

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



MURRAY
CITY
WATER

Water Specifications & Requirements

Cory Wells, Water Superintendent
Joe Goodman, Water Distribution Supervisor
Aron Frisk, Field Supervisor
Phone 801.270.2440

Amended January 2019

Murray City Water Division



Table Of Contents



MURRAY
CITY WATER

Pre Construction.....	2
Construction.....	2
Water System Design.....	3
Material Specifications.....	5
Pipe.....	5
Fittings.....	5
Mechanical Joint Restraint Followers.....	5
Wrap.....	5
Tape.....	5
Grease.....	5
Ductile Tapping Sleeve.....	5
Steel Tapping Sleeves.....	5
Valves.....	5
Valve Boxes.....	5
Valve Box Aligner.....	5
Fire Hydrants.....	5
Service Line.....	6
Service Fittings.....	6
Corporation Stops.....	6
Saddles.....	6
1" Meter Setters.....	6
1 1/2" & 2" Meter Setters.....	6
3/4" & 1" Meter Box.....	6
1 1/2" & 2" Meter Box.....	6
Meter Rings & Lids.....	6
Larger Meter Lids.....	6
Water Meters.....	6
Sampling Station.....	6
Installation.....	7
Ductile Iron Pipe and Fittings.....	7
Required Method of Pipe Installation.....	8
Hydrant Installation.....	9
Hydrant Bonnet Color Code.....	9
Hydrant Concrete Pads.....	9
Hydrant Sectional Drawing.....	10
Valve Installation.....	11
Water Service Installation.....	11
Water Service Taps Sectionals.....	12
Point of Use Sectionals.....	13
Meter Box Installation.....	14
3/4" & 1" Meter Box Sectional.....	14
1 1/2" & 2" Meter Sectional.....	15
Meter Box in Concrete Installation.....	15
Meters Larger than 2" Sectional.....	16
Sampling Station Installation.....	17
Jack & Bore Requirements.....	18
Trench Backfill Requirements.....	19
Disinfection & Testing Requirements.....	20
Murray City Water Fees.....	21
Backflow Prevention Requirements.....	22
Fire Flow Testing Requirements.....	22

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

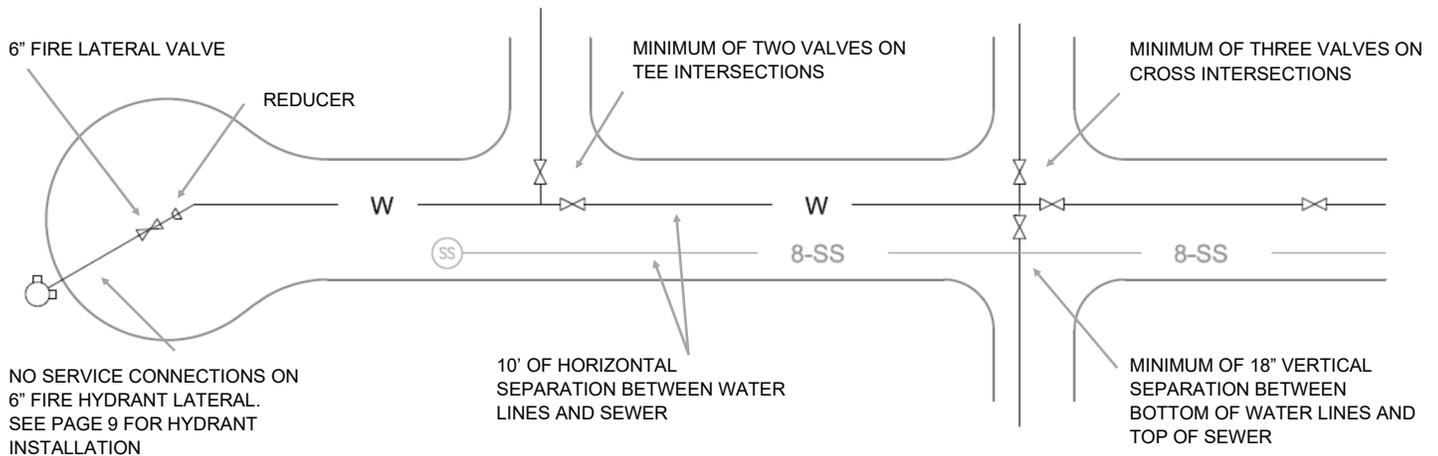
Pre Construction

- 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 should 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 asked 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 and pressure requirements in accordance with the Murray City Water Master Plan.
 - * Fire hydrant laterals shall be six inches in diameter.
- 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.
- Dead Ends
 - * All dead-end water mains shall be equipped with a fire hydrant.
- 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); and
 4. Separation of at least 6 inches must be maintained between all utilities.
 - * Anything deviating from these requirements must be approved by Murray City Public Works and the City Engineer.
- 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.
- 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.

Material Specifications

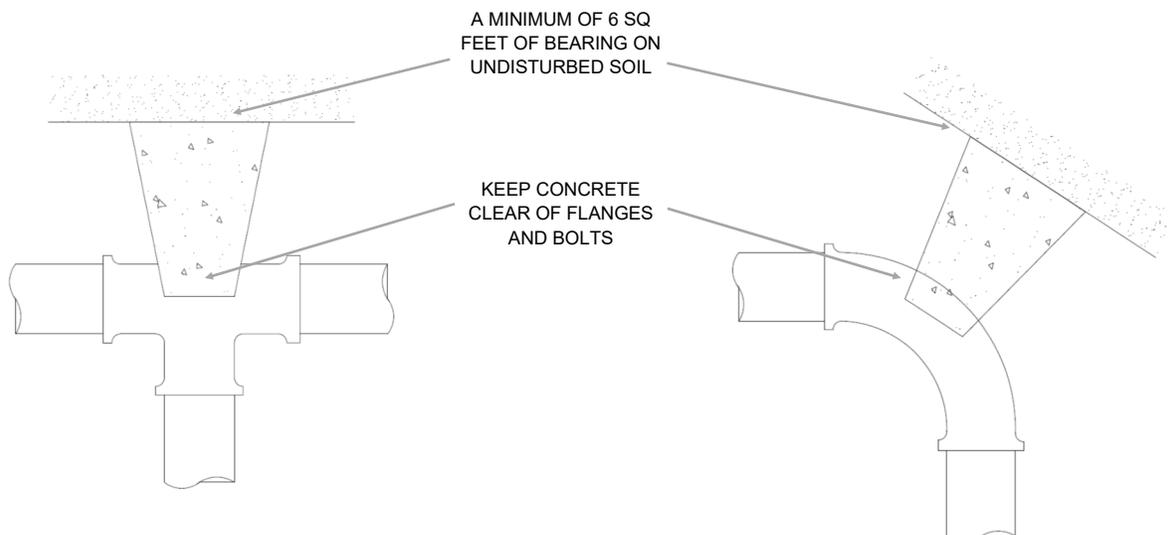
	<p>Pipe</p> <p>Special thickness Class 52 Ductile Iron Pipe (ANSI A21.4/AWWA C151)</p> <p>Pipe size shall be approved by the Murray City Water Department.</p>		<p>Pipe Wrap</p> <p>Polyethylene Encasement (ANSI/AWWA C105/A21.5-99)</p> <p>All piping should be wrapped with AWWA approved polyethylene encasement.</p>
	<p>Fittings</p> <p>Ductile Iron</p> <p>Cement Lining and Asphalitic seal coat in accordance with (ANSI/AWWA C104/A21.4)</p>		<p>Tape</p> <p>2" Wide 20 Mill Tape</p> <p>No other type of tape will be allowed.</p>
	<p>Mechanical Joint Restraint Followers</p> <p>Megalug, Stargrip or the use of a suitable equivalent with the approval by Murray City Water Department prior to installation.</p>		<p>Grease</p> <p>FM Food Quality Grease</p> <p>Applied to all nuts and bolts</p>
	<p>Ductile Tapping Sleeves</p> <p>It is Murray City policy to use ductile tapping sleeves on 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>	 <p style="color: red; font-weight: bold;">Only on approval</p>	<p>Steel Tapping Sleeves</p> <p>PowerSeal stainless steel sleeve (model 3490). Wrapped with Canusa Shrink Wrap or a suitable equivalent.</p> <p style="color: red; font-weight: bold;">Steel tapping sleeves are only to be used on steel waterlines unless approved by Murray City.</p>
	<p>Valves</p> <p>Gate: Mueller type resilient seat valves or the use of a suitable equivalent with approval by Murray City Water Department prior to installation.</p>		<p>Fire Hydrants</p> <p>Mueller A-423 or Super Centurion.</p>
	<p>Valve Boxes</p> <p>Sliding Adjustable type, cast iron, with cast iron cover with the word "WATER" cast into it.</p>		<p>Electronic Marker Balls</p> <p>Murray City provides and installs marker balls.</p> <p>Note: Contractor assistance may be requested during installation.</p>
	<p>Valve Box Aligner</p> <p>Posi-Cap valve box aligners are furnished by Murray City but installed by contractor</p>		

