURBED SOIL. KEEP CONCRETE CLEAR OF FLANGES & BOLTS



VERTICAL BEND TIE DOWN RESTRAINTS

THRUSTS MUST BE POURED AGAINST OR UPON UNDISTURBED SOIL. CONDITIONS MUST BE INSPECTED AND APPROVED PRIOR TO POUR. KEEP CONCRETE CLEAR OF FLANGES & BOLTS

Hydrant Installation

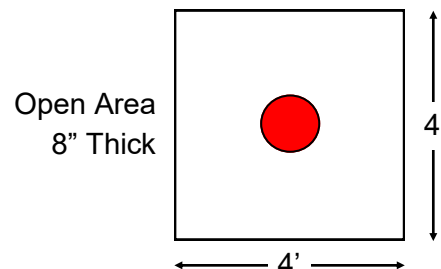
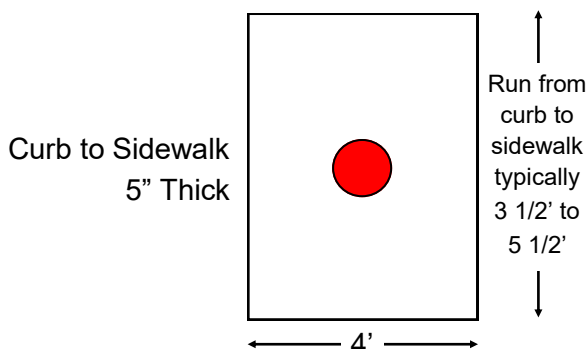
(Sectional Drawing on Page 12)

Fire hydrants will not be accepted by the City unless all criteria listed below is met.

- Hydrants shall be set at the location shown with a minimum of 1' from the back of curb. Each hydrant shall be set in true vertical alignment. The 4 1/2" steamer nozzle shall face the street.
- Hydrants shall be bedded on a firm foundation; undisturbed soil or solid concrete blocks.
- All nuts and bolts below the finished grade shall be given a heavy coat of FM food quality grease. Everything below the finished grade shall be wrapped completely with 8 mil polyethylene and 20 mil tape appropriately. Polyethylene shall be cut at the bottom to allow drainage from the drain ports.
- Concrete thrust block required from the rear of the hydrant to the end of the trench with a minimum of 6 square feet bearing on undisturbed soil. Entire pipe system must be polyethylene wrapped prior to pouring concrete. Special care must be taken so that concrete does not plug the drain ports. 6 1/2 Bag Class 4000 is the minimum requirement for concrete.
- When there is a bell between an auxiliary valve and a hydrant there must be a locking gasket and blocking installed. Anytime the distance between the auxiliary valve and hydrant is under 17' a solid length of pipe must be installed.
- Where the distance between the main and hydrant is greater than 17', two gate valves may be required (one at main, and one at hydrant). Where gate valves are installed at hydrants, provide a riser such that a standard valve key will clear top of the hydrant.
- During backfill a minimum of 1/2 cubic yard of clean 1 1/2" minus gravel shall be placed around the base of the hydrant to a point 12" above the drain port.
- All work must be inspected by city personnel prior to backfill. No hydrant shall be backfilled until directed by a Murray City Water Division inspector.
- All hydrant bonnets must be painted by the contractor to coincide with the size of the water main serving the hydrant, specifically the larger main in the street not the 6" auxiliary line between the main and the hydrant (See color code on page 10). Must be painted with Sherwin Williams B-54Z Industrial Enamel or equal.
- Concrete pads must be installed around all completed fire hydrants, with 6 1/2 Bag Class 4000 concrete. When hydrants are installed in an open area the pads are to be 4' X 4' and 8" thick. When hydrants are installed in a park strip the pads are to be 5" thick, 4' wide and run from curb to sidewalk approximately 3 1/2' to 5 1/2'. If the bolts on the hydrant are touching or are in the concrete a hydrant riser must be installed.
- Bury line mark on hydrant shall not be more the 6" above finish grade.
- Contractor shall place and maintain a black plastic bag over new fire hydrants until they are placed in service.
- Hydrants must be clean, with no chipped paint, vertically aligned & operating properly

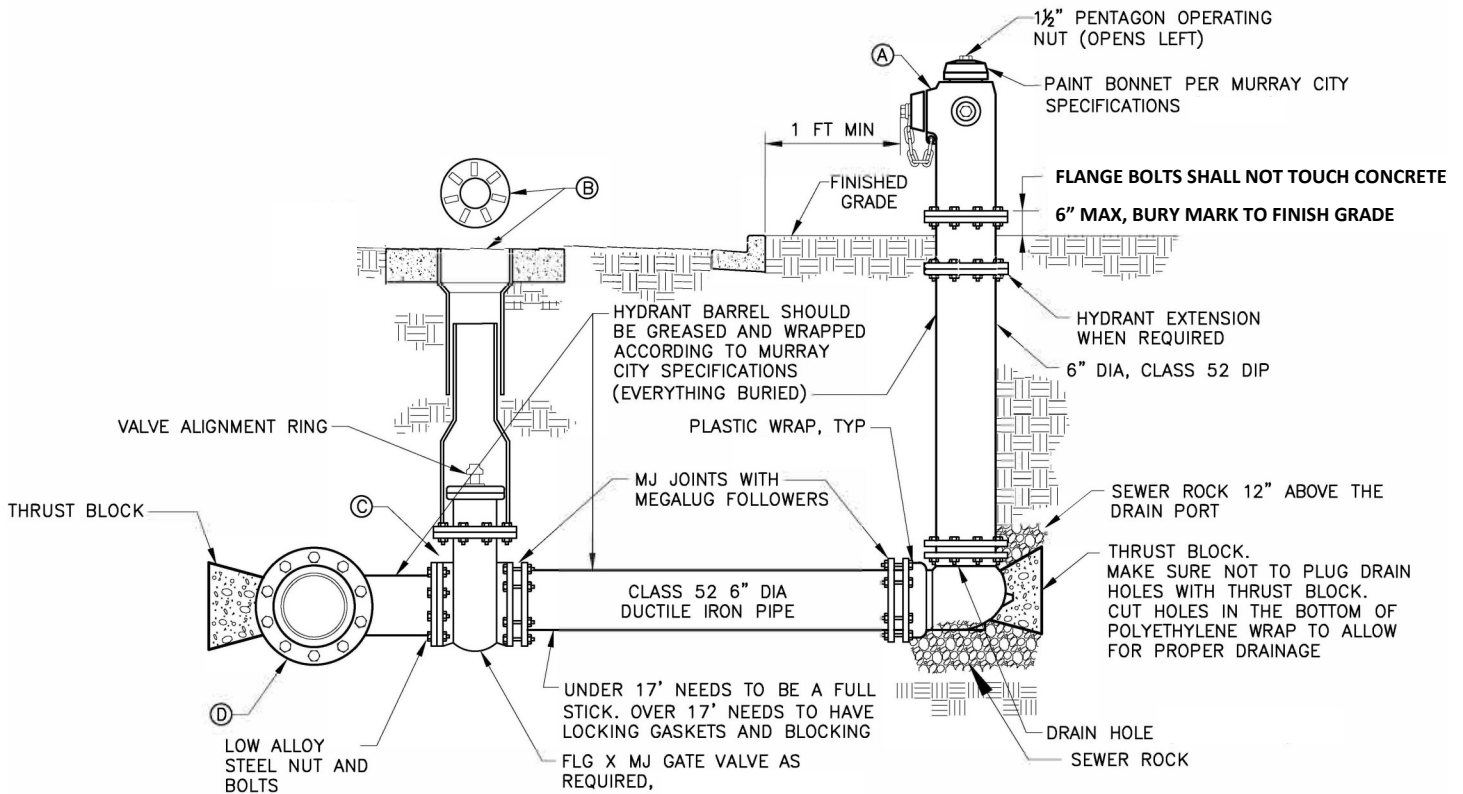
Hydrant Concrete Pads

SECTIONALS FOR HYDRANT PADS		
AREA	SIZE	CONCRETE MIN
OPEN AREA	4' X 4'	8" THICK-6 1/2 BG (CLASS 4000)
CURB TO SIDEWALK	5' X 3'	5" THICK-6 1/2 BG (CLASS 4000)





Hydrant Sectional Drawing



LEGEND					
ITEM	DESCRIPTION	PART NUMBER	ITEM	DESCRIPTION	PART NUMBER
(A)	FLANGE OR MJ FIRE HYDRANT AS REQUIRED. PAINT BONNET PER MURRAY CITY SPECIFICATIONS	Mueller Super Centurion or Clow Medallion AWWA/ANSI C502	(C)	GATE VALVE WITH 2" X 2" OPERATING NUT	MUELLER 6" RESILIENT SEAT GATE VALVE, OR EQUAL
(B)	SLIDING ADJUSTABLE VALVE BOX WITH DROP LID WITH THE WORD "WATER" CAST INTO IT	D&L M-8040 OR EQUAL	(D)	MJ X FLG TEE WITH ACCESSORIES	MJ X FLG TEE ANSI/AWWA C110/AS1.10 WITH 125 POUND FLANGE

- All work and materials to be in accordance with ANSI/AWWA C502 and the APWA general conditions and standard specifications for construction.
- All ductile iron pipe to be in accordance with ANSI/AWWA C115/A21.15 Class 52.
- Gate valves to be in accordance with AWWA C509.
- Standard flange drilling—cast flanges, ANSI/AWWA C110 125/A21.10
- Substitutions to be in accordance with APWA Sec. 01 25 00.

