Standard Specifications for Installation and Repairs of Water and Sewer Service Lines

Effective December 1, 2013

Approved

/S/ Kyle Mathis

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Kyle Mathis
City Engineer

/S/ Robert Glenn

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Robert Glenn
Water/Wastewater Utilities Superintendent

Table of Contents

Policy for Repair or Replacement of Water/Sewer Services

The City of Spearfish City Code states (Ord No 996, 11-5-04) that each and every service line to a residence or commercial property is owned by and the responsibility of the property owner. This responsibility begins at the service tap on the main and extended into the customers building. In order to more equitably address the sharing of costs for repairs done to the service lines within the right of way and also within private property, the following changes are established as required in Ordinance No. 1163 Section 18-19.

Step 1: Leak Detection Procedure and Notice:
Upon locating a leak on a customer's service, the Water/Wastewater Department shall notify the property owner verbally and in writing.

Step 2: Repair Coordination

It shall be the responsibility of the property owner to obtain a Water/Sewer Repair Permit and begin contracting for repair within 5 days of notification. Repair work must commence within 10 days of notification unless a waiver is granted by the Water/Wastewater Utilities Superintendent. Waivers will only be granted in limited situations such as contractor unavailability, inclement weather, personal emergencies, etc. For financial hardships, see Step 3 regarding contractor payment.

Repairs or disconnection for the city system may be required sooner if damage is being done, there is a risk of contamination of the city's system or any other public health and safety concerns.

Only licensed contractors approved by the Water/Wastewater Utilities Superintendent or the City Engineer shall be allowed to make repairs to services between the city main and the customer's water meter. Additionally, the owner shall ensure that the contractors invoice reflects costs divided between what is the responsibility of the owner and what is the responsibility of the city, as noted in the paragraph titled "Responsibility for Cost of Repairs".

Step 3: Choose Contractor Payment Method.

There are two options for contractor payment:

Option 1 – Full payment upon completion of the work:

Upon receiving the invoice, the owner shall pay the contractor directly.

Option 2 – Payment Plan:

A payment plan may be established, at the discretion of the City Finance Officer, for the customer's portion of the contractor's bill. These payment plans are generally the traditional special tax assessment placed on the owner's property tax. These can be established for up to five years at the prime interest rate plus 1% certified to Lawrence County for collection. The property owner shall still remain responsible for payment to the contract for work performed and the city will establish a loan to the property owner with a pre-determined payment plan.

Responsibility for Cost of Repairs:

The customer/property owner shall be responsible for all costs for work done within their private property including:

- Excavation of the service line from the main (time and equipment)
- All parts and labor for the service line repair
- Repair/replacement of sidewalks, driveways, and all landscape that lies within the city's right of way and within customer/property owners' private property.

The City of Spearfish shall be responsible for the following:

- Backfill material for the trench in the city right of way
- Hauling of backfill material
- Repair of asphalt/gravel surface of the street/alley
- Repair/replacement of curb and gutter
- Any required compaction testing

Curb Stops:

It shall be the responsibility of each property owner to maintain their curb stop in working condition. The curb stop shall be available and free from obstructions at all times. If the curb stop is obstructed, the city shall notify the property owner of the obstruction. It shall be the responsibility of the property owner to remove the obstruction within 24 hours. If the property owner fails to remove the obstruction, the city shall remove the obstruction at the property owner's expense. A Curb Stop Obstruction fee will be assessed against the customer's account.

If the curb stop is not in working order, the property owner will be notified verbally and in writing and shall make repairs within the same time frame and process established for water service line leaks.

Failure to Make Required Repairs:

If the property owner fails to make the required repairs, the City of Spearfish shall make all required repairs and the property owner shall be liable for costs as stated above plus a 10% penalty.