Material Specifications

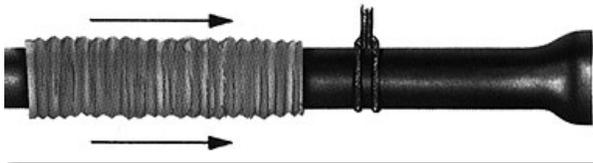
	<p>Service Line</p> <p>Type K, soft temper. Copper tubing.</p> <p>Minimum service line for new installations should be 1 inch.</p> <p>Murray City Water Department may require larger line sizes to meet the minimum flow requirements of the user.</p>		<p>Corporation Stops</p> <p>All corporation stops to be ball valve.</p> <p>AWWA tapered C.C. threads with flare fittings on 1" direct tap connections</p> <p>I.P. threads with flare fittings used with double strap saddles on 1 1/2" and 2" connections.</p>
	<p>Service Fittings</p> <p>Flare Fittings</p> <p>Compression fittings are not allowed under any circumstance.</p>		<p>Saddles</p> <p>Double Strap Brass Saddles on 1 1/2" and 2" connections.</p>
	<p>1" Meter Setters</p> <p>1 inch meters must have an 18" copper setter with a ball valve (no backflow).</p>		<p>1 1/2" & 2" Meter Setters</p> <p>1 1/2" and 2" meters must have an 18" copper setter. Double valve, inlet and outlet with lockable bypass valve (no backflow).</p>
	<p>3/4" & 1" Meter Box</p> <p>Oldcastle Carson HW-0020-B</p> <p>or</p> <p>Concrete 18X30</p>		<p>1 1/2" & 2" Meter Box</p> <p>4X4 Dura-Crete removable top box without a floor, or a pre approved suitable equivalent.</p> <p>3" meters and up must be concrete without a floor and have adequate room for service and maintenance.</p>
	<p>Meter Rings & Lids</p> <p>Cast iron that fit the appropriate box with holes for the AMR systems.</p>		<p>Larger Meter Lids</p> <p>D & L Supply</p> <p>B-5018</p>
	<p>Sampling Station</p> <p>Kupferle Eclipse #88-SS</p>		<p>Water Meters</p> <p>Murray City provides water meters based on planned flow (Badger Meters).</p> <p>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.</p>

Ductile Iron & Pipe Fittings

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 be thoroughly cleaned before being laid and shall be kept clean until installed.
5. 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.
6. 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 in case of an emergency.
7. 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. Polyethylene encasement should be installed according to AWWA C105/A21.5-99 (See attached Murray City Required Method of Pipe Installation page 6). 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.

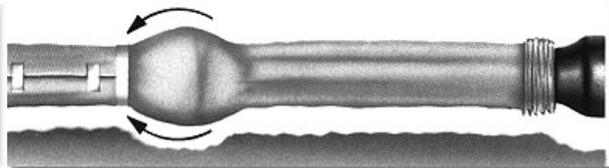


Murray City's Required Method of Pipe Installation



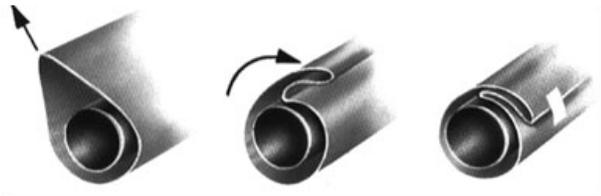
STEP 1

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 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.



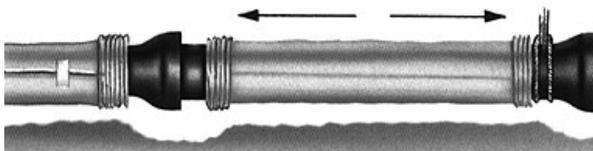
STEP 2

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 7

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



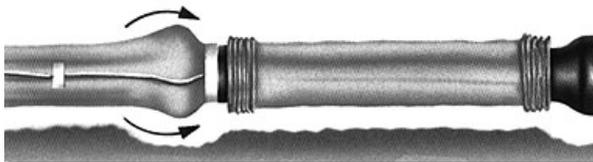
STEP 3

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.



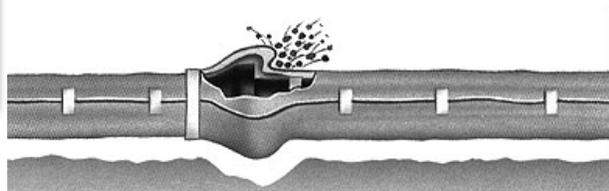
STEP 8

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 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 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.

Hydrant Installation

(Sectional Drawing on Page 10)

- Hydrants shall be set at the location shown and bedded on a firm foundation. Each hydrant shall be set in true vertical alignment. All nuts and bolts below the finished grade should be given a heavy coat of FM food quality grease. Everything below the finished grade should be wrapped completely with polyethylene and tapping appropriately. Polyethylene should be cut at the bottom to allow drainage from the drain ports.
- Hydrants should be set a minimum of 1 foot from the back of the curb.
- Concrete thrust blocks shall be placed between the rear of the hydrant inlet and undisturbed soil at the end of the trench. Special care shall be taken so that concrete does not plug the drain port. 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.
- During backfill sewer rock should be placed around the rear of the hydrant to a point 12 inches above the drain port.
- 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 below). Must be painted with Sherwin Williams B-54Z Industrial Enamel or equal.
- Concrete pads must be installed around the completed hydrant, in an open area they are to be 4' X 4' and in a park strip area it should be 4' wide and run from curb to sidewalk approximately 3 1/2' to 5 1/2' (See drawing below). The concrete should be 6 1/2 Bag Class 4000, concrete will be 5" thick on a curb to sidewalk application and 8" thick in an open area installation. All pads should be installed with #4 rebar. If the bolts on the hydrant are touching or are in the concrete a hydrant riser must be installed.

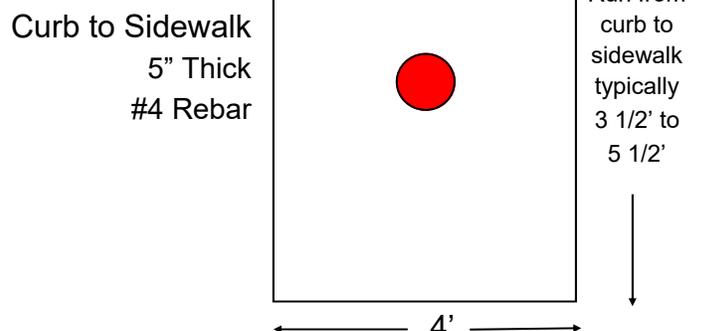
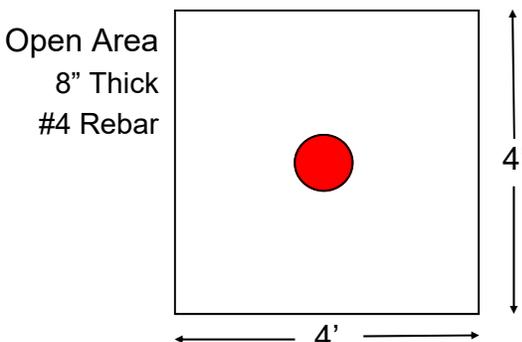
Hydrant Bonnet Color Code