Hydrant Bonnet Color Code

Fire hydrant bonnets shall be color coded to coincide with the size of the water main serving the hydrant.

- 4" and smaller main..... White
- 6" main..... Red
- 8" and 10" main..... Orange
- 12" or larger main..... Green





Valve Installation

1. All valves should be set in true vertical alignment.
2. All nuts and bolts shall be given a heavy coat of FM food quality grease.
3. Valves shall be wrapped with polyethylene with only the operating nut exposed. The valve shall be tapped in a way to not infringe on the operation of the valve.
4. Murray City may request that a concrete block be placed underneath each valve and wedged tightly to support the weight and prevent slippage.
5. Valve boxes of the sliding adjustable type must be centered over the nut or the valve so that a valve key can access the nut and open and close it smoothly. The contractor is also responsible to make sure all valve boxes are clear of dirt and debris and ready for operation.
6. Posi-cap valve box aligners will be provided by Murray City and installed by the contractor on all valves.

Water Service Installation

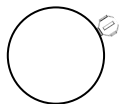
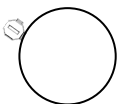
(Sectional Drawing on Page 12)

1. $\frac{3}{4}$ and 1 inch taps shall be installed using C.C. corps
 - Corporation stops shall be installed on $\frac{3}{4}$ and 1 inch taps at the 2 o'clock or 10 o'clock position. These are direct taps without the use of saddles.
2. 1 $\frac{1}{2}$ and 2 inch taps shall be installed using I.P. corps with double strap brass saddles.
 - Corporation stops on 1 $\frac{1}{2}$ inch and above should be installed at the 3 o'clock or 9 o'clock position.
3. All corporation stops should be rotated so that the valve actuator runs parallel with the pipe or in other words the valve actuator is not on the top or bottom but placed on the side (see photo below).
4. Do not install corporation stops in the new water main at the time of pipe installation they should be installed later when the service connections are constructed. Service connections shall not be constructed until after pipe has been disinfected and tested.
5. Prior to tapping service, cut and remove poly wrap at least 8" from tap site. Use 20 mil tape to fully cover ductile iron pipe and seal both ends of the cut poly wrap. Tap service through the middle of taped area.
6. Corporation stops shall be tightened only sufficiently to be watertight.
7. Install type K copper tubing from the corporation stop to the water meter, or to the existing service if performing a changeover.
8. Care should be exercised in the placing and laying of copper tubing to be sure that the pipe does not have any kinks and is not installed near any sharp stones that may cause damage to the copper tubing.
9. Poly tubing is only allowed from the water setter to the (Point of Use) building or residence (See sectional on page 13). Must be PE 4710 CTS tubing or equivalent with brass fittings and stainless steel stiffeners.

$\frac{3}{4}$ and 1 inch taps

10 o'clock

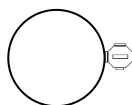
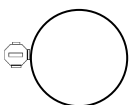
2 o'clock



