CITY OF NORTH POLE

SERVICE LINE REQUIREMENTS FOR WATER AND WASTEWATER

COMMERCIAL AND RESIDENTIAL STRUCTURES

Revised: June 2007

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INTRODUCTION

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 reviewed by the North Pole City Council.

Copies of City of North Pole Title 13, Public Services Ordinance, including all rates, charges, rules, and regulations are available at City Hall for public inspection during regular business hours or you may view them or download from our website at http://www.northpolealaska.com.

If you have any questions after reading this booklet, please contact the Public Works Director 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 specification covers the acceptable design and construction features for connection to the City of North Pole water and wastewater systems and will serve as the official inspection guideline prior to connection by the Utility. Deviation from this standard is permitted only by written consent of the Utility.

1.2 - LIABILITY

The City of North Pole assumes no responsibility or liability concerning the suitability or applicability of this standard to the requirements of the customer.

1.3 - INTENT

It is not the intent of this standard to supersede ordinance regulations, but rather to provide designers, contractors, and customers a basic guide for design and installation of underground piping systems to ensure compatibility with the Utility's system.

1.4 - OWNERSHIP

The extent of ownership by the Utility is limited to water or wastewater mains, water meter, and Automatic Meter Reading (AMR) equipment. All other piping, fittings, valves, pumps, and other material, whether required by law, necessity, or this Standard, **are the sole responsibility of the customer.**

1.5 - DEFINITIONS

The following definitions apply to this Standard:

Utility: City of North Pole.

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.

1.6 - RESPONSIBILITY

The customer is responsible for obtaining verification from the designer and installer that all design and installation work is in conformance with this Standard.

The customer and installer are responsible for meeting the requirements of the City of North Pole ordinances. The customer is responsible for obtaining all required permits. This includes, but is not limited to, Alaska Department of Transportation Right of Way permit, or other as required. The customer and installer will be held accountable for violations of the City of North Pole ordinances and/or damage to Utility facilities resulting from failure to comply with the requirements of the City of North Pole ordinances and this Standard.

The installer is responsible for meeting the applicable requirements of this Standard, the Uniform Plumbing Code, and the Construction Code of the Occupational Safety and Health Standards except as modified by this Standard.

SECTION 2 - PROCEDURES FOR OBTAINING A NEW SERVICE

2.1 - INFORMATION TO OBTAIN

Call or visit City Hall, 488-2281 for information on:

A. The availability of service.

B. The location of mains.

C. Whether or not assessments have been paid.

2.2 - SERVICE LINE SIZE AND INSTALLATION

The type of connection provided by the Utility will depend upon piping sizes, customer material preferences and the water or wastewater main to which the customer will connect. The person requesting connection is required to state the type and size of piping that he intends to install. Each leg of the water dual service line shall be a minimum of 1" diameter.

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 one (1) inch service line. (Refer to Section 4 for 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.

C. Wastewater: Wastewater services are generally four (4) inch (minimum) with six (6) inch for multifamily and commercial connections. Wastewater service line size is based on the number and type of plumbing fixtures in the proposed building. Refer to Section 5 for 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.

2.3 - APPLICATION FOR SERVICE

The customer is responsible for making application for service with the City of North Pole prior to requesting field location of the mains.

Application: Apply for service and pay necessary fees at City of North Pole, 125 Snowman Lane, North Pole, Alaska 99705

For residential structures, the building owner may perform the hookup (not the connection to the main), 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 valid Alaska Department of Labor Journeymen Plumber Cards (Required by Alaska State Law). The hookup to the main line must be done by a licensed and bonded contractor.

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

Responsibility to Locate Underground Utilities: The customer or his installer shall be responsible for determining the location of all underground utilities and shall be responsible for any damages to underground utilities caused by the work. Possible underground utilities to be located are telephone lines, cable TV lines, fiber optic lines, electrical lines, street light power, water and wastewater mains, storm drains, etc. If a line location is needed, an appointment must be made in advance. Alaska Statutes require a forty-eight (48) hour notice; however, based on workflow, the Utility can normally support a twenty-four (24) hour notice. Water and wastewater locates are provided without charge.

Prior to excavation, the property owner must:

A. Complete a Service Tie-in Application for service to the property.

B. Secure a permit from the City of North Pole or the ADOT if within a street right-of-way.

SECTION 3 - GENERAL REQUIREMENTS

3.1 - STANDARDS

Only work, materials, and tools meeting acceptable standards shall be permitted.

A. All plumbing shall conform to the standards set forth in the most recent edition of the Uniform Plumbing Code.

B. All work and materials shall be free of defects and leaks.

C. All materials used shall be new.

3.2 - SCOPE OF UTILITY PERSONNEL WORK

Utility personnel will shut off water main lines reactivate the water main line once the contractor has connected the service line, and install the water meter. This, together with the inspection of all materials and work, will 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 - REQUIRED INSPECTION

Inspection of the facilities is the responsibility of the Utility. Each phase of work must be inspected by Utility personnel before going on to the next phase. Inspection No. 1 inspects the service line for correct installation of materials prior to authorizing the Contractor to drill into the water main. Inspection No. 2 inspects the amount of insulation on a service line and re-insulation on the main line. For additional information concerning the inspections, please see Section 4.6 and 4.13. In the event of conflicts between this Standard and other Standards, the following governance shall apply:

A. 1. City of North Pole Ordinance

B. 2. This specification

C. 3. Uniform Plumbing Code

3.4 - CONNECTION OF SERVICE LINES TO UTILITY MAIN

All water connections shall be installed and mains tapped by a contractor licensed in the State. The Contractor must provide the City with the following:

A. Contractor’s License (State of Alaska)

B. Proof of Workman’s Compensation Insurance, if required by law

C. A bond in the amount of five thousand dollars ($5,000)

D. Other proof of capability to perform such work as required by the Director of Public Works

Alaska Statutes require a forty-eight (48) hour notice prior to connection to the main.

3.5 - EXCAVATION

The customer, or their contractor, shall do all the excavating, (including the excavation around the main line necessary to install saddles) pitorifices, tees, and valves.
ANY DAMAGE to the main repaired by Utility personnel and billed to the contractor or customer.

