

Section 13
SITE WATER SUPPLY, GAS SUPPLY AND SANITARY SEWER CONNECTION

A. GENERAL

This work shall include all sitework to provide water, gas and sanitary sewer connections from the existing supply to the new building. Internal water, gas and sanitary shall be by the individual contractors in the respective contracts.

The location of the proposed work and actual extent of the various Contract items are either shown on the Contract Plans or described in the Detailed Specifications. The work to be done under this Contract shall include the furnishing of all labor, materials, equipment and tools necessary to construct the indicated water, gas and sewer pipelines, including all appurtenances, complete and operable, in a satisfactory workmanlike manner and in accordance with the Contract Documents.

The work shall include, but not be limited to, the following:

1. Clearing and grubbing along the line of work.
2. Provision of protection prior to starting work for all landscaping, utilities, structures and facilities which might be damaged if not protected.
3. Removal and stockpiling of topsoil.
4. Removal and storage of bushes, shrubs and trees to be replanted.
5. Removal of paving, landscaping, fences, barriers and obstructions as required.
6. Hauling, unloading and distribution of the pipe fittings and appurtenances.
7. Excavation, including extra depth excavation for bells, joints and proper bedding.
8. Barricades, fencing, lighting, watching and protection of the site.
9. Reconstruction or relocation of other lines, pipes, ducts and utilities as necessary.
10. All sheeting, bracing, shoring and supporting necessary to protect adjoining ground and adjacent structures.
11. Sheeting and shoring necessary for the safety of workmen in the trench and necessary to comply with all applicable safety codes.
12. Pumping, bailing or draining of the trench as required to permit proper execution of the work.
13. Laying of the water, gas and sewer pipeline and installation of all appurtenances, including anchors, cradles, encasement, etc.

14. Connection to other water, gas and sewers as required and including installation of stubs, wyes and service laterals.
15. Tunneling, boring, jacking and the installation of all types of carrier pipe, casing or liner plate.
16. Backfilling and tamping of the pipeline trench.
17. Repair or replacement of all damaged drains, sewers, utilities and structures, including gas lines, water lines, sanitary sewers, storm sewers, oil lines, gasoline lines, electrical conduit and cables, utility poles, culverts, bridges, foundations, driveways, streets and other items as required.
18. Testing of completed pipeline sections for watertight condition.
19. Maintenance of the streets and other surfaces over the trenches and other areas affected by the work.
20. Proper completion of all work in accordance with the Contract Documents.

Any exception to the foregoing requirements will be specifically noted on the Drawings or in the Detailed Specifications.

B. GAS SUPPLY PIPING

1. This Contractor shall install all new gas service line with isolation valves from the existing Gas Meter to the new building (minimum isolation at each end of new line).
2. All gas piping shall be of materials approved by and installed in strict compliance with the requirements of the National Fuel Gas Code, the gas supplier and all applicable codes.
3. All exposed steel piping shall be painted with two coats of Rustoleum, a prime coat and a final yellow coat.
4. Site gas piping shall be SDR-9 HDPE plastic or as required by the gas supplier. Coordinate the installation with gas supplier. Install tracer tape with the line.
5. Notification Tape and Detectable Wire - All installations of non-metallic pipeline shall include the furnishing and installation of identification tape and copper tracing wire (#10 size). This tape shall be constructed of non-degradable plastic at least 6" wide, shall be yellow in color and imprinted in a contrasting color with the words "CAUTION – BURIED GAS LINE BELOW". The tape shall be installed at a depth of twelve to eighteen inches below the surface. Cost is to be included in pipe installation.

C. WATER SERVICE LINE

1. This Contractor shall provide an extension of domestic water service line from the existing water service provided to the municipal offices as shown on the plan.
2. The Contractor shall furnish and install 1" service lines, corporation stops, tapping saddles, curb boxes and curb stops.
3. Service Line Material

a. Corporation Stops

The corporation stops designed for insertion into water mains under pressure and shall be, depending on specified size, Ford Meter Box Company, Inc., F600, F1000 or FB1000, or approved equal. The stops shall be constructed with an inlet and outlet fitting CC thread or flanged compression fittings iron pipe size threads, Type K, when copper service pipes are used. When PVC service pipes are used, the pipe should be Copper Tube Size (CTS) and must be back 100 feet or more and require a vault.