1 $\frac{1}{2}$ and 2 inch taps

9 o'clock

3 o'clock



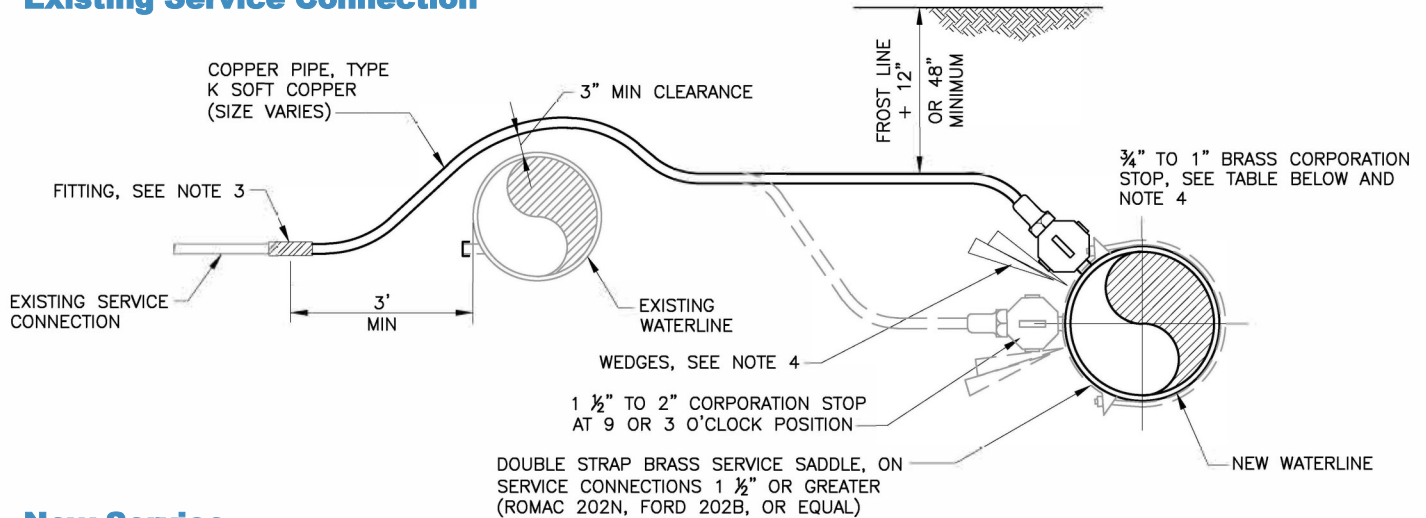
1" Corporation Stop Installation



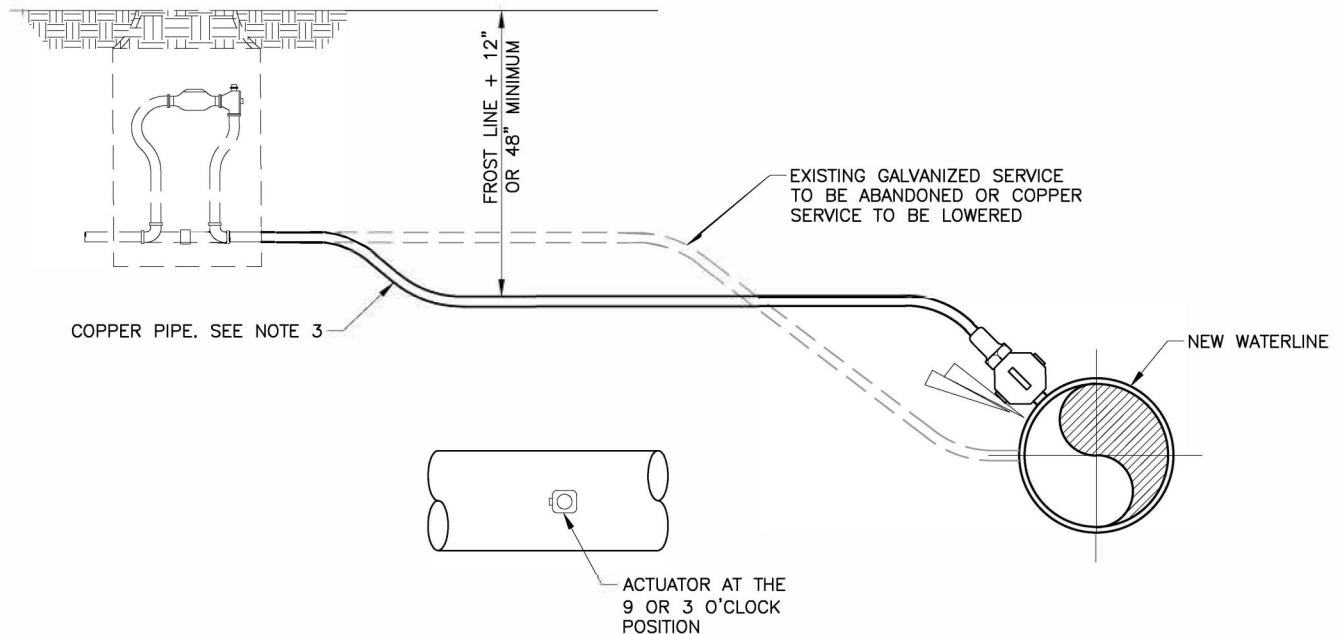


Water Service Taps

Existing Service Connection



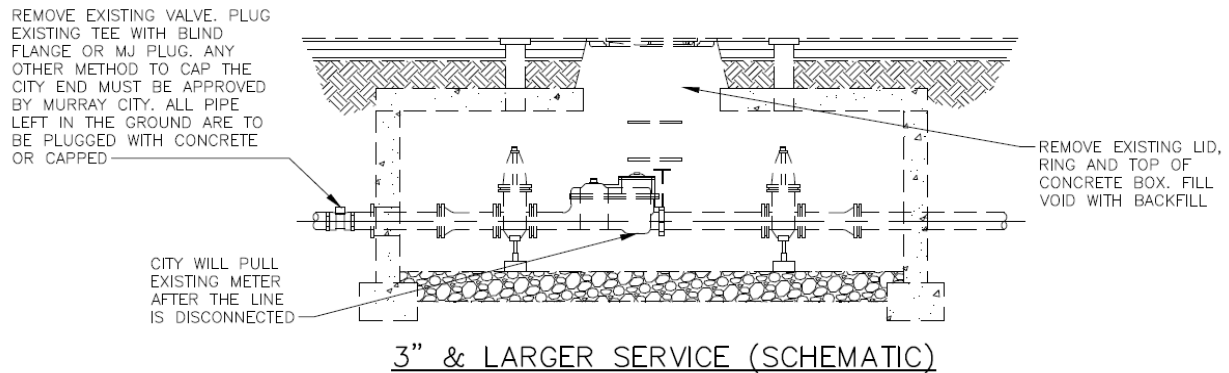
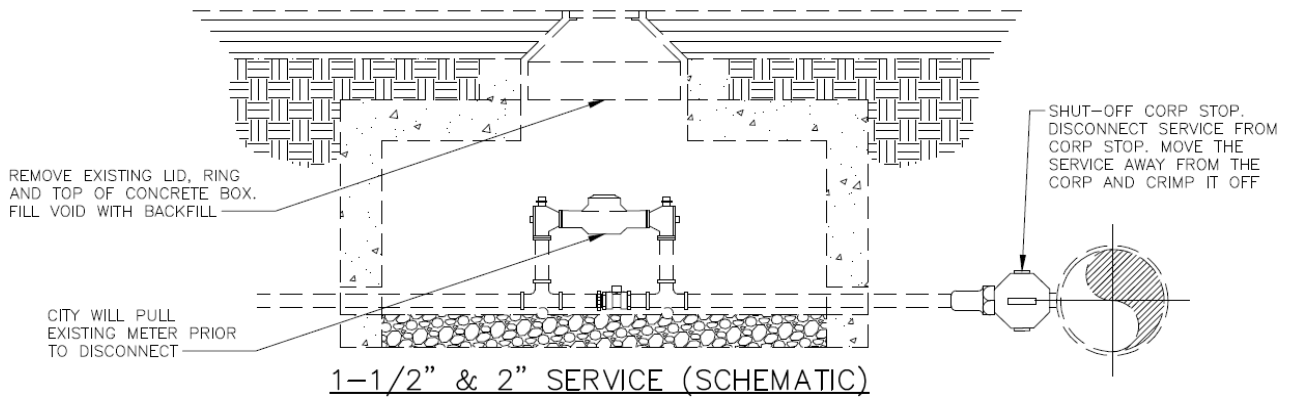
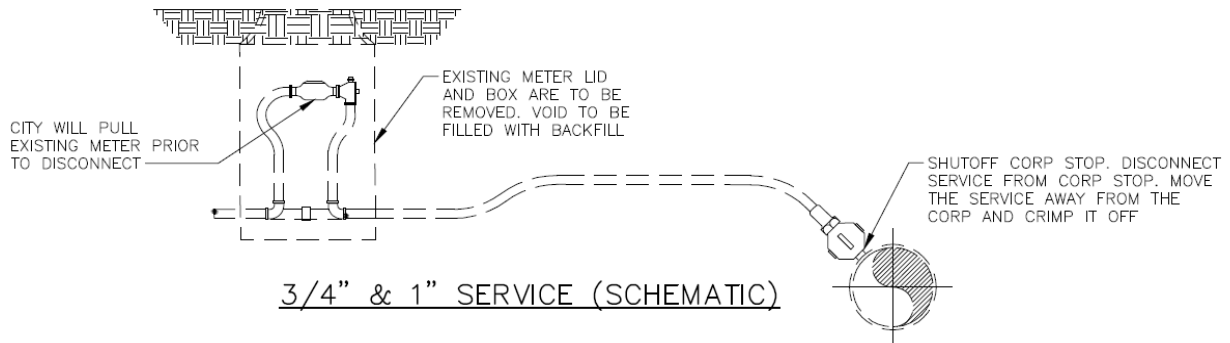
New Service



NOTES:

1. FOR EXISTING COPPER SERVICES, DETACH EXISTING SERVICE CONNECTION, EXTEND (USING COPPER SERVICE OF EQUAL SIZE) OR SHORTEN AS NECESSARY, AND RECONNECT TO NEW WATER MAIN, UNLESS NOTED OTHERWISE.
2. FOR EXISTING GALVANIZED SERVICES, REPLACE EXISTING SERVICE WITH COPPER SERVICE OF EQUAL SIZE. REPLACE BETWEEN EXISTING METER AND NEW WATER MAIN, INCLUDING REPLACEMENT OF METER, YOKE, AND BOX, UNLESS NOTED OTHERWISE.
3. USE COPPER TO COPPER FLARE FITTINGS.
4. CONTRACTOR SHALL ROTATE CORPORATION STOP SO THAT VALVE ACTUATOR RUNS PARALLEL WITH PIPE AT THE 9 OR 3 O'CLOCK POSITION. REDWOOD OR PRESSURE TREATED WOOD SHIMS SHALL BE PLACED UNDER CORPORATION STOP TO PROVIDE SUPPORT DURING BACKFILLING.
5. ALL NEW SERVICES SHALL BE A MINIMUM OF 1". 3/4" CONNECTIONS SHALL ONLY BE USED FOR RECONNECTED SERVICES.

CORP STOP TABLE	
3/4" OR 1"	1 1/2" OR 2"
MUELLER H-15000 (OR EQUAL)	MUELLER B-25000 (OR EQUAL)



GENERAL NOTES:

1. EXISTING PIPES ARE TO BE DISCONNECTED FROM THE WATER MAIN.
2. ALL WORK TO MEET THE SPECIFICATIONS AND REQUIREMENTS OF MURRAY CITY.
3. ALL WORK TO BE INSPECTED PRIOR TO BACKFILL BY MURRAY CITY WATER.

REV. NO.



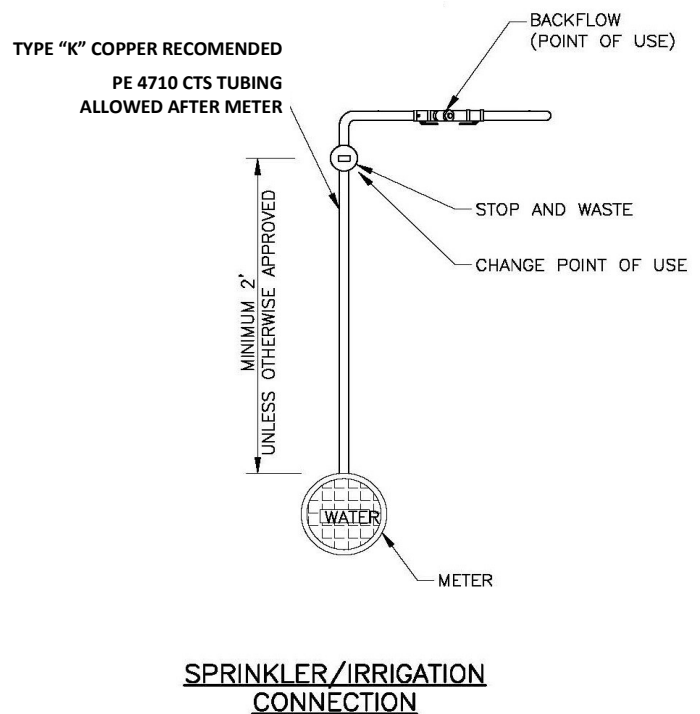
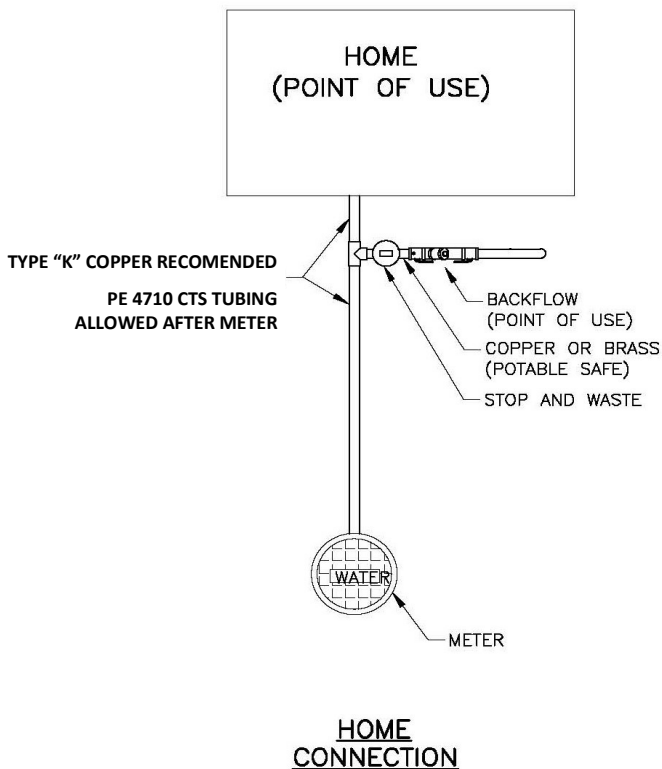
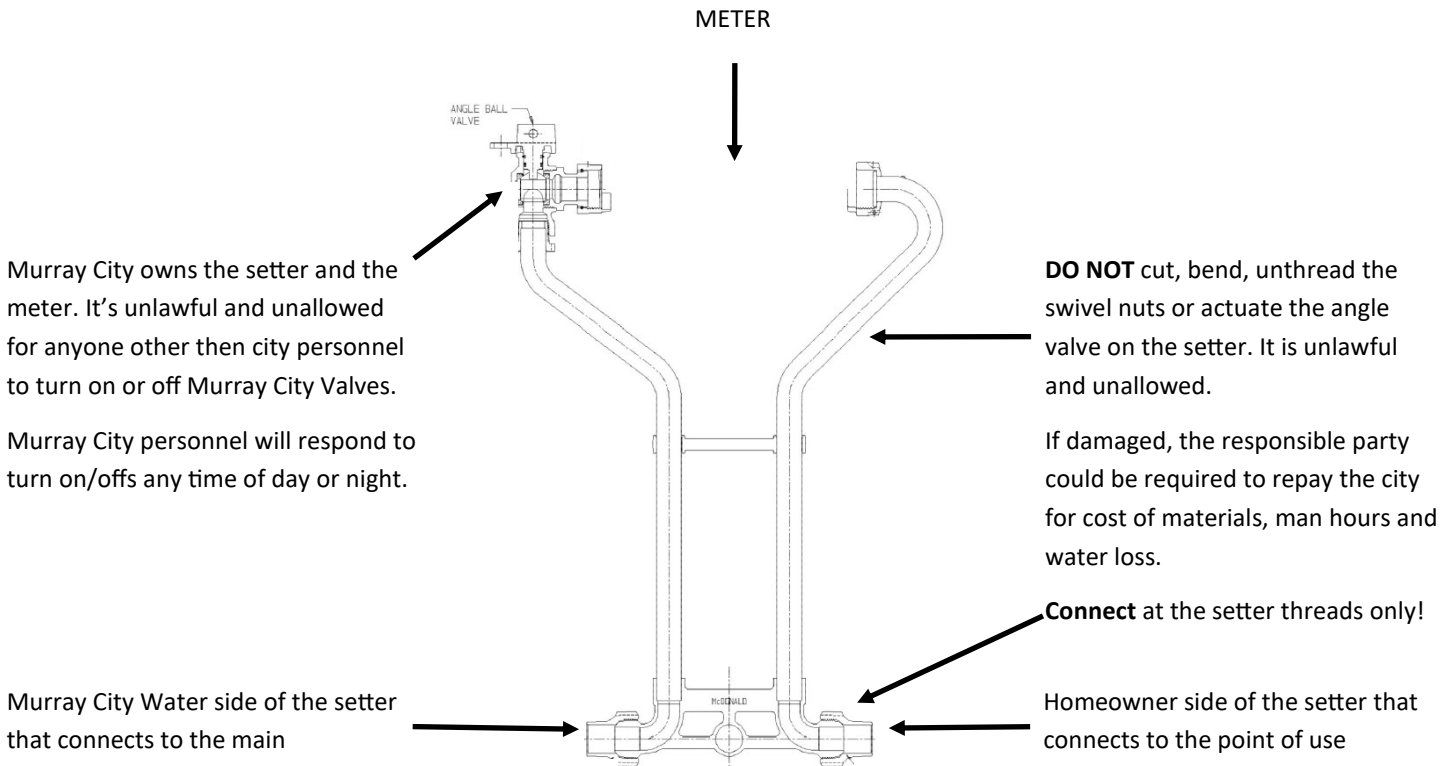
MURRAY CITY WATER DEPARTMENT