Water Service Lines and Water Meters

Each residential unit or commercial unit within the City of Spearfish shall have an independent service line connected with the municipal water system. Such service lines shall be of material allowed by this standard, and of such size as to meet the minimum requirements of the South Dakota Plumbing Code. Existing service lines inconsistent with this standard may be continued until such time as a repair or replacement of a service line serving multiple units shall be required. At such time, each unit requiring independent service by this standard shall be installed at the service owner's expense.

When, pursuant to the following exceptions, premises are not served by independent service lines capable of being shut off outside the building, all charges to the water services to such premises shall be borne by the owner of the premises.

At no time will it be permitted for one service line to serve more than one (1) parcel or individually platted property. As an example, a townhouse or condominium will require an individual service line, curb stop and meter for each unit.

Exceptions of the independent service line requirements are as follows:

A. Residential dwellings units containing a primary residence and one (1) apartment need only have a single line.
B. A duplex shall have two options for service lines:
    a. Each unit may be served by individual service lines, with individual curb stops and meters. This allows for the city utility account to be in the name of the occupant.
    b. Both units may be served by one service line with one curb stop and meter. If using this option, the city utility account must remain in the property owner's name.
C. Building with three (3) or more dwelling units shall be considered as an apartment building. Apartments building are required to have (1) curb stop and one meter per building. Apartment complexes (more than one (1) apartment building owned by the same person or entity) are required to have a main shut off valve for the entire complex along with individual curb stops and water meters for each building in the complex.

Upon annexation of developed properties:

A. Each commercial unit, when municipal water service becomes available, shall connect to the municipal system with an independent service line at the property owner's expense.
B. Each residential unit being served by a private well shall have the option of retaining the well or, at the property owner's expense, connecting to the municipal system when the service becomes available, providing the requirements of the State Plumbing Code are met.
    a. Residence choosing to keep a private well for irrigation may do so as long as no cross-connection is made with the municipal water system. Cross-connection inspections will be required prior to connection to the municipal service.
C. Sections A & B above may be amended on an individual basis in accordance with the terms of a city council approved annexation agreement.

Polyethylene Water Service Lines

A. Minimum service line size is 1", maximum service line size is 2"
B. Tapping saddles and corporation stops are required. Tapping and all materials are the responsibility of the Contractor.
C. Tapping saddles shall be made of high strength ductile iron per ASTM A536, double wide band and 5/8" UNC threaded bolts of 18-8 type 304 stainless steel, gasket is EPDM rubber, ASTM-D2000, finish on saddle body is fusion bonded epoxy coat approximately 12 mils thick. (Ford FC202 or approved equivalent)
D. Corporation stop shall be AWWA/CC taper thread inlet by **Quick joint** for copper or plastic tubing (CTS) outlet. (Ford FB1000 or approved equivalent) All corporation stops shall meet the "No Lead" requirements and shall be marked NL or No Lead.
E. One inch (1") through two inch (2") diameter shall be copper tube size (CTS) poly SDR 9 pipe, 200 psi; with stiffener inserts at each curb stop, fittings, and corporation stop. Tubing shall meet the requirements of AWWA C901, NSF Standards 14 and 61, and shall have the material designation of PE3608 by the Plastic Pipe Institute. Stiffener inserts shall be Ford 50 series or approved equivalent.
F. Insta-tights or compression type connections with inserts are required. (No yellow brass allowed. Red brass only). Insert shall be Ford 50 series Stainless Steel inserts or approved equivalent.
G. No service line splices on any section of the line.
H. Tracer wire shall be installed at each service line and exposed at the tracer wire box. Do not cut the tracer wire when continuing to house. On new construction of service lines to the house a tracer wire is required from the corporation stop to the water meter with a tracer wire box next to the curb stop.

I. Curb Stop shall be a Ford B44-444-MQ-NL or approved equivalent. All curb stops shall meet the “No Lead” requirements and shall be marked NL or No Lead. Insert shall be Ford 50 series Stainless Steel inserts or approved equivalent and shall be used. Rod shall be installed to a level 1 foot below finished grade.

J. Curb stops with boxes shall be placed on each new service line at the property line or as shown on the approved plans and marked with a steel fence post.