The corporation stops shall be precision fitted and individually lapped ground key stops. The threaded end of the key shall be designed so that tightening of the key as many times as is required for normal adjustment will merely strip the threads instead of breaking the stem. The stop shall be of all bronze construction. Each corporation stop and/or pressure quick tap fitting shall be fully tested in both open and closed position with air pressure under water.

b. Curb Stops

Curb Stops shall be, depending on specified size, Ford Meter Box Company, Inc., B22-333, B22-777, B44-333, B44-777, or approved equal, unless otherwise indicated in the Detailed Specifications. The stops shall be constructed with an inlet and outlet having fitting threads for use with flared copper service tubes, Type K, or plastic (PVC) pipe with the same outside diameter as Type K copper.

c. Curb Boxes

Curb boxes shall be either screw type or sliding type, as specified, PVC with cast iron lid with the word "WATER" cast into it, and shall be Bingham and Taylor Series 200, or approved equal. The curb boxes shall be Type 200 Bingham and Taylor having an extension of 4'0" to 5'6". The shaft shall be 2-1/2" in size. The curb boxes shall be constructed of cast iron.

The screw for the curb box lid shall be made of red brass, be about 17/32" in diameter, be about 1-13/32" long, and have 12 threads to the inch. The curb box lid shall be furnished with the "Water" cast thereon.

d. Copper Pipe

The copper pipe shall be seamless tubing designed for underground water service, and shall be the Type K, as manufactured in accordance with Federal Specification WW-7-799, or the Type K, as manufactured in accordance with the A.S.T.M. Specification B88-47.

The copper tubing shall be in accordance with the following:

Standard Water Tube Size - Inches	Actual O.D. Inches	Theoretical Wt. per foot - pound
3/4"	0.875	0.641
1"	1.125	0.830

e. Service Saddles

For C-900 PVC Pipe style, service saddles shall be AWWA Thread 3/4" to 2" A.Y. McDonald 3825, Brass, Double Strap, Mueller BRRB, Ford 202B, or approved equal.

4. Pipe Anchors and Thrust Blocking

Pipe anchors shall be installed on every line laid at a grade equal to or greater than 15%, and where indicated on the Contract Plans. The Contractor shall block all bends in excess of 10 degrees. All plugs caps, tees, wye branches, and other fittings shall be in accordance with the Detail Drawings. Suitable metal rods or clamps shall be installed to prevent movement of fitting where necessary. The installation of the items will be incidental to the job and should be included in the overall cost of the project.

C. SANITARY SEWER LATERAL

1. This Contractor shall provide sanitary sewer lateral from the new building to the existing sanitary sewer lateral as shown on the plan.
2. Unless superseded by Detailed Specifications, Drawings or special conditions or instructions, material used in the construction of sewers or appurtenances shall conform to the following. All sewers and appurtenances shall be manufactured in accordance with the latest applicable specifications as indicated herein. The Contractor shall submit such alternate bids as are required relative to the use of different types of pipe.

a. PVC Gravity Sewer Pipe

PVC Gravity Sewer Pipe shall meet or exceed the requirements of Standard Specifications for Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings A.S.T.M. Designation D-3034, latest revision, and as further described herein. The pipe and fittings shall have thicknesses, dimensions and properties as described under the Designation SDR-35. Pipe shall be furnished in standard lengths of twelve and one-half feet with a tolerance of one inch.

All fittings and accessories shall be manufactured and furnished by the pipe manufacturer. Pipe shall be capable of passing the pipe stiffness, pipe flattening, impact resistance and joint tightness tests as described in A.S.T.M. Designation D-3034 and other referenced A.S.T.M. designations. Pipe shall have compression joints conforming to the material, testing and performance requirements of Standard Specifications A.S.T.M. Designation D-1869, latest revision.