STANDARD
DWG. NO.

WATER SYSTEM DISCONNECTS

XX

Point of Use

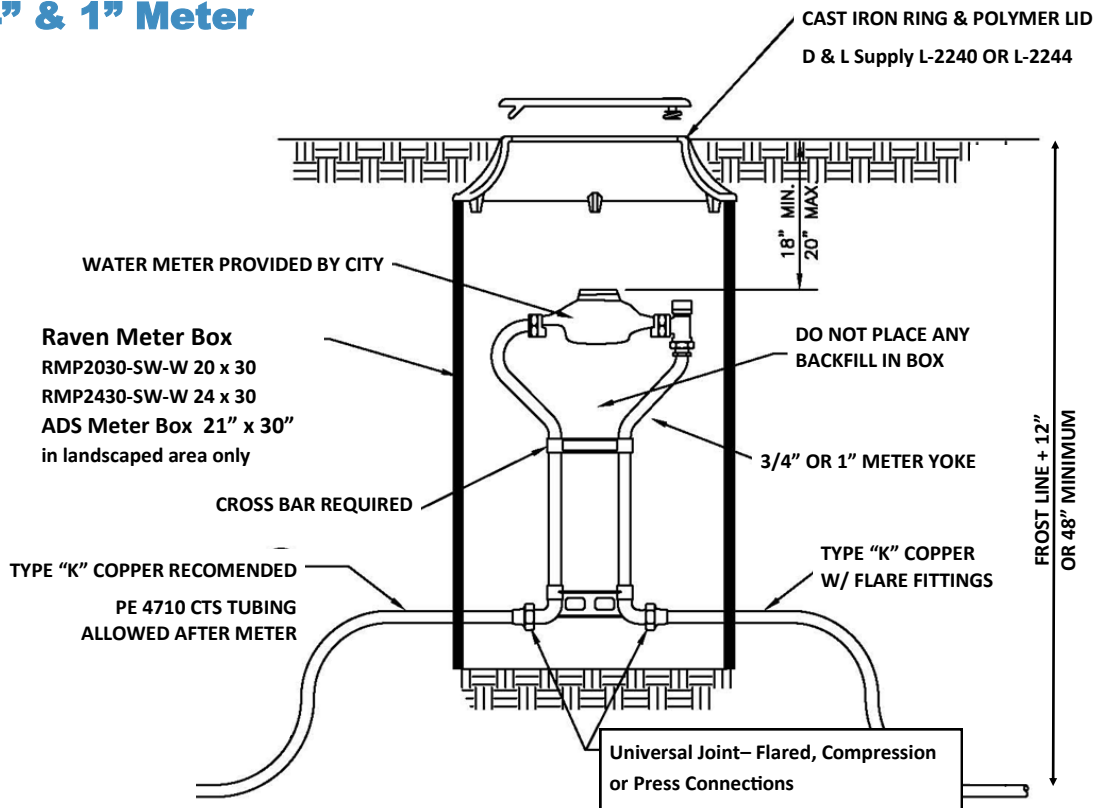




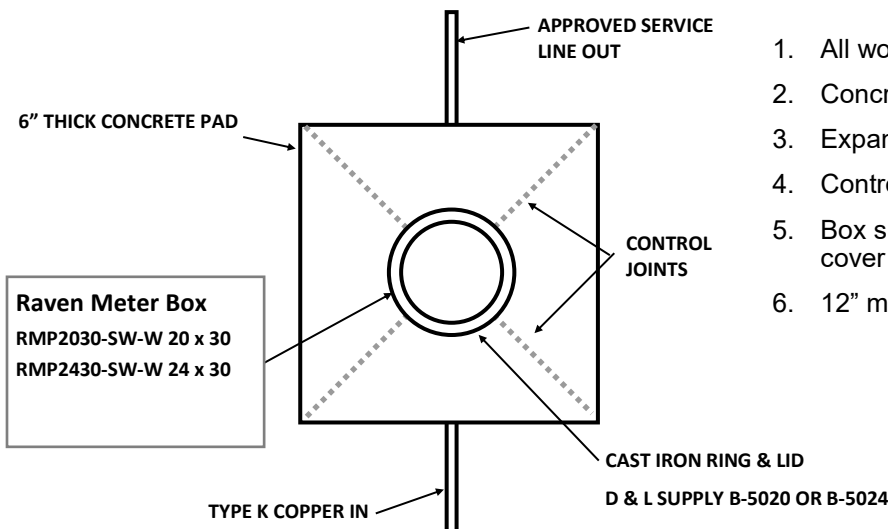
Meter Box Installation

1. All meters are to be installed in the park strip or within 5 feet of the property line (street side).
2. Do not install meter boxes under driveway approaches, sidewalks, in parking lots, or under curb and gutter. Box should be placed in a landscaped area.
3. The box shall be set so that the grade of the frame and the cover matches the grade of the surrounding surface.
4. Larger ring and lid may be deemed necessary by Murray City personnel in a situation where the meter must be placed in an asphalt, concrete or other high traffic area.

