



City of New Britain



Standard Specifications For Municipal Construction

**Prepared & Issued
By
City of New Britain
Water Department**

Gilbert Bligh, P.E – Director
Kenneth W. Marzi, Superintendent of Water
July 2011

**NEW BRITAIN WATER DEPARTMENT
1 000 SHUTTLE MEADOW AVE.
NEW BRITAIN, CT 06052**



**PHONE: 860-826-3536
FAX: 860-826-3551**

INDEX

Building Contractors (Notice): Pg. 48

Butterfly Valves: Pgs. 17-19

Description: pg. 18

Materials: pg. 18

Construction Methods: pg. 19

Measurement and Payment: pg. 19

Contractor's Material & Test Certificate for Underground Piping: Pg. 40

Contractor's Qualification Form: Pgs. 36-38

Cut and Plug Existing Water Main: Pgs. 30-31

Description: pg. 30

Materials: pg. 30-31

Construction Details: pg. 31

Details: Back of booklet

D.I. Water Main: Pgs. 2-16

Description: pg. 2

Materials: pgs. 2-5

Pipe and Fittings: pg. 2-3

Joints: pg. 3

Lining and Coating: pg. 3

Testing of Ductile Iron Pipe: pg. 4-5

Testing of Cast Iron Fittings: pg. 5

Construction Methods: pgs. 6-16

General: pgs. 6-7

Inspection: pg. 7

Alignment and Grade: pg. 7

Hauling and Distribution of Pipe: pg. 8

Dewatering: pg. 8

Excavation and Backfill: pg. 8

Laying of Pipe: pg. 8-10

Lowering of Water Main Material into Trench: pg. 10

Inspection Before Installation: pg. 11

Cleaning or Pipe and Fittings: pg. 11

Pipe Installation: pgs. 11-12

Cutting of Pipe: pg. 12

Bell Ends to Face Direction of Laying: pg. 12

Permissible Deflection at Joints: pg. 12

Pipe Joining: pgs. 12-13

Axial Thrust: pg. 14

Testing and Disinfection: pg. 14-15

Water Main Construction in Proximity to Sewers: pg. 15

Water Main Construction Crossing Sewers: pg. 15

Measurement pg. 16

Payment: pg. 16

Disinfection of all Water Mains: Pg. 39

Domestic Water Lines with Fire Sprinklers: Pgs. 45-46

Excavating Contractors (Notice): Pg. 47

Exterior Reduced Pressure Device and Protection: Pgs. 32-33

Description: pg. 32

Materials: pg. 32

Construction Methods: pg. 32

Underground Installation: pg. 32

Above Ground, Seasonal: pg. 33

Fire Flow Tests: Pg. 44

Freeze Service Line to Replace Gate Valve Policy: Pgs. 53-54

Gate Valves: Pgs. 16-17

Description: pg. 16

Materials: pg. 16-17

Construction Methods: pg. 17

Measurement and Payment: pg. 17

Hydrants: Pgs. 25-28

Description: pg. 25

Materials: pg. 25-26

Construction Methods: pg. 26-28

Method of Measurement: pg. 28

Basis of Payment: pg. 28

Hydrant Use Regulations: Pg. 41-42

Hydrant Use Permit: Pg. 43

Joint Restraints/Thrust Blocks: Pgs. 28-30

Description: pgs. 28-29

Materials: pg. 29

Construction Methods: pgs. 29-30

Method of Measurement: pg. 30

Basis of Payment: pg. 30

Permanent Right of Way and Easement: Pgs. 55-56

INDEX

Relay Water Services/Corporation Stops (2" and Smaller): Pgs. 22-24

Description: pg. 22

Materials: pg. 22

Construction Methods: pg. 22-23

Method of Measurement: pg. 24

Basis of Payment: pg. 24

Reports: Pgs. 49-51

Schedule A: Pg. 57

Shut-Off Valves- 2" and Smaller: Pgs. 21-22

Description: pg. 21

*Materials and Construction Methods:
pg. 21*

Measurement and Payment: pg. 22

Specifications: Pg. 35

Tapping Sleeve and Valves: Pgs. 19-21

Description: pg. 19

Materials: pg. 19-20

Construction Methods: pg. 20

Measurement and Payment: pg. 20-21

Water Tap Permit Policy: Pg. 52



DETAILED WRITTEN
MATERIAL & INSTALLATION
INSTRUCTIONS
&
SPECIFICATIONS



D.I. WATER MAIN

1. DESCRIPTION

Under this item, the Contractor shall furnish and install all cement lined ductile iron water main with all joints, fittings, castings and other appurtenances and shall test and disinfect said mains, all as specifically called for herein, as shown on the plans or as ordered by the Director of Water. This work shall include the maintenance and protection of all existing water mains and appurtenances by the Contractor unless otherwise noted. Work shall also include the removal of the existing water mains. (Cutting and plugging.)

2. MATERIALS

A. Pipe and Fittings

All ductile iron pipe shall be new pipe manufactured in accordance with A.W.W.A. C151, ANSI A21.51-81 or latest revision thereof.

Any cut pipe that does not socket, due to the outside diameter of the pipe barrel exceeding the tolerances stated in the American Standard Specifications, shall be replaced with new pipe.

The ductile iron pipe to be furnished shall conform to the following dimensions and classes:

<u>Size (Inches)</u>	<u>Thickness Class</u>
4	52
6	52
8	52
12	52

All fittings of all sizes shall be cast iron cement lined mechanical joint type, Class 250, short pattern ANSI 21. 10-77 A.W.W.A. C-110-76, plus tar coating on exterior and interior or Ductile Iron cement lined.

Where services or hydrants are called for on the plans, the Contractor shall provide tees of the mechanical type for the new pipe to accommodate these services and thereby reduce the number of taps into the new pipe.

Each pipe shall have cast on it or stamped on it by means of a hand die stamp, the maker's name or mark, the letters "DI" and the casting date (month, day and year), as required by the American National Standards Institute Specifications. The length and weight of the pipe,



thickness class and running (serial) number shall be painted on each pipe, as required by the American National Standards Institute Specifications. All fittings shall be identified in a similar manner.

B. Joints

Pipe joints shall be either the mechanical or push-on type which employ a single elongated grooved rubber gasket to effect a watertight joint seal except for 6" pipe which shall have mechanical joints only. Leadite joints will only be permitted when connecting to an existing pipe, as approved by the Engineer.

All fittings shall be mechanical joint only.

The rubber gaskets for the pipe shall be manufactured from first quality rubber with the heel of the gasket having a durometer hardness of 83+5, and the bulb of plantation stock natural rubber having a durometer hardness of 53+5, similar to the gaskets used in a mechanical or push-on type joints as manufactured by the United States Pipe and Foundry Company, or approved equal.

Rubber gaskets shall be furnished with the pipe and shall be considered included in the price quoted per linear foot of pipe. The gasket shall be plainly identified as the pipe size and packaged in a suitable and satisfactory manner for shipment.

C. Lining and Coating

All pipe and fittings shall be lined with cement mortar in accordance with the American National Standards Institute Specifications for Cement Lining for Ductile Iron Pipe and Gray-Iron and Fittings, for water A21. 4-80, A.W.W.A. C104. Single copies of the results of thickness determinations in accord with Section 4-16 shall be submitted.

All pipe and fittings shall be coated inside and outside with an approved bituminous material neither sufficiently soft to flow when exposed to the summer sun, nor brittle enough to crack and scale off when exposed to temperature below freezing.

Sample of coating material shall be submitted and approval obtained before coating any pipe or fitting, if requested by the New Britain Water Department.

Coating may be applied by either painting, dipping, or spraying, but in no case is the pipe, fitting or the coating material to be heated to a high enough temperature to be detrimental to the cement lining. In addition, the coating of the interior shall conform with the requirements of American National Standards Institute Specifications A21. 4-80.



D. Testing of Ductile Iron Pipe

I. Testing for Preliminary Evidence of Ductility

From the last length of pipe poured from each ladle in which inoculation for ductile iron is done, a ring shall be cut from the spigot end. A ring section from such ring, at least one inch wide, shall be subjected to pressure along a diameter and the deflection measured.

Preliminary evidence of ductility will be presumed if the minimum deflection without failure is as follows:

<u>Nominal Pipe Size</u>	<u>Minimum Deflection</u>
3"	1/4"
4"	3/8"
6"	1/2"
8"	5/8"
10"	3/4"
12"	7/8"
16"	1-1/8"
20"	1-3/8"
24"	1-5/8"

If a ring does not meet the above deflection test, a second ring may be cut and tested. If both rings fail, all pieces of pipe from that ladle may be rejected by the manufacturer; or each pipe successively preceding that pipe during manufacture may be tested as above for preliminary acceptance. When a pipe is reached which passes the test, it and the other before it are acceptable, subject to final acceptance tests below.

Pipe failing the preliminary deflection test shall be so marked and removed from the storage area used for acceptable City pipe.

If all pipe made from that ladle fail, a pipe case from the last previous and first subsequent ladle shall be retested to assure that the failures are confined to the bracketed ladle.

In lieu of ring tests for preliminary evidence of ductility, the City may accept an alternate test offered by a manufacturer, provided that in the opinion of the city, it gives such evidence of ductility and that the frequency of such test during manufacture is acceptable to the city.

II. Final Acceptances

Final acceptance shall be on tests and values conforming to Sections 51-12 and 51-13 of the ASA standard above. Paragraph 51-12.3 shall be modified to read: At least one tensile sample and six impact samples shall be taken from pipe during each casting period of



approximately 3 hours, such that each hour of production is equally represented. As an alternate, one tensile and two impact samples shall be taken from pipe made from every fifth ladle in which inoculation from ductile iron had been done, provided that less than 3 hours have elapsed between the first and fifth ladle inoculations. Samples shall be selected to properly represent extremes of pipe diameters and thickness.

If ductile cast iron pipe being made for the City is intermixed with pipe being made for others, the City pipe shall be the source of the sample, as closely located as possible to the above criteria of time or ladle.

Substitute for Sections 51-17 and 51-18 of ANSI. 51-81 the following on rejecting of pipe:

“If the results of any physical acceptance test fail to meet the requirements of Section 51-12 or Section 51-16 of ANSI A21.51-81, City pipe cast in the same casting period shall be rejected, except if the manufacturer elects the following procedure:

The manufacturer may determine the number of pipe warranting acceptance by making similar additional tests on City pipe preceding the failed pipe and City pipe following the failed pipe, in order of manufacture, until pipe which fail and are rejected are bracketed by City pipe are intermixed in that same casting period, the acceptability of pipe of different sizes may be established by a similar bracketing procedure for each size involved.”

Rejected City pipe shall be so marked and removed from the same storage area used for acceptable City pipe.

The manufacturer shall submit a sworn statement that the inspection and all of the specified tests have been made and the results thereof comply with the requirements of ANSI 21.51-81 and the additional requirements set forth in this specification.

E. Testing of Cast Iron Fittings

All requirements of the American National Standards Institute Specifications will be rigidly enforced and the foundry shall submit single copies of the reports of chemical analysis, secant modulus of elasticity and modulus of rupture as the work progresses.

The manufacturer shall make a hardness test on the outside of each and every length of fitting and any fitting exceeding the equivalent Rockwell Number of B-95 shall be rejected. A certified statement that hardness tests have been made and met as specified shall be submitted, in addition to the manufacturer’s certification as required in Section 6-4 and B-4 of the American National Standards Institute Specifications.



3. CONSTRUCTION METHODS

A. General

Where water main connections are called for on the plans, the Contractor shall provide tees of the mechanical type for the new pipe to accommodate these services and thereby reduce the number of taps into the new pipe.

On or before the completion of the work, the Contractor shall return all unused or salvaged materials to the Water Department yard. The Contractor will unload the materials from the Contractor's trucks. However, acceptance of the unused materials will be subject to inspection for condition and usability (in the case of cut pipe) by the Director of Water.

Water Main Pipe shall be of the sizes, types and materials indicated by the Contract Documents with no substitutions. All pipe shall be laid, supported, jointed, tested and backfilled as indicated or required for the particular job, location, or condition by the Contract Drawings, Technical Specifications, or other Contract Documents. All pipe, when in place, shall be to the line and grade indicated therefore in the Contract documents or directed by the Director of Water, sound, well laid, jointed and bedded and free from defects.

At the start of each job, when the Contractor is in a position to start laying the pipe, he shall notify the proper representative of the supplying pipe company who will come to the job and thoroughly instruct the Contractor, his men and the Inspector in the proper methods of laying said pipe. The Contractor shall notify his men who are actually doing the laying that this method shall be strictly enforced unless otherwise specified or directed by the Engineer.

Details of gasket attachment and joint formation will, in general, follow the directions of the manufacturer of the joint material and of the pipe, based upon the design thereof and their experience with such joints elsewhere, all subject to approval of the Engineer.

All harnessing rods, nuts, washers, ductile iron pipe, fittings, flexible couplings, socket clamps for harnessing shall be coated with two layers of Interol 49 thick to a total dry film thickness not less than 4 mils.

At any time during pipe-laying operations, if the occasion arises, when instruction or advice is required from a pipe representative, he shall be notified and shall come to the site of pipe-laying operations for consultation before any further pipe is laid involving any such problems.

In this contract the top of the pipe shall be laid at 4 ½ feet below the street grade except as otherwise shown on drawings or directed by the Engineer. The bottom of the trench shall be at the bottom of the pipe.



The Contractor shall not start any pipe work until he has satisfied the Director of Water that he has on hand and available the following minimum equipment:

Wheel pipe cutters, wheeled hydraulic pipe cutter or a pipe saw for the sizes of pipe to be laid; ratchet type socket wrenches for mechanical joint bolts and nuts; a lead furnace; an air compressor and pneumatic tampers; a dry tapping machine; at least two expandable pipe stoppers of the proper size for closing the end of the pipe being laid when not actually laying pipe; and a torch for burning out leadite or lead joints.

The Contractor shall give the City Water Department/Local Water Company at least 48 hours notice to cut, plug or disconnect their facilities or any other work which the Water Department/Company has agreed to do to facilitate the Contractor's work.

B. Inspection

I. One Inspector per Pipe-Laying Crew

To enable the representatives of the Director of Water to oversee pipe-laying and other work, in general, only one pipe-laying crew will be permitted to operate at any time under one Inspector. Thus, the number of pipe-laying crews and the number of locations at which pipe may be laid simultaneously under this Contract may be limited by the number of Inspectors assigned by the Director of Water to oversee that type of work on the Contract. If the Contractor wishes to lay pipe at more than one location on a given day, or additional pipe-laying crews, he must notify the Director of Water at least two days in advance so that an adequate number of inspectors may be assigned to the job.

II. Field Inspection

All pipe and accessories shall be laid, joined, and tested under pressure for defects and leakage in the manner herein specified and in the presence of, and as approved by, the Engineer.

C. Alignment and Grade

The Contract Drawings show the proposed line and grade and the location of appurtenances. The line and grade shown may be modified as necessary by the Director of Water in order to meet field conditions. Whenever obstructions not shown on the Contract Drawings are encountered during the progress of the work and interference to such an extent that an alteration in the Contract Drawings is required, the Director of Water shall have the authority to change the Contract Drawings and order a deviation from the line and grade or arrange with the owners of the structures for the removal, relocation or reconstruction of the obstruction. However, the minimum cover as specified or shown on the Contract Drawings shall be maintained unless otherwise directed by the Director or Water. See also "Water Main Construction in Proximity to Storm/Sanitary Sewers."



D. Hauling and Distribution of Pipe

Pipe, fittings, valves, hydrants and accessories shall be loaded and unloaded by lifting with hoists or skidding so as to avoid shock or damage. Under no circumstances shall such materials be dropped. Pipe handled on skidways shall not be skidded or rolled against pipe already on the ground. In distributing the material at the site of the work, each piece shall be unloaded opposite or near the place where it is to be laid in the trench.

Pipe shall be so handled that the coating and lining will not be damaged. If, however, any part of the coating or lining is damaged, the repairs shall be made by the Contractor at his expense in a manner satisfactory to the Director of Water.

E. Dewatering

The Contractor shall provide all necessary pumps, dams, drains, ditches, flumes, well points and other means for excluding and removing water from trenches, tunnels, and other parts of the work, and for preventing the slopes from sliding or caving all in accordance with the Items "Trench Excavation" and "Trench Backfill".

F. Excavation and Backfill

Methods of excavation and backfilling shall be in conformance with the applicable sections of the Items "Trench Excavation and Backfill".

G. Laying of Pipe

G-1) Pipe Laid on Natural Soil or Type I Bedding

G-1a) Pipe laid on Natural Soil: Where no foundation or special bedding is required, pipe shall be laid as follows:

The undisturbed natural soil at the bottom of the trench shall be excavated carefully by hand just before pipes are set in place to conform as nearly as possible to the shape and grade of the outside of the lower part of the pipe barrel. Holes shall be dug to contain bells so that pipe will rest upon barrels. The trench bottom shall be such that the barrel of the pipe will be evenly supported for its entire length except for a distance of not over 12 inches beyond the end of the bell. Pipe shall not be supported by the bells or by lumps of soil, sills, shims, etc.

Skilled workmen must be employed who can and will accurately excavate to subgrade for the pipe. If at any point the subgrade is too low, the excess space shall be filled with crushed stone, gravel or concrete, without cost to the Local Public Agency.



Pipe will then be laid accurately to grade and line, pushed home against the end of the last pipe previously laid and held in position. Sufficient fine native soil or gravel fill as required shall then be placed on each side to hold the pipe in position while the joint is being made. Joints will then be made, as described elsewhere, and inspected. Backfill of fine granular native soil or gravel fill as required will then be placed on both sides of pipe in thin layers and well rammed into place. Holes under bells must be completely filled. Suitable tools must be provided and used to ram the fill tightly under and against the rounded sides of the pipe so that all space on each side of each pipe is entirely filled and well-compacted material.

G-1b) Pipe laid on Type I Bedding: The provisions of paragraph 1a) above, "Pipe Laid on Natural Soil" shall apply except that the Contractor may, at his option, over-excavate the trench and backfill with gravel fill as bedding material directly under the pipe, a minimum of 4 inches and pre-shape same to a height of 10 percent of the total height of the pipe. After the pipe has been installed, the trench shall be backfilled with granular materials for bedding to a height of 25 percent of the total height of the pipe. Note that granular fill for bedding shall simply be granular fill as specified, but with stones over 2 inches in diameter removed from close proximity to the pipe barrel. No payment will be made for granular fill when this pipe bedding option is selected by the Contractor and the Director of Water is of the opinion that natural soil is adequate so that the pipe could be laid on natural soil as in the paragraphs above. Should the Engineer elect to direct gravel fill to be utilized for the remainder of the trench backfill, the bottom payment line for gravel fill will be the top surface of the Type 1 bedding.