K. All curb boxes shall be adjustable and installed to finish grade.

L. Curb boxes shall be A.Y. McDonald 5614 Minneapolis pattern or approved equivalent.

M. Water services shall be bedded with Cushion Sand meeting the City of Spearfish (COS) specification and ASTM C33/AASHTO M6 on the far right hand column of the table below:

Cushion (Concrete) Sand Specification			
Seive Size	ASTM C33/ AASHTO M6 SPEC.	Johner Sieve Analysis	COS Spec.
3/8"	100%	100%	100%
#4	95-100%	99%	95-100%
#8	80-100%	98.70%	80-100%
#16	50-85%	96.60%	80-100%
#30	25-60%	88.30%	70-90%
#50	5-30%	13.40%	5-30%
#100	0-10%	3.60%	0-10%
#200		1.90%	

N. Select soil material is required for a minimum of 18” above the pipe and shall include no rocks 2” or larger.

O. **Compaction** The backfill above the initial pipe covering shall be placed in eight (8) inch layers and be well tamped by mechanical means or other means acceptable to the City of Spearfish to 95% of maximum density at optimum moisture content, ASTM D698.
For paved streets, the trench shall be backfilled according to the above method. Surplus material then remaining after backfill is complete shall be wasted at the direction of the City of Spearfish. See the construction plans for base coarse and asphalt patching depths.

Copper Water Service Lines

A. Minimum service line size is 1", maximum service line size is 2”

B. Tapping saddles and corporation stops are required. Tapping and all materials are the responsibility of the Contractor.
C. Tapping saddles shall be made of high strength ductile iron per ASTM A536, double wide band and 5/8" UNC threaded bolts of 18-8 type 304 stainless steel, gasket is EPDM rubber, ASTM-D2000, finish on saddle body is fusion bonded epoxy coat approximately 12 mils thick. (Ford FC202 or approved equivalent)
D. Corporation stop shall be AWWA/CC taper thread inlet by quick joint for copper of plastic tubing (CST) outlet. (Ford FB1000 or approved equivalent) All corporation stops shall meet the "No Lead" requirements and shall be marked NL or No Lead.
E. Copper tubing shall be of Type K copper meeting ASTM B 88 and NSF 61.
F. Compression type connections with inserts are required. (No yellow brass allowed. Red brass only).
G. No service line splices on any section of the line.
H. Tracer wire shall be installed at each service line and exposed at the tracer wire box. Do not cut the tracer wire when continuing to house. Tracer wire box required at curb box. On new construction of service lines to the house a tracer wire is required from the corporation stop to the water meter or valve inside the house with a tracer wire box next to the curb stop.
I. Curb stops shall be a Ford B44-444MQ-NL or approved equivalent. All curb stops shall meet the "No Lead" requirements and shall be marked NL or No Lead.
J. Curb stops with boxes shall be placed on each new service line at the property line or as shown on the plans.
K. Curb boxes shall be placed behind the sidewalk and marked with a steel fence post.
L. All curb boxes shall be adjustable and installed to finish grade. Finished grade is defined as the top of finished and graded topsoil and concrete collar.
M. Curb boxes shall be A.Y. McDonald 5614 Minneapolis pattern or approved equivalent.
N. Copper water services shall be bedded with ¾ minus Non Spec Base Course with a minimum 5" below the pipe, 5" above the pipe and 5" on each side of the pipe.
O. Select soil material is required for a minimum of 18" above the pipe and shall include no rocks 2" or larger.
P. **Compaction** The backfill above the initial pipe covering shall be placed in eight (8) inch layers and be well tamped by mechanical means or other means acceptable to the City of Spearfish to 95% of maximum density at optimum moisture content, ASTM D698.

For paved streets, the trench shall be backfilled according to the above method. Surplus material then remaining after backfill is complete shall be wasted at the direction of the City of Spearfish. See the construction plans for base coarse and asphalt patching depths.