The installer is responsible for protection of private and public property and provisions of a safe excavation for connection. All excavations shall meet the requirements of Alaska Department of Labor and Federal OSHA Regulations. The installer shall furnish all necessary construction and safety equipment including shoring, de-watering pumps, excavation equipment, ladders, barricades and signs. The installer shall remove all standing and inflowing water from the excavation. Connections will not be made in cases of improper excavation, excessive groundwater, or other unsafe conditions.

3.6 - BACKFILL

Up to the spring line, bedding material shall be placed in maximum layers of four (4) inches and compacted by hand-operated tampers. Above the pipe, a twelve (12) inch layer will be permitted. Under unimproved areas, yards, and lawns the backfill material shall be placed in layers not exceeding twelve (12) inches. Under existing roadways and driveways backfill material or subbase shall be placed in uniform layers not exceeding eight (8) inches. All backfill thicknesses are given in loose depths.

3.7 - COMPACTION REQUIREMENTS

Compaction in street right of ways must meet Alaska Department of Transportation, or Section 7- of City of North Pole Utility Standards of Construction.

Compaction beneath the Utility main and to a point twelve (12) inches above the main shall be ninety-two (92%) percent, or greater. Special care shall be taken to assure complete compaction under the haunches of the pipe.

3.8 - PERMITS

Information on applying for Fairbanks North Star Borough utility permits may be made by calling the Public Works department at (907) 459-1345. These permits are required if you plan to dig in a Borough maintained area. To find out if the road is Borough maintained, call (907) 459-1223. Information on City of North Pole permits is available by calling (907) 488-2281. You may also need to contact Department of Transportation at (907) 451-5400 or (907) 451-5179.

These permits must be completed and approved prior to excavation within the right-of-way.

3.9 - INSULATION

Insulation material shall be sprayed urethane foam; Resin Technology, 2035. 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, the minimum insulation thickness shall be three (3) inches on the top, sides and bottom.

B. For water and wastewater service lines shallower than four (4) feet, the minimum insulation thickness shall be four (4) inches on the top, sides, and bottom, 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 contractor shall be responsible for re-insulating the main at the service connection.

3.10 - SERVICE LINE PLACEMENT

A. Water service piping shall be installed such that a two (2) inch minimum horizontal separation is provided between supply and return.

B. Buried piping shall be installed with a minimum four (4) feet soil cover or additional insulation must be provided. Typically one (1) inch of insulation shall be provided for each foot of soil cover less than four (4) feet.

C. 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.

D. Water and sewer service lines shall be installed in two (2) separate trenches a minimum of ten (10) feet apart.

E. Water and sewer service lines shall be installed a minimum of ten (10) feet from lot lines.

SECTION 4 - WATER SERVICE REQUIREMENTS

4.1 - PITORIFICE SADDLE CONNECTION

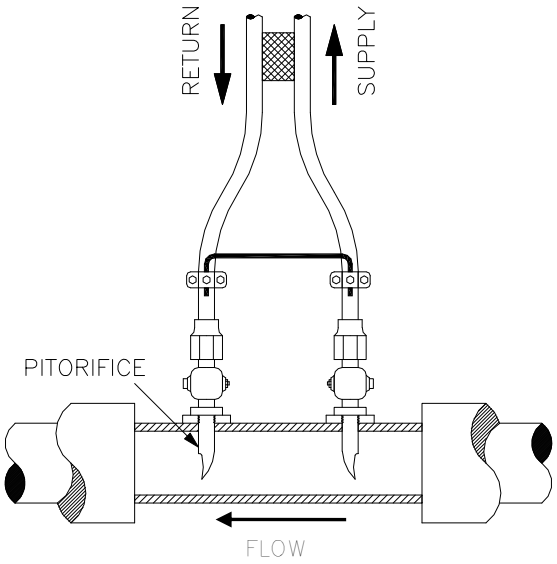


Figure 1: Pitorifice Circulation

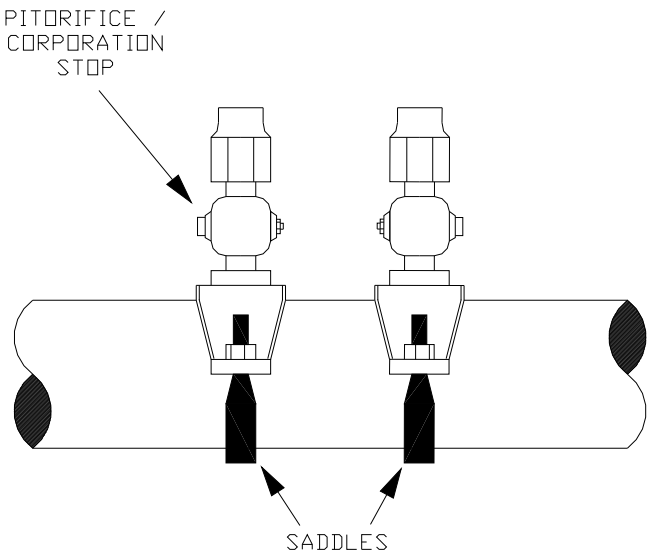
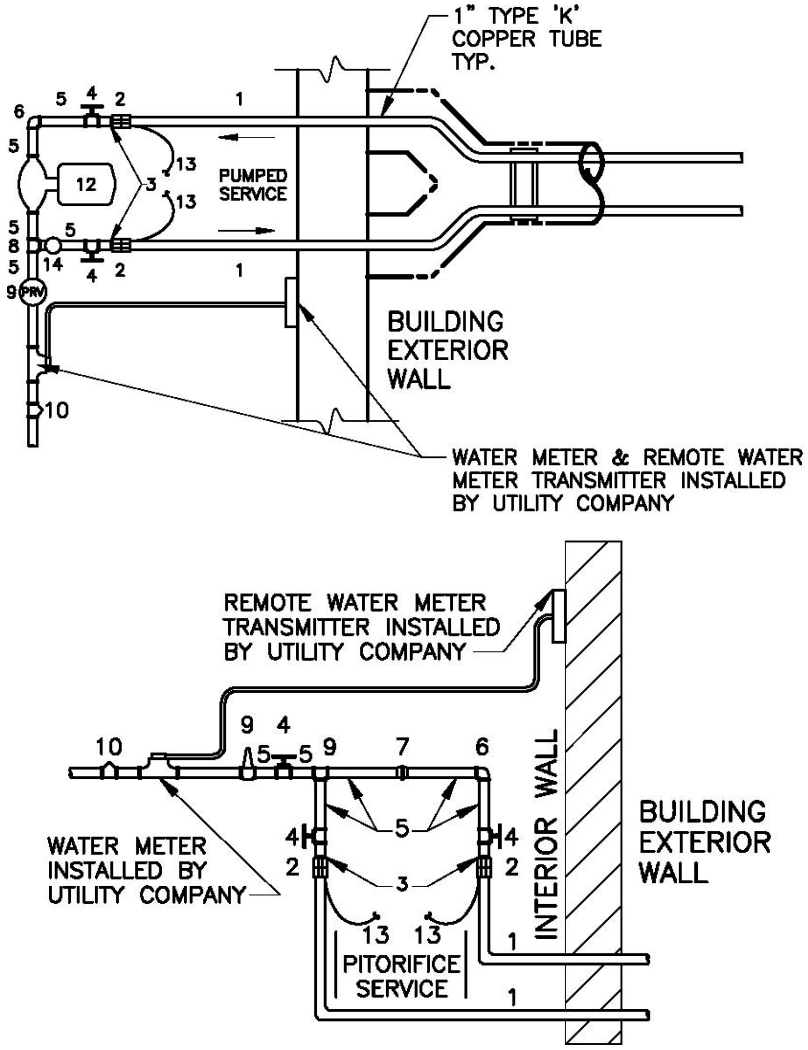