G-2) Pipe Laid on Foundation Stone

Foundations of Foundation Stone required by the Contract Drawings, other Contract Documents or ordered by the Engineer, shall be constructed as required or ordered. The top of the stone shall be brought carefully to the proper grade well tamped or compacted as may be directed and shaped for the barrel of the pipe and the pipe laid thereon.

G-3) Concrete Foundations

Where called for on the Contract Drawings or directed by the Engineer, pipe shall be constructed on a concrete slab, on a concrete cradle, on foundation stone with concrete cap, or encased entirely in concrete. Slabs may be pre-poured ahead of pipe placement or poured integrally with the cradle after the pipe is placed, at the option of the Contractor and subject to the approval of the Engineer.

Where pipe is to be laid on a foundation as described in preceding sections and encased or bedded in concrete above that base, it will be laid as described in those



sections and then concrete will be placed on each side up to the height or extent required, using methods that will insure that all spaces under and on the sides of the pipe are completely filled. Concrete will be carried out to the trench walls or to sheeting resting against those walls or to the minimum required lines if such lines are stipulated for the job.

Where pipe is to be encased in concrete or laid in a Class "A" Concrete cradle, as detailed in the drawings or directed by the Director of Water, the pipe will be laid on wooden cross sills of adequate size and area to support the pipe to grade and line after excavating to required subgrade. Wooden wedges or shims and tie downs will be used to secure pipe in place and to proper lines and grades.

A pre-poured foundation will consist of a slab of Class "A" concrete of the sizes and dimensions shown on the Contract Drawings and of such thickness and width as the Engineer may order, poured into place a sufficient time in advance of laying pipe thereon so that the concrete will have set prior to laying pipe.

The time required for and the degree of setting of concrete will be approved by the Director of Water (minimum of three (3) days). The upper surface of the concrete base will be carefully leveled off to a grade about 2 inches below the bottom of the barrel of the pipe for a sufficient width. The top of the pre-poured slab should contain adequate bell holes. Pipe will then be laid to line and grade, using wooden shims or wedges as necessary, jointed as specified elsewhere, and then the space between slab and lower surface of pipe filled with concrete carried up to such height as may be required. Concrete will be poured in from one side until it appears flowing through into the other side. Backfill on sides of pipe above the concrete base will be as specified or as directed by the Director of Water. Backfill shall not be placed thereon for two (2) days unless public safety requires otherwise.

H. Lowering of Water Main Material into Trench

Proper implements, tools and facilities satisfactory to the Engineer shall be provided and used by the Contractor for the safe and convenient performance of the work. All pipe fittings, valves and hydrants shall be carefully lowered into the trench piece by piece by means of a derrick, ropes or other suitable tools or equipment, in such a manner as to prevent damage to water main materials and protective coatings and linings. Under no circumstances shall water main materials be dropped or dumped into the trench.

If the damage occurs to any pipe, fittings, valves, hydrants or water main accessories in handling, the damage shall be immediately brought to the Engineer's attention. The Director of Water shall prescribe corrective repairs or rejection of the damaged items.



I. Inspection Before Installation

All pipe fittings shall be carefully examined for cracks and other defects while suspended above the trench immediately before installation in final position, as specified. Spigot ends shall be examined with particular care as this area is the most vulnerable to damage from handling. Defective pipe or fittings shall be laid aside for inspection by the Director of Water, who will prescribe corrective repairs or rejection.

J. Cleaning of Pipe and Fittings

All lumps, blisters and excess coating shall be removed from the bell-and-spigot end of each pipe, and the outside of the spigot and the inside of the bell shall be wire brushed and wiped clean and dry and free from all oil and grease before the pipe is laid.

K. Pipe Installation

Every precaution shall be taken to prevent foreign material from entering the pipe while it is being placed in the line. If the pipe laying crew cannot put the pipe into trench and in place without getting earth into it, the Engineer may require that before lowering the pipe into the trench, a heavy, tightly woven canvas bag of suitable size shall be placed over each end and left there until the connection is made to the adjacent pipe. During laying operations, no debris, tools, clothing or other materials shall be placed in the pipe.

As each length of pipe is placed in the trench, the spigot end shall be centered in the bell and the pipe forced home and brought to correct line and grade. Eight-inch and smaller pipes can usually be pushed home with a heavy crow bar. Larger pipes must be jacked home with a jacking device made for that purpose. Pipes shall not be pushed home with the shovel bucket. Cut pipe shall be rebeveled with a suitable file or pipe lathe. The pipe shall be secured in place with approved backfill material tamped under it except at the bells. Precautions shall be taken to prevent dirt from entering the joint space.

At times when pipe laying is not in progress, the open ends of pipe shall be kept plugged and watertight with rubber and metal pipe stoppers or other means approved by the Director of Water and the Contractor shall have two of each size required on the job. This provision shall apply during the noon hour as well as overnight. If the water is in the trench, the seal shall remain in place until the trench is pumped completely dry.

Gate boxes shall be carefully guarded and protected during backfilling operations.

Where the new main is to be tapped into an existing main, the City shall make said taps unless otherwise specified. All cutting, plugging, disconnection of water mains or other similar work shall be done by the Contractor at the Contractor's expense unless otherwise specified.



The Contractor shall dig test pits at all such connections to determine exact size, location and condition of the existing main.

L. Cutting of Pipe

The cutting of pipe for inserting valves, fittings, or closure pieces shall be done in a neat and workmanlike manner without damage to the pipe or cement lining and as so as to leave a smooth end at right angles to the axis of the pipe.

When machine cutting is not available for cutting pipe 20 in. in diameter or larger, the electric-arc cutting method, using a carbon or steel rod, will be permitted. Only qualified and experienced workmen shall be used on this work.

Ductile iron pipe shall be cut only by means of abrasive saws, hack saws, wheel type cutters or milling type cutters. The use of "squeeze" type pipe cutters, cutting torches, diamond points and dog chisels will not be permitted. This work shall be done by the Contractor in a manner satisfactory to the Director of Water and only experienced men shall be engaged thereon.

Flame cutting of pipe by means of an oxyacetylene torch shall not be allowed.

M. Bell Ends to Face Direction of Laying

Pipe shall be laid with bell ends facing in the direction of laying, unless directed otherwise by the Director of Water. Where pipe is laid on a grade of 10 percent or greater, the laying shall start at the bottom and shall proceed upward with the bell ends of the pipe upgrade.

N. Permissible Deflection at Joints

Whenever it is necessary to deflect from a straight line, either in the vertical or horizontal plane, to avoid obstructions or plumb stems, or where long radius curves are permitted, the amount of deflection allowed shall not exceed that required for the joint and shall be approved by the Director of Water.

Maximum deflection shall not exceed those specified in AWWA C600 for the type of joint used.

O. Pipe Jointing

O-1 Mechanical Joint

The last 8 in. outside of the spigot and inside of the bell of mechanical-joint pipe shall be thoroughly cleaned to remove oil, grit, excess coating and other foreign matter from the joint, and then painted with a soap solution made by dissolving one-half cup of granulated soap



in 1 gallon of water. The cast-iron gland shall then be slipped on the spigot end of the pipe with the lip extension of the gland toward the socket, or bell, end. The rubber gasket shall be painted with the soap solution and placed on the spigot end with the thick edge toward the gland.

The entire section of the pipe shall be pushed forward to seat the spigot end in the bell. The gasket shall then be pressed into space within the bell; care shall be taken to locate the gasket evenly around the entire joint. The cast-iron gland shall be moved along the pipe into position for bolting, all of the bolts inserted and the nuts screwed up tightly with the fingers. All nuts shall be tightened with a suitable (preferably torque-limiting) wrench. The torque for various sizes of bolts shall be as follows.

Size in.	Range of Torque ft.-lb.
5/8	40-60
3/4	60-90
1	70-100
1 1/4	90-120

Nuts spaced 180 degrees apart shall be tightened alternately in order to produce an equal pressure on all parts of the gland.

O-2 Push-on Joint

The inside of the bell and the outside of the spigot end shall be thoroughly cleaned to remove oil, grit, excess coating and other foreign matter. The circular rubber gasket shall be flexed inward and inserted in the basket recess of the bell socket.

A thin film of gasket lubricant shall be applied to either the inside surface of the gasket or the spigot end of the pipe or both. Gasket lubricant shall be as supplied by the pipe manufacturer and approved by the Director of Water.

The spigot end of the pipe shall be entered into the socket with care used to keep the joint from contacting the ground. The joint shall then be completed by forcing the plain end to the bottom of the socket with a forked tool or jack-type tool or other device approved by the Director of Water. Pipe that is not furnished with a depth mark shall be marked before assembly to assure that the spigot end is inserted to the full depth of the joint. Field-cut pipe lengths shall be filed or ground to resemble the spigot end of such pipe as manufactured. Complete assembly instructions are available from the pipe manufacturer.



P. Axial Thrust

Thrust blocks and/or harnessed joints shall be installed at the locations and in accordance with the details shown on the Contract Drawings, as specified and required by the Item “Joint Restraints/Thrust Blocks” or as directed by the Director of Water.

Q. Testing and Disinfection

A formal pressure/leakage test will be required of the water mains, valves and fittings in the system constructed (not services 2” in diameter or less.) Where any section of a main is provided with concrete thrust blocks, the test shall not be made until at least 5 days have elapsed after the concrete was installed. If high-early-strength cement is used in the concrete thrust blocks, the test shall not be made until at least 2 days have elapsed. The pipe line or sections thereof shall be filled with water, and subjected to a pressure/leakage test with water under a hydrostatic pressure of 200 psi unless otherwise specified. This pressure shall be maintained for the duration of the test which shall be 2 hours. Air valves may be used for test connections. Any excessive indicated leakage, as determined by the Director of Water, shall be located and repairs made. The total leakage per day from the pipe line or sections thereof shall not exceed the amounts allowable under AWWA C600-82 Section 13.7. Should the pipe line or sections thereof not come within the permissible leakage limits, the Contractor shall be required to excavate and locate the source of leakage and make repairs. After the Contractor has notified the Director of Water that repairs have been made, the test will be repeated until the pipe line or sections thereof are made satisfactory.

All mains, valves, hydrants, hydrant connections and other appurtenances built under this Contract shall, upon completion of all water supply related construction, be disinfected in accordance with AWWA Standard C601-81 and the requirements of the Water Department.

Unless otherwise specified, upon flushing the new main, the Contractor, under the supervision of the Director of Water or Water Department Representative, shall take samples of the water and have same tested by an approved laboratory. If said testing proves unsatisfactory, the Contractor shall again disinfect the main and retest. Said procedure shall be repeated until satisfactory results are obtained.

The Contractor shall furnish all labor, materials, tools and equipment necessary for or incidental to satisfactory disinfection and testing leakage, and shall be responsible for any damage so the pipe line or to adjoining property due to this work.

The City Water Company will furnish water free for flushing, testing and disinfecting the pipe line if hydrants or other connections are convenient to the work, otherwise, the Contractor shall be responsible to secure a water supply acceptable to the Engineer at no additional cost to the Owner.



In order for the Water Department to take samples after the disinfection of the new mains, the Contractor shall install one or more 1" services, each composed of a corporation stop, bushing, flared fitting, shutoff valve and pipe, of the length at the locations ordered by the Engineer. After disinfection, sufficient time must be allowed, as determined by the Director of Water, to allow the chlorine residual to reach normal. The Director of Water will then order the above service or services to be turned on, allowed to run for one hour, at which time the Water Department will take its samples. The Water Department reserves the right to allow 24 hours for the testing of each sample. Taking water samples for testing from fire hydrants will not be permitted.

R. Water Main Construction in Proximity to Sewers

The Engineer may vary the location of Water Mains in close proximity to sewers. No variations on location will be permitted without approval of the Director of Water.

1) Horizontal separation – Water mains should be laid at least 10 feet horizontally from any existing or proposed sewers. Should local conditions prevent a lateral separation of 10 feet, a water main may be laid closer to than 10 feet to a sewer if (1) it is laid in a separate trench, or if (2) it is laid in the same trench with the water mains located at one side on a bench of undisturbed earth and if in either case the elevation of the crown of the sewer is at least 18 inches below the invert of the water main.

2) Vertical separation – Whenever water mains must cross over sewers, the water main shall be laid at such an elevation that the top of the sewer is at least 18 inches below the bottom of the water main. When the elevation of the sewer cannot be varied to meet the above requirement, the water main shall be relocated to provide this separation or reconstruct it with mechanical joint pipe for a distance of 10 feet on each side of the sewer. One full length of water main should be centered over the sewer so that both joints will be as far from the sewer as possible.

When it is impossible to obtain proper horizontal and vertical separation as stipulated above, both the water main and sewer shall be constructed of mechanical joint cast iron pipe or ductile iron pipe and shall be pressure tested to assure water tightness; or, the sewer shall be concrete encased for a distance of 10 feet on either side of the water main in accordance with the details shown on the Contract Drawings or as ordered by the Director of Water.

S. Water Main Construction Crossing Sewers

Where the proposed water main is to cross conflicting existing storm, water and sanitary sewers at side streets and at catch basins, test pits should be dug to determine the location of the existing utilities. Test pits should be dug far enough ahead of the work to allow for deflection above or below the conflicting utility. Test pits are to be paid for under that Item and they shall be dug only as directed and approved by the Director of Water.



4. MEASUREMENT

This work shall be measured for payment per linear foot of water main installed, complete and accepted in place as measured along its centerline without deduction for valves, fittings, and special castings.

5. PAYMENT

This work will be paid for at the contract unit price bid for these items, which price shall include furnishing and placing all pipe and fittings, harnessing of joints both in existing and proposed pipe, closure pipes or sleeves, testing, disinfection, corporation stops, cutting and plugging of all existing water mains, removal of all hydrants and conflicting valves to storage at Water Department yard, 1000 Shuttle Meadow Avenue, New Britain, Connecticut, removal of all existing water mains to be relayed and all labor, equipment and materials necessary to complete the work described above, and all costs incurred by the New Britain Water Department for water main tapping, opening and closing water valves, repacking leaking joints and any other service work that the New Britain Water Department shall perform for the Contractor.

Concrete for thrustblocks, foundations, cradles, plugging or encasement shall be paid for under item "Class A Concrete".

Excavation, gravel/sand cushion, backfill, replacement of unsuitable materials will be paid for under their respective items.

GATE VALVES

1. DESCRIPTION

Under this item, the Contractor shall furnish and install gate valves with valve box for water mains of the various sizes and at the locations shown on the plans or as ordered by the Director of Water.

2. MATERIALS

All gate valves on the mains shall be New Britain mechanical joint type. All valves on hydrant branches shall be New Britain Standard mechanical joint type. All valves shall open to the right (clockwise) with non-rising stems with "O" Ring seals, and 2" square operating nuts and with bolts, glands and rubber gaskets. All valves to be built for 300 psi test pressure and 175 working pressure.



The valves shall conform to all applicable requirements of American Water Works Association C500-80 Standard for Gate Valves for Ordinary Water Works Service or latest revision thereof.

All valves shall conform to the following Mueller Figure No. or approved equal:

- 4"-12" inclusive vertical valves = Fig No. A-2380-20
- 16"-24" inclusive horizontal valves = Fig. No. A-2480-20-06

All valves shall be as manufactured by Mueller Valve only.

All valves shall be equipped with two-piece sliding type cast iron valve box with round base and drop cover lettered "WATER", equal to that manufactured by the Pioneer Foundry Company.

The top of gate boxes shall be set flush with the proposed or existing grade. Boxes shall be protected during the backfilling operation and shall be exposed and unusable before the Water Bureau will flush the main and put said main in service.

3. CONSTRUCTION METHODS

The valves shall be set and jointed to pipe in the manner herein before specified under the gate valve installation detail.

4. MEASUREMENT AND PAYMENT

This work will be paid for at the contract price per each of the size of valve specified complete in place including all materials, valve boxes, equipment, tools and labor incidental thereto.

BUTTERFLY VALVES

- A - 6" Butterfly Valve and Valve Box
- B - 8" Butterfly Valve and Valve Box
- C - 12" Butterfly Valve and Valve Box



1. DESCRIPTION

Under this item, the Contractor shall furnish and install butterfly valves with valve box for water mains of the various sizes and at the locations shown on the plans or as ordered by the Director of Water.

2. MATERIALS

All butterfly valves shall be fit for underground operation and of the rubber seated tight closing type equal to performance requirement C504 of the American Water Works Association.

Both valves ends shall be mechanical joint and include all accessories, bolts, glands and gaskets.

Valve body shall be high strength cast iron ASTM A126 Class B with 18-8 type 304 stainless steel body seat. Valve vane shall be high strength cast iron ASTM A48 Class 40, having rubber seat mechanically secured with an integral 18-8 stainless steel clamp ring and 18-8 stainless steel nylon locked screws.

Rubber seat shall be a full circle 360° seat not penetrated by the valve shaft. Valve shaft shall be one piece, extending full size through the entire valve and operator with no neckdown, keyways or holes to weaken it. Valve shaft shall have 304 stainless steel journals rotating in reinforced Teflon bearings. Valve shall have permanently set two-way thrust bearing. Packing shall be "Triple Seal" rubber designed for permanent duty in underground service.

Valve operator shall be of the traveling-nut type, sealed, gasketed, and lubricated for underground service. It shall be capable of withstanding an overload input torque of 450 foot lbs at full open or closed position without damage to the valve or valve operator. It shall be designed to resist submergence in water to 25 feet head pressure. Number of turns to operate valve shall closely resemble conventional distribution valve practices.

Valve shall be capable of easy closure by one man using standard valve key, even under emergency line-break condition as severe as those that would cause a valve maximum opening torque requirement of as much as two times AWWA class 150B.

All valves shall open right and be equipped with a 2" AWWA operating nut.

All valves shall be tested, bubble-tight-air-under-water by the manufacturer up to 175 PSI. In addition, a 300 PSI hydrostat test shall be given to the assembled valve. This 300 PSI pressure shall also be applied against the fully enclosed vane of each valve to prove structural soundness and assure compatibility with field lines test procedures.