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

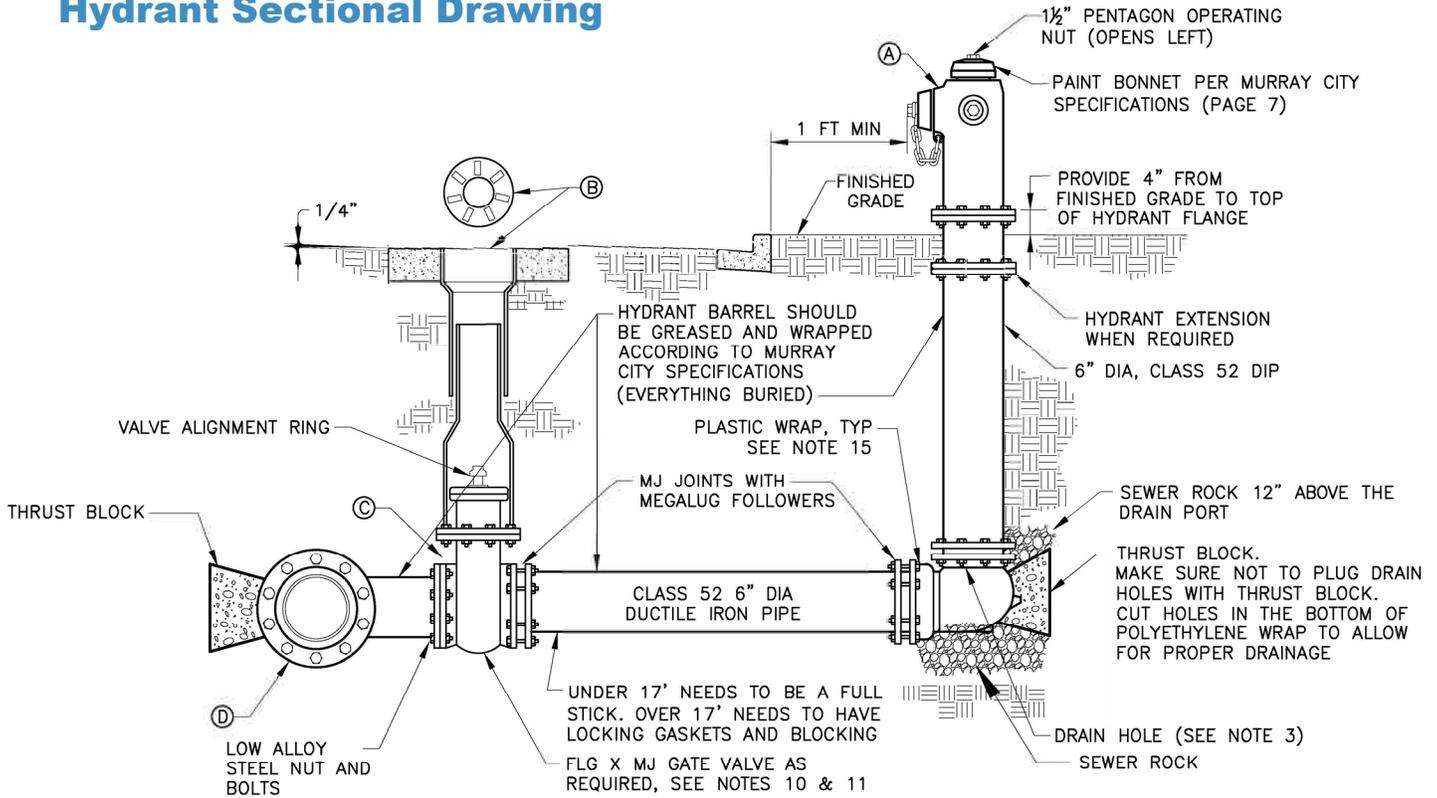
- | | | |
|-----------------------------|---|--------|
| 1. 4" and smaller main..... |  | White |
| 2. 6" main..... |  | Red |
| 3. 8" and 10" main..... |  | Orange |
| 4. 12" or larger main..... |  | Green |



Hydrant Concrete Pads



Hydrant Sectional Drawing



LEGEND					
ITEM	DESCRIPTION	PART NUMBER	ITEM	DESCRIPTION	PART NUMBER
Ⓐ	FLANGE OR MJ FIRE HYDRANT AS REQUIRED. PAINT BONNET PER MURRAY CITY SPECIFICATIONS	MUELLER A-423 OR SUPER CENTURION HYDRANT AWWA/ANSI C502 DRY BARREL	Ⓒ	GATE VALVE WITH 2" X 2" OPERATING NUT	MUELLER 6" RESILIENT SEAT GATE VALVE, OR EQUAL
Ⓑ	SLIDING ADJUSTABLE VALVE BOX WITH DROP LID WITH THE WORD "WATER" CAST INTO IT	D&L M-8040 OR EQUAL	Ⓓ	MJ X FLG TEE WITH ACCESSORIES	MJ X FLG TEE ANSI/AWWA C110/AS1.10 WITH 125 POUND FLANGE

SECTIONALS FOR HYDRANT PADS		
AREA	SIZE	CONCRETE MIN
OPEN AREA	4' X 4'	8" THICK-6 ½ BG (CLASS 4000)
CURB TO SIDEWALK	5' X 3'	5" THICK-6 ½ BG (CLASS 4000)

- ALL WORK MUST BE INSPECTED BY CITY PERSONNEL PRIOR TO BACKFILL.
- HYDRANT THRUST BLOCK REQUIRED WITH A MINIMUM OF 6.0 SQ. FEET BEARING ON UNDISTURBED SOIL.
- DRAIN HOLES AT BASE OF HYDRANT TO REMAIN CLEAR WITH A MINIMUM OF ½ CU. YD. OF CLEAN 1 ½" MINUS GRAVEL PLACED AROUND HYDRANT BASE AND DRAIN. GRAVEL SHALL BE WRAPPED IN GEOTEXTILE FABRIC TO PREVENT MIGRATION OF FINES.
- THE 4 ½" STREAMER NOZZLE TO FACE THE STREET.
- FIRE HYDRANTS SHALL BE INSTALLED IN SUCH A MANNER THAT THE HYDRANT FLANGE IS 4" ABOVE FINISHED GRADE.
- CONTRACTOR SHALL PLACE AND MAINTAIN A BLACK PLASTIC BAG OVER NEW FIRE HYDRANTS UNTIL THEY ARE PLACED IN SERVICE.
- HYDRANT SHALL BE PAINTED RED WITH SHERWIN WILLIAMS B-54Z INDUSTRIAL ENAMEL OR EQUAL. BONNETS SHALL BE PAINTED ACCORDING TO THE MAIN SERVING THE HYDRANT AS FOLLOWS: 4" OR LESS = WHITE, 6" = RED, 8" AND 10" = ORANGE, 12" OR GREATER = GREEN
- STANDARD DRILLING - CAST FLANGES, ANSI/AWWA C110 125/A21.10 125.
- SUPPLY AND INSTALL SERIES 1100 MEGALUG JOINT RESTRAINTS OR APPROVED EQUAL, AS REQUIRED ON D.I. PIPE.
- GATE VALVES TO BE IN ACCORDANCE WITH AWWA C509. WHERE THE DISTANCE BETWEEN THE MAIN AND HYDRANT IS GREATER THAN 17', TWO GATE VALVES MAY BE REQUIRED (ONE ON MAIN, AND ONE AT HYDRANT)
- ALL BURIED FITTINGS, AND BOLTS TO BE COATED WITH CHEVRON FM GREASE #1 OR EQUAL AND WRAPPED WITH 8 MIL SHEET POLYETHYLENE.
- ALL DUCTILE IRON PIPE TO BE IN ACCORDANCE WITH ANSI/AWWA C115/A21.15 CLASS 52.
- SUBSTITUTIONS TO BE IN ACCORDANCE WITH APWA SEC. 01 25 00.
- ALL WORK AND MATERIALS TO BE IN ACCORDANCE WITH ANSI/AWWA C502 AND THE APWA GENERAL CONDITIONS AND STANDARD SPECIFICATIONS FOR CONSTRUCTION.
- PRIOR TO POURING CONCRETE, WRAP PIPE SYSTEM WITH 8 MIL THICK PLASTIC SHEET TO PREVENT BONDING OF CONCRETE TO PIPE SYSTEM. CUT HOLES IN PLASTIC AROUND DRAIN HOLES ON HYDRANT.