Figure 2: Pitorifice Saddles

Saddles and pitorifices/corporation stops are installed at the time of connection and are to be provided by the installer/customer. The pitorifices/corporation stops shall be manufactured by Ford Meter Corporation. One (1) inch saddles are standard for most residential services. See Figure 3 for typical water service. (Saddle connections are not allowed on transmission mains if a distribution main is available.)



RESIDENCE BRANCH - SECTION (NTS)

MATERIAL LIST - CUSTOMER ITEMS

ITEM	DESCRIPTION
1	COPPER TUBING, TYPE "K", LENGTH AS REQUIRED
2	FLARE NUT
3	FLARE X MALE IRON PIPE THREAD ADAPTER
4	STEM GATE VALVE
5	PIPE AND NIPPLES, LENGTH AS REQUIRED
6	ELBOW
7	UNION
8	TEE
9	PRESSURE REDUCING VALVE, 100–40 PSI
10	CHECK VALVE
11	BLUE UTILITY WARNING TAPE
12	CIRCULATION PUMP, GRUNDFOS 26–64BF OR EQUAL
13	2/0 COPPER THAW WIRE; RUBBER COATED, TYREX OR EQUAL, WITH CLAMP, BURNDY OPX 3428 OR EQUAL (OPTIONAL)
14	SIGHT FLOW INDICATOR

NOTES:

1. ALL FITTINGS SHALL BE BRONZE THREADED.
2. ALL TUBING SHALL BE TYPE 'K' COPPER (SOFT): 1"
3. BLUE UTILITY TAPE SHALL BE PLACED 2" ABOVE WATER SERVICE PIPING FOR THE FULL LINGTH OF THE SERVICE.
4. WATER SERVICE PIPING SHALL SLOPE DOWN FROM RESIDENCE TO WATER MAIN.
5. PUMPS SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:
   a. THE PUMP VOLUTE SHALL BE BRONZE OR STAINLESS STEEL.
   b. THE PUMP IMPELLER SHALL BE BRONZE OR STAINLESS STEEL.
   c. THE PUMP BODY SHALL BE FLANGED AND RATED FOR 140 psgi WORKING PRESSURE.
   d. HORSEPOWER: 1/12 HP
   e. MAXIMUM FLOW AT ZERO HEAD: 30 GPM
   f. MAXIMUM FLOW AT ZERO FLOW: 20 FEET
   g. PUMP SHALL BE INSTALLED SUCH THAT FLOW DIRECTION THROUGH SERVICE IS THE SAME AS RESULTS FROM PITORIFICE FLOW DIRECTION THROUGH THE MAIN. THIS IS SHOWN ON THE DRAWINGS AVAILABLE AT CITY HALL.