3. CONSTRUCTION METHODS

The valves shall be set and jointed to pipe in the manner herein before specified under the "D.I. Water main" items.

4. MEASUREMENT AND PAYMENT

This work will be paid for at the contract price bid per each "Butterfly Valve" of the size of valve specified, complete in place, including all materials, valve boxes, equipment, tools and labor incidental thereto.

TAPPING SLEEVE AND VALVES

- A. 6" x 6" Tapping Sleeve and 6" tapping valve
- B. 8" x 6" Tapping Sleeve and 6" tapping valve
- C. 8" x 8" Tapping Sleeve and 8" tapping valve
- D. 12" x 6" Tapping Sleeve and 6" tapping valve
- E. 12" x 8" Tapping Sleeve and 8" tapping valve
- F. 12" x 12" Tapping Sleeve and 12" tapping valve

1. DESCRIPTION

Under this item, the Contractor shall furnish and install tapping sleeves and valves with the valve boxes on existing water mains of the sizes and in the locations shown on the plans or designated by the Director of Water.

2. MATERIALS

Valve and valve boxes shall conform to the requirements of the item for water main valves and fittings, open right, non-rising stems with "O" ring seals and 2" square operating nuts, mechanical joint on valve outlet 300 PSI test pressure and 175 PSI working pressure.



Tapping sleeves shall consist of two sections of heavy welded carbon steel ASTM A285 Grade C which bolt together on the pipe and seal against a Grade 60 Concave Wedge Gasket around the tap opening. The gasket shall be compounded to resist oil, natural gas, salts, acids, alkaline, hydrocarbon fluid, water and other chemicals and withstand temperatures to 212°F. The outlet half shall have a flat faced flange (AWWA C207 Class D, ANSI 150lb. drilling) that is recessed to mate with standard tapping valves per MSS-SP60. The outlet shall have a 3/4" NPT Test plug. Bolts and nuts shall be corrosion resistant high strength low alloy steel with heavy semifinished hexagon nuts to AWWA C111 (ANSI A21.11) standards. Finish shall be fusion bonded epoxy, coated to an average of 12 mil thickness. Tapping sleeves shall be Smith Blair 622 or Mueller H 615 or approved equal.

3. CONSTRUCTION METHODS

The Contractor shall obtain and pay for all City required permits.

Location of the tap shall be as indicated on the plans or as directed by the Director of Water. Tapping sleeves shall not be installed until said locations are verified and approved by the Engineer and no work shall be performed without a representative of the City Water Department present at the tap location.

It shall be the Contractor's responsibility to determine the class, type and outer diameter of the existing water main at the location of each tap. Tapping sleeves are to be mounted on the water main and properly supported and aligned with the side flange blots taken up evenly and uniformly. The tapping valve shall be properly supported and positioned and a hydrostatic test of both units conducted before the tap is made.

The existing water main shall be kept in service at all times during the tapping operation.

All taps shall be made by the Water Department, City of New Britain, Conn. at the Contractor's expense.

Shop drawings of the tapping sleeve and valve shall be submitted to the Engineer for approval before installation of any tapping sleeve or valve.

4. MEASUREMENT AND PAYMENT

This work shall be paid for at the contract price bid per each "tapping sleeve and valve and valve box" of the size specified complete in place in accordance with the plans or as directed by the Director of Water.



The unit price bid shall include the cost of all co-ordination with City forces, City permits, testing and all other labor, material plant and equipment necessary to furnish and install the various sleeves with valve and valve box complete and accepted in place.

SHUT-OFF VALVES – 2” AND SMALLER

1. DESCRIPTION

Under this item, the Contractor shall furnish and install shut-off valves with valve boxes and covers in sizes up to and including 2” at those locations shown on the plans or as ordered by the Director of Water. This item shall also include connection of the new shut-off valve to new or existing water services.

This item will be used to replace existing shut-off valves encountered during the course of construction, as ordered by the Director of Water.

This item will not be used to replace existing valves damaged due to the Contractor’s negligence, as determined by the Director of Water.

2. MATERIALS AND CONSTRUCTION METHODS

All materials and construction methods shall be as required by the City Water Department and all work shall be subject to the approval of said Department.

Material specifications shall be as follows:

- Female flared fittings - Mueller Cat. No. H-15450
- Female Compression Fittings - Mueller Cat. No. H-15451

- Male flared fittings - Mueller Cat. No. H-15425
- “ Compression fittings - Mueller Cat. No. H-15428

- Shut-off valves - Mueller Cat. No. H-19201
or approved equal;
- Valve box with cover - Buffalo curb type 94E or an approved equal.

It is the Contractor’s responsibility to contact the party owning the valve to arrange a shut down schedule prior to doing any work. All such schedules must be approved by the Engineer prior to the shut down.



3. MEASUREMENT AND PAYMENT

This work shall be measured and paid for at the Contract unit price bid for each shut-off valve installed and approved which price shall include all coordination with owners, connection of the new valve to existing or new services, complete valve boxes with covers and all labor, materials, tools, and equipment necessary to complete the above described work.

RELAY WATER SERVICES/CORPORATION STOPS
(2" AND SMALLER")

1. DESCRIPTION

The work under this item shall be the furnishing and/or relaying of copper water services with 4.5 feet of cover and corporation stops including couplings of sizes up to and including two inches at those locations shown on the Contract Drawings or ordered by the Director of Water. This work includes resetting the water valve box and cover to new grade.

This work will not be used to pay for repair of water services damaged due to the Contractor's negligence as determined by the Director of Water.

2. MATERIALS

All materials shall be as specified herein and as required and approved by the City Water Department as applicable; all work shall be subject to the approval of said Department.

Unless otherwise specified, all pipe for Water Services shall be seamless copper water tubing and shall conform to the provisions of ASTM B-88, Type K Annealed (soft) AWWA Specification 7SOCR or Federal Specification WWT-779.

Corporation stops and couplings shall be Mueller Cat. #H-10003 and H-15450 or equal respectively. For 1" service, use a 3/4" stop with a 3/4" x 1" coupling; for a 2" service, use a 1 1/2" stop with a 1 1/2" x 2" coupling.

3. CONSTRUCTION METHODS

Water services shall be of the size, type and materials indicated by the Contract Documents and shall be installed in the locations shown on the Contract Drawings, specified, or ordered by the Director of Water.



Corporation stops, couplings and caps shall be furnished and installed at the points designated on the Contract Drawings, at all high points in the line and in locations directed by the Engineer. They shall be installed in such a manner as to permit ready access for operation of the corporation stops as required.

Where an existing galvanized service is encountered, it shall be replaced with copper unless otherwise ordered by the Director of Water.

In this contract wherever cuts have resulted in less than 4.5' of cover over the water laterals the Contractor shall furnish and/or relay the water lateral to provide the 4.5' cover.

All portions of all water services, whether existing or re-laid, with less than 4.5' of cover shall be insulated to protect them from freezing. The insulation shall be sheathed, flexible, formed plastic pipe insulation completely suitable for direct underground burial equivalent to ultra foam available from Certainteed St. Gobain Insulation Corp. or equal. Minimum thickness is 3/4" and all cut edges and joints shall be sealed with B.F. Goodrich Construction Adhesive 105 or approved equal. For new services, slide sleeve over pipe; for existing services, cut insulation longitudinally and seal all over with a 6" minimum sand collar prior to trench backfilling.

Where a water service must be shut down, it is the contractor's responsibility to contact the party owning the service to arrange a shutdown schedule prior to doing any work. All such shutdown schedules must be approved by the Engineer prior to shut down. If a new service is required, the City Water Department will perform the tapping at the Contractor's expense.

Water service trenches shall be excavated and backfilled in accordance with the Items "Trench Excavation" and "Trench Backfill". It shall be required that a one foot (1') collar of sand encase the copper water service on top and sides. Normal backfill then can be used for trench once the water service is protected.

NOTE: "All tapping of water mains for house service connections shall be done by the City of New Britain Water Department at the Contractor's expense."

Generally, water services will be laid on native soil, with the trench bottom being firmly compacted and shaped to accept the pipe. Where the soil in the subgrade is found to be soft, loose, freshly filled earth, unstable or unsuitable as a base for a proposed water service, the Engineer may at his discretion order it excavated to such additional depth and width as he may deem necessary and replace the unsuitable foundation with trench backfill, Gravel/Sand Cushion, Class "A" Concrete or other such materials as he may direct.



4. METHOD OF MEASUREMENT

A. Corporation Stops will not be measured for payment unless an item therefore appears in the Bid Proposal. When the item for “Corporation Stops” does appear they will be measured by the unit. (The Unit includes the corporation stop, coupling and cap).

B. Water services will be measured for payment by the actual number of linear feet of water service of the various sizes and types indicated on the Bid Proposal, completed, accepted and measured in place along the centerline of the pipe.

C. Resetting the water valve box will not be measured for payment when the lateral has to be re-laid. It shall be included in cost of lateral. Only when the water valve box itself is reset will it be paid for as a separate item, if the item appears in the Bid Proposal.

5. BASIS OF PAYMENT

A. When no item for “Corporation Stops” appears in the Bid Proposal, the cost of such work shall be considered to be included in the prices bid for other items of work. When the item appears in the Bid Proposal therefore, “Corporation Stops” will be paid for at the contract unit price per each of the type and size specified, completed and accepted, which price shall include all materials, equipment, tools, labor, and work incidental to or necessary for the completion of the Item.

B. Water services will be paid for at the contract unit price per linear foot for the type and size specified in the Bid Proposal, completed in place, including all materials, equipment, insulation, corporation stops, fittings and couplings, tools, tapping of new service, labor and work incidental or necessary for the completion of the Item. The work shall also include resetting the water valve box to proposed grades.

C. Excavation will be paid for in accordance with the Item “Trench Excavation.”

D. Trench Backfill, Replacement of Unsuitable Material, Gravel/Sand Cushion will be paid for in accordance with their respective items.

E. Concrete for water service foundations, cradles or encasement shall be paid for in accordance with the Item “Class A Concrete.”

F. There will be no payment to the Contractor for plumbing repairs required in the home of the private party owning the service should any repair work be required because sediment, dirt, etc. being introduced by the Contractor’s work.



HYDRANTS
(HYDRANTS RESET AND/OR RECONNECTED)

1. DESCRIPTION

Work under this item shall be the furnishing and installing of the new fire hydrants or the removing and resetting of existing hydrants where shown on the Contract Drawings, specified or ordered by the Director of Water.

2. MATERIALS

Fire hydrants shall be 5 1/4" Mueller A423 Super Centurion Only, and more specifically as follows:

They shall be break-away type with safety flange and safety stem coupling design, breaking point to be below flange. Hydrants will be 3 way, 5-1/2 foot depth of trench, 6" mechanical joint bell connection with lugs, rubber gasket, gland, cast iron bolts and nuts, outlet nozzle caps and chains. 5 1/4" valve opening with mechanical joint shoe to fit pit cast and centrifugal cast pipe, synthetic rubber ring type main valve, open left, two 2-1/2" hose nozzles with national standard threads, 1-1/2" pentagon operating nut, dry top bonnet, pressure seal, factory filled sealed lubricant, self lubricating with a teflon coated anti-friction washer. Operating nut shall show direction of opening. Hydrant will have four large drain openings which are flushed during opening and closing of hydrant. Drain openings will be brushed with bronze or other type of corrosion-resistant material. There shall be no toggles, springs, linkages or synchronized mechanism of any kind. Hydrant shall have compression type main valve, closes with pressure. Hydrant waterway shall be bronze. The waterway is defined to include a bronze upper valve plate, a bronze seat ring; a bronze elbow bushing and a bronze subseat. Year and date shall be case on the hydrant. Hydrant shall have no less than 150 PSI working pressure and no more than 300 PSI test pressure AWWA standard. Hydrants shall be painted chrome yellow. Hydrants shall come with a weathercap over operating nut. Hydrants shall be capable of having extension installed at ground line and not at the elbow.

In locations where R.D. Wood-Mathews hydrant barrels are damaged and are to be replaced, the replacement hydrants without shoes shall be R.D. Wood-Mathews modernized fire hydrant type or approved equal. The hydrants shall be of the dry barrel type conforming to ANSI/AWWA Standard C-502-80 and more specifically as follows: The hydrants shall be of the break away variety, 2 way, with frost jackets, 5 1/2 foot depth of trench 4 1/2 inch valve opening with synthetic rubber main valve, open left, two 2 1/2" hose nozzles, 1 1/2" pentagon operating nut, national standard threads, outlet nozzle caps and chains, self flushing drain holes, hydrant year shall be cast on hydrant and shall be painted red.



Hydrants, valves and fittings shall be of the type specified or shown on the Contract Drawings. Concrete shall be in accordance with the Item "Class A Concrete." Other materials such as foundation stone, etc. shall conform to the requirements of the various items in these specifications.

All materials shall be as specified herein and as required and approved by the City Water Department; all work shall be subject to the approval of said Department.

3. CONSTRUCTION METHODS

Construction methods for the work required to install the hydrants shall conform to the requirements herein, the applicable construction methods described under the other Technical Specifications for like work, requirements of the City Water Department, the manufacturer's recommended installation procedures or as directed by the Director of Water.

Unless otherwise specified or shown, hydrants shall be located as shown on the Contract Drawings or as directed, in such a manner as to provide complete accessibility.

Unless otherwise specified or noted on the Contract Drawings, when placed behind the curb, the hydrant shall be set so that no portion of the hose nozzle cap will be less than six (6) inches nor more than twelve (12) inches from the gutter face of the curb. When set in the lawn space between the curb and the sidewalk, or between the sidewalk and property line, no portion of the hydrant or nozzle cap shall be within six (6) inches of the sidewalk.

Unless otherwise specified, all hydrants shall stand plumb and shall have their nozzles 90° apart and shall be set with the hose nozzles parallel to the curb and the pumper nozzle facing the curb at an angle of 90°. Hydrants shall be set to the established grade, with nozzles at least 16 inches above the ground, as shown or as directed by the Director of Water.

All existing hydrants to be removed shall be removed by the Contractor and the cost to be included under Item, Ductile Iron Water Main.

Hydrants shall be located as shown or as directed and in a manner to provide complete accessibility and also in such a manner that the possibility of damage from vehicles or injury to pedestrians will be minimized. All hydrant locations are approximate and their exact location shall be determined in the field.

Hydrants shall be set in accordance with the details shown on the Contract Drawings or as otherwise specified. If details or other specifications are not given, the following will apply:



Each hydrant shall be connected to the main by mechanical joint fittings, with a 6 inch cast iron or ductile iron branch controlled by an independent 6 inch gate valve as specified in these specifications under “Water Main Valves and Fittings.”

Whenever a hydrant is set in soil that is pervious, a drainage pit shall be provided at the base of the hydrant by placing coarse gravel or crushed stone mixed with coarse sand, from the bottom of the trench to at least 6 inches above the waste opening in the hydrant. The diameter of this drainage pit will be minimum of two feet greater than the hydrant barrel. Felt tar paper or 6 mil polyethylene plastic shall be placed on top of the stone to prevent fines from entering the stones.

Whenever a hydrant is set in clay or other impervious soil, a drainage pit 2 feet in diameter and 3 feet deep shall be excavated below each hydrant and filled with compacted coarse gravel or crushed stone mixed with coarse sand, under and around the elbow of the hydrant and to a level of 6 inches above the waste opening. No drainage pit shall be connected to a sewer. Felt tar paper or 6 mil polyethylene plastic shall be placed on top of the stone to prevent fines from entering the stones.

The hydrant base elbow shall be set on a 4”x8”x16” solid concrete thrust block (unless it is determined by the Engineer that a larger block (unless it is determined by the Engineer that a larger block is required). A concrete thrust block shall be poured between the base elbow and the undisturbed trench wall.

Construction methods for “hydrants” above shall apply for reconnecting or resetting fire hydrants with the following exceptions:

- 1) If the hydrant is pushed back on the same lead and the valve and fittings are in good condition, the hydrant may be reset.
- 2) Where the hydrant is to be reset in a different location and all fittings are in good condition, the contractor will be required to reset the hydrant and fittings. The valve will be provided and paid for under the specifications for “Valves” herein.
- 3) Where reset or reconnected hydrant is called for on the Contract Drawings and portions of the existing valves or fittings are not in good condition as determined by the Engineer, the Engineer shall order the Contractor either to:
 - a) Install a new hydrant and deliver the usable used valve/fittings/hydrant to the City Water Department, or
 - b) Replace the unusable valve/fittings with the new valve/fitting. If the hydrant is in unsatisfactory condition, the hydrant will not be reset. The Engineer shall order the Contractor to install a new hydrant.



4) Where an existing hydrant has to be reconnected to the new main using a shorter lead and the valve and fittings are in good condition, the hydrant is to be reconnected and the valve and valve box reset.

4. METHOD OF MEASUREMENT

“Hydrants” and Reset or Reconnected Hydrants” shall be measured by the unit. The definition of unit is in paragraph 5 below.

5. BASIS OF PAYMENT

“Hydrants shall be paid for by the unit, which price shall include furnishing all materials, labor, hydrant, foundation stone, concrete, excavation and all materials, equipment, tools and labor incidental to or necessary for the completion of the Item including such capping or cutting of existing water mains as may be required.

“Reset or Reconnected Hydrants” shall be paid for by the unit, which price shall include furnishing all materials, foundation stone, concrete, excavation and all materials, equipment, tools, labor and work incidental to or necessary for the completion of the Item. This work may also include the cutting and capping of an existing pipe, main, or lead, all as ordered by the Engineer.

Water main (including leads to hydrants), “valves” and “fittings” shall all be paid for in accordance with their separate items.

JOINT RESTRAINTS/THRUST BLOCKS

1. DESCRIPTION

The work under this item shall be the furnishing and installing of joint restraints/thrust blocks for the purpose of resisting axial thrust in the locations and of the size and type shown on the Contract Drawings. Thrust blocks, mechanical joint retainer glands, or other suitable means of thrust restraint shall be provided at each change in the direction of a pipeline and at all tees, plugs, caps, bends, reducers and crosses.

Reference is made to the National Fire Protection Association Bulletin No. 24, Installation of Private Fire Service Mains 1981, amended to date, as issued by the National Fire Protection Association Battery March Park, Quincy, MA. 02269. Copies of this bulletin may be obtained from the source above. This bulletin shall hereinafter be known as “Bulletin 24.”