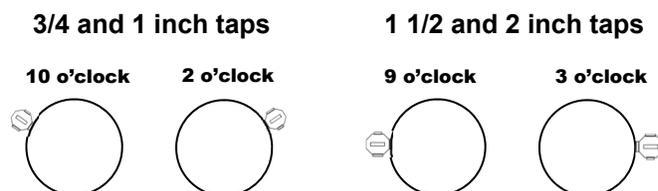
Valve Installation

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.

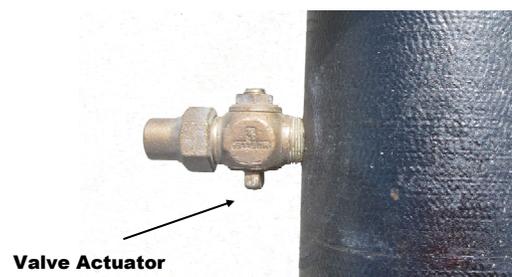
Water Service Installation

(Sectional Drawing on Page 10)

1. ¾ and 1 inch taps shall be installed using C.C. corps with flare fittings.
 - Corporation stops shall be installed on ¾ 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 ½ and 2 inch taps shall be installed using I.P. corps with double strap brass saddles.
 - Corporation stops on 1 ½ 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. Corporation stops shall be tightened only sufficiently to be watertight.
6. Install type K copper tubing from the corporation stop to the water meter, or to the existing service if performing a changeover.
7. 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.
8. Copper must also be installed from the water main to the (Point of Use) building or residence (See sectional on page 11).



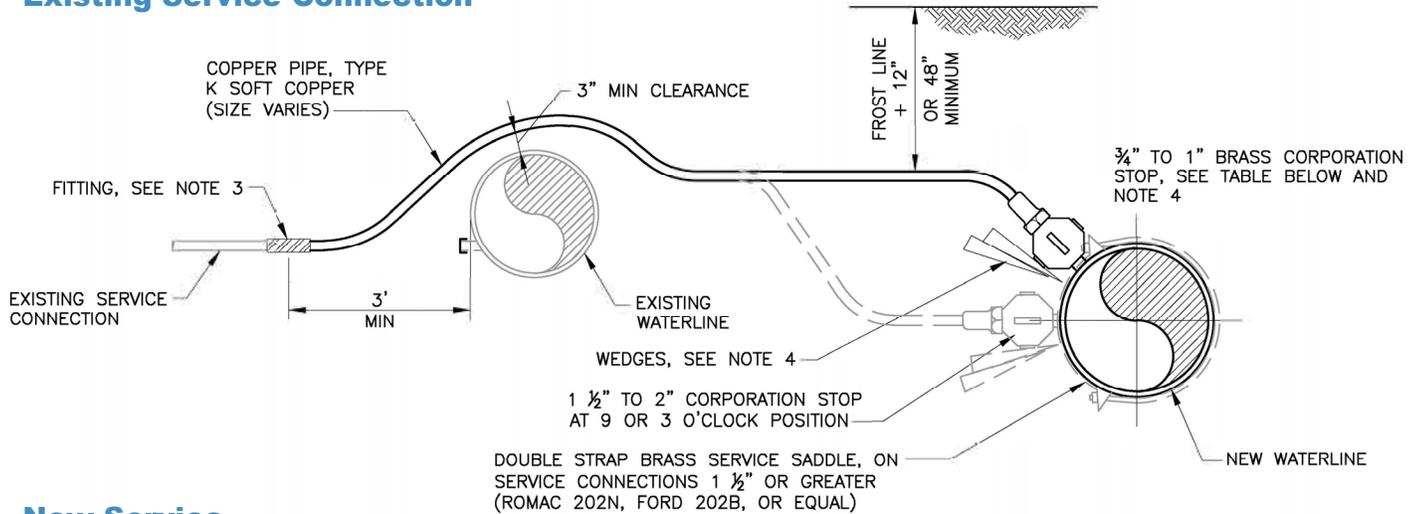
Top View of Corporation Stop Installation



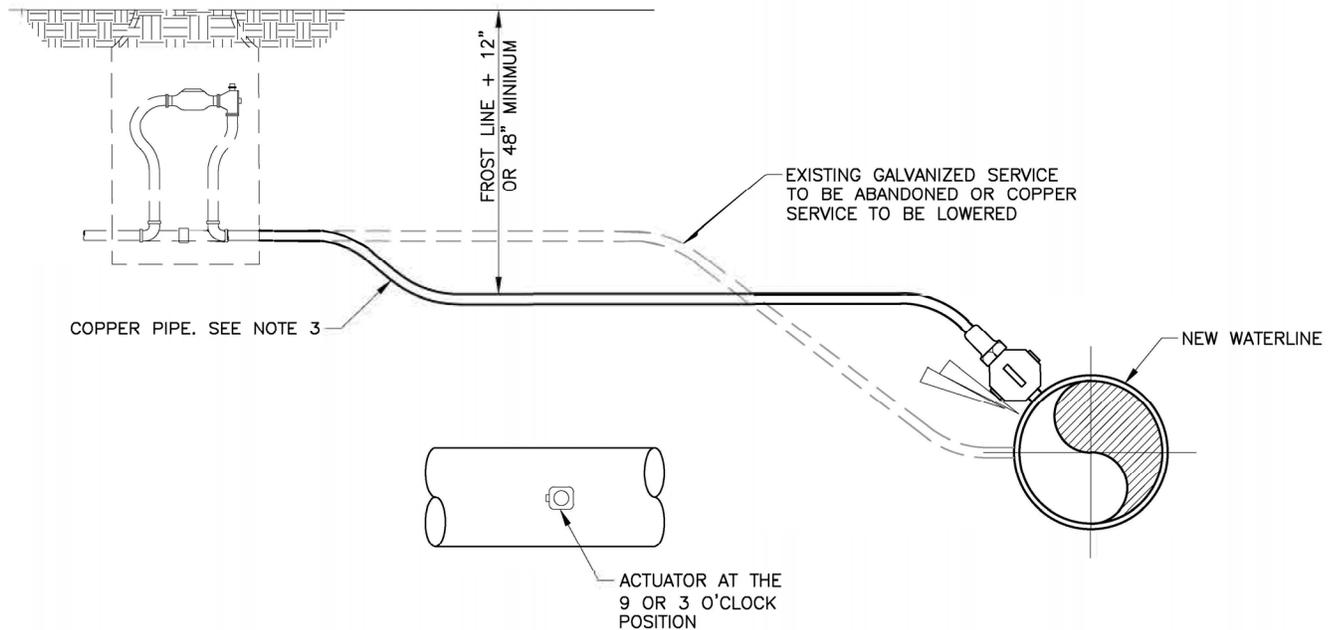


Water Service Taps

Existing Service Connection



New Service



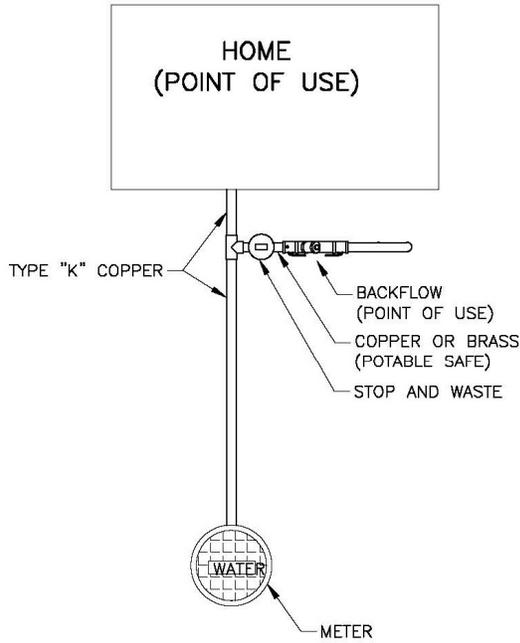
NOTES:

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.