PVC Service Lines

A. PVC class water pipe: All PVC water main pipe (4" through 12") shall conform to C-900 Polyvinyl Chloride Pressure Pipe, DR-18, Class 150 psi or C-900 DR-14, Class 200 psi, as specified with the plans. PVC pipe shall have bell ends with elastometric gaskets.
B. All valves will be an epoxy coated resilient seated ductile iron gate valve with box. All new valves shall be connected to the tees and crosses using foster adapters or megalugged in in-line mains.
C. Joint restraint devises
    a. In general, solid ring restraints shall be used whenever possible. Split restraints may be used when connecting to existing systems, for special cases, and when a solid ring restraint is not available for the application. All joint restraint devises shall meet the corrosion requirements for fittings which states that all internal and external ferrous surfaces be epoxy coated and that all bolts, rods, etc. be COR-Blue, epoxy coated, or stainless steel.
D. Valve boxes shall be of a heavy duty construction, Tyler Pipe 666S or approved equivalent. Valve boxes shall be installed using a Valve Box Adapter on the valve bonnet to prevent settling and shift on the valve. Valve box shall be a 2 piece screw type construction with 5 ¼ inches riser and shall be adjustable from 4 ½ feet to 6 feet, with the top section to be at least 24 inches in length. Drop lids shall be marked "water" and are to be of all metal construction.
E. Tracer wire shall be installed at each service line and exposed at the tracer wire box. Do not cut the tracer wire when continuing to house. Tracer wire box required at valve box. On new construction of service lines a tracer wire is required from the corporation stop to the water meter or valve inside the structure with a tracer wire box next to the valve box.
F. PVC water services shall be bedded with ¾ minus Non Spec Base Course with a minimum 5" below the pipe, 5" above the pipe and 5" on each side of the pipe.
G. Select soil material is required for a minimum of 18" above the pipe and shall include no rocks 2" or larger.
H. **Compaction** The backfill above the initial pipe covering shall be placed in eight (8) inch layers and be well tamped by mechanical means or other means acceptable to the City of Spearfish to 95% of maximum density at optimum moisture content, ASTM D698.
    For paved streets, the trench shall be backfilled according to the above method. Surplus material then remaining after backfill is complete shall be wasted at the

direction of the City of Spearfish. See the construction plans for base coarse and asphalt patching depths.

I. Thrust Restraints

a. Thrust restraints in the form of concrete thrust blocks shall be provided at tees, crosses, horizontal bends, plugs, caps, valves and similar locations whether specifically indicated on the drawings or not.

J. Disinfection:

a. Disinfection shall conform to the South Dakota D.E.N.R. Standards and AWWA/ANSI C600 and AWWA/ANSI C651-05.

b. Prior to being placed in service, the entire line shall be chlorinated. The contractor shall place hypo chlorite tablets in each section of water pipe installed, including the hydrant branch, according to the table below:

Number of 5-Gram Calcium Hypo Chlorite Tablets Required (50 Mg/l Dose)

Length of Pipe Section (feet)	Diameter of Pipe (in.)						
	4	6	8	10	12	14	16
13 or less	1	2	2	3	5	6	8
13-17	1	2	3	5	6	8	11
18-20	1	2	3	5	7	9	12
21-30	2	3	5	7	10	14	18
31-40	2	4	6	9	14	18	24

c. Placing Tablets: Tablets shall be adhered to the inside top section of each pipe length using a food grade adhesive, such as Permatex Form-A-Gasket No. 2 or Permatex Clear RTV Silicon Adhesive Sealant as manufactured by Loctite Corporation, or approved equivalent.

d. Flushing: Within 48 hours of the end of the 24-hour retention period, the Contractor shall flush the heavily-chlorinated water from the main until the chlorine concentration in the water leaving the main is no higher than that prevailing in the system or is less than one (1) ppm chlorine residual as determined by the Engineer. The highly-chlorinated water shall not be discharged to any waterway where danger to fish or other aquatic life may occur. Decholination of the water may be necessary prior to discharge.

e. Bacteriological Testing: Two bacteria samples taken a minimum of 24 hours apart must be passed prior to placing the new main into service.