3/4" & 1" Meter

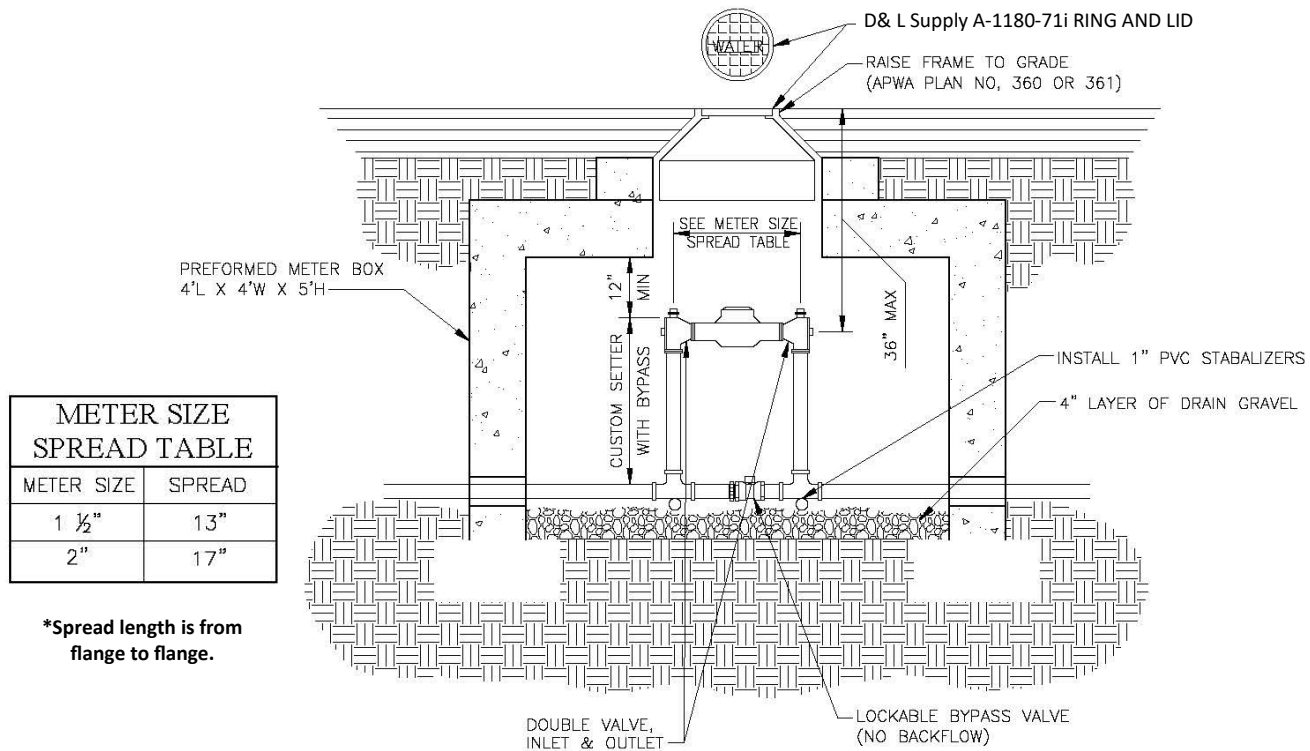


Meter Box in Concrete Installation

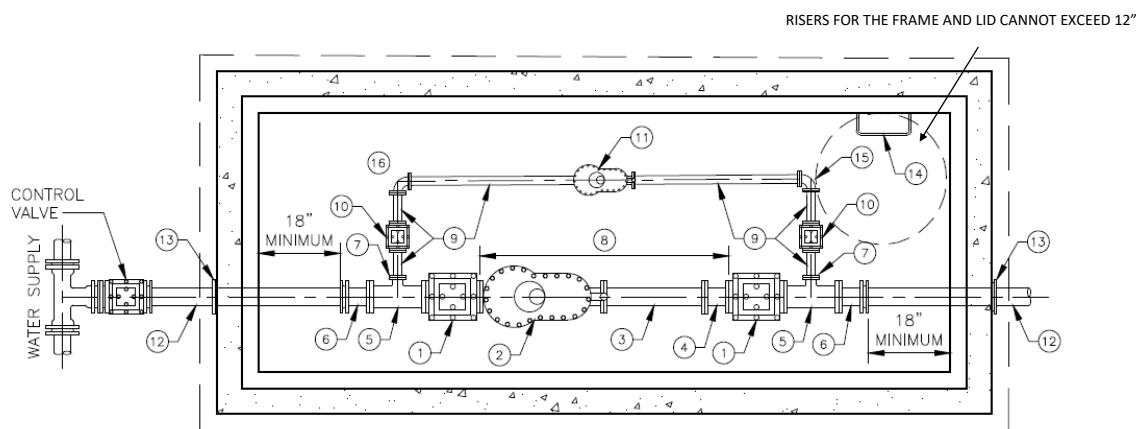


1. All work must be inspected by City personnel.
2. Concrete shall be 6" thick — 6 1/2 Bag Class 4000.
3. Expansion board all around.
4. Control joints from lid to edge of pad.
5. Box shall be set so that the grade of the frame and cover matches the grade of the surrounding surface.
6. 12" minimum from lid to edge of concrete.

1 1/2" & 2" Meter




1. All work must be inspected by City personnel prior to backfill.
2. From the top of the lid to the center line of the meter to be 20" ± 4".
3. Center of manhole over meter.
4. 6" grade ring where required.
5. Allow a 1" clearance around water line where passing through concrete walls. Seal hole with Ram-Nek sealant.
6. Minimum depth for water service to be frost line + 12" or 48".
7. Turbine meters to be used exclusively for irrigation.
8. Murray City to supply water meter.
9. Bypass valve to be left in open position until meter set.
10. Substitutions: APWA 01 25 00.

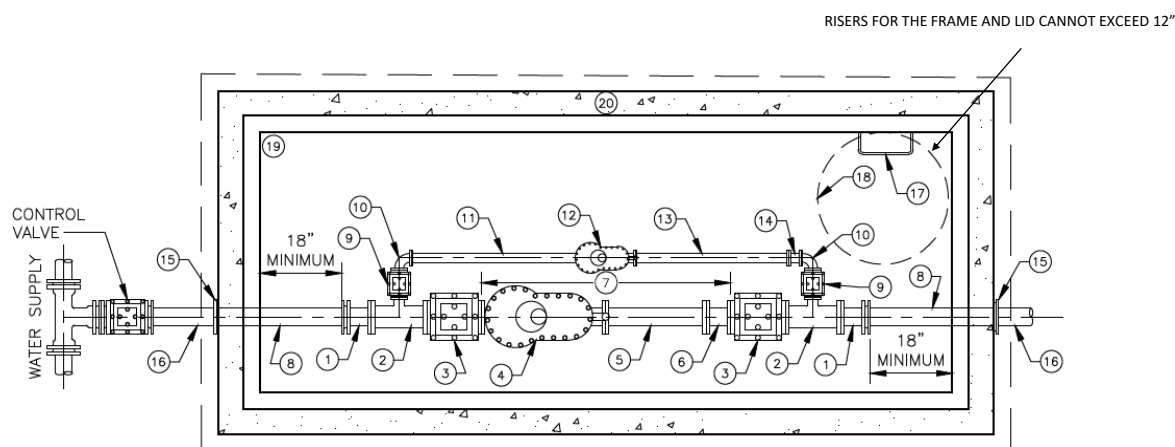


PLAN VIEW (SCHEMATIC)

LEGEND	
①	3" OR 4" FLANGED RESILIENT SEAT GATE VALVE
②	3" OR 4" METER—CITY WILL DETERMINE AND PROVIDE THE METER
③	3" OR 4"x2½' FLANGEDxPLAIN END DUCTILE IRON SPOOL
④	3" OR 4" ROMAC ALPHA FC OR HYMAX GRIP FLANGE ADAPTOR
⑤	3" OR 4" FLANGED TEE
⑥	3" OR 4" MJxFLANGE ADAPTOR
⑦	3" OR 4" BLIND FLANGE WITH A 2" IP THREAD OUTLET
⑧	4' MEASUREMENT FROM VALVE FLANGE TO VALVE FLANGE
⑨	2" BRASS PIPING
⑩	2" RESILIENT SEAT GATE VALVE — FEMALE IP THREADED
⑪	2" METER AND METER FLANGES — CITY WILL DETERMINE AND PROVIDE THE METER
⑫	3" OR 4" CLASS 52 DUCTILE IRON — POLYWRAPPED — COULD REQUIRE FIELD LOCK GASKETS INSTALLED — 2 TO 3 LENGTHS FROM OR TOWARDS THE METER VAULT
⑬	LOCKING RESTRAINT
⑭	ACCESS STEPS @12" O.C. M.A. INDUSTRIES OR EQUAL. TOP STEP SHALL BE NO MORE THAN 16" LOWER THAN THE OPENING
⑮	27" FRAME AND COVER LOCATED OVER ACCESS STEP
⑯	METER ELEVATION SHALL BE 30" FROM THE GROUND—MUST USE PIPE STANDS FOR BLOCKING
⑰	METER VAULT SHALL MEET APWA PLAN 523

IF THERE IS A REDUCTION IN METER SIZE COMPARED TO THE WATER MAIN SIZE. THE REDUCERS MUST BE INSIDE THE METER BOX WITH A MINIMUM OF 18" FROM THE MECHANICAL JOINT FITTING TO THE EDGE OF THE METER BOX. THE SIZES OF ALL PIPING, FITTINGS, VALVING AND METER, INBETWEEN THE REDUCERS WILL BE REDUCED BY ONE SIZE IN THIS SCENARIO.