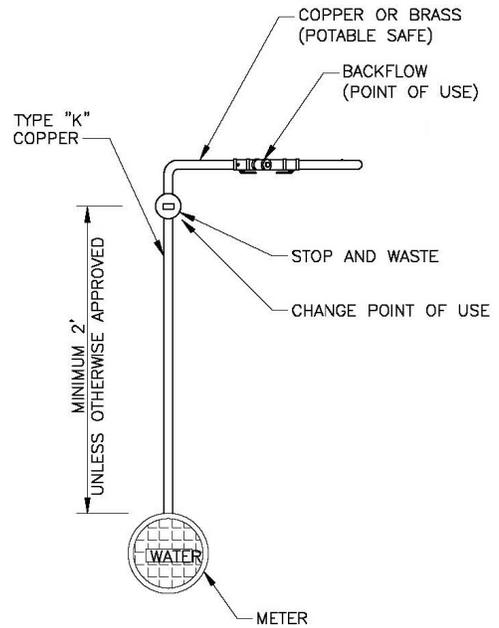
CORP STOP TABLE	
3/4" OR 1"	1 1/2" OR 2"
MUELLER H-15000 (OR EQUAL)	MUELLER B-25000 (OR EQUAL)



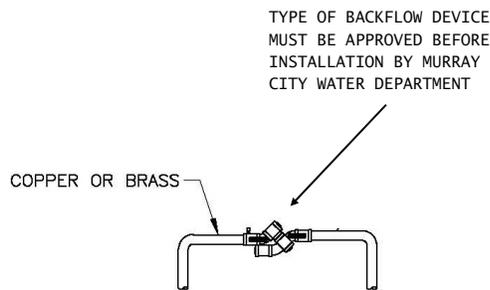
Point of Use



HOME CONNECTION



SPRINKLER/IRRIGATION CONNECTION

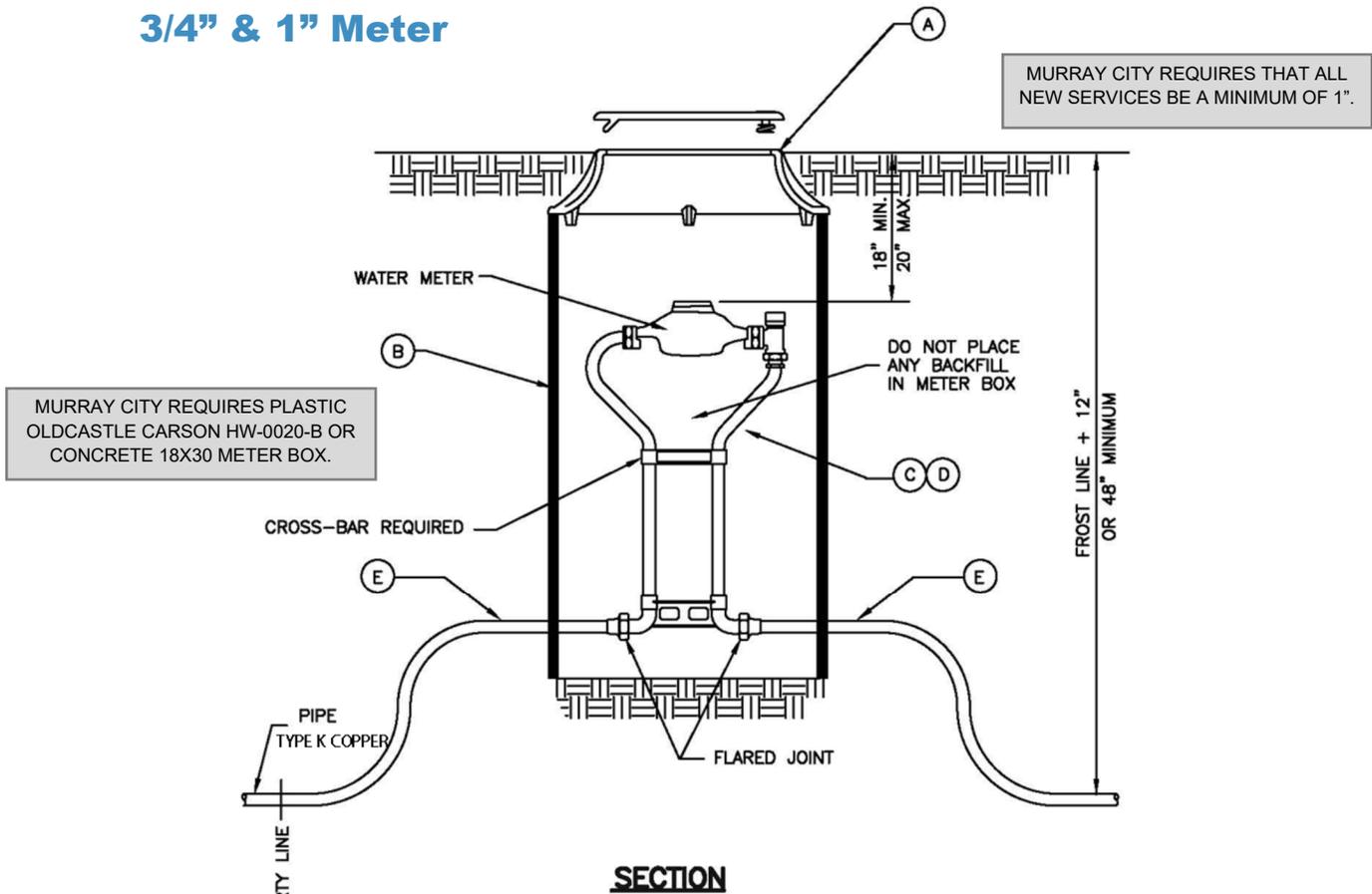


BACKFLOW ELEVATION

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. Concrete meter boxes with larger lids 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.