Figure 3: Typical Pitorifice Circulating Loop Water System

4.2 - TEE CONNECTION

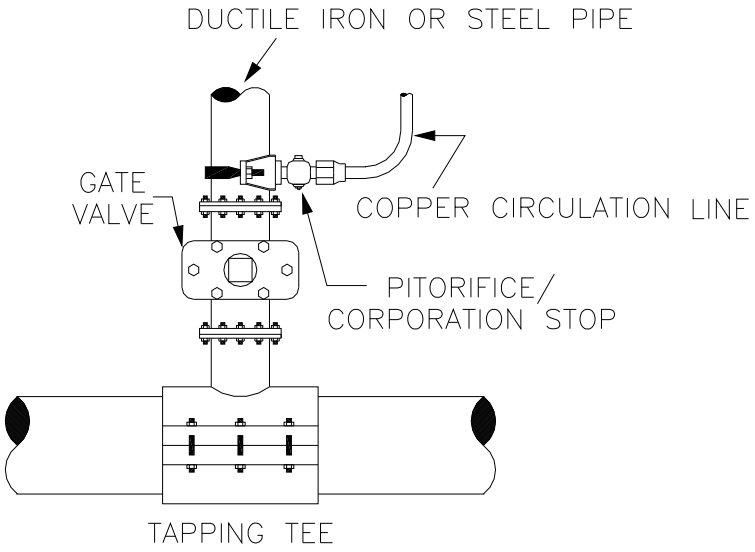
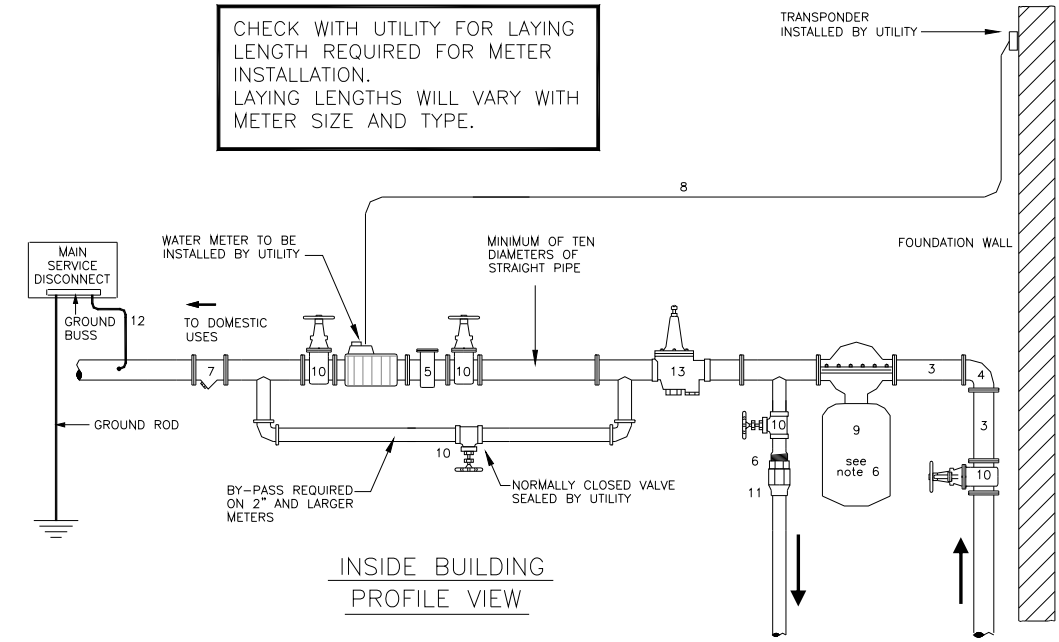


Figure 4: Typical Tee Connection

Where customer design requires a connection larger than two (2) inches, tees and gate valves are used. The tapping tee and gate valve must be installed by a Contractor licensed in the state. The gate valve will be a minimum of six (6) inches. The Customer will be responsible for providing reducers if the service is to be less than six (6) inches. The tapping tee and gate valve end connections shall be mechanical joint. See Figure 5 for typical large service.

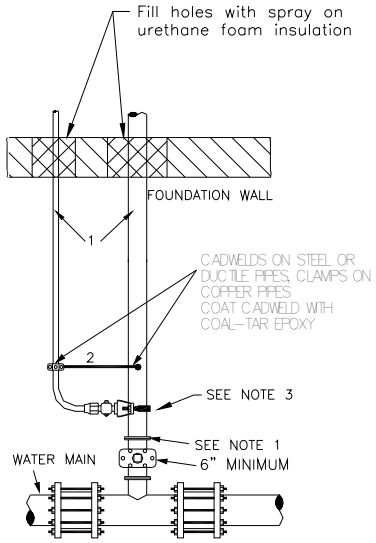
Valve boxes including risers and/or collars for access to Utility service valves shall be placed on valves by the installer in conjunction with backfill and street repair. See Utility Standards of Construction for details. Valve boxes shall be plumb, straight, and clean prior to acceptance by the Utility.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



INSIDE BUILDING
PROFILE VIEW

MATERIAL LIST – CUSTOMER ITEMS

ITEM	DESCRIPTION
1	Piping per section 4.4
2	Thaw Buss #1 AWG min., length as required
3	Pipe and nipples, lengths as required
4	Elbow
5	Plate Strainer (Supplied by Utility)
6	Flare X Male iron pipe thread adapter
7	Check valve
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
13	Pressure reducing valve, 80-40 PSI



CONNECTION AT MAIN
PLAN VIEW

NOTES:

1. Point of connection with 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. Circulation/Domestic connection per customer preference.
4. Sealed by-pass required on 2" and larger meters.
5. Meter shall be a minimum of 1' and a maximum of 4' above floor level.
6. Install circulation pump according to manufacturer's recommendations.

Figure 5: Large Water Service (2" or larger)
(Customer to supply all items on material list.)

4.3 - PROPERTY LOOP

Pitorifice service 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.

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

To determine if a service stub was installed at the time that the water main was constructed, consult the City of North Pole. The as-built drawings indicate if there is a water service stub. In many cases the water service stub was marked with a white post along the property line. Service stubs installed in 2005 and later will have electronic ball markers that can be located by the Utility.

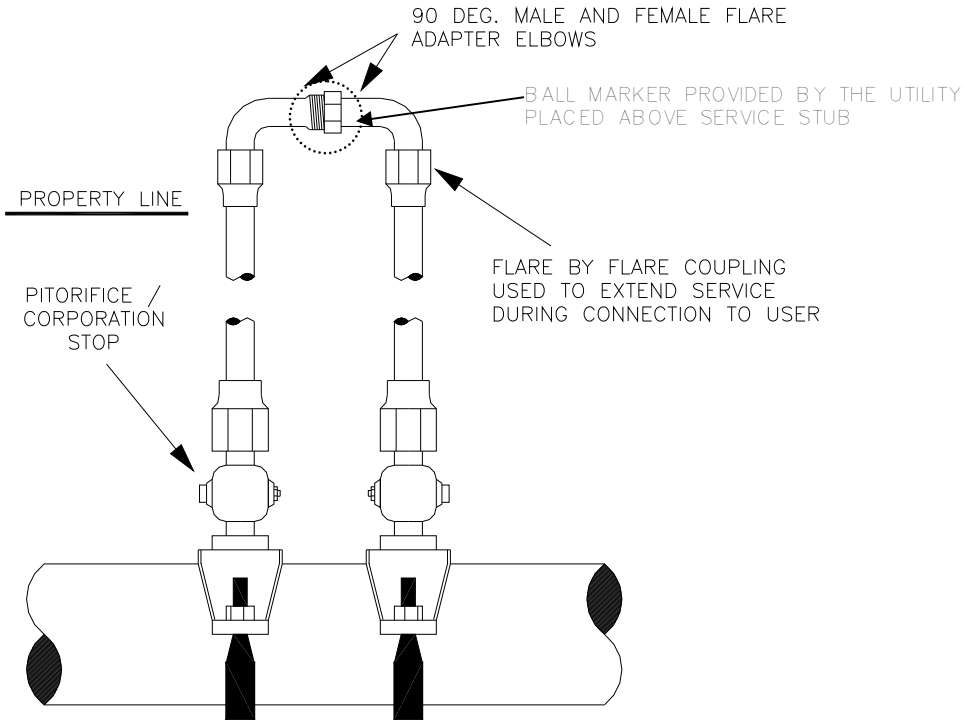


Figure 6: Temporary Property Loop

4.4 - MATERIAL STANDARDS

A. Type "K" soft drawn copper for sizes one (1) inch, and one and one-half (1-1/2) inches. Any joints in the service loop below ground shall employ brass flare type connections. **No compression type unions shall be used.**

B. Ductile iron pipe shall be used for pipe sizes three (3) inches and larger. 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.