Joint restraints for cast iron pipe or ductile iron pipe 12” in diameter or smaller shall consist of rods, clamps, straps, washers and other harnessing or strapping device all as shown in Section 8-6.2 of Bulletin 24, figures A-8-6.2 through A-8-6.2.10, or as otherwise detailed in the Contract Drawings, specified or ordered by the Director of Water. Joint restraints for other types and sizes of pipe shall be as shown on the Contract Drawings or specified elsewhere.

Thrust blocks shall be defined herein as the construction of concrete thrust blocks as shown in Bulletin 24 Section 8-6.2.9, Fig. A-8-6.2.10, on the Contract Drawings, as specified or ordered by the Director of Water.

2. MATERIALS

Unless otherwise specified or ordered by the Engineer, joint restraints for CIP and DIP 12” in diameter or smaller shall be constructed of materials in accordance with Section 8-6.2.7 of Bulletin No. 24 and/or the “Schedule of Joint Restraints.”

The materials for joint restraints for other types or sizes of pipe shall be as specified elsewhere or shown on the Contract Drawings.

Thrust blocks shall be constructed of Class “A” concrete in accordance with these specifications.

3. CONSTRUCTION METHODS

Joint restraints shall be installed in accordance with the applicable provisions of Bulletin 24, and, as shown on the Contract Drawings, specified, shown in the “Schedule for Joint Restraints,” or as ordered by the Engineer.

NUMBER OF 3/4” HIGH TENSILE STRENGTH STEEL RODS REQUIRED

Pipe Size – Inches	8”	12”	14” thru 24”
Number of Rods	2	4	8

When using combinations of rods greater in number than two, the rods shall be symmetrically spaced.

After installation, all harnessing rods, nuts, bolts, washers, socket clamps, fittings, flexible couplings and other restraining devices except thrust blocks shall be cleaned and thoroughly coated with a bituminous or other acceptable corrosion retarding material.



All thrust blocks shall be placed against undisturbed native soil approved by the Engineer and in such a manner that the pipe and joints will be accessible for repair. Trust blocks shall be in accordance with Section 8-6.2.9 and Fig A-8-6.2.10 of Bulletin 24, or as shown on the Contract Drawings, or as otherwise specified or ordered by the Director of Water.

4. METHOD OF MEASUREMENT

Joint restraints shall not be measured for payment.

Thrust blocks shall be measured for payment by the number of cubic yards of class "A" concrete in accordance with and under that item.

5. BASIS OF PAYMENT

No separate payment will be made for joint restraints, the cost of such work will be considered included in the Contract unit price bid for other items of work.

Concrete for thrust blocks will be paid for under that Contract item per cubic yard Class "A" concrete.

CUT AND PLUG EXISTING WATER MAIN

1. DESCRIPTION

Work consists of cutting and plugging or capping existing water mains that are to remain in service, as required in the Contract Documents and as directed by the Director of Water.

2. MATERIALS

Ductile iron plugs and caps shall be required on ductile iron, cast iron and PVC/ PVCO pipe. PVC plugs and caps are not to be used.

Tapped plugs and caps, if used, shall have a 2 inch tap and brass plug.

Plugs and caps installed on ductile iron and PVC/PVCO pipe shall be restrained to the pipe using mechanical joint or harness type joint restraint device in conformance with the requirements of Water Main Pipe and Fittings.



Tie rods, socket clamps and tie bars may be used on cast iron pipe, in lieu of mechanical joint or harness type joint restraint device, subject to the prior approval of the Director of Water.

Tie bars shall be 3 inch steel channels, 5 pounds per foot.

3. CONSTURCTION DETAILS

Whenever possible, plug shall be installed at a tee, cross or similar connection fitting. Where the water main is to be plugged at a water pipe joint, the plug shall be installed in the bell end of the water pipe.

A section of water main pipe shall be cut and removed and the interior of all water main pipe and fittings not receiving 24 hour chlorine disinfection contact time must be spray or swab disinfected with a 1 to 5 percent solution of chlorine no more than 30 minutes prior to installation. The interior and exterior of existing fitting or pipe joint and cut end of existing pipe which will be plugged or capped shall also be cleaned and disinfected.

On cast iron water pipe and fittings, where plugs cannot be bolted directly to the water pipe or fitting joint or otherwise restrained using a mechanical joint or harness type joint restraint device, the plug or cap shall be installed and held in place by a retaining bar extending across the center of the plug. A socket clamp shall be installed on the water pipe or fitting behind the bell, and the retaining bar secured to the socket clamp with steel rods, socket clamp washers, lock washers and nuts.

Prior to backfilling, uncoated tie rods, clamps and any components made of metal used for restrained joints are to receive hand brushed application of an approved bitumastic coating specifically manufactured for underground use or petrolatum wax tape coating system.

Non epoxy coated ductile iron fittings installed on PVC/PVCO water main pipe shall be coated with petrolatum wax tape coating system applied conformance with manufacturer's instructions. One nine pound anode shall be thermite welded to each ductile iron fitting.

All joints shall be made watertight. Prior to backfilling, the water main shall be filled with potable water and installation tested for leaks under line pressure in the presence of the Project Manager.

In conjunction with mechanical restrains, cast-in-place concrete thrust blocks shall be provided to transmit the thrust due to water pressure to undisturbed earth. Prior to placing the concrete, all wet and undesirable material shall be removed from the excavation. Timber blocking will not be allowed.



EXTERIOR REDUCED PRESSURE DEVICE AND PROTECTION

1. **DESCRIPTION**

Under this item the contractor shall furnish and install reduced pressure devices (RPD) with protection at locations shown on plans or as ordered by the Director of Water.

2. **MATERIALS**

RPDs shall conform with the regulations of the New Britain Water Department, the State of Connecticut Health Department Cross Connection Regulations, and the AWWA Standard C506, and other applicable regulations in effect at the time of installation.

The device shall be rated to 175 PSI water working pressure and water temperature range from 32 degrees F to 180 degrees F.

RPDs shall be Febco model 825Y or equal for water lines 3/4" through 2" inclusive. For RPDs on water lines greater than 2" the contractor shall submit to the Engineer and the Water Department product specifications for review and approval.

3. **CONSTRUCTION METHODS**

Each RPD shall be installed in conformance with the State of Connecticut Health Department Cross Connection Regulation, Section 19-13-B38g.

A. **UNDERGROUND INSTALLATION**

“Underground installations will only be allowed in custom made enclosures that meet all of the criteria spelled out in State of Connecticut Health Department Cross Connection Regulations, Section 19-13-B38g. These underground installations are subject to approval by the New Britain Water Department.

Provisions must be made to assure that the chamber is well ventilated, drained by gravity and have a removable top. The box shall be placed on a 24" bed of crushed stone. Precast concrete meter pit boxes of Rotondo MP 4x6x6 or equal shall be used.



B. ABOVE GROUND, SEASONAL

Above ground seasonal RPD protection shall consist of a clamshell enclosure made of No. 9 expanded steel welded into a 3/16" angle steel frame. It shall have handles for lifting and provisions for padlocking.



CITY OF NEW BRITAIN
NEW BRITAIN, CONNECTICUT
WATER DEPARTMENT



CITY OF NEW BRITAIN

**BOARD OF WATER
COMMISSIONERS**

**SPECIFICATION AND DETAIL
BOOKLET**

July, 2011 Edition



NEW BRITAIN WATER DEPARTMENT SPECIFICATIONS

PIPE:	CLASS 52-DUCTILE IRON
VALVES:	MUELLER-OPEN RIGHT-RSV
HYDRANTS:	5 X" MUELLER CENTURION
FITTINGS:	NORTH AMERICAN MADE-NO FOREIGN MADE
PIPE RESTRAINT:	MEGALUG SERIES 1100
TAP SLEEVES:	SMITH BLAIR 622 OR MUELLER H615
VALVE BOX:	SLIDE TYPE-NORTH AMERICAN MADE-NO FOREIGN
CURB BOX:	SCREW TYPE-GENERAL FOUNDRIES OR EQUIVALENT
CURB STOP VALVE:	MUELLER 300 WITH 110 CONNECTION
COPPER:	K TUBING

CONTRACTOR QUALIFICATION FORM
DISINFECTION OF WATER MAINS
BACTERIA SAMPLING
PRESSURE TEST FORM
HYDRANT USE REGULATIONS
WATER MAIN TRENCH
WATER SERVICE TRENCH
OFFSETS
FIRE HYDRANT INSTALLATION
GATE VALVE INSTALLATION
PLUGGING OF PIPE
THRUST BLOCKS
1" COPPER SERVICE
1 ½" -2" COPPER SERVICE
2" BLOW-OFF
BCKFLOW PREVENTION DEVICE INSTALLATION
UTILITIES CROSSING UNDER WATER MAINS
PRECAST METER PIT
FIRE FLOW TESTS
DOMESTIC WATER LINES WITH FIRE SPRINKLERS
TRENCH EXCAVATION AND SHORING REGULATIONS
OUTSIDE METER READING INSTALLATION
WATER SERVICE OWNERSHIP
WATER TAP PERMIT POLICY
FREEZING WATER LINES
RIGHT OF WAY AGREEMENT
DETAILS

DETAILED WRITTEN MATERIAL & INSTALLATION INSTRUCTIONS &
SPECIFICATIONS



CONTRACTORS QUALIFICATION FORM

Principals:

Names:

Social Security Numbers:

City, State, Zip:

1. QUALIFICATION OF CONTRACTOR:

The Water Department may make such investigations as we deem necessary to determine the ability of the contractor to perform the work, and the contractor shall furnish to the Water Department all such information and data for this purpose as the Water Department may request. The Water Department reserves the right to reject any and all contractors if evidence submitted by our investigation of such contractor fails to satisfy the Water Department that such contractor is properly qualified to carry out the obligations of the project and to complete the work contemplated therein.

1a. STATEMENT OF CONTRACTOR QUALIFICATIONS

(To be submitted by the contractor)

All questions must be answered and the data given must be clear and comprehensive. This statement must be notarized. If necessary, questions may be answered on separate attached sheets. The contractor may submit any additional information he/she desires.

2. Name of Contractor

2a. Corporation _____ Partnership _____ Individual _____ Joint _____ Other _____

3. Permanent main office address and telephone number(s).

4. When organized? _____

1000 Shuttle Meadow Ave. New Britain, CT 06052 (860) 826-2536



CITY OF NEW BRITAIN
NEW BRITAIN, CONNECTICUT
WATER DEPARTMENT



5. If a corporation, answer the following:

1. President's Name _____
2. Vice-President's Name _____
3. Secretary's Name _____
4. Treasurer's Name _____

6. If an individual or a partnership, answer the following:

1. Date of organization: _____
2. Name and address of all partners: (State whether general or limited partnership)

7. If other than a corporation or partnership or individual, describe organization and name principals:

8. How many years have you been engaged in construction under your present firm or trade name?

9. Contracts on hand: (Schedule these on a separate sheet, showing name of project: owner: architect and or engineer: gross amount of each contract: percent complete and the scheduled dates of completion)

10. General character of work performed by you and work normally performed with your own forces.

11. Have you ever failed to complete any work awarded to you? If so, note when, where, & why.

12. Within the last five years, has any officer or partner of your organization ever been an officer or partner of another organization when it failed to complete a construction contract?

13. Have you ever defaulted on a contract? If so, where and why?

14. List the major projects on a separate sheet your organization has completed in the past five years, giving the name of the project; owner; architect and or engineer; contract amount; date of completion; and percentage of the cost of the work performed by your own forces.



CITY OF NEW BRITAIN
NEW BRITAIN, CONNECTICUT
WATER DEPARTMENT



15. List your major equipment available for this contract, stating which is owned and which will be leased.

16. LIST EXPERIENCE IN INSTALLING WATER MAINS SIMILAR IN IMPORTANCE TO THIS PROJECT AND WHEN COMPLETED BY YOU. ALSO INDICATE METHOD USED ALONG WITH EXPERIENCE IN DISINFECTING AND HYDROSTATIC TESTING OF WATER MAINS AND APPURTENANCES. INDICATE WHO THE OWNER OF THE JOB WAS AND GIVE US THE NAME AND CURRENT TELEPHONE NUMBER OF A CONTACT PERSON WE CALL TO VERIFY THIS INFORMATION. THIS IS THE MOST IMPORTANT SECTION OF THIS FORM.

17. Name of Bonding Company and name and address of agent.

18. Will you, upon request, furnish any other information that may be Required by the City of New Britain?

19. The undersigned hereby authorize and request any persons, firms or corporations to furnish any information requested by the City of New Britain in verification of the recitals comprising this statement of Contractor's Qualifications.

Dated at _____ this _____ day _____ of 20 _____

Name of Contractor

Notary BY _____

TITLE _____

QUALIFY



DISINFECTION OF ALL WATER MANS

1. The main shall be isolated from all service connections and to any other parts of the distribution system until ruled sterile by the City of New Britain Water Department.
2. The main shall be chlorinated, 50 ppm, minimum and shall be allowed to stand at least 24 hours. The main shall be filled slowly.
3. After standing for 24 hours, the pipeline shall be flushed, not fast enough to create problems in other areas-through a hydrant, corporation, tapped plug, etc... Flushing shall continue until water has residual equal to normal- No chlorine odor , 0.30 ppm.
4. A corporation shall be provided with a copper standpipe for sample. A detail of this standpipe is attached. Water shall be run for at least one hour before taking sample, keeping end of copper standpipe out of contact with anything and keeping the end clean, No samples shall be taken from a hydrant. Contractor is responsible for the safe discharge of all water.
5. After sample is taken, shut main down, leave isolated and await results, usually within 24 hours.
6. If OK, no coliform, pipe can then be pressure tested. A hydro-static test shall be applied @ 200psi and held for 2 hours. A pressure test form must be filled out, and witnessed by someone in the New Britain Water Department, or their designee. A copy of this form is attached.

If the test is not OK, the line shall be rechlorinated to 50 ppm, and the procedure started again until OK.

7. No employee of the Water Department shall allow anyone to open a valve, line or service, to or from a pipe which has not been approved to be coliform free by the New Britain Water Department except as provided in #3 above.

This means that all curb stops shall be kept shut, bypasses shut and main line valves shut until the main is clean.



CONTRACTOR'S MATERIAL & TEST CERTIFICATE FOR UNDERGROUND PIPING

PROCEDURE:

UPON COMPLETION OF WORK, INSPECTION AND TESTS SHALL BE MADE BY THE CONTRACTOR'S REPRESENTATIVE AND WITNESSED BY AN OWNERS REPRESENTATIVE. ALL DEFECTS SHALL BE CORRECTED AND THE SYSTEM LEFT IN SERVICE BEFORE CONTRACTOR'S PERSONNEL LEAVE THE JOB.

A CERTIFICATE SHALL BE FILLED OUT AND SIGNED BY BOTH REPRESENTATIVES. COPIES SHALL BE PREPARED FOR APPROVING AUTHORITIES, OWNERS AND CONTRACTOR. IT IS UNDERSTOOD THAT OWNER'S REPRESENTATIVE'S SIGNATURE IN NO WAY PREJUDICES ANY CLAIM AGAINST THE CONTRACTOR FOR FAULTY MATERIAL, POOR WORKMANSHIP, OR FAILURE TO COMPLY WITH APPROVING AUTHORITY'S REQUIREMENTS OR LOCAL ORDINANCES.

PROPERTY NAME DATE

PLANS:

ACCEPTED BY APPROVING AUTHORITY(S) NAMES ADDRESS

INSTALLATION CONFORMS TO CITY STANDARDS: YES NO

IF NO, STATE DEVIATIONS:

UNDERGROUND PIPES & JOINTS:

PIPE TYPE AND CLASS TYPE JOINT

PIPE CONFORMS TO ASA A21.51 STANDARD LATEST REVISION YES NO

FITTINGS CONFORM TO CLASS 250, SHORT PATTERN ASA 21.10-1982, AWWA C110, PLUS TAR COATING ON EXTERIOR AND INTERIOR OR DUCTILE IRON CEMENT LINED.

YES NO

IF NO, EXPLAIN:

JOINT RESTRAINTS/THRUST BLOCKS HAVE BEEN INSTALLED AS SPECIFIED BY THE ENGINEER, IN THE CONTRACT DRAWINGS AND IN BULLETIN 24- INSTALLATION OF PRIVATE FIRE SERVICE MAINS 1981 BY THE NATIONAL FIRE PROTECTION ASSOCIATION, INC. YES NO

IF NO, EXPLAIN:

HYDROSTATIC TEST:

ALL NEW UNDERGROUND PIPING HYDROSTATICALLY TESTED AT PSI FOR HRS

LEAKAGE TEST AWWA C600:

TOTAL AMOUNT OF LEAKAGE MEASURED GALS. HRS

ALLOWABLE LEAKAGE GALS. HRS

HYDRANTS:

NUMBER INSTALLED TYPE & MAKE ALL OPERATE SATISFACTORY YES NO

REMARKS:

DATE LEFT IN SERVICE

SIGNATURES:

NAME OF INSTALLING CONTRACTOR

TEST WITNESSED BY:

FOR CITY OF NEW BRITAIN TITLE DATE

FOR INSTALLING CONTRACTOR TITLE DATE

USE OTHER SIDE FOR ADDITIONAL EXPLANATION & NOTES



HYDRANT USE REGULATIONS

1. Contractors use of hydrants to fill tank trucks, rollers, vac-alls; street sweepers, etc. **must** comply with the following regulations:
 - a. In order to comply with the State Department of Health Services regulation 19-13-B38a, in the filling of tank trucks, etc., from the fire hydrant there is a danger of contaminated water being siphoned back into the water supply lines. The use of hydrants, etc. shall be only by permit and at points approved by the New Britain Water Department. The contractor's equipment must be equipped with a backflow preventor device and/or an air gap. (see detail of approved air gap device)

2. Before any hydrant is used, the operator will strictly adhere to the following rules and regulations as set forth by the Board of Water Commissioners governing the proper use of a fire hydrant
 - a. Operator will refer to the "authorized hydrant use map" and choose one of the hydrants indicated.

 - b. Before using hydrant, operator will call Station B, or telephone 826-3536, and inform the Water Department of the location of the hydrant to be used. (After hours calls will be answered by our Filtration Plant)

 - c. After approval is given, the operator will use the hydrant in the exact order as follows:
 1. Remove nozzle cap and attach a guard valve with:
 - A. 2 1/2" hose to wash street.