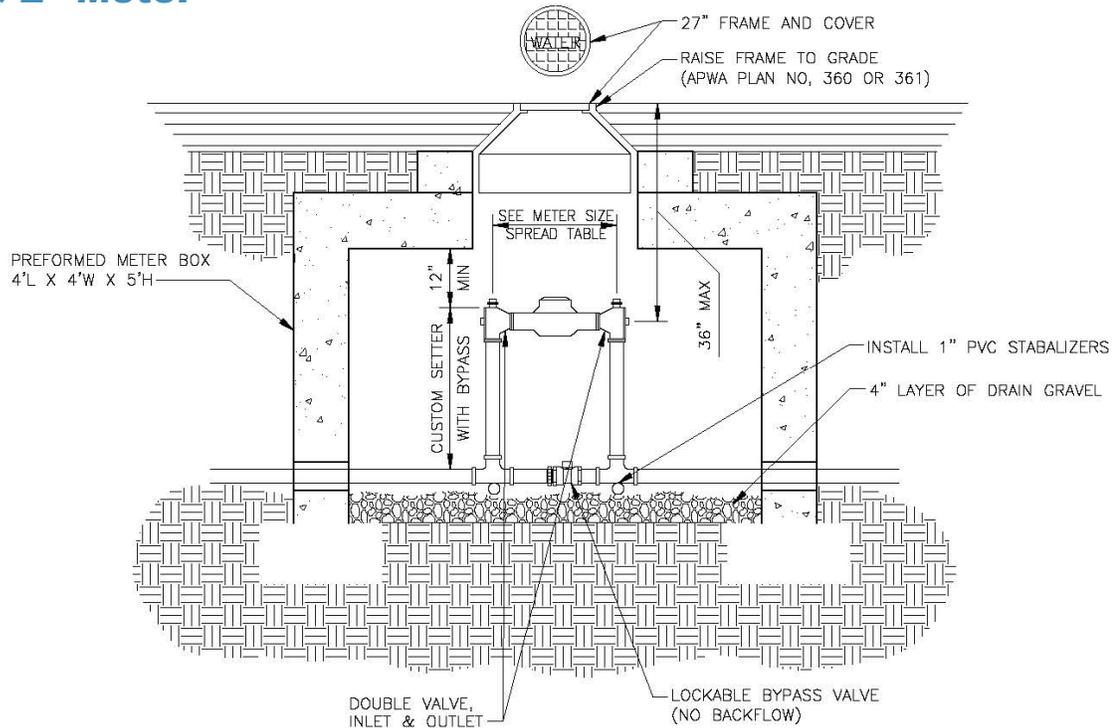
3/4" & 1" Meter



LEGEND			
No.	*	ITEM	DESCRIPTION
(A)		FRAME AND COVER	CAST IRON WITH HOLES FOR AMR SYSTEMS
(B)		METER BOX	SEE MATERIAL SPECIFICATIONS
(C)		3/4" METER YOKE	18 COPPER SETTER WITH BALL VALVE (NO BACKFLOW)
(D)		1" METER YOKE	18 COPPER SETTER WITH BALL VALVE (NO BACKFLOW)
(E)		COPPER PIPE	TYPE K (SOFT)



1 1/2" & 2" Meter

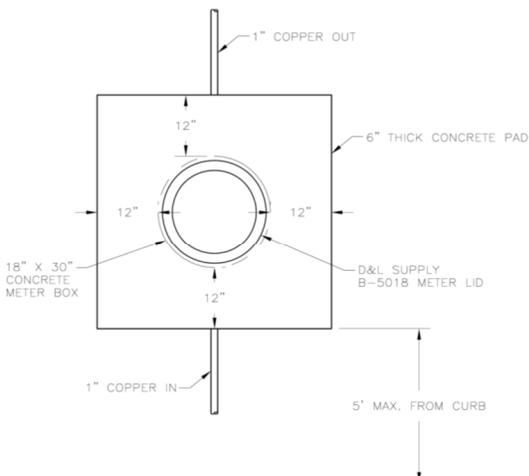


NOTES:

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 MANHOLE OVER METER.
4. TURBINE METERS ON ALL SYSTEMS USED EXCLUSIVELY FOR IRRIGATION OR FIRE PROTECTION. WHERE DOMSETIC USE IS TO BE USED, USE STANDARD METER.
5. BYPASS VALVE TO BE LEFT IN THE OPEN POSITION.
6. 6" GRADE RING REQUIRED.
7. ALLOW A 1" CLEARANCE AROUND WATER LINE WHERE PASSING THROUGH CONCRETE WALLS. SEAL HOLE WITH RAMNECK SEALANT.
8. MURRAY CITY TO SUPPLY WATER METER
9. MINIMUM DEPTH FOR WATER SERVICE TO BE 48 INCHES EXCEPT WHERE 60 INCHES IS DESIGNATED BY THE ENGINEER.
10. SUBSTITUTIONS: APWA 01 25 00

METER SIZE SPREAD TABLE	
METER SIZE	SPREAD
1 1/2"	13"
2"	17"

Meter Box in Concrete Installation

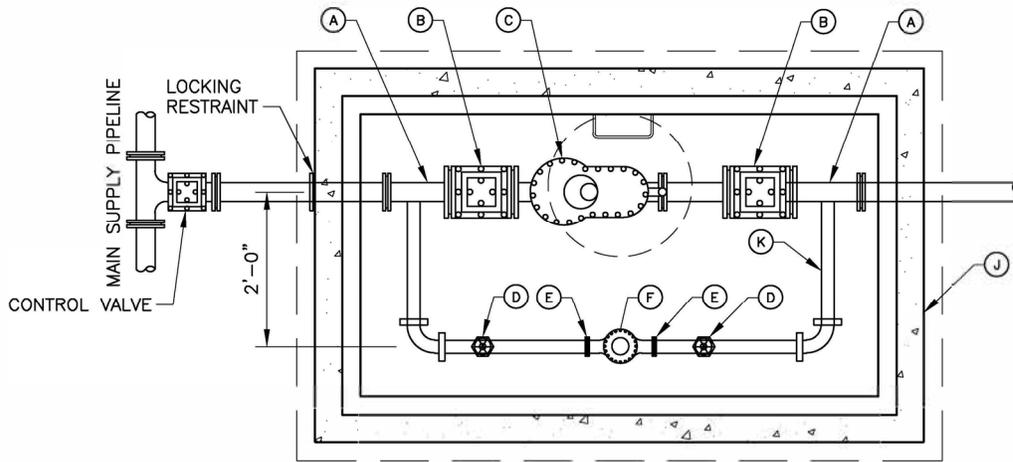


NOTES:

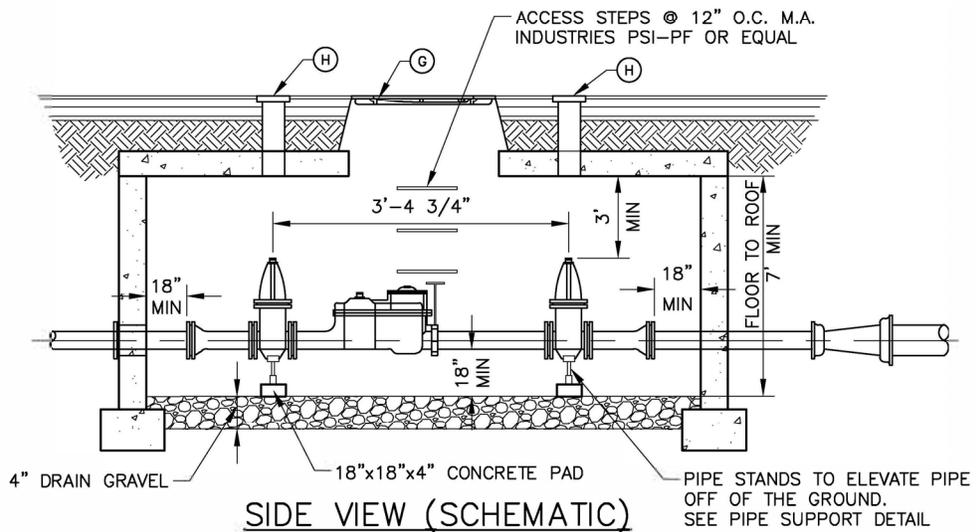
1. ALL WORK MUST BE INSPECTED BY CITY PERSONNEL.
2. CONCRETE SHALL BE 6" THICK - 6 1/2 Bag Class 400.
3. EXPANSION BOARD ALL AROUND.
4. CONTROL JOINTS FROM LID TO EDGE OF PAD.
5. BOX SHALL BE SET SO THAT THE GRADE OF THE FRAME AND THE COVER MATCHES THE GRADE OF THE SURROUNDING SURFACE.
6. CONCRETE METER BOXES WITH LARGER LIDS 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.