C. Steel pipe (Schedule 40) is allowed for sizes two (2) inch. **Threaded or galvanized pipe is not permitted**. Pipe shall be butt welded or connected with dresser type couplings with appropriate restraints.

D. All pipe and fittings shall meet the requirements of the National Sanitation Foundation (NSF) 61.

4.5 - PIPE FITTINGS

A. 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 check valve. Brass flared fittings shall be used below ground to join copper tubing on long runs.

B. Ductile iron pipe fittings shall conform to AWWA C110/C153.

C. Flanged connections for underground piping runs and underground fittings are not acceptable.

D. Thrust restraint for all piping four (4) inch and larger shall be by use of field lok gaskets, and mechanical joints with gripper glands. Submit thrust restraint plan to the City for approval. The use of anchors, restraining rods, and/or thrust blocks shall not be used.

E. 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 check valve.** Water service lines shall be sloped down to the main and installed as straight as possible (except for angle points).

F. Lead free solder is required in the domestic piping.

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 meter will be installed during the first inspection. The Utility requires that all the components of the water service be present at the time Utility personnel arrive on site to do the first inspection. If all of the components, such as the PRV, check valve, and service loop are not present and complete, utility personnel will not authorize the Contractor to install the service saddle and will reschedule the appointment for a later time. If all of the components are present and complete, utility personnel will authorize the contractor to install the saddles, the water meter, and do the first inspection.

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.

The size of meter is determined prior to installation of the service. Meter size will normally be the same as service size unless otherwise specified. Customer/installer shall leave the correct space (dimension) for Utility crews to install the meter. Check with the Utility for laying length required for meter installation. Laying length will vary with meter size and type.

Services two (2) and larger shall have a by-pass line around the meter for meter maintenance work.

Meter shall be a minimum of one (1) and a maximum of four (4) 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.

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. Pump shall be installed such that flow direction through the pump is the same as the flow through the service that is induced by pitorifices on the main. The flow direction for water circulating in the main is available from the Utility.

Circulation pumps shall conform to the following requirements:

A. All services one hundred (100) feet or less in length (one way):
   Horsepower: 1/12 HP
   Maximum flow at zero head: 30 GPM
   Maximum head at zero flow: 20 feet
   Grundfos UPS 26-64 BF or equal
   Rated for 150 PSI

B. All household services between one hundred (100) feet and five hundred (500) feet in length (one way):
   Horsepower: 1/12 HP
   Maximum flow at zero head: 25 GPM
   Maximum head at zero flow: 30 feet
   Grundfos UPS 26-96 BF or equal
   Rated for 150 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 UPS 43-75 BR or equal
   Rated for 150 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.

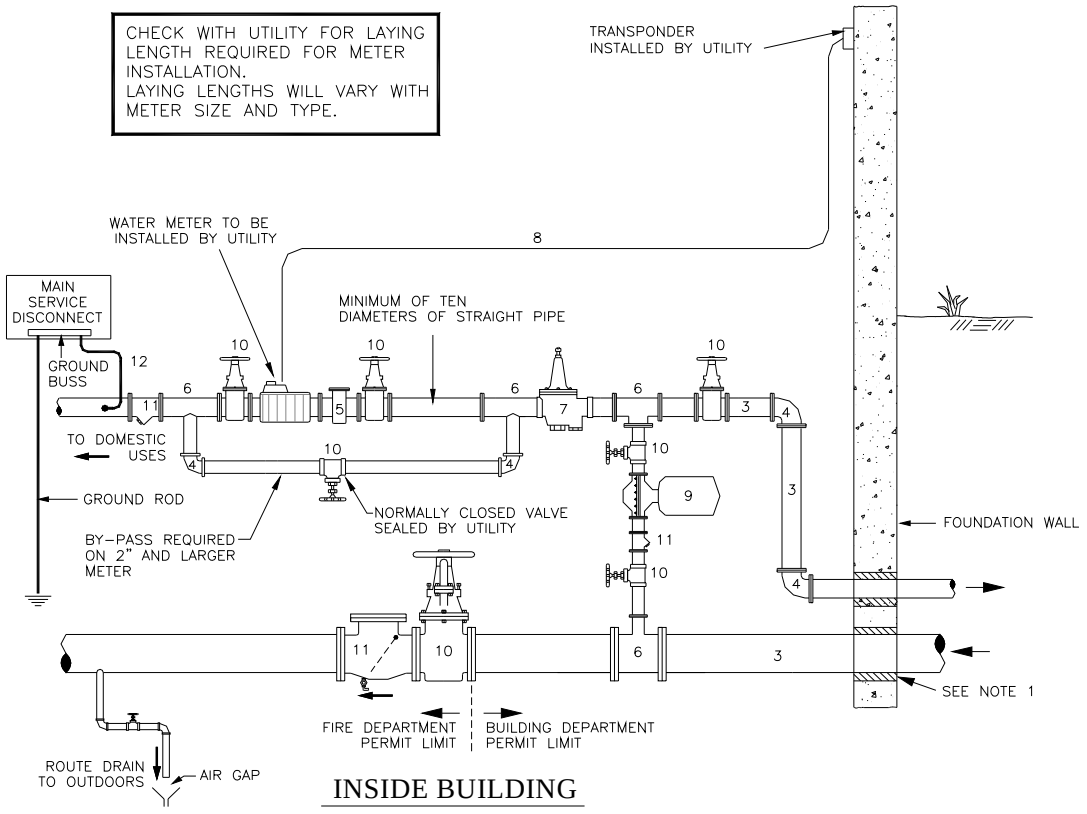
E. The private circulating pump shall have a bronze or stainless steel body.