- B. RPZ device when flushing sewers, filling sweepers, filling Vac-All, filling water wagon, or rodding. (Note: An approved air gap is an acceptable alternative to the use of a RPZ device)
2. With guard valve closed, open hydrant **slowly** all the way.
3. Regulate flow through guard valve.
4. When job is done, close guard valve.
5. Close hydrant slowly!! Then open guard valve to insure hydrant is shut down. If it is, remove guard valve, check to make sure barrel has drained, and inform the Water Department that you are finished using the hydrant.

If unable to shut the hydrant down, do not force the hydrant closed. Leave everything in place and call the Water Department and report the location of the hydrant and the problem.

Under no circumstances are Cory hydrants to be used or hydrants painted RED. Do not use pipe wrenches to open and close hydrants. If when you are opening the hydrant you feel a chatter, shut down **slowly**, and call the Water Department. In any event, call the Water Department anytime you have a problem or are in doubt of what you are doing.

NO HOSES FROM HYDRANTS WITHOUT AN RPZ DEVICE ATTACHED SHALL BE INSERTED INTO MANHOLES, CATCHBASINS, WATER WAGONS, VAC-ALLS, SEWER PIPES, ETC..



CITY OF NEW BRITAIN
NEW BRITAIN, CONNECTICUT
WATER DEPARTMENT



BOARD OF WATER COMMISSIONERS

HYDRANT USE PERMIT

I _____, hereby make application for a hydrant use permit at

_____ for the purpose of _____
on (date) _____.

USE OF HYDRANT

FROM _____ TO _____
PERMIT FEE PAID _____ YES _____ NO.

I understand no permit will be issued unless the New Britain Water Department's water supply is protected from back-siphonage or back pressure by my installing a reduced pressure zone type backflow preventer as determined by the Superintendent of Distribution or his agent.

_____ Date _____ Signature

Approved: _____
Superintendent of Distribution Date

NOTES:

cc: File



FIRE FLOW TESTS

NEW BRITAIN WATER DEPARTMENT

THE NEW BRITAIN WATER DEPARTMENT WILL ALLOW FIRE FLOW TESTS 7:00 A.M. -3:30 P.M. DURING OUR ANNUAL 10 WEEK FLUSHING PROGRAM, APRIL THROUGH JUNE, OR AFTER 8:00 P.M. DURING THE REST OF THE YEAR.

FOR TESTS CONDUCTED AFTER 8:00 P.M., THE FOLLOWING GUIDELINES MUST TAKE PLACE:

1. THE COMPANY CONDUCTING THE FIRE FLOW TEST MUST TAKE OUT AN AD IN THE HERALD NEWSPAPER. THIS AD MUST APPEAR THE NIGHT BEFORE THE TEST, AND BE LOCATED ON THE NEW BRITAIN NEWS PAGE. A SAMPLE OF THE AD TO BE USED IS ATTACHED.
2. THE COMPANY CONDUCTING THE FIRE FLOW TEST WILL PROVIDE ALL THEIR OWN GAGES.
3. THE WATER DEPARTMENT WILL BE REIMBURSED FOR THE AMOUNT OF TIME OUR STANDBY/SHOP MAN SPENDS OPERATING THE HYDRANTS. NO ONE IS TO OPERATE THE HYDRANTS OTHER THAN A REPRESENTATIVE OF THE NEW BRITAIN WATER DEPARTMENT.
4. A WRITTEN COPY OF THE RESULTS MUST BE SENT TO US FOR OUR RECORDS.

FOR TESTS CONDUCTED DURING OUR FLUSHING PROGRAM, NO AD IS NECESSARY IF THE HYDRANT(S) TO BE FLOWED IS IN THE AREA WE ARE CURRENTLY FLUSHING. ANY OTHER AREA WILL REQUIRE AN AD. THERE WILL BE NO CHARGE FOR FLOWING THE HYDRANT.

#2 & #4 WILL STILL APPLY.



DOMESTIC WATER LINES WITH FIRE SPRINKLERS

Installation of sprinkler heads off the domestic water supply in residential homes may be allowed per State of Connecticut Life Safety Code 101-15, 7-7.1.2.

The New Britain Water Department will allow on existing structures only, up to six (6) sprinkler heads off residential metered domestic water lines.

When such installations are allowed by the fire department a plumbing schematic shall be provided to the Water Department by the owner or his agent for approval showing all pertinent information including location of tie ins, size of pipelines, type of material, number of heads.

All valves used on the fire supply branch shall be the indicating type.

The new sprinkler line will be looped internally to insure against stagnated water being backsiphoned into the internal plumbing or the distribution system. The actual connection of sprinklers to water system shall be 'done by licensed plumber. The sprinkler connections shall be properly flushed and disinfected before activation.

Proper initial and periodic inspection will be required by the Water Department to insure no illegal cross connections or theft of services occurs.

The owner of the building shall submit a notarized letter to the Water Department relieving the Water Department of any responsibility in the event the sprinkler heads fail to perform as designed. Water Meters are not UFLM approved for fire flows. If required flow or pressure are not available in the event of a fire, the New Britain Water Department will not be held liable for failing to provide such pressure or flow. If we enter a residential home to replace a water meter, or terminate water service for non payment, we will not be held liable in the event a fire occurs during the time.

The existing policy will be followed with regard to non-residential property. All new construction, which requires separate fire and domestic services, will not be covered under this regulation.



CITY OF NEW BRITAIN
NEW BRITAIN, CONNECTICUT
WATER DEPARTMENT



 Date

Board of Water Commissioners
 1000 Shuttle Meadow Ave.
 New Britain, Connecticut 06052

Dear Sir:

I own the property at _____, New Britain, Connecticut, and will be installing a sprinkler line with _____ heads off my domestic water service. This connection will be made by a licensed plumber after the water meter, will be looped internally, and will have an indicating gate valve installed.

I understand that the New Britain Water Department will not be held liable in the event that the sprinkler line fails either for lack of water pressure or flow, or in the event my water service has to be shut down by the Water Department.

I further stipulate that there will _____, will not _____, be any chemicals added to this sprinkler line. If chemicals are to be added, I understand the need for a reduced pressure zone device to prevent against contamination, and that this device will have to be inspected and tested once a year for which I will be billed.

 Witness

 Witness

On this _____ day of _____, 20_____,
 _____ personally appeared before me.

 Notary

 Date



NOTICE TO ALL EXCAVATING CONTRACTORS

THE NEW BRITAIN WATER DEPARTMENT WAS RECENTLY CITED BY OSHA FOR IMPROPER SHORING USED WHILE WORKING IN AN EXCAVATED AREA. AS A RESULT, THE NBWD HAS IMPLEMENTED NEW PROCEDURES TO BE FOLLOWED BY OUR LINE PERSONNEL WITH REGARD TO SHORING EXCAVATED AREAS, AND THESE PROCEDURES WILL ALSO BE ADHERED TO BY CONTRACTORS WE PERFORM SERVICE AND WET TAPS FOR.

NO WATER DEPARTMENT EMPLOYEE WILL BE ALLOWED TO ENTER AN UNSAFE TRENCH OR EXCAVATED AREA. THE CONTRACTOR MUST SHORE UP THE AREA PER THE SAME REGULATIONS WE AT THE CITY ARE FOLLOWING. THESE REGULATIONS ARE SPELLED OUT IN OSHA HANDOUT #2226, AND MORE SPECIFICALLY IN SUBPART P, SECTIONS 1926.650, 1926.651, 1926.652, & 1926.653. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN & ADHERE TO ALL OSHA REGULATIONS REGARDING SHORING.

BOARD OF WATER COMMISSIONERS



NOTICE TO ALL BUILDING CONTRACTORS

EFFECTIVE IMMEDIATELY, ALL NEW BUILDINGS WHICH WILL BE SERVICED BY THE NEW BRITAIN WATER DEPARTMENT WILL HAVE A 1/4" DIAMETER HOLE PRE-DRILLED BY THE BUILDER TO FACILITATE THE INSTALLATION OF A REMOTE METER READING DEVICE. A WIRE WILL THEN BE THREADED THROUGH THE HOLE AND LEFT IN PLACE TO ALLOW OUR INSTALLERS TO TIE ONTO AND SNAKE OUR REMOTE CABLE DURING THE INSTALLATION. THE FOLLOWING INSTRUCTIONS AND ILLUSTRATIONS ON THE OTHER SIDE ARE PROVIDED AS A GUIDE FOR THE BUILDER. WE SUGGEST CALLING THE WATER DEPARTMENT AT 826-3536 BEFORE DRILLING THE HOLE SO ONE OF OUR INSTALLERS CAN STOP AT THE SITE AND ASSIST THE BUILDER IN DETERMINING THE LOCATION.

PLANNING THE INSTALLATION

WHEN PLANNING THE LOCATION OF THE HOLE, SELECT A LOCATION AS CLOSE AS POSSIBLE TO WHERE THE WATER METER WILL GO, AND ALSO BE CONVENIENT FOR THE METER READER, PREFERABLY NEAR A WALK OR DRIVEWAY. AVOID LOCATIONS THAT WOULD REQUIRE THE READER TO CROSS A FLOWER BED OR LAWN. CALL THE WATER DEPARTMENT IF IN DOUBT OR IF YOU HAVE ANY QUESTIONS.

DRILLING CABLE ENTRANCE HOLE

BEFORE DRILLING THE CABLE ENTRANCE HOLE, CHECK THAT THE PROPOSED LOCATION IS SUITABLE (FREE OF INTERFERENCE BY BEAM ENDS, PIPES, OR OTHER OBSTRUCTIONS). THIS CAN BE DONE IN MOST INSTANCES BY MEASURING FROM A COMMON POINT TO BOTH THE INSIDE AND OUTSIDE OF THE BUILDING. SOMETIMES, DRILLING A SMALL HOLE OR DRIVING A LONG THIN NAIL THROUGH THE WALL WILL AID IN FINDING A SUITABLE LOCATION FOR THE HOLE. (THE ILLUSTRATIONS ON THE OTHER SIDE SHOW SOME TYPES OF CONSTRUCTION ENCOUNTERED AND SUGGESTED ENTRANCE HOLE LOCATIONS).

WHEN THE EXACT LOCATION OF THE HOLE HAS BEEN DETERMINED, DRILL A 1/4" DIAMETER HOLE (OR LARGER), SLANTING IT UPWARD SO THAT RAIN CANNOT ENTER. THREAD A WIRE THROUGH THE HOLE AND RUN THE WIRE TO WHERE THE METER IS TO GO. TIE OFF BOTH ENDS AND LEAVE IN PLACE. ANY FINISH WORK DONE AFTER HOLE IS DRILLED AND WIRE STRUNG MUST BE DONE IN SUCH A MANNER AS TO ALLOW US ACCESS TO THE WIRE. THE WATER DEPARTMENT WILL NOT BE RESPONSIBLE FOR REPAIRS NEEDED TO ALTER FINISH WORK.



CITY OF NEW BRITAIN
NEW BRITAIN, CONNECTICUT
WATER DEPARTMENT



REPORT OF COMMITTEE ON ORDINANCE AND SALARIES

The Honorable Mayor, and the Common Council of the City of New Britain: the undersigned beg leave to report the following:

ITEM # 24418-1

RE: Code of Ordinances be amended by adding new Division 4 of Chapter 23, Article IV, concerning Water Services

The Committee on Ordinance and Salaries at a regular meeting held on Wednesday evening, May 5, 1999 at 7:30 p.m. in the Council Chambers to which was referred the matter of Code of Ordinances be amended by adding new Division 4 of Chapter 23, Article IV, concerning Water Services respectfully begs leave to recommend that the following be accepted, adopted and legalized by printing.

AN ORDINANCE OF THE CITY OF NEW BRITAIN PROVIDING THAT THE CODE OF ORDINANCES, CITY OF NEW BRITAIN BE AMENDED BY ADDING A NEW DIVISION 4 OF CHAPTER 23, ARTICLE IV, CONCERNING WATER SERVICES.

BE IT ORDAINED BY THE COMMON COUNCIL OF THE CITY OF NEW BRITAIN that the Code of Ordinances, City of New Britain, be amended by adding a new Division 4 of Chapter 23, Article IV, to read as follow:

DIVISION 4. WATER SERVICES.

Sec. 23-170. Application for installation and renewal of a water service line.

An application for the installation of a new water service line, or for the renewal of an old water service line, shall be made by the owner of a property, or their agent, by obtaining a tapping permit at the office of the building department of the city of New Britain. The application must state fully and truthfully the purpose for which the water service line is to be used, provide the proper legal description of the property to be served and state the official city street and the street number to be served. An acceptable plot plan which shows the location of the water service line must accompany the permit application.



CITY OF NEW BRITAIN
NEW BRITAIN, CONNECTICUT
WATER DEPARTMENT



REPORT OF _____

The Honorable Mayor, and the Common Council of the City of New Britain: the undersigned beg leave to report the following:

ITEM # _____

RE: _____

PAGE 2

Sec. 23-171. Installation of a water service.

Corporation stops shall be installed by the water department only at the distribution main in the street. The charge for the installation of the corporation stop shall be at the rate established in the annual budget of the board of water commissioners and must be paid in advance by the owner of the property or its agent. The property owner or its agent shall excavate around the water main and properly shore the excavation site in order for the corporation stop to be installed by the water department. The water service line must lay in a straight line from the corporation stop to the inside of the building perpendicular to the distribution main. The water service line must have at least four cover to avoid freezing. All water service lines two inches (2") or smaller in diameter shall be type K, extra heavy, soft temper, cold drawn, seamless, deoxidized copper tubing, having a minimum ultimate tensile strength of not less than 30,000 pounds per square inch. Water service lines larger than two inches (2") shall be class 52 cement lined ductile iron pipe in accordance with ASA specifications. All water service lines shall have a shut off valve as close to the property line as possible.



CITY OF NEW BRITAIN
NEW BRITAIN, CONNECTICUT
WATER DEPARTMENT



REPORT OF _____

The Honorable Mayor, and the Common Council of the City of New Britain: the undersigned beg leave to report the following:

ITEM # _____

RE: _____

PAGE 3

The shut off valve must be accessible through a curb box bottom and top section. No water service line shall be laid in the same trench with a building drain or sewer pipe. The water service line shall be no closer to any sewer pipe than six feet at any point. The water service line installation shall be inspected and approved by a representative of the water department before being covered. If the water service line is covered prior to inspection, the water department representative will order the area to be uncovered and will not approve the line until an inspection has taken place and is approved.

Sec. 23-172. Ownership of service pipes.

Any and all maintenance and repair of the water service line between the water main in the street and the water meter is the responsibility of the owner of the property it serves.

Alderman Jeffrey W. Gacek

Chair



WATER TAP PERMIT POLICY

THE WATER DEPARTMENT WILL NOT ISSUE A TAP PERMIT UNLESS THE FOLLOWING GUIDELINES ARE STRICTLY ADHERED TO:

1. BEFORE COMING TO THE WATER DEPARTMENT TO MAKE APPLICATION FOR A WATER SERVICE, THE BUILDING DEPARTMENT AND THE PUBLIC WORKS DEPARTMENT MUST FILL IN THEIR PERTINENT SECTIONS OF THE PERMIT FORM, VERIFYING THAT THE PLUMBER AND CONTRACTOR ARE LICENSED AND BONDED TO DO THE WORK REQUIRED UNDER THE SCOPE OF THE PROJECT.
2. ONCE BOTH SECTIONS ARE COMPLETED, THE APPLICANT MUST BRING A PLOT PLAN SHOWING THE SIZE AND LOCATION OF THE WATER SERVICE ALONG WITH THE PERMIT FORM TO THE WATER DEPARTMENT. (PLOT PLAN SHOULD BE ATTAINED FROM DEVELOPER/CONTRACTOR WHEN YOU ARE HIRED)
3. ONCE THE PLOT PLAN IS REVIEWED BY THE WATER DEPARTMENT TO INSURE THE WATER SERVICE IS PERPENDICULAR TO OUR WATER MAIN; RUNS IN A STRAIGHT LINE INTO THE BUILDING; IS MINIMUM 1: AND OF K TYPE TUBING, THE APPLICANT WILL PAY FOR THE TAP AND SCHEDULE WHEN IT IS TO BE DONE. (MINIMUM 48 HOURS NOTICE REQUIRED)

ANY QUESTIONS CAN BE DIRECTED TO THE WATER DEPARTMENT AT:
(860)826-3536.



FREEZE SERVICE LINE TO REPLACE GATE VALVE POLICY

(Note: This service is offered only as a last resort. If the curb stop is functioning, you as the property owner shall get a plumber, or rent a key, to do the work. The City of New Britain Water Department ("City") will only freeze the line if the curb box valve is broken. If the curb box is filled with dirt, the City will clean it out at no charge.)

1. For requesting this service, I am required to send in, or hand deliver, a check in the amount of \$100.00, payable to Board of Water Commissioners. This will be for two hours work. Anything over 2 hours will be billed at the rate of \$25.00 per half-hour.

2. An appointment will be scheduled using two consecutive blocks of time for the ARB crew. The City's Meter Foreman or the Superintendent of Distribution shall make the appointment. No one else is to make the appointment.

If I know the size of the water service, and the size of the valve to be replaced, that information should be transmitted. If not, the City shall have an inventory of various sized valves in their service truck.

3. On the day of the appointment, the City's employees sent to freeze the line will make the determination in the field if they can, or cannot, freeze the pipe. If they cannot, I will be refunded the \$100.00, and will have to get a contractor to replace the curb stop valve.

4. If the City is able to freeze the line, and it lets go and it is necessary to crimp the pipe, my house will be without water. The City will attempt to hook my water line up hose to hose with a willing neighbor. Once this temporary hookup is installed, I must hire a contractor within a reasonable period of time to make any necessary repairs. If my neighbor is not willing to temporarily give me water service, then I will be without water until I hire a contractor to make the necessary repairs.

5. I have reviewed and understand the City of New Britain Ordinances listed on the reverse of this form.

6. I have read this agreement and have signed below and agree that in the event the City's attempt to freeze the water line causes damage to the internal piping, or the water service, I agree to hold the Board of Water Commissioners harmless as attested to by the authorized signature below. In that event, I agree to pay for all repairs which are required to restore the water service.

I agree to the above _____ Date _____



Section 23-121. Board to terminate service on violation.

(a) The Board of Water Commissioners shall order water service terminated in any premises where:

1. The person responsible for the payment of the water bill has failed, neglected or refused to pay the same within the time specified; or,
2. There has been a violation of any rules or regulations established by the Board.