Meters Larger than 2"



PLAN VIEW (SCHEMATIC)



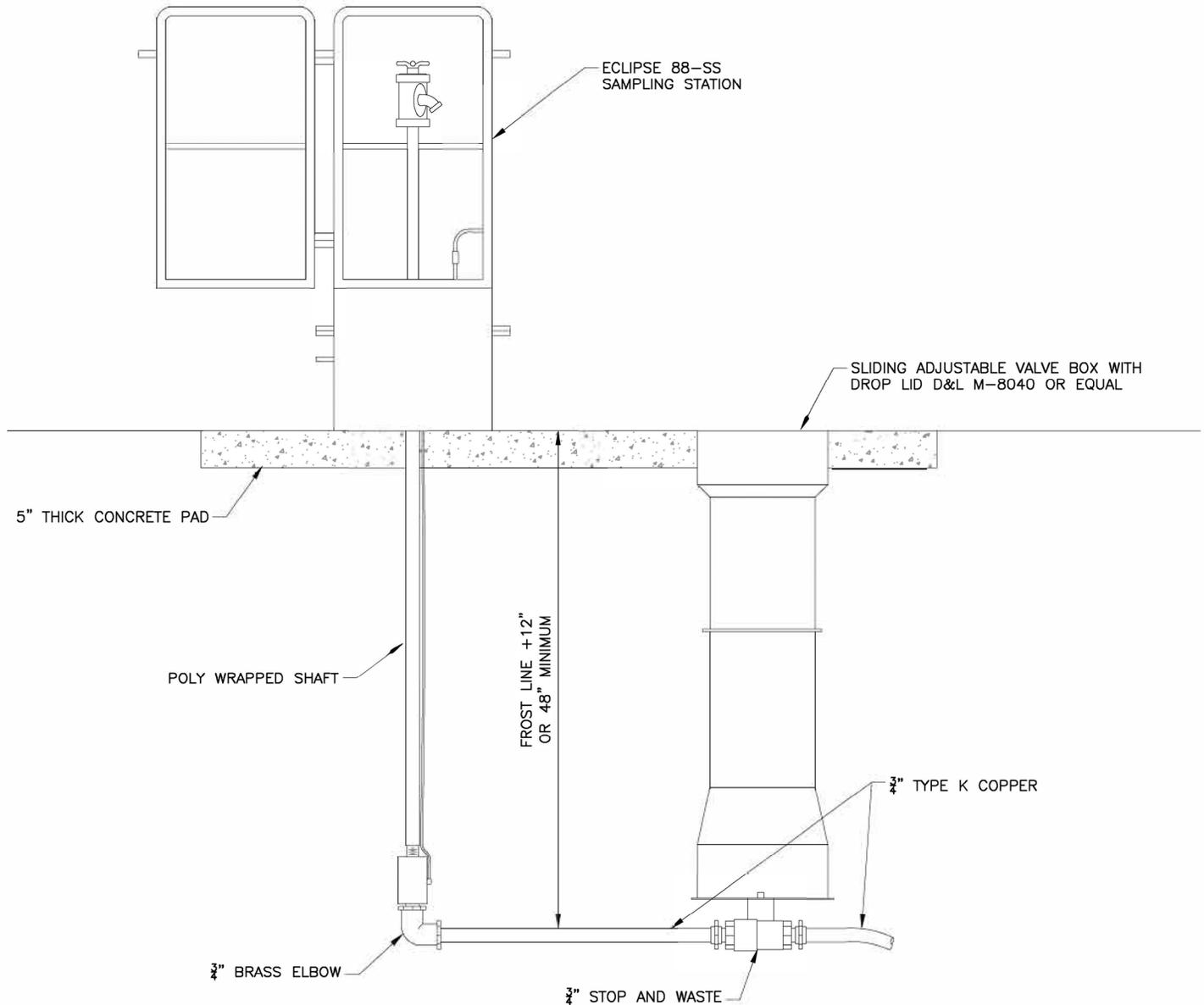
SIDE VIEW (SCHEMATIC)

LEGEND			
No.	*	ITEM	DESCRIPTION
(A)		3" OR 4" FLANGE X MJ ADAPTER	
(B)		3" OR 4" GATE VALVE WITH 2" X 2" OPERATING NUT	
(C)	*	3" OR 4" METER	
(D)		2" GATE VALVE	
(E)		2" METER FLANGE	
(F)	*	2" DISPLACED METER	
(G)		27" FRAME AND COVER	
(H)		TOP SECTION OF VALVE BOX WITH LID	
(J)		CONCRETE BOX	APWA PLAN NO. 505
(K)		BRASS PIPING	

* FURNISHED BY MURRAY CITY



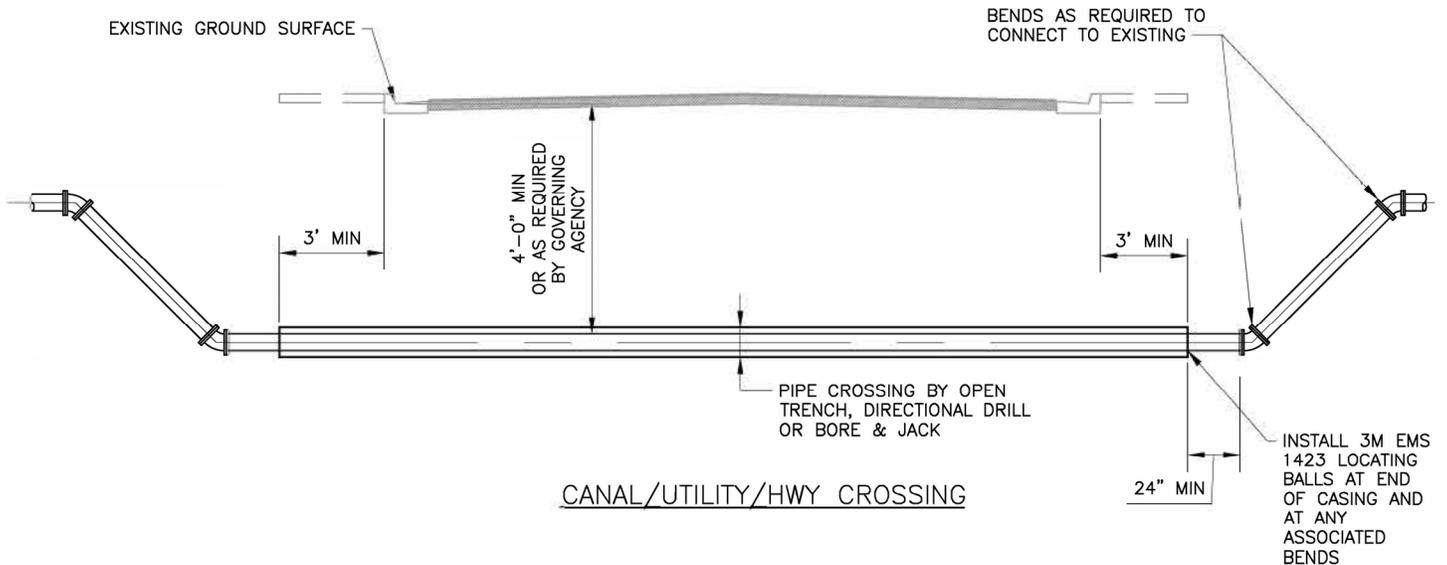
Sampling Stations



1. 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 sampling station.
3. All connections shall be lead free brass with flared 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.

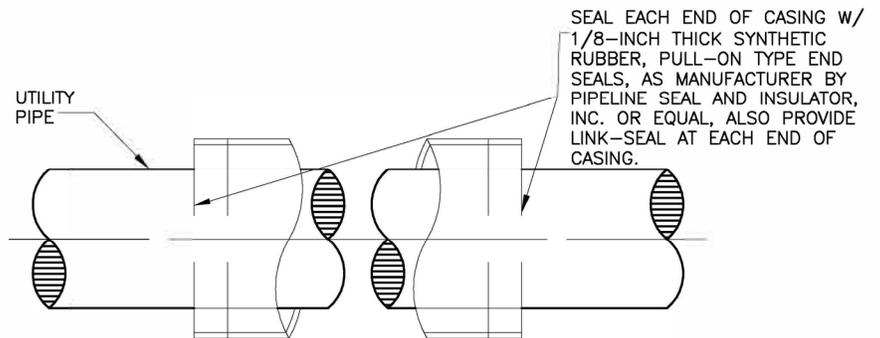


Jack & Bore



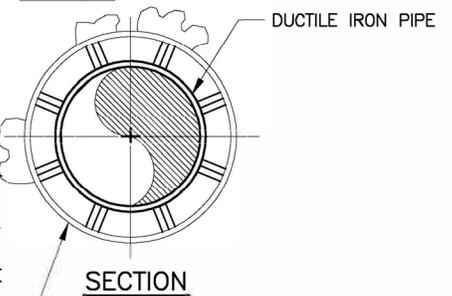
NOTES:

1. CARRIER PIPE SHALL HAVE RESTRAINED JOINTS.
2. CARRIER PIPE SHALL BE TESTED BEFORE SEALING THE ENDS OF THE CASING.
3. SPACERS SHALL BE SECURELY ATTACHED TO CARRIER PIPE PER MANUFACTURER'S REQUIREMENTS.
4. CASING PIPE SHALL BE WELDED STEEL, ASTM A53, GRADE B. 42,000 PSI MIN YIELD STRESS. WELD SHALL CONFORM TO AWWA C206
5. THE DIAMETER OF THE CASING PIPE SHALL BE AT LEAST THE OUTSIDE DIAMETER OF CARRIER PIPE PLUS 6-INCHES.