The Contractor shall sample for coliform bacteria contamination after all water lines have been flushed. One sample of water from the end of the disinfected/flushed line must be collected from new installation. The sample must be collected in the presence of a City of Spearfish Water/Wastewater Operator and then turned over to the operator for mailing. Both the contractor and the Spearfish Operator shall sign the Chain of Custody form prior to shipment of the sample. The contractor shall bear all costs for the bacteriological testing.

K. Hydrostatic Testing:

a. The Contractor shall perform all the work required in connection with the test and shall provide all the equipment including but not limited to a pressure gauge, water container, appropriate pump, valve, hydrant connection and corporation stop connection. The test shall be in accordance with AWWA C605-05.

b. Care shall be taken to expel all of the air from the mains and service lines while the test section is slowly being filled with water. If permanent air vents are not located at all high points, corporation cocks shall be installed at such points so that the air can be expelled as the system is filled with water. The cost of the corporation stops shall be considered incidental to the cost of the main. The lines should be filled at least 24 hours prior to testing.

c. The test section shall be placed under a constant 150 p.s.i. pressure measured at the point of lowest elevation for a minimum period of 2 hours. The test pressure shall not vary by more than +/- 5 p.s.i. for the duration of the test.

d. The testing allowance shall be defined as the quantity of makeup water that must be supplied into the newly laid pipe or any valved section thereof to maintain pressure within 5 p.s.i. of the specified test pressure after the pipe has been filled with water and the air has been expelled. Testing allowance shall not be measured by a drop in pressure in the test section over a period of time.

e. The amount of water required to maintain the specified test pressure shall be measured by an approved method. All valves, hydrants, etc., shall be in full “open” position during the test period. The PVC pipe shall be pressure and leakage tested in accordance with AWWA C605-05. The Ductile Iron pipe shall be pressure and leakage tested in accordance with AWWA C600. No pipe installation, PVC pipe or ductile

iron pipe will be accepted if the leakage is greater than that indicated in Table 200-7.

Table 200-7
ALLOWABLE LEAKAGE IN GALLONS PER HOUR PER 1000 FT OF PIPE (GPH)

Pipe.	Average Test Pressure (PSI)					
Dia. (in.)	50 psi (gph)	100 psi (gph)	150 psi (gph)	200 psi (gph)	250 psi (gph)	300 psi (gph)
4	0.19	0.27	0.33	0.38	0.43	0.47
6	0.29	0.41	0.50	0.57	0.64	0.70
8	0.38	0.54	0.66	0.76	0.85	0.94
10	0.48	0.68	0.83	0.96	1.07	1.17
12	0.57	0.81	0.99	1.15	1.28	1.40
14	0.67	0.95	1.16	1.34	1.50	1.64
16	0.76	1.08	1.32	1.53	1.71	1.87
18	0.86	1.22	1.49	1.72	1.92	2.11
20	0.96	1.35	1.66	1.91	2.14	2.34
24	1.15	1.62	1.99	2.29	2.56	2.81
30	1.43	2.03	2.48	2.87	3.21	3.51
36	1.72	2.43	2.98	3.44	3.85	4.21

f. Acceptance shall be determined on the basis of allowable leakage. If any test of installed pipe discloses leakage greater than that specified in Table 200-7, the Contractor shall, at his own expense, locate and make approved repairs as necessary until the leakage is within the specified allowance. All visible leaks shall be repaired, regardless of the amount of leakage.

Live Tapping Saddles

Live tapping saddles 4” and larger must be pressure tested to the same standards as the above PVC water services prior to tapping.