4.9 - FIRE SPRINKLER SYSTEMS

Refer to Figure 7 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 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.

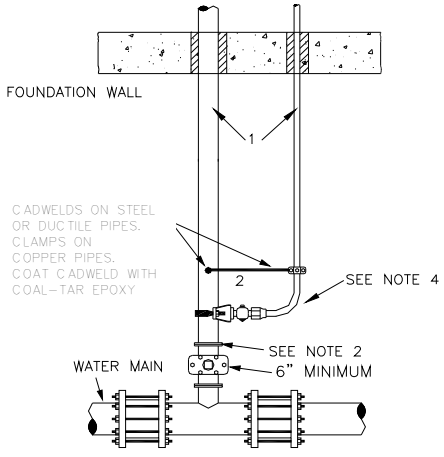
The installation of a fire booster pump is prohibited on the North Pole water systems without advance written approval from the Utility.



INSIDE BUILDING
PROFILE VIEW

MATERIAL LIST – CUSTOMER ITEMS

ITEM	DESCRIPTION
1	Piping per section 4.4
2	Thaw Buss #1 AWG min., length as required
3	Pipe and nipples, lengths as required
4	Elbow
5	Plate Strainer
6	Tee
7	Pressure reducing valve, 80–40 psi
8	#18, 2 conductor wire
9	Circulation pump (Mandatory)
10	Gate valve (only)
11	Double Check Valve Assembly
12	Ground wire #4 AWG min., length as required



CONNECTION AT MAIN
PLAN VIEW

NOTES:
1. Provide minimum 1" clearance at wall penetration for pipe movement, insulate clearance.
2. Point of connection with Utility.
3. 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.
4. Circulation/Domestic connection per customer preference.
5. Meter shall be a minimum of 1' and a maximum of 4' above floor level.

Figure 7: Water Service with Fire Sprinkler

4.10 - 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 North Pole Utility Standards of Construction.

4.11 - 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.

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 fifty (150) pounds per square inch (psi). 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 North Pole Utility Standards of Construction. See NFPA 13 and 24 for the applicable leakage rates for fire supply piping. Fire system test pressure shall be two hundred (200) psi for two (2) hours.

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) 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.

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.

4.12 - 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.

4.13 - INSPECTION

The Utility shall exercise the power of inspection in conjunction with the deactivation of the water main and installation of the water meter.

A. Utility personnel shall examine the piping lengths; methods used to connect the lengths, and shall verify proper installation of isolation valves, couplings, and unions prior to connection to the Utility water mains. Immediately following connection, the Contractor shall install the thaw wire.

B. The Utility personnel shall inspect the pipe insulation prior to backfilling. They shall also inspect the service piping indoors prior to installation of the meter. This inspection shall cover all piping from the loop isolation valves to the domestic piping system.

C. The meter will be installed during the first inspection. The Utility requires that all the components of the water service be present at the time Utility personnel arrive on site to do the first inspection. If all of the components, such as the PRV, check valve, and service loop are not present and complete, utility personnel will not authorize the Contractor to install the service saddle and will reschedule the appointment for a later time. If all of the components are present and complete, utility personnel authorize the contractor to install the saddles, the water meter, and do the first inspection.