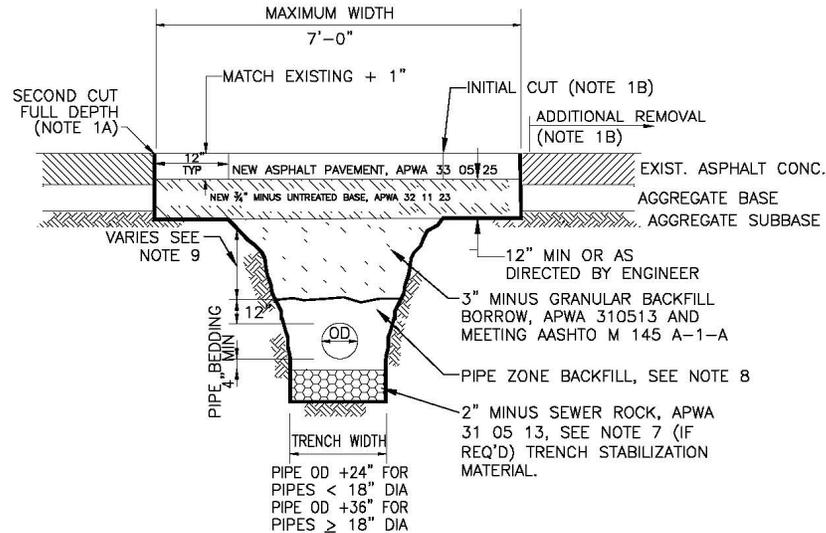
ANY VOIDS CREATED BY BORING, JACKING, OR TUNNELING SHALL BE FILLED BY PRESSURE GROUTING.

CASING SPACERS MANUFACTURED BY PIPELINE SEAL AND INSULATOR, INC. MODEL C12G-2 (OR EQUAL EPOXY COATED STEEL BAND 12" WIDE 14 GAUGE, WITH 10 GAUGE RISER, POLYMER RUNNERS AND SST HARDWARE), SPACED EVERY 5-FT TO CENTER THE PIPE INSIDE THE CASING. PIPE THROUGHOUT THE LENGTH OF THE CASING SHALL BE AT A CONTINUOUS DEPTH AS SHOWN. PLACE A SPACER A MINIMUM OF 1' FROM EACH END OF CASING.



MINIMAL WALL THICKNESS OF CASINGS	
DIAMETER	WALL THICKNESS
10" AND UNDER	0.25"
12"-18"	0.313"
20"-22"	0.375"

LARGER CASING AS DIRECTED BY THE CITY



NOTES:

- ASPHALT PAVEMENT REMOVAL: (REMOVE PAVEMENT AS SPECIFIED IN APWA 024114):
 - MILL OR SAW CUT FULL DEPTH OF ASPHALT TO PROVIDE STRAIGHT VERTICAL PAVEMENT EDGE FOR PAVEMENT REPAIR.
 - 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.
- TACK COAT: PROVIDE FULL TACK COAT COVERAGE ON ALL VERTICAL SURFACES.
- JOINT REPAIR: WHERE CRACKS OCCUR BETWEEN THE PATCH AND ANY EXISTING PAVEMENT OR ANY STREET FIXTURE, REPAIR THE CRACK PER APWA 320117.
- TRENCH EXCAVATION IN ACCORDANCE WITH APWA 312316, OSHA, AND UOSH SAFETY STANDARDS.
- 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.
- 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).
- 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.
- 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.
- 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.
- PROVIDE AC-20-DM-1/2 ASPHALT CONCRETE UNLESS OTHERWISE DIRECTED BY ENGINEER.
- RECYCLED ASPHALT SHALL NOT BE USED FOR BACKFILL IN ANY PART OF THE TRENCH.
- 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.



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.**

Murray City Water Impact Fees



MURRAY
CITY WATER

Effective June 25th, 2018

The Water Impact Fee shall be based on the Water Meter Size serving the property as follows:

Water Meter Size	Impact Fee
1"	\$3,027.20
1 1/2"	\$6,053.27
2"	\$9,685.46
3"	\$21,187.01
4"	\$36,321.88
6"	\$75,669.84
8"	\$108,964.52
10"	\$175,553.89
12"	\$231,515.30

Murray City Water offers hydrant meter rentals and water use to homes during Construction. To sign up for either of these programs please contact us at 801.270.2440

Fire Flow Testing



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

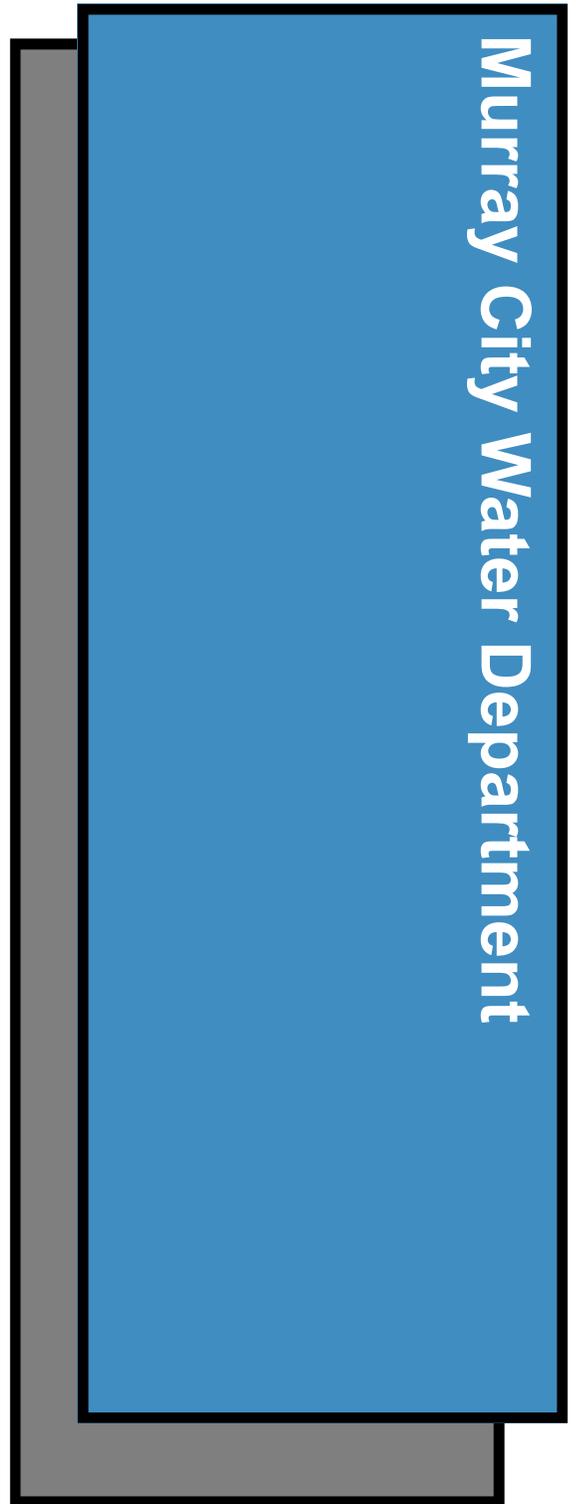
- Whenever Murray Water Department deems a service connection's water usage contributes a sufficient hazard to the water supply, an approved backflow prevention assembly shall be installed on the service line of the identified consumer's water system, at or near the property line, or immediately inside the building being served; but, in all cases, before the first branch line leading off the service line.
- 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 Steve Davis through standard mail, email or fax.

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



MURRAY

CITY
WATER



Tap into
Murray
Quality 
MURRAY CITY WATER 