Tracer Wire Access Box

Tracer wire access box shall be a Valvco TWAB or equivalent and shall have a cast iron lid that can be locked and opened with a standard pentagon head key wrench. Tracer wires shall be stripped and attached to stainless steel screws mounted to the underside of the lid. Sufficient slack shall be left in wire length so cover can be lifted with wire intact. Tracer wire access box shall be located directly adjacent to the valve box or curb box and be set to grade.

Sanitary Sewer Lines

New Sewer Mains:

A. 4” Taps
    a. Will have in-line wyes with rubber gaskets for main and tap. (GPK Sewer fittings or approved equivalent)
    b. Taps will be set between the 11:00 and 1:00 position on the sewer main
    c. Sewer pipe for service line from sewer tap to the foundation wall will be ASTM D-3034, SDR-35 – Gaskets will conform to ASTM F-477.
    d. Required grade of service line is 2% = ¼’ per foot.
B. 6” Taps
    a. Will have in-line tees with rubber gaskets for main and tap. (GPK Sewer fittings or approved equivalent)
    b. Taps will be set between the 11:00 and 1:00 position on the sewer main.
    c. Sewer pipe for service line from sewer tap to foundation wall will be ASTM D-3034, SDR-35 – Gaskets will conform to ASTM F-477.
    d. Required grade of service line is 2% = 1/4 per foot.
C. 8” Taps and larger
    a. Will have a manhole installed where it connects to the sewer main.
    b. Manhole must meet all City of Spearfish specifications before installation.
    c. Sewer pipe for service line from the manhole to foundation will be ASTM-D-3034, SDR-35 – Gaskets will conform to ASTM F-477
    d. Required grade of service line is 2% = ¼’ per foot.

Existing PVC Sewer Mains:

A. 4” Taps
    a. Will have a PVC saddle wye with rubber gaskets for main and tap.
    b. Saddle will be fastened to the PVC sewer main with two stainless steel bands.
    c. Taps will be set between the 11:00 and 1:00 position on the sewer main unless grade of existing service cannot be obtained at these positions. City of Spearfish must approve any changes to the position of the tap.
    d. Hole to be cut out of sewer main for saddle will be cut ¼” larger than the hole in the saddle. This is to prevent a lip for solids and paper to catch on which could cause a backup in the service line.
    e. Sewer pipe for service line from sewer tap to foundation will be ASTM D-3034, SDR-35 – Gaskets will conform to ASTM F-477
    f. Required grade of service line is 2% - 1/4” per foot.
B. 6” Taps

a. Will have a PVC saddle tee with rubber gaskets for main and tap.
b. Saddle will be fastened to the PVC sewer main with two stainless steel bands.
c. Taps will be set between the 11:00 and 1:00 position on the sewer main unless grade of existing service cannot be obtained at these positions. City of Spearfish must approve any changes to the position of the tap.
d. Hole to be cut out of sewer main for saddle will be cut ¼" larger than the hole in the saddle. This is to prevent a lip for solids and paper to catch on which could cause a backup in the service line.
e. Sewer pipe for service line from sewer tap to foundation will be ASTM D-3034, SDR-35 – Gaskets will conform to ASTM F-477
f. Required grade of service line is 2% - 1/4" per foot.

C. 8" Taps (and larger)
a. Will have a manhole installed where it connects to the sewer main.
b. Manhole must meet all City of Spearfish specifications before installation
c. Sewer pipe for service line from manhole to foundation will be ASTM D-3034, SDR-35-gaskets will conform to ASTM F-477
d. Required grade of service line is 2% = ¼" per foot.

Existing Clay Tile Sewer Mains:

A. 4" Taps
a. Will have a rubber saddle wye. (A PVC saddle wye may be used if saddle fits main properly.)
b. Saddle will be fastened to the clay tile sewer main with two stainless steel bands.
c. Taps will be set between the 11:00 and 1:00 position on the sewer main unless grade of existing service cannot be obtained at these positions. City of Spearfish must approve any changes to the position of the tap.
d. A round hole will be cut out of sewer main for saddle and will be cut ¼" larger than the hole in the saddle. This is to prevent a lip for solids and paper to catch on which could cause a backup in the service line.
e. Sewer pipe for service line from sewer tap to foundation will be ASTM D-3034, SDR-35 – Gaskets will conform to ASTM F-477
f. Required grade of service line is 2% - 1/4" per foot.