(b) No person shall cause or allow water service terminated pursuant to the terms of this section to be resumed without prior consent of the Board of Water Commissioners. (Code 1970, & 23-7)

Section 23-141. Required. All water from the City's water works shall be supplied through one primary meter or a battery of primary meters for each separate service. All water passing through such meters will be billed to the owner of the property supplied as it appears in the records of the department, whether the water was used or wasted. Customers are advised to read their meters frequently in order that leaks of waste may be detected early and large bills prevented. (Code 1970, & 23-2(A): Ord. Of 2-72)

Section 23-144. Accessibility. Meters shall be easily accessible at all times so that they may be examined and read by employees of the department. They shall not be exposed to danger from frost or contamination. (Code 1970, & 23-2(D): Ord. Of 2-72)

Section 23-145. Repairs, etc., to be performed by department: stop and waste valves to be installed by owner. The installation, repair, conversion and disconnection of all meter shall be performed by employees of the water department only. Approved stop and waste valves shall be installed by property owner and kept in proper working condition at the expense of the property owner both before and after the meter on the service line to ease the removal or installation of the meters. (Code 1970, 23-2(E): Ord. of 2-72)

Section 23-146. Owner to pay for damages. If the meter or any part thereof, after being set, sustains damage by frost, hot water or any external cause by the occupant of the premises, property owner, or his agent the city's water department will repair or replace the meter and the owner shall reimburse the department for all costs incurred. (Code 1970, & 23-2(D): Ord. Of 2-72)

Section 23-172. Ownership of service pipes. Any and all maintenance and repair of the water service line between the water main in the street and the water meter is the responsibility of the owner of the property it serves.



PERMANENT RIGHT OF WAY AND EASEMENT

KNOW ALL MEN BY THESE PRESENTS, That

of the City of _____, County of _____ and

State of _____, in consideration of One Dollar (\$1.00) and other good and valuable considerations, receipt of which is hereby acknowledged, of the CITY OF NEW BRITAIN, a municipal corporation organized and existing under the laws of the State of Connecticut does give, grant, bargain, sell, convey and confirm unto the said CITY OF NEW BRITAIN, its successors and assigns forever, a water pipeline and permanent right of way and easement to lay, maintain, construct, operate, use, alter, repair and replace said water main and all appurtenances thereto in, through, on and over a certain piece or parcel of land located in the City of New Britain, County of Hartford, State of Connecticut, more particularly bounded and described on Schedule A attached hereto.

Within said parcel described on Schedule A, the grantee CITY OF NEW BRITAIN, or its agents, servants, employees, successors and assigns, shall have the right to enter in and upon said land and to pass over same to perform any work as may be part of said laying, maintaining, operating, construction, using, alteration, repair or replacement, to store materials to be incorporated in the work and park such equipment and tools as may be required to perform said work for the term of this easement.

Grantor reserves the right to use the easement area for purposes which will not interfere with grantee's full enjoyment of the rights hereby granted; provided that grantor shall not erect or construct any building or other obstruction on the strip, or diminish or substantially add to the ground cover over the pipe lines.

The Grantee shall, upon completion of the construction replace or restore, to the extent possible, the easement area to a condition equal to the original including all topsoil, lawns, bushes, shrubs, tree, fences, fields, incidental works or any and all other property removed or harmed in any way by reason of work done in the construction of said water main within the permanent right of way and easement described herein.

To have and to hold the above granted and bargained permanent right of way and easement unto it, the said CITY OF NEW BRITAIN, and unto its successors and assigns forever, to its own proper use and behoof.

And also, the said grantor, for himself, his heirs, successors and assigns, covenants with the said grantee, its successors and assigns; that at and until the ensembling of these presents he is well seized of the permanent right of way and easement as a good and indefeasible estate in fee simple; and that he has a good right to bargain and sell the same in manner and form as above



CITY OF NEW BRITAIN
NEW BRITAIN, CONNECTICUT
WATER DEPARTMENT



written; and that the same is free from all encumbrances whatsoever, except as hereinbefore mentioned.

And furthermore, the said grantor, by these presents binds himself, his heirs, successors and assigns to forever warrant and defend the above granted and bargained right of way and easement to it, the said CITY OF NEW BRITAIN, and to its successors and assigns, against all claims and demands whatsoever, except as hereinbefore mentioned or reserved.

IN WITNESS WHEREOF, I have hereunto set my hand and seal

This _____ day of _____, 20_____

WITNESSED:

STATE OF CONNECTICUT)
COUNY OF HARTFORD) ss: New Britain ' 20

Personally appeared, _____, signer hereof who swore that the signing hereof was his free act and deed, before me.

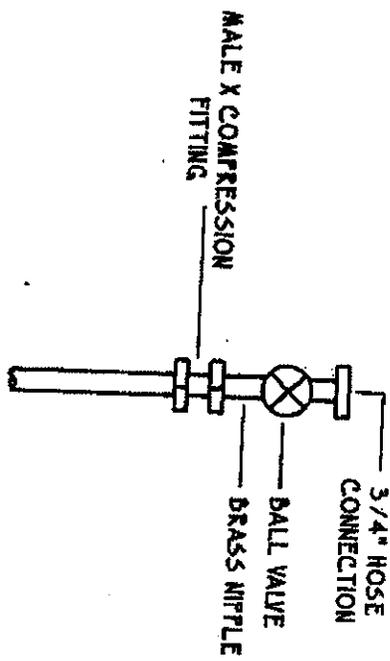
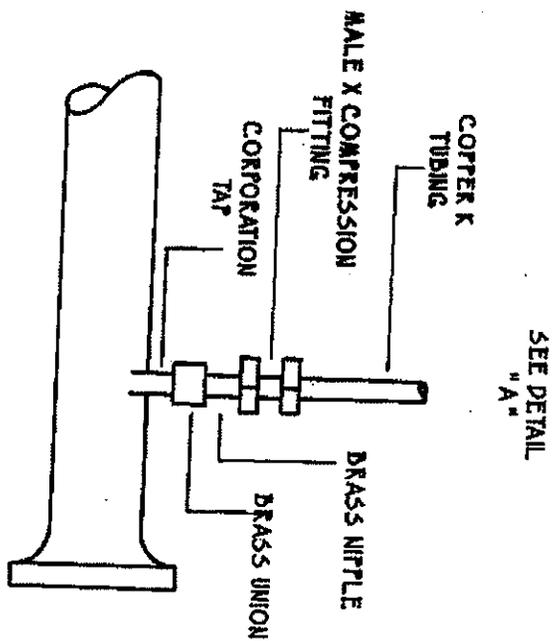
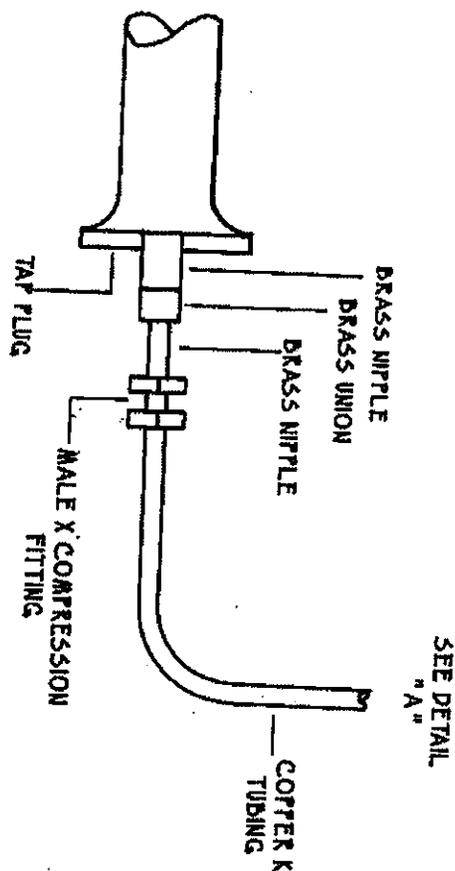
Notary Public
Commissioner of Superior Court



CITY OF NEW BRITAIN
NEW BRITAIN, CONNECTICUT
WATER DEPARTMENT



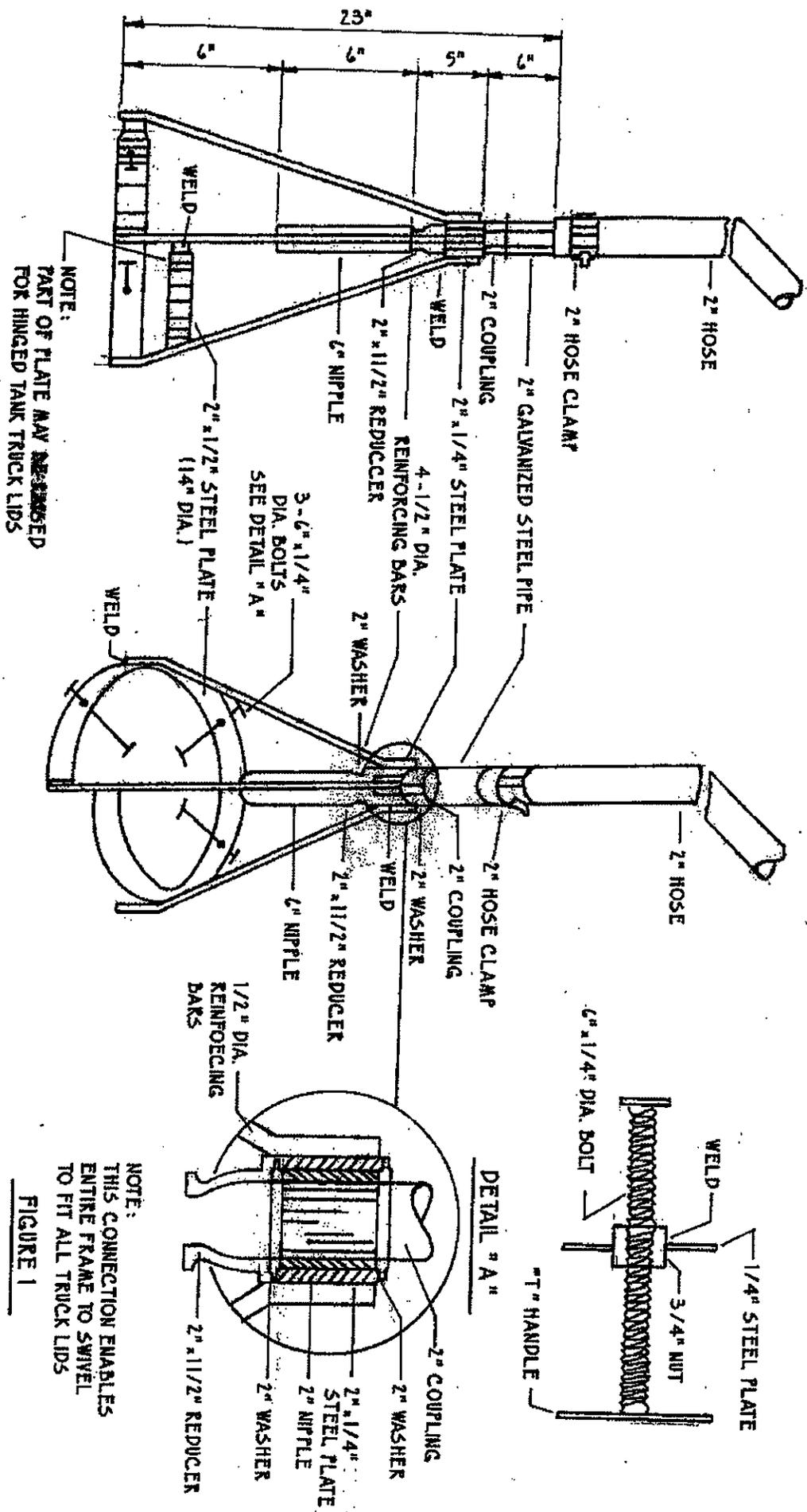
SCHEDULE A



DETAIL "A"

NOTES:
 CONTRACTOR MUST MAKE PROVISIONS TO SAFELY DISCHARGE WATER DURING FLUSHING SEGMENT.
 BACTERIA TEST IS TAKEN FROM COPPER STAND PIPE (NOT BLACK IRON/PVC).