SECTION 5 - WASTEWATER SERVICE REQUIREMENTS

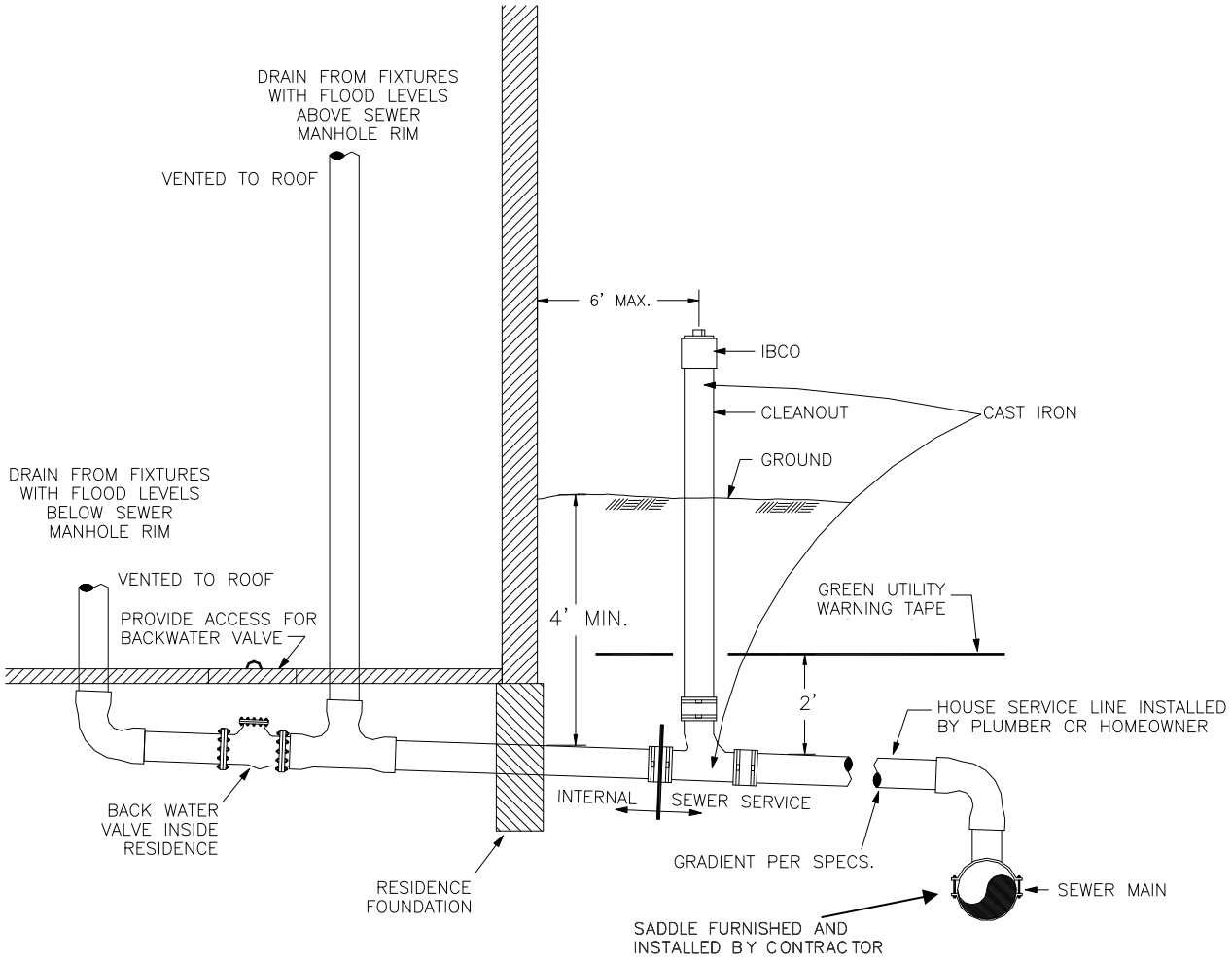


Figure 8: Wastewater Service

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 approved ductile iron or high-density polyethylene pipe. Wastewater service begins with the cleanout. Piping from the building to the cleanout is considered internal plumbing.

The building's wastewater service connection will be in compliance with Figure 9.

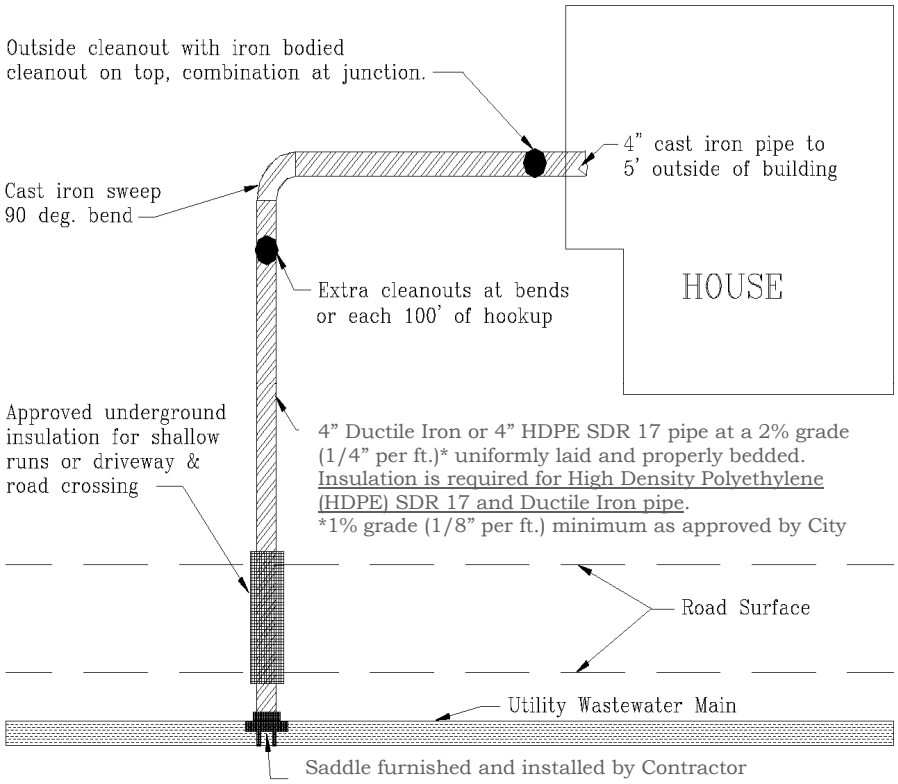


Figure 9: Typical Wastewater Service

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. The Utility assumes no responsibility or liability for the found condition or integrity of the wastewater stub-out. 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.

To determine if a service stub was installed at the time that the water main was constructed, consult the City of North Pole. The as-built drawings indicate if there is a water service stub. In many cases the water service stub was marked with a white post along the property line. Service stubs installed in 2005 and later will have electronic ball markers that can be located by the Utility.

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 3350-05 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

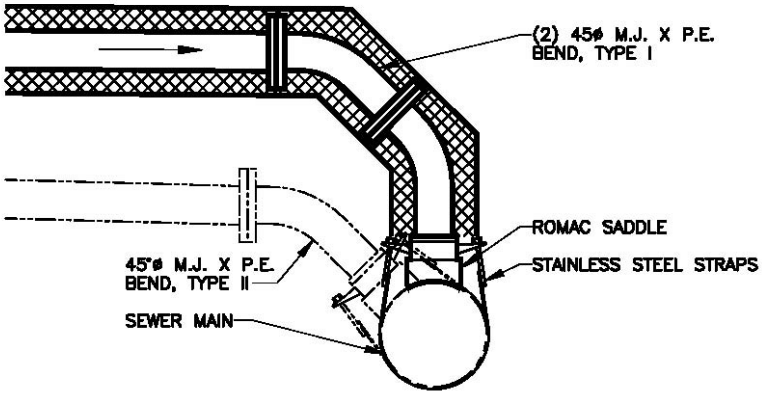


Figure 10: Connection Schemes

A. Wastewater service connections shall be cut or bored into wastewater mains. Only Contractors licensed in the State shall tap Utility mains and install 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 10. 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. 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.

C. 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.

D. Wastewater service line piping shall be laid on a firm bed of approved materials that have been properly compacted throughout its entire length.

E. 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. Ductile iron must also be insulated.

F. 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.

G. Fittings shall consist of the following:
- No-Hub cast iron fittings for HDPE pipe (HDPE fittings are not allowed).
- Ductile iron fittings for ductile iron pipe.

H. Persons seeking approval of materials that are not specifically mentioned as being approved in this document must do so prior to installation.

I. High-density polyethylene pipe shall be installed with gas tight and water tight, non-fusion joints. The connection of HDPE to HDPE pipe or HDPE pipe to a No-Hub fitting shall be a flexible coupling, such as Mission Rubber Company XL 56-44 ARC Flex-Seal Coupling 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. The Fernco Coupling 1056-44RCXL is an acceptable substitute. 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.