REV. NO.		MURRAY CITY WATER DEPARTMENT	STANDARD DWG. NO.
		3" AND 4" METER	XX



PLAN VIEW (SCHEMATIC)

LEGEND	
①	8" OR 6" MJxFLANGE ADAPTOR
②	8"x6" FLANGED TEE OR 6"x4" FLANGED TEE
③	8" OR 6" FLANGED RESILIENT SEAT GATE VALVE
④	8" OR 6" METER – CITY WILL DETERMINE WHICH METER AND PROVIDE THE METER
⑤	8" OR 6"x2½' FLANGEDxPLAIN END DUCTILE IRON SPOOL
⑥	8" OR 6" ROMAC ALPHA FC OR HYMEX GRIP FLANGE ADAPTOR
⑦	4' OF SEPERATION FROM FLANGE TO FLANGE – FOR INSTALLING A SPOOL FOR DISINFECTION AND PRESSURE TESTING BEFORE INSTALLING THE METER, FLANGE ADAPTOR AND CHECK VALVE
⑧	8" OR 6" CLASS 52 DUCTILE IRON – POLLYWRAPPED
⑨	6" OR 4" FLANGED RESILIENT SEAT GATE VALVE
⑩	6" OR 4" FLANGED DUCTILE IRON 90 DEGREE BEND
⑪	6" OR 4"x2' FLANGED DUCTILE IRON SPOOL
⑫	6" OR 4" METER – CITY WILL DETERMINE WHICH METER AND PROVIDE THE METER
⑬	6" OR 4"x3' FLANGEDxPLAIN END DUCTILE IRON SPOOL
⑭	6" OR 4" ROMAC ALPHA FC OR HYMAX GRIP FLANGE ADAPTOR
⑮	LOCKING RESTRAINT
⑯	COULD REQUIRE FIELD LOCK GASKETS INSTALLED – 2 TO 3 LENGTHS TOWARDS OT AFTER THE METER VAULT
⑰	ACCESS STEPS @12" O.C. M.A. INDUSTRIES OR EQUAL. TOP STEP SHALL BE NO MORE THAN 16" LOWER THAN THE OPENING
⑱	27" FRAME AND COVER LOCATED OVER ACCESS STEP
⑲	METER ELEVATION SHALL BE 30" FOR 6" AND 24" FOR 8" FROM THE GROUND—MUST USE PIPE STANDS FOR BLOCKING
⑳	METER VAULT SHALL MEET APWA PLAN 527

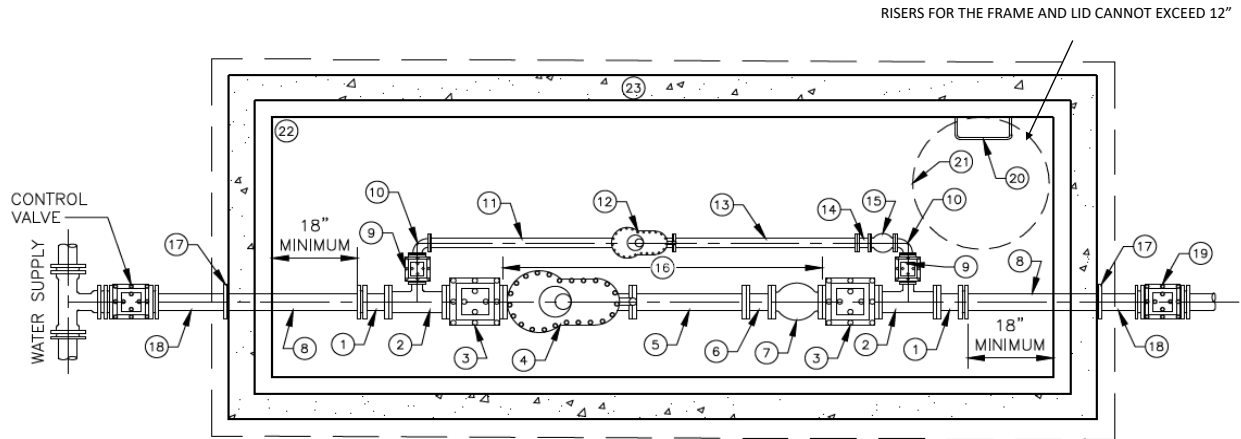
IF THERE IS A REDUCTION IN METER SIZE COMPARED TO THE WATER MAIN SIZE. THE REDUCERS MUST BE INSIDE THE METER BOX WITH A MINIMUM OF 18" FROM THE MECHANICAL JOINT FITTING TO THE EDGE OF THE METER BOX. THE SIZES OF ALL PIPING, FITTINGS, VALVING AND METER, INBETWEEN THE REDUCERS WILL BE REDUCED BY ONE SIZE IN THIS SCENARIO.

REV. NO.		MURRAY CITY WATER DEPARTMENT	STANDARD DWG. NO.
		6" AND 8" METER	XX

Single Connection Master Meter



MURRAY
CITY WATER



PLAN VIEW (SCHEMATIC)

LEGEND

①	8" MJxFLANGE ADAPTOR
②	8" FLANGED TEE
③	8" FLANGED RESILIENT SEAT GATE VALVE
④	8" METER – CITY WILL DETERMINE WHICH METER AND PROVIDE THE METER
⑤	8"x2½' FLANGEDxPLAIN END DUCTILE IRON SPOOL
⑥	8" ROMAC ALPHA FC OR HYMAX GRIP FLANGE ADAPTOR
⑦	8" FLANGED CHECK VALVE
⑧	8" CLASS 52 DUCTILE IRON – POLLYWRAPPED
⑨	6" FLANGED RESILIENT SEAT GATE VALVE
⑩	6" FLANGED DUCTILE IRON 90 DEGREE BEND
⑪	6"x2' FLANGED DUCTILE IRON SPOOL
⑫	6" METER – CITY WILL DETERMINE WHICH METER AND PROVIDE THE METER
⑬	6"x3' FLANGEDxPLAIN END DUCTILE IRON SPOOL
⑭	6" ROMAC ALPHA FC OR HYMAX GRIP FLANGE ADAPTOR
⑮	6" FLANGED CHECK VALVE
⑯	4' OF SEPARATION FROM FLANGE TO FLANGE – FOR INSTALLING A SPOOL FOR DISINFECTION AND PRESSURE TESTING BEFORE INSTALLING THE METER, FLANGE ADAPTOR AND CHECK VALVE
⑰	LOCKING RESTRAINT
⑱	COULD REQUIRE FIELD LOCK GASKETS INSTALLED – 2 TO 3 LENGTHS TOWARDS OT AFTER THE METER VAULT
⑲	COULD REQUIRE AN ADDITIONAL CONTROL VALVE BEFORE THE FIRST CONNECTION OUTSIDE THE VAULT
⑳	ACCESS STEPS @12" O.C. M.A. INDUSTRIES OR EQUAL. TOP STEP SHALL BE NO MORE THAN 16" LOWER THAN THE OPENING
㉑	27" FRAME AND COVER LOCATED OVER ACCESS STEP
㉒	METER ELEVATION SHALL BE 24" FROM THE GROUND—MUST USE PIPE STANDS FOR BLOCKING
㉓	METER VAULT SHALL MEET APWA PLAN 529

ONE CONNECTION MASTER METERS MUST BE 8". NO EXCEPTIONS TO THIS SPECIFICATION

REV. NO.



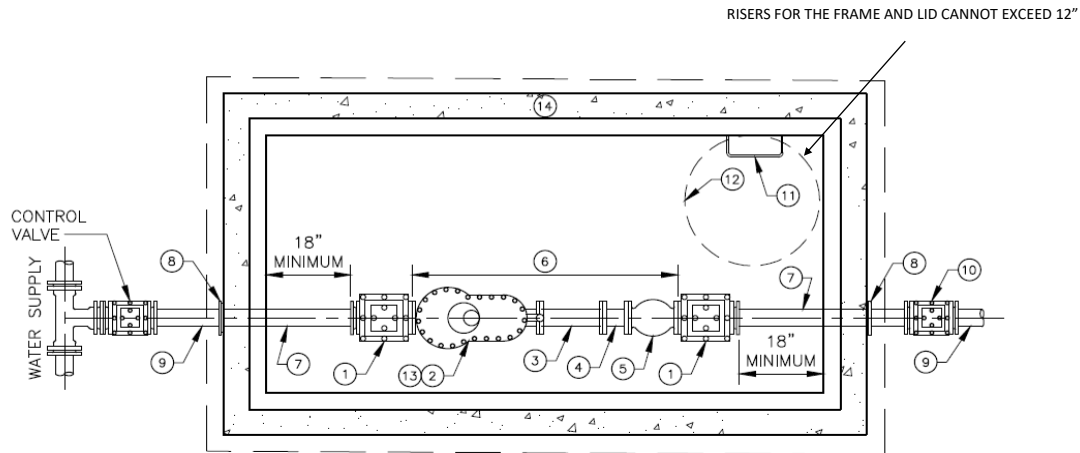
MURRAY CITY WATER DEPARTMENT

STANDARD
DWG. NO.

ONE CONNECTION MASTER METER

XX

Looped System Master Meter



PLAN VIEW (SCHEMATIC)

LEGEND	
①	8" MJxFLANGE RESILIENT SEAT GATE VALVE
②	8" METER – CITY WILL DETERMINE WHICH METER AND PROVIDE THE METER
③	8"x2½' FLANGEDxPLAIN END DUCTILE IRON SPOOL
④	8" ROMAC ALPHA FC OR HYMEX GRIP FLANGE ADAPTOR
⑤	8" FLANGED CHECK VALVE
⑥	4' OF SEPARATION FROM FLANGE TO FLANGE – FOR INSTALLING A SPOOL FOR DISINFECTION AND PRESSURE TESTING BEFORE INSTALLING THE METER, FLANGE ADAPTOR AND CHECK VALVE
⑦	8" CLASS 52 DUCTILE IRON – POLLYWRAPPED
⑧	LOCKING RESTRAINT
⑨	COULD REQUIRE FIELD LOCK GASKETS INSTALLED – 2 TO 3 LENGTHS TOWARDS OT AFTER THE METER VAULT
⑩	COULD REQUIRE AN ADDITIONAL CONTROL VALVE BEFORE THE FIRST CONNECTION OUTSIDE THE VAULT
⑪	ACCESS STEPS @12" O.C. M.A. INDUSTRIES OR EQUAL. TOP STEP SHALL BE NO MORE THAN 16" LOWER THAN THE OPENING
⑫	27" FRAME AND COVER LOCATED OVER ACCESS STEP
⑬	METER ELEVATION SHALL BE 30" FOR 6" AND 24" FOR 8" FROM THE GROUND—MUST USE PIPE STANDS FOR BLOCKING
⑭	METER VAULT SHALL MEET APWA PLAN 527

IF THERE IS A REDUCTION IN METER SIZE COMPARED TO THE WATER MAIN SIZE. THE REDUCERS MUST BE INSIDE THE METER BOX WITH A MINIMUM OF 18" FROM THE MECHANICAL JOINT FITTING TO THE EDGE OF THE METER BOX. THE SIZES OF ALL PIPING, FITTINGS, VALVING AND METER, INBETWEEN THE REDUCERS WILL BE REDUCED BY ONE SIZE IN THIS SCENARIO.