BACTERIA SAMPLING



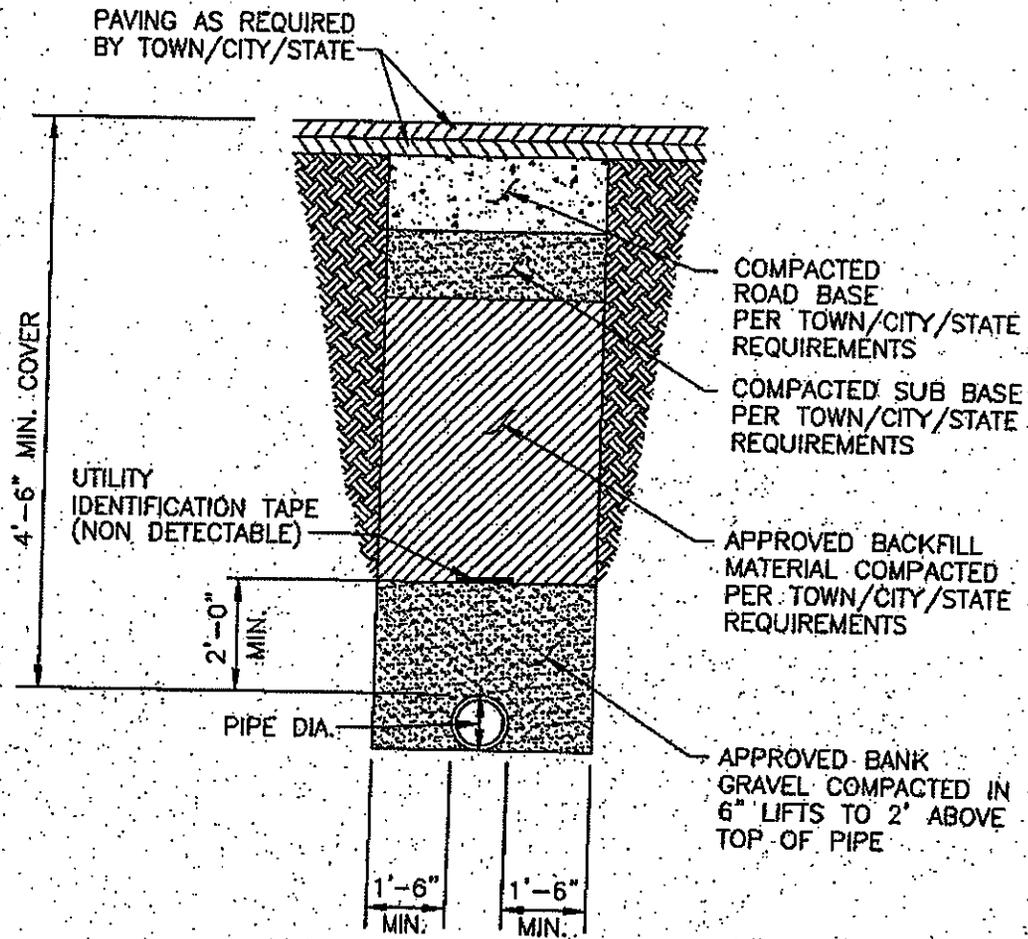
NOTE:
PART OF PLATE MAY BE EXPANDED
FOR HINGED TANK TRUCK LIDS

NOTE:
THIS CONNECTION ENABLES
ENTIRE FRAME TO SWIVEL
TO FIT ALL TRUCK LIDS

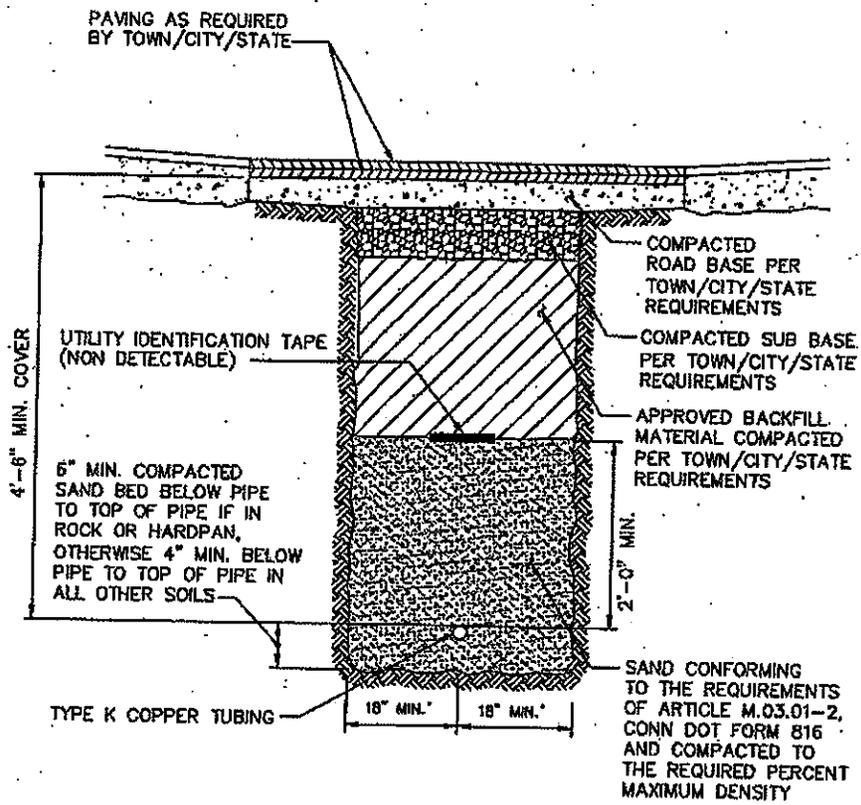
SUGGESTED CROSS-CONNECTION CONTROL FILLING DEVICE
 FOR WATER LOADING STATIONS

RECOMMENDED WATER WORKS STANDARDS
 1976 EDITION

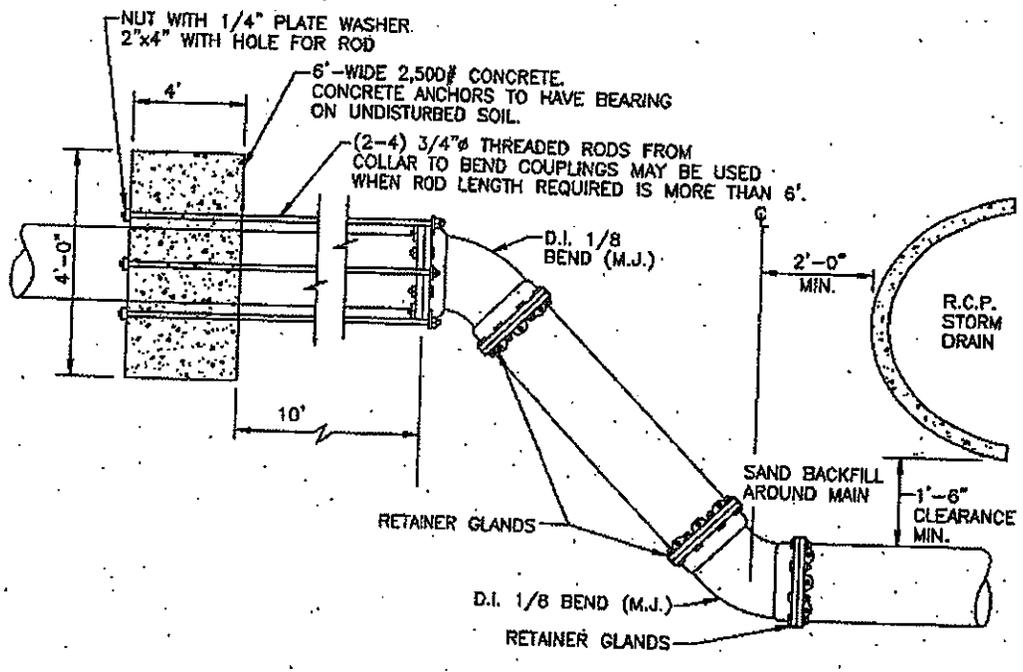
FIGURE 1



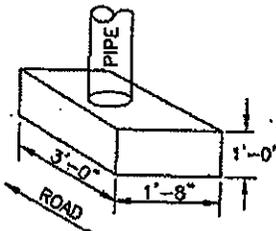
TYPICAL WATER MAIN TRENCH
CROSS SECTION



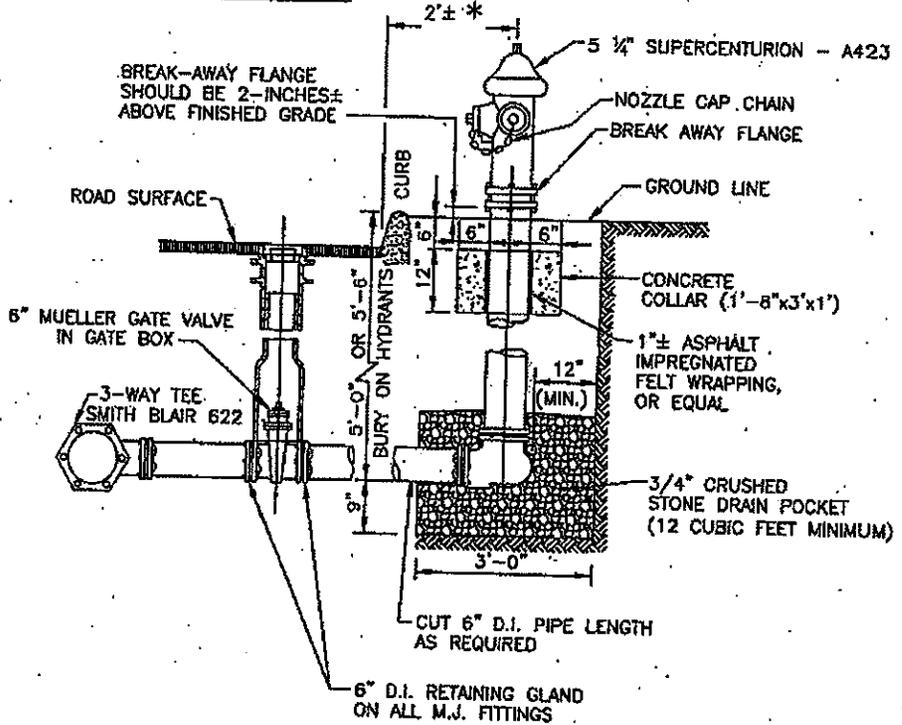
TYPICAL WATER SERVICE TRENCH CROSS SECTION
 (EXCAVATION SUPPORT NOT SHOWN)



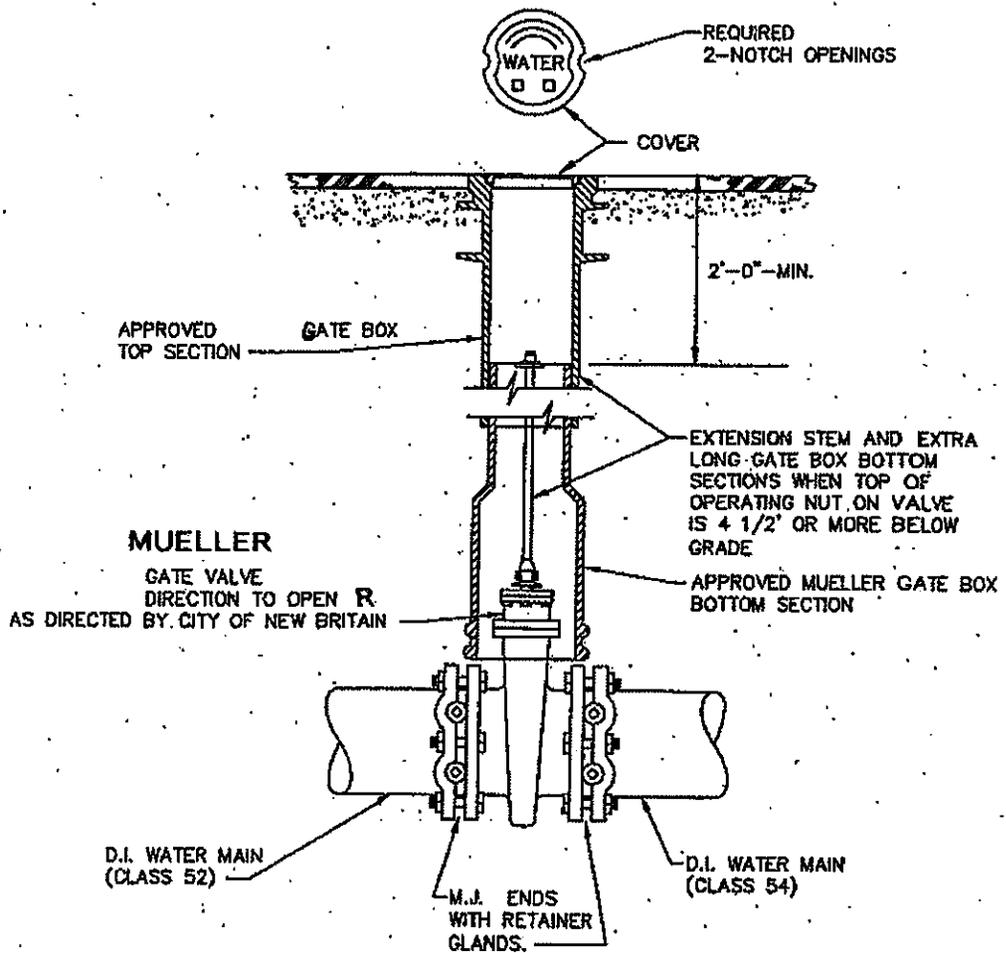
TYPICAL OFFSET



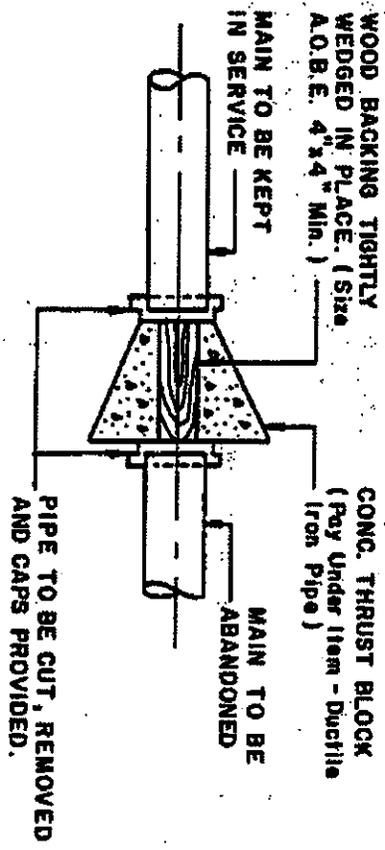
CONCRETE COLLAR



FIRE HYDRANT ASSEMBLY
TYPICAL RETAINING GLAND INSTALLATION

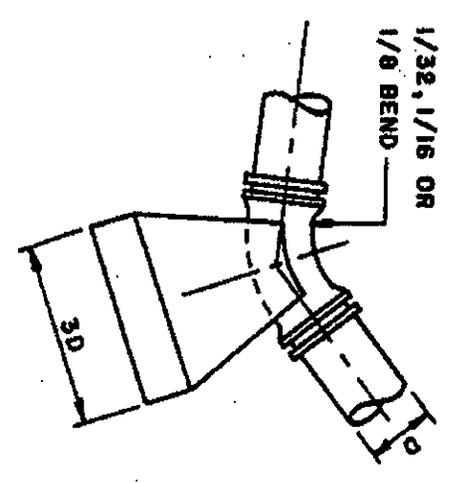


TYPICAL GATE VALVE INSTALLATION
12" & SMALLER

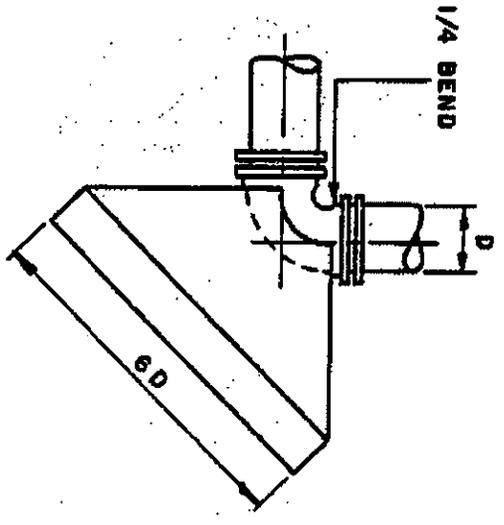


PLUGGING OF PIPE TO BE ABANDONED

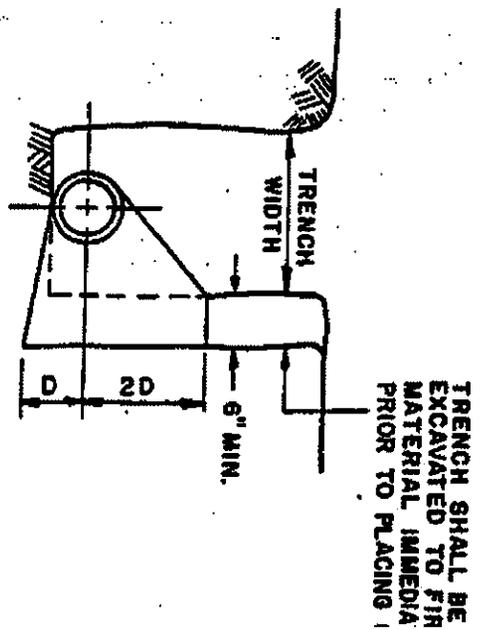
TYPE I



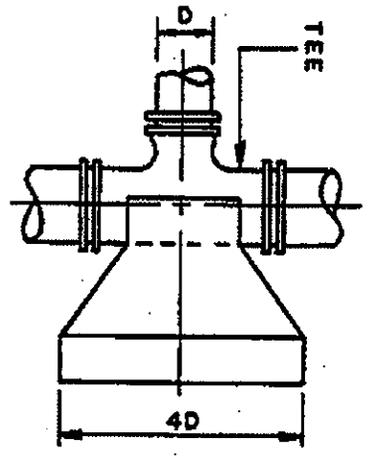
TYPE I



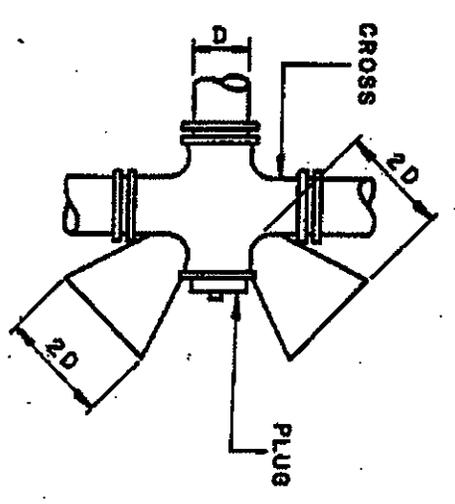
TYPICAL SECTION



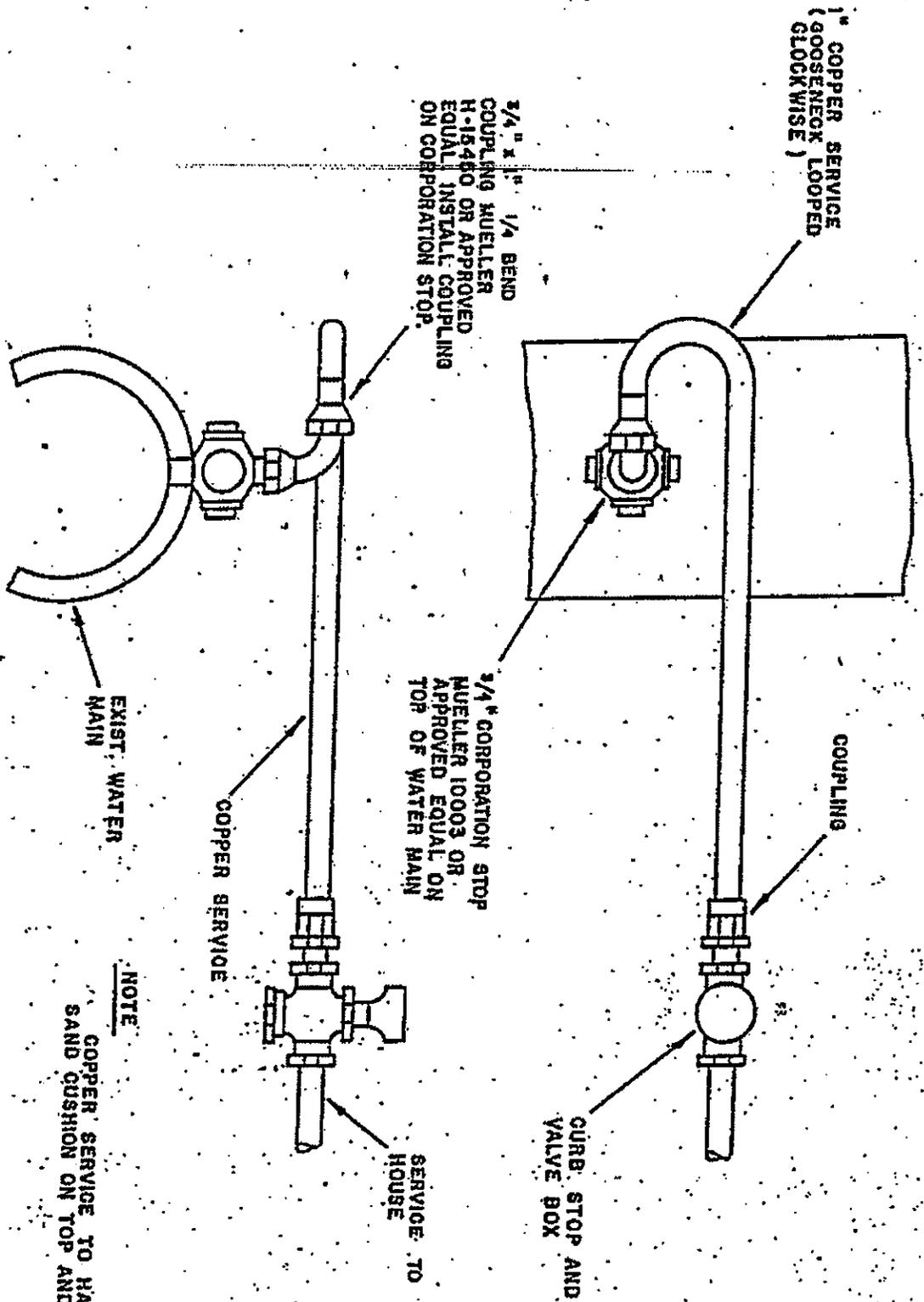
TYPE II



TYPE III



CONC. THRUST BLOCK DETAILS



1" COPPER SERVICE
(GOOSENECK LOOPED
CLOCKWISE)

3/4" x 1/4" BEND
COUPLING MUELLER
H-15450 OR APPROVED
EQUAL INSTALL COUPLING
ON CORPORATION STOP.