B. 6" Taps
a. Will have a rubber saddle tee. (A PVC saddle tee may be used if saddle fits main properly.
b. Saddle will be fastened to the PVC sewer main with two stainless steel bands.
c. Taps will be set between the 11:00 and 1:00 position on the sewer main unless grade of existing service cannot be obtained at these positions. City of Spearfish must approve any changes to the position of the tap.

d. A round hole will be cut out of sewer main for saddle will be cut ¼" larger than the hole in the saddle. This is to prevent a lip for solids and paper to catch on which could cause a backup in the service line.
e. Sewer pipe for service line from sewer tap to foundation will be ASTM D-3034, SDR-35 – Gaskets will conform to ASTM F-477
f. Required grade of service line is 2% - 1/4" per foot.

C. 8" Taps (and larger)
a. Will have a manhole installed where it connects to the sewer main.
b. Manhole must meet all City of Spearfish specifications before installation
c. Sewer pipe for service line from manhole to foundation will be ASTM D-3034, SDR-35-gaskets will conform to ASTM F-477
d. Required grade of service line is 2% = ¼" per foot.

Existing Sewer Service Connections:

A. PVC Service Lines
a. A PVC gasketed repair coupling with no stop in center shall be used to tie plastic service lines to new taps on sewer main.
B. Clay Service Lines
a. A "Fernco" PVC to clay rubber boot (or approved equivalent) shall be used to tie clay service lines to new taps on sewer main.
C. Orange Burg Service Lines
a. A "Fernco" rubber coupling (or equivalent) shall be used to tie orange burg service lines to new taps on sewer main.

Water Main and Sewer Main/Storm Sewer Separation

A. Vertical Separation at Crossings:

Water mains may cross above sanitary and storm sewers with a minimum vertical distance of eighteen (18) inches between the invert of the water main and the top of the sewer. In these cases where the water main is above the sewer and there is at least 18 in. of separation, then at the crossings one full 20 ft. length of water pipe shall be centered on the crossing.

A water main may cross above a sewer main with a vertical separation of less than eighteen (18) inches or below the sewer main if either the water or sewer main is encased in PVC or ductile iron or cast iron for at least ten (10) feet each side of the crossing. If PVC or ductile iron is utilized as encasement material, the ends shall be sealed with six (6) inches of concrete.
Water mains crossing under vitrified clay sewer pipes or concrete sewer pipes shall be encased in six (6) inches of concrete extending ten (10) feet either side of the crossing.

The 10 feet either side shall be measured from the outside wall of the sewer to the end of the encasement and is not measured from the centerline of the sewer main.

B. Water Main and Sewer Main/Storm Sewer Horizontal Separation:

Water mains shall be constructed with 10 feet of horizontal separation from any existing sanitary or storm sewer or proposed sanitary or storm sewer. The 10 feet horizontal separation shall be the clear distance (water pipe sidewall to sewer pipe sidewall) and not the centerline distance between the utilities.

The following installation requires Engineer's approval and is appropriate for installations where the 10 feet separation physically is not possible.

A water main may be constructed closer than 10 feet to a Sanitary or Storm sewer if it is laid in a separate trench or it is laid in the same trench and the water main is located on the opposite side on a bench of undisturbed earth.

In both cases, the elevation of the crown of the sewer has to be at least 18 inches below the invert of the water main. The sewer main shall be constructed of water main pipe (pressure class pipe) meeting the requirements of Section 200.4 and pressure tested for water tightness in accordance with AWWA standards for leakage testing.

As an alternative to constructing the sewer with water main pipe (pressure class pipe) and pressure testing the sewer, it would also be acceptable to either encase the water or sewer main within a PVC or cast iron casing.