All PVC pipe and fittings used on the project shall be certified by the manufacturer to have met the requirements of these Specifications. Each section of pipe shall be marked as indicated in A.S.T.M. Designation D-3034, with the manufacturer's name, wall thickness and type. All PVC pipe must not be stored in areas where it is exposed to extreme temperatures, hot and cold, and direct sunlight. Any material showing discoloration will not be permitted for use in the system.

b. Wye Branches

Branches for connections fitted with suitable stoppers shall be laid at the points and in the positions called for on the Drawings or as directed by the Engineer. Each branch shall be located by the Contractor and its station recorded relative to the downstream manhole.

During the process of laying the pipe, care shall be taken to protect both pipe and joint from disturbance, and the trench shall be kept free of water until the joint shall have set. At all times when pipe laying is not actually in progress, the open ends of pipe shall be closed by temporary watertight plugs or by other approved means. If water is in the trench when work is resumed, the plug shall not be removed until all danger of earth or other materials entering the pipe has passed.

c. Notification Tape and Detectable Wire

All installations of non-metallic pipeline shall include the furnishing and installation of identification tape and copper tracing wire (#10 size). This tape shall be constructed of non-degradable plastic at least 6" wide, shall be green in color and imprinted in a contrasting color with the words "CAUTION – BURIED SEWER LINE BELOW". The tape shall be installed at a depth of twelve to eighteen inches below the surface. Cost is to be included in pipe installation.

d. Testing

The Contractor shall provide a low-pressure air test test to determine the tightness of the lateral sewer joints.

The section of pipe to be tested must be isolated by completely plugging all outlets. All plugs must be braced to prevent slippage and blow-out due to the internal pressure.

One of the plugs must be equipped with an air inlet tap for connection of an air hose. This test should be performed on a pipe which is in a damp condition to minimize loss of air through the pipe wall as a result of air permeability.

When air pressure is applied, it should be monitored and controlled so that at no time will it exceed 5 psig. The air pressure should be maintained between 4.0 and 3.5 psig for a period of at least two minutes in order to stabilize the air temperature. During this period, plugs may be checked for tightness.

After the air temperature has been allowed to stabilize, the air supply is to be disconnected and the pressure allowed to decrease to 3.5 psig. At 3.5 psig a stop watch will be started to determine the time required for the pressure to drop to 2.5 psig.

This time required for a loss of 1.0 psi at an average pressure must be 3 psi greater than the average back pressure of any ground water in order for the test to have significance and, therefore, if the ground water surface is higher than the sewer centerline the air test pressure is to be increased by one psig for each 2.3 feet by which the water surface is higher than the pipe centerline.

The pipeline will pass the low pressure air test if the loss of air is not greater than a rate of 0.0030 cubic feet per minute per square foot of internal pipe surface. The loss of air will be considered acceptable if the time for the pressure to drop one psi is not less than that shown in the following table, for the respective pipe diameters:

ALLOWABLE TIME TABLE

Pipe Size	Time		Pipe Size	Time	
	Min.	Sec.		Min.	Sec.
6"	2	15	36"	17	00
7"	3	18	42"	19	50
8"	3	57	48"	22	40
10"	4	43	54"	25	30
12"	5	40	60"	28	20
15"	7	5	66"	31	10
18"	8	30	72"	34	00
21"	9	50	84"	39	40
24"	11	20	96"	47	00
27"	12	45	108"	51	00
30"	14	10			

If the leakage exceeds these amounts, the Contractor shall determine the cause of the leakage and make such repairs or replacement as found necessary until the sewer is found to comply with the requirements of this hydrostatic test.

D. Delivery, Handling and Storage

The Contractor shall be responsible for all materials and equipment furnished by him and shall replace, at his own expense, all such material or equipment found defective in manufacture or damaged in delivery or in handling after delivery. This shall include responsibility for furnishing labor and material required for the replacement of installed material found defective prior to the final acceptance of the work.

The pipe, fittings and other appurtenances shall be hauled to the site from the point of delivery, and unloaded by means that will not result in any damage. Under no circumstances, shall material be dropped from the truck. The pipe and fittings shall always be handled with care to prevent damage when being transported, loaded or unloaded.

The pipe and fittings shall be unloaded and either stored or placed near where they are to be laid in the trench, with the bell or proper ends facing in the direction in which the work will proceed, exercising care and keeping the pipe and fittings free from dirt and foreign material.

END OF SECTION