REV. NO.



MURRAY CITY WATER DEPARTMENT

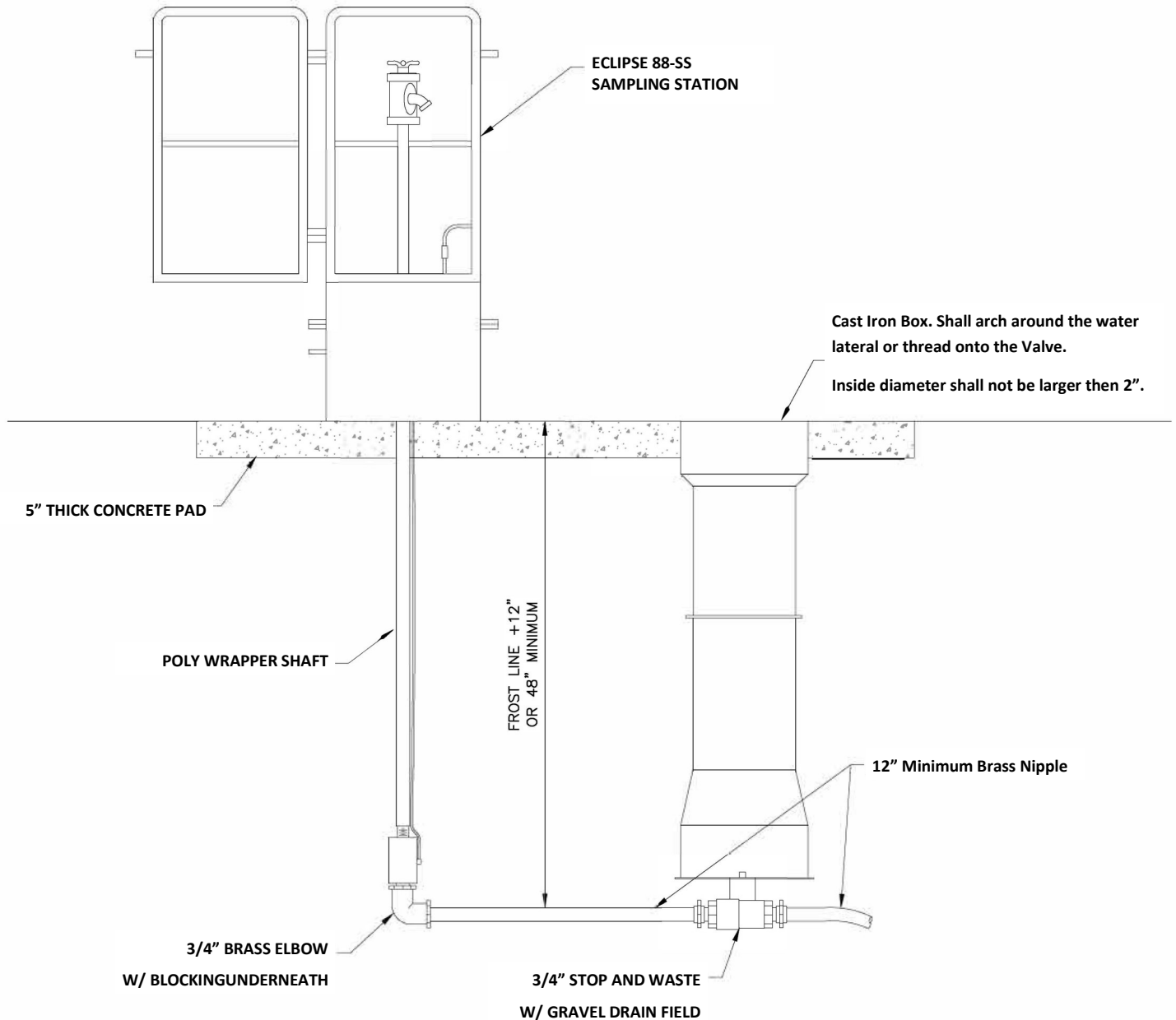
STANDARD
DWG. NO.

LOOPED SYSTEM MASTER METER

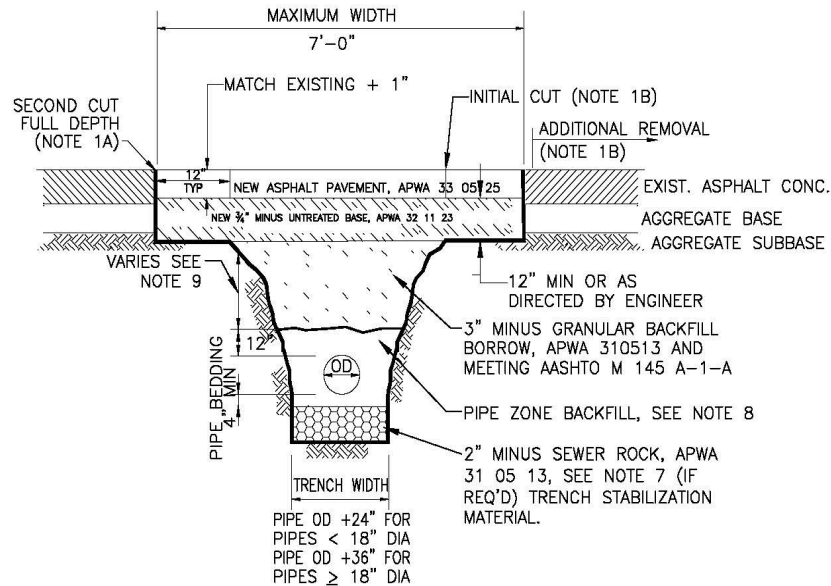
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Sampling Stations



1. $\frac{3}{4}$ inch tap shall be installed using C.C. corp with flare fitting (see water service taps page 9).
2. Type K copper tubing must be installed from the water main to the Stop & Waste. Brass Nipple from Stop & Waste to Sample Stations
3. All connections shall be lead free brass with approved fittings.
4. All work must be inspected by a Murray City Water Division inspector prior to being backfilled.
5. Bottom of sampling station enclosure needs to be wrapped in 20 mil tape and set in concrete pad for support.



NOTES:

1. ASPHALT PAVEMENT REMOVAL: (REMOVE PAVEMENT AS SPECIFIED IN APWA 024114):
 - A. MILL OR SAW CUT FULL DEPTH OF ASPHALT TO PROVIDE STRAIGHT VERTICAL PAVEMENT EDGE FOR PAVEMENT REPAIR.
 - B. IF A LIP OF GUTTER, A CURB, OR AN EDGE OF THE PAVEMENT IS WITHIN 2- FEET OF THE NEW PATCH, REMOVE EXISTING PAVEMENT TO THE STREET FEATURE. RETAIN AND PROTECT EXISTING CURB AND GUTTER.
2. TACK COAT: PROVIDE FULL TACK COAT COVERAGE ON ALL VERTICAL SURFACES.
3. JOINT REPAIR: WHERE CRACKS OCCUR BETWEEN THE PATCH AND ANY EXISTING PAVEMENT OR ANY STREET FIXTURE, REPAIR THE CRACK PER APWA 320117.
4. TRENCH EXCAVATION IN ACCORDANCE WITH APWA 312316, OSHA, AND UOSH SAFETY STANDARDS.
5. ALL BACKFILL PLACED IN TRENCH SHALL MEET SPECIFIED GRADATION AND COMPACTION REQUIREMENTS. NATIVE MATERIAL SHALL BE ALLOWED ONLY IF MEETING THE SPECIFIED GRADATION AND COMPACTION REQUIREMENT AND APPROVED BY THE ENGINEER.
6. COMPACT BACKFILL MATERIALS IN ACCORDANCE WITH APWA 330520, 312326, AND UDOT 02721 (AS APPLICABLE). TRENCH BACKFILL IN UDOT RIGHT-OF-WAY SHALL BE COMPACTED TO 97% OR GREATER, MODIFIED STANDARD PROCTOR. TRENCH BACKFILL IN ALL OTHER STREETS SHALL BE COMPACTED TO 95% OR GREATER MODIFIED STANDARD PROCTOR (PER ASTM D 1557).
7. ENGINEER MUST APPROVE USE OF TRENCH STABILIZATION MATERIAL. IF TRENCH STABILIZATION MATERIAL IS USED, TRENCH STABILIZATION MATERIAL AND PIPE BEDDING SHALL BE SEPARATED USING GEOTEXTILE MEETING THE REQUIREMENTS OF APWA 310519.
8. PIPE ZONE MATERIAL SHALL BE SAND MEETING ENGINEER'S APPROVAL (100 PERCENT PASSING 3/8" SCREEN, 35 PERCENT PASSING NO. 4 SCREEN, AND LESS THAN 10 PERCENT PASSING NO. 100 SCREEN) AND CONFORMING TO AASHTO M 145 A-1. PEA GRAVEL AND "SQUEEGY" IS NOT ALLOWED IN ANY PART OF THE PIPE ZONE. MATERIAL SHALL BE PLACED IN LIFT NOT EXCEEDING 8" AND COMPACTED TO A MODIFIED PROCTOR DENSITY OF 95% OR GREATER (PER ASTM 1557) WITHOUT DAMAGING OR DEFLECTING PIPE.
9. PROVIDE A MINIMUM OF 4 FEET OF COVER FROM THE TOP OF THE WATER MAIN TO FINISHED GRADE. FOR PIPING THAT CANNOT BE PROVIDED THE MINIMUM COVER, CONTRACTOR TO PROVIDE SPECIAL DESIGN SUBJECT TO THE APPROVAL OF MURRAY CITY.
10. PROVIDE AC-20-DM-1/2 ASPHALT CONCRETE UNLESS OTHERWISE DIRECTED BY ENGINEER.
11. RECYCLED ASPHALT SHALL NOT BE USED FOR BACKFILL IN ANY PART OF THE TRENCH.
12. FOR UNIMPROVED AREAS, PROVIDE NATIVE TOPSOIL FOR THE TOP 12" OF THE EXCAVATION COMPACTED TO 80 PERCENT MODIFIED PROCTOR (ASTM D 698) AND RESTORE PER APWA 32 92 00 OR 32 93 13 (AS APPLICABLE). THE TRENCH ZONE SHALL BE COMPACTED TO 92 PERCENT MODIFIED PROCTOR (PER ASTM D 698). NATIVE MATERIAL MAY BE ALLOWED IN THE TRENCH ZONE IF FREE OF ROCKS LARGER THAN 3" IN DIAMETER.