3/4" CORPORATION STOP
MUELLER 10003 OR
APPROVED EQUAL ON
TOP OF WATER MAIN

CURB STOP AND
VALVE BOX

COUPLING

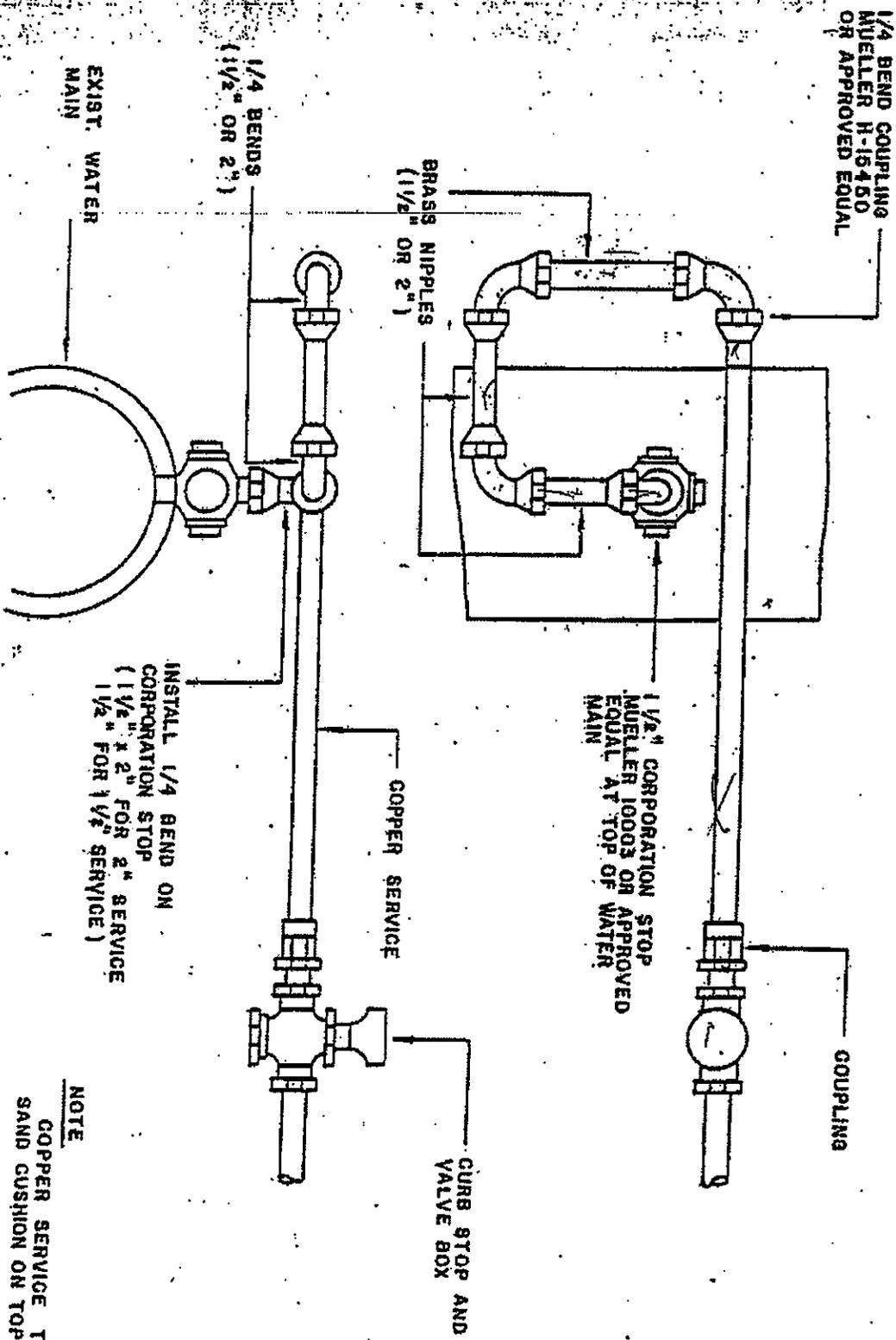
SERVICE TO
HOUSE

COPPER SERVICE

EXIST. WATER
MAIN

NOTE
COPPER SERVICE TO HAVE 1" MIN.
SAND CUSHION ON TOP AND SIDES.

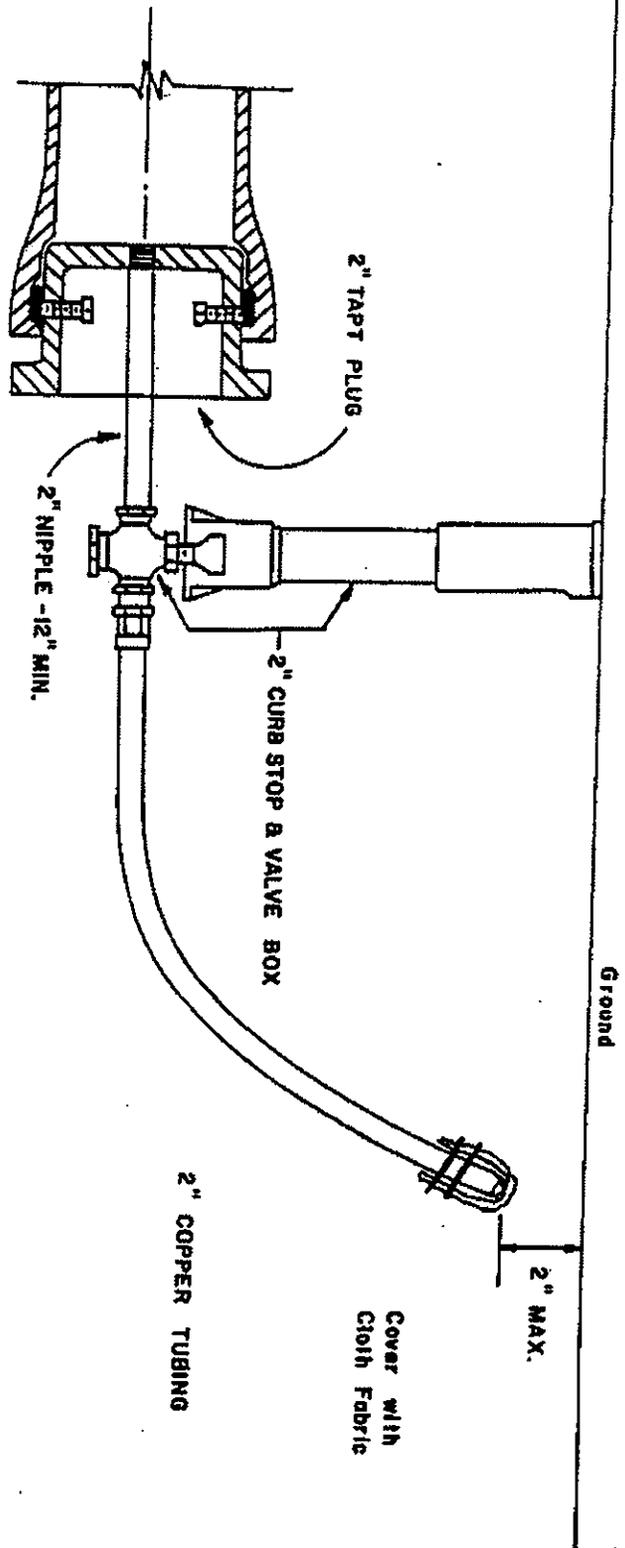
WATER SERVICE CONNECTION DETAIL
TYPICAL FOR 1" COPPER



WATER SERVICE CONNECTION DETAIL
 TYPICAL FOR 1 1/2" OR 2" COPPER

INSTALL 1/4 BEND ON CORPORATION STOP (1 1/2" x 2" FOR 2" SERVICE 1 1/2" FOR 1 1/2" SERVICE)

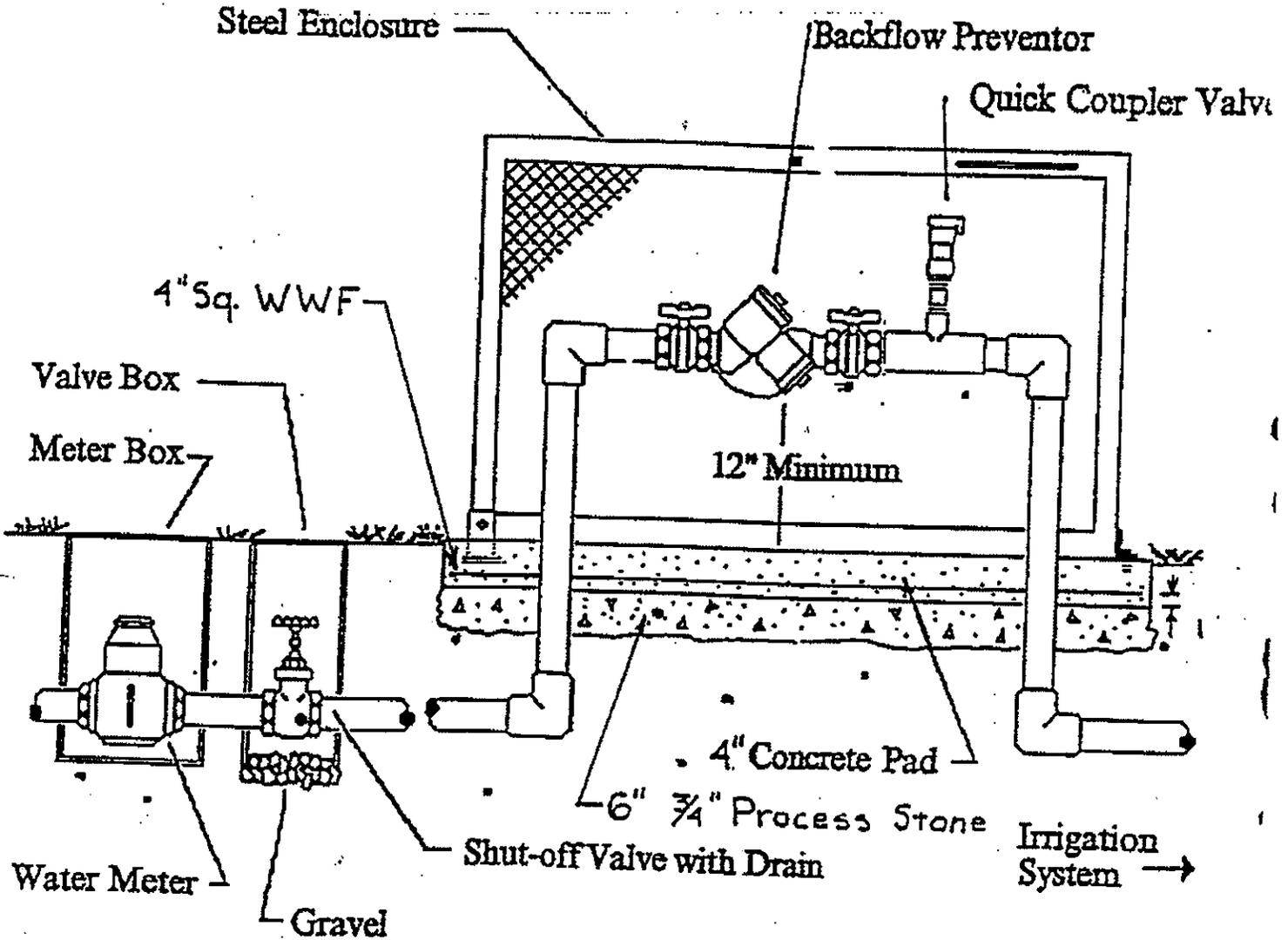
NOTE
 COPPER SERVICE TO HAVE 1' MIN. SAND CUSHION ON TOP AND SIDES.



2" BLOW-OFF DETAIL

TYPICAL INSTALLATION OF BACKFLOW PREVENTION DEVICE

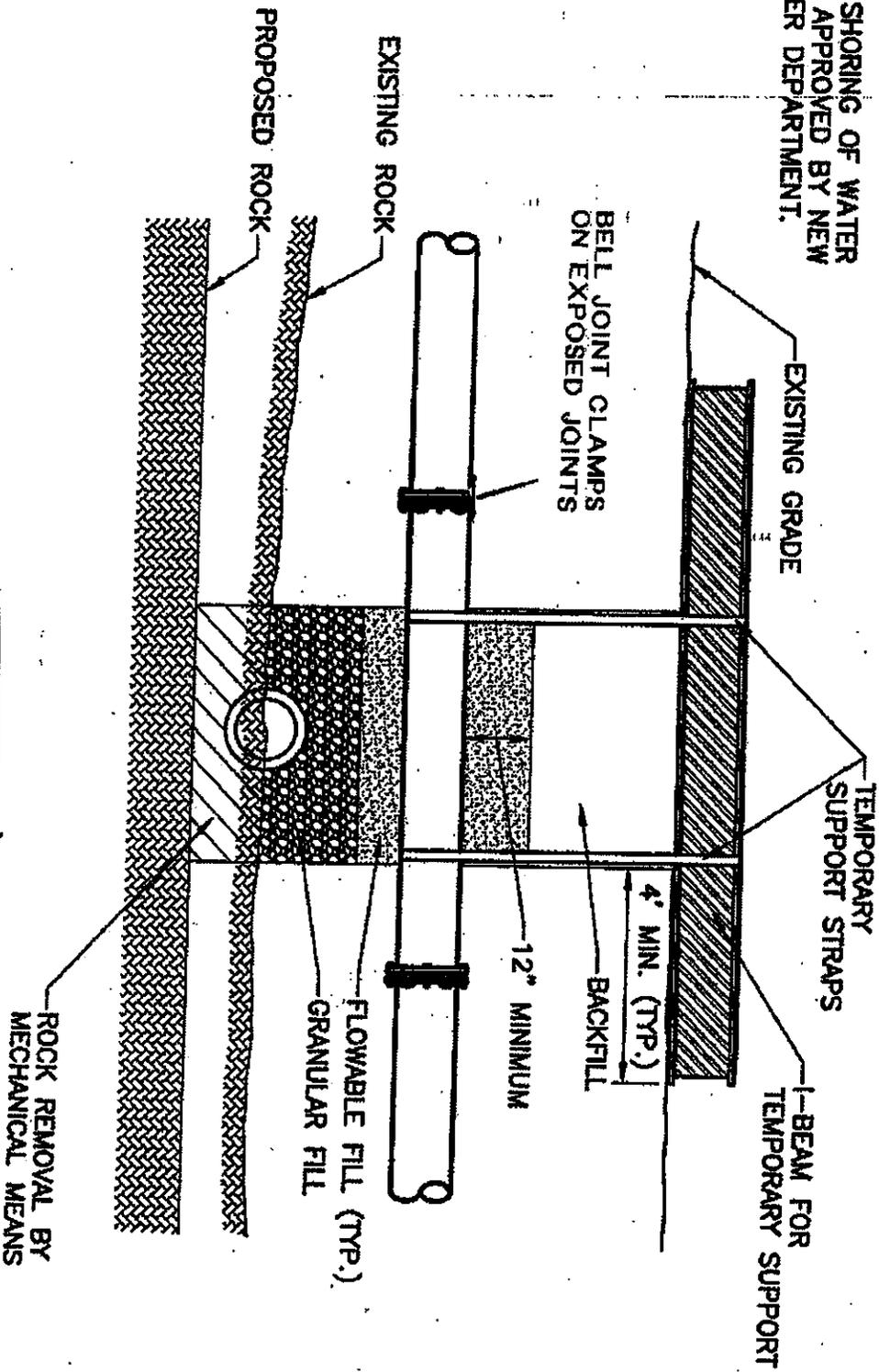
NTS



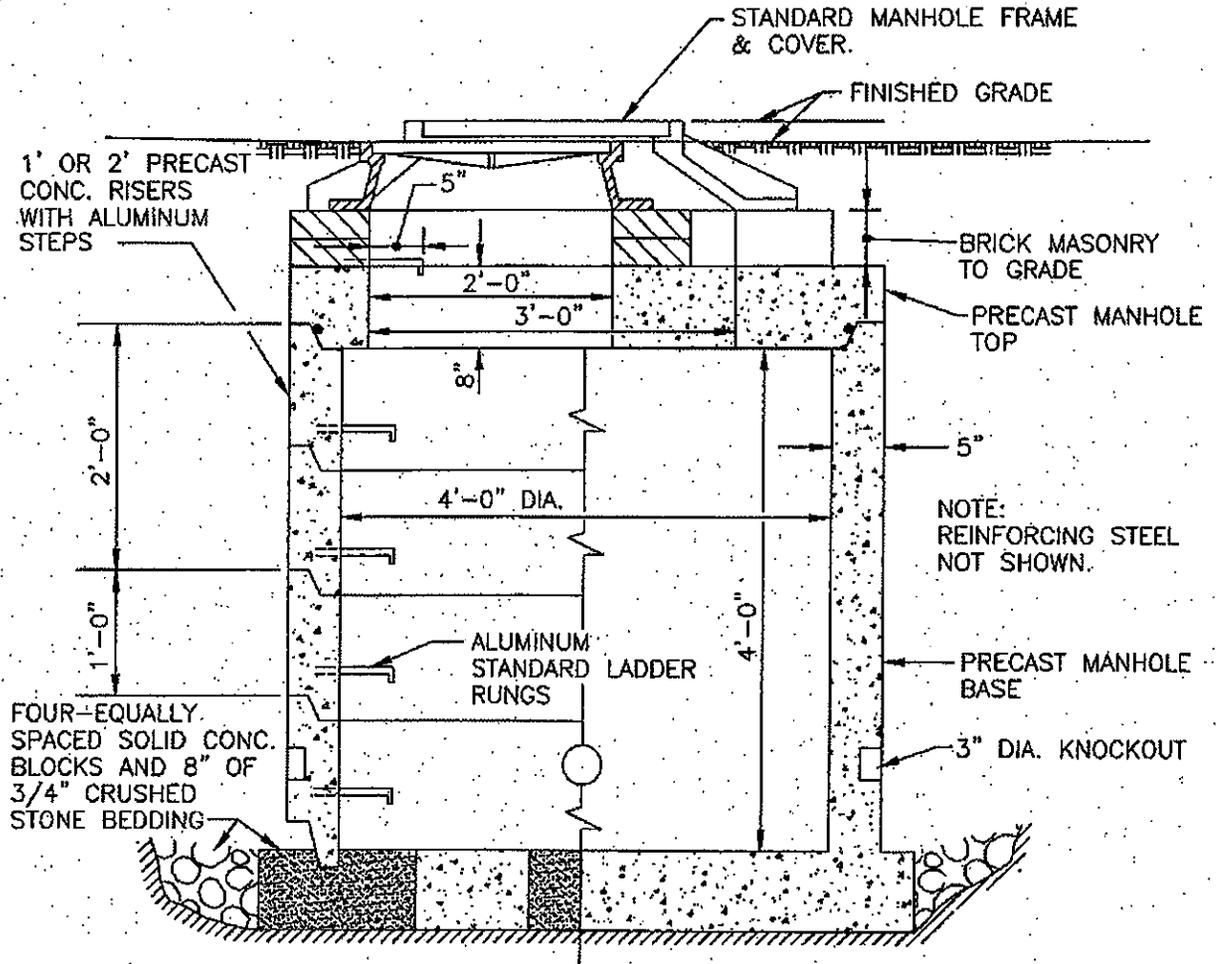
NOTE: Water meter and shut-off valve are drawn merely as a representation. Actual type and location may be different.

UTILITIES CROSSING UNDER WATER MAINS

NOTE:
TEMPORARY SHORING OF WATER
MAIN TO BE APPROVED BY NEW
BRITAIN WATER DEPARTMENT.



NOTE: PRECAST CONCRETE SPECIFICATIONS
 CONCRETE MIN. STRENGTH 4000 P.S.I. IN 28 DAYS
 STEEL REINFORCEMENT - A.S.T.M. C-478
 CONSTRUCTION JOINT - SEALED WITH BUTYL RUBBER GASKET.



PRECAST METER PIT
(1 1/2" TO 2" SERVICE)