J. 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.

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 shall be served by a clean out.

5.6 - BACKWATER VALVES

A. The installer shall provide a suitable backwater valve (as shown in Figure 11) 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.

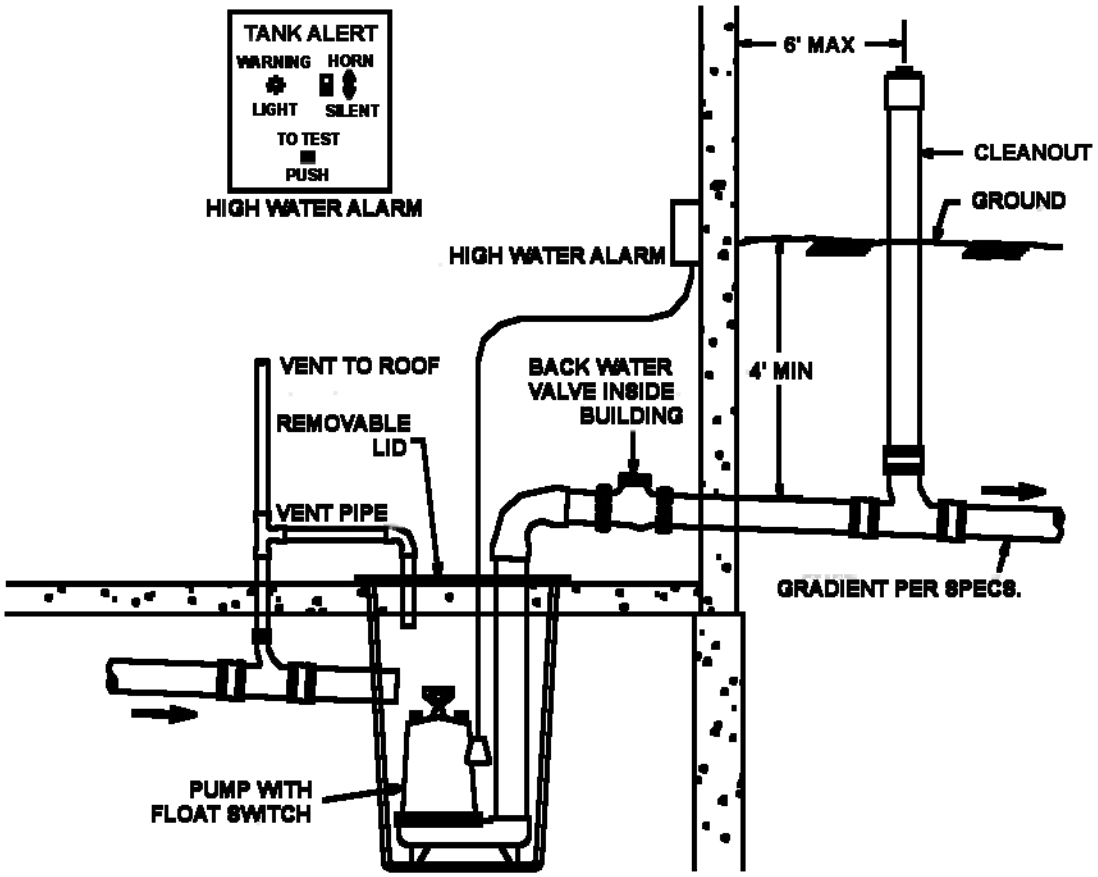


Figure 11: Wastewater Service Lift Station

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 11, 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.

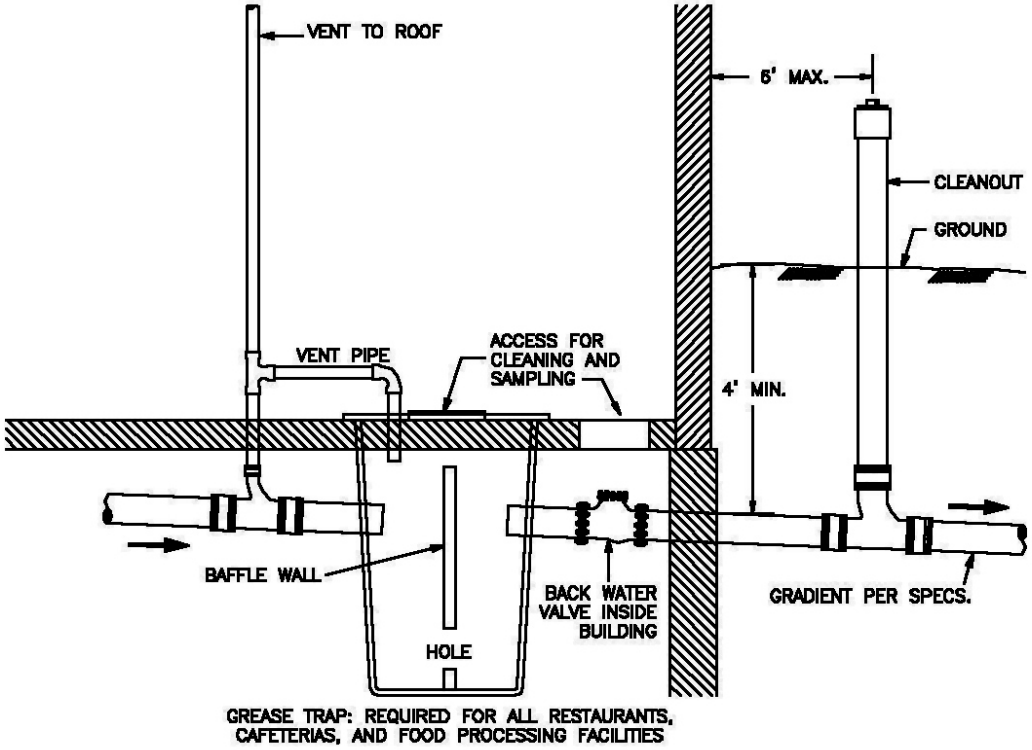


Figure 12: Typical Wastewater Interceptor Tank

5.8 - PRE-TREATMENT

All solid or liquid wastes which are prohibited, by ordinance, 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 12.

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 sludges, 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.