Disinfection & Hydrostatic Testing Requirements



MURRAY
CITY WATER

Murray City Corporation recognizes the American Water Works Association (AWWA) standard C651-05 is widely accepted and recognized within the water industry as the guide to use for main water line disinfection. However, Murray City has found additional safety measures must be observed to protect the water quality within newly constructed water mains.

For the purpose of main water line disinfection, we recommend using one of the methods described in the AWWA standard C651-05. For ease and safety purposes we recommend using a granular type of hypochlorite. However, any of the disinfection methods given would be adequate.

Once a section of pipe has been completed and is ready to be filled the testing process can begin. At this point the following steps should be taken.

1. Murray City personnel will slowly fill the section of pipe that is to be tested. Contractors are not to operate valves at any time.
2. Once the line has been filled Murray City personnel will take a chlorine residual sample at two different locations. There must be a free chlorine residual greater than 100mg/L to proceed to step 3. If the chlorine residual is less than 100mg/L then steps must be taken to chlorinate the line again before testing can proceed.
3. Now the line must remain static for a minimum of 24 hours to allow the disinfection process to take place.
4. After the minimum 24 hour period Murray City personnel will again take two chlorine residual samples to verify that the free chlorine residual is greater than 100mg/L. If the residual is still greater than 100mg/L then testing can proceed.
5. Now the main can be flushed. While disposing of chlorinated water, care must be taken not to pollute the environment in any way.
6. After flushing has been completed Murray City personnel will take a chlorine residual test to make sure the waterline is free from chlorine. If chlorine is present more flushing will be needed. Once the line is chlorine free testing can proceed.
7. Murray City personnel can now take the first bacteriological samples. One sample is required for every 800 feet of being put into service. Sample results take a minimum of 24 hours to receive and sometimes longer based on when the sample is received by the lab. If the sample results are negative you may proceed to step 8, if the sample results are positive then additional flushing will be required along with repeat samples, all repeat samples will be at the expense of the contractor.
8. Hydrostatic testing shall comply with AWWA Standard C600-17. However, Murray City also requires that a pressure of 200 psi be maintained for two hours. Special care must be taken during the pressure test not to contaminate the water in the main. All components of the pressure test must be supplied by the contractor.
9. A second set of bacteriological samples can now be taken from the previous sample points used in step 7. If the sample results return negative the water main will be accepted and put into service. **Positive results will result in further testing at the contractors' expense as well as a charges for the water used. Also the contractor will be required to pump in chlorine bleach (T-Chlor, Sodium Hypochlorite) to disinfect the line also at their expense.**

Fire flow testing is the determination of actual flow conditions within a water system. Murray City does not perform the actual fire flow test but requires Murray City personnel be present during the testing and requires that all results be submitted to Murray City.

- Fire flow test should be arranged in advance with Murray City personnel.
- Murray personnel will open and close all hydrants slowly and fully to prevent a pressure surge. It is unlawful for anyone besides Murray personnel to operate a fire hydrant.
- Special care should be taken to make sure that water from the flow test does not impact traffic or do damage to property. Murray City reserves the right to stop the testing process at anytime if personnel believes the test is creating a negative environment in any way.
- All results of the fire flow test must be submitted to Murray Water Department through standard mail, email or fax.

Murray Water Department	
Mail	c/o Joe Goodman 4646 South 500 West Murray, Utah 84123-3615
Email	jgoodman@murray.utah.gov
Fax	801.270.2450

Backflow Prevention Requirements



- Whenever Murray Water Department deems a service connection's water usage contributes a sufficient hazard to the water supply, an approved backflow prevention assembly shall be installed on the service line of the identified consumer's water system, at or near the property line, or immediately inside the building being served; but, in all cases, before the first branch line leading off the service line.
- Only RPZs and PVBs are allowed on sprinkler systems.
- No backflow assembly may be installed in the park strip for any reason, and must be a minimum of 2' from any sidewalk.
- Stop and waste valves are not allowed in meter boxes or park strips.
- Backflow device must be tested within ten days of being placed in service.
- Device must be tested annually by a Certified Backflow Tester with results sent to Murray City Water through standard mail, email or fax.

Murray Water Department	
Mail	c/o Water Backflow 4646 South 500 West Murray, Utah 84123-3615
Email	backflow@murray.utah.gov
Fax	801.270.2450

FIGURE 1
PVB BACKFLOW PREVENTION ASSEMBLY INSTALLATION

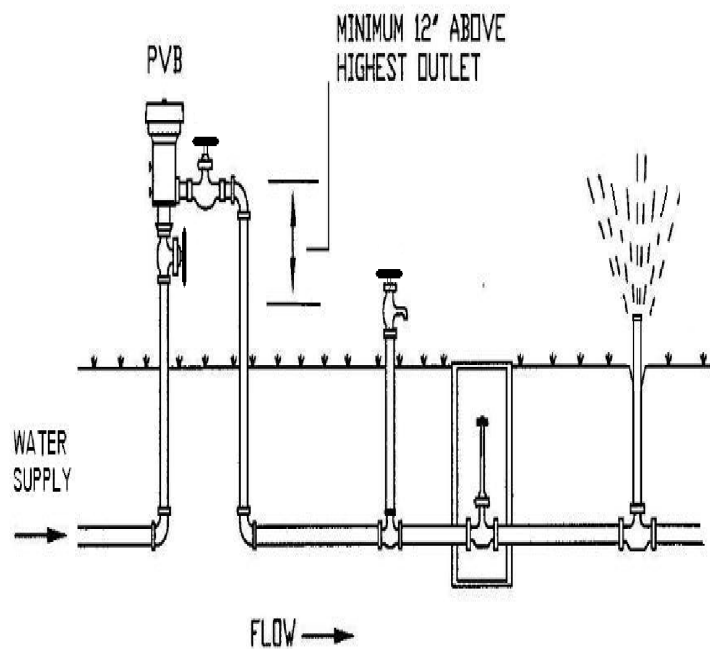
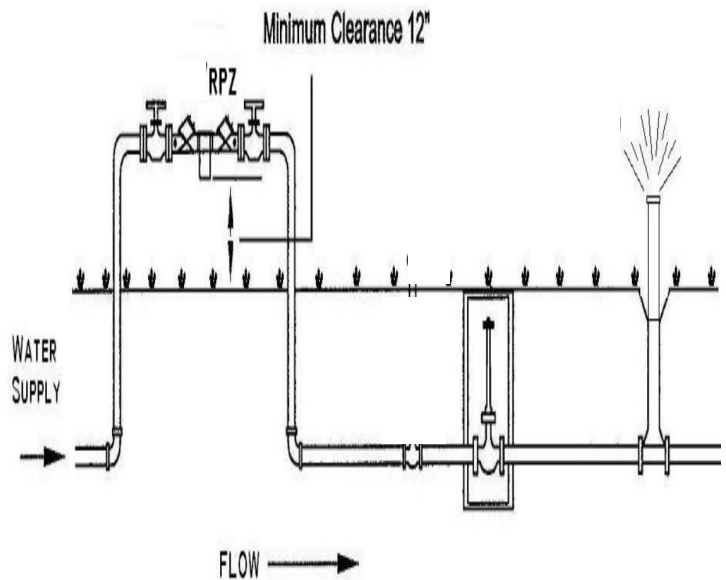


FIGURE 2
RPZ BACKFLOW PREVENTION ASSEMBLY INSTALLATION





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