



**College
Utilities™**



Golden Heart Utilities™

SERVICE LINE STANDARDS

Revised: May 2024



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2024 Service Line Standard Revisions

Item	Section	Description
1	1.1	Various revisions
2	1.3	Various revisions
3	1.4	Various clarifications
4	1.6	Section deleted.
5	2.1	Retitled "Service Inquiries." Section is revised significantly.
6	2.2	Section is retitled, "Application for Service." Section is retitled and significantly revised for content. Added requirements related to Commercial Water/Sewer Application Checklist
7	3.1	Retitled section "Safety," and made significant revisions to content.
8	3.2	Significant revisions to content.
9	3.3	Retitled revised with clarifications. Information on required inspections moved to other sections.
10	3.4/3.5/3.6/3.7	Sections combined with signification revisions to content.
11	3.5	Section renamed/renumbered and revised for clarity.
12	3.6	Section renamed/renumbered and revised slightly for clarity.
13	3.7	Section renamed/renumbered and added information. Added requirements relating to contaminated sites.
14	4	Added additional information.
15	4.3	Added clarifying information.
16	4.4	Revised information relating to water materials requirements
17	4.5	Revised information relating to water materials requirements
18	4.6	Section revised for clarity/consistency
19	Figure 9	Various updates/corrections
20	4.11	Added items f) and g) to clarify Utility requirements
21	4.12	Added clarifying information
22	4.14	Renamed section and added significant clarifying information
23	4.15	New heat exchangers installations are no longer allowed upstream of the Utility meter. Section revised to reflect change.
24	4.18	Section is revised for clarity.
25	5	Added clarifying information
26	5.1	Minor revisions for clarification
29	5.4	Subsections h), i) and j) revised for clarity.
30	5.8	Added new section describing sewer service inspections.
31	5.9	Renamed/renumbered section.

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INTRODUCTION

Thank you for your interest in Utility Services of Alaska, hereinafter referred to as (USA). USA provides administrative support to both College Utilities Corporation (CUC) and Golden Heart Utilities (GHU). We have prepared the following information to guide you and/or your contractor through the required steps in the service line installation process and to serve as the inspection guideline prior to connection. This booklet was designed as a guideline to supplement the Utilities' rates, charges, and rules and regulations as filed with the Regulatory Commission of Alaska (RCA).

These standards are modified from time to time, generally on an annual basis during the first quarter of the year. When substantive revisions occur, the Utilities will publicly notice its customers. These standards will be enforced. It is the responsibility of the individual to ensure they have the most recent version of the Utilities' Service Line Standards. To confirm that you have the most recent version, please check our website at <https://www.myutility.us/akwater> or contact customer service. You may also sign up at our website to be added to our mailing list for Service Line Standard updates. You will then be notified by email when new standards are issued.

Copies of CUC/GHU's water and wastewater tariffs, including all rates, charges, rules and regulations are available at USA's office for public inspection during regular business hours or you may view them or download them from our website.

If you have any questions after reading this booklet, please contact our office for further information. We look forward to serving you and providing you with high quality drinking water and wastewater treatment services.

SECTION 1 GENERAL

1.1 SCOPE

This Standard covers the acceptable design and construction for water and sewer service connections to CUC and GHU water distribution and wastewater collections systems. This document will serve as the official inspection criteria used by Utility personnel for evaluating the suitability of new, revised and repaired Utility services for connection to the Utility. Deviation from this Standard is permitted only by written consent of the Utility.

1.2 LIABILITY

CUC and/or GHU assume no responsibility or liability concerning the suitability or applicability of this Standard to the requirements of the customer.

1.3 INTENT

The intent of the Standard is to provide designers, contractors, and customers a basic guide for design and installation of underground water and sewer service piping to ensure compatibility with the Utilities' system.

1.4 OWNERSHIP

The extent of ownership by the Utility is limited to water or wastewater mains, pitorifice/corporation stop and/or service valve and tee, wastewater saddle, water meter, and Automatic Meter Reading (AMR) equipment. The service piping/tubing from the point of connection to the water or sewer main, and all associated service fittings, valves, pumps, and other material, whether required by law, necessity, or this Standard are owned by and **are the sole responsibility of the Customer.**

1.5 DEFINITIONS

The following definitions apply to this Standard:

Utility: College Utilities Corporation (CUC) and/or Golden Heart Utilities (GHU).

Customer: That person making contact with the Utility for the purpose of obtaining water and/or wastewater service. The customer has certain responsibilities and liabilities detailed in Section 3 of this Standard.

Designer: Any person who designs the system governed by this specification.

Installer: Any person acting on behalf of the customer who will perform installation, excavation, insulation, or any other work relating to complete or partial accomplishment of connection to the Utility system. The installer is

responsible to the customer to provide a system which conforms to the requirements of this Standard.

SECTION 2 PROCEDURES FOR OBTAINING A NEW SERVICE

2.1 SERVICE INQUIRIES

Call or visit USA's office at 3691 Cameron Street, Suite 201, 907-479-3118 for information on:

- a) The availability of water and/or sewer service.
- b) The approximate location of mains.
- c) Cost of assessments (i.e., Contribution In Aid of Construction (CIAC) fees) due on the property.

The Customer Service department will collect information about the property in question to determine the availability of service and associated costs. Depending on the location of the property, Customer Service may require several days to determine the cost of a service connection.

If a location is not currently served by Utility water/sewer mains, Customer Service will work with the interested party to determine the feasibility of serving the location. The feasibility of serving any location is determined by several factors and can require significant field work and engineering to properly assess. All such requests will be handled on a case-by-case basis in an effort to supply a sufficiently informative response in a timely way.

2.2 APPLICATION FOR SERVICE

The customer is responsible for completing an application for service with USA Customer Service prior to requesting connection to the mains.

Application: Apply for service and pay necessary fees at USA's office located at 3691 Cameron Street, Suite 201, Fairbanks, Alaska 99709.

For residential structures, the building owner may perform the hookup, provided that the owner does the actual installation. If the actual installation is not to be performed by the owner, then the work must be performed by competent plumbers holding a valid State of Alaska Department of Labor PU and/or Journeymen Plumber Cards (required by Alaska State Law).

Furthermore, the owner must accept liability for any damage done to Utility property by themselves, their contractor, or a person acting on their behalf.

For commercial services, the Customer or their representative must complete a Commercial Water/Sewer Service Application Checklist to the Utility's satisfaction. This is to allow the Utility to properly assess service requirements for the property, including meter type and size, backflow protection requirements, service valve size, connection equipment requirements and to verify existing mainline capacity.

The Customer is responsible for determining the service size and type that will satisfy their needs. The service size will be determined by the number of fixtures being served, and the distance of the location to be served from the main, the elevation of the fixture served relative to the mains (for sewer service), and other factors. The configuration of any water or sewer service is subject to the minimum requirements laid out in this Standard. For commercial properties, the customer is responsible for providing sufficient information regarding the property so that the Utility may determine the appropriate water meter type and size, the hazard level of the plumbing and sprinkler system (if applicable), as well as other relevant service requirements.

Specific information on water and sewer service sizing is included in the sections below.

- a) Determine the size of the service line based on number of units in the building for residential service and square footage of building for commercial service.
- b) Water: Standard residential water service is a three-quarter (3/4") inch service line. **For water service connections over two (2") inches in diameter, check with the Utility well in advance of the anticipated connect date to ensure materials are available for the connection.** (Refer to Section 4 for available service configuration.) A service connection shall serve no more than one (1) lot. No service connection may cross a lot line other than that for which it is intended to provide service unless an easement has been provided. A structure shall be served by a single service connection. Where multiple buildings occupy a single lot, there shall be one (1) service connection for each building on a lot, unless the Utility has approved a branched service extension in writing. Branched services may be considered "water distribution systems" by DEC, and subject to additional regulatory requirements. Customers are responsible for complying with all applicable regulations.
- c) Wastewater: Wastewater services are generally four (4") inch (minimum) with six (6") inch for special cases. Wastewater service line size is based on the number and type of plumbing fixtures in the proposed building. Refer to Section 5 for available service configuration. A service connection shall serve no more than one (1) lot. No service connection may cross a lot line other than that for which it is intended to provide service unless an easement has

been provided. A structure shall be served by a single service connection. Where multiple buildings occupy a single lot, there shall be one (1) service connection for each building on a lot, unless the Utility has approved a branched service extension in writing. All service lines shall be installed with an approved backwater valve if required. See Section 5.6 (a) (b).

Prior to service connection, the property owner must:

- a) Complete an application for service to the property.
- b) For commercial services, complete a Commercial Water/Sewer Service Application Checklist form.
- c) If required based on the location of service, sign a Contribution In Aid of Construction (CIAC) agreement, and pay all associated fees.

SECTION 3 GENERAL REQUIREMENTS

3.1 SAFETY

The Utility's priority is to protect the safety of the public and its employees. Utility workers are expected to work in a safe manner and always observe best safety practices, comply with all applicable OSHA requirements and to stop work if subject to unsafe conditions. These can include but not limited to:

- Unsafe trenching. Inadequate sloping of trench walls, inadequate shoring, spoil piles laid too close to the edge of the trench, excessive water in the trench, inadequate access, unsupported overhead utilities crossing the trench.
- Unsafe site conditions. Inadequate traffic control, incomplete utility locates, uncontrolled pets in the area, hostile or threatening behavior by people on site or any number of other hazards.
- Unsafe confined space entry. For work that requires entry into Utility manholes or vaults, all confined space entry shall be conducted in compliance with applicable OSHA requirements including "hole watch" personnel, ventilation, use of gas sensing equipment, confined space entry permit, and retrieval gear if necessary.

Utility work will not resume until unsafe conditions are rectified to the Utilities satisfaction. The Installer is responsible for maintaining safe work site conditions at all times.

3.2 SCOPE OF UTILITY PERSONNEL WORK

Utility personnel shall review water service and plumbing plans if required, determine the required meter size, determine the level of backflow protection

required, determine the location of service connections to existing mains, and make other determinations about the configuration of the service as required to ensure a high quality of service over time that does not adversely impact public health or the service quality of other customers. Utility personnel review and approve any required testing on service piping and connections that may be necessitated in the course of service line work.

Utility personnel shall be responsible for operating water main lines valves, removing insulation from main, furnishing and installing saddles for both water and wastewater services, pit orifices, tees, valves, and thaw wire, , and installing the water meter and associated equipment on Tuesdays and Thursdays of each week. The Utility is responsible for inspecting and approving all water and sewer service piping and associated materials as described in sections below. These items constitute the scope of Utility personnel work unless specific arrangements have been made in writing for the Utility to do other work for the Customer.

3.3 CONNECTION OF SERVICE LINES TO UTILITY MAIN

The Utility's tariff states that service connections may be performed between May 1 and September 15. If, in the judgement of the Utility, a connection will jeopardize existing facilities, service to existing customers or impair normal functioning of the water system, service line connections may be postponed until conditions are more suitable. Historically, water service connections are performed after May 15 to maintain continuous freeze protection for Utility customers. Requests for connections made outside of the dates stated in the tariff will be evaluated by the Utility on a case-by-case basis.

Connections to water and wastewater mains will be made on Tuesdays and Thursdays during normal Utility working hours. No person, other than Utility personnel, shall cut or bore any holes in a water or wastewater main or attempt to install a connection. Connections will not be performed until the application for service is completed, all applicable fees are paid, and the service line construction has been inspected and approved by Utility personnel.

3.4 EXCAVATION/COMPACTION/BACKFILL

Safety is of critical importance to the Utility. Utility personnel will not enter ditches or excavations that are unsafe due to improper excavation, inadequate traffic control, excessive groundwater, or any other hazard. The Utility is not responsible for damages related to delays related to unsafe site conditions.

Prior to any excavation in connection with a water or sewer service line installation the Customer shall request utility locates. Call Alaska Digline at 811 or online at <http://www.811ak.com>. It is the Customers responsibility to ensure that complete locates are performed prior to commencing any excavation. Alaska Statutes require a forty-eight (48) hour notice for non-emergency

construction line locates. The Utility is not responsible for locating existing water and sewer service lateral piping, as they are customer owned.

Additionally, the Customer must obtain all necessary permits for the service line installation (and associated construction activities) from the appropriate agencies. These may include State of Alaska DOT&PF, the City of Fairbanks, the Fairbanks North Star Borough Rural Services department, or others, depending on the service location. It is the Customer's responsibility to know and understand all applicable requirements at their service location.

The Customer, or their Installer, shall perform all excavation and backfill required for service line installation. This includes the excavation around the main line necessary to install saddles, pitorifices, tees, and valves, and all associated backfill. Restoration of any surface improvements disturbed, damaged or destroyed in the course of the work are the responsibility of the customer.

Backfill service trench by hand a minimum of twelve (12") inches above the pipe and compact as necessary. Fill remainder by mechanical means and compact as appropriate based on location of worksite.

Compaction in road right of ways must meet Alaska Department of Transportation, City of Fairbanks or Fairbanks North Star Borough compaction requirements as appropriate based on the location.

Compaction beneath the Utility main and to a point twelve (12") inches above the main shall be 95% or greater. Provide backfill suitable to ensure bedding and support under all parts of any exposed main and service piping.

ANY DAMAGE to the main that takes place during the course of the work will be repaired by Utility personnel and billed to the contractor or customer.

The installer is responsible for protection of private and public property and maintaining a safe excavation for connection. All excavations shall meet the requirements of Alaska Department of Labor and Federal OSHA Regulations. The installer shall provide all necessary construction and safety equipment including shoring, de-watering pumps, excavation equipment, ladders, barricades, support for existing utilities, signs, and other equipment as needed to ensure protection of personnel and all existing utilities. The installer shall remove all standing and inflowing water from the excavation prior to connection of a service.

3.5 PERMITS

Information on applying for Fairbanks North Star Borough street digging permits may be made by calling the Rural Services (907) 459-1223. Information on City of Fairbanks permits is available by calling (907) 459-6770. You may also need

to contact the Alaska Department of Transportation at (907) 451-5400 or (907) 451-5179. This list of interested agencies is not all inclusive. Depending on the area other parties or agencies may require notice, permitting or other documentation. The Customer is responsible for obtaining all appropriate permits or permissions required to work in any area.

3.6 INSULATION

Insulation material shall be sprayed urethane foam; UPC 2.0 HFO or approved equal. Applicator shall demonstrate prior experience of at least two (2) years and the Utility shall be the sole judge of the qualifications of system, application method, and applicator.

- a) For water and wastewater service lines with a four (4') foot or deeper bury measured to top of pipe, the minimum insulation thickness shall be three (3") inches all around the pipe..
- b) For water and wastewater service lines shallower than four (4') feet, the minimum insulation thickness shall be four (4") inches all around the pipe, including where water services rise vertically near an outside wall. Additional insulation will be required by the Utility for conditions such as shallow service lines installed under driveways and sidewalks, and vertical service lines.
- c) Any hole cut in an outside concrete wall for service must be sprayed full of insulation.
- d) The customer or their contractor shall be responsible for re-insulating the main at the service connection.

3.7 SERVICE LINE PLACEMENT

- a) The Customer is responsible for determining the routing of service lines. In doing so, the Customer is also responsible for resolving conflicts with existing utilities that may exist in the work area.
- b) The Utility must approve any service tie in location on Utility mains. The location of service connections must not adversely impact existing services or the integrity of Utility infrastructure. If a new service connection must be relocated on the main due to an existing utility conflict it is the Customer's responsibility to resolve the conflict.
- c) Water service piping shall be installed such that a two (2") inch minimum horizontal separation is provided between supply and return.
- d) Buried piping shall be installed with a minimum four (4') foot soil cover.

Exceptions to this rule must be approved by the Utility.

- e) The service line depth shall be increased to provide protection against breakage or damage from heavy vehicles moving on the surface of the ground over or adjacent to such connections.
- f) A minimum twelve inches (12") horizontal separation from wastewater services shall be provided. In addition, the bottom of the water service piping shall be installed at least twelve inches (12") above the top of the wastewater service piping. These separation distances are required by the Alaska Department of Environmental Conservation. The water service pipe shall be placed on a solid shelf excavated at one side of the common trench. See Figure 1: Buried Pipe Separation.
- g) If the requirements of this section cannot be met, then it is necessary that the service lines be installed in two (2) separate trenches a minimum of ten (10) feet apart.
- h) Due to the risk associated with hydrocarbon permeation of HDPE water lines, HDPE service lines must be placed no closer than 10 (ten) feet to any underground fuel tank, fuel lines or source of potential contamination. Furthermore, all trench backfill must be clean and free of measurable hydrocarbon or other contamination.
- i) For commercial water services, the Utility reserves the right to require a field screening of the water service piping trench by a Qualified Environmental Professional (QEP). This may occur when:
 - a. The service is crossing a suspected contaminated site
 - b. Site contamination may permeate HDPE water service piping
 - c. Any time the Utility detects visual or other sign of POL (Petroleum, Oil or Lubricant) contamination or other hazardous substance on the site.

When a site screening is required by the Utility, it is the Customer's responsibility to coordinate the screening activities on site. If the trench is clean, the Customer must deliver a written report by the QEP prior to commissioning/connecting the line. If the trench is "dirty," then it is Customers responsibility to implement any mitigation measures to protect the water service as appropriate. Any such measures must be approved the Utility prior to commissioning the water line. For more information on contaminated sites in the area the Utility serves, go to the State of Alaska Department of Environmental Conservation Division of Spill Prevention and Response Contaminated Sites website at <https://dec.alaska.gov/spar/csp/>.

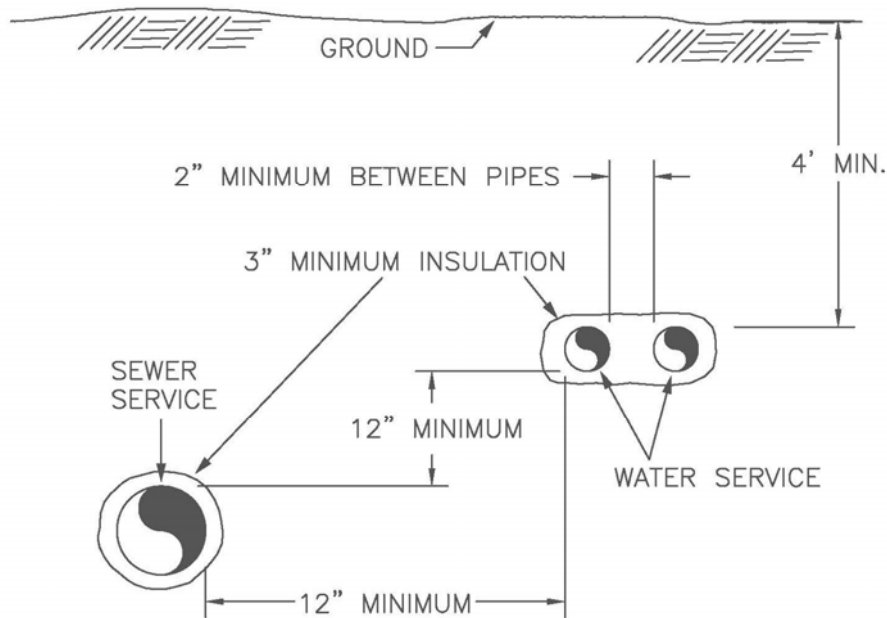


Figure 1: Buried Pipe Separation

SECTION 4 WATER SERVICE REQUIREMENTS

Section 4 below describes various aspects of water service construction, minimum standards for acceptance, and allowable materials of construction. There are multiple configurations for a water service available based on the needs of the customer. The Customer is primarily responsible for selecting the water service configuration that suits their needs.

All work within the scope of Standard shall comply with the Standard and the latest version of the Uniform Plumbing Code. In the case of a conflict, the more stringent standard shall apply.

For residential customers, the typical service size is a $\frac{3}{4}$ " dual line service. In larger homes, or homes with an unusually large number or special fixtures a larger service may be required. It is the Customer's responsibility to inform the Utility of the size of the residence to be connected and any special circumstances that may drive higher water demand.

Commercial customers are required to fill out a Commercial Water/Sewer Service Application Checklist when the service application is complete to ensure that the Utility can provide required fittings and metering equipment in a timely way.

If the customer anticipates a service larger than 2" or if the building served has a

sprinkler system, the Customer should contact the Utility well in advance to ensure that parts and material required for the connection are available.

4.1 PITORIFICE SADDLE CONNECTION

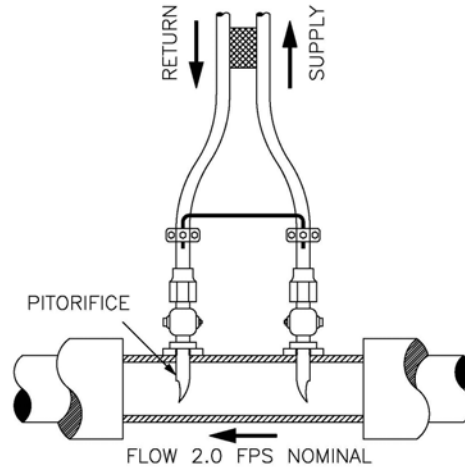


Figure 2: Pitorifice Circulation

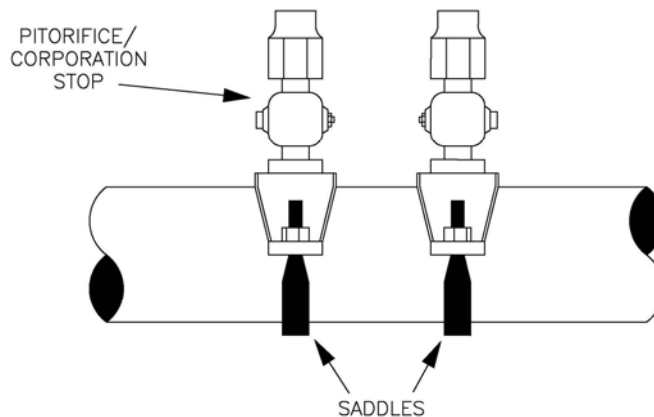
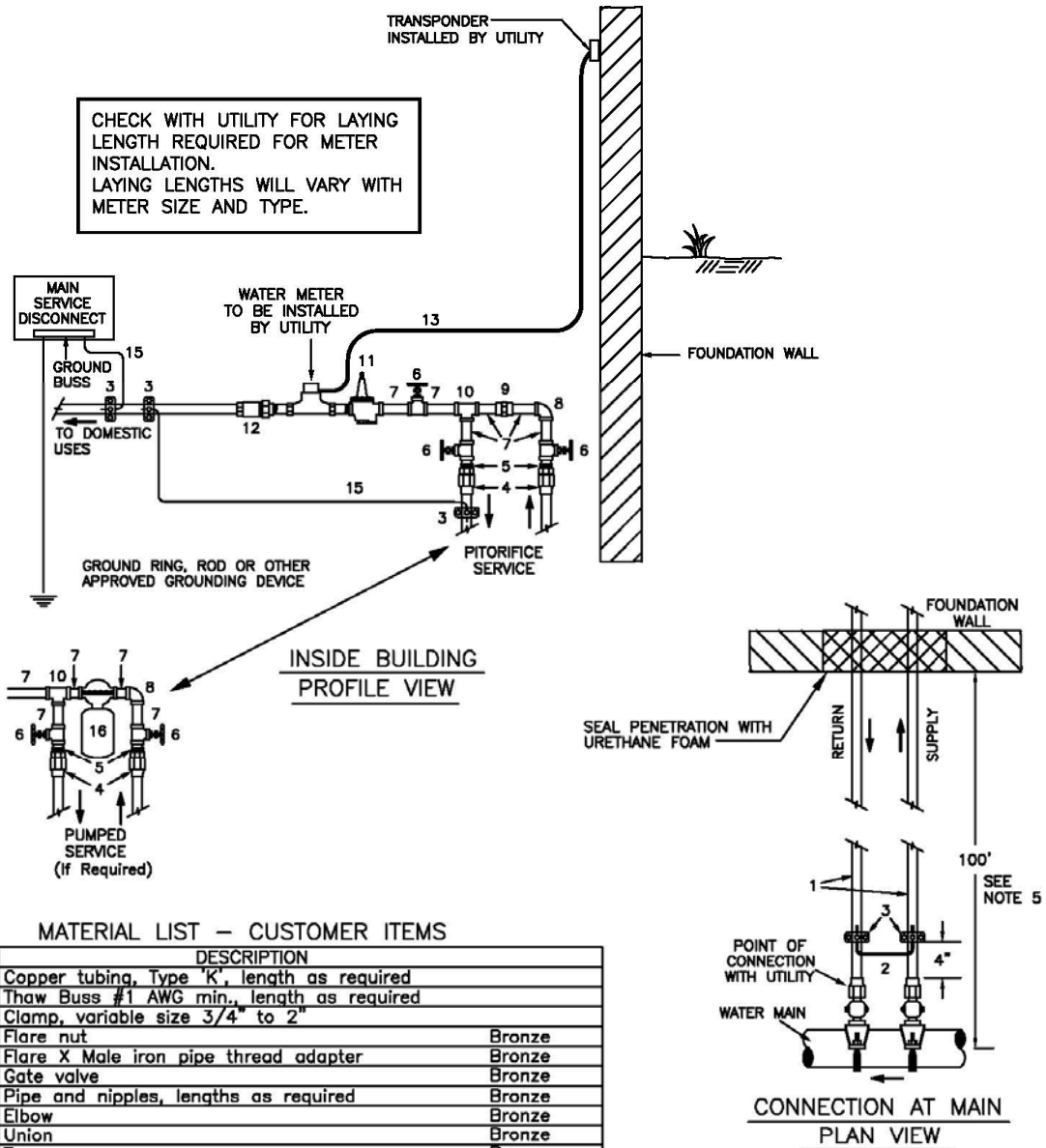


Figure 3: Pitorifice Saddles

Pitorifices with corporation stops are installed and available for services three quarter (3/4") inch, one (1") inch, one and one-half (1-1/2") inch, and two (2") inch. Saddles and pitorifices/corporation stops are installed by the Utility at the time of connection. Three quarter (3/4") inch saddles are standard for most residential services. See Figure 4, 4A and 4B for typical water service. (Saddle connections are not allowed on transmission mains if a distribution main is available in the immediate area.)



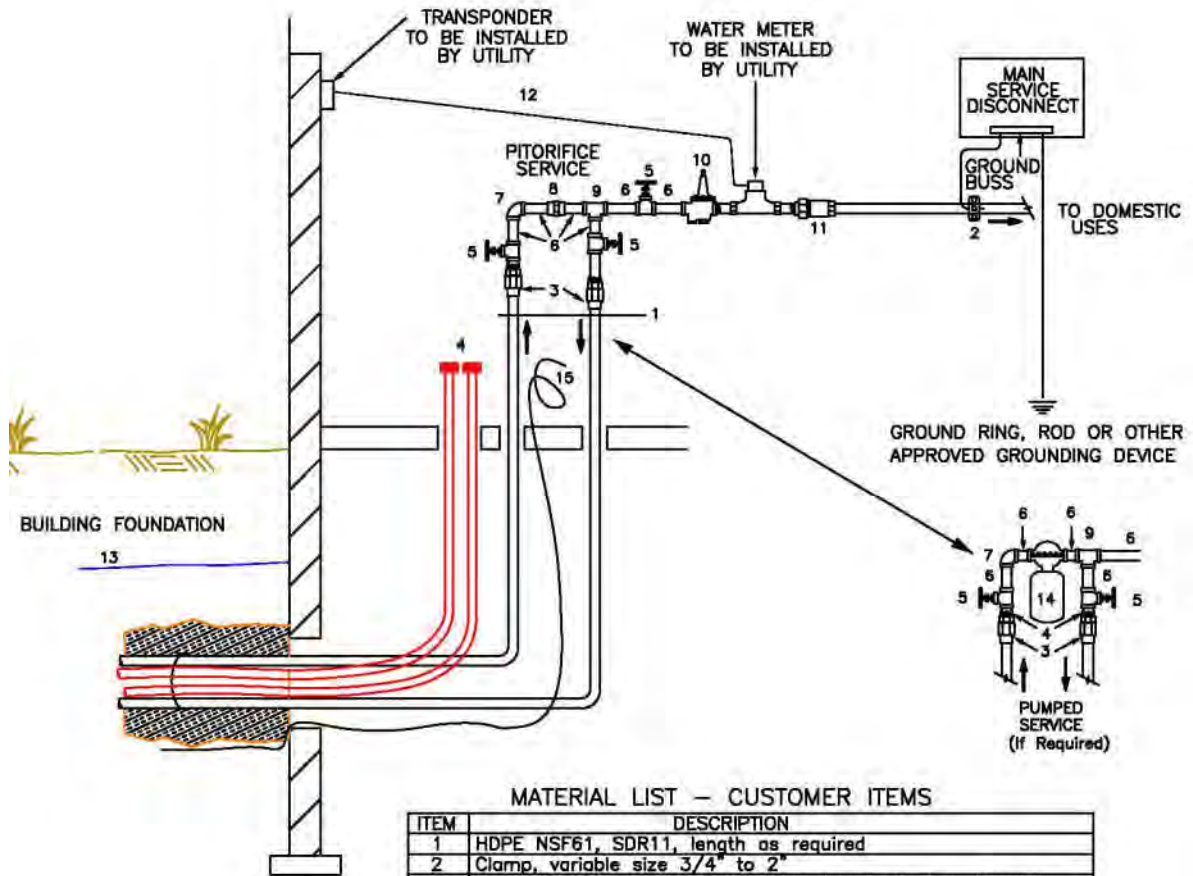
MATERIAL LIST – CUSTOMER ITEMS

ITEM	DESCRIPTION	
1	Copper tubing, Type 'K', length as required	
2	Thaw Buss #1 AWG min., length as required	
3	Clamp, variable size 3/4" to 2"	
4	Flare nut	Bronze
5	Flare X Male iron pipe thread adapter	Bronze
6	Gate valve	Bronze
7	Pipe and nipples, lengths as required	Bronze
8	Elbow	Bronze
9	Union	Bronze
10	Tee	Bronze
11	Pressure reducing valve, 80-40 PSI	Bronze
12	Dual Check valve/backflow preventer	Bronze
13	Conduit or #18 2-conductor wire	
14	Blue utility warning tape, optional	
15	Ground wire #4 AWG min., length as required	
16	Circulation pump, Grundfos 26-96BF	Bronze or stainless

NOTES:

1. All fittings shall be bronze threaded.
2. All tubing shall be type 'K' copper (soft). 3/4", 1", or 1-1/2".
3. Blue utility tape (item 14) may be placed 2' above water service piping for the full length of the service.
4. Water service piping shall be positive grade or level (no humps or dips) from water main to residence.
5. 100' Max. length for service without circulation pump.
6. Meter shall be a minimum of 1' and a maximum of 4' above floor level.

Figure 4: Typical copper pitorifice circulating loop water system
(Customer to supply all items on material list)



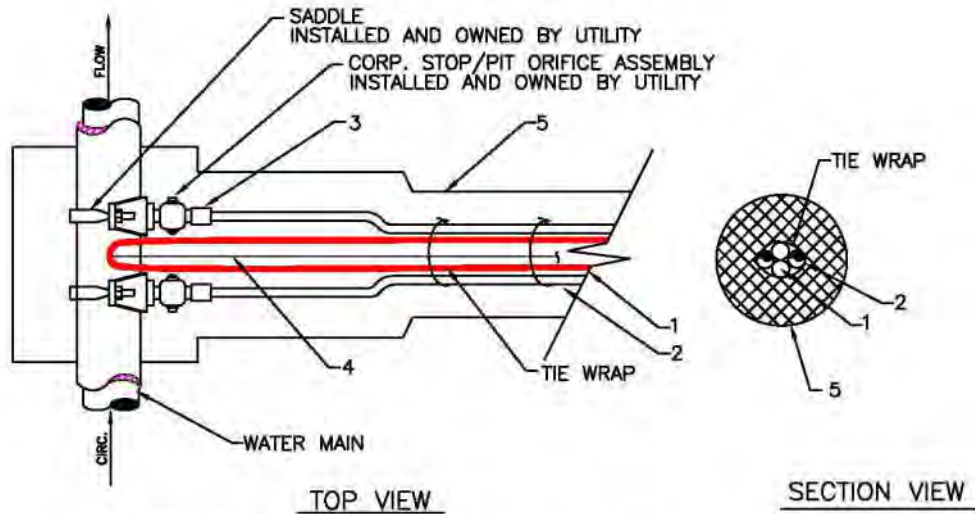
MATERIAL LIST – CUSTOMER ITEMS

ITEM	DESCRIPTION	
1	HDPE NSF61, SDR11, length as required	
2	Clamp, variable size 3/4" to 2"	
3	Male NPTXSDR 11 HDPE Plain end fused adapter	Bronze
4	PEX A or B tubing (see spec.)— extend 24" min. above floor with oxygen barrier	
5	Gate valve	Bronze
6	Pipe and nipples, lengths as required	Bronze
7	Elbow	Bronze
8	Union	Bronze
9	Tee	Bronze
10	Pressure reducing valve, 80–40 PSI	Bronze
11	Dual check valve (Watts LF7, or equal)	Bronze
12	Conduit or #18 2-conductor wire	
13	Blue utility warning tape, optional	
14	Circulation pump, Grundfos or equal	Bronze or stainless
15	locate wire extend a min. of 24" above floor —12ga jacketed	

NOTES:

1. All fittings shall be bronze threaded.
2. Thaw lines and locate wire must be in accessible location.
3. Blue utility tape (item 13) may be placed 2' above water service piping for the full length of the service.
4. Water service piping shall be positive grade or level (no humps or dips) from water main to residence.
5. 100' Max. length for service without circulation pump.
6. Meter shall be a minimum of 1' and a maximum of 4' above floor level.
7. HDPE pipe fusion must be performed using suitable equipment operated by certified personnel. Contractor shall produce documentation of such certification upon request.
8. 3" Min. spray urethane foam insulation around service line.
9. Customer is responsible for providing equipment and labor required to perform all HDPE fusion.

Figure 4A: HDPE Service Entry Detail
(Customer to supply all items on material list)



MATERIAL LIST – CUSTOMER ITEMS (UNLESS NOTED)

ITEM	DESCRIPTION
1	PEX A or B Thaw tubes (see specs.)
2	HDPE NSF61, SDR 11 service piping
3	Flare X Plain End HDPE adapter (furnished by Utility)
4	Locate Wire – (jacketed copper 12ga)
5	Spray urethane foam insulation (see note 2)

NOTES:

1. HDPE pipe fusion must be performed using suitable equipment operated by certified personnel. Contractor shall produce documentation of such certification upon request.
2. Service piping shall be field insulated with 3" polyurethane foam or 4" thickness when depth of bury is under 4-1/2'
3. Blue utility tape may be placed 2' above water service piping for the full length of the service.
4. Water service piping shall be positive grade or level (no humps or dips) from water main to residence.
5. Extend thaw tubing and locate wire to main.
6. Clean/flush HDPE shavings out of new service lines prior to making final connection.
7. Customer is responsible for providing equipment and labor required to perform all HDPE Fusion.

Figure 4B: HDPE Service Main Connection
(Customer to supply all items on material list)

4.2 TEE CONNECTION

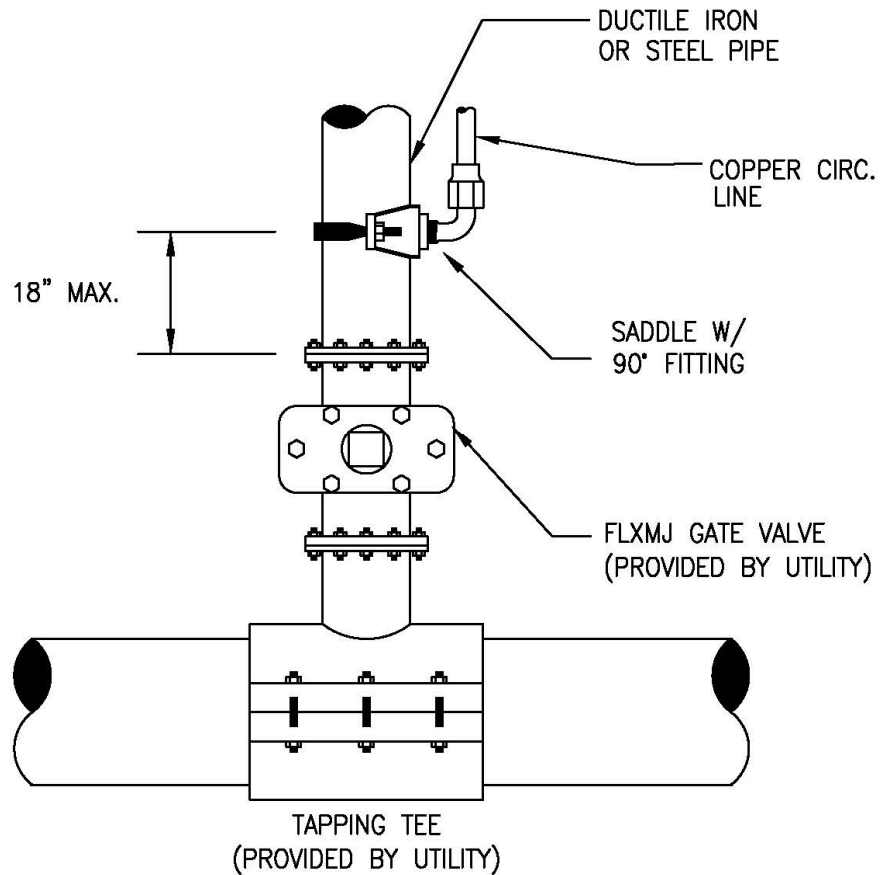


Figure 5A: Typical Tee Connection

Where customer design requires a connection larger than two (2") inches; tees and gate valves are used. Utility personnel will install the tee and gate valve. The gate valve will be a minimum of six (6") inches. Customer will be responsible for providing reducers if the service is to be less than six (6") inches. Gate valve end connection will normally be mechanical joint. Other configurations are available based on customer's requirements. Contact USA Customer Service for further information. See Figure 7 for typical large service.

In cases where a tapping tee must be installed, the customer must expose the main in a manner that facilitates safe access sufficient to position the tapping equipment and affix the tapping tee to the main. Reference Figure 5B.

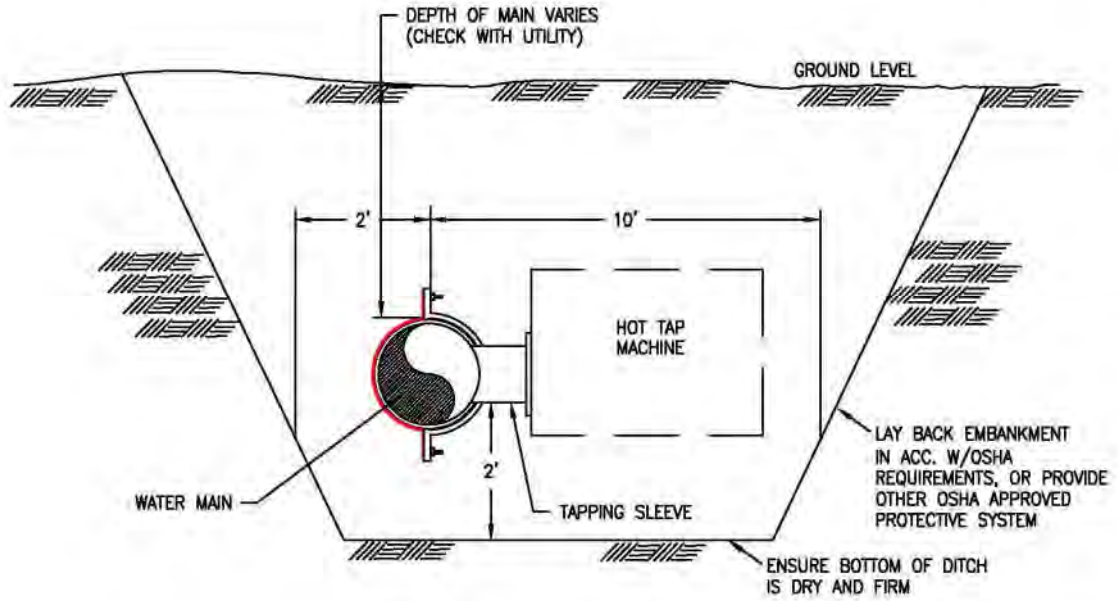
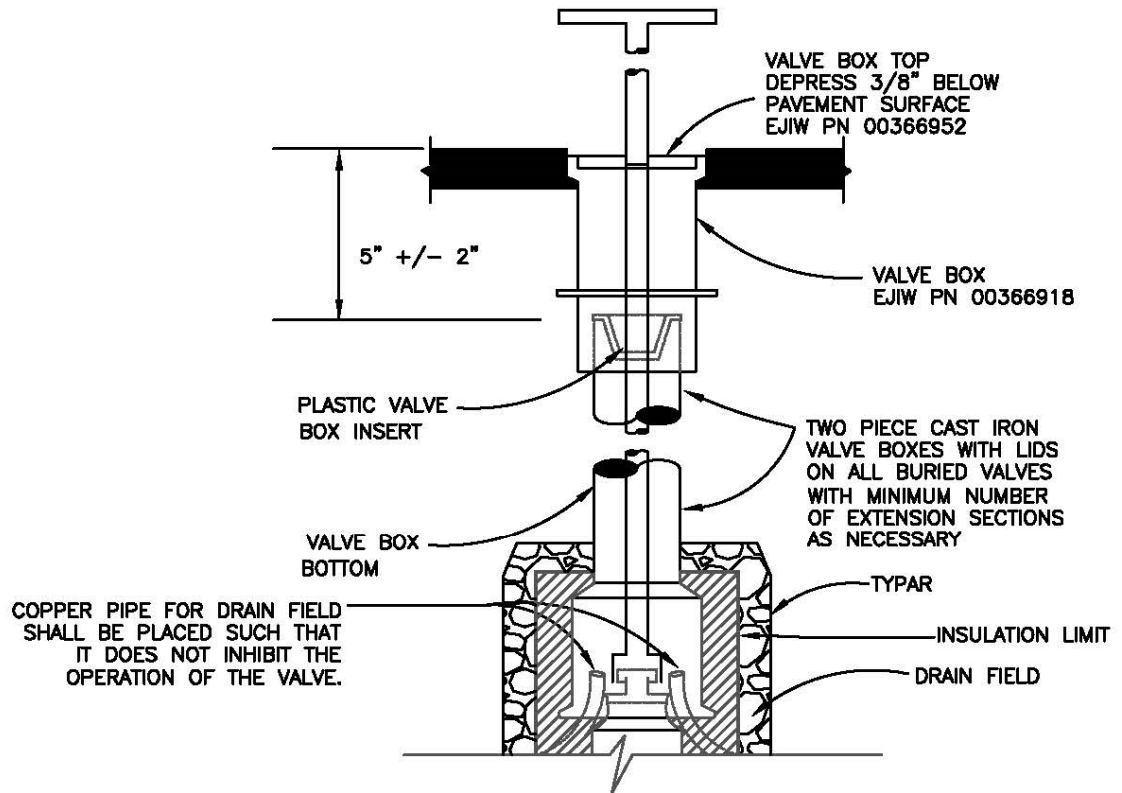


Figure 5B: Tapping Tee Excavation Detail

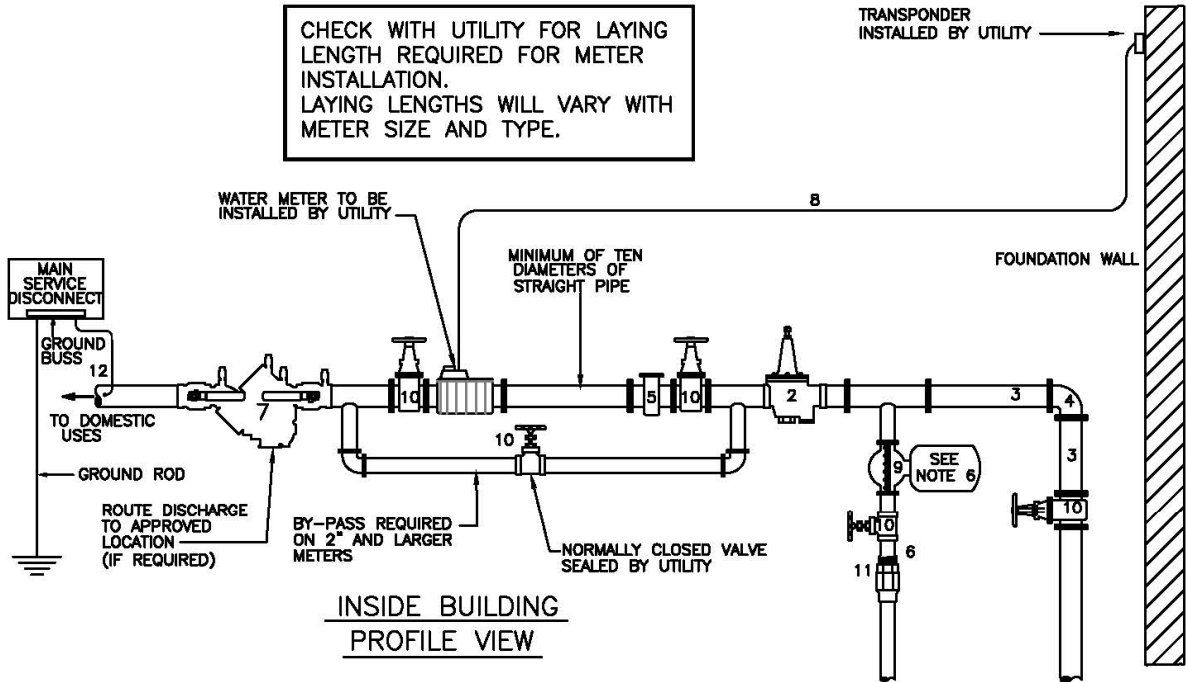
Valve boxes including risers and/or collars provided by the Utility for access to Utility service valves shall be placed on valves by the installer in conjunction with backfill and street repair. Valve boxes shall be plumb, straight, and clean prior to acceptance by the Utility. Assistance with final adjustment of valve box tops will be provided upon 24-hour notification of the Utility.



NOTES:

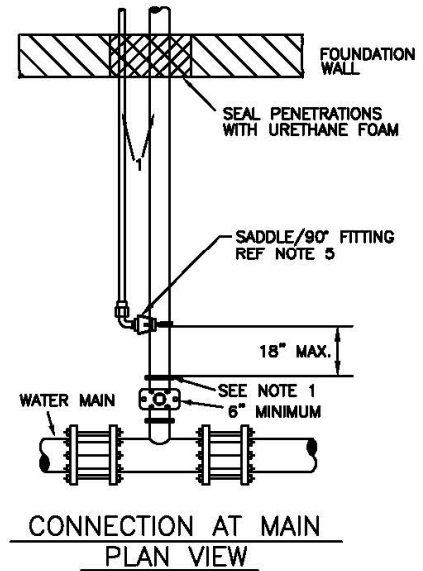
1. VALVE BOX ASSEMBLY SHALL BE GENERALLY PLUMB AFTER ROAD IS RESURFACED.
2. FOR ACCEPTANCE, IT MUST BE POSSIBLE TO OPERATE A VALVE WITH THE KEY IN A VERTICAL POSITION WITHOUT INTERFERENCE FROM VALVE BOX BOTTOM, RISERS, OR CAN.
3. FOR ACCEPTANCE, VALVE BOX TOP MUST SIT FLAT IN FRAME.
4. FOR ACCEPTANCE, THE BOX ASSEMBLY MUST BE CLEARED OF DEBRIS (MUD, GRAVEL, ETC.)

Figure 6: Valve Box



MATERIAL LIST – CUSTOMER ITEMS

ITEM	DESCRIPTION
1	Piping per section 4.4
2	Pressure reducing valve, 80–40 PSI
3	Pipe and nipples, lengths as required
4	Elbow
5	Plate Strainer (Supplied by Utility)
6	Flare X Male iron pipe thread adapter
7	Dual check valve/backflow prevention assembly
8	Conduit or #18, 2–conductor wire
9	Circulation pump (Mandatory)
10	Gate valve (only)
11	Flare nut
12	Ground wire #4 AWG min., length as required



NOTES:

1. Tee and valve provided by Utility.
2. Water service pipes shall have a level or positive grade from the water main to the building (no humps or dips) to prevent air traps.
3. Meter shall be a minimum of 1' and a maximum of 4' above floor level.
4. Install circulation pump according to manufacturer's recommendations.
5. Bronze NPTxflare 90° fitting to connect copper circulation line.
6. Install circulation pump according to manufacturer's recommendations.

Figure 7: Large Water Service (2" or larger)
(Customer to supply all items on material list)

4.3 PROPERTY LOOP

Property loops are short, looped sections of tubing that extend onto a property that are not connected to any service piping inside a structure. They are constructed to facilitate continuous circulation in the winter months such that the loop is thermally protected year around. These property loops may be extended into full water services at some future date.

Property loops have occasionally been installed with new water mains at the time of construction and stubbed out to the property line. No warranty as to the current condition and proper function of the property loop piping can be made by the Utility. Complete shutoff can only be accomplished by excavating to the main. In areas where service disconnects require excavation of arterial roads and/or sidewalks, property loops may be allowed by the Utility. Property loops must be requested prior to installation by customers or property owners. Requests are reviewed and approved by the Utility on a case-by-case basis.

Property loops belong to the property owner of the lot served by the loop. The property owner shall be responsible for the installation, maintenance and all other costs associated with the property loop.

Upon installation the Utility will record at the Fairbanks District Recording Office "NOTICE OF NON-COMPLIANCE OF UTILITY SERVICE LINE HOOKUP". This will notify all interested parties that the service stub exists and is the property owner's responsibility.

Failure of a property loop leading to any damage to roads, other surface improvements or existing utilities will be the responsibility of the owner.

Electronic markers, as manufactured by 3M, shall be placed over the ends of all property loops.

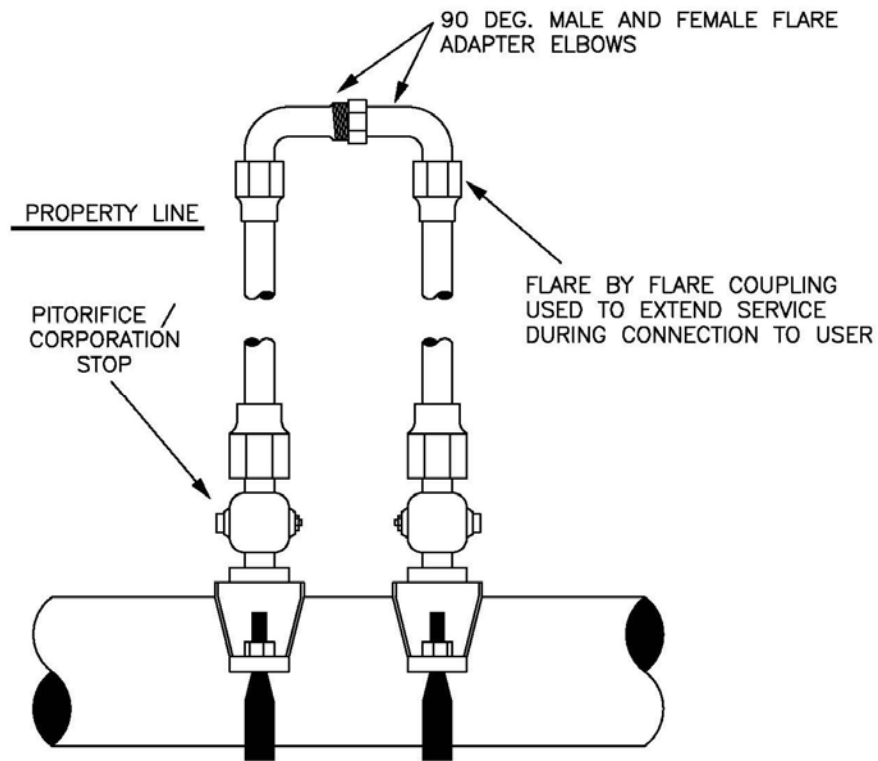


Figure 8: Temporary Property Loop

4.4 MATERIAL STANDARDS

All materials in contact with potable water must be NSF-certified for use in drinking water systems. Except as noted in the standard all materials of construction used must be new.

- a) Type "K" soft drawn copper for sizes three-quarters (3/4") of an inch, one (1") inch, one and one-half (1-1/2") inch, and two (2") inch. Any joints in the service loop below ground shall employ brass flare type connections. No compression type unions shall be used. See Figure 4.
- b) HDPE SDR 11 tubing for sizes three-quarters (3/4") of an inch, one (1") inch, one and one-half (1-1/2") inch, and two (2") inch. No joints are permitted in the tubing run between the main and the service entry. All tubing shall be NSF 61 listed for potable water use. See figures 4A and 4B. Tubing shall be rated for 200 psig @ 73 deg F.
- c) HDPE SDR 11 piping for larger sizes. Piping shall be NSF 61 listed for potable water use. Piping shall be rated for 200 psig @ 73 deg F
- d) Thaw tubing shall be PEX A or PEX B, complying with ASTM F876/F877.
- e) Ductile iron pipe is preferred for underground piping in sizes four (4") inch, six (6") inch, and eight (8") inch. Ductile iron pipe shall conform to the

latest revision of AWWA C151. Joints may be push on (Tyton), or mechanical joint. Joints shall conform to AWWA C111. Ductile iron pipe shall be thickness Class 50, cement mortar lined.

- f) Steel pipe (Schedule 40) and fittings conforming to ASTM A36/A53 are allowed for sizes two (2") inch, three (3") inch, four (4") inch, and six (6") inch. **Galvanized pipe is not permitted.** Pipe shall be butt welded, connected with dresser type couplings, or with appropriate lug-type restraints. **Threaded pipe is not permitted underground.** SCH 40 steel fittings that are not NSF 61 compliant are NOT allowed.
- g) Locate/Tracer wire shall be copper-clad steel 12-AWG high strength wire with min .030" HDPE insulation, minimum 450# break strength. Jacketing shall be blue in color.
- h) All pipe/tubing, fittings, flux and solder, pumps and other appurtenances in the service shall comply with National Sanitation Foundation (NSF) 61 and comply with the "lead free" requirement of the Safe Drinking Water Act adopted on January 4, 2014.
- i) For services connecting to an automatic fire sprinkler system, piping up to the backflow preventer discharge in the sprinkler tree must comply with Utility specifications.

4.5 PIPE FITTINGS

- a) In a service constructed from copper, all fittings on the circulating loop shall be threaded bronze or brass material. (Soldered joints are not permitted in the circulation loop.) Soldered joints are permitted only in the domestic branch after the dual check valve or approved backflow prevention assembly. Brass flared fittings shall be used below ground to join copper tubing on long runs.
- b) All isolation valves 2" and smaller must be gate valves, bronze bodied and seated, solid wedge, compliant with MSS SP-80, Type 1 rated for 300 psig cold working pressure. Valves must be IAPMO tested and certified for NSF/ANSI 61 "lead free": compliance.
- c) Ductile iron fittings shall conform to AWWA C153/C110.
- d) Steel pipe systems shall utilize NSF listed/compliant Schedule 40 fittings above ground. Malleable iron fittings must be NSF listed and approved for potable water service. **Threaded joints are not permitted below ground.**
- e) Bronze or brass fittings shall not be used in services constructed from

steel, and steel fittings shall not be used in services constructed from copper. Galvanized fittings are not permitted.

- f) Flanged connections for underground piping runs and underground fittings are not acceptable except for valves.
- g) All piping two (2") inch and larger, that is not welded, shall be restrained by use of anchors, restraining rods and/or thrust blocks wherever necessary.

For steel and iron pipe above grade, transitions to flanged pipe may be accomplished using grooved, Victaulic-style fittings. Fittings shall be Victaulic Style 807 with Grade P gasket (for steel) or Victaulic Style 31 with Grade M gasket (for ductile), or equal. All materials in contact with water must be NSF-61 compliant. Minimum pressure rating shall be 300 psig.

In a fire service, the branch to the domestic leg may be made using a grooved, Victaulic style tee.

- h) Non-toxic thread sealant is required for all threaded joints on the service loop. Threaded pipe below ground is not authorized. **Solder joints shall not be used between the Utility water main and the dual check valve.** Water service lines shall be sloped to the main and installed as straight as possible (except for angle points).
- i) Lead free solder is required in the domestic piping.
- j) All thread sealant/compound shall be NSF 61 compliant.
- k) Saddles shall have ductile iron casting with corrosion resistant finish mated with electrogalvanized steel U-bolt (single or double) style backing. Ductile iron shall meet ASTM A536, steel U-bolt shall comply with AISI C1018. Nuts and flat washers shall be steel. Bolt thread shall be coarse, roll thread. Gasket shall be NBR per ASTM MBC610. Pressure rating shall be 350 psig. NSF 61 listed for potable water use. Thread size/type shall be selected based on application. Basis of design: Romac 101U/202U.
- l) Lug style fitting (Romagrip, Megalug), do not develop their full pressure rating in use above ground. If such a fitting is used above ground, the fitting must be rigidly anchored to the building structure or floor (concrete or structural steel) and the transition fitting to the satisfaction of the Utility. This is only allowed at a single location where service piping through the floor or the wall transitions to interior fitted pipe.
- m) For HDPE water services larger than 2", fittings shall be NSF listed and

rated for potable water use. Fittings may be butt fusion or electrofusion.

Fittings shall be suitable for use with DR 11 pipe. Fittings shall comply with AWWA C901/C0901, ASTM F1055 (for electrofusion fittings), and have a minimum pressure rating of 200 psig.

4.6 CIRCULATING LOOP AND WATER METER

The circulating loop and meter shall be located in a warm, accessible area and remain so during the life of the service.

The plumbing must be installed in such a manner that will allow the meter to be installed horizontally with the register upward.

The customer is responsible at all times for protecting the water service and the loop within the building, as well as the meter, from freezing and breaking and for any other damage that may occur to those facilities.

Services two (2") inches and larger shall have a by-pass line around the meter for meter maintenance work. The bypass will have a tamper-proof utility seal applied at the time of commissioning to prevent meter bypass operation.

Meter shall be a minimum of one (1') foot and a maximum of four (4') feet above floor level.

4.7 SHUT-OFF VALVE

A gate valve must be installed between the circulation loop and the meter for customer use. The customer shall not use the valves on the circulating loop. These valves are to remain open for proper circulation in the service lines. Closing one of these valves could cause the service to freeze during winter months.

4.8 PRIVATE CIRCULATING PUMP

Customer is responsible for providing and maintaining a circulation pump if:

- a) The length of either the supply or return piping run exceeds one hundred (100') feet.
- b) The service is connected to a main with circulating flow velocities that are inadequate to ensure thermal protection of the water service as determined by the Utility.
- c) Service conditions at a location present an elevated risk of excessive thermal decay leading to freeze up.

- d) The service has no pitorifices at the connection to the main.

Pump installation is subject to approval by the Utility. Pump shall be installed downstream of the supply valve, and upstream of the tee for the domestic branch. Pump shall be sized to provide a minimum flow velocity of 0.1 feet per second in the largest pipe or ten (10) gallons per minute, whichever is larger, without consideration of the contributions of pitorifices. Circuit setters or other flow control devices are not allowed in pumped loops. Customers should contact the Utility to confirm appropriate orientation for the pump.

Circulation pumps shall conform to the following requirements:

- a) All services one hundred (100') feet or less in length (one way):
Horsepower: 1/8 HP
Maximum flow at zero head: 24 GPM (at speed 3)
Maximum head at zero flow: 18 feet (at speed 3)
Grundfos UPS 15-55SFC or equal
Rated for 145 PSI
- b) All household services between one hundred (100') feet and five hundred (500') feet in length (one way):
Horsepower: 1/6 HP
Maximum flow at zero head: 32 GPM
Maximum head at zero flow: 30 feet
Grundfos UPS 26-99 FC or equal
Rated for 145 PSI
- c) All commercial services between one hundred (100') feet and five hundred (500') feet in length (one way):
Horsepower: 1/6 HP
Maximum flow at zero head: 45 GPM
Maximum head at zero flow: 25 feet
Grundfos UP 26-116 or equal
Rated for 145 PSI
- d) Any service which services more than one structure and is over five hundred (500') feet in length shall utilize a pumping system that is designed with consideration given to pump load requirements, circulation path, and heat balance. Calculated thermal degradation shall be limited to two (2° F) degrees Fahrenheit over the entire distance through the service piping. A circulation plan is required.
- e) The private circulating pump shall have a bronze or stainless steel body and shall be NSF 61 listed for use in potable water systems.
- f) "Smart" pumps, or pumps that adjust pump speeds automatically in response to changing operating conditions are NOT allowed.

4.9 FIRE SPRINKLER SYSTEMS

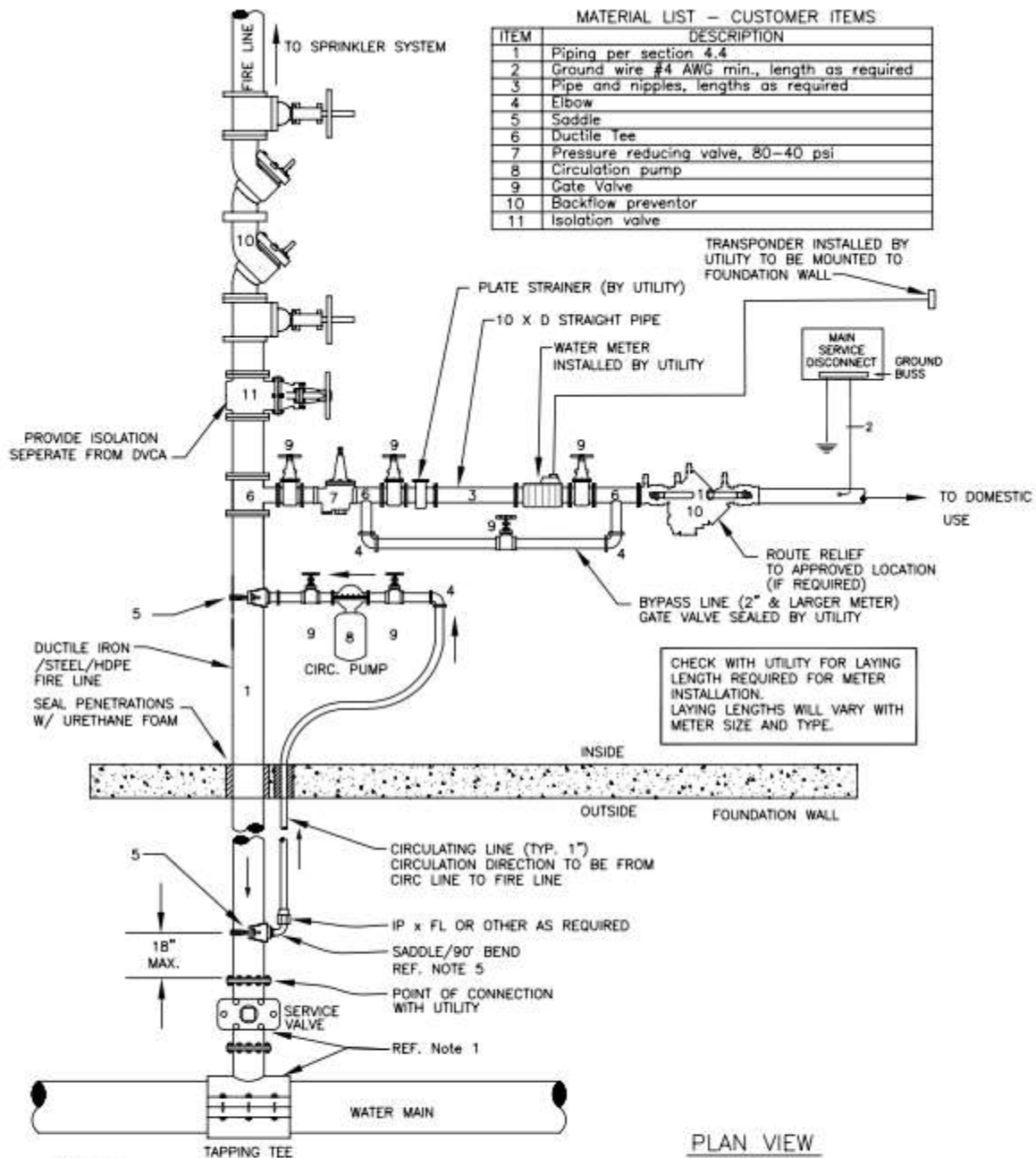
Refer to Figure 9 for specific elements to be included in fire sprinkler system underground piping. All items shown in the drawing and identified as under customer ownership are the sole responsibility of the customer to furnish and maintain.

An approved backflow preventer assembly (usually a double check valve assembly) shall be installed in the sprinkler line, to prevent reintroduction of aged fire-line water into the customer's domestic water branch or into the Utility's system. A separate isolation valve must be placed in the fire line upstream of the backflow preventer assembly. The valve must be provided in addition to integral isolation valves that may be included as part of a backflow preventer assembly.

Hydrant flow/pressure data is maintained by the Utility. Contact the Utility for fire flow data. Hydrant flow/pressure data collection, if needed, must be scheduled in advance with the Utility. Hydrant data collection during winter months is usually not possible due to the risk to the public and the risk of damage to water infrastructure.

The Utility water mains are circulated during winter. This can lead to significant depression of main static pressure while circulating pumps are in operation. Consult with the Utility Engineer prior to developing a sprinkler system design in any facility with a fire water supply that is connected to Utility mains.

The installation of a fire booster pump is prohibited on the CUC/GHU water systems without advance written approval from the Utility.



NOTES:

1. Tapping tee and service valve provided by Utility.
2. Water service pipes shall have a level or positive grade from the water main to the building (no humps or dips) to prevent air traps.
3. Meter shall be a minimum of 1' and a maximum of 4' above floor level.
4. Install circulation pump according to manufacturer's recommendations.
5. Bronze IPxFL 90° fitting to connect copper circulation line. (sized appropriately)
6. Isolation valve in fire riser must comply with all applicable codes relating to fire protection as determined by the authority having jurisdiction.
7. All materials shall comply to Section 4.4 and 4.5 of the Service Line Standards.
8. Install circulation pump according to manufacturer's recommendations.
9. Insulate service per section 3.9
10. Isolation valve in fire riser must comply with all applicable codes relating to fire protection as determined by the authority having jurisdiction.

Figure 9: Water Service with Fire Sprinkler(Customer to supply all items on material list)

4.10 SEASONAL WATER SERVICES

Any service that serves a facility that is unoccupied during the winter months is considered a seasonal water service. If the seasonal service is not circulated, or if the service entry is not located in a heated area, the service must be configured with a gate valve (6" minimum) off the main to facilitate annual shutdowns. Seasonal water services in meter pits or underground vaults are not permitted. The customer is responsible for providing thermal and physical protection to any aboveground services. These services must be configured with a backflow preventer assembly. Note that drain valves, plugged tees or other similar appurtenances are not allowed between the main and the meter.

For non-circulating seasonal services, the Utility cannot guarantee a perfect shutoff at the main and cannot be held responsible for damage resulting from such leaks. Therefore, the Utility strongly recommends that water service entries are located in a heated area and maintained with continuous circulation.

4.11 FIRE HYDRANTS

If a fire hydrant is required on customer owned service lines by the fire department, all equipment and methods of installation shall be designed and installed in accordance with the following:

- a) Hydrants shall be Waterous Pacer WB-67-250 or approved equal. Approval must be granted by the Utility on a case by case basis prior to construction.
- b) The hydrant shall be installed as a part of the building water system and shall be protected from freezing by the building circulation pump.
- c) Install a reflective hydrant marker flag, contact Utility for manufacturer and model.
- d) Each guard post shall be painted with two coats of Federal Safety Yellow industrial enamel. The hydrant shall be supplied with a factory applied epoxy primer, and a two-part polyurethane Federal Safety Yellow coating. The hydrant base shall be factory coated with a fusion-bonded epoxy.
- e) Completed fire hydrants shall be contributed to the Utility to own, operate, and maintain. The customer must execute a Facilities Agreement with the Utility to facilitate the contribution. Contact Customer Service for more information.
- f) Prior to contribution of the hydrant, the property owner shall convey to the Utility a 10'x10' easement centered over the centerline of the hydrant barrel for purposes of maintenance. The easement shall be recorded at the District Recorder's office. The property owner is responsible for all

direct and indirect costs associated with developing the easement description as well as recording of the easement.

- g) If the hydrant is not contributed to the Utility, all ongoing hydrant maintenance and repairs are the responsibility of the Owner. If the Utility determines that a customer owned hydrant is in a poor state of repair, inoperable, and presents a significant risk to the public or Utility infrastructure the Utility may shut off water service until repairs are performed to the satisfaction of the Utility. The owner is responsible for all associated damages from loss of domestic water service and fire protection that may occur.

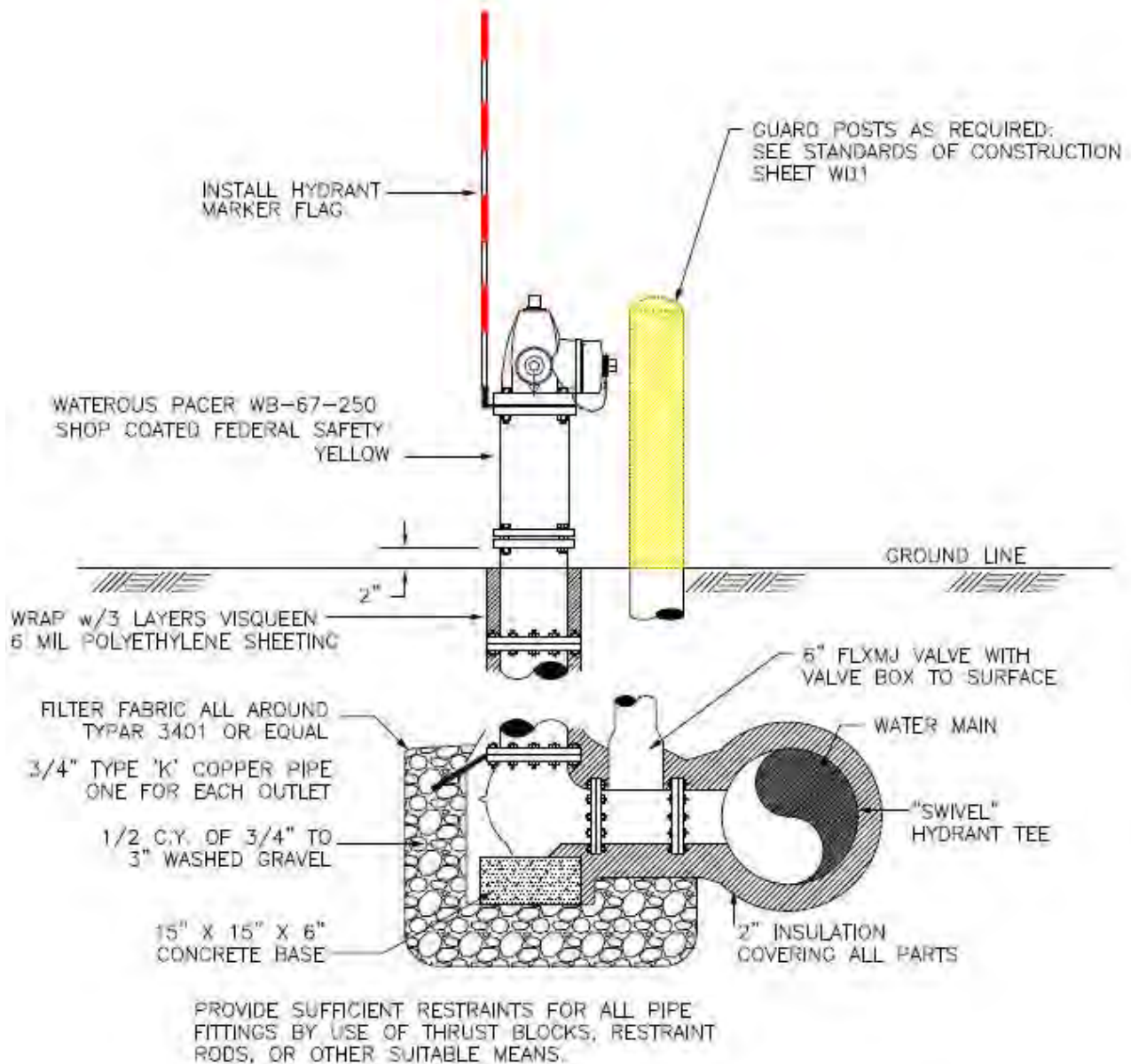


Figure 10: Fire Hydrant

4.12 COMMISSIONING

All piping shall be hydrostatically tested, disinfected, and flushed. The installer shall furnish all temporary hose, pipes, pumps, and fittings required to accomplish this work. Utility personnel shall witness pressure testing and disinfection tests. Tests must be scheduled by the Customer in advance with the Utility.

Pressure Testing: Residential services shall be tested at main line pressure upon energizing the service. All pipe and fittings shall be free of any drips or leaks during visual inspection. Large commercial services (other than fire systems) will be tested at one hundred forty-five (145) pounds per square inch (psi) for College Utilities and ninety-five (95) pounds per square inch (psi) for connections to Golden Heart Utilities. Leak-down tests are required for pipe runs of over one hundred-fifty (150') feet and shall be conducted in accordance with the current test procedure as published in the CUC/GHU Standards of Construction. See NFPA 13 and 24 for the applicable leakage rates for fire service piping.

In accordance with NFPA 13, fire service piping shall be hydrostatically tested at 200 psig for 2 hours with no allowable loss. Hydrostatic tests prior to the line being disinfected shall not be performed against a service valve due to the risk of cross contamination and backflow. The contractor is responsible for ensuring that the line is purged of air and the line is adequately restrained prior to test. Contractor shall provide all necessary equipment, labor and materials to facilitate testing according to NFPA 13 requirements.

HDPE fire service piping shall be pressure tested in accordance with ASTM F2164.

Disinfection: Disinfection of service lines over two (2") inches in diameter shall be with a chlorine solution which shall be of sufficient strength (300 PPM minimum) to provide a contact kill of bacteria and shall remain in contact with all inside surfaces of the piping for three (3) hours. Upon completing disinfection, the chlorinated water shall be flushed to a safe location and disposed of properly. One half (1/2) cup of Clorox bleach in five (5) gallons of water is approximately a 300 PPM solution. Alternatively, a solution of 50 ppm minimum strength with a 24 hour contact time may be used.

Flushing: Upon connection of the installed pipe to the Utility mains, the pipes shall be full bore flushed. Flushed water shall be conveyed to a safe location away from the excavation. The flushing shall be sufficient to remove all debris and disinfectant solution.

BAC-T Testing: For water services 2" and larger, a water sample from the disinfected, flushed service line shall be submitted to a state certified drinking water laboratory for testing according to test method SM9223B-PA (coliforms in Drinking Water). Test results indicating absence of coliforms must be presented

to the Utility before the service valve can be opened. All costs associated with sampling and testing are the responsibility of the customer/installer. In the event of a failed test, disinfection, flushing and BACT testing shall be repeated at the expense of the customer/installer.

The Utility may require multiple biological test sample locations on services in special cases where their size and length or other conditions present elevated risk of contamination.

4.13 CROSS CONNECTIONS

Cross connections to other sources of water or interconnection to other services are expressly prohibited. Any connection that can allow entry of untreated water or contaminated water into the Utility distribution system is forbidden.

4.14 WATER SERVICE INSPECTION

The Utility shall inspect and approve all water service lines prior to connection to Utility mains. The Customer is responsible for scheduling inspections with the Utility during normal business hours. Inspections must be scheduled with the Utility at least 2 days in advance. At least two inspections are required for all service line installations. Inspections shall be scheduled in advance by the Customer or Installer with the Utility. Inspections of large diameter services serving fire suppression systems and/or fire hydrants require commissioning to be completed prior to visual inspections and must be coordinated in advance by the Customer (or the Installer) with the Utility. Reference section 4.12 above.

First Inspection:

- The first inspection covers service piping laid in the ground from the Utility main, up to the water service piping in the building including the dual check valve or the backflow preventer (reference Figures 4, 4A, 4B and 7). Utility personnel shall examine the piping for workmanship and compliance with this Standard as appropriate. If the installation is deemed acceptable by the Utility, the Utility will install service saddles the water meter. Once the service piping is connected to saddles and pressurized, all joints will be examined for leaks. All leaks must be repaired immediately to the Utility's satisfaction. Immediately following connection, Utility personnel shall install the thaw wire, if appropriate.
- If, after inspection, the service piping is found to be incomplete or is defective, the Utility will inform the Installer of the deficiencies and the Installer will schedule a re-inspection.
- Once the meter is installed, monthly billing will commence.

Second Inspection

- Utility personnel shall inspect the service piping insulation and mainline pipe re-insulation for compliance with this Standard prior to backfilling.
- If insulation is found to be inadequate or defective, the Utility will inform

the Installer of the deficiencies and the Installer will schedule a re-inspection.

The Utility reserves the right to bill the Customer for additional inspections resulting from defective work or unsafe site conditions that impact the ability to inspect the work. The Customer and their Installer are responsible for rectifying all defective work. If inspections are not completed to the Utility's satisfaction, the Utility reserves the right to deny service until such time that all required inspections are completed and defects are corrected.

On occasion, the requirements or environment at a site may constrain activities relating to service line construction making the sequence above impractical. The Utility may, on a case-by-case basis, approve deviations from the standard sequence. The Customer is responsible for obtaining approval for any deviation from the Utility in advance. It is the owner's responsibility to coordinate construction activities such that all inspections and commissioning activities are conducted to the Utility's satisfaction. The Utility reserves the right to reject any work is not tested and/or inspected or is judged unsuitable for any reason. The Owner is responsible for all damages or costs that may be incurred related to rework required to inspect and/or test any part of a service.

4.15 HEAT EXCHANGERS

Heat exchangers are no longer allowed in the Utility distribution system upstream of the domestic water meter.

4.16 BACKFLOW PREVENTION

All water services must comply with the Uniform Plumbing Code Chapter 6 and the Utility's Cross Connection Control Program requirements. The Utility has discretionary authority to determine the hazard level, and the type of backflow assembly (if any) required at any connected facility. Note that backflow assembly or dual check valve may induce pressure relief valves attached to water heaters or boilers to 'pop-off' continuously due to thermal expansion. It is the Customers' responsibility to ensure that internal plumbing, fixtures and equipment are connected to thermal expansion tanks of the appropriate type as required by Code. Failure to do so may risk injury or cause damage to Customers' property.

Refer to the Utility's Cross Connection Control Program documentation for specific information and customer responsibilities associated with this program. This document may be found online at https://www.myutility.us/docs/default-source/akwater/general/golden-heart-utilities_cccp_02_03_20.pdf?sfvrsn=9fb6375b_2.

4.17 REPAIRS/RECOMMISSIONING OF SERVICE PIPING

If large diameter water service piping is damaged due to freezing or mechanical

trauma, the damaged section must be removed, and replaced with new material complying with these standards. The repaired piping must be hydrostatically pressure tested, disinfected, and flushed to the Utility's satisfaction (reference section 4.12 above).

If the customer wishes to commission a previously abandoned water service, the piping must be hydrostatically pressure tested, disinfected, and flushed to the Utility's satisfaction (reference section 4.12 above). Any repairs to the piping must be approved by the Utility.

If the existing piping material does not comply with current Standards or repairs made are insufficiently robust in the opinion of the Utility, the Utility reserves the right mandate replacement or disconnection of the service.

4.18 DISCONNECTION OF WATER SERVICE PIPING

Under certain circumstances, disconnection of water service may become necessary. Water service disconnects must be performed at the main. For services connected to the main with saddles, the saddles must be exposed (foam must be removed if present), and the Utility will remove the corporation stops and plug the saddles. For services connected with a gate valve off the main, the valve must be exposed. The Utility will shut off the main, remove the valve and cap the tee. The excavation must be backfilled, and compacted up to the surface, and any improvements must be restored to their original condition in a timely way. For a Customer to initiate a disconnect, the Customer should contact Customer Service. The Customer is responsible for performing all work except the disconnection at the main, which is performed by the Utility. All of the aforementioned general requirements that apply to service work apply to service disconnection work as well. Costs for disconnects are the responsibility of the Customer.

Service disconnects initiated by the Utility for non-payment or other issues are performed by the Utility. The Customer is responsible for all costs.

SECTION 5 WASTEWATER SERVICE REQUIREMENTS

Section 5 below describes various aspects of sewer service construction, minimum standards for acceptance, and allowable materials of construction. There are multiple configurations for a sewer service available based on the needs of the customer. The Customer is primarily responsible for selecting the sewer service configuration that suits their needs.

All work within the scope of Standard shall comply with the Standard and the latest version of the Uniform Plumbing Code. In the case of a conflict, the more stringent standard shall apply.

For residential customers, the typical service size is a 4" HDPE gravity sewer service.

Commercial customers are required to fill out a Commercial Service Information when the service application is completed to ensure that Utility.

If the Customer anticipates a service connection with flows in excess of what a 4" service is capable of supporting, the Customer should contact the Utility well in advance of the service connection to ensure that materials for the service connection are available.

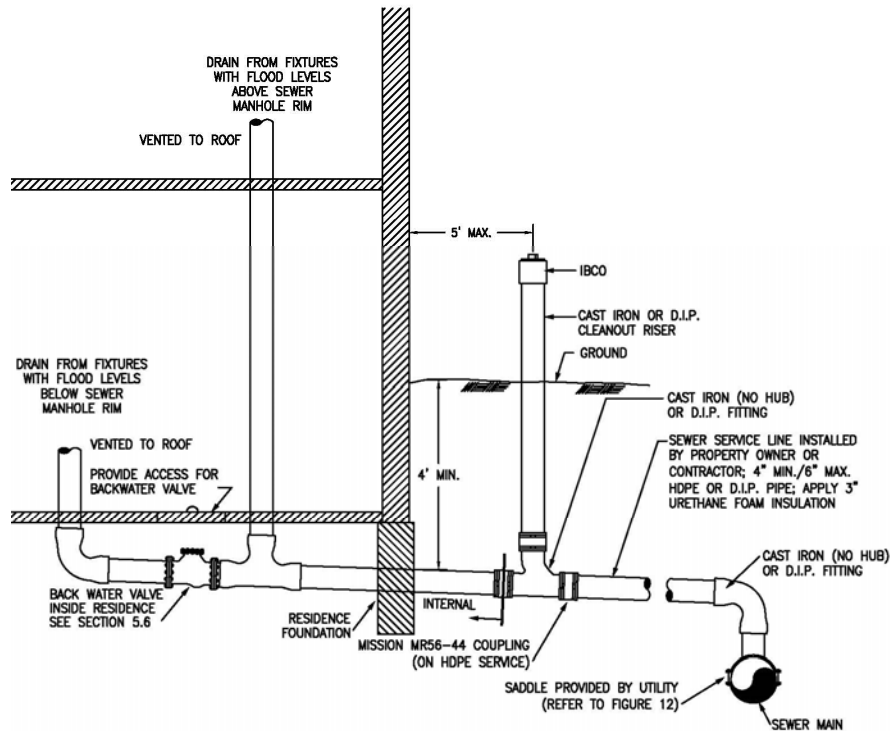


Figure 11: Wastewater Service

5.1 CONNECTION

A number of connection alternatives are acceptable depending upon the type of saddle, riser, fitting(s), and service line. The Utility will furnish and install the saddle connection to the main. All other work and material shall be provided by the customer/installer.

All wastewater service piping shall be ductile iron, or high-density polyethylene (HDPE) pipe. Wastewater service begins with the outside cleanout that is within five (5') feet of the building wall. Piping from the building to the cleanout is considered internal plumbing.

The building's wastewater service connection will be in compliance with Figure 11 A.

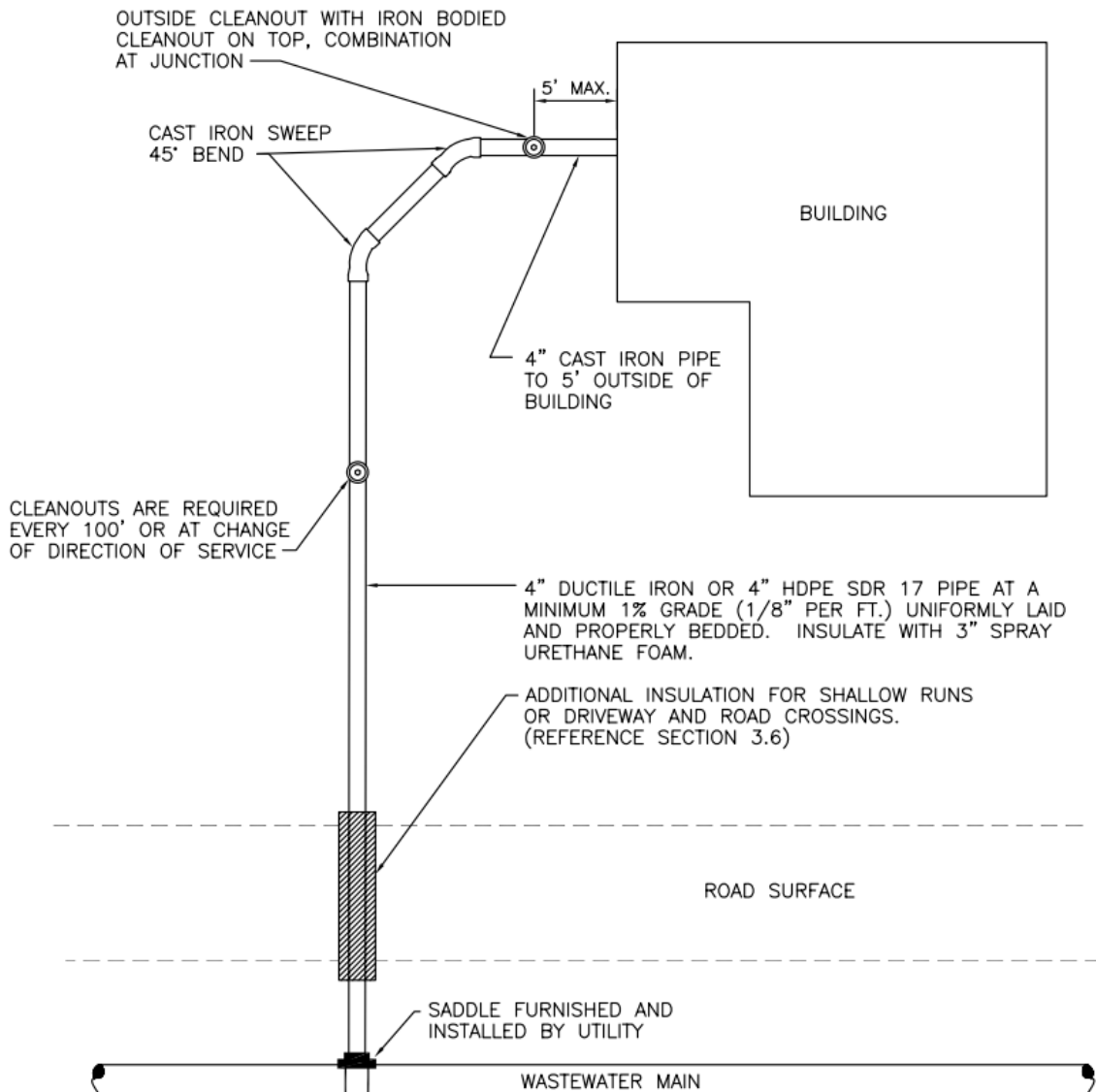


Figure 11 A: Typical Wastewater Service

5.2 STUB OUTS

The building's wastewater service may be connected to a Utility furnished wastewater service stub-out if available. Utility personnel shall verify the condition of the stub-out against blockage and structural integrity prior to final connection. No warranty as to the current condition and proper function of the stub out can be made by the Utility. Any repairs to the stub-out are the sole responsibility of the installer.

Service connection stubs belong to the property owner of the lot served by the stub. The property owner shall be responsible for the maintenance and all other costs associated with the service connection stub.

The Utility will record at the Fairbanks District Recording Office “NOTICE OF NON-COMPLIANCE OF UTILITY SERVICE LINE HOOKUP”. This will notify all interested parties that the service stub exists and is the property owner’s responsibility.

Electronic markers, as manufactured by 3M, shall be placed over the ends of all stub outs, which are installed for future use.

5.3 MATERIAL STANDARDS

- a) Ductile iron pipe shall conform to AWWA C-151 and shall be a minimum thickness class fifty (50). Ductile iron pipe shall be cement mortar lined. Cast iron pipe is not acceptable.
- b) High density polyethylene pipe shall be made from P.E. 3408 resin with a Cell Classification of 345434C in accordance with ASTM D3350-83 and shall conform to standard iron pipe size outside dimensions (IPS) having a wall thickness with a standard dimensional ratio (SDR) of 17.

5.4 SERVICE REQUIREMENTS

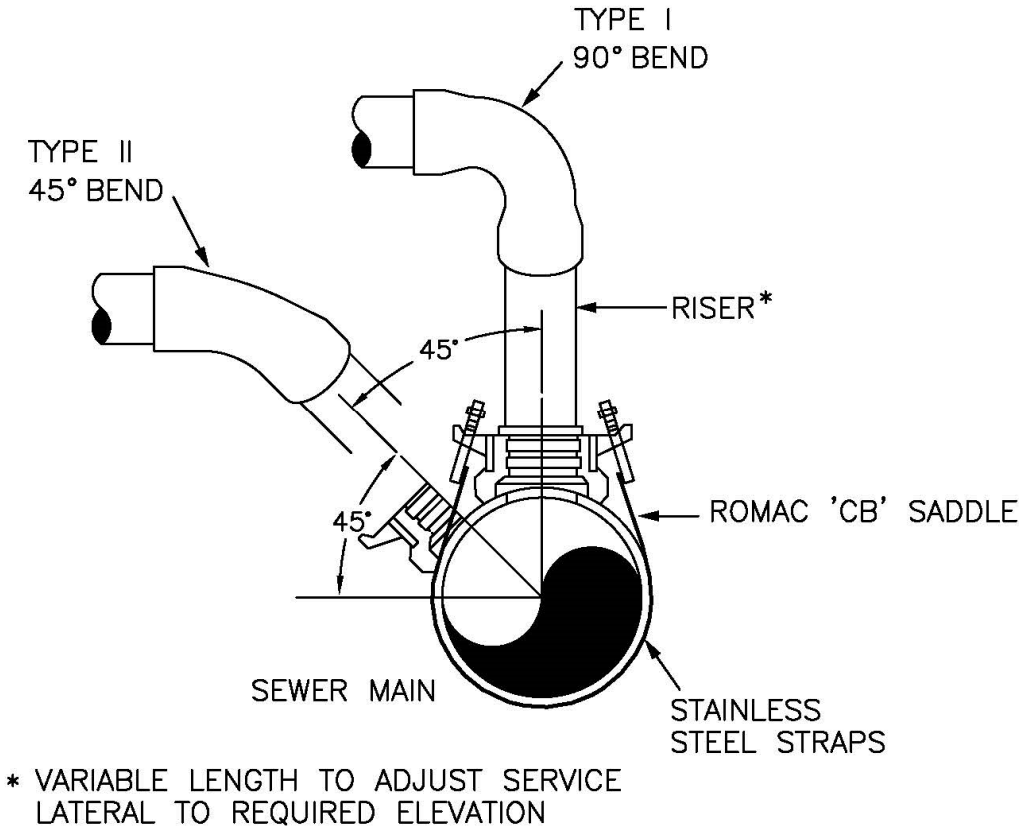


Figure 12: Connection Schemes

- a) Wastewater service connections shall be cut or bored into wastewater mains. The Utility claims sole jurisdiction for the tapping of Utility mains and installation of wastewater service saddles and connections. All wastewater saddles, both new installations and upon replacement of a service line, shall be attached to the top of the main (Type I) as illustrated in Figure 12. Type II connections require Utility approval at the time of application. It is imperative that the installer verifies the wastewater main elevation and the wastewater service elevation/slope prior to the installation of the wastewater service piping.
- b) Depending on the location and depth of the Utility main and the presence of groundwater at depth, the Utility may require or allow service connection to the nearest manhole. Connection to manholes present certain risks to the customer and the Utility. As such, these situations will be evaluated on a case-by-case basis for suitability by the Utility.
- c) For connecting Type I services, provide a "long sweep" no-hub cast iron elbow fitting as shown in Figure 12. For D.I.P. services, provide two 45° mechanical joint fittings in series. The wastewater service line shall be run in practical alignment and at a uniform slope of not less than one-quarter (1/4") inch per foot toward the point of disposal. Where it is impractical, due to the depth of the street wastewater main or to structure features to obtain a slope of one-quarter (1/4") inch per foot, any such pipe four (4") inches or larger may have a slope of not less than one-eighth (1/8") inch per foot.
- d) The wastewater service line shall not be laid through any existing cesspool or septic tank unless such cesspool or septic tank has been excavated, backfilled, and compacted.
- e) Wastewater service line piping shall be laid on a firm bed of approved materials that have been properly compacted throughout its entire length.
- f) Wastewater service lines constructed of HDPE pipe must use pipe that is pre-insulated in a factory setting with a minimum of three (3") inches of urethane spray foam insulation. Insulation shall be rigid closed cell, two (2) component, urethane foam and be applied by an experienced applicator.
- g) Wastewater services that are insulated in the trench shall be laid to grade and blocked every five (5') feet so that there are no sags, and the bottom of the pipe is at least three (3") inches above the bottom of the trench. This is necessary to ensure adequate insulation on the bottom of the service pipe.
- h) Fittings shall consist of the following:

- No-Hub cast iron fittings complying with ASTM A888 and CISPI Standard 301 for HDPE pipe (HDPE fittings are not allowed).
 - Ductile iron fittings complying with AWWA C110 or AWWA C153 for ductile iron pipe.
- i) Persons seeking Utility approval of materials that are not specifically mentioned as being approved in this document must do so prior to installation.
 - j) High-density polyethylene pipe shall be installed with gas tight and water tight joints. The connection of HDPE to HDPE pipe or HDPE pipe to a No-Hub fitting shall be a flexible, shielded coupling, such Fernco Coupling 1056-44RCXL for four (4") inch diameter piping. Any substitute must be approved by the Utility in writing, prior to installation. The Utility does not allow the use of standard No Hub clamps from the building stub out to the wastewater main. Butt welding of HDPE pipe joints is not allowed. As an alternative, pipe connections may be made with an all stainless steel, full circle clamp coupling with neoprene gasket as a Rockwell No. 256, Romac style SS1.
 - k) When connecting wastewater service pipe having different outside diameters, an all stainless steel, full circle clamp coupling as described above shall be used and the smaller outside diameter pipe shall be built up with three (3") inch wide neoprene gasket material to match inside diameter.
 - L) When connecting a HDPE pipe to a woodstave saddle, a compression joint sealer shall be used such as a Fernco donut (490-405 for four (4") inch piping). When connecting a ductile iron pipe to a woodstave saddle, a compression joint sealer shall be used as a Fernco donut (490-111D for four (4") inch piping).

5.5 CLEANOUTS

- a) Wastewater clean-outs will be installed using a "No Hub" cast iron wye and one eighth (1/8) bend, or combination, and a vertical cast iron pipe riser with iron bodied clean out cap, not less than four (4") inch in diameter.
- b) A clean out shall be placed in every service line no farther than five (5') feet outside the building and at intervals not to exceed one hundred (100') feet, in straight runs.
- c) Changes in alignment or grade in excess of forty five (45) degrees in a building wastewater service line shall be served by a clean out.

5.6 BACKWATER VALVES

- a) The installer shall provide a backwater valve approved by the Utility (as shown in Figure 13: designed to prevent the flow of wastewater from Utility mains into the structure for that part of the wastewater service that is connected to fixtures with flood level rims located below the elevation of the nearest upstream manhole cover of the Utility wastewater system as required by Section 710 of the Uniform Plumbing Code.
- b) Backwater valves shall be located where they will be accessible for inspection and repair at all times, and unless continuously exposed shall be enclosed in a watertight pit, fitted with an adequately sized removable cover.

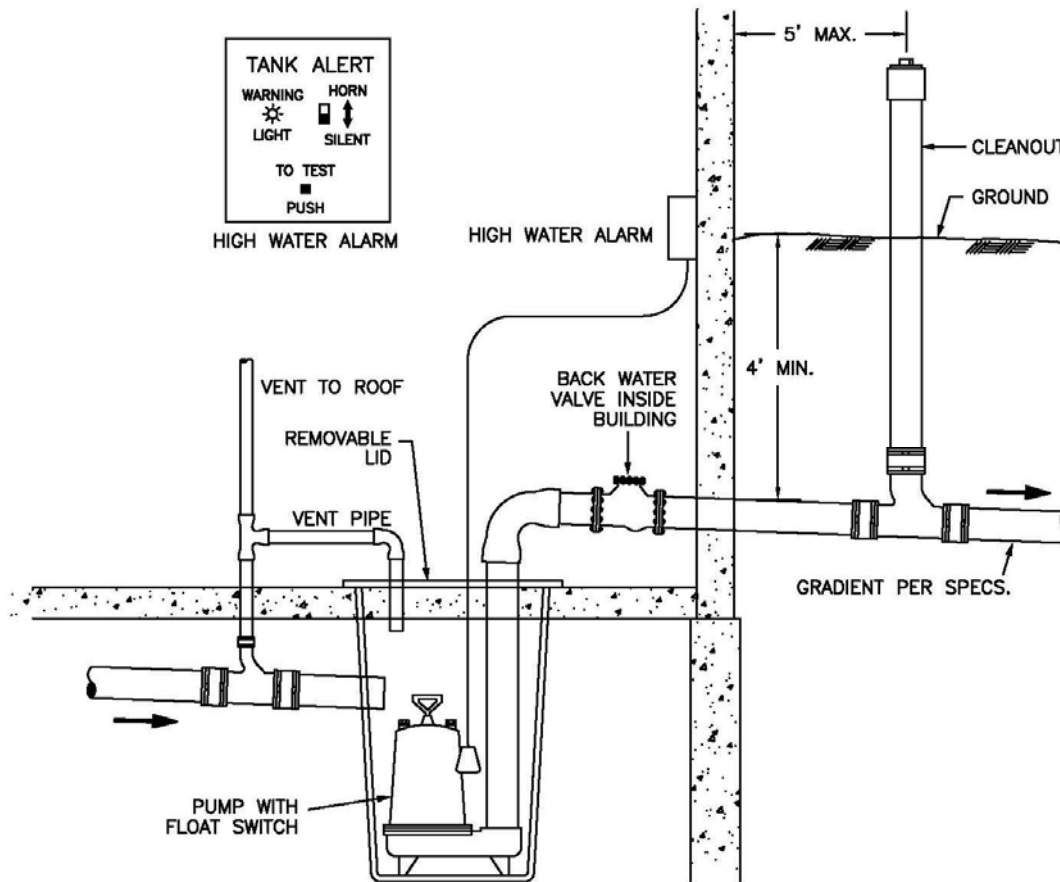


Figure 13: Wastewater Service Lift Station

5.7 LIFT STATIONS

- a) Occasionally, the location and distance of the facility to be served by the Utility is such that gravity drainage is not possible along the entire length of the wastewater service. The installer shall, at the direction of the Utility, install a suitable lift station to provide the necessary pumping capacity to meet the volume, elevation, and distance requirements of the wastewater service. Basic requirements and features of lift stations are as shown in

Figure 13, and as described by the Uniform Plumbing Code.

- b) The lift station shall feature a tank, a suitable pump with motor starting control, a level switch, an access plate for maintenance of the tank, and alarm switch contacts for high water level.
- c) The installer shall furnish an alarm light and audible alarm to be activated on high water level switch closure.

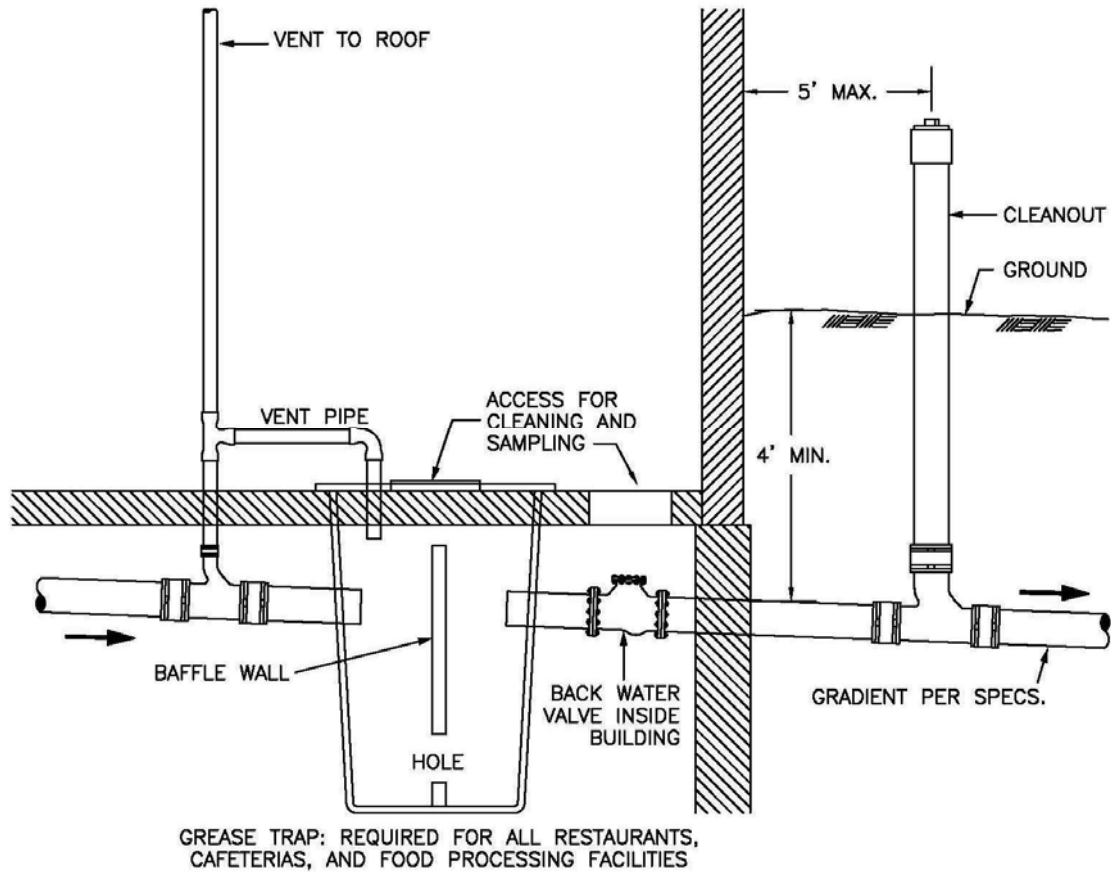


Figure 14: Typical Wastewater Interceptor Tank

5.8 SEWER SERVICE INSPECTIONS

The Utility shall inspect all installed sewer service lines prior to connection to Utility mains. At least two inspections are required for all service line installations. The Customer or Installer is responsible for scheduling inspections with the Utility during normal business hours. Inspections must be scheduled with the Utility at least 2 days in advance.

First Inspection:

- The first inspection covers service piping laid in the ground from the end

of the horizontal run of service piping at the main up to and including the exterior cleanout which must be within 5 feet of the building outer wall. For pressurized sewer services, the inspection shall also extend to piping 5 feet of the building wall. Utility personnel shall examine the piping for workmanship and compliance with this Standard as appropriate. If the installation is deemed acceptable by the Utility, a service saddles will be installed by the Utility and the service piping connected to the saddle by the Installer.

- If, after inspection, the service piping is found to be incomplete or is defective, the Utility will inform the Installer of the deficiencies and the Installer will schedule a re-inspection.

Second Inspection

- Utility personnel shall inspect the service piping insulation and mainline pipe re-insulation for compliance with this Standard prior to backfilling.
- If insulation is found to be inadequate or defective, the Utility will inform the Installer of the deficiencies and the Installer will schedule a re-inspection.

The Utility reserves the right to bill the Customer for re-inspections resulting from non-complying work or unsafe site conditions that impact the ability to inspect the work. If inspections are not completed to the Utility's satisfaction, the Utility reserves the right to deny service until such time that all required inspections are completed.

On occasion, the requirements or environment at a particular site may constrain activities relating to service line construction. The Utility may, on a case-by-case basis, approve deviations from the standard sequence. The Customer is responsible for obtaining approval for any deviation from the Utility in advance.

Any existing service saddle to be reused for a new service connection must be exposed sufficiently on the main for the Utility to verify the integrity of the saddle, associated connecting hardware and the main.

5.9 PRE-TREATMENT

The Utility has established a federally required Industrial Pre-treatment Program. All solid or liquid wastes which are prohibited, by ordinance or tariff, from being discharged into the Utility wastewater system shall be removed from the waste stream or pre-treated prior to final discharge. The type of pre-treatment device or system will be determined by the Utility.

- a) Grease Traps/Interceptors: The customer will furnish and maintain a grease trap/interceptor to trap animal and vegetable-based greases and oils. Final acceptance of such a device is subject to approval by the Utility. All commercial kitchens and other food processing facilities shall be equipped

with such a device. Further applicability and information on this requirement can be obtained from the Utility. See Figure 14.

- b) Sand Traps and Oil/Water Separators: The customer will furnish and maintain an approved sand trap designed to collect sand, dirt, silt, and gravel from vehicle washing facilities or those facilities of similar purpose. As determined by the Utility, the customer will furnish and maintain an approved oil/water separator designed to collect petroleum or mineral based oils and greases. Those facilities requiring an oil/water separator include, but are not limited to, those performing vehicle maintenance and vehicle washing. Specific discharge limits and applicability of such pre-treatment devices shall be determined by the Utility.
- c) Disposal: The sludge, grease, oils, silt, grit, or sand collected in the pre-treatment devices shall not be disposed in the wastewater main. The waste material must be disposed in a safe and acceptable manner in accordance with the Environmental Protection Agency and Alaska Department of Environmental Conservation regulations, or any other applicable